EPA

United States
Environmental Protection
Agency

Solid Waste And
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December 1992
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# SUPERFUND: Progress at National Priority List Sites

# MARYLAND 1992 UPDATE

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December 1992

# NATIONAL PRIORITIES LIST SITES:

## Maryland

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Emergency & Remedial Response
Office of Program Management
Washington, DC 20460

U.S. Environmental Protection Agency
Region 5, Library (PL-12J)
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Chicago, IL 60604-3590

If you wish to purchase copies of any additional State volumes, contact:

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5285 Port Royal Road
Springfield, VA 22161
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The complete set of the 49 State reports may be ordered as PB93-963250.

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# INTRODUCTION

## A BRIEF OVERVIEW OF SUPERFUND

During the second half of the Twentieth Century, the environmental consequences of more than 100 years of industrialization in the United States became increasingly clear. Authors such as Rachel Carson wrote passionately about the often-hidden environmental effects of our modern society's widespread use of chemicals and other hazardous materials. Their audience was small at first, but gradually their message spread. Growing concern turned to action, as people learned more about the environment and began to act on their knowledge

The 1970s saw environmental issues burst onto the national scene and take hold in the national consciousness. The first Earth Day was observed in 1970, the year that the U.S. Environmental Protection Agency (EPA) was founded. By the end of the 1970s, Love Canal in New York and the Valley of the Drums in Kentucky had entered the popular lexicon as synonyms for pollution and environmental degradation.

### Superfund Is Established

The industrialization that gave Americans the world's highest standard of living also created problems that only a national program could address. By 1980, the U.S. Congress had passed numerous environmental laws, implemented by the EPA, but many serious hazardous waste problems were slipping through the cracks.

Responding to growing concern about public health and environmental threats from uncontrolled releases of hazardous materials, the U.S. Congress passed the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Popularly known as Superfund, CERCLA had one seemingly simple job—to uncover and clean up hazardous materials spills and contaminated sites.

### A Big Job

Few in Congress, the EPA, the environmental community, or the general public knew in 1980 just how big the nation's hazardous materials problem is. Almost everyone thought that Superfund would be a short-lived program requiring relatively few resources to clean up at most a few hundred sites. They were quite mistaken.

As the EPA set to work finding sites and gauging their potential to harm people and the environment, the number of sites grew. Each discovery seemed to lead to another, and today almost 36,000 hazardous waste sites have been investigated as potential hazardous waste sites. They are catalogued in the EPA's computerized database, CERCLIS (for the Comprehensive Environmental Re-

sponse, Compensation, and Liability Information System).

The damage to public health and the environment that each site in CERCLIS might cause is evaluated; many sites have been referred to State and local governments for cleanup. The EPA lists the nation's most serious hazardous waste sites on the National Priorities List, or NPL. (These Superfund sites are eligible for federally-funded cleanup, but whenever possible the EPA makes polluters pay for the contamination they helped create.) The NPL now numbers 1,275 sites, with 50 to 100 added each year. By the end of the century, the NPL may reach as many as 2,100 sites.

Superfund faces some of the most complex pollution problems ever encountered by an environmental program. Improperly stored or disposed chemicals and the soil they contaminate are one concern. More difficult to correct are the wetlands and bays, and the groundwater, lakes, and rivers often used for drinking water that are contaminated by chemicals spreading through the soil or mixing with storm water runoff. Toxic vapors contaminate the air at some sites, threatening the health of people living and working near by.

Superfund aims to control immediate public health and environmental threats by tackling the worst problems at the worst sites first. Wherever possible, Superfund officials use innovative treatment techniques—many developed or refined by the EPA—to correct hazardous materials problems once and for all. Many of the treatment techniques they use did not exist when the program was created.

The EPA Administrator had challenged Superfund to complete construction necessary for cleanup work at 130 NPL sites by the end of the 1992 federal fiscal year. By September 30, 1992, the end of fiscal year 1992, construction had been completed at a total of 149 NPL sites. Superfund is well on its way of meeting the Administrator's goal of completing construction at 200 NPL sites by the end of fiscal year 1993, and 650 sites by the end of fiscal year 2000.

## Quick Cleanup at Non-NPL Sites

Long-standing hazardous waste sites are not Superfund's only concern. The EPA also responds to hazardous spills and other emergencies, hauling away chemicals for proper treatment or disposal. Superfund teams perform or supervise responses at rail and motor vehicle accidents, fires, and other emergencies involving hazardous substances. They also evacuate people living and working near by, if necessary, and provide clean drinking water to people whose own water is contaminated. Removal crews also post warning signs and take other precautions to keep people and animals away from hazardous substances.

*Superfund employee prepares equipment for groundwater treatment.*

Quick Cleanups, or Removals, are not limited to emergencies. When cleanup crews at contaminated sites find hazardous substances that immediately threaten people or the environment, they act right away to reduce the threat or to remove the chemicals outright. As the EPA implements the Superfund Accelerated Cleanup Model (SACM), more and more sites will undergo quick cleanups, and many of these will be cleaned up completely without ever being included on the NPL. (See "Streamlining Superfund: The Superfund Accelerated Cleanup Model.")

Some of Superfund's most significant gains in public health and environmental protection have been won by the removal program. As of March 31, 1992, the Emergency Response Program had logged more than 2,300 removal completions since Superfund was established.

*Superfund employee removing drums from a Superfund site.*

## The Public's Role

Superfund is unique among federal programs in its commitment to citizen participation. Although the EPA is responsible for determining how dangerous a site is and how best to clean it up, the Agency relies on citizen input as it makes these decisions.

Community residents are often invaluable sources of information about a hazardous waste site, its current and previous owners, and the activities that took place there. Such information can be crucial to experts evaluating a site and its potential dangers.

Residents also comment on EPA cleanup plans by stating their concerns and preferences at public meetings and other forums and in formal, written comments to Agency proposals. The EPA takes these comments and concerns seriously, and has modified many proposals in response to local concerns. For, ultimately, it is the community and its citizens that will live with the results of the EPA's decisions and actions; it is only fair that citizens participate in the process.

## A Commitment to Communication

The Superfund program is very serious about public outreach and communication. Community relations coordinators are assigned to each NPL site to help the public understand the potential hazards present, as well as the cleanup alternatives. Local information repositories, such as libraries or other public buildings, have been established near each NPL site to ensure that the public has an opportunity to review all relevant information and the proposed cleanup plans.

The individual State volumes contain summary fact sheets on NPL sites in each State and territory. Together, the fact sheets provide a concise report on site conditions and the progress made toward site cleanups as of March 1992. The EPA revises these volumes periodically to provide an up-to-date record of program activities. A glossary of key terms relating to hazardous waste management and Superfund site cleanup is provided at the back of this book.

# INTRODUCTION

Superfund is, of course, a public program, and as such it belongs to everyone of us. This volume, along with other State volumes, comprises the EPA's report on Superfund progress to the program's owners for the year 1992.

# STREAMLINING SUPERFUND: THE SUPERFUND ACCELERATED CLEANUP MODEL

Historically, critics and supporters alike have measured Superfund's progress by the number of hazardous waste sites deleted from the NPL. Although easy enough to tally, this approach is too narrow. It misses the major gains Superfund makes by reducing major risks at the nation's worst hazardous sites long before all clean-up work is done and the site deleted. It also ignores the Removal Program's contributions to meeting Superfund's twin mandates of maximizing public health and environmental protection.

Renewing Superfund's commitment to rapid protection from hazardous materials, the EPA is streamlining the program. The Superfund Accelerated Cleanup Model, or SACM, will take Early Actions, such as removing hazardous wastes or contaminated materials, while experts study the site. SACM also will combine similar site studies to reduce the time required to evaluate a site and its threats to people and the environment. This way, immediate public health and environmental threats will be addressed while long-term cleanups are being planned.

Emergencies such as train derailments and motor vehicle accidents will continue to be handled expeditiously. Teams of highly trained technicians will swing into action right away, coordinating the cleanup and removal of hazardous substances to ensure public safety as quickly as possible.

## Breaking With Tradition

The traditional Superfund process begins with a lengthy phase of study and site assessment, but SACM will save time by combining separate, yet similar, activities. Each EPA Region will form a Decision Team of site managers, risk assessors, community relations coordinators, lawyers, and other experts to monitor the studies and quickly determine whether a site requires Early Action (taking less than five years), Long-term Action, or both.

While the site studies continue, the Decision Team will begin the short-term work required to correct immediate public health or environmental threats from the site. Besides removing hazardous materials, Early Actions include taking precautions to keep contaminants from moving off the site and restricting access to the site. Early Actions could eliminate most human risk from these sites, and Superfund will further focus its public participation and public information activities on site assessment and Early Action.

## Long-Term Solutions

While Early Actions can correct many hazardous waste problems—and provide the bulk of public health and environmental protection—some contamination will take longer to correct. Cleanups of mining sites, wetlands, estuaries, and projects involving incineration of contaminants or restoration of groundwater can take far longer than the three to five years envisioned for Early Actions. Under SACM, these sites will be handled much as they are now.

Also under SACM, the EPA will continue its pursuit of potentially responsible parties who may have caused or contributed to site contamination. Expedited enforcement and procedures for negotiating potentially responsible party settlements will secure their participation. Superfund personnel will continue to oversee clean-up work performed by potentially responsible parties.

# HOW SUPERFUND WORKS

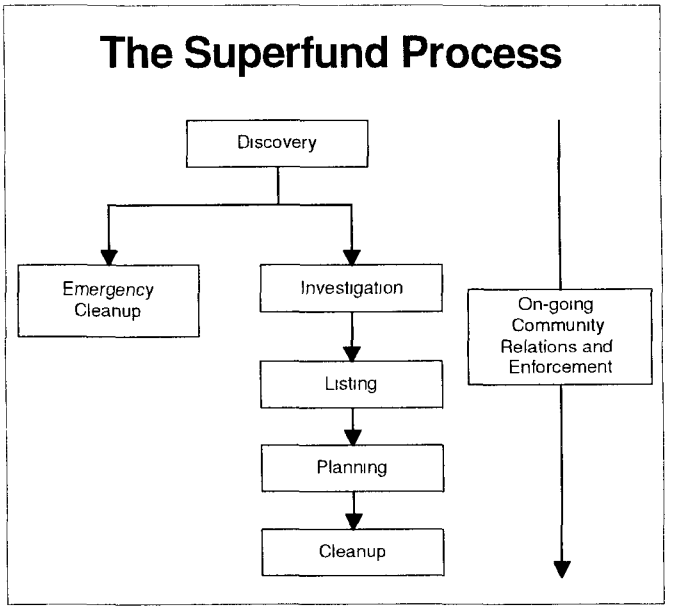
Each Superfund site presents a different set of complex problems. The same hazardous materials and chemicals often contaminate many sites, but the details of each site are different. Almost always, soil is contaminated with one or more chemicals. Their vapors may taint the air over and around the site. Contaminants may travel through the soil and reach underground aquifers which may be used for drinking water, or they may spread over the site to contaminate streams, ponds, and wetlands. The contaminating chemicals may interact with each other, presenting even more complicated cleanup problems.

Superfund's cleanup process is arduous and exacting. It requires the best efforts of hundreds of experts in science and engineering, public health, administration and management, law, and many other fields.

The average NPL site takes from seven to ten years to work its way through the system, from discovery to the start of long-term cleanup. Actual cleanup work can take years, decades if contaminated groundwater must be treated. Of course, imminent threats to public health or the environment are corrected right away.

The diagram to the right presents a simplified view of the cleanup process. The major steps in the Superfund process are:

- Site discovery and investigation to identify contaminants and determine whether emergency action is required;
- Emergency site work such as removing contaminants for proper treatment or disposal, and securing the site to keep people and animals away, if warranted by conditions at the site;
- Site evaluation to determine how people living and working nearby, and the environment, may be exposed to site contaminants;
- Detailed studies to determine whether conditions are serious enough to add the site to the National Priorities List of sites eligible for federally funded cleanup under Superfund;
- Selection, design, and implementation of a cleanup plan, after a thorough review of the most effective cleanup options, given site conditions, contaminants present, and their potential threat to public health or the environment.
- Follow-up to ensure that the cleanup work done at the site continues to be effective over the long term.




From the earliest stages, EPA investigators work hard to identify those responsible for the contamination. As their responsibility is established, the EPA negotiates with these "responsible parties" to pay for cleaning up the problem they helped create. This "enforcement first" policy saves Superfund Trust Fund monies for use in cleanups where the responsible parties cannot be identified, or where they are unable to fund cleanup work.

# THE VOLUME

## How to Use the State Book

The site fact sheets presented in this book are comprehensive summaries that cover a broad range of information. The fact sheets describe hazardous waste sites on the NPL and their locations, as well as the conditions leading to their listing ("Site Description"). The summaries list the types of contaminants that have been discovered and related threats to public and ecological health ("Threats and Contaminants"). "Cleanup Approach" presents an overview of the cleanup activities completed, underway, or planned. The fact sheets conclude with a brief synopsis of how much progress has been made in protecting public health and the environment. The summaries also pinpoint other actions, such as legal efforts to involve polluters responsible for site contamination and community concerns.

The fact sheets are arranged in alphabetical order by site name. Because site cleanup is a dynamic and gradual process, all site information is accurate as of the date shown on the bottom of each page. Progress always is being made at NPL sites, and the EPA periodically will update the site fact sheets to reflect recent actions and will publish updated State volumes. The following two pages show a generic fact sheet and briefly describe the information under each section.

## How Can You Use This State Book?

You can use this book to keep informed about the sites that concern you, particularly ones close to home. The EPA is committed to involving the public in the decision making process associated with hazardous waste cleanup. The Agency solicits input from area residents in communities affected by Superfund sites. Citizens are likely to be affected not only by hazardous site conditions, but also by the remedies that combat them. Site cleanups take many forms and can affect communities in different ways. Local traffic may be rerouted, residents may be relocated, temporary water supplies may be necessary.

Definitive information on a site can help citizens sift through alternatives and make decisions. To make good choices, you must know what the threats are and how the EPA intends to clean up the site. You must understand the cleanup alternatives being proposed for site cleanup and how residents may be affected by each one. You also need to have some idea of how your community intends to use the site in the future, and you need to know what the community can realistically expect once the cleanup is complete.

The EPA wants to develop cleanup methods that meet community needs, but the Agency only can take local concerns into account if it understands what they are. Information must travel both ways in order for cleanups to be effective and satisfactory. Please take this opportunity to learn more, become involved, and assure that hazardous waste cleanup at "your" site considers your community's concerns.

# THE VOLUME

**NPL LISTING HISTORY**

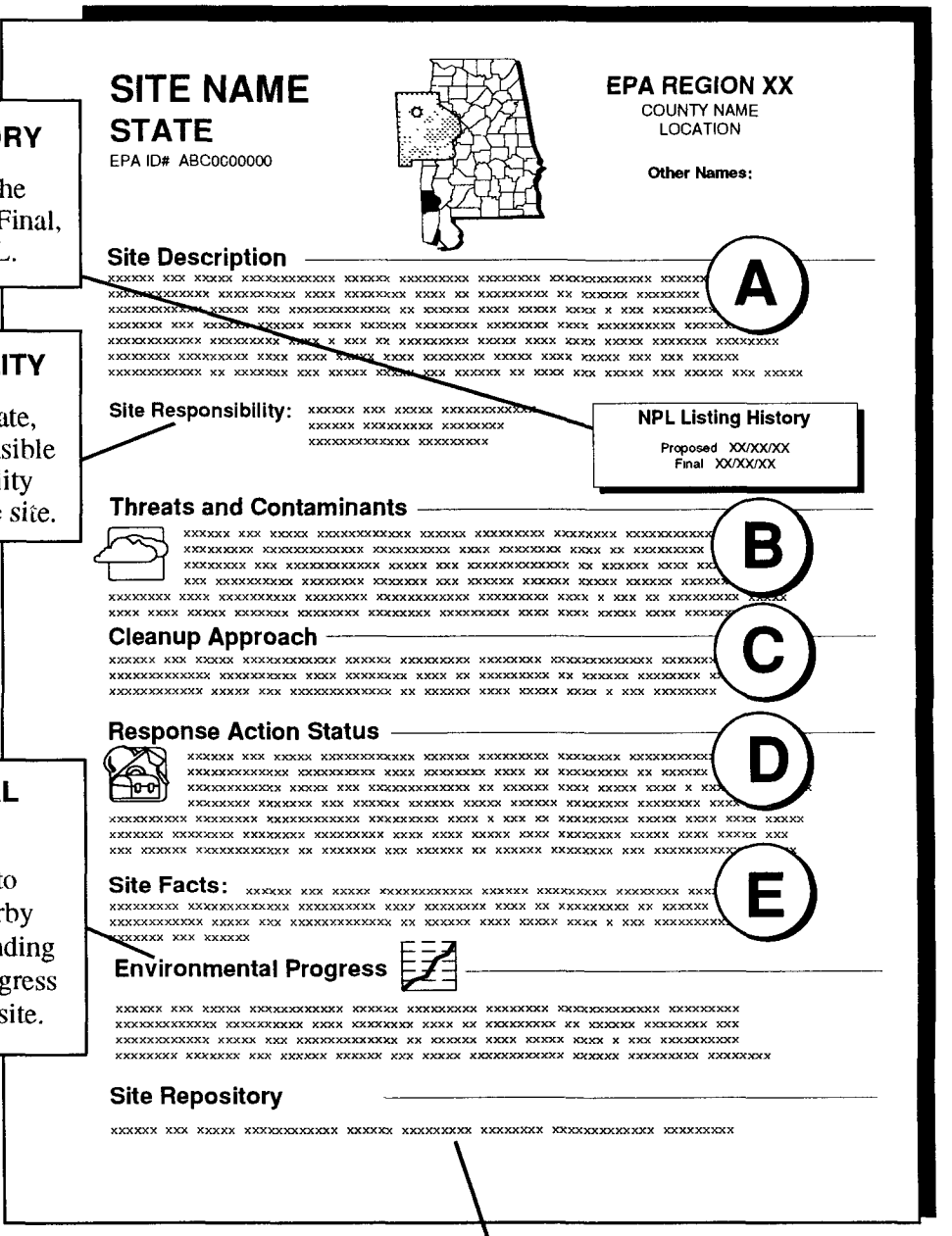
Provides the dates when the site was Proposed, made Final, and Deleted from the NPL.

**SITE RESPONSIBILITY**

Identifies the Federal, State, and/or potentially responsible parties taking responsibility for cleanup actions at the site.

**ENVIRONMENTAL PROGRESS**

Summarizes the actions to reduce the threats to nearby residents and the surrounding environment and the progress towards cleaning up the site.




**SITE REPOSITORY**

Lists the location of the primary site repository. The site repository may include community relations plans, public meeting announcements and minutes, fact sheets, press releases, and other site-related documents.

A

### SITE DESCRIPTION

This section describes the location and history of the site. It includes descriptions of the most recent activities and past actions at the site that have contributed to the contamination. Population estimates, land usages, and nearby resources give readers background on the local setting surrounding the site.

B

### THREATS AND CONTAMINANTS

The major chemical categories of site contamination are noted, as well as which environmental resources are affected. Icons representing each of the affected resources (may include air, groundwater, surface water, soil, and contamination to environmentally sensitive areas) are included in the margins of this section. Potential threats to residents and the surrounding environments arising from the site contamination also are described.

C

### CLEANUP APPROACH

This section contains a brief overview of how the site is being cleaned up.

D

### RESPONSE ACTION STATUS

Specific actions that have been accomplished or will be undertaken to clean up the site are described here. Cleanup activities at NPL sites are divided into separate phases, depending on the complexity and required actions at the site. Two major types of cleanup activities often are described: initial, immediate, or emergency actions to quickly remove or reduce imminent threats to the community and surrounding areas; and long-term remedial phases directed at final cleanup at the site. Each stage of the cleanup strategy is presented in this section of the summary. Icons representing the stage of the cleanup process (initial actions, site investigations, EPA selection of the cleanup remedy, engineering design phase, cleanup activities underway, and completed cleanup) are located in the margin next to each activity description.

E

### SITE FACTS

Additional information on activities and events at the site are included in this section. Often details on legal or administrative actions taken by the EPA to achieve site cleanup or other facts pertaining to community involvement with the site cleanup process are reported here.

## THE VOLUME

The "icons," or symbols, accompanying the text allow the reader to see at a glance which environmental resources are affected and the status of cleanup activities at the site.

### Icons in the Threats and Contaminants Section

Contaminated *Groundwater* resources in the vicinity or underlying the site. (Groundwater is often used as a drinking water source.)

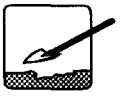
Contaminated *Surface Water and Sediments* on or near the site. (These include lakes, ponds, streams, and rivers.)

Contaminated *Air* in the vicinity of the site. (Air pollution usually is periodic and involves contaminated dust particles or hazardous gas emissions.)

Contaminated *Soil and Sludges* on or near the site. (This contamination category may include bulk or other surface hazardous wastes found on the site.)

Threatened or contaminated *Environmentally Sensitive Areas* in the vicinity of the site. (Examples include wetlands and coastal areas or critical habitats.)

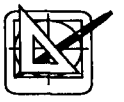
### Icons in the Response Action Status Section



*Initial, Immediate, or Emergency Actions* have been taken or are underway to eliminate immediate threats at the site.

*Site Studies* at the site to determine the nature and extent of contamination are planned or underway.

*Remedy Selected* indicates that site investigations have been concluded, and the EPA has selected a final cleanup remedy for the site or part of the site.



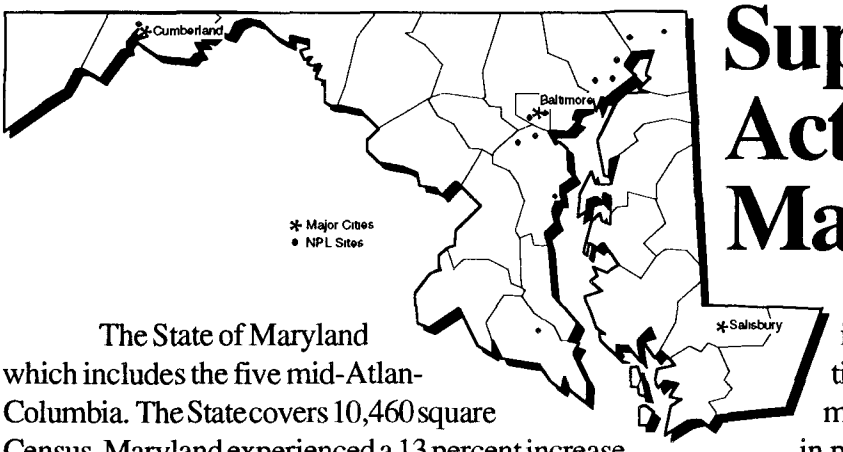
*Remedy Design* means that engineers are preparing specifications and drawings for the selected cleanup technologies.

*Cleanup Ongoing* indicates that the selected cleanup remedies for the contaminated site, or part of the site, currently are underway.

*Cleanup Complete* shows that all cleanup goals have been achieved for the contaminated site or part of the site.

# A SUMMARY OF THE STATE PROGRAM

# Superfund Activities in Maryland

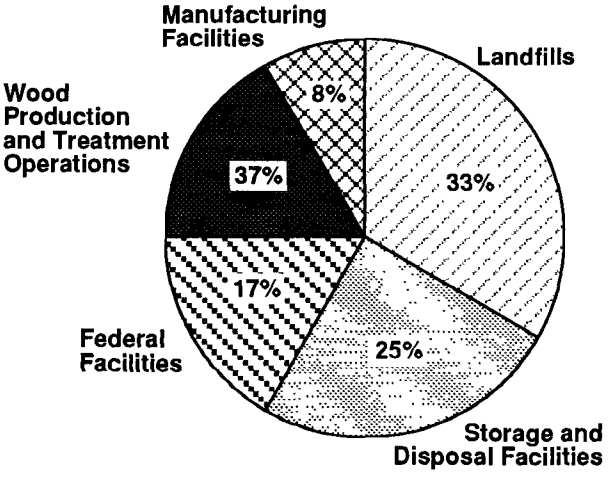



The State of Maryland is located within EPA Region 3, which includes the five mid-Atlantic States and the District of Columbia. The State covers 10,460 square miles. According to the 1990 Census, Maryland experienced a 13 percent increase in population between 1980 and 1990, and is ranked nineteenth in U.S. population with approximately 4,782,000 residents.

Title 7-Hazardous Material and Hazardous Substances, Subtitle 2-Controlled Hazardous Substances of the Annotated Code of Maryland, Environmental Article provides the State with enforcement authorities, including the right to compel polluters to conduct or pay for cleanup activities. While the State prefers to settle with polluters, it does have the authority to conduct cleanup activities itself and then recover the cost of cleanup at a later time in those cases where polluters are unable or unwilling to pay. The State may apportion liability among polluters if there is a reasonable basis upon which contributions to cleanup costs can be determined. The 1990 statute also created the Hazardous Substance Control Fund to pay for cleanup activities conducted by the State, including emergency response actions, studies and design activities, long-term cleanup activities, operation and maintenance activities, and the 10 percent contribution from the State required under the Federal Superfund program. Currently, 10 sites in the State of Maryland have been listed as final on the NPL; two have been deleted. No new sites have been proposed for listing in 1992.

## The Department of the Environment
implements the Superfund Program in the State of Maryland

### Activities responsible for hazardous waste contamination in the State of Maryland include:




### Facts about the 12 NPL sites in Maryland:

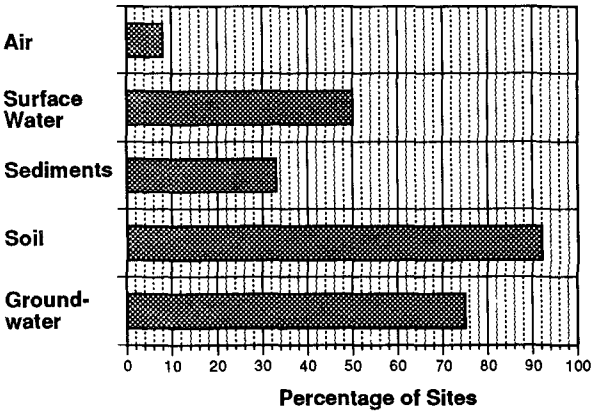
Immediate Actions (such as removing hazardous substances or restricting site access) were performed at nine sites.

Four sites endanger sensitive environments.

Ten sites are located near residential areas.

# Most Sites Have Multiple Contaminants and Contaminated Media:

*Media Contaminated at Sites*




*Contaminants Found at Sites*

| | Percentage of Sites |
|---|---|
| Heavy Metals | 83% |
| VOCs | 67% |
| PCBs | 25% |
| Creosotes | 25% |
| Cyanide | 25% |
| Pesticides/Herbicides | 17% |
| Plastics | 17% |
| Other* | 17% |
| Petrochemicals/Explosives | 8% |
| Acids | 8% |

*Other contaminants include ammonia compounds and phosphorus

## The Potentially Responsible Party Pays...

In the State of Maryland, potentially responsible parties are paying for or conducting cleanup activities at six sites.

## For Further Information on NPL Sites and Hazardous Waste Programs in the State of Maryland Please Contact:

| | | |
|---|---|---|
| ☎ EPA Region 3 Environmental Education and Outreach Branch | For information concerning community involvement | (215) 597-9370 |
| ☎ National Response Center | To report a hazardous waste emergency | (800) 424-8802 |
| ☎ The Department of the Environment Waste Management | For information about the State's responsibility in the Superfund Program | (410) 631-3304 |
| ☎ EPA Region 3 Site Assessment Section | For information about the Regional Superfund Program | (215) 597-8229 |
| ☎ EPA Superfund Hotline | For information about the Federal Superfund Program | (800) 424-9068 |

# THE NPL REPORT

## PROGRESS TO DATE

The following Progress Report lists all sites currently on, or deleted from, the NPL and briefly summarizes the status of activities for each site at the time this report was prepared. The steps in the Superfund cleanup process are arrayed across the top of the chart, and each site's progress through these steps is represented by an arrow (⇨) indicating the current stage of cleanup.

Large and complex sites often are organized into several cleanup stages. For example, separate cleanup efforts may be required to address the source of the contamination, hazardous substances in the groundwater, and surface water pollution, or to clean up different areas of a large site. In such cases, the chart portrays cleanup progress at the site's *most advanced* stage, reflecting the status of site activities rather than administrative accomplishments.

⇨ An arrow in the "Initial Response" category indicates that an emergency cleanup, immediate action, or initial action has been completed or currently is underway. Emergency or initial actions are taken as an interim measure to provide immediate relief from exposure to hazardous site conditions or to stabilize a site to prevent further contamination.

⇨ A final arrow in the "Site Studies" category indicates that an investigation to determine the nature and extent of the contamination at the site currently is ongoing or planned.

⇨ A final arrow in the "Remedy Selection" category means that the EPA has selected the final cleanup strategy for the site. At the few sites where the EPA has determined that initial response actions have eliminated site contamination, or that any remaining contamination will be naturally dispersed without further cleanup activities, a "No Action" remedy has been selected. In these cases, the arrows are discontinued at the "Remedy Selection" step and resume in the "Construction Complete" category.

⇨ A final arrow at the "Remedial Design" stage indicates that engineers currently are designing the technical specifications for the selected cleanup remedies and technologies.

⇨ A final arrow in the "Cleanup Ongoing" column means that final cleanup actions have been started at the site and currently are underway.

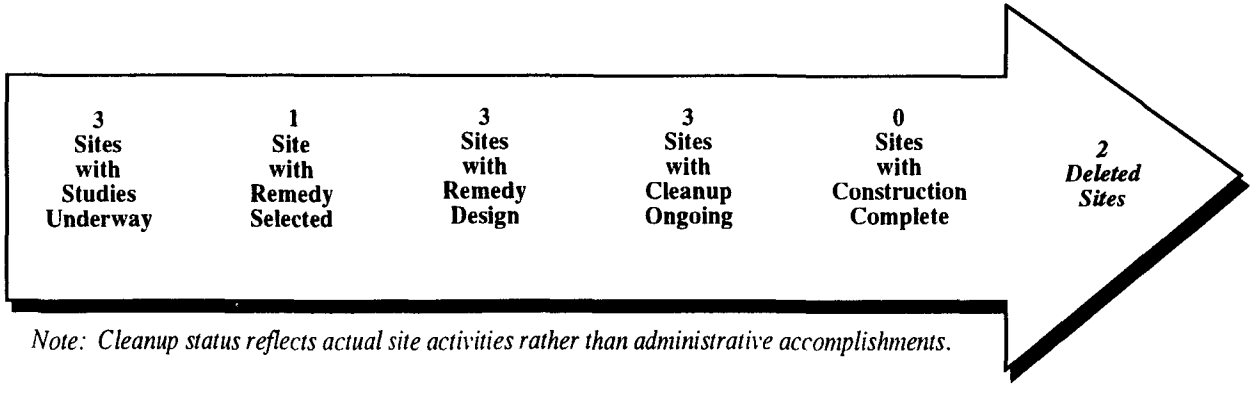
⇨ A final arrow in the "Construction Complete" category is used only when all phases of the site cleanup plan have been performed, and the EPA has determined that no additional construction actions are required at the site. Some sites in this category currently may be undergoing long-term operation and maintenance or monitoring to ensure that the cleanup actions continue to protect human health and the environment.

✓ A check in the "Deleted" category indicates that the site cleanup has met all human health and environmental goals and that the EPA has deleted the site from the NPL.

Further information on the activities and progress at each site is given in the site "Fact Sheets" published in this volume.

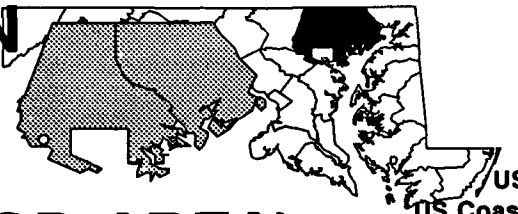
# Progress Toward Cleanup at NPL Sites in the State of Maryland

| Site Name | County | NPL | Date | Initial Response | Site Studies | Remedy Selected | Remedy Design | Cleanup Ongoing | Construction Complete | Deleted |
|---|---|---|---|---|---|---|---|---|---|---|
| ABERDEEN PROVING GROUND (EDGEWOOD AREA) | HARFORD/ BALTIMORE | Final | 02/21/90 | ⇨ | ⇨ | ⇨ | ⇨ | | | |
| ABERDEEN PROVING GROUND (MICHAELSVILLE LANDFILL) | HARFORD | Final | 10/04/89 | ⇨ | ⇨ | ⇨ | | | | |
| ANNE ARUNDEL COUNTY LANDFILL | ANNE ARUNDEL | Final | 02/11/91 | ⇨ | ⇨ | | | | | |
| BUSH VALLEY LANDFILL | HARFORD | Final | 03/31/89 | | ⇨ | | | | | |
| CHEMICAL METALS INDUSTRIES | BALTIMORE | Deleted | 12/30/82 | | ⇨ | ⇨ | ⇨ | ⇨ | ⇨ | ✓ |
| KANE & LOMBARD STREET DRUMS | BALTIMORE | Final | 06/01/86 | ⇨ | ⇨ | ⇨ | ⇨ | ⇨ | | |
| LIMESTONE ROAD | ALLEGHANY | Final | 09/01/83 | | ⇨ | ⇨ | ⇨ | | | |
| MID-ATLANTIC WOOD PRESERVERS | ANNE ARUNDEL | Final | 06/01/86 | ⇨ | ⇨ | ⇨ | ⇨ | | | |
| MIDDLETOWN ROAD DUMP | ANNE ARUNDEL | Deleted | 04/18/88 | ⇨ | ⇨ | ⇨ | ⇨ | ⇨ | ⇨ | ✓ |
| SAND, GRAVEL & STONE | CECIL | Final | 09/01/83 | ⇨ | ⇨ | ⇨ | ⇨ | ⇨ | | |
| SOUTHERN MARYLAND WOOD TREATING | ST. MARY'S | Final | 06/01/86 | ⇨ | ⇨ | ⇨ | ⇨ | ⇨ | | |
| WOODLAWN COUNTY LANDFILL | CECIL | Final | 07/01/87 | ⇨ | ⇨ | | | | | |




*Note: Cleanup status reflects actual site activities rather than administrative accomplishments.*

# ABERDEEN PROVING GROUND (EDGEWOOD AREA)



## MARYLAND

EPA ID# MD2210020036

**EPA REGION 3**

Harford and Baltimore Counties

**Other Names:**
**USA Aberdeen Proving Ground**
**US Coast Guard - Upper Chesapeake Range**
**USA Edgewood Arsenal**
**US Coast Guard - Poole Island Range**

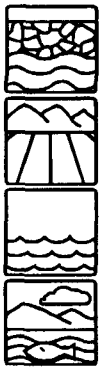
## Site Description

The Aberdeen Proving Ground (APG) occupies 79,000 acres of land and water near the head of the Chesapeake Bay. The APG consists of two areas that are listed separately on the NPL: the Edgewood area and the Michaelsville area. The Edgewood area is 13,000 acres and includes Gunpowder Neck, Pooles Island, Carroll Island, and Graces Quarters. The Edgewood area is separated from the Michaelsville area by the Bush River. The Edgewood area was used for the development and testing of chemical agent munitions. From 1917 to the present, the Edgewood area conducted chemical research programs, manufactured chemical agents, and tested, stored, and disposed of toxic materials. The Edgewood area has large areas of land and water and numerous buildings that are contaminated or suspected of contamination. Virtually all the land areas of the site reportedly are contaminated or potentially contaminated. Substances disposed of in the area include significant quantities of napalm, white phosphorus, and chemical agents. On-site surface waters include rivers, streams, and wetlands. There are 38,600 people living within 3 miles of the site. On-site residences house military personnel and military dependents. Four Edgewood-area standby water supply wells in the Canal Creek area previously served approximately 3,000 people. The Long Bar Harbor well field of the County Department of Public Works and the well field used by the Joppatowne Sanitary Subdistrict serve 35,000 people within 3 miles of the site.

**Site Responsibility:** This site is being addressed through Federal actions.

**NPL LISTING HISTORY**
Proposed Date: 04/01/85
Final Date: 02/21/90

## Threats and Contaminants

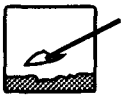


Preliminary on-site groundwater sampling has identified various metals, phosphorus, and volatile organic compounds (VOCs) including chloroform and benzene. Preliminary on-site soil contamination sampling has identified various VOCs, metals, and unexploded ordnance in surface and subsurface soil. Preliminary on-site surface water sampling has identified various metals, phosphorus, and VOCs. People who accidentally ingest or come in direct contact with contaminated groundwater, surface water, soil, or sediments may be at risk. The wetlands area is a designated habitat for bald eagles.

## Cleanup Approach

The site is being addressed in 12 stages: initial actions and 11 long-term remedial phases focusing on cleanup of the entire site, grouped here according to type of activity.

### Response Action Status



**Initial Actions:** As an initial action, the Army conducted an environmental monitoring program in 1977 and 1978 at the Edgewood area. Evidence was found of substantial groundwater and surface water contamination. Contamination at the Edgewood area has been identified in separate study areas, which will be addressed in future cleanup actions. In 1991, a leaking underground storage tank was removed from the Nike site. Other removal efforts include: testing and removing underground storage tanks, removing contaminated soil and taking post excavation samples, and removing surface wastes from the G-street location and transporting the wastes to an off-site disposal facility.

**O-Field, J-Field, Canal Creek, and Carroll Island:** Investigations have begun at these areas to determine the nature and extent of contamination present. The O-Field and J-Field study areas both require separate source control and groundwater cleanup phases. Large quantities of munitions were disposed of in varying methods at these areas. A landfill, several disposal pits, and burn areas and a former munitions production plant are among the targets for cleanup in these areas. White phosphorus, mustard gas, lewesite, and other chemical agents have been identified as the principal contaminants of these areas. The investigations taking place at these areas are scheduled to be completed at various times during 1993 and 1994.

**Carroll Island, Graces Quarters, Nike Site, and Bush River:** Investigations are underway at these areas to determine the nature and extent of contamination. These areas were principally use for testing chemical and biological agents, as well as for chemical warfare training. The Bush River area has been used mainly for chemical storage, but also contains a facility that has been used for radioactive waste material handling. It is believed that many of the chemicals tested or stored in these areas have contaminated the surrounding environment. Investigations at these areas are scheduled to be completed at various times during 1993 and 1994.

**O-Field Groundwater:** In late 1991, remedies were selected to address cleanup at the O-Field groundwater area. The remedies selected include: contaminated groundwater plume containment through downgradient extraction using newly installed wells; on-site treatment of extracted groundwater using chemical precipitation for inorganics removal followed by ultra-violet oxidation for organics destruction; and discharge of the treated groundwater to the Gunpowder River. The technical design of these remedies began in 1991, and is scheduled to be completed in 1993.

**Westwood Area:** The Westwood area covers approximately 523 acres and was used as a bomb drop-test area. There is an active solid waste landfill on site, which is licensed to receive only rubble and asbestos wastes. A spill of radioactive material occurred at the Westwood Area and reportedly was cleaned up. An investigation is underway to define the extent of contamination at this site. The investigation is scheduled to be completed in late 1993.

**Other Edgewood Areas:** This investigation includes all areas not covered by specific study areas. Other study areas may be added as deemed necessary by this investigation, which is planned for completion in late 1993.

**Site Facts:** The Aberdeen Proving Ground is participating in the Installation Restoration Program, a specially funded program established by the Department of Defense (DOD) in 1978 to identify, investigate, and control the migration of hazardous contaminants at military and other DOD facilities.

## Environmental Progress

The various initial actions taken at the site have reduced the threat of exposure to contaminants at the Aberdeen Proving Ground (Edgewood Area) site while final studies are underway and cleanup activities are being designed.

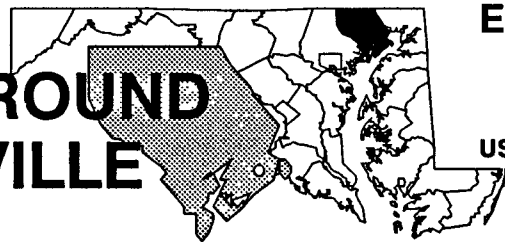
## Site Repository

Harford County Public Library, Aberdeen Branch, 21 Franklin Street, Aberdeen, MD 21001

# ABERDEEN PROVING GROUND (MICHAELSVILLE LANDFILL)

## MARYLAND

EPA ID# MD3210021355



**EPA REGION 3**

Harford County

**Other Names:**
**USA Edgewood Arsenal**
**US Coast Guard - Poole Island Range**
**US Coast Guard - Upper Chesapeake Range**

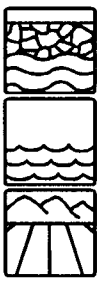
## Site Description

The Aberdeen Proving Ground (APG) occupies 79,000 acres of land and water near the head of the Chesapeake Bay. The APG consists of two areas that are listed separately on the NPL: the Michaelsville area and the Edgewood area. The Michaelsville area consists of 17,000 acres, including the 20-acre Michaelsville Landfill, the Phillips Field Disposal Area, the White Phosphorous Munition Burial Site, and numerous known or suspected solid waste management units that may be sources of contamination. The Michaelsville area is separated from the Edgewood area of the site by the Bush River. The area contains firing ranges, impact areas, vehicle test tracks, a fire training area, and laboratories in support of the testing activities. The Michaelsville Landfill operated as a sanitary landfill from the 1970s until 1980. The landfill received household garbage and refuse from the installation. The Phillips Field Disposal Area includes the active Phillips Field Landfill, Disposal Areas 1 through 4, and two grease pits. The active Phillips Field Landfill is a construction debris landfill and lies on top of an older landfill that is unlined and is about 16 feet deep. The White Phosphorous Munition Burial Site is believed to be within a 15-acre area in the Chesapeake Bay near Mosquito Creek. Allegedly, munitions were buried under 2 feet of soil at the location. The Michaelsville area is bordered on the west by the Bush River and to the northeast and south by the Chesapeake Bay. The area is drained by seven creeks plus the Bush River. There are 38,600 people living within 3 miles of the site. Residences located on the Michaelsville area of the site house military personnel and dependents. Harford County and town of Aberdeen have water supply wells on the APG property, near the site boundaries.

**Site Responsibility:** This site is being addressed through Federal actions.

**NPL LISTING HISTORY**
Proposed Date: 04/01/85
Final Date: 10/04/89

## Threats and Contaminants

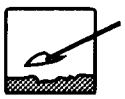


Preliminary groundwater and surface water sampling has identified various heavy metals, phosphorous, and volatile organic compounds (VOCs). Soil is contaminated with pesticides and polychlorinated biphenyls (PCBs). People who come in direct contact with or accidentally ingest contaminated groundwater, surface water, soil, or sediments may be at risk. There also is a possible risk of bioaccumulation of contaminants in the food chain.

## Cleanup Approach

The site is being addressed in six stages: initial actions and five long-term remedial phases focusing on cleanup of Michaelsville Landfill Source Control and Groundwater, the Phillips Field Disposal Area, the White Phosphorous Underwater Munitions Burial Site, the Aberdeen Fire Training Area, and other Michaelsville Areas.

### Response Action Status



**Initial Actions:** The Army has begun excavating pesticide-contaminated soil at the golf course and sampling is underway. Abandoned underground storage tanks also are being removed. Soil sampling around the tanks has been conducted to determine if additional excavation and soil removal are required. Visually contaminated soil has been removed at each location and post excavation soil samples have been taken. Wells are installed in each case where contaminated soil is left in place. In 1991, soil contaminated with pesticides was removed from the site and again from the golf course and incinerated at an off-site location.

**Michaelsville Landfill Source Control and Groundwater:** The Michaelsville Landfill operated as a sanitary landfill from 1970 until 1980 and received household garbage and refuse from the installation. In addition, there are reports of pesticides, waste oils, paints, solvents, and other materials having been dumped illegally in this landfill. The landfill originally was excavated to depths below the water table, but was later excavated to a higher depth. Two separate investigations are underway to determine the nature and extent of groundwater and source contamination. Upon completion of these investigations, scheduled for late 1993, appropriate cleanup technologies will be selected and cleanup will begin.

**Phillips Field Disposal Area:** The Phillips Field Disposal Area consists of the active Phillips Field Landfill, Disposal Areas 1-4, and two grease pits. The active Phillips Field landfill is a construction debris landfill located on top of an older landfill. Disposal Areas 1-4 consist of small landfills, borrow pits, and burn pits. Oil wastes suspected to include solvents and transformer oil were dumped in the grease pits until they closed in 1980. An investigation currently is underway to determine the nature and extent of contamination in this area and the most appropriate ways to cleanup this contamination. The investigation is scheduled for completion in 1993.

**White Phosphorous Underwater Munitions Burial Site:** This 15-acre site was reported to have munitions buried in soil and underwater. An investigation was completed in 1991, and it was determined that suspected contamination does not exist. Therefore, no further action is needed.

**Aberdeen Fire Training Area:** An investigation currently is underway to determine the nature and extent of contamination at the Aberdeen Fire Training Area. This investigation is scheduled for completion in late 1993.

**Other Michaelsville Areas:** This investigation includes all areas not included in the other specific study areas. Identified areas include, but are not limited to, the Kirk Incinerator, the Shell Washout Facility, settling tanks, Disposal Areas 5-11, and the Melt Load Facility. This investigation began in 1991 and is expected to be completed in 1994.

**Site Facts:** The EPA and the Army entered into an Interagency Agreement in March 1990. Under this agreement, the Army will conduct investigations and cleanup activities at the site. APG (Michaelsville Landfill) is participating in the Installation Restoration Program, a specially funded program established by the Department of Defense (DOD) in 1978 to identify, investigate, and control the migration of hazardous contaminants at military and other DOD facilities.

## Environmental Progress

The EPA and the Army have excavated contaminated soil at the golf course, around the underground storage tanks, and at other areas. Underground storage tanks are being removed, and the Army has isolated various areas of contamination at the Michaelsville site. Completed investigations at the White Phosphorous Underwater Munitions Burial Site concluded that no further cleanup actions were needed at this area. Further investigations leading to the final selection process for cleaning up the various remaining areas currently are being conducted.

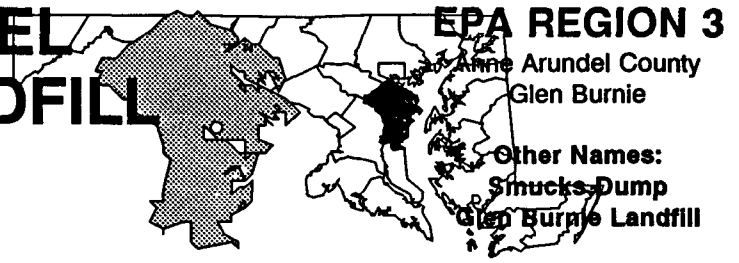
## Site Repository

Harford County Public Library, Aberdeen Branch, 21 Franklin Street, Aberdeen, MD 21001

# ANNE ARUNDEL COUNTY LANDFILL

## MARYLAND

EPA ID# MDD980705057



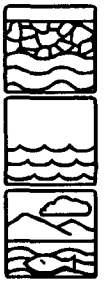

## Site Description

The Anne Arundel Landfill site is a 130-acre parcel, in the suburban Baltimore town of Glen Burnie, that was used by the County of Anne Arundel as a municipal solid waste landfill for domestic waste, from 1970 until it was closed in 1982. Beginning in 1945, 80 acres of the site were used as a gravel and sand excavation operation owned by a private individual. During and following the excavation of borrow soils, the site was used as an "uncontrolled dump," with open burning. In 1968, the site was reported as having two large surface water ponds, into which the residues from the burning were placed. By 1969, most of the 80 acres was used for dumping. Anne Arundel County took over the site and began operations in 1970. In the late 1970s, the State began to investigate the possible presence of hazardous substances at the site. Monitoring wells installed in 1980 showed that groundwater was contaminated. The Patapsco Aquifer, which lies under the site, is the most productive water source in the county and is an important source of water for public and private wells. An estimated 93,000 people live within 3 miles of the site, which is in a mixed industrial, commercial, and residential area. Approximately 3,000 people live within a mile of the site, and less than 100 live within 1,000 feet.

**Site Responsibility:** This site is being addressed through Federal, State, and County actions.

**NPL LISTING HISTORY**
Proposed Date: 06/16/88
Final Date: 02/11/91

## Threats and Contaminants



Sampling by the EPA of 11 groundwater monitoring wells in 1983 confirmed that the groundwater is contaminated with volatile organic compounds (VOCs), cyanide, and heavy metals including lead. The EPA also found the sediments of Furnace Creek to be contaminated with lead and cyanide. Contaminants in the groundwater may pose a threat to people in the area because the underlying Patapsco Aquifer is a water supply source for municipal and domestic wells. This water system is interconnected to Baltimore's water supply. Contamination found in sediments may pose a threat to the ecosystem of Furnace Creek which borders the site and connects to the Chesapeake Bay.

## Cleanup Approach

The site is being addressed in two stages: an initial action and a single long-term remedial phase directed at cleanup of the entire site.

### Response Action Status

**Initial Action:** Gas venting pipes have been inserted to prevent methane buildup in the old uncontrolled dump area.

**Entire Site:** The State is monitoring drinking water sources to test for the migration of contaminants. In 1991, the County began an intensive study to determine the nature and extent of contamination and to identify alternatives for cleanup.

**Site Facts:** Maryland's Solid Waste Department and the County signed an agreement requiring the County to conduct site investigations. After the agreement was signed, the State opposed the listing of the site on the NPL due to the use of unfiltered inorganic samples as the basis for listing. In May 1992, the court ruled in favor of the State. Currently, there is no enforceable schedule to complete the site study.

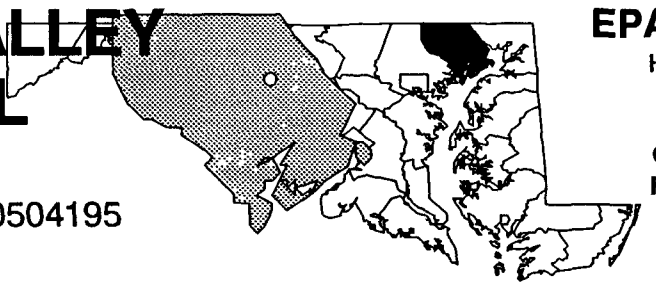
## Environmental Progress

The installation of gas venting pipes to eliminate the danger of explosion from methane buildup has reduced the potential for the Anne Arundel County Landfill site to pose an immediate threat to the surrounding public or the environment while the site is awaiting further cleanup activities.

## Site Repository

Not established.

# BUSH VALLEY LANDFILL
## MARYLAND
EPA ID# MDD980504195



**EPA REGION 3**
Harford County
Abingdon

**Other Names:**
**Harris Landfill**

## Site Description

Before 1977, the 29-acre Bush Valley Landfill site allegedly was used for the open burning of trash. The property, which was privately owned, was used as a landfill for municipal wastes from 1975 to 1982. During this period, the landfill had a State permit to accept municipal wastes. Between 1979 and 1984, the State issued orders to the owner to neutralize leachates and build drainage ditches and containment berms as part of the landfill's operating procedures and closure plans. The owner of the facility never complied fully with the orders. During a site inspection in 1984, the EPA observed erosion and leachate seeping from slopes at the landfill. The landfill did not contain diversion ditches or leachate collection systems and was only partially covered. The Perryman Water Treatment Plant supplies approximately 35,000 people from eight municipal wells. Three of the eight wells are within 3 miles of the site. A few private wells are nearby, the closest of which is a shallow well 500 feet away. The residents closest to the site have been placed on a public water supply system.

**Site Responsibility:** This site is being addressed through Federal, State, and potentially responsible parties' actions.

**NPL LISTING HISTORY**
Proposed Date: 06/16/88
Final Date: 03/31/89

## Threats and Contaminants

An on-site groundwater monitoring well contained volatile organic compounds (VOCs) including vinyl chloride from former waste disposal practices. Also, the EPA observed soil leachate seeping from slopes of the landfill. Potential risks exist if contaminated groundwater is used as a drinking water supply or if people come in direct contact with contamination. Runoff from the landfill goes to two basins on the site; one of these basins runs into Bynum Run, which is near the site. A wetland that adjoins the site could become contaminated, threatening the wildlife in the area.

## Cleanup Approach

This site is being addressed in a single long-term remedial phase focusing on cleanup of the entire site.

### Response Action Status

**Entire Site:** In 1992, the parties potentially responsible for contamination began conducting an intensive study to determine the nature and extent of contamination and to identify alternatives for cleanup. After completion of this investigation, expected in 1994, the EPA will select the most appropriate remedy to clean up the site.

**Site Facts:** An Administrative Order was issued on December 21, 1990, requiring the potentially responsible parties to conduct an investigation at the site.

## Environmental Progress

After listing this site on the NPL, the EPA performed a preliminary investigation and determined that conditions at the Bush Valley Landfill site do not pose an immediate threat to nearby residents or the surrounding environment while the investigations are underway and cleanup activities are being planned.

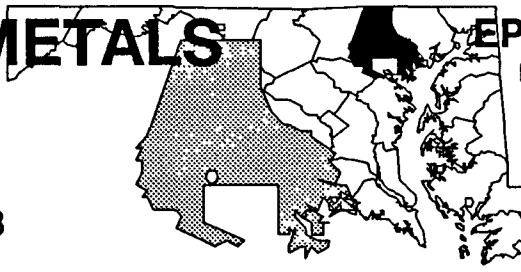
## Site Repository

Not established.

# CHEMICAL METALS INDUSTRIES

## MARYLAND

EPA ID# MDD980555478



**EPA REGION 3**

Baltimore County
Baltimore

**Other Names:**
CMI

## Site Description

The Chemical Metals Industries site is divided into two areas: a former gas station that operated on one area and was also used as a dump yard for chemicals, and a laboratory and manufacturing center that contained chemical processing equipment designed for recrystallization of solid materials from liquid solutions. Gwynn's Falls, a tributary to the Patapsco River, is located near the site. There are approximately 10,000 people living within 3 miles of the site. The site is located in a mixed residential and industrial area, with 20 homes located between the two site areas.

**Site Responsibility:** This site was addressed through Federal and State actions.

**NPL LISTING HISTORY**

Deletion Date: 12/30/82

## Threats and Contaminants

Specific contaminants detected in the air, soil, and surface water included cyanides, ammonia compounds, acids, caustics, and heavy metal salts. Health threats at the site included coming in direct contact with contaminated air, surface water, and soils; breathing contaminated air; and drinking contaminated surface water or accidentally ingesting contaminated soils. Danger of fire and explosion from volatized chemicals on the site posed an additional threat to nearby residents.

## Cleanup Approach

This site was addressed in a single long-term remedial phase focusing on cleanup of the contamination at the entire site.

## Response Action Status

**Entire Site:** All materials posing an immediate threat were identified, removed, and disposed of in 1982. Drums and scrap debris were removed from the site and liquid organic waste was removed. Liquid inorganic wastes were treated to make them acceptable for discharge to the city sewer system. The underground storage tank at the former gas station was filled with concrete slurry. A clay cap and topsoil were applied and compacted over the site. Sand blasters removed chemical contamination from the walls of the former gas station. The interior of the laboratory and manufacturing area were cleaned and decontaminated. The site was fenced and police and fire personnel were made available to ensure site security. As a result of the cleanup activities and subsequent sampling to ensure the effectiveness of the remedy, the EPA, in cooperation with the State of Maryland, determined that the site no longer posed a threat to the public. The site was deleted from the NPL in 1982.

**Site Facts:** The Chemical Metals Industries site was placed on the Interim Priorities List in October 1981. All cleanup actions were completed before the first proposed NPL was established.

## Environmental Progress

By performing all cleanup actions described above, the EPA has eliminated or contained contamination sources at the site. In conjunction with the State, the EPA has determined that the Chemical Metals Industries site has been cleaned to established standards and is no longer a threat to the public or the environment.

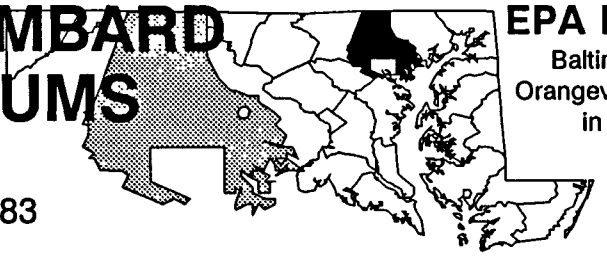
## Site Repository

Information is no longer available.

# KANE & LOMBARD STREET DRUMS

## MARYLAND

EPA ID# MDD980923783



**EPA REGION 3**

Baltimore County
Orangeville Subdivision
in Baltimore

## Site Description

The approximately 10-acre Kane & Lombard Street Drums site operated as part of an open dump between 1962 and 1984 and accepted demolition, municipal, and industrial wastes. The site and some of the adjacent properties have a long history of excavation and filling. Approximately 1,200 drums containing hazardous materials have been removed from the site. There are approximately 37,000 people within 3 miles of the site. Residential developments and a large medical complex are found about 1/3 mile from the site, and a large park area is about 3/4 mile from the site. A high school and its recreation areas border the property. The site lies along the edge of an industrial and commercial strip that borders a railroad and highway network. Herring Run and Back River, downgradient of the site, are an arm of the Chesapeake Bay and are used for fishing, crabbing, and recreational purposes.

**Site Responsibility:** This site is being addressed through Federal and State actions.

**NPL LISTING HISTORY**
Proposed Date: 10/01/84
Final Date: 06/01/86

## Threats and Contaminants

The on-site groundwater is contaminated with volatile organic compounds (VOCs) including vinyl chloride and benzene and metals including cadmium and beryllium from former waste disposal practices. Specific contaminants detected in soils include VOCs, polychlorinated biphenyls (PCBs), polynuclear aromatics (PNAs), phthalates, and lead. Health threats include exposure to contaminated soil and air through ingestion, inhalation, and direct contact.

## Cleanup Approach

This site is being addressed in three stages: emergency actions and two long-term remedial phases focusing on source control and cleanup of contaminated groundwater.

### Response Action Status

**Emergency Actions:** In 1984, the EPA removed approximately 1,150 drums from the site. The majority of full drums contained flammable solids. An additional drum containing PCBs was removed and stored, pending shipment to a disposal facility. The site was covered with 12,000 cubic yards of topsoil, and surface contours were reshaped to prevent surface water from mixing with contaminants and moving off site. The EPA also installed a fence for security purposes.

**Source Control:** In 1987, the final selection of cleanup technologies to address contamination was made. It included construction of a slurry wall around the waste disposal areas, construction of a multi-layer soil cap, construction of a drainage system, and continued groundwater monitoring. The EPA prepared the technical specifications and design for the selected cleanup technologies. Final source control activities were completed in 1991.

**Groundwater:** The State is conducting a second investigation to determine the nature and extent of groundwater contamination emanating from the site. This investigation will identify alternatives for cleanup and is scheduled to be completed in 1993.

**Site Facts:** In 1983, the State of Maryland issued an order to the potentially responsible parties to conduct cleanup activities. The parties appealed the order, and the State requested the EPA's assistance to clean up the site.

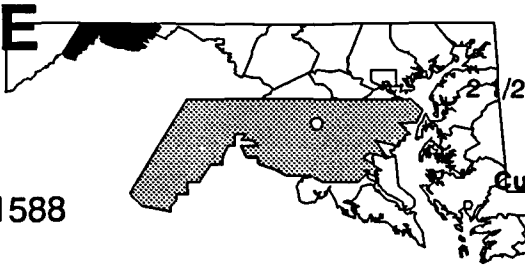
## Environmental Progress

By removing wastes, fencing, and completing source control measures, the EPA and the State have reduced the potential for exposure to contamination at the Kane & Lombard Street Drums site. Ongoing investigation activities are evaluating the nature and extent of groundwater contamination so that remaining cleanup activities can be planned.

## Site Repository

Highland Multi-Purpose Center, 3411 Banle Street, Baltimore, MD 21224

# LIMESTONE ROAD
## MARYLAND
EPA ID# MDD980691588



**EPA REGION 3**
Alleghany County
2 1/2 miles southeast of Cumberland

**Other Names:**
Cumberland Cement & Supply
Diggs Sanitation

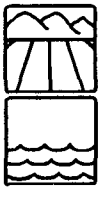
## Site Description

The 210-acre Limestone Road site consists of two parcels of land: the former Diggs Sanitation Company and the Cumberland Cement and Supply Company. The site includes large areas of landfilled and dumped commercial, residential, and demolition refuse on both properties. It is estimated that approximately 110 tons of chromium-containing sludge also were disposed of on the properties in April 1979. Beginning in the mid-1970s, various contractors were allowed to dump clean fill (housing demolition wastes) on the property to provide a larger and more level working surface. Allegations were made that 11 tons of hazardous waste have been disposed of on the Diggs property as an extension of previous filling and grading operations. There are approximately 425 people living within a mile of the site. The site is bordered by several residences and the Cumberland City Dump. There is one residence on the Diggs property, and 18 residences are within 1/2 mile downgradient of the site. The residences are supplied with groundwater from private wells.

**Site Responsibility:** This site is being addressed through Federal, State, and potentially responsible parties' actions.

**NPL LISTING HISTORY**
Proposed Date: 12/01/82
Final Date: 09/01/83

## Threats and Contaminants



Inorganic chemicals and heavy metals including zinc and lead were detected in on-site soils during test pit sampling. The surface water is contaminated with chromium, cadmium, and zinc. Possible health threats include direct contact with or accidental ingestion of contaminated soil or surface water. There also is a possibility that groundwater may become contaminated through runoff from the soil or surface water.

## Cleanup Approach

This site is being addressed in two long-term remedial phases focusing on cleanup of the entire site and groundwater cleanup.

### Response Action Status

**Entire Site:** The EPA has selected the following remedies for cleanup of the site contamination: (1) reshaping site surface contours to manage water infiltration and runoff; (2) capping contaminated soil on all properties; (3) fencing both properties; (4) continuing monitoring of groundwater, surface water, and sediment; (5) completing a historical review of pertinent geological information; (6) chemically analyzing shale to determine its composition; (7) re-evaluating and establishing background data control points for groundwater; and (8) frequent groundwater sampling, as well as increasing stream and residential sampling. In addition, the EPA remedy requires evaluating the effects of natural conditions on the overall water quality of the area. The potentially responsible parties began preparing the technical specifications and design of the selected cleanup technologies in 1992. Cleanup activities will begin once the design phase is completed, expected in 1993.

**Groundwater:** In 1992, a supplemental investigation began to explore the nature and extent of groundwater contamination. The study is expected to be completed in 1994, at which time alternative cleanup options will be identified for the site.

**Site Facts:** In 1988, the potentially responsible parties entered into a Consent Decree with the EPA to conduct cleanup activities at the site. The State subsequently filed a motion to intervene, requesting that it be made a party to the Consent Decree on equal terms with the EPA. The issue related to the State's role was settled among the parties, and the decree was amended and signed by the parties, the State, and the EPA. The Decree was entered in court in 1990.

## Environmental Progress

After adding the Limestone Road site to the NPL, the EPA performed preliminary investigations and found that the site does not currently pose an immediate threat to public health or the environment while further investigations are underway and cleanup activities are being planned.

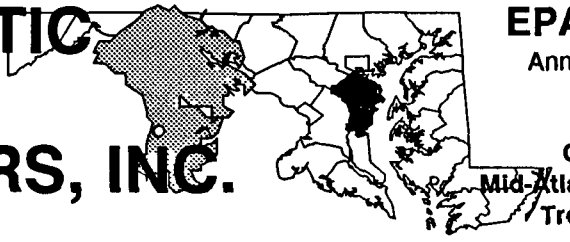
## Site Repository

Allegany County Library, 31 Washington Street, Cumberland, MD 21502

# MID-ATLANTIC WOOD PRESERVERS, INC.

## MARYLAND

EPA ID# MDD064882889



**EPA REGION 3**

Anne Arundel County
Harmans

**Other Names:**
**Mid-Atlantic Harmans Wood Treatment Factory**

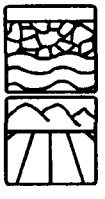
## Site Description

The Mid-Atlantic Wood Preservers, Inc. site is an active wood-treating facility that stands on a 3-acre parcel in Harmans. It consists of two impoundments that straddle Shipley Avenue near its intersection with Dorsey Road. Both are enclosed by chain-link fencing. The operation employs a two-part chromated copper arsenate (CCA) process. In the first part, workers pressure-treat lumber in an enclosed processing plant; in the second, the wood is allowed to drip and dry. From 1976 until 1981, operators allowed the contaminated drippings to fall directly onto the ground. Surface water runoff from the site drains toward Stoney Run Creek, while the groundwater moves in a northwesterly direction. The surface soils are contaminated with wood-treating metals. The pollution was determined to have come from the overflow of a CCA storage tank and from lumber drippings. The owner undertook certain cleanup activities in 1980; however, some contaminated soils remained. The area surrounding the site is industrial, commercial, and residential. The closest residence is within 200 feet of the site. Stoney Run Creek flows north through a wetland area approximately 600 feet west of the site, extending 4 miles before discharging to the Patapsco River near Elkridge. Stoney Run is restricted to secondary recreational use.

**Site Responsibility:** This site is being addressed through a combination of Federal and potentially responsible parties' actions.

**NPL LISTING HISTORY**
Proposed Date: 10/01/84
Final Date: 06/01/86

## Threats and Contaminants



Groundwater beneath and downgradient of the site was contaminated with arsenic and chromium from a spill of CCA solution, but recent sampling shows little remaining effect from that release. Heavy metals including arsenic and chromium from former process wastes have been detected in elevated concentrations in the soils on the site. Individuals are at risk from direct contact with, accidental ingestion of, or inhalation of contaminated residues in the soils. The wetlands and stream areas near the site are not being adversely affected but are subject to a monitoring plan.

## Cleanup Approach

The site is being addressed in two stages: immediate actions and a single long-term remedial phase focusing on cleanup of the entire site.

### Response Action Status

**Immediate Actions:** Under orders from the State, the owner developed plans to remedy the groundwater contamination in 1980. Operational changes included leaving the drying wood on the concrete drainage pad longer before moving it to the storage lot and modifying the drainage pad so that it collects all waste drippings for reuse. All wastes captured by the drip pad are recirculated within the process system, and sludges are shipped off site for disposal. The owner also removed 26 cubic yards of contaminated soil from beneath the chemical storage tank overflow pipe and disposed of it at an EPA-approved facility.

**Entire Site:** A study of groundwater and soil contamination at the site was completed in 1990 and was financed by the owner. This investigation explored the nature and extent of contamination and recommended strategies for final cleanup. In 1990, remedies were selected for site cleanup, including: excavation, stabilization and off-site disposal of arsenic-contaminated soils; capping of arsenic-contaminated soils in areas where the concentrations are not high enough to warrant removing the soils; construction of an enlarged roofed drip pad; environmental monitoring; and deed restrictions. Design of the remedies is currently being prepared by the potentially responsible parties and is scheduled to be completed in 1993.

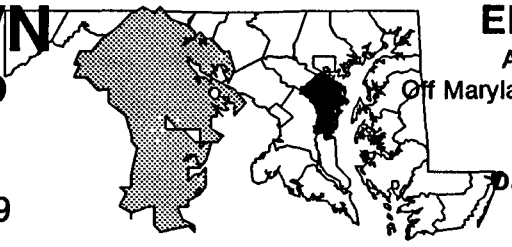
## Environmental Progress

The owner's actions to limit the spread of groundwater contamination and the removal of contaminated soil from the site have reduced the potential of the further spread of contamination at the Mid-Atlantic Wood Preservers, Inc. site while the final cleanup approach is being designed and implemented.

## Site Repository

Provinces Branch Library, Severn Square Shopping Center, 2624 Annapolis Road, Severn, MD 21144

# MIDDLETOWN ROAD DUMP
## MARYLAND
EPA ID# MDD980705099



**EPA REGION 3**
Anne Arundel County
Off Maryland Route 50, near Annapolis

**Other Names:**
Dale Dickerson Dump

## Site Description

The Middletown Road Dump, situated on approximately 2 1/2 acres, is a privately owned dump located off Route 50 near Annapolis. The facility, now inactive, took in rubble and construction debris for several decades without proper State permits. In 1981, it was discovered that about 40 drums and four dumpster loads of suspected hazardous substances were on the site. The owner was forced to initiate cleanup when a drum-crushing accident spread contaminants over 1/2 acre. That year, the State shut down the dump because of its violations of State water pollution and hazardous waste laws. Approximately 5,000 people live within 1 mile of the site; 2,500 people within 3 miles are served by groundwater in both public and private wells. A stream flowing off the site enters Whitehawk Creek, which is used for recreation.

**Site Responsibility:** This site was addressed through Federal actions.

**NPL LISTING HISTORY**
Proposed Date: 12/01/82
Final Date: 09/01/83
Deleted Date: 04/18/88

## Threats and Contaminants

Soil was contaminated with heavy metals such as lead, aluminum, chromium, zinc, cyanide, barium, and cadmium. Access to the site was unrestricted, making the risk of direct contact with contaminated areas possible; however, no contamination remains on site.

## Cleanup Approach

The site was addressed through emergency actions; further investigations showed that no other cleanup actions were required.

### Response Action Status

**Emergency Actions:** In 1983, the EPA conducted an emergency cleanup to eliminate immediate threats from contamination. EPA workers performed the following: removed contaminated soil and 5-gallon pails of marine paint; sampled the soil to confirm that contaminant removal had been adequate; installed six groundwater monitoring wells around the site perimeter; sampled and tested drums; and moved 1 million tires elsewhere on the site to expedite subsurface investigation. More drums were discovered under the tires. The EPA later removed 68 drums, 70 contaminated tires, and 610 tons of contaminated soil.

**Entire Site:** The EPA and the State conducted an intensive investigation of site conditions during and after the emergency removal. The study evaluated water, soil, and sediment quality in the vicinity of the site. It revealed that as a result of the previous EPA cleanup actions, the hazardous wastes had been eliminated, and that no threat to public health remained. The site contains only uncontaminated trash and tires. Declaring that no further cleanup action was warranted, the EPA, with agreement from the State, deleted the site from the NPL in April 1988.

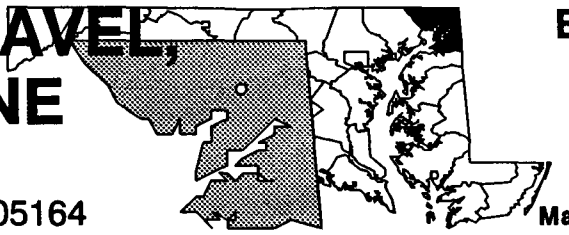
## Environmental Progress

The EPA, through emergency removal of hazardous wastes and evaluations of the extent of contamination at the Middletown Dump, successfully cleaned up the site. After further studies, the EPA, with concurrence by the State, determined that the site no longer posed a threat to the surrounding community or the environment, and deleted the site from the NPL in 1988.

## Site Repository

Information is no longer available.

# SAND, GRAVEL, AND STONE
## MARYLAND
EPA ID# MDD980705164



**EPA REGION 3**
Cecil County
3 miles west of Elkton

**Other Names:**
**Elkton Quarry**
**Maryland Sand and Gravel**

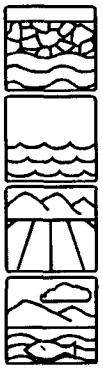
## Site Description

From 1969 to 1974, 3 acres of the Sand, Gravel, and Stone site, which is on a 200-acre parcel, were used for the disposal of bulk wastes such as processing wastewater, sludges, and still bottoms, and over 1,000 drums of various waste material. The operator dug pits and disposed of approximately 700,000 gallons of waste into them, including drums and sludges. In 1982, the EPA detected volatile organic compounds (VOCs) in the groundwater at the site, although water samples from nearby homes were not contaminated. Approximately 570 people live within a 1-mile radius of the site; 8,000 are within 3 miles. The nearest home is 1,800 feet downgradient from the site. Upgradient homes are not at risk. Elk Nest State Forest is within 3 miles, as is the Elk River estuary and wetlands. Mill Creek, a headwater located on the site, is a spawning area.

**Site Responsibility:** This site is being addressed through Federal and potentially responsible parties' actions.

**NPL LISTING HISTORY**
Proposed Date: 12/01/82
Final Date: 09/01/83

## Threats and Contaminants



The shallow groundwater has been shown to contain heavy metals including cadmium and chromium, VOCs including benzene and toluene from former waste disposal practices, and semi-volatile organic compounds. Heavy metals, pesticides, and VOCs have been detected in sediments and surface water. Soil is contaminated with VOCs. Accidental ingestion of shallow on-site groundwater can be a potential health risk. Trespassers are at risk by coming into direct contact with, inhaling, or accidentally ingesting contaminated soils. Site access is restricted by a fence around the perimeter of the facility. Fish samples taken from downstream show no sign of being contaminated.

## Cleanup Approach

The site is being addressed in four stages: immediate actions and three long-term remedial phases focusing on drum and shallow aquifer cleanup, cleanup of the deep aquifers, and on-site soil cleanup.

## Response Action Status

**Immediate Actions:** Under State order, the owner removed 200,000 gallons of liquid waste from the site in 1974. In 1985, a temporary fence was constructed around the site to limit access.

**Drums and Shallow Aquifer:** In 1983, the EPA began an investigation into the nature and extent of contamination. The study resulted in recommendations to remove buried materials to an approved facility and to pump and treat shallow groundwater and leachate. Fencing was proposed to limit access and was completed in 1989. Design of a groundwater treatment unit is underway and is expected to be completed in 1993.

**Deep Aquifers:** In 1986, the potentially responsible parties began an intensive study to determine the nature and extent of deep aquifer contamination and to identify alternatives for cleanup. The EPA selected on-site and off-site groundwater monitoring and on- and/or off-site point-of-use treatment for the contaminated groundwater, as necessary, as the appropriate cleanup options. Design specifications and plans for cleanup actions are currently under review.

**On-Site Soils:** An intensive study of on-site soil contamination is slated for 1993. This investigation will determine the nature and extent of the problem and will identify the best approaches for cleanup.

**Site Facts:** In 1985, a steering committee of potentially responsible parties volunteered to perform investigations, signing a Consent Order in 1986. Forty-one potentially responsible parties and the EPA signed a Consent Decree in November 1987, in which the parties agreed to conduct cleanup actions and to pay a portion of the EPA's past and future oversight costs. In 1991, 43 potentially responsible parties signed a Consent Decree agreeing to implement additional cleanup actions associated with the deep aquifers.

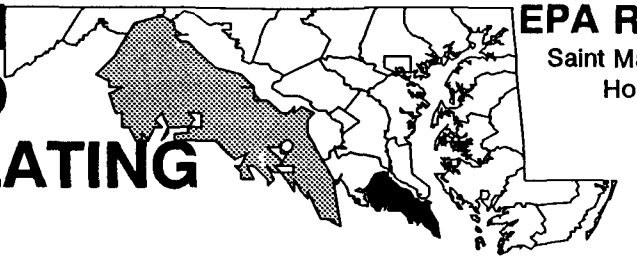
## Environmental Progress

The immediate construction of a fence around the site to limit public access, the removal of liquid wastes, and the excavation and removal of buried drums have reduced the potential for direct contact with hazardous materials at the Sand, Gravel, and Stone site while further studies are underway and cleanup actions are being planned.

## Site Repository

Cecil County Public Library, Elkton Branch, 301 Newark Avenue, Elkton, MD 21921

# SOUTHERN MARYLAND WOOD TREATING



**EPA REGION 3**
Saint Mary's County
Hollywood

## MARYLAND

EPA ID# MDD980704852

## Site Description

Four acres of the 25-acre Southern Maryland Wood Treating (SMWT) site, located about 50 miles southeast of Washington, D.C., were used to treat wood from 1965 to 1978. The facility treated wood with creosote and pentachlorophenol (PCP) and is now inactive. Operators disposed of process wastes in six unlined lagoons. Additional waste was released via spillage and drippings from treated wood. In 1977, under an order from the Maryland Department of Health and Mental Hygiene, the potentially responsible parties attempted to clean up the site and dispose of the lagoon liquids and landfarming lagoon sludges in two areas on site via spray irrigation and land treatment, respectively. Sludges were mixed with wood chips and sewage sludge, and were spread over a 3-acre section of the site. This attempt was not successful, and now the top several feet of soil in this area are contaminated with polycyclic aromatic hydrocarbons (PAHs). Soil under the former lagoon area also is heavily contaminated from seepage from the lagoons. Surface soil in other areas of the site was contaminated by drippings from treated wood. The site is surrounded by residential and agricultural areas. About 40 homes are located within 1/2 mile of the site, and 150 homes are within a mile of the site. Approximately 260 people living within 3 miles of the site depend on wells for drinking water.

**Site Responsibility:** This site is being addressed through a combination of Federal and State actions.

**NPL LISTING HISTORY**
Proposed Date: 10/01/84
Final Date: 06/01/86

## Threats and Contaminants

The groundwater is contaminated with volatile organic compounds (VOCs), PAHs, and PCP from the wood treatment operations. The main threat to public health is long-term exposure to carcinogens found in PAHs in the site's subsurface and surface soils. Surface water and sediments are also contaminated with PAHs.

## Cleanup Approach

This site is being addressed in two stages: immediate actions and a long-term remedial phase focusing on cleanup of the entire site.

### Response Action Status

**Immediate Actions:** After a preliminary assessment of the site in 1985 indicated widespread soil contamination, as well as on-site groundwater, surface water, and sediment contamination, the EPA initiated an immediate cleanup action. Filter fences were installed in the site drainage ways to reduce downstream migration of contaminants. In addition, by 1986, approximately 1,400 cubic yards of contaminated soil were excavated from the northwestern bank of the freshwater pond. The soils then were placed onto a synthetic liner east of the former lagoon area and capped with a synthetic cover. A decontamination pad was used to clean the heavy excavation equipment.

**Entire Site:** The cleanup remedies selected for this site in 1988 include: (1) excavating and incinerating contaminated soils and sediments on site; (2) installing a barrier to control groundwater migration through the pond and process area; (3) pumping and treating contaminated groundwater and surface water; (4) backfilling, regrading, and replanting the site where necessary; and (5) monitoring groundwater, surface water, sediment, and organisms. The cleanup processes will be completed in different phases; the first phase is to install a barrier wall around the pond and process area and then constructing a permanent decontamination area. The design of this phase was finished in 1989. Construction was completed in 1991. The next phase will accomplish the remainder of the cleanup actions. The pre-design work of the remedy is underway for this phase, and is expected to be completed in 1992.

**Site Facts:** In 1980, a Consent Decree was signed between the State and SMWT Corporation, one of the potentially responsible parties, to conduct immediate cleanup actions at the site.

## Environmental Progress

Excavating, treating, fencing, and capping contaminated soils, and installing a barrier wall around the pond and process area at the SMWT site have prevented the further spread of contaminants and have reduced the risk to the public while the site awaits the completion of the remaining cleanup remedies selected.

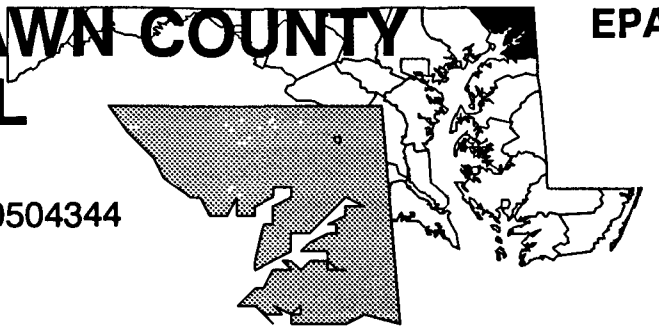
## Site Repository

St. Mary's County Memorial Library, Route 1, Leonardtown, MD 20650

# WOODLAWN COUNTY LANDFILL

## MARYLAND

EPA ID# MDD980504344



**EPA REGION 3**
Cecil County
Woodlawn

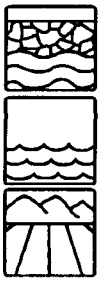
## Site Description

Cecil County owned and operated the 37-acre Woodlawn County Landfill from 1965 to 1979, when it was closed under a State order. Before becoming a landfill, the property was a privately-owned sand and gravel quarry. Operators filled two large quarry pits with agricultural, municipal, and industrial wastes. According to State records, the only documented hazardous waste disposal at the site was polyvinyl chloride (PVC) sludge from the Firestone Tire and Rubber Company (now Bridgestone/Firestone, Inc.). This sludge initially was disposed of throughout the site, but between 1978 and 1981 three designated disposal cells were put into use. Analyses by the EPA, State, and parties potentially responsible for site contamination showed contamination of on-site groundwater as well as stream sediments near the site. An estimated 5,700 people draw drinking water from public and private wells within 3 miles of the site. The nearest private well is within 400 feet of the landfill. All homeowners adjacent to the site use private wells as their sole source of drinking water. Samples obtained from 13 domestic wells surrounding the site were found to be free of site-related contamination at levels of concern. However, recent sampling has indicated the presence of vinyl chloride in one private well. The contaminated stream enters Basin Run, a State-designated trout stream, about 2 miles from the site.

**Site Responsibility:** The site is being addressed through Federal, State, and potentially responsible parties' actions.

**NPL LISTING HISTORY**
Proposed Date: 01/22/87
Final Date: 07/01/87

## Threats and Contaminants



The groundwater is contaminated with volatile organic compounds (VOCs), including vinyl chloride, benzene, and toluene; pthalates; polynuclear aromatic hydrocarbons (PAHs); and heavy metals including manganese, lead, cadmium, and arsenic. VOCs and heavy metals are found in stream sediments. Vinyl chloride has been detected in the on-site sludge. Possible health threats include accidentally ingesting or coming in direct contact with contaminated groundwater or sludge.

## Cleanup Approach

This site is being addressed in a long-term remedial phase focusing on cleanup of the entire site.

### Response Action Status

**Entire Site:** The potentially responsible parties agreed to undertake an intensive study of soil and groundwater contamination at the site and to recommend the best approaches for cleanup. Prior to the beginning of the investigation, 19 monitoring wells were installed by Cecil County and the State. Twelve additional wells were installed during the investigation. The investigation began in 1988 and is scheduled for completion in 1993, after which the EPA will select the most appropriate remedies to clean up the site.

**Site Facts:** The EPA signed a Consent Order in 1988 with the Firestone Tire and Rubber Company (now Bridgestone/Firestone, Inc.) and Cecil County to conduct a site investigation.

## Environmental Progress

After adding the site to the NPL, the EPA performed preliminary investigations and determined that the Woodlawn County Landfill site presents no immediate threats to the nearby population or the environment while further studies are taking place.

## Site Repository

Cecil County Public Library, Elkton Branch, 301 Newark Avenue, Elkton, MD 21921

# GLOSSARY

## Terms Used in the NPL Book

*This glossary defines terms used throughout the NPL Volumes. The terms and abbreviations contained in this glossary apply specifically to work performed under the Superfund program in the context of hazardous waste management. These terms may have other meanings when used in a different context. A table of common toxic chemicals found at NPL sites, their sources, and their potential threats is located on page G-15*

**Acids:** Substances, characterized by low pH (less than 7.0), that are used in chemical manufacturing. Acids in high concentration can be very corrosive and react with many inorganic and organic substances. These reactions possibly may create toxic compounds or release heavy metal contaminants that remain in the environment long after the acid is neutralized.

**Administrative Order On Consent:** A legal and enforceable agreement between the EPA and the parties potentially responsible for site contamination. Under the terms of the Order, the potentially responsible parties (PRPs) agree to perform or pay for site studies or cleanups. It also describes the oversight rules, responsibilities, and enforcement options that the government may exercise in the event of non-compliance by potentially responsible parties. This Order is signed by PRPs and the government; it does not require approval by a judge.

**Administrative Order [Unilateral]:** A legally binding document issued by the EPA, directing the parties potentially responsible to perform site cleanups or studies (generally, the EPA does not issue Unilateral Orders for site studies). This type of Order is not signed by the PRPs and does not require approval by a judge.

**Aeration:** A process that promotes breakdown of contaminants in soil or water by exposing them to air.

**Agency for Toxic Substances and Disease Registry (ATSDR):** The Federal agency within the U.S. Public Health Service charged with carrying out the health-related responsibilities of CERCLA.

**Air Stripping:** A process whereby volatile organic chemicals (VOCs) are removed from contaminated material by forcing a stream of air through the contaminated material in a pressurized vessel. The contaminants are evaporated into the air stream. The air may be further treated before it is released into the atmosphere.

**Ambient Air:** Any unconfined part of the atmosphere. Refers to the air that may be inhaled by workers or residents in the vicinity of contaminated air sources.

**Applicable or Relevant and Appropriate Requirements (ARARs):** Federal, State, or local laws which apply to Superfund activities at NPL sites. Both emergency and long-term actions must comply with these laws or provide sound reasons for allowing a waiver. ARARs must be identified for each site relative to the characteristics of the site, the substances found at the site, or the cleanup alternatives being considered for the site.

# GLOSSARY

**Aquifer:** An underground layer of rock, sand, or gravel capable of storing water within cracks and pore spaces, or between grains. When water contained within an aquifer is of sufficient quantity and quality, it can be tapped and used for drinking or other purposes. The water contained in the aquifer is called groundwater. A "sole source aquifer" supplies 50 percent or more of the drinking water of an area.

**Artesian (Well):** A well made by drilling into the earth until water is reached, which, due to internal pressure, flows up like a fountain.

**Asbestos:** A mineral fiber that can pollute air or water and is known to cause cancer or asbestosis when inhaled.

**Attenuation:** The naturally occurring process by which a compound is reduced in concentration over time through adsorption, degradation, dilution, or transformation.

**Background Level:** The amount of a substance typically found in the air, water, or soil from natural, as opposed to human, sources.

**Baghouse Dust:** Dust accumulated in removing particulates from the air by passing it through cloth bags in an enclosure.

**Bases:** Substances characterized by high pH (greater than 7.0), which tend to be corrosive in chemical reactions. When bases are mixed with acids, they neutralize each other, forming salts.

**Berm:** A ledge, wall, or a mound of earth used to prevent the migration of contaminants.

**Bioaccumulate:** The process by which some contaminants or toxic chemicals gradually collect and increase in concentration in living tissue, such as in plants, fish, or people, as they breathe contaminated air, drink contaminated water, or eat contaminated food.

**Biological Treatment:** The use of bacteria or other microbial organisms to break down toxic organic materials into carbon dioxide and water.

**Bioremediation:** A cleanup process using naturally occurring or specially cultivated microorganisms to digest contaminants and break them down into non-hazardous components.

**Bog:** A type of wetland that is covered with peat moss deposits. Bogs depend primarily on moisture from the air for their water source, are usually acidic, and are rich in plant residue [see Wetland].

**Boom:** A floating device used to contain oil floating on a body of water or to restrict the potential overflow of waste liquids from containment structures.

**Borehole:** A hole that is drilled into the ground and used to sample soil or ground-water.

**Borrow Pit:** An excavated area where soil, sand, or gravel has been dug up for use elsewhere.

**Cap:** A layer of material, such as clay or a synthetic material, used to prevent rainwater from penetrating and spreading contaminated materials. The surface of the cap generally is mounded or sloped so water will drain off.

**Carbon Adsorption:** A treatment system in which contaminants are removed from groundwater and surface water by forcing water through tanks containing activated carbon, a specially treated material that attracts and holds or retains contaminants.

**Carbon Disulfide:** A degreasing agent formerly used extensively for parts washing. This compound has both inorganic and organic

properties, which increase cleaning efficiency. However, these properties also cause chemical reactions that increase the hazard to human health and the environment.

**Carbon Treatment:** [see Carbon Adsorption].

**Cell:** In solid waste disposal, one of a series of holes in a landfill where waste is dumped, compacted, and covered with layers of dirt.

**CERCLA:** [see Comprehensive Environmental Response, Compensation, and Liability Act].

**Characterization:** The sampling, monitoring, and analysis of a site to determine the extent and nature of toxic releases. Characterization provides the basis for acquiring the necessary technical information to develop, screen, analyze, and select appropriate cleanup techniques.

**Chemical Fixation:** The use of chemicals to bind contaminants, thereby reducing the potential for leaching or other movement.

**Chromated Copper Arsenate:** An insecticide/herbicide formed from salts of three toxic metals: copper, chromium, and arsenic. This salt is used extensively as a wood preservative in pressure-treating operations. It is highly toxic and water-soluble, making it a relatively mobile contaminant in the environment.

**Cleanup:** Actions taken to eliminate a release or threat of release of a hazardous substance. The term "cleanup" sometimes is used interchangeably with the terms remedial action, removal action, response action, or corrective action.

**Closure:** The process by which a landfill stops accepting wastes and is shut down under Federal guidelines that ensure the protection of the public and the environment.

**Comment Period:** A specific interval during which the public can review and comment on various documents and EPA actions related to site cleanup. For example, a comment period is provided when the EPA proposes to add sites to the NPL. Also, there is minimum 3-week comment period for community members to review and comment on the remedy proposed to clean up a site.

**Community Relations:** The EPA effort to establish and maintain two-way communication with the public. The goals of community relations programs include creating an understanding of EPA programs and related actions, assuring public input into decision-making processes related to affected communities, and making certain that the Agency is aware of, and responsive to, public concerns. Specific community relations activities are required in relation to Superfund cleanup actions [see Comment Period].

**Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA):** Congress enacted the CERCLA, known as Superfund, in 1980 to respond directly to hazardous waste problems that may pose a threat to the public health and the environment. The EPA administers the Superfund program.

**Confluence:** The place where two bodies of water, such as streams or rivers, come together.

**Confined Aquifer:** An aquifer in which groundwater is confined under pressure that is significantly greater than atmospheric pressure.

**Consent Decree:** A legal document, approved and issued by a judge, formalizing an agreement between the EPA and the parties potentially responsible for site contamination. The decree describes cleanup actions that the potentially responsible parties are required to perform, or the costs incurred by the government that the parties will reimburse, and the roles, responsibilities, and enforcement options that the government may exercise in the event of non-compliance by potentially responsible parties. If a settlement between the EPA and a potentially responsible party includes cleanup actions, it must be in the form of a Consent Decree. A Consent Decree is subject to a public comment period.

**Consent Order:** [see Administrative Order on Consent].

**Containment:** The process of enclosing or containing hazardous substances in a structure, typically in a pond or a lagoon, to prevent the migration of contaminants into the environment.

**Contaminant:** Any physical, chemical, biological, or radiological material or substance whose quantity, location, or nature produces undesirable health or environmental effects.

**Contingency Plan:** A document setting out an organized, planned, and coordinated course of action to be followed in case of a fire, explosion, or other accident that releases toxic chemicals, hazardous wastes, or radioactive materials into the environment.

**Cooperative Agreement:** A contract between the EPA and the States, wherein a State agrees to manage or monitor certain site cleanup responsibilities and other activities on a cost-sharing basis.

**Cost Recovery:** A legal process by which potentially responsible parties can be required to pay back the Superfund program for money it spends on any cleanup actions [see Potentially Responsible Parties].

**Cover:** Vegetation or other material placed over a landfill or other waste material. It can be designed to reduce movement of water into the waste and to prevent erosion that could cause the movement of contaminants.

**Creosotes:** Chemicals used in wood preserving operations and produced by distillation of tar, including polycyclic aromatic hydrocarbons and polynuclear aromatic hydrocarbons [see PAHs and PNAs]. Contaminating sediments, soils, and surface water, creosotes may cause skin ulcerations and cancer through prolonged exposure.

**Culvert:** A pipe used for drainage under a road, railroad track, path, or through an embankment.

**Decommission:** To revoke a license to operate and take out of service.

**Degradation:** The process by which a chemical is reduced to a less complex form.

**Degrease:** To remove grease from wastes, soils, or chemicals, usually using solvents.

**Deletion:** A site is eligible for deletion from the NPL when Superfund response actions at the site are complete. A site is deleted from the NPL when a notice is published in the Federal Register.

**De minimis:** This legal phrase pertains to settlements with parties who contributed small amounts of hazardous waste to a site. This process allows the EPA to settle with small, or *de minimis* contributors, as a single group rather than as individuals, saving time, money, and effort.

**Dewater:** To remove water from wastes, soils, or chemicals.

**Dike:** A low wall that can act as a barrier to prevent a spill from spreading.

**Dioxin:** An organic chemical by-product of pesticide manufacture which is known to be one of the most toxic man-made chemicals.

**Disposal:** Final placement or destruction of toxic, radioactive, or other wastes; surplus or banned pesticides or other chemicals; polluted soils; and drums containing hazardous materials. Disposal may be accomplished through the use of approved secure landfills, surface impoundments, land farming, deep well injection, or incineration.

**Downgradient:** A downward hydrologic slope that causes groundwater to move toward lower elevations. Therefore, wells *downgradient* of a contaminated groundwater source are prone to receiving pollutants.

**Ecological Assessment:** A study of the impact of man-made or natural activity on living creatures and their environment.

**Effluent:** Wastewater, treated or untreated, that flows out of a treatment plant, sewer, or industrial outfall. Generally refers to wastes discharged into surface waters.

**Emission:** Pollution discharged into the atmosphere from smokestacks, other vents, and surface areas of commercial or industrial facilities.

**Emulsifiers:** Substances that help in mixing materials that do not normally mix; e.g., oil and water.

**Endangerment Assessment:** A study conducted to determine the risks posed to public health or the environment by contamination at NPL sites. The EPA or the State conducts the study when a legal action is to be taken to direct the potentially responsible parties to clean up a site or pay for the cleanup. An endangerment assessment supplements an investigation of the site hazards.

**Enforcement:** EPA, State, or local legal actions taken against parties to facilitate settlements; to compel compliance with laws, rules, regulations, or agreements; or to obtain penalties or criminal sanctions for violations. Enforcement procedures may vary, depending on the specific requirements of different environmental laws and related regulatory requirements. Under CERCLA, for example, the EPA will seek to require potentially responsible parties to clean up a Superfund site or pay for the cleanup [see Cost Recovery].

**Erosion:** The wearing away of land surface by wind or water. Erosion occurs naturally from weather or surface runoff, but can be intensified by such land-related practices as farming, residential or industrial development, road building, or timber-cutting. Erosion may spread surface contamination to off-site locations.

**Estuary (estuarine):** Areas where fresh water from rivers and salt water from nearshore ocean waters are mixed. These areas may include bays, mouths of rivers, salt marshes, and lagoons. These water ecosystems shelter and feed marine life, birds, and wildlife.

**Evaporation Ponds:** Areas where sewage sludge or other watery wastes are dumped and allowed to dry out.

**Feasibility Study:** The analysis of the potential cleanup alternatives for a site. The feasibility study usually starts as soon as the remedial investigation is underway. In this volume, the feasibility study is referred to as a site study [see also Remedial Investigation].

**Filtration:** A treatment process for removing solid (particulate) matter from water by passing the water through sand, activated carbon, or a man-made filter. The process is often used to remove particles that contain contaminants.

**Flood Plain:** An area along a river, formed from sediment deposited by floods. Flood plains periodically are innundated by natural floods, which can spread contamination.

**Flue Gas:** The air that is emitted from a chimney after combustion in the burner occurs. The gas can include nitrogen oxides, carbon oxides, water vapor, sulfur oxides, particles, and many chemical pollutants.

**Fly Ash:** Non-combustible residue that results from the combustion of flue gases. It can include nitrogen oxides, carbon oxides, water vapor, sulfur oxides, as well as many other chemical pollutants.

**French Drain System:** A crushed rock drain system constructed of perforated pipes, which is used to drain and disperse wastewater.

**Gasification (coal):** The conversion of soft coal into gas for use as a fuel.

**General Notice Letter:** [See Notice Letter].

**Generator:** A facility that emits pollutants into the air or releases hazardous wastes into water or soil.

**Good Faith Offer:** A voluntary offer, generally in response to a Special Notice letter, made by a potentially responsible party, consisting of a written proposal demonstrating a potentially responsible party's qualifications and willingness to perform a site study or cleanup.

**Groundwater:** Water that fills pores in soils or openings in rocks to the point of saturation. In aquifers, groundwater occurs in sufficient quantities for use as drinking and irrigation water and other purposes.

**Groundwater Quality Assessment:** The process of analyzing the chemical characteristics of groundwater to determine whether any hazardous materials exist.

**Halogens:** Reactive non-metals, such as chlorine and bromine. Halogens are very good oxidizing agents and, therefore, have many industrial uses. They are rarely found by themselves; however, many chemicals such as polychlorinated biphenyls (PCBs), some volatile organic compounds (VOCs), and dioxin are reactive because of the presence of halogens.

**Hazard Ranking System (HRS):** The principal screening tool used by the EPA to evaluate relative risks to public health and the environment associated with abandoned or uncontrolled hazardous waste sites. The HRS calculates a score based on the potential of hazardous substances spreading from the site through the air, surface water, or groundwater and on other factors such as nearby population. The HRS score is the primary factor in deciding if the site should be on the NPL.

**Hazardous Waste:** By-products of society that can pose a substantial present or potential hazard to human health and the environment when improperly managed. Hazardous waste possesses at least one of four characteristics (ignitability, corrosivity, reactivity, or toxicity), or appears on special EPA lists.

**Heavy Metals:** Metallic elements with high atomic weights, such as arsenic, lead, mercury, and cadmium. Heavy metals are very hazardous even at low concentrations and tend to accumulate in the food chain.

**Herbicide:** A chemical pesticide designed to control or destroy plants, weeds, or grasses.

**Hot Spot:** An area or vicinity of a site containing exceptionally high levels of contamination.

**Hydrocarbons:** Chemical compounds that consist entirely of hydrogen and carbon.

**Hydrology:** The properties, distribution, and circulation of water.

**Hydrogeology:** The geology of groundwater, with particular emphasis on the chemistry and movement of water.

**Impoundment:** A body of water or sludge confined by a dam, dike, floodgate, or other barrier.

**Incineration:** A group of treatment technologies involving destruction of waste by controlled burning at high temperatures, e.g., burning sludge to reduce the remaining residues to a non-burnable ash that can be disposed of safely on land, in some waters, or in underground locations.

**Infiltration:** The movement of water or other liquid down through soil from precipitation (rain or snow) or from application of wastewater to the land surface.

**Influent:** Water, wastewater, or other liquid flowing into a reservoir, basin, or treatment plant.

**Injection Well:** A well into which waste fluids are placed, under pressure, for purposes of disposal.

**Inorganic Chemicals:** Chemical substances of mineral origin, not of basic carbon structure.

**Installation Restoration Program:** The specially funded program established in 1978 under which the Department of Defense has been identifying and evaluating its hazardous waste sites and controlling the migration of hazardous contaminants from those sites.

**Intake:** The source from where a water supply is drawn, such as from a river or water body.

**Interagency Agreement:** A written agreement between the EPA and a Federal agency that has the lead for site cleanup activities, setting forth the roles and responsibilities of the agencies for performing and overseeing the activities. States often are parties to interagency agreements.

**Interim (Permit) Status:** Conditions under which hazardous waste treatment, storage, and disposal facilities, that were operating when regulations under the RCRA became final in 1980, are temporarily allowed by the EPA to continue to operate while awaiting denial or issuance of a permanent permit. The facility must comply with certain regulations to maintain interim status.

**Lagoon:** A shallow pond or liquid waste containment structure. Lagoons typically are used for the storage of wastewaters, sludges, liquid wastes, or spent nuclear fuel.

**Landfarm:** To apply waste to land or incorporate waste into the surface soil, such as fertilizer or soil conditioner. This practice commonly is used for disposal of composted wastes and sludges.

**Landfill:** A disposal facility where waste is placed in or on land. *Sanitary* landfills are disposal sites for non-hazardous solid wastes. The waste is spread in layers, compacted to the smallest practical volume, and covered with soil at the end of each operating day. Secure *chemical* landfills are disposal sites for hazardous waste. They are designed to minimize the chance of release of hazardous substances into the environment [see Resource Conservation and Recovery Act].

**Leach, Leaching [v.t.]:** The process by which soluble chemical components are dissolved and carried through soil by water or some other percolating liquid.

**Leachate [n]:** The liquid that trickles through or drains from waste, carrying soluble components from the waste.

**Leachate Collection System:** A system that gathers liquid that has leaked into a landfill or other waste disposal area and pumps it to the surface for treatment.

**Liner:** A relatively impermeable barrier designed to prevent leachate (waste residue) from leaking from a landfill. Liner materials include plastic and dense clay.

**Long-term Remedial Phase:** Distinct, often incremental, steps that are taken to solve site pollution problems. Depending on the complexity, site cleanup activities can be separated into several of these phases.

**Long-term Response Action:** An action which requires a continuous period of on-site activity before cleanup goals are achieved. These actions typically include the extraction and treatment of groundwater and monitoring actions.

**Marsh:** A type of wetland that does not contain peat moss deposits and is dominated by vegetation. Marshes may be either fresh or saltwater and tidal or non-tidal [see Wetland].

**Migration:** The movement of oil, gas, contaminants, water, or other liquids through porous and permeable soils or rock.

**Mill Tailings:** [See Mine Tailings].

**Mine Tailings:** A fine, sandy residue left from mining operations. Tailings often contain high concentrations of lead, uranium, and arsenic or other heavy metals.

**Mitigation:** Actions taken to improve site conditions by limiting, reducing, or controlling toxicity and contamination sources.

**Modeling:** A technique using a mathematical or physical representation of a system or theory that tests the effects that changes on system components have on the overall performance of the system.

**Monitoring Wells:** Special wells drilled at specific locations within, or surrounding, a hazardous waste site where groundwater can be sampled at selected depths and studied to obtain such information as the direction in which groundwater flows and the types and amounts of contaminates present.

**National Priorities List (NPL):** The EPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term cleanup under Superfund. The EPA is required to update the NPL at least once a year.

**Natural Attenuation:** [See Attenuation].

**Neutrals:** Organic compounds that have a relatively neutral pH, complex structure and, due to their organic bases, are easily absorbed into the environment. Water is the most commonly known neutral, however, naphthalene, pyrene, and trichlorobenzene also are examples of neutrals.

**Nitroaromatics:** Common components of explosive materials, which will explode if activated by very high temperatures or pressures; 2,4,6-Trinitrotoluene (TNT) is a nitroaromatic.

**Notice Letter:** A General Notice Letter notifies the parties potentially responsible for site contamination of their possible liability. A Special Notice Letter begins a 60-day formal period of negotiation during which the EPA is not allowed to start work at a site or initiate enforcement actions against potentially responsible parties, although the EPA may undertake certain investigatory and planning activities.

The 60-day period may be extended if the EPA receives a good faith offer from the PRPs within that period. [See also Good Faith Offer].

**On-Scene Coordinator (OSC):** The predesignated EPA, Coast Guard, or Department of Defense official who coordinates and directs Superfund removal actions or Clean Water Act oil- or hazardous-spill corrective actions.

**Operation and Maintenance:** Activities conducted at a site after a cleanup action is completed to ensure that the cleanup or containment system is functioning properly.

**Organic Chemicals/Compounds:** Chemical substances containing mainly carbon, hydrogen, and oxygen.

**Outfall:** The place where wastewater is discharged into receiving waters.

**Overpacking:** Process used for isolating large volumes of waste by jacketing or encapsulating waste to prevent further spread or leakage of contaminating materials. Leaking drums may be contained within oversized barrels as an interim measure prior to removal and final disposal.

**Pentachlorophenol (PCP):** A synthetic, modified petrochemical that may be used as a wood preservative because of its toxicity to termites and fungi. It is a common component of creosotes and can cause cancer.

**Perched (groundwater):** Groundwater separated from another underlying body of groundwater by a confining layer, often clay or rock.

**Percolation:** The downward flow or filtering of water or other liquids through subsurface rock or soil layers, usually continuing downward to groundwater.

**Pesticide:** A substance or mixture of substances intended to prevent, destroy, or repel any pest. If misused, pesticides can accumulate in the foodchain and contaminate the environment.

**Petrochemicals:** Chemical substances produced from petroleum in refinery operations and as fuel oil residues. These include fluoranthene, chrysene, mineral spirits, and refined oils. Petrochemicals are the bases from which volatile organic compounds (VOCs), plastics, and many pesticides are made. These chemical substances often are toxic to humans and the environment.

**Phenols:** Organic compounds that are used in plastics manufacturing and are by-products of petroleum refining, tanning, textile, dye, and resin manufacturing. Phenols are highly poisonous.

**Physical Chemical Separation:** The treatment process of adding a chemical to a substance to separate the compounds for further treatment or disposal.

**Pilot Testing:** A small-scale test of a proposed treatment system in the field to determine its ability to clean up specific contaminants.

**Plugging:** The process of stopping the flow of water, oil, or gas into or out of the ground through a borehole or well penetrating the ground.

**Plume:** A body of contaminated groundwater flowing from a specific source. The movement of the groundwater is influenced by such factors as local groundwater flow patterns, the character of the aquifer in which groundwater is contained, and the density of contaminants [see Migration].

**Pollution:** Generally, the presence of matter or energy whose nature, location, or quantity produces undesired health or environmental effects.

**Polycyclic Aromatic Hydrocarbons or Polyaromatic Hydrocarbons (PAHs):** PAHs, such as pyrene, are a group of highly reactive organic compounds found in motor oil. They are a common component of creosotes and can cause cancer.

**Polychlorinated Biphenyls (PCBs):** A group of toxic chemicals used for a variety of purposes including electrical applications, carbonless copy paper, adhesives, hydraulic fluids, microscope immersion oils, and caulking compounds. PCBs also are produced in certain combustion processes. PCBs are extremely persistent in the environment because they are very stable, non-reactive, and highly heat resistant. Chronic exposure to PCBs is believed to cause liver damage. It also is known to bioaccumulate in fatty tissues. PCB use and sale was banned in 1979 with the passage of the Toxic Substances Control Act.

**Polynuclear Aromatic Hydrocarbons (PNAs):** PNAs, such as naphthalene, and biphenyls, are a group of highly reactive organic compounds that are a common component of creosotes, which can be carcinogenic.

**Polyvinyl Chloride (PVC):** A plastic made from the gaseous substance vinyl chloride. PVC is used to make pipes, records, raincoats, and floor tiles. Health risks from high concentrations of vinyl chloride include liver cancer and lung cancer, as well as cancer of the lymphatic and nervous systems.

**Potable Water:** Water that is safe for drinking and cooking.

**Potentially Responsible Parties (PRPs):** Parties associated with a Superfund site who may be liable for the cost of remedying the release of hazardous substances. This may include owners or operators of the site or transporters who disposed of materials at the site. PRPs may admit liability, or liability may be determined by a court of law. PRPs may sign a Consent Decree or Administrative Order on Consent to participate in the site cleanup without admitting liability.

**Precipitation:** The removal of solids from liquid waste so that the solid and liquid portions can be disposed of safely; the removal of particles from airborne emissions. Electrochemical precipitation is the use of an anode or cathode to remove the hazardous chemicals. Chemical precipitation involves the addition of some substance to cause the solid portion to separate.

**Preliminary Assessment:** The process of collecting and reviewing available information about a known or suspected waste site or release to determine if a threat or potential threat exists.

**Pump and Treat:** A groundwater cleanup technique involving the extracting of contaminated groundwater from the subsurface and the removal of contaminants, using one of several treatment technologies.

**Radionuclides:** Elements, including radium and uranium-235 and -238, which break down and produce radioactive substances due to their unstable atomic structure. Some are man-made, and others are naturally occurring in the environment. Radon, the gaseous form of radium, decays to form alpha particle radiation, which cannot be absorbed through skin. However, it can be inhaled, which allows alpha particles to affect unprotected tissues directly and thus cause cancer. Radiation also occurs naturally through the breakdown of granite.

**RCRA:** [See Resource Conservation and Recovery Act].

**Recharge Area:** A land area where rainwater saturates the ground and soaks through the earth to reach an aquifer.

**Record of Decision (ROD):** A public document that explains which cleanup alternative(s) will be used to clean up sites listed on the NPL. It is based on information generated during the remedial investigation and feasibility study and consideration of public comments and community concerns.

**Recovery Wells:** Wells used to withdraw contaminants or contaminated groundwater.

**Recycle:** The process of minimizing waste generation by recovering usable products that might otherwise become waste.

**Remedial Action (RA):** The actual construction or implementation phase of a Superfund site cleanup following the remedial design [see Cleanup].

**Remedial Design:** A phase of site cleanup where engineers design the technical specifications for cleanup remedies and technologies.

**Remedial Investigation:** An in-depth study designed to gather the data necessary to determine the nature and extent of contamination at a Superfund site, establish the criteria for cleaning up the site, identify the preliminary alternatives for cleanup actions, and support the technical and cost analyses of the alternatives. The remedial investigation is usually done with the feasibility study. In this volume, the remedial investigation is referred to as a site study [see also Feasibility Study].

**Remedial Project Manager (RPM):** The EPA or State official responsible for overseeing cleanup actions at the site.

**Remedy Selection:** The selection of the final cleanup strategy for the site. At the few sites where the EPA has determined that initial response actions have eliminated site contamination, or that any remaining contamination will be naturally dispersed without further cleanup activities, a "No Action" remedy is selected [see Record of Decision].

**Removal Action:** Short-term immediate actions taken to address releases of hazardous substances [see Cleanup].

**Residual:** The amount of a pollutant remaining in the environment after a natural or technological process has taken place, e.g., the sludge remaining after initial wastewater treatment, or the particulates remaining in air after the air passes through a scrubber.

**Resource Conservation and Recovery Act (RCRA):** A Federal law that established a regulatory system to track hazardous substances from the time of generation to disposal. The law requires safe and secure procedures to be used in treating, transporting, storing, and disposing of hazardous substances. RCRA is designed to prevent new, uncontrolled hazardous waste sites.

**Retention Pond:** A small body of liquid used for disposing of wastes and containing overflow from production facilities. Sometimes retention ponds are used to expand the capacity of such structures as lagoons the store waste.

**Runoff:** The discharge of water over land into surface water. It can carry pollutants from the air and land and spread contaminants from its source.

**Scrubber:** An air pollution control device that uses a spray of water or reactant or a dry process to trap pollutants in emissions.

**Sediment:** The layer of soil, sand, and minerals at the bottom of surface waters such as streams, lakes, and rivers, that absorbs contaminants.

**Seeps:** Specific points where releases of liquid, usually leachate, form from waste disposal areas, particularly along the lower edges of landfills.

**Seepage Pits:** A hole, shaft, or cavity in the ground used for the storage of liquids, usually in the form of leachate, from waste disposal areas. The liquid gradually leaves the pit by moving through the surrounding soil.

**Septage:** Residue remaining in a septic tank after the treatment process.

**Sinkhole:** A hollow depression in the land surface in which drainage collects; associated with underground caves and passages that facilitate the movement of liquids.

**Site Characterization:** The technical process used to evaluate the nature and extent of environmental contamination, which is necessary for choosing and designing cleanup measures and monitoring their effectiveness.

**Site Inspection:** The collection of information from a hazardous waste site to determine the extent and severity of hazards posed by the site. It follows, and is more extensive than, a preliminary assessment. The purpose is to gather information necessary to score the site, using the Hazard Ranking System, and to determine if the site presents an immediate threat that requires a prompt removal action.

**Slag:** The fused refuse or dross separated from a metal in the process of smelting.

**Sludge:** Semi-solid residues from industrial or water treatment processes that may be contaminated with hazardous materials.

**Slurry Wall:** Barriers used to contain the flow of contaminated groundwater or subsurface liquids. Slurry walls are constructed by digging a trench around a contaminated area and filling the trench with an impermeable material that prevents water from passing through it. The groundwater or contaminated liquids trapped within the area surrounded by the slurry wall can be extracted and treated.

**Smelter:** A facility that melts or fuses ore, often with an accompanying chemical change, to separate the metal. Emissions from smelters are known to cause pollution.

**Soil Gas:** Gaseous elements and compounds that occur in the small spaces between particles of soil. Such gases can move through or leave the soil or rock, depending on changes in pressure.

**Soil Vapor Extraction:** A treatment process that uses vacuum wells to remove hazardous gases from soil.

**Soil Washing:** A water-based process for mechanically scrubbing soils in-place to remove undesirable materials. There are two approaches: dissolving or suspending them in the wash solution for later treatment by conventional methods, and concentrating them into a smaller volume of soil through simple particle size separation techniques [see Solvent Extraction].

**Stabilization:** The process of changing an active substance into inert, harmless material, or physical activities at a site that act to limit the further spread of contamination without actual reduction of toxicity.

**Solidification/Stabilization:** A chemical or physical reduction of the mobility of hazardous constituents. Mobility is reduced through the binding of hazardous constituents into a solid mass with low permeability and resistance to leaching.

**Solvent:** A substance capable of dissolving another substance to form a solution. The primary uses of industrial solvents are as cleaners for degreasing, in paints, and in pharmaceuticals. Many solvents are flammable and toxic to varying degrees.

**Solvent Extraction:** A means of separating hazardous contaminants from soils, sludges, and sediment, thereby reducing the volume of the hazardous waste that must be treated. It generally is used as one in a series of unit operations. An organic chemical is used to dissolve contaminants as opposed to water-based compounds, which usually are used in soil washing.

**Sorption:** The action of soaking up or attracting substances. It is used in many pollution control systems.

**Special Notice Letter:** [See Notice Letter].

**Stillbottom:** Residues left over from the process of recovering spent solvents.

**Stripping:** A process used to remove volatile contaminants from a substance [see Air Stripping].

**Sumps:** A pit or tank that catches liquid runoff for drainage or disposal.

**Superfund:** The program operated under the legislative authority of the CERCLA and Superfund Amendments and Reauthorization Act (SARA) to update and improve environmental laws. The program has the authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health, welfare, or the environment. The "Superfund" is a trust fund that finances cleanup actions at hazardous waste sites.

**Surge Tanks:** A holding structure used to absorb irregularities in flow of liquids, including liquid waste materials.

**Swamp:** A type of wetland that is dominated by woody vegetation and does not accumulate peat moss deposits. Swamps may be fresh or saltwater and tidal or non-tidal [see Wetlands].

**Thermal Treatment:** The use of heat to remove or destroy contaminants from soil.

**Treatability Studies:** Testing a treatment method on contaminated groundwater, soil, etc., to determine whether and how well the method will work.

**Trichloroethylene (TCE):** A stable, colorless liquid with a low boiling point. TCE has many industrial applications, including use as a solvent and as a metal degreasing agent. TCE may be toxic to people when inhaled, ingested, or through skin contact and can damage vital organs, especially the liver [see Volatile Organic Compounds].

**Unilateral [Administrative] Order:** [see Administrative Order].

**Upgradient:** An upward hydrologic slope; demarks areas that are higher than contaminated areas and, therefore, are not prone to contamination by the movement of polluted groundwater.

**Vacuum Extraction:** A technology used to remove volatile organic compounds (VOCs) from soils. Vacuum pumps are connected to a series of wells drilled to just above the water table. The wells are sealed tightly at the soil surface, and the vacuum established in the soil draws VOC-contaminated air from the soil pores into the well, as fresh air is drawn down from the surface of the soil.

**Vegetated Soil Cap:** A cap constructed with graded soils and seed for vegetative growth, to prevent erosion [see Cap].

**Vitrification:** The process of electrically melting wastes and soils or sludges to bind the waste in a glassy, solid material more durable than granite or marble and resistant to leaching.

**Volatile Organic Compounds (VOCs):** VOCs are manufactured as secondary petrochemicals. They include light alcohols, acetone, trichloroethylene, perchloroethylene, dichloroethylene, benzene, vinyl chloride, toluene, and methylene chloride. These potentially toxic chemicals are used as solvents, degreasers, paints, thinners, and fuels. Because of their volatile nature, they readily evaporate into the air, increasing the potential exposure to humans. Due to their low water solubility, environmental persistence, and widespread industrial use, they are commonly found in soil and groundwater.

**Waste Treatment Plant:** A facility that uses a series of tanks, screens, filters, and other treatment processes to remove pollutants from water.

**Wastewater:** The spent or used water from individual homes or industries.

**Watershed:** The land area that drains into a stream or other water body.

**Water Table:** The upper surface of the groundwater.

**Weir:** A barrier to divert water or other liquids.

**Wetland:** An area that is regularly saturated by surface or groundwater and, under normal circumstances, is capable of supporting vegetation typically adapted for life in saturated soil conditions. Wetlands are critical to sustaining many species of fish and wildlife. Wetlands generally include swamps, marshes, and bogs. Wetlands may be either coastal or inland. Coastal wetlands have salt or brackish (a mixture of salt and fresh) water, and most have tides, while inland wetlands are non-tidal and freshwater. Coastal wetlands are an integral component of estuaries.

**Wildlife Refuge:** An area designated for the protection of wild animals, within which hunting and fishing are either prohibited or strictly controlled.

# Some Common Contaminants at NPL Sites

| Contaminant Category | Example Chemical Types | Sources | Potential Health Threats* |
|---|---|---|---|
| Heavy Metals | Arsenic, Barium, Beryllium, Cadmium, Cobalt, Copper, Chromium, Lead, Manganese, Mercury, Nickel, Silver, Selenium, Zinc | Electroplating, batteries, paint pigments, photography, smelting, thermometers, fluorescent lights, solvent recovery | Tumors, cancers, and kidney, brain, neurological, bone and liver damage |
| Volatile Organic Compounds (VOCs) | Trichloroethylene (TCE), Perchloroethylene (PCE), Acetone, Benzene, Ketone, Methyl chloride, Toluene, Vinyl Chloride, Dichlorethylene | Solvents and degreasers, gasoline octane enhancers, oils and paints, dry cleaning fluids, chemical manufacturing. | Cancers, kidney and liver damage, impairment of the nervous system resulting in sleepiness and headaches, leukemia |
| Pesticides/ Herbicides | Chlordane, DDT 4-4, DDE, Heptachlor, Aldrin, Endrin, Atrazine, Dieldrin, Toxaphene | Agricultural applications, pesticide and herbicide production | Various effects ranging from nausea to nervous disorders. Dioxin is a common by-product of the manufacture of pesticides and is both highly toxic and a suspected carcinogen. |
| Polychlorinated biphenyls (PCBs) | — | Electric transformers and capacitors, insulators and coolants, adhesives, caulking compounds, carbonless copy paper, hydraulic fluids. | Cancer and liver damage. |
| Creosotes | Polyaromatic hydrocarbons (PAHs), Polynuclear aromatics (PNAs), Phenolic Tars, Pentachlorophenol (PCP) | Wood preserving, fossil fuel combustion | Cancers and skin ulcerations with prolonged exposure |
| Radiation (Radionuclides) | Radium-226, Radon, Uranium-235, Uranium-238 | Mine tailings, radium products, natural decay of granites | Cancer |

*Sources:* *Toxic Chemicals—What They Are, How They Affect You (EPA, Region 5)*
*Glossary of Environmental Terms (EPA, 1988)*

**The potential for risk due to these contaminants is linked to a number of factors; for example, the length and level of exposure and environmental and health factors such as age.*

*U.S. G.P.O.:1993-341-835:81019