



United States  
Environmental Protection  
Agency

Solid Waste And  
Emergency Response  
(5102 G)

EPA/540/R-93/037  
December 1992  
PB93-963239

# **SUPERFUND:**

**Progress at  
National  
Priority  
List Sites**



## **RHODE ISLAND 1992 UPDATE**



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# INTRODUCTION

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## A BRIEF OVERVIEW OF SUPERFUND

**D**uring 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.

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### 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-

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## INTRODUCTION

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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.

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### 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.*

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## INTRODUCTION

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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



*Superfund employee removing drums from a Superfund site.*

Program had logged more than 2,300 removal completions since Superfund was established.

### 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.

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## INTRODUCTION

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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

**H**istorically, 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.



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## INTRODUCTION

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### HOW SUPERFUND WORKS

**E**ach 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.

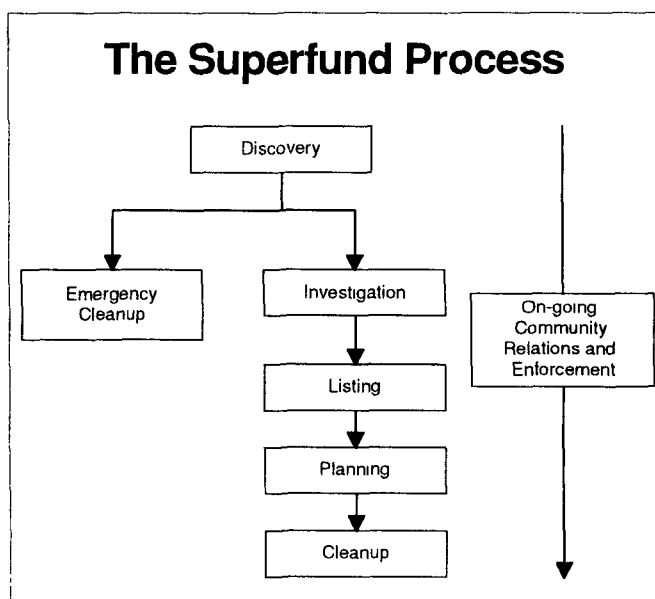
Superfund's cleanup process is arduous and exacting. It requires the best efforts of hundreds of experts in science and engineering, public health, administration and management, law, and many other fields.

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.

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# THE VOLUME

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## How to Use the State Book

**T**he 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.

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## 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

SITE NAME STATE EPA ID# ABC0000000		EPA REGION XX COUNTY NAME LOCATION  Other Names:
<b>NPL LISTING HISTORY</b> Provides the dates when the site was Proposed, made Final, and Deleted from the NPL.	<b>Site Description</b>	<b>A</b>
	<b>Site Responsibility:</b>	<b>NPL Listing History</b> Proposed XX/XX/XX Final XX/XX/XX
	<b>Threats and Contaminants</b>	<b>B</b>
	<b>Cleanup Approach</b>	<b>C</b>
	<b>Response Action Status</b>	<b>D</b>
<b>SITE RESPONSIBILITY</b> Identifies the Federal, State, and/or potentially responsible parties taking responsibility for cleanup actions at the site.	<b>Site Facts:</b>	<b>E</b>
	<b>Environmental Progress</b>	
	<b>Site Repository</b>	
<b>ENVIRONMENTAL PROGRESS</b> 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.

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## THE VOLUME

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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.



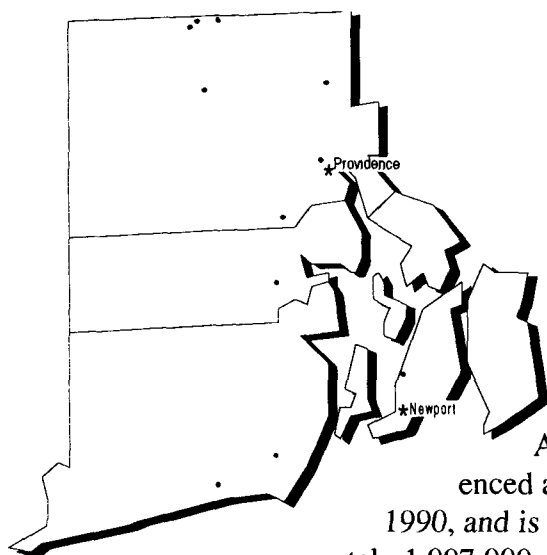
*Cleanup Ongoing* indicates that the selected cleanup remedies for the contaminated site, or part of the site, currently are underway.



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

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## **A SUMMARY OF THE STATE PROGRAM**



# Superfund Activities in Rhode Island

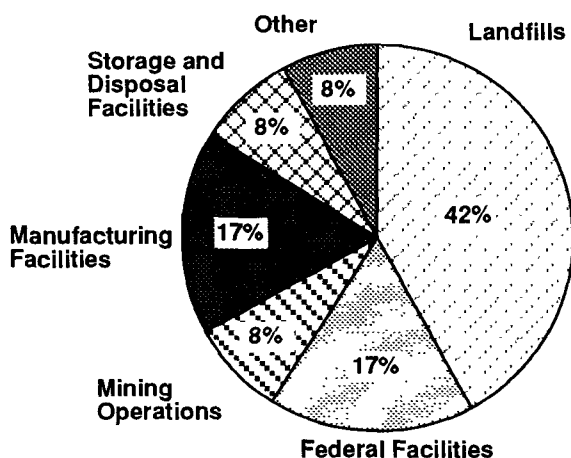
The State of Rhode Island is located within EPA Region 1, which includes the six States of New England. The State covers 1,212 square miles.

According to the 1990 Census, Rhode Island experienced a 6 percent increase in population between 1980 and 1990, and is ranked forty-third in U.S. population with approximately 1,007,000 residents.

The Hazardous Waste Management Act of 1978, most recently amended in 1987, provides enforcement authorities for cleanup of abandoned, uncontrolled, or inactive sites. The statute grants the State the authority to make polluters liable for site cleanup regardless of fault, issue subpoenas, collect penalties and punitive damages from polluters, and recover costs from polluters who refuse to participate in site cleanup activities. In 1984, the statute was amended to create the Environmental Response Fund. In addition to the required 10 percent contribution from the State under the Federal Superfund program, this Fund provides for site investigation, emergency response, removals, site evaluation, long-term cleanup actions, and temporary water supplies and resident relocation. Currently, 11 sites in the State of Rhode Island have been listed as final on the NPL. One new site was proposed for listing in 1992.

## The Department of Environmental Management implements the Superfund Program in the State of Rhode Island

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



### Facts about the 12 NPL sites in Rhode Island:



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



Nine sites endanger sensitive environments.



Eleven sites are located near residential areas.

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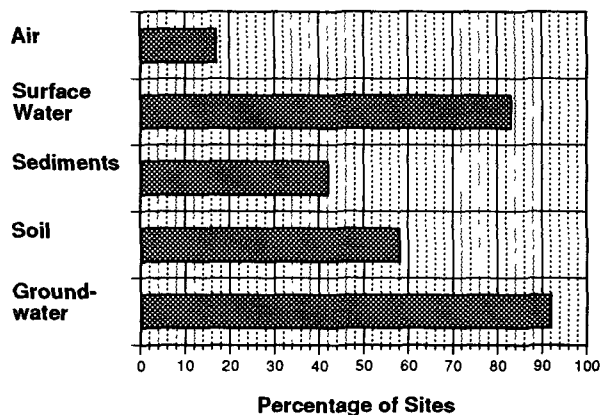
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## RHODE ISLAND

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### Most Sites Have Multiple Contaminants and Contaminated Media:

#### *Media Contaminated at Sites*



#### *Contaminants Found at Sites*

Percentage of Sites	
VOCs	100%
Heavy Metals	75%
PCBs	33%
Creosotes	17%
Pesticides/Herbicides	17%
Petrochemicals/Explosives	17%
Plastics	8%

### The Potentially Responsible Party Pays...

In the State of Rhode Island, potentially responsible parties are paying for or conducting cleanup activities at eight sites.

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

☎ EPA Region 1 Superfund Community Relations Section	For information concerning community involvement	(617) 565-2713
☎ National Response Center	To report a hazardous waste emergency	(800) 424-8802
☎ The Department of Environment Management: Division of Air and Hazardous Materials, Environmental Response Section	For information about the State's responsibility in the Superfund Program	(401) 277-2797
☎ EPA Region 1 Superfund Office: Waste Management Division	For information about the Regional Superfund Program	(617) 573-5707
☎ EPA Superfund Hotline	For information about the Federal Superfund Program	(800) 424-9068



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# THE NPL REPORT

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## PROGRESS TO DATE

**T**he 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.

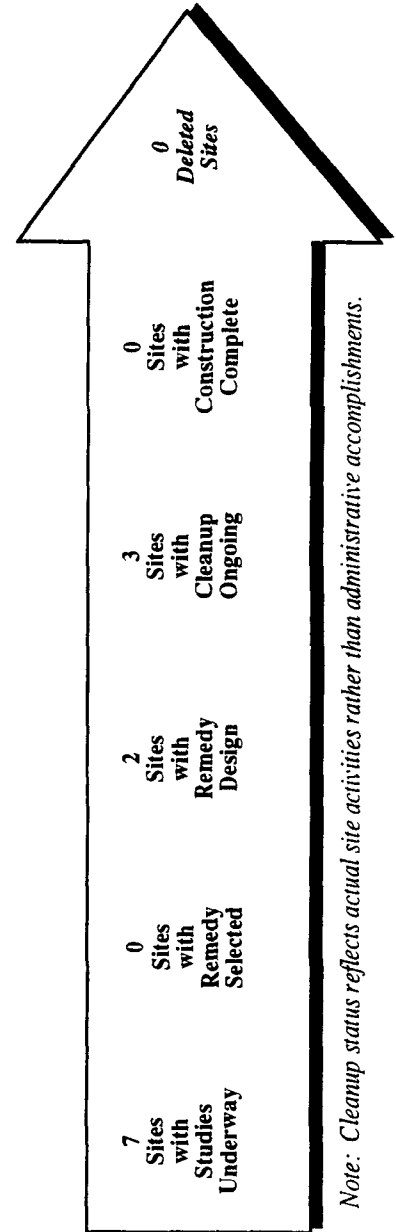
⇒ A final arrow in the "Construction Complete" category is used only when all phases of the site cleanup plan have been performed, and the EPA has determined that no additional construction actions are required at the site. Some sites in this category currently may be undergoing long-term operation and 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 Rhode Island

Site Name	County	NPL Date	Initial Response	Site Studies	Remedy Selected	Remedy Design	Cleanup Ongoing	Construction Complete	Deleted
CENTRAL LANDFILL	PROVIDENCE	Final	06/01/86	⇨					
DAVIS (GSR) LANDFILL	PROVIDENCE	Final	06/01/86	⇨					
DAVIS LIQUID WASTE	PROVIDENCE	Final	09/08/83	⇨	⇨		⇨		
DAVISVILLE NAVAL CONSTRUCTION BATTALION CENTER	WASHINGTON	Final	11/15/89	⇨					
LANDFILL AND RESOURCE RECOVERY, INC.	PROVIDENCE	Final	09/01/83	⇨	⇨				
NEWPORT NAVAL EDUCATION & TRAINING CENTER	NEWPORT	Final	11/15/89	⇨					
PETERSON/PURITAN, INC.	PROVIDENCE	Final	09/08/83	⇨					
PICILLO FARM	KENT	Final	09/01/83	⇨	⇨		⇨		
ROSE HILL REGIONAL LANDFILL	WASHINGTON	Final	10/04/89	⇨					
STAMINA MILLS, INC.	PROVIDENCE	Final	09/01/83	⇨	⇨				
WEST KINGSTON TOWN DUMP/URI DISPOSAL AREA	WASHINGTON	Prop.	7/29/91	⇨					
WESTERN SAND & GRAVEL	PROVIDENCE	Final	09/01/83	⇨	⇨		⇨		

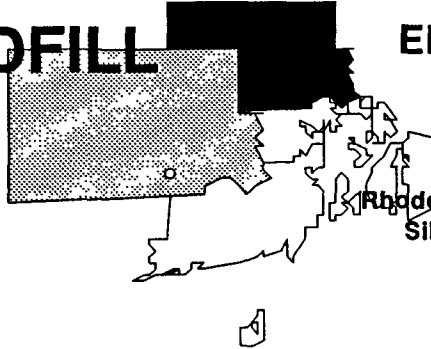


*Note: Cleanup status reflects actual site activities rather than administrative accomplishments.*

# CENTRAL LANDFILL

## RHODE ISLAND

EPA ID# RID980520183



## EPA REGION 1

Providence County  
Johnston

### Other Names:

Rhode Island Central Landfill  
Silvestri Bros. Landfill  
Johnston Site

## Site Description

The Central Landfill site covers approximately 155 acres of a 600-acre tract in Johnston. Licensed by Rhode Island and supported by State funds, this active municipal landfill receives approximately 85 percent of Rhode Island's solid waste. State records indicate that 1 1/2 million gallons of hazardous wastes generated within the State were disposed of at the site in 1978 and 1979. In 1982, the owner complied with a State order to close the areas that had received hazardous wastes. These areas have been excavated, backfilled, and capped to prevent further contamination of the groundwater and surface water and revegetated as part of the closure plan. Approximately 4,000 people live within 3 miles of the site. The nearest home is 1/2 mile away. Nearby private wells downgradient from the site are contaminated with solvents. The bedrock aquifer may be contaminated, and the adjacent wetlands also may be affected. Cedar Swamp Brook, used for recreational boating, flows southeast along the southwest perimeter of the site.

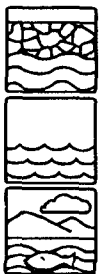
**Site Responsibility:** This site is being addressed through Federal and potentially responsible parties' actions.

### NPL LISTING HISTORY

Proposed Date: 10/01/84

Final Date: 06/01/86

## Threats and Contaminants



The groundwater, surface water, and sediments are contaminated with volatile organic compounds (VOCs), including toluene and methylene chloride from disposal of solvents. The EPA has determined that the public is not at immediate risk from site contamination, however, people who drink water from nearby wells are under potential health risk from elevated lead levels in groundwater. Cedar Swamp Brook and adjacent wetlands also may contain contamination.

## Cleanup Approach

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

## Response Action Status

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**Initial Actions:** The current owner has installed a landfill gas collection and combustion system, which is used to generate electricity, and public water lines in the area of central landfill. The current owner also purchased all residential land within 1,000 feet of the landfill, and has offered to purchase all residential property up to 2,000 feet from landfill.



**Entire Site:** In 1987, the owner began a study to determine the extent and nature of site contamination and to evaluate alternatives for cleanup. The site is being addressed in two phases. The first phase will address cleanup and control of the source of contamination. The second phase will address the cleanup of offsite contaminated groundwater, surface water, and sediments. Groundwater monitoring and sampling wells have been completed. The EPA expects to evaluate study findings and select a cleanup remedy in 1993. At that point, the EPA will outline the owner's further responsibilities for cleaning up the site.

**Site Facts:** The owner of the landfill entered into a Consent Order with the EPA, signed in 1987, to conduct a study of the contamination at the site.

## Environmental Progress



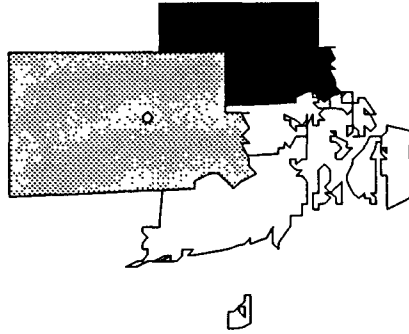
The installation of public water lines and the purchase of residential property around the landfill has reduced the threat of health risks to the public while studies at the Central Landfill are being conducted and the final cleanup alternatives are being addressed.

## Site Repository



Marion J. Mohr Memorial Library, 1 Memorial Drive, Johnston, RI 02919

**DAVIS (GSR)  
LANDFILL  
RHODE ISLAND**  
EPA ID# RID980731459



**EPA REGION 1**  
Providence County  
Glocester/Smithfield

## Site Description

The Davis (GSR) Landfill is a 58-acre inactive landfill located in the towns Glocester and Smithfield and is located near the Davis Liquid Waste Site in Smithfield, which was placed on the NPL in 1983. Between 1974 and 1976, the landfill, which was privately owned and licensed by the State to accept municipal wastes, accepted wastes from Glocester, Smithfield, Warwick, and Providence. In 1978, the State declined to renew the permit because the facility, during the previous year, had violated numerous rules and regulations for operating solid waste management facilities. Numerous legal actions to close the site ensued, and the State Supreme Court ruled in favor of the State in 1982, at which time the site became inactive, but it was not properly capped or stabilized. The State found both surface water and groundwater contamination on site, and the EPA confirmed off-site contamination. Fifteen people live within 1,000 feet of the site. Approximately 200 residents who utilize private water wells live within a 1-mile radius, and within a 3-mile radius there are approximately 4,700 people using private wells.

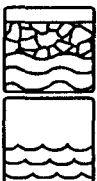
**Site Responsibility:** This site is being addressed through Federal actions.

### NPL LISTING HISTORY

Proposed Date: 04/01/85

Final Date: 06/01/86

## Threats and Contaminants



The on-site groundwater, surface water, and sediments are contaminated with volatile organic compounds (VOCs), such as toluene and benzene and heavy metals including lead. Access to the site is limited only by a locked gate on the access road. Direct contact with or accidental ingestion of contaminated on-site surface water, sediment, or groundwater may pose a potential health threat.

## Cleanup Approach

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

## Response Action Status

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**Entire Site:** In 1990, the EPA began an investigation into the nature and extent of contamination at the site, the results of which will lead to the identification of cleanup alternatives. Completion of the investigation is planned for 1994, at which time the EPA will select a final cleanup remedy.

## Environmental Progress



In 1990, the EPA conducted tests of the site conditions and determined that the Davis Landfill poses no immediate threat to the public or the environment while the investigation leading to final cleanup activities is taking place.

## Site Repository

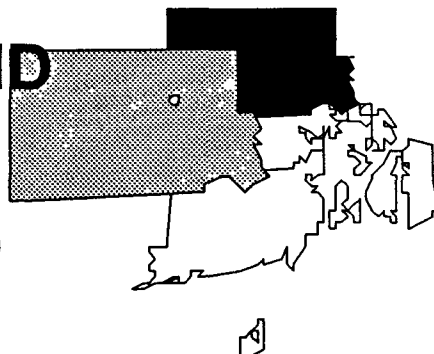


East Smithfield Public Library, 50 Esmond Street, Esmond, RI 02917

# DAVIS LIQUID WASTE

## RHODE ISLAND

EPA ID# RID980523070



## EPA REGION 1

Providence County  
Smithfield

### Site Description

The Davis Liquid Waste site is a disposal facility for hazardous wastes covering approximately 10 acres and located in a rural section of Smithfield. Throughout the 1970s, the site accepted liquid and chemical wastes such as paint and metal sludges, oily wastes, solvents, acids, caustics, pesticides, phenols, halogens, metals, fly ash, and laboratory pharmaceuticals. Liquid wastes were transported in drums and bulk tank trucks and were dumped directly into unlined lagoons and seepage pits. The operator periodically excavated the semi-solid lagoon materials, dumped them at several locations on the site, and covered them with soil. Other operations included the collection of junked vehicles and machine parts, metal recycling, and tire shredding. These activities resulted in soil, surface water, sediment, and groundwater contamination, both on and off the site. In 1978, discovery of off-site well contamination prompted the State Superior Court to prohibit further dumping of hazardous substances on the Davis property. The owner still is using sections of the disposal area and adjacent property (20 acres) as a staging and storage area for 10 to 15 million tires. The area is residential; the nearest homes are within 1,500 feet of the site. There are 240 people living within 1 mile and 4,700 people within 3 miles of the site; the nearest well is 300 feet away. The property is bordered on the north and south by wetlands and swamp areas.

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

#### NPL LISTING HISTORY

Proposed Date: 12/30/82

Final Date: 09/08/83

### Threats and Contaminants



Groundwater contamination consists of volatile organic compounds (VOCs) and heavy metals including arsenic and lead from the lagoons and seepage pit areas. The soil, lagoon sediments, and surface water also are contaminated with VOCs and heavy metals. Residential wells to the north and northeast of the site are contaminated with VOCs. People could be exposed to contaminants by ingesting contaminated groundwater, coming in contact with contaminated soils on site, or by inhaling chemicals that evaporate from the soil or surface water. Because the bordering wetlands have been filled with tires and waste material, water elevations have increased, resulting in a large area of stressed wetland vegetation.

## Cleanup Approach

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The site is being addressed in three stages: initial actions and two long-term remedial phases focusing on provision of a new water supply line and cleanup of the entire site.

## Response Action Status

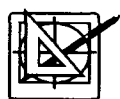
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**Initial Actions:** In 1985 to 1986, the EPA sampled, packed, and staged approximately 600 intact and crushed drums and shipped them off site for approved disposal. At the same time, bottled water for drinking and cooking was supplied by the Rhode Island Department of Environmental Management to residences with contaminated wells. This temporary action provided a safe water supply while a permanent remedy was being investigated.



**Water Supply Line:** Residents with contaminated wells are being provided a permanent source of clean water. This water distribution system will serve 120 lots along Forge Road, Log Road, Burlingame Road, and Bayberry Road. The new system includes construction of a 300,000-gallon water storage tank, a water main, pumping stations, and connections to existing residences. For undeveloped lots, the EPA will bring a service connection up to the property line so that future connection may take place at the owner's expense. Installation of the water storage tank and waterline piping to residents in the vicinity of the site has been completed. The EPA is currently reviewing the workplan for the design and construction of pump stations needed to complete the system. Construction of the system is planned for completion in 1995.



**Entire Site:** The EPA has obtained a court order for access to the site to clean it up. Features of the remedy include excavating 25,000 cubic yards of raw waste and contaminated soils for on-site incineration and treating on-site groundwater using an air stripper, followed by carbon filtration to remove the contaminants from the air; cleaned water will be recirculated into the aquifer. In addition, soil will be tested. Clean soil will be used to backfill the area; the rest will be placed in an EPA-approved landfill located at the site. The remedy selected for cleaning up the site now is being designed by an environmental engineering design firm under U.S. Army Corps of Engineers oversight and EPA monitoring. Design activities are expected to be completed in 1993. The EPA expects soil cleanup to be completed in two years, and groundwater cleanup to take five to 10 years.

**Site Facts:** Discovery of off-site well contamination in 1978 resulted in the State Superior Court banning dumping on the site. The EPA obtained a Court Order to gain temporary access to the site. The Department of Justice is preparing a motion for a "conditional" site access to be entered in the Rhode Island Federal Court. The site owner has resisted attempts by Federal officials to investigate the site for cleanup and has continued to conduct business operations within 100 feet of the hazardous dumping site.



## Environmental Progress

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The initial cleanup actions at the Davis Liquid Waste site to remove drums and provide an alternative water supply have reduced the potential for exposure to hazardous substances in the drinking water and on the site while it awaits the completion of planned cleanup activities.

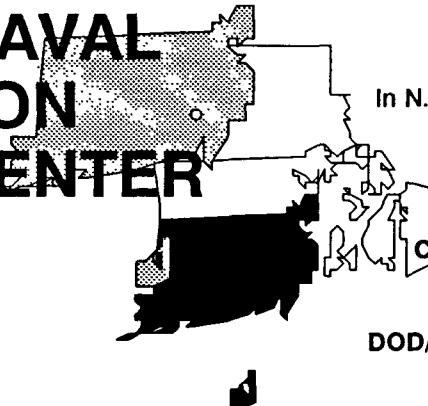
## Site Repository



East Smithfield Public Library, 50 Esmond Street, Esmond, RI 02917

# DAVISVILLE NAVAL CONSTRUCTION BATTALION CENTER RHODE ISLAND

EPA ID# RI6170022036



## EPA REGION 1

Washington County  
In N. Kingstown, 18 miles south of  
Providence

### Other Names:

Camp Fogarty

Calf Pasture Point Landfill

NCBC Davisville

Allen Harbor Estuary

DOD/NCBC/Allens Harbor Landfill

## Site Description

The Davisville Naval Construction Battalion Center (NCBC), located 18 miles south of Providence in North Kingstown, covers approximately 1,500 acres. A military installation since 1951, its primary mission is to provide mobilization support to Naval construction forces. Much of the NCBC-Davisville site is contiguous with Narragansett Bay and consists of three areas, including the Main Center, the West Davisville storage area, and Camp Fogarty, a training facility 4 miles west of the Main Center in the town of East Greenwich. Adjoining NCBC's South Boundary is the decommissioned Naval Air Station Quonset Point, which was given to the Rhode Island Port Authority in 1973. The Navy disposed of wastes in all four areas. The Navy has identified at least 24 areas with potential hazardous contamination, but the Department no longer owns several of them. These areas are being investigated by the Army Corps of Engineers; chief among the areas is the Camp Avenue Landfill at the decommissioned Naval Air Station. The Navy's current studies focus on ten areas: the Allen Harbor Landfill (the largest of the areas) received solvents, paint thinners, degreasers, polychlorinated biphenyls (PCBs) from transformers, sewage sludge, and contaminated fuel oil from 1946 to 1972; the Calf Pasture Landfill, which received "decontamination agents" and various other contaminants; the Construction Equipment Department (CED) Battery Acid Disposal Area; the CED Solvent Disposal Area; the Transformer Oil Disposal Area (near Building 37); the Solvent Disposal Area; the Defense Property Disposal Office (DPDO) Film Processing Disposal Area; the Camp Fogarty Disposal Area; the Fire Fighting Training Area; and the Disposal Areas Northwest of Buildings W-3, W-4 and T-1. About twenty 5-gallon cans of calcium hypochlorite were disposed of in a drainage ditch on the site between 1960 and 1971. In 1973, thirty to forty 35-gallon cardboard containers of a chloride compound were stored at the site and deteriorated over time. From 1968 to 1974, about 2,500 3-gallon cans also were disposed of. From 1968 to 1974, the Transformer Oil Disposal Area received 30 gallons of PCB-containing oil, which was drained from transformers and poured on the ground east of Building 37. The surrounding area is single-family residential. Approximately 27,000 people get their drinking water from public wells within 3 miles of the site.

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

### NPL LISTING HISTORY

Proposed Date: 07/14/89

Final Date: 11/15/89

## Threats and Contaminants

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Heavy metals including lead, cadmium, silver, mercury, and chromium were found in the sediments and on the shoreline of Allen Harbor. Other contaminants in Allen Harbor include polycyclic aromatic hydrocarbons (PAHs), polynuclear aromatic hydrocarbons (PNAs), solvents, and PCBs. Soil contamination is not specified, but dumping practices involved organic solvents, PCBs, sewage sludge, contaminated fuel oil, and halogens. Some public wells are located upgradient between 1 and 3 miles from disposal sites. The potential for contamination of these wells is small. Groundwater is shallow (2-4 feet in some areas), and the soil is permeable, conditions that facilitate movement of contaminants into the groundwater. In addition, it has been shown that Allen Harbor is polluted. A number of salt marshes that could be affected by contamination from the site have been identified in the Allen Harbor, Calf Pasture Point, and Narragansett Bay areas.

## Cleanup Approach

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The Navy has separated its cleanup efforts into four stages: initial actions and three long-term remedial phases focusing on cleanup of the Allen Harbor Landfill, the DPO/FPD, and other areas of the site.

### Response Action Status

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**Initial Actions:** In 1991, the Navy removed materials from two on-site buildings that were contaminated by PCB spills. An additional study is being planned to address the removal of the remaining PCB-contaminated materials that were not removed during the initial phase.



**Allen Harbor Landfill:** In 1985, the water, sediment, and organisms in Allen Harbor were sampled as part of the confirmation studies and found to be contaminated. Given the landfill's location adjacent to the Harbor, it is likely that leachate will migrate into the Harbor. A study of the nature and extent of site contamination and assessment of possible cleanup alternatives is scheduled for completion in 1994.



**DPO/FPD:** The Navy took 16 soil samples from the transformer oil disposal area in 1985 and six samples in 1986 and analyzed them for PCBs. An additional study of the nature and extent of site contamination and assessment of possible cleanup choices is scheduled for completion in 1994. The migration potential of contaminants off site is moderate to high. Groundwater flow is assumed to be toward Hall Creek, which is 600 feet from the site.



**Other Areas:** Studies of the nature and extent of contamination at eight additional areas identified by the Navy are scheduled for completion in 1994.

These areas include the CED Battery Disposal Area, CED Solvent Disposal Area, Transformer Oil Disposal Area, Calf Pasture Point, Camp Fogarty Disposal Area, Fire Fighting Training Area, and the Disposal Area northwest of buildings W-3, W-4 and T-1. A magnetometer study was conducted at the Calf Pasture Point area to locate the cans containing contaminants. Soil borings were taken in 1985 to determine the depth of contamination. The mobility of contaminants is moderate to high; however, the effect on the groundwater to date is minimal.

**Site Facts:** NCBC 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. In 1988, the EPA and the Naval Ocean Systems Center began conducting a study at the Allen Harbor landfill, under a Memorandum of Agreement.

## Environmental Progress



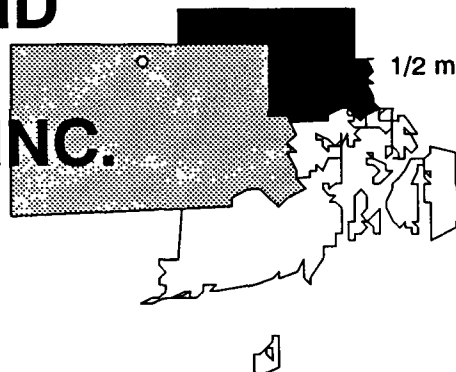
The removal of materials from two on-site buildings has reduced threats to the public and the environment while studies leading to the cleanup of the site are underway.

## Site Repository



North Kingstown Free Library, 100 Boone Street, North Kingstown, RI 02852

**LANDFILL AND  
RESOURCE  
RECOVERY, INC.  
(L&RR)  
RHODE ISLAND  
EPA ID# RID093212439**



**EPA REGION 1**

Providence County

1/2 mile east of Slatersville Reservoir  
in North Smithfield

## Site Description

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The Landfill and Resource Recovery, Inc. (L&RR) site is a 28-acre landfill on a 36-acre parcel of land. The site originally was a sand and gravel pit and was used for small-scale refuse disposal from 1927 to 1974. In 1974, the site was sold and developed into a large-scale disposal facility accepting commercial, municipal, and industrial wastes. Until 1979, an estimated 1 1/2 million gallons of hazardous wastes were accepted and disposed with other wastes in the central portion of the landfill. The hazardous wastes included many types of bulk and drummed organic and inorganic materials in liquid, sludge, and solid forms. In 1979, the operator placed a polyvinyl chloride cover over the area containing hazardous waste to prevent rainwater from entering. Landfilling of commercial and residential wastes continued until 1985, when the owners closed the landfill and placed another synthetic cover over nearly the entire landfill. Soil was placed over the synthetic cover, and it was partially planted with vegetation. Although the area still is rural, there are approximately 10,000 residents in a 25-square-mile area; the area appears to be undergoing a substantial growth in residential development. Within a 1/2-mile radius of the site, there are fewer than 50 residences and no multi-residential housing developments. More than 3,000 people live within 3 miles of the site. An industrial park is located approximately 3,000 feet to the north, and Air National Guard installations are approximately 1,000 feet to the east and 3,000 feet to the south of the site. Most, if not all, residences in the site vicinity obtain their drinking water from individual wells. Trout Brook, adjacent to the site, and the Slatersville Reservoir, into which it discharges, are used for fishing and other recreation, but are not public water supply sources.

**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

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The air at the landfill vents is contaminated with volatile organic compounds (VOCs) including carbon tetrachloride, chloroform, and benzene. The groundwater on site is contaminated with arsenic, lead, and VOCs from waste liquids disposed of on site and from rainwater entering the landfilled wastes and causing contamination to move into the groundwater. The surface water on the site is contaminated with lead. The only health threat is from gaseous emissions from the landfill. The landfill is enclosed by a single-strand fence. The only significant environmental threat is to the wetlands surrounding the site. The wetlands are being affected by sand eroding from the landfill. The eroded sand is not contaminated; however, it is filling in the wetlands, destroying vegetation and decreasing the ability of the wetland area to support plant and animal life.

## Cleanup Approach

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

## Response Action Status

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**Entire Site:** In 1977, the owner installed monitoring wells on site to ensure compliance with State regulations. The owner closed the landfill in 1985, and 3/4 of the site was covered with a synthetic cap to minimize infiltration of rain and melted snow. Soil also was used to establish a vegetative cover. The cap was designed and constructed with gas vents to prevent the buildup of gases under the cap. These vents currently are sealed. The selected long-term remedy for this site includes: (1) installation of more substantial fencing; (2) stabilization of the steep side slopes of the landfill and installation of a synthetic cap over the uncapped area of the landfill, with establishment of a vegetative cover over the entire landfill; (3) collection and thermal destruction of underlying gases; and (4) groundwater and air monitoring. Design of these cleanup actions by the potentially responsible parties began in 1990.

**Site Facts:** In 1985, the landfill was closed by the owner under a Consent Order with the State. In 1990, an Administrative Order was issued to the potentially responsible parties to conduct design and cleanup activities.

## Environmental Progress



Closing the landfill, installing a cover, and constructing a fence to limit access to the site have reduced the potential for exposure to hazardous materials at the Landfill and Resource Recovery site while cleanup activities are being designed and implemented.

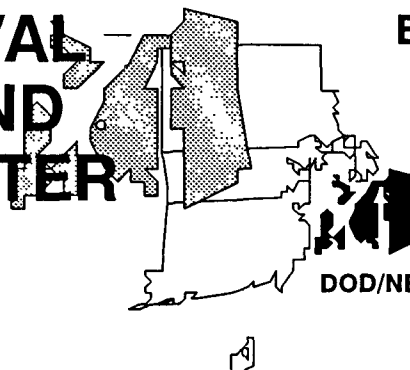
## Site Repository



Municipal Annex Building, 85 Smithfield Road, North Smithfield, RI 02895

# NEWPORT NAVAL EDUCATION AND TRAINING CENTER RHODE ISLAND

EPA ID# RI6170085470



## EPA REGION 1

Newport County  
Aquidneck Island

Other Names:  
U.S. Navy McAllister  
DOD/NETC/McAllister Point Landfill

## Site Description

The 1,400-acre Newport Naval Education and Training Center (NETC) site has been used by the Navy as a refueling depot since 1900. From 1955 to the mid-1970s, the 6-acre McAllister Point Landfill, along the shore of Narragansett Bay, accepted wastes consisting primarily of domestic refuse, acids, solvents, paint, waste oil, and oil contaminated with polychlorinated biphenyls (PCBs). Three tank farms are located in the Melville area and one in Midway. Sludge from nearby tank farms was dumped on the ground or burned in chambers. Other contaminated areas on site, such as the Melville North Landfill, are classified as Formerly Used Defense sites and are being addressed separately. Surface water and groundwater flow from the landfill into the bay, which is used for boating and fishing. One tank farm is 300 feet from a coastal wetland. An estimated 4,800 people obtain drinking water and 220 acres of land are irrigated from private wells within 3 miles of hazardous substances at the site. Approximately 10,000 people live within 3 miles of the site.

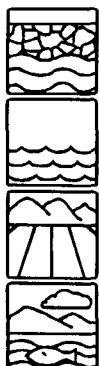
**Site Responsibility:** This site is being addressed through Federal actions.

### NPL LISTING HISTORY

Proposed Date: 07/14/89

Final Date: 11/15/89

## Threats and Contaminants



Monitoring wells detected petroleum products and heavy metals, including lead and copper, in the groundwater. Groundwater also is contaminated with volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), and petroleum hydrocarbons. Sediments collected from Narragansett Bay contain lead, copper and nickel. Landfill soil and leachate contain heavy metals, petroleum hydrocarbons, and polychlorinated biphenyls (PCBs). Initial studies have shown that none of the areas within the site pose an immediate threat to public health. However, the site warrants a study to assess potential long-term impacts. Tidal action of the Narragansett Bay may spread contamination to nearby wetlands.



## Cleanup Approach

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The site is being addressed in four stages: initial actions and three long-term remedial phases focusing on the McAllister Point Landfill, Tank Farms, and the remaining areas of the site.

## Response Action Status

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**Initial Actions:** A 1991 investigation revealed elevated levels of total petroleum hydrocarbons in soils. This led to the removal of the contents of tanks 53 and 56. These tanks are being closed pursuant to the State of Rhode Island hazardous waste closure requirements. Another action also is planned to remove known soil contamination and to address groundwater contamination around the tanks.



**McAllister Point Landfill:** An investigation into the nature and extent of site contamination is underway. This investigation will include ambient air and radiological surveys, a geophysical survey, surface and subsurface soil sampling, and groundwater sampling. A second investigation, which began in 1992, will define the source and extent of soil and groundwater contamination. Off-shore sediment sampling will be conducted in mid-1992 to evaluate ecological risks. Investigation are planned for completion in 1992.



**Tank Farms:** An investigation into the nature and extent of site contamination due to the tank farms is underway, including ambient air and radiological surveys, a soil gas survey, surface soil sampling, groundwater sampling, surface water/sediment sampling, and underground storage tanks investigations. Additional investigations are planned that will further define the extent of contamination associated with the ruins, characterize the sludge material in the oil/water separator, confirm the contamination levels in on-site groundwater, and determine the significance of inorganic contaminant levels in soil and groundwater. Investigations are planned for completion in 1992.



**Other Site Areas:** Investigations of the contamination at the remaining site areas are underway, including the former Fire Fighting Training Area, the Coddington Cove Rubble Fill, the Naval Undersea Warfare Center, and the Gould Island Electroplating Shop. These studies will define the source and extent of soil and groundwater contamination.

**Site Facts:** This site is being addressed under 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



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Following listing of this site on the NPL, the EPA completed a site assessment and determined that the Newport Naval Center does not pose an immediate threat to public health or the environment at the present time. The Newport Naval Center site is safe while it awaits the start of cleanup actions.

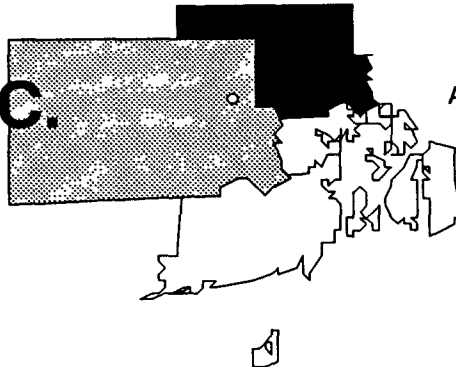
## Site Repository



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Newport Public Library, Aquidneck Park, Newport, RI 02840

**PETERSON/  
PURITAN, INC.  
RHODE ISLAND**  
EPA ID# RID055176283



**EPA REGION 1**

Providence County  
Along the Blackstone River in  
Cumberland and Lincoln

**Other Names:**  
**Blackstone Valley**

## Site Description

The Peterson/Puritan, Inc. site is located along the Blackstone River within the towns of Cumberland and Lincoln. The site is about two miles long and extends approximately 2,000 feet to the east and west of the main river channel. The Peterson/Puritan, Inc. plant was built in 1959 and began packaging aerosol consumer products. In 1976, following a major fire, the plant was rebuilt. The site "study area" comprises an industrial park, including the Peterson/Puritan facility, extraction areas, an inactive landfill known as J.M. Mills Landfill, an inactive solid waste transfer station and gravel operations, Rhode Island State park development, affected municipal water supply wells, the Dexter Quarry/Dupaw Dump, and numerous interspersed areas of undeveloped land along the Blackstone River. The Martin Street well and Lenox Street well in the Town of Cumberland and the Quinville well field in the Town of Lincoln were closed due to contamination and remain out of service. Attempts to flush contaminants from the wells were abandoned after repeated efforts to remove the contaminants failed. The Peterson/Puritan Inc., site is located in a mixed industrial and residential area. There are approximately 12,000 people living within a 4-mile radius of the site; the nearest residence is less than 1/4 mile away. Approximately 17,000 people were affected by the contaminated groundwater prior to abandoning the Lenox Street Well. The town of Lincoln has since been connected to alternate water supplies.

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

**NPL LISTING HISTORY**

Proposed Date: 12/30/82

Final Date: 09/08/83

## Threats and Contaminants



Groundwater is contaminated with chlorinated solvents, volatile organic compounds (VOCs) including acetone and benzene; phthalates; and heavy metals such as chromium, lead, and mercury. Certain sediment sample locations are contaminated with polychlorinated biphenyls (PCBs). Surface water is contaminated with low concentrations of VOCs. People are at risk if they come in direct contact with or accidentally ingest contaminated groundwater, surface water, sediment, leachate or potentially contaminated soil. The site is located in a flood plain, which may cause water, sediments, plants, and animals to become contaminated.

## Cleanup Approach

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The site is being addressed in three stages: initial action and two long-term remedial phases directed at cleanup of the primary source area and the J.M. Mills Landfill.

## Response Action Status

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**Initial Action:** In 1992, a fence was constructed to restrict access to the J.M. Mills landfill and a drum containing contaminated materials was removed from the base of the landfill.



**Primary Source Area:** The party potentially responsible for contamination at the site completed a preliminary study on the nature and extent of the contamination. Based on the initial investigation, the EPA determined that a more detailed study to further characterize contaminant source is required. The study is currently underway. Once this study is completed, scheduled for mid-1993, the EPA will evaluate the recommended alternatives and will select the final cleanup remedy.



**J.M. Mills Landfill:** A separate investigation, scheduled to begin in 1994, will characterize the nature and extent of contamination at the landfill. Following the completion of this study, final cleanup remedies will be selected.

**Site Facts:** After a preliminary investigation in 1982, the EPA identified the Peterson/Puritan facility as the major source of the contamination in the Quinville well field. The Town of Lincoln filed a lawsuit against Peterson/Puritan, Inc. based on these findings. In 1984, the company reached a settlement with Lincoln and assisted with the cost of the town's new water supply. The company also installed a recovery well on its property for the purpose of capturing contaminated groundwater underlying its property. In 1987, an Administrative Order was issued to Peterson/Puritan, Inc. to take over the site investigation from the EPA.

## Environmental Progress



The initial actions have provided a safe drinking water supply to affected area residents, and access to the landfill has been restricted while the EPA awaits the results of the ongoing investigations to select final cleanup remedies.

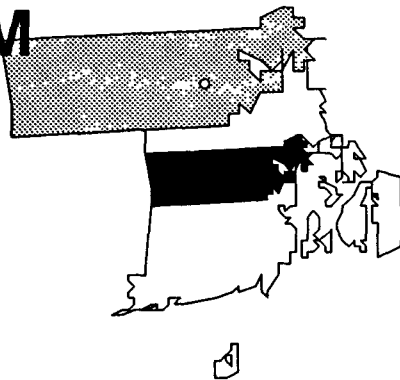
## Site Repository



Cumberland Public Library, 1464 Diamond Hill Road, Cumberland, RI 02864

# PICILLO FARM RHODE ISLAND

EPA ID# RID980579056



## EPA REGION 1

Kent County  
Piggy Hill Lane in Coventry

**Other Names:**  
**Candy Box Farm**

## Site Description

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The Picillo Farm site is a portion of a former 100-acre pig farm. More than 10,000 drums of hazardous waste and an undetermined bulk volume of liquid chemicals were disposed of into several unlined trenches on an 8-acre area of the farm. The site was discovered in 1977, when a fire and explosion occurred. After requiring the property owners to halt the illegal disposal operations, the State of Rhode Island conducted an emergency removal of drums containing sodium aluminum hydride. From 1980 through 1982, the Rhode Island Department of Environmental Management and the EPA excavated the trenches and removed the majority of the wastes. The contaminated soil was stored on site in three piles. These piles were moved off site in 1988. More than 2,000 people live within 3 miles of the site. There are 50 residences located within a mile of the site; two are within 1/4 mile. All residences rely on private wells for their water; these wells are sampled approximately once a year by the Rhode Island Department of Health. The site lies near the upper Roaring Brook watershed, which is a tributary to the Moosup River. Groundwater and surface water runoff flows away from the disposal site toward an unnamed swamp, Great Cedar Swamp, and Whitford Pond, which is used to irrigate a cranberry bog.

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

### NPL LISTING HISTORY

Proposed Date: 10/01/81  
Final Date: 09/01/83

## Threats and Contaminants

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Air on the site contains volatile organic compounds (VOCs) and pesticides. On-site groundwater is contaminated with polychlorinated biphenyls (PCBs) and VOCs including toluene and xylene. Off-site groundwater and surface water in the swamp are contaminated with VOCs. On-site soil is contaminated with phenols, PCBs, and VOCs. Potential threats include direct contact with contaminated soil, surface water, or sediments; drinking of groundwater; and inhalation of VOCs. Contaminated surface water and sediments may pose ecological risks, especially to the nearby wetlands.

## Cleanup Approach

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The site is being addressed in three stages: emergency actions and two long-term remedial phases focusing on controlling the source of the contamination and cleanup of groundwater and surface water.

### Response Action Status

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**Emergency Actions:** From 1980 to 1982, the EPA and the State conducted emergency actions by removing 10,000 buried drums from five trenches on the site. Bulk wastes also were removed. Contaminated soils were dug from trenches and were stockpiled on site.



**Source Control:** The remedy selected by the EPA and performed by the parties potentially responsible for the site contamination included: disposal of 3,500 cubic yards of PCB-contaminated soils and 3,000 cubic yards of phenol-contaminated soils off site in an approved landfill; installation of a fence; installation of a surface drainage control system; and closure of the site. These remedies were completed in 1988. The Rhode Island Department of Health samples private wells in the vicinity approximately once a year. The Rhode Island Department of Environmental Management is responsible for operation and maintenance of the cleanup remedies.



**Groundwater and Surface Water:** The EPA is studying the on- and off-site groundwater and surface water contamination, as well as residual soil contamination. The investigation will define the nature and extent of contamination, present human and ecological risk assessments and will recommend alternatives for the final cleanup. The field investigation is expected to be completed in 1992, and the risk assessment and selection of final cleanup remedies are scheduled for completion in late 1993.

**Site Facts:** In 1988, the EPA entered into an agreement with 12 potentially responsible parties. Four of these companies removed contaminants and closed down the site under close monitoring by the EPA in 1988.

## Environmental Progress



With the cleanup actions described above, the EPA has reduced the potential for accidental contact or exposure to contaminated soil and dust. Removing the contaminated soil from the trenches also addressed the source of contamination to groundwater, which will be cleaned up in future actions at the Picillo Farm site.

## Site Repository

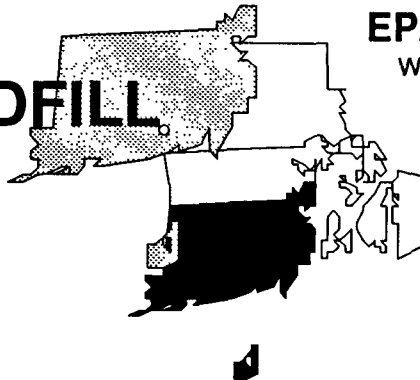


Greene Public Library, Hopkins Hollow Road, Greene, RI 02827

# ROSE HILL REGIONAL LANDFILL

## RHODE ISLAND

EPA ID# RID980521025



## EPA REGION 1

Washington County  
Rose Hill Road

### Site Description

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The Rose Hill Regional Landfill site is a former municipal landfill located in the Town of South Kingstown. The Town leased the land for a domestic and industrial waste disposal facility, which operated from 1967 to 1983. In 1983, the facility became inactive, and the operator reportedly graded and seeded the disposal areas. A transfer station for municipal waste, currently owned and operated by the Town, is located on a portion of the site. Three separate areas on the site received waste: a solid waste landfill, a bulky waste disposal area, and a sewage sludge landfill. Current owner-operated activities within the site boundary include a hunting preserve, field skeet range, qualifying range, kennel and field training of bird dogs, and a pet cemetery. An estimated 17,300 people obtain water from wells within 3 miles of the site. The area is rural to residential, with forested areas, fields, small farms and sand/gravel extraction activities nearby. The site is bordered by the Saugatucket River to the east, and Mitchell Brook flows through the site.

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

#### NPL LISTING HISTORY

Proposed Date: 06/21/88

Final Date: 10/04/89

### Threats and Contaminants

---



On-site monitoring wells contain several volatile organic compounds (VOCs) including chloroform, benzene, and xylenes, as well as some heavy metals. Observations indicate that Mitchell Brook, an unnamed brook, and the Saugatucket River could be affected by contaminated runoff from the site. Three private wells adjacent to the site are contaminated with low levels of organic compounds, as is on-site soil. The site is not completely fenced, making it possible for people to come into direct contact with hazardous substances. Saugatucket Pond, 2,000 feet downstream, is used for fishing and swimming. A freshwater wetland is 500 feet downstream and also could be subject to contamination.



## Cleanup Approach

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

## Response Action Status

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**Initial Actions:** In 1985, the Town of South Kingstown Utilities Department extended the municipal water line to residences on Rose Hill Road with contaminated wells.



**Entire Site:** An investigation into the nature and extent of contamination in three separate disposal areas is planned for completion in late 1993. The scope of the investigation includes sampling of groundwater, surface water, soils and sediments. Expanded studies include an ecological impact assessment, and a methane migration evaluation. The EPA will evaluate the recommended cleanup alternatives and will select final remedies in late 1993.

## Environmental Progress



With the provision of a safe drinking water supply to the affected residents, the EPA has determined that the site does not currently pose an imminent threat to the public or the surrounding environment. The EPA will continue to assess conditions at the Rose Hill Regional Landfill site as studies leading to the selection of cleanup alternatives are continued.

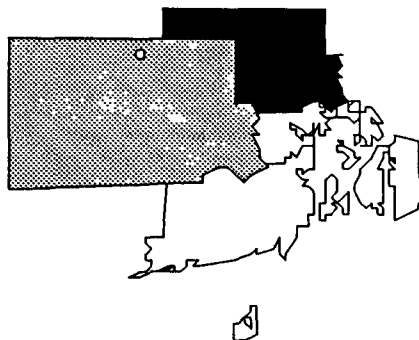
## Site Repository



South Kingstown Public Library, 1057 Kingstown Road, Peace Dale, RI 02883

# STAMINA MILLS, INC. RHODE ISLAND

EPA ID# RID980731442



## EPA REGION 1

Providence County  
North Smithfield

**Other Names:**  
Forestdale-Stamina  
Mills, Inc.

## Site Description

Stamina Mills is on a 5-acre parcel of land and began operating as a textile mill in the early 1900s. It was closed for an undetermined period of time during the Depression and changed ownership in the 1940s. In 1969, a solvent scouring system for removing oil and dirt from newly woven fabric was installed. Some time during that year, a trichloroethylene (TCE) spill occurred and never was cleaned up. In 1975, the mill was closed. In 1977, a fire destroyed the manufacturing complex; the site has been vacant and unused since then. In 1981, in response to the discovery of private well contamination, the Rhode Island Water Resources Board and the Town of North Smithfield installed a public water line to area residences. However, not all residences connected to the service; the EPA provided resources to extend the water system and complete connections to those residences in 1984. By 1987, all residences were on the public water supply. The Village of Forestdale, with a population of approximately 1,000, is within a 1/2-mile radius of the site. A school and private residences with nearly 300 people are within 1/4 mile of the site. Industrial and commercial facilities with about 1,200 people are within 1/2 mile of the site. The site is bordered by wetlands and the Branch River to the south.

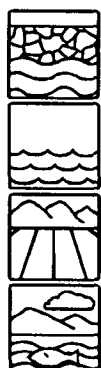
**Site Responsibility:** The site is being addressed through Federal and potentially responsible parties' actions.

### NPL LISTING HISTORY

Proposed Date: 12/01/82

Final Date: 09/01/83

## Threats and Contaminants



Groundwater is contaminated with volatile organic compounds (VOCs), primarily TCE and its constituents. Sediments are contaminated with TCE, dieldrin, and polycyclic aromatic hydrocarbons (PAHs). The soil is contaminated with TCE, the pesticide dieldrin, and heavy metals including lead, arsenic, and cadmium, as well as PAHs. Surface water is contaminated primarily with VOCs. People who trespass on the site potentially are at risk from direct contact with contaminated soils, surface water, or groundwater. In 1986, a security fence was erected to prevent entry to the site.

## Cleanup Approach

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

## Response Action Status

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**Immediate Actions:** In 1981, the Rhode Island Water Resources Board and the Town of North Smithfield installed a public water line to area residences and provided bottled water to those residences that were not connected to the services. In 1984, the EPA provided resources for extending the public water system and connecting additional residences to the system. By 1987, all residences were on the public water supply. In 1986, the EPA also installed a fence to prevent entry to the site. In 1988, the EPA removed two tanks from the site, pumped the waste from the tanks, and sent it to an approved hazardous waste facility. In 1990, the EPA removed the contents of an aboveground storage tank, decontaminated the tank shell, and disposed of the tank contents at an approved hazardous waste facility.



**Entire Site:** Based on its investigation, the EPA selected the following remedy to clean up the site: in-situ vacuum extraction of soil contaminated with trichloroethylene (TCE) in the spill area, which involves installation of a number of shallow wells to withdraw air containing TCE and other VOCs for carbon treatment, and excavation of approximately 550 cubic yards of landfill waste and sediments to be redeposited into a landfill under the new multi-layer cap to be installed. Groundwater will be extracted and treated with ultraviolet light and hydrogen peroxide, an innovative technology, to remove VOCs. Mill raceways will be sealed, and on-site buildings will be demolished. Deed restrictions will be used at the site to regulate land use and preserve the integrity of the remedy's components. The septic tank location will be confirmed and its contents tested and removed. The contents of the tank and the tank itself will be disposed of. A monitoring program for the groundwater, soil, surface water, and sediments will be implemented to ensure the effectiveness of the remedy selected. Demolition activities are expected to begin in the summer of 1992 and are planned for completion in the fall of 1992. The removal of the partially standing structures and debris will allow workers to begin cleanup activities at other areas of the site, including the contaminated soil, groundwater and on-site landfill. The technical design of these remaining cleanup remedies is planned for completion in 1994.

**Site Facts:** In 1991, an Administrative Order was issued to the operator of the site to demolish on-site structures and remove the debris. A plan was submitted by the operator to EPA to perform this cleanup action, which was approved in 1992.

## Environmental Progress



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The initial actions of providing a public water supply and fencing of the site have reduced the potential of people to be exposed to the contamination at the Stamina Mills site. A deteriorating tank containing low pH hazardous substances was removed and properly disposed of. Some drums of hazardous substances will be addressed in the near future, further reducing the potential for exposure to contamination while the site awaits final cleanup activities.

## Site Repository

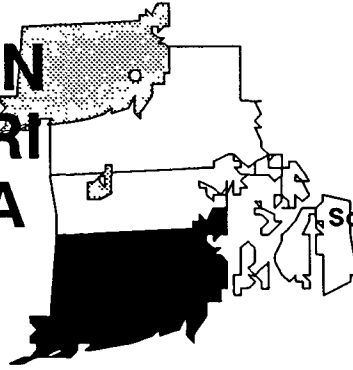


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North Smithfield Public Library, 20 Main Street, Slatersville, RI 02876

# WEST KINGSTON TOWN DUMP/URI DISPOSAL AREA RHODE ISLAND

EPA ID# RID981063993



## EPA REGION 1

Washington County  
South Kingstown

### Other names:

South Kingstown Landfill No. 2  
URI Gravel Bank  
Sherman Farm

## Site Description

This site consists of two adjacent properties, the West Kingston Town Dump and the University of Rhode Island (URI) Disposal Area. Known in the past as "South Kingstown Landfill #2", the 6 1/2 acre West Kingston Town Dump received solid waste from the Town of South Kingstown beginning in the 1930s. In the early 1950s, the Town of Narragansett and URI also began disposing of their solid waste in the landfill. This disposal of solid waste went unregulated until 1967, when the Rhode Island Department of Health (RI DOH) noted, during a site inspection, that wastes disposed of at the site were from industrial, residential, commercial, and institutional sources. Numerous operational violations were subsequently cited by RI DOH. A 1975 study conducted by the URI Department of Civil Engineering and the Rhode Island Water Resources Board resulted in the discovery of a leachate plume beneath the landfill which was contaminating groundwater as far as 1,200 feet west of the dump. From 1945 to 1987, solid waste was also accepted at the 12-acre URI Disposal Area, referred to in the past as the "URI Gravel Bank" or the "Sherman Farm." After closure of the town dump in 1978, the URI Disposal Area began to accept most of URI's waste, including small quantities of empty paint cans, oil containers, and pesticide containers. Lab equipment, machinery, closed drums, and old tanks buried on site were discovered by the Rhode Island Department of Environmental Management (RI DEM) during a 1987 inspection. RI DEM instructed URI to remove contaminated debris from the site, an action which was completed by URI in 1987. Vehicle access to the site is restricted by a locked chain-link gate across the gravel access road at its intersection with Plains Road. An estimated 15,800 persons obtain their drinking water supply from three major public wells within 4 miles of the site. An additional 12,000 persons are supplied by private wells, the nearest being approximately 1,000 feet northwest of the site. Three private wells approximately 875 feet west of the site were closed in 1988 due to contamination. The Chipuxet River valley basin is located alongside the site. Hundred Acre Pond, part of the river, is an estimated 1,500 feet from the site. The river basin is a major groundwater resource.

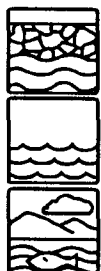
**Site Responsibility:** This site is being addressed through Federal, State, and potentially responsible parties' actions.

### NPL LISTING HISTORY

Proposed Date: 07/29/91

## Threats and Contaminants

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Private wells near the site are contaminated with various volatile organic compounds (VOCs). VOCs also have been detected in the on-site pond. Heavy metals, including lead, were detected by on-site monitoring wells. Wetlands on site may be at risk from contaminated surface water.

## Cleanup Approach

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

### Response Action Status

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**Immediate Actions:** In 1987, URI removed 159 tons of materials and transported them to regulated waste disposal facilities.



**Entire Site:** An investigation to determine the extent of contamination at the entire site is planned to begin in early 1994.

## Environmental Progress

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The immediate removal and disposal of materials has reduced health hazards on-site while investigations to determine final cleanup remedies are being planned.

## Site Repository

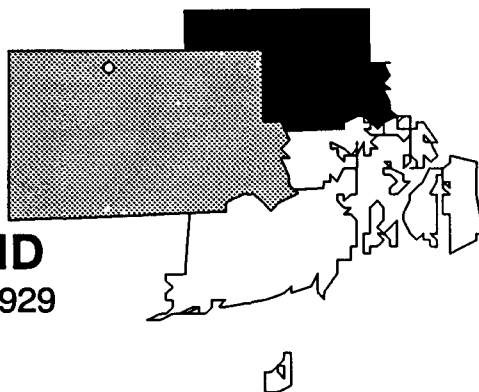
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Not established.

# WESTERN SAND & GRAVEL RHODE ISLAND

EPA ID# RID009764929



**EPA REGION 1**  
Providence County  
Burrillville, adjacent to Douglas Pike

## Site Description

Western Sand & Gravel, a 20-acre site located in a rural residential area of Burrillville, was a sand and gravel quarry operation from 1953 until 1975. The quarrying operation is continuing. From 1975 to April 1979, approximately 12 acres of the 20-acre site were used for the disposal of liquid wastes, including chemicals and septic waste. Over time, the wastes penetrated into the porous soil and contaminated the groundwater. Contents of tank trucks were emptied directly into 12 open lagoons and pits, none of which were lined with protective materials. The pits were concentrated on a hill that slopes to Tarkiln Brook, which is used for recreational purposes and drains into the Slaterville Reservoir. The State closed the disposal operation because nearby residents complained of odors. Approximately 600 people within a 1-mile radius of the site depend on groundwater. Eight homes were found to have contaminated wells.

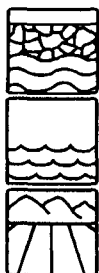
**Site Responsibility:** The site is being addressed through Federal and potentially responsible parties' actions.

### NPL LISTING HISTORY

Proposed Date: 10/01/81

Final Date: 09/01/83

## Threats and Contaminants



The on-site groundwater is contaminated with volatile organic compounds (VOCs) including toluene, trichloroethylene (TCE), trichloroethane, benzene, chlorobenzene, and dichloroethane. The water of Tarkiln Brook contains similar contaminants. The soil also is contaminated with VOCs. Prior to the capping of the soil and sludge and the installation of carbon filters, potential exposure to VOCs may have occurred by inhalation, ingestion, or direct contact with contaminated soil or groundwater.

## Cleanup Approach

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The site is being addressed in four stages: initial actions to limit the spread of contamination and three long-term remedial phases concentrating on installation of a permanent water supply, capping of the contaminated soil and sludge, and investigating the extent of groundwater contamination and cleanup alternatives.

## Response Action Status

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installed.

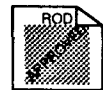
**Initial Actions:** Early in 1980, the State began to pump one lagoon dry to halt leachate movement. Approximately 60,000 gallons of liquid chemical and septic waste were removed for off-site disposal. A groundwater recirculation system was



**Water Line:** The EPA will install a permanent alternate water supply to service approximately 56 parcels of land, and the potentially responsible parties installed carbon canister filters as a temporary protective measure in all the homes in the affected area until the permanent water supply is functional. Construction of the water line was completed in 1990. A schedule for operation of the water line currently is being negotiated between the State and the EPA. Additional tests of the system have been required by the state. Operation of the water line will begin following evaluation of test results.



**Soil Capping:** The parties potentially responsible for the contamination have installed a 2 1/2-acre cap over the areas of contaminated soil and sludge and graded the site to promote runoff and drainage. Also included are fencing, fence maintenance, and posting of the site and cap. Cleanup was completed in 1988.



**Groundwater:** The potentially responsible parties conducted an investigation to determine the extent of contamination and to evaluate alternatives for cleanup of the groundwater. The investigation was completed in early 1991. Based on the investigation, the EPA selected a remedy of natural attenuation. The site will be monitored until 1995. At that time, a system to pump and treat the groundwater will be installed if monitoring shows that natural cleanup is not occurring as predicted. The potentially responsible parties will monitor groundwater and conduct evaluations every three years, with EPA oversight.

**Site Facts:** Approximately 45 potentially responsible parties entered into a Consent Decree with the EPA and agreed to pay for past costs, to construct a cap, to conduct an investigation to determine the nature and extent of contamination, and to identify alternatives for cleanup of contaminated groundwater. The parties also will pay the EPA to construct the permanent alternate water supply.



## Environmental Progress



The initial actions including fencing, capping, and grading the contaminated areas of the Western Sand & Gravel site and installing the carbon canister filters have met the goals for cleanup of the land, thereby protecting human health and the environment while the site awaits remaining cleanup activities.

## Site Repository



Burrillville Town Hall, 105 Harrisville Main Street, Harrisville, RI 02830

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# GLOSSARY

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## Terms Used in the NPL Book

**T**his 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

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**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.

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## GLOSSARY

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**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 ground-water 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.

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## GLOSSARY

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**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.

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## GLOSSARY

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**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].

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## GLOSSARY

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**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 inundated 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.

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**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.



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**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 contaminants 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.

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**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 con-

tamination 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.

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**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.

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**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, Dichloroethylene	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.