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United States
Environmental Protection
Agency

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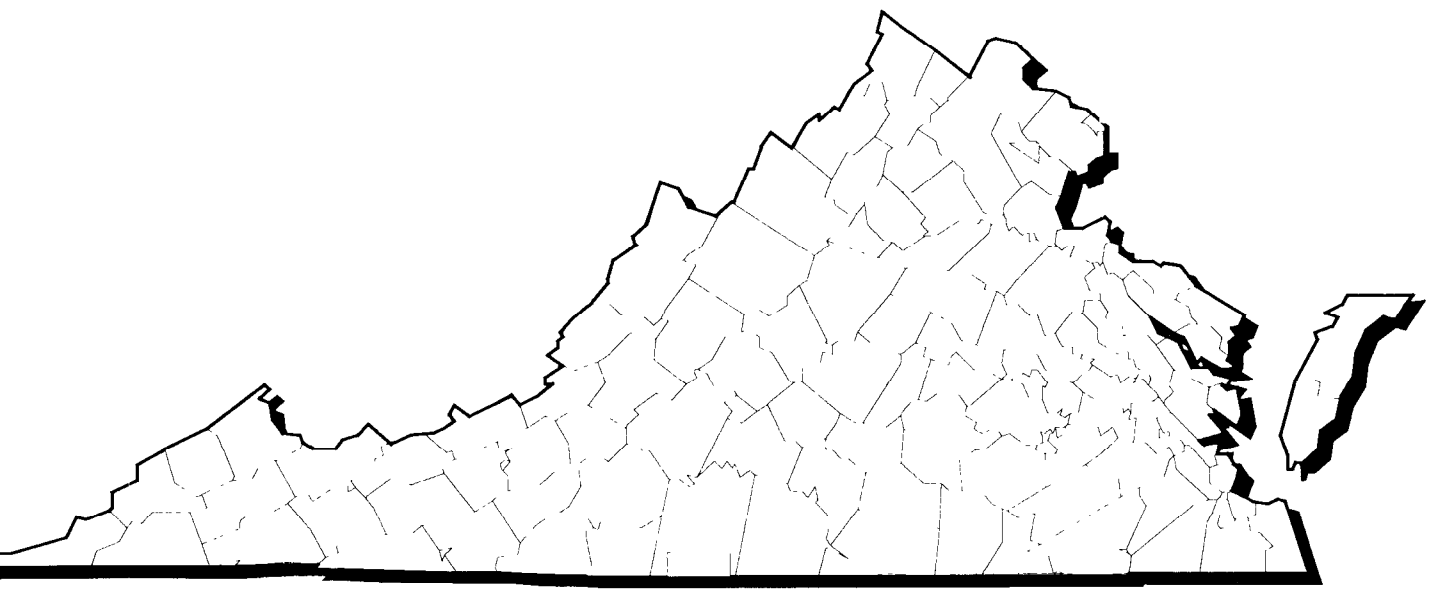
SUPERFUND: Progress at National Priority List Sites



VIRGINIA 1992 UPDATE

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December 1992

NATIONAL PRIORITIES LIST SITES:

Virginia

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

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INTRODUCTION

A BRIEF OVERVIEW OF SUPERFUND

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

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

Superfund Is Established

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

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

A Big Job

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

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

sponse, Compensation, and Liability Information System).

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

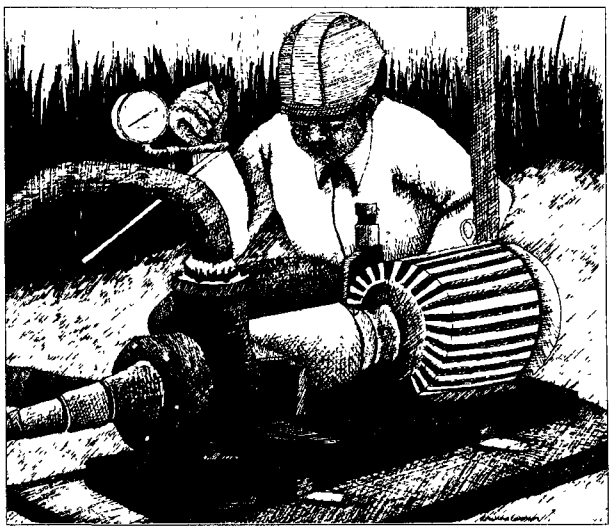
Superfund faces some of the most complex pollution problems ever encountered by an environmental program. Improperly stored or disposed chemicals and the soil they contaminate are one concern. More difficult to correct are the wetlands and bays, and the groundwater, lakes, and rivers often used for drinking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

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

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

Quick Cleanup at Non-NPL Sites

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



Superfund employee prepares equipment for groundwater treatment.

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

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

Superfund employee removing drums from a Superfund site.

The Public's Role

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

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

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

A Commitment to Communication

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

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

INTRODUCTION

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

STREAMLINING SUPERFUND: THE SUPERFUND ACCELERATED CLEANUP MODEL

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

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

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

Breaking With Tradition

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

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

Long-Term Solutions

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

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

HOW SUPERFUND WORKS

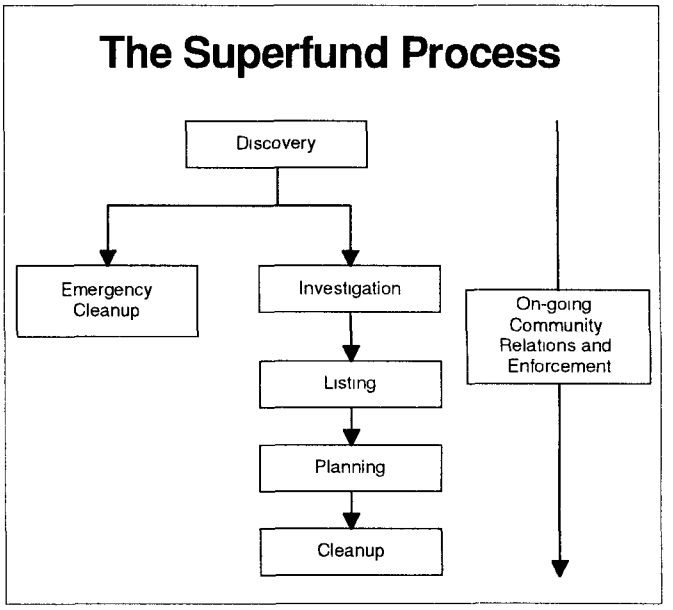
Each Superfund site presents a different set of complex problems. The same hazardous materials and chemicals often contaminate many sites, but the details of each site are different. Almost always, soil is contaminated with one or more chemicals. Their vapors may taint the air over and around the site.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

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

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

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

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



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

THE VOLUME

How to Use the State Book

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

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

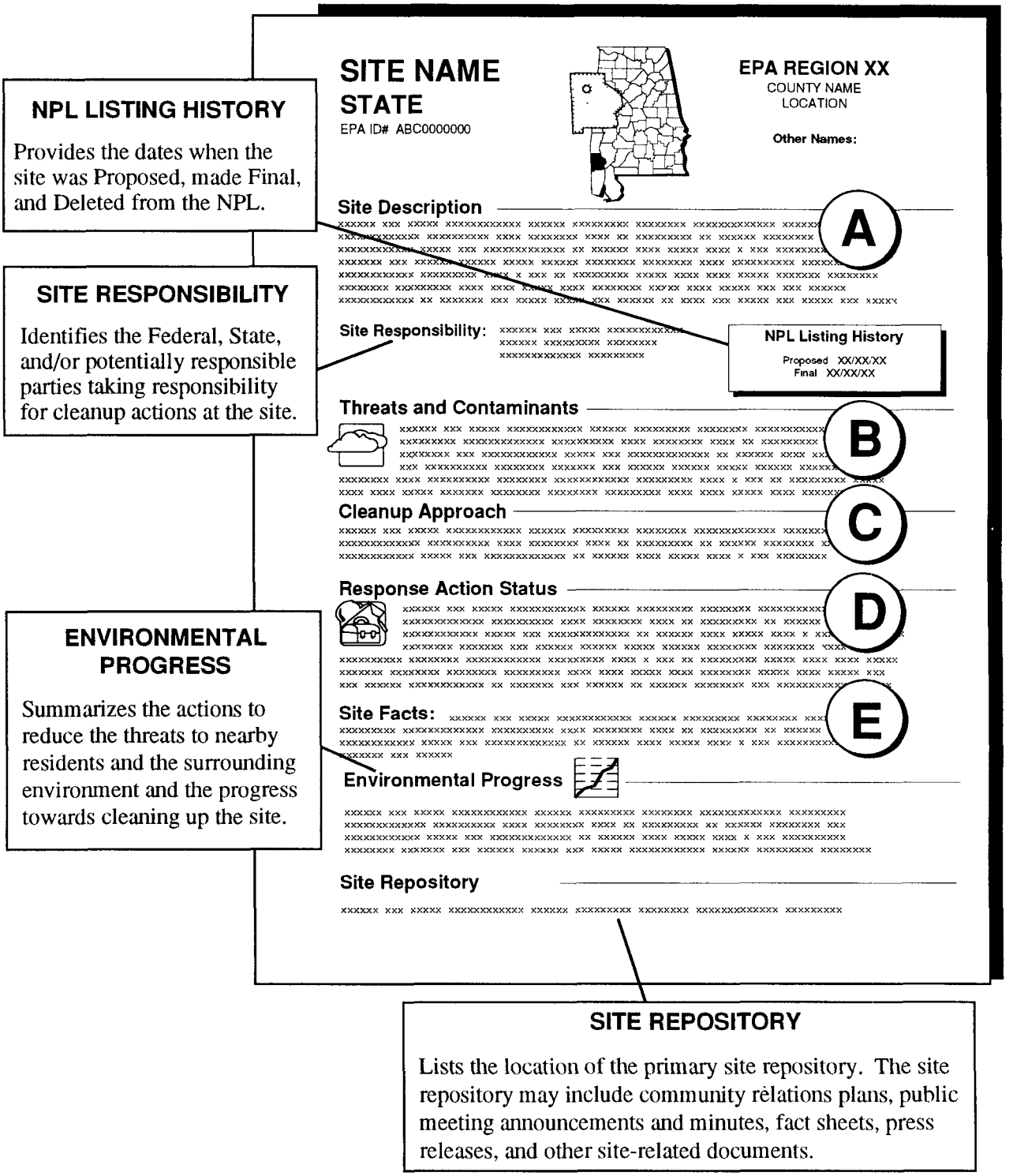
How Can You Use This State Book?

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

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

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

THE VOLUME



NPL LISTING HISTORY

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

SITE RESPONSIBILITY

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

ENVIRONMENTAL PROGRESS

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

SITE REPOSITORY

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

A

SITE DESCRIPTION

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

B

THREATS AND CONTAMINANTS

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

C

CLEANUP APPROACH

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

D

RESPONSE ACTION STATUS

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

E

SITE FACTS

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

THE VOLUME

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

Icons in the Threats and Contaminants Section

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

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

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

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

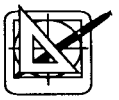
Threatened or contaminated *Environmentally Sensitive Areas* in the vicinity of the site. (Examples include wetlands and coastal areas or critical habitats.)

Icons in the Response Action Status Section

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

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

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

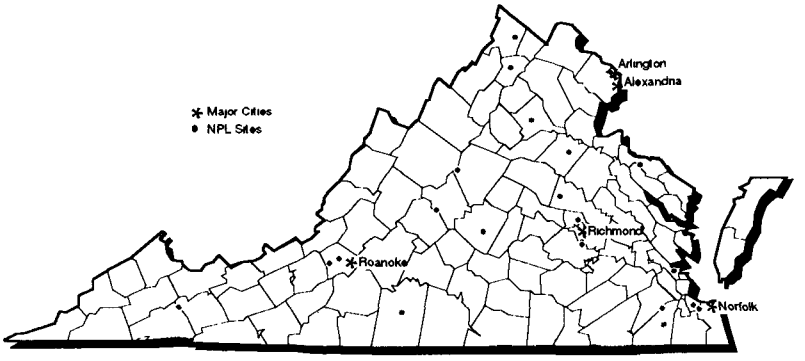


Remedy Design means that engineers are preparing specifications and drawings for the selected cleanup technologies.

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

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

A SUMMARY OF THE STATE PROGRAM



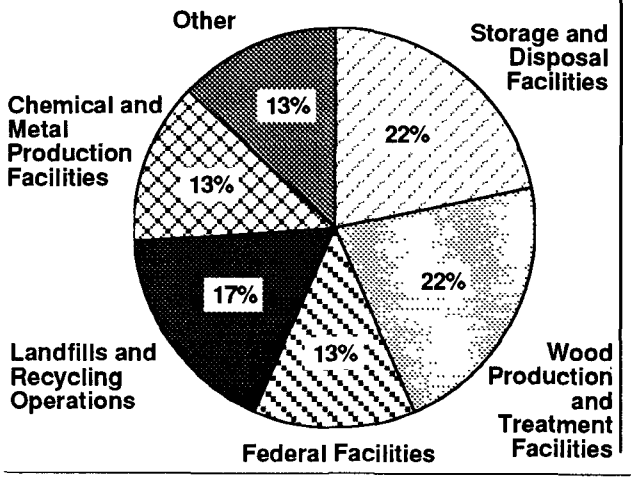
Superfund Activities in Virginia

The Commonwealth of Virginia is located within EPA Region 3, which includes the five mid-Atlantic States and the District of Columbia. The Commonwealth covers 39,704 square miles. According to the 1990 Census, Virginia experienced a 16 percent increase in population between 1980 and 1990, and is ranked twelfth in U.S. population with approximately 6,187,000 residents.

The Virginia Waste Management Act of 1986, most recently amended in 1990, establishes the Solid and Hazardous Waste Contingency Fund and provides for State enforcement authority. The statute authorizes the Commonwealth to issue orders compelling polluter participation in site cleanup activities, recover costs, pursue civil and criminal penalties, and place a lien on property as a means of payment. In practice, the Commonwealth has been successful in encouraging voluntary polluter participation and, to date, has not initiated any enforcement or cost recovery activities. In addition to the 10 percent contribution from the Commonwealth required under the Federal Superfund program, the Fund provides for emergency response and removals, studies and design, site investigation, long-term cleanup actions, and operation and maintenance activities. Currently, 20 sites in the Commonwealth of Virginia have been listed as final on the NPL; one has been deleted. Two new sites have been proposed for listing in 1992.

The Department of Waste Management
implements the Superfund Program in the Commonwealth of Virginia

Activities responsible for hazardous waste contamination in the Commonwealth of Virginia include:



Facts about the 23 NPL sites in Virginia:

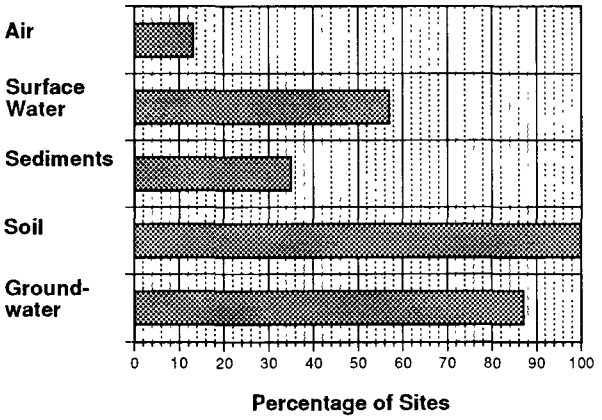
Immediate Actions (such as removing hazardous substances or restricting site access) were performed at 18 sites.

Eleven sites endanger sensitive environments.

Fifteen sites are located near residential areas.

Most Sites Have Multiple Contaminants and Contaminated Media:

Media Contaminated at Sites



Contaminants Found at Sites

	Percentage of Sites
Heavy Metals	87%
VOCs	43%
Creosotes	30%
PCBs	22%
Pesticides/Herbicides	17%
Other*	17%
Dioxin	9%
Acids	9%
Cyanide	9%
Petrochemicals/Explosives	9%
Plastics	4%

*Other contaminants include disulfides, aluminum and sulfate.

The Potentially Responsible Party Pays...

In the Commonwealth of Virginia, potentially responsible parties are paying for or conducting cleanup activities at 15 sites.

For Further Information on NPL Sites and Hazardous Waste Programs in the Commonwealth of Virginia Please Contact:

☎ EPA Region 3 Environmental Education and Outreach Branch	For information concerning community involvement	(215) 597-9370
☎ National Response Center	To report a hazardous waste emergency	(800) 424-8802
☎ The Department of Waste Management: Division of Special Programs	For information about the State's responsibility in the Superfund Program	(804) 786-3063
☎ EPA Region 3 Site Assessment Branch	For information about the Regional Superfund Program	(215) 597-8229
☎ Superfund Hotline	For information about the Federal Superfund Program	(800) 424-9068

THE NPL REPORT

PROGRESS TO DATE

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

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

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

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

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

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

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

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

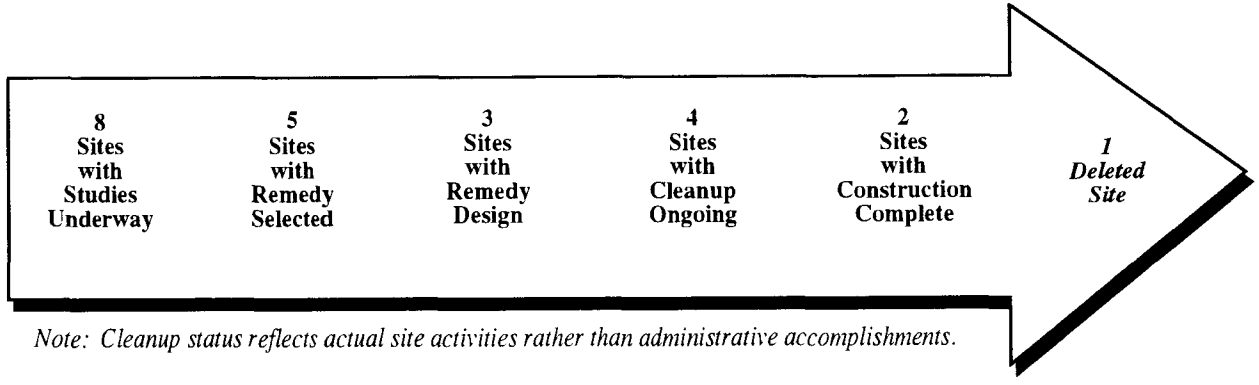
✓ A check in the "Deleted" category indicates that the site cleanup has met all human health and environmental goals and that the EPA has deleted the site from the NPL.

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

Progress Toward Cleanup at NPL Sites in the State of Virginia

Site Name	County	NPL	Date	Initial Response	Site Studies	Remedy Selected	Remedy Design	Cleanup Ongoing	Construction Complete	Deleted
ABEX CORPORATION	PORTSMOUTH	Final	08/30/90	⇨	⇨					
ARROWHEAD ASSOCIATES/SCOVILL CORP.	WESTMORELAND	Final	02/15/90	⇨	⇨	⇨				
ATLANTIC WOOD INDUSTRIES, INC.	PORTSMOUTH	Final	02/15/90	⇨	⇨					
AVTEX FIBERS, INC.	WARREN	Final	06/01/86	⇨	⇨	⇨	⇨	⇨		
BUCKINGHAM COUNTY LANDFILL	BUCKINGHAM	Final	10/04/89		⇨					
C & R BATTERY COMPANY, INC.	CHESTERFIELD	Final	07/01/87	⇨	⇨	⇨	⇨			
CHISMAN CREEK	YORK	Final	09/01/83	⇨	⇨	⇨	⇨	⇨	⇨	
CULPEPER WOOD PRESERVERS, INC.	CULPEPER	Final	10/04/89	⇨	⇨					
DEFENSE GENERAL SUPPLY CENTER	CHESTERFIELD	Final	07/01/87		⇨	⇨				
DIXIE CAVERNS COUNTY LANDFILL	ROANOKE	Final	10/04/89	⇨	⇨	⇨				
FIRST PIEDMONT CORP. ROCK QUARRY (RT. 719)	PITTSYLVANIA	Final	07/01/87		⇨	⇨				
GREENWOOD CHEMICAL CO.	ALBEMARLE	Final	07/01/87	⇨	⇨	⇨	⇨			
H & H, INC., BURN PIT	HANOVER	Final	03/31/89	⇨	⇨					
L. A. CLARKE & SON	SPOTSYLVANIA	Final	06/01/86		⇨	⇨	⇨	⇨		
MATTHEWS ELECTRIC PLATING	ROANOKE	Deleted	12/27/88	⇨	⇨	⇨	⇨	⇨	⇨	✓
NAVAL SURFACE WARFARE CENTER	KING GEORGE	Proposed	02/07/92	⇨	⇨					
NAVAL WEAPONS STATION-YORKTOWN	YORK	Proposed	02/07/92	⇨	⇨					
RENTOKIL, INC. (VIRGINIA WOOD PRESERVING DIVISION)	HENRICO	Final	03/31/89	⇨	⇨					
RHINEHART TIRE FIRE DUMP	FREDERICK	Final	06/01/86	⇨	⇨	⇨	⇨	⇨		
SALTVILLE WASTE DISPOSAL	SMYTH	Final	09/01/83	⇨	⇨	⇨	⇨	⇨		
SAUNDERS SUPPLY CO.	SUFFOLK	Final	10/04/89	⇨	⇨	⇨				
SUFFOLK CITY LANDFILL	SUFFOLK	Final	02/21/90	⇨	⇨				⇨	
U.S. TITANIUM	NELSON	Final	09/01/83		⇨	⇨	⇨			

Progress Toward Cleanup at NPL Sites in the State of Virginia (Continued)

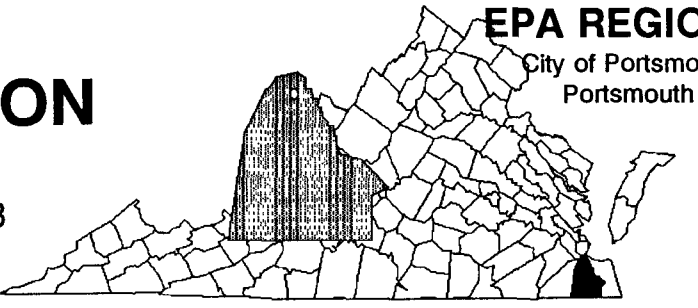


Note: Cleanup status reflects actual site activities rather than administrative accomplishments.

ABEX CORPORATION

VIRGINIA

EPA ID# VAD980551683



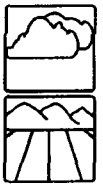
Site Description

The Abex Corporation site covers 2 acres in Portsmouth. The company operated a brass and bronze foundry from 1928 to 1978. Abex produced parts such as brake shoes and ball bearings for railroad cars. The EPA estimates that lead was released into the air at a rate of 10 pounds per day from a 1-acre process area and that 3,500 cubic yards of lead-laden furnace sands were dumped into an adjoining 1-acre area. In 1984, the EPA identified elevated levels of lead in the fill area and in residential lots next to the fill area. Abex has found significant soil contamination around both the landfill and the old process areas. Approximately 10,000 people live or work within a mile of the site. A number of those residents live either on or immediately adjacent to the lead-contaminated soils. The site also is adjacent to an elementary school.

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

NPL LISTING HISTORY
Proposed Date: 06/16/88
Final Date: 08/30/90

Threats and Contaminants



The air has been contaminated with heavy metals including lead, copper, and tin. Soils exhibit high pH levels and are contaminated with lead. Public health threats include direct contact with soil, surface water, and air. Groundwater is not used as a drinking water source within 3 miles of the site. In 1986, the EPA sampled home surfaces that demonstrated the presence of contaminated air.

Cleanup Approach

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

Response Action Status

Immediate Actions: In 1988, Abex graded the site and surrounded it with fencing topped with barbed wire. The company also covered much of the old landfill with asphalt, excavated some areas adjacent to the landfill, filled them in and revegetated. Due to results of samples collected from the excavated areas, additional soil contaminated with lead was excavated in mid-1992 and will be disposed of at a federally approved landfill. A second removal action for 1992 currently is being assessed. The site is secured against direct contact with contaminated areas while additional cleanup actions are pending.

Entire Site: Abex initiated site investigations in 1989 to determine the extent of the contamination and to recommend cleanup technologies. Investigations were completed in 1992. The EPA and the State are evaluating the study findings and are scheduled to select final cleanup remedies to address contamination at the Abex Corporation site 1993.

Site Facts: On August 11, 1986, the EPA and Abex signed a Removal Consent Agreement and Order, which requires Abex to reduce lead contamination to levels that do not constitute an imminent threat to public health.

Environmental Progress

While the investigations leading to a final solution to address site contamination are being conducted, the Abex Corporation site has been securely fenced and most exposed sources of contamination have been excavated or covered to eliminate the threat of exposure to hazardous materials or air at the site.

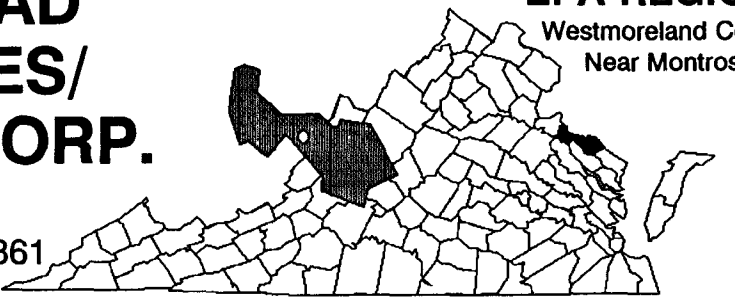
Site Repository

Portsmouth Public Library, 601 Court Street, Portsmouth, VA 23704

ARROWHEAD ASSOCIATES/ SCOVILL CORP.

VIRGINIA

EPA ID# VAD042916361



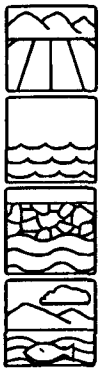
Site Description

The Arrowhead Associates/Scovill Corp. site is located on 25 acres in a rural area near Montross. The Scovill Corp. electroplated cosmetic cases from 1966 to 1972, when Arrowhead, Inc. of Delaware acquired the business and its assets. Arrowhead continued the electroplating operations until 1979. During 1979 to 1981, Arrowhead also filled the cases with cosmetics. From 1981 to the present, several other firms have assembled and filled cosmetic cases on the site, and from 1975 to the present, wiring harnesses for automobiles have been manufactured on the site. Plating wastes were treated in a surface impoundment system and discharged to Scates Branch under a permit issued through the National Pollutant Discharge Elimination System (NPDES). After the plating operations ended in 1979, process equipment and materials were abandoned at the site. An estimated 1,100 people obtain drinking water from shallow private wells within 3 miles of the site. A coastal wetland is about 1 mile from the site, and local surface water is used for recreational activities.

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

NPL LISTING HISTORY
Proposed Date: 06/16/88
Final Date: 02/15/90

Threats and Contaminants

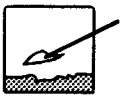


Many drums of cyanide-containing wastes, heavy metals, and other plating wastes and raw materials including solvents such as benzene and trichloroethylene (TCE) from the former electroplating operations remain on the soil at the site. Five sludge beds contain elevated levels of copper, zinc, cyanide, and other hazardous substances. The Virginia State Water Control Board detected cyanide, copper, and zinc in the discharge from the settling pond to Scates Branch. Elevated levels of cyanide and other hazardous substances were detected in a settling pond on site. People currently working at the manufacturing facility are not restricted from entering the abandoned electroplating process hazardous waste area; therefore, the potential risk for coming in direct contact with hazardous materials exists. Accidental ingestion of contaminated water and soil also is a threat.

Cleanup Approach

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

Response Action Status



Immediate Actions: To date, the Scovill Corp. has removed 300 drums containing benzene, paints, lacquers, thinners, metal plating wastes, and cyanide, in addition to approximately 395 cubic yards of contaminated soil from the drum disposal area. Contaminated surface water and soils were removed from six lagoons on site. All wastes and waste residuals have also been removed from inside the building. Final closure of the six lagoons was completed in 1990.

Entire Site: In 1991, an investigation at this site was completed and remedies were selected to address contaminated groundwater and soils. The major components of the selected remedy for contaminated groundwater include construction of a groundwater extraction system to remove contaminated groundwater from the aquifer for treatment, with inorganic contaminants treated through precipitation and organic contaminants treated through air stripping and carbon adsorption. The treated water will be discharged to the Scates Branch Stream. Contaminated soils will be treated through vapor extraction, using carbon adsorption to capture and treat gas from the extraction process prior to discharge to the atmosphere. Technical design of the selected remedies is expected to begin in 1993.

Site Facts: In 1986, Scovill Corp. signed a Consent Order with the EPA, requiring Scovill to develop and undertake a cleanup plan. In 1989, Scovill and the Virginia Department of Waste Management signed a Consent Order and Agreement, requiring Scovill to conduct an investigation to determine the extent of contamination and the alternative technologies for cleanup.

Environmental Progress

The immediate removal of the contaminated drums, soils, and surface water, as well as sludges and contaminated soils from the six lagoons at the Arrowhead Associates/Scovill Corp. site, has reduced the potential for exposure to hazardous materials while it awaits further cleanup activities.

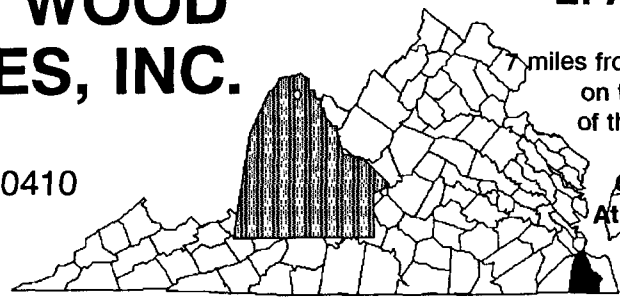
Site Repository

Assistant County Administrator, Westmoreland County, Social Services Building, Peachgrove Lane, Montross, VA 22520

ATLANTIC WOOD INDUSTRIES, INC.

VIRGINIA

EPA ID# VAD990710410



EPA REGION 3

Portsmouth
7 miles from the Chesapeake Bay
on the South Branch
of the Elizabeth River

Other Names:
Atlantic Creosote

Site Description

The 47 1/2-acre Atlantic Wood Industries, Inc. site houses an active wood-treating facility that has been in operation since 1926. Contaminants from the wood preservatives used by the facility are present in the soil and water. Sediments and 20,000 cubic feet of landfilled wood chips are contaminated with creosote and pentachlorophenol (PCP). According to the State, wastes on site have entered the groundwater and are infiltrating a city storm sewer that discharges into an intertidal drainage ditch, which is part of the South Branch of the Elizabeth River. In 1982, 350,000 gallons of contaminated water in leaking aboveground storage tanks were removed. The site is on the Elizabeth River, about 7 miles from the Chesapeake Bay. Approximately 14,000 people work within a 1/2-mile radius of the site. The water supply for a 3-mile radius area is provided by public utilities. Groundwater within the 3-mile radius is not used as a water source.

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

NPL LISTING HISTORY
Proposed Date: 06/01/86
Final Date: 02/15/90

Threats and Contaminants

Benzene, toluene, xylenes, and naphthalenes have been measured in the air. Creosote, PCP, and other contaminants from former wood-treating processes have been detected in the groundwater and soils. Polycyclic aromatic hydrocarbons (PAHs) are in on- and off-site sediments. Off-site sediments also contain phenol and PCP. PCP, arsenic, and chromium have been detected in surface water near the site. Direct contact with and accidental ingestion of soil on site could harm people. Coming in direct contact with materials that have moved off site or inhaling dust from the site also poses a threat to health. Oyster beds are located within 3 miles downstream. Studies by the Virginia Institute of Marine Science have shown that oysters within this reach have accumulated significant levels of creosotes.

Cleanup Approach

This site is being addressed in three stages: initial actions and two long-term remedial phases focusing on cleanup of the on-site soils, sediments, and non-aqueous product and cleanup of groundwater and Elizabeth River sediments.

Response Action Status

Initial Actions: The parties potentially responsible for the site contamination agreed to remove the creosote-contaminated drainage ditch. Currently, they are designing the technical specifications for the ditch cleanup, which is planned for completion in 1993. Removal of the ditch will end the migration of creosote into the Elizabeth River.

On-Site Soils, Sediments, and Non-Aqueous Product: A study to determine the nature and extent of contamination of on-site soils, sediments, and non-aqueous product is underway. The investigation also will address techniques for site cleanup and is planned for completion in late 1992. Once the study is completed, the EPA will evaluate and select the most timely and effective remedies for final cleanup of the site.

Groundwater and Elizabeth River Sediments: An additional investigation is being planned to address the extent of contamination of groundwater and of the Elizabeth River adjacent to the site. This investigation is expected to begin in 1993 and will include groundwater studies and sampling and analysis of Elizabeth River sediments.

Site Facts: A Consent Order to conduct a removal on site and to initiate site studies was signed by the potentially responsible parties in 1987. The EPA and the National Oceanic and Atmospheric Administration (NOAA) have entered into an Interagency Agreement to conduct an Ecological Risk Assessment of the Elizabeth River.

Environmental Progress

Once the removal is completed the migration of creosote into the Elizabeth River will discontinue, rendering the Atlantic Wood Industries, Inc. site safer while investigation actions are underway and cleanup activities are being planned.

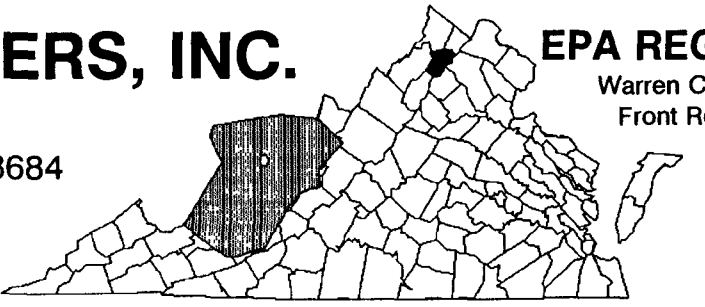
Site Repository

Portsmouth Public Library, 601 Court Street, Portsmouth, VA 23704

AVTEX FIBERS, INC.

VIRGINIA

EPA ID# VAD070358684



EPA REGION 3
Warren County
Front Royal

Site Description

A rayon manufacturing plant has operated at this 440-acre site since 1940 under various owners, including American Viscose from 1940 to 1963, the FMC Corporation from 1963 to 1976, and its present owner Avtex Fibers, Inc. The plant also produced polyester and polypropylene for short periods. Rayon manufacturing wastes and by-products, as well as fly ash and boiler room solids, were placed in 23 land-disposal impoundments on site. In 1983, land disposal of the liquid waste material was discontinued, and treatment at the on-site wastewater treatment plant was initiated. State studies have detected groundwater contamination under and across the river from the site. In 1982, the State found carbon disulfide in wells in a residential area near the site. Avtex Fibers purchased the properties with contaminated wells in 1983 and 1984. A groundwater pumping system to keep contaminated groundwater from migrating was installed by Avtex Fibers in 1984. The plant held a National Pollutant Discharge Elimination System (NPDES) permit to discharge its effluent into the Shenandoah River. From 1987 to 1988, a significant number of violations of the NPDES permit occurred. In 1989, polychlorinated biphenyl (PCB) contamination in the Shenandoah River was linked to the Avtex Fibers plant, and the plant's NPDES permit was revoked. Shutdown of the Avtex Fibers plant followed this action. Approximately 1,300 people live within a 3-mile radius of the site and depend on groundwater as a drinking water supply. The site is situated within the 100-year flood plain of the Shenandoah River.

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

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

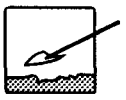
Threats and Contaminants

The groundwater is contaminated with carbon disulfide, phenol, sodium, and heavy metals including lead, arsenic, and cadmium from wastes deposited in the viscose disposal basins. The soil is contaminated with carbon disulfide, phenol, arsenic, lead, and PCBs. The Shenandoah River contains PCBs from the plant. Public health may be threatened by ingesting or coming in contact with contaminated water or soil and inhaling dust from the site.

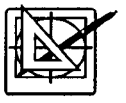
Cleanup Approach

The site is being addressed in four stages: immediate actions and three long-term remedial phases focusing on groundwater cleanup; buildings, soils, and drums cleanup; and cleanup of remaining contaminated areas.

Response Action Status



Immediate Actions: In 1984, Avtex Fibers supplied bottled drinking water for four families and assisted one family in building a cistern. After the plant was shutdown in 1989, the EPA conducted site stabilization activities including: an imminent hazard evaluation; establishment of site security, control, and maintenance of critical systems; design and implementation of a low-flow wastewater treatment system to maintain freeboard in the industrial basins; transfer and transport of raw chemicals such as carbon disulfide and sulfuric acid to suppliers; denotation of explosive labpack chemicals; labpacking, off-site transport, and disposal of all flammables, peroxide formers, and short-life chemicals; completion of a three-phase decommissioning of 22 carbon disulfide impoundments using an innovative on-site treatment system; and draining, flushing, and on site treatment of various process line, tank, and vessel fluids from areas of the plant.



Groundwater: In 1988, the EPA selected a remedy to clean up the groundwater, which includes: pumping and treating the groundwater and surface water; dewatering viscose basins; monitoring the groundwater; and placing deed restrictions prohibiting the use of groundwater on the properties affected by contamination. Avtex Fibers pumped and treated the groundwater under the direction of the State. The FMC Corporation currently is performing the treatment design for the selected remedy and is scheduled to finish in 1993. Additional data will be collected during an upcoming investigation which will aid in the design of the remedy.

Buildings, Soils, and Drums: Based on findings at other areas of the site, a cleanup remedy was selected to address several thousand drums of waste staged on site, PCB-contaminated soil, and an unstable acid reclamation facility. To date, approximately 8,000 tons of PCB contaminated soil and debris have been excavated, transported, and disposed of off site in an approved chemical waste landfill. This action was completed in early 1992. Also in 1992, the dismantling and demolition of the acid reclaim facility was completed. Over 750 tons of chemical debris removed from pipes, tanks, and building structures were disposed of in approved solid waste and hazardous waste landfills. Activities to identify, transport, and dispose of approximately 2,879 drums of wastes on site are expected to begin in 1992. Site security measures will be instituted as well. The cleanup is expected to be completed by late 1994.

Remaining Contaminated Areas: The EPA has initiated a study to determine the nature and extent of contamination and to identify alternatives for cleanup of the plant, the remaining disposal areas, and the south fork of the Shenandoah River. The cleanup may be divided into several phases as the study progresses.

Site Facts: Avtex Fibers entered into an Administrative Order on Consent with the EPA in 1986 to perform site studies. The Order was expanded in 1988 to include the FMC Corporation. The EPA issued an Administrative Order to the FMC Corporation and Avtex Fibers on June 30, 1989, requiring implementation of groundwater cleanup actions. In February 1990, Avtex Fibers filed for bankruptcy, and the EPA filed a Superfund lien against the property. Original negotiations for Avtex Fibers and the FMC Corporation to perform site studies failed; however, at their request the FMC Corporation will likely implement a portion of the site-wide investigation being developed by the EPA.

Environmental Progress

Providing bottled water to affected residents and completing most of the site stabilization activities have eliminated immediate threats at the Avtex Fibers, Inc. site while the EPA continues investigations and site cleanup activities. In addition, concepts to redevelop the Avtex Fibers property are being planned by the FMC Corporation in conjunction with the Front Royal Industrial Development Authority and state and local officials.

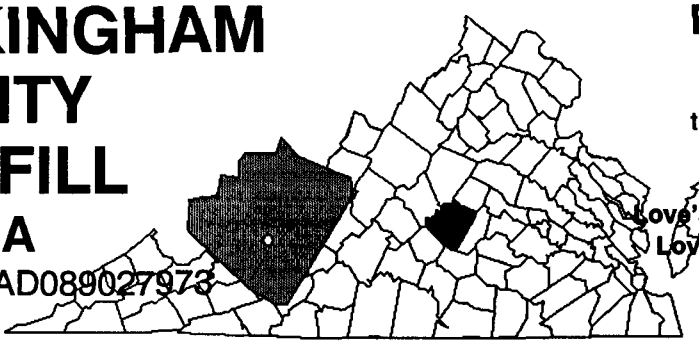
Site Repository

Samuels Public Library, 538 Villa Avenue, Front Royal, VA 22630

BUCKINGHAM COUNTY LANDFILL

VIRGINIA

EPA ID# VAD089027973



EPA REGION 3

Buckingham County
Virginia Route 640 near
the Town of Buckingham

Other Names:
Love's Container Service Landfill
Love's Hazardous Waste Site

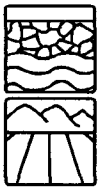
Site Description

The Buckingham County Landfill encompasses approximately 8 acres, including a 1-acre hazardous waste site and a 7-acre solid waste landfill. The site is situated on 175 acres of wooded land. Love's Container Service operated as an unlicensed landfill from 1962 until early 1972. In November 1972, the Virginia State Board of Health (VSBH) issued a permit to the facility to dispose of municipal waste. In 1977, the permit was modified to allow the disposal of chemical wastes that a local furniture-making industry generated. In 1979, the solid waste landfill operation was closed and covered to the satisfaction of the VSBH; however, the facility received Interim Status as a hazardous waste disposal facility. Subsequently, the facility accepted approximately 1,250 drums of used organic solvents and flammable liquids and solids. These wastes were poured into a clay-lined evaporation trench. After the liquids were poured into the trench, the empty barrels were buried in a separate trench. The solid residue remaining after the liquids had evaporated was then dug out and emptied into hazardous waste trenches. Buckingham County purchased the site and retained its hazardous waste disposal permit in 1982; however, the site was never operated by the County. In 1983, the County closed the hazardous waste portion of the site in accordance with State regulations, but not within EPA requirements. An estimated 1,100 people depend on wells within 3 miles of the site as a source of drinking water. Approximately 40 people live within 1/2 mile of the site.

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

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

Threats and Contaminants



The EPA sampled the site in September 1983 and found that on-site groundwater and some off-site residential wells were contaminated with volatile organic compounds (VOCs) from former disposal practices. Soils were contaminated with heavy metals and solvents. Potential risks exist if individuals ingest or make direct contact with contaminated groundwater or contaminated soil.

Cleanup Approach

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

Response Action Status

Entire Site: The parties potentially responsible for the site contamination began an investigation in 1991 to determine the extent of soil and groundwater contamination. The investigation is expected to be completed in 1993 at which time alterative cleanup options will be identified for final remedy selection for the site.

Site Facts: On November 8, 1985, the EPA terminated the landfill's interim approval for hazardous waste management and closed the non-hazardous waste disposal portion of the landfill, which had remained open after the partial landfill closure in 1983.

Environmental Progress

The EPA has performed preliminary investigations at the Buckingham County Landfill site and determined that there are no immediate threats to nearby residents or the environment. Once the investigations into cleanup technologies are completed, they will be reviewed by the EPA, and the permanent cleanup of the site will be selected.

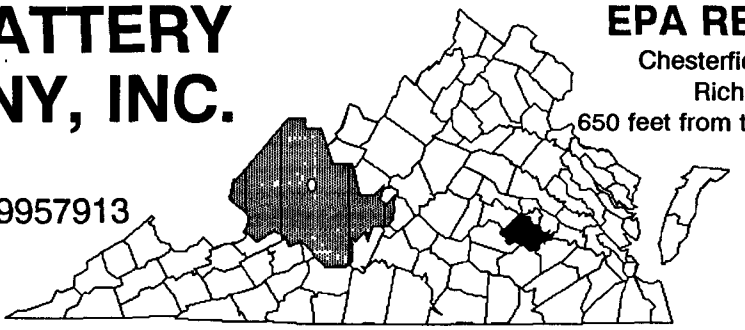
Site Repository

Not established.

C & R BATTERY COMPANY, INC.

VIRGINIA

EPA ID# VAD049957913



EPA REGION 3

Chesterfield County
Richmond
650 feet from the James River

Site Description

The 4 1/2-acre C & R Battery Company site is located in a rural and industrial area. Between 1969 and 1985, the company recovered lead and lead oxide from old automobile and truck batteries. In 1982, the company detected high levels of lead in an on-site monitoring well, in soils, and in drainage ditches leading to the James River. Approximately 300 people live within a mile of the site. An estimated 1,200 people, living within 3 miles of the site, draw drinking water from private wells that tap the contaminated aquifer. The nearest well is about 1,250 feet from the site.

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

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

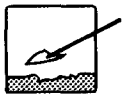
Threats and Contaminants

Monitoring of the air at several work stations during battery breaking operations indicated lead contamination levels well above the Federal standards. The company detected high levels of lead in an on-site monitoring well and in soils to a depth of 15 feet. Surface water was found to be contaminated with heavy metals and acids. Ingesting or coming in direct contact with contaminated soil, surface water, or groundwater may pose health risks to the nearby population. Inhalation of contaminated particles in the air also may pose a health risk to individuals. Prior to 1986, during routine health screenings, some company employees were found to have elevated levels of lead in their blood. Portions of the James River, approximately 3 miles downstream, are designated wetlands and are used for recreational purposes. The river currently shows no sign of contamination from the site.

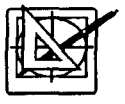
Cleanup Approach

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

Response Action Status



Emergency Actions: The EPA took emergency action at the site in 1986. Soils and pools of acid on the site were treated with lime to reduce acidity. Some contaminated soils were excavated and stored pending final disposal. Drainage controls were installed, and the site was graded, capped, and fenced. Direct access to contaminated areas of the site was restricted by fencing.



Entire Site: The EPA completed an investigation into contamination at the site in early 1990. Based on the results of this investigation, the EPA selected a cleanup remedy that includes on-site stabilization or solidification of lead-contaminated soils and sediments; disposal of the solidified product in a nearby landfill; clean closure of an on-site acid pond area; and covering of the area outside the pond with clean soil before revegetating the area. The design of these technologies was completed in 1992 and cleanup activities are expected to begin in late 1992.

Site Facts: The Commonwealth of Virginia took numerous enforcement actions at the site between 1979 and 1984. Actions resulted in a court order requiring development of a cleanup plan, construction of a treatment plant, and reclamation of the site. During site inspections in 1983, the Virginia Occupational Safety and Health Administration (OSHA) noted numerous violations of current OSHA standards. In 1985, Chesterfield County forbade the C & R Battery Company from further operation due to OSHA violations.

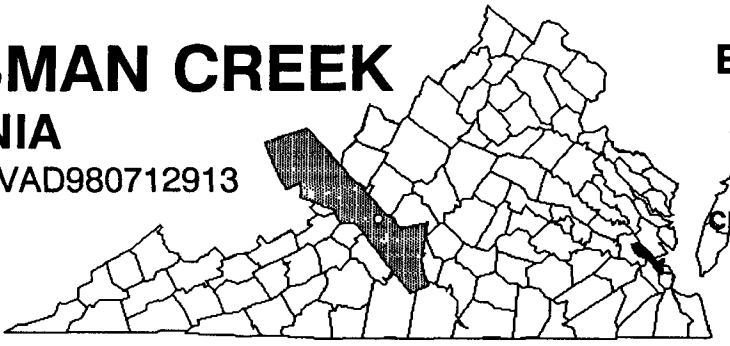
Environmental Progress

The emergency actions performed by the EPA, including removing acids and contaminated soils and capping and fencing the site, have reduced the potential for exposure to hazardous materials at the C & R Battery Company, Inc. site while further investigations and cleanup activities are taking place.

Site Repository

Chesterfield Public Library, 9501 Lori Road, Chesterfield, VA 23832

CHISMAN CREEK
VIRGINIA
EPA ID# VAD980712913



EPA REGION 3
York County
Suburban York County

Other Names:
Chisman Creek Disposal

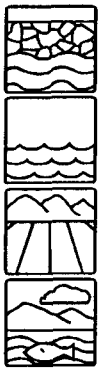
Site Description

The 27-acre Chisman Creek site consists of four fly ash pits in a watershed of the Chisman Creek Coastal Basin. These pits were originally sand and gravel borrow areas, but were filled with fly ash from the Yorktown Power Generating Station between 1957 and 1980. In 1980, and in subsequent studies, evidence of trace metals was found in groundwater near the pits. In 1980, off-site shallow residential wells became contaminated with vanadium and no longer could be used. These homes later were connected to public water supplies. Approximately 500 to 1,000 people live within a 1-mile radius of the site.

Site Responsibility: This 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

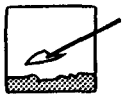


Vanadium, nickel, selenium, and sulfate have been found in groundwater near the four fly ash pits. Surface water in Chisman Creek was shown to be contaminated with vanadium, nickel, and sulfate. Drinking contaminated groundwater posed a risk to the public; however, potential risks have been reduced because residences with contaminated wells were connected to the public water supply and long-term groundwater treatment measures are underway. The subsurface fly ash and pond sediment materials do not pose a public health threat in their present, covered location. Nearby estuaries were potentially threatened by site contamination.

Cleanup Approach

This site was addressed in three stages: immediate actions and two long-term remedial phases focusing on cleanup of the pond areas and surface water and cleanup of the groundwater and soils.

Response Action Status



Immediate Actions: Virginia Power Co., the party potentially responsible for site contamination, connected public water lines to affected residences, placed covers over pits, and conducted groundwater diversion in selected areas, under EPA monitoring.

Pond Areas and Surface Water: Surface drainage modifications have been made to divert runoff. This included water quality monitoring and sediment monitoring of ponds, tributaries, and estuaries. Cleanup actions were completed in 1989.

Groundwater and Soils: Construction of the remedies was completed and included: installing temporary erosion and sedimentation control facilities; relocating the creek adjacent to one of the pits; installing horizontal groundwater drains to collect groundwater and dewater one of the pits; installing discharge pipes and a tie-in to a discharge; constructing flow and water quality monitoring stations and outlet channels; capping the fly ash pits using a low permeability cap and soil cover; revegetating the disturbed areas; and installing an on-site treatment system to treat collected groundwater from the pit area to remove nickel and vanadium. Groundwater treatment and monitoring of surrounding areas will continue until established cleanup goals have been met. The need for continued treatment will be evaluated during 5 year reviews.

Site Facts: A Consent Decree was signed with Virginia Power Co. to conduct site cleanup.

Environmental Progress

All construction of cleanup actions has been completed as planned at the Chisman Creek site, making the surroundings safe again for nearby residents and the environment while treatment of the groundwater continues to reduce contamination levels at the site.

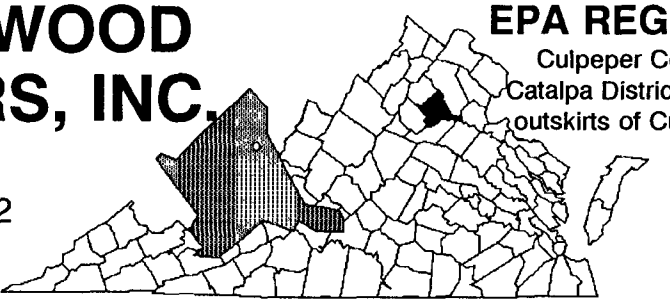
Site Repository

York County Public Library, 8500 George Washington Highway, Yorktown, VA 23692

CULPEPER WOOD PRESERVERS, INC.

VIRGINIA

EPA ID# VAD059165282



EPA REGION 3

Culpeper County
Catalpa District on the outskirts of Culpeper

Site Description

Culpeper Wood Preservers, Inc. is an active wood treatment facility that uses a chromated copper arsenate (CCA) waterborne treating process on a 20-acre site. The two-part wood treatment process begins by pressure-treating dimensional lumber in an enclosed processing plant. The wood then is moved to a dripping pad and left to dry for 3 days. Early on in the plant's history, the dripping pad was uncovered, and CCA-contaminated drippings were allowed to drop directly to the ground. In early 1981, approximately 100,000 gallons of CCA-contaminated wastewater escaped from an unlined, on-site waste impoundment, contaminating neighboring surface waters. The drip pad presently is covered, and the surrounding area is paved. An estimated 8,750 people live within a 3-mile radius of the site. Approximately 1,750 persons draw drinking water from private wells within that distance; the remaining population uses the Culpeper municipal system, which draws water upgradient of the contaminated area. Over 40 residences located within 2,000 feet of the site rely on groundwater for their drinking water supplies.

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

NPL LISTING HISTORY
Proposed Date: 10/01/84
Final Date: 10/04/89

Threats and Contaminants

The groundwater is contaminated with arsenic and chromium from the wood-treatment processes, according to analyses conducted by the Virginia State Water Control Board (SWCB). Contaminated soil containing chromium, copper, and arsenic was removed from the site in 1983; however, some remaining soil contamination might still be present. Wastewater containing CCA has contaminated neighboring surface waters. Potential risks exist for individuals who drink contaminated groundwater or surface water. The SWCB determined in 1986 that homeowner wells were not contaminated. An unnamed tributary that lies 750 yards northeast of the site and extends approximately 3 miles before entering Jonas Run potentially could be contaminated. Contaminated groundwater or surface water also may affect recreation and fishing.

Cleanup Approach

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

Response Action Status

Immediate Actions: In response to enforcement actions in 1981, the site owner removed a quantity of contaminated soil, constructed new drip pads to ensure return of drips and runoff to appropriately contained treatment facilities, built a roof over the drip pads, and reconstructed the waste impoundment. In addition, 20-foot trenches were dug downgradient from the impoundments to catch leachate, and barrier walls were constructed to prevent further migration of contaminants.

Entire Site: A study to determine the extent of contamination and to identify alternative technologies for the cleanup is expected to begin in 1992. The work plan for the site study was finalized in mid-1992. The study is expected to be completed in 1994. Once the investigations are completed, the EPA will select a final cleanup remedy for the site, with design of the selected remedy and final cleanup actions slated to start soon thereafter.

Site Facts: One of the potentially responsible parties signed a Consent Agreement and Consent Order, requiring certain cleanup actions and a surface water and groundwater monitoring plan. In April 1985, the EPA issued a Notice Letter informing another potentially responsible party of its responsibility for operations at the site.

Environmental Progress

The immediate actions performed at the Culpeper Wood Preservers, Inc. site have reduced the potential for contact with hazardous materials and have limited further contamination at the site. These actions have stabilized conditions at the site while final site investigations are being planned and cleanup remedies are being sought.

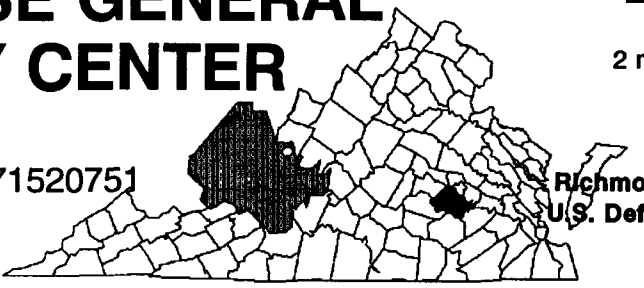
Site Repository

Not established.

DEFENSE GENERAL SUPPLY CENTER

VIRGINIA

EPA ID# VA3971520751



EPA REGION 3
Chesterfield County
2 miles south of Richmond

Other Names:
Richmond Defense General Supply
U.S. Defense General Supply Center

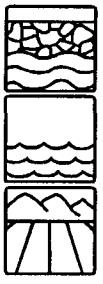
Site Description

The Defense General Supply Center manages and furnishes general military supplies to the Armed Forces and several Federal civilian agencies. The one-square-mile site includes a hazardous waste landfill, a fire training pit, an acid neutralization pit, and storage areas where hazardous substances were spilled. Beginning in 1942, the site was used as a storage and recovery area for chemicals and as a reclamation area for drums. The pits were used for training and for the disposal of chemical waste from the mid-1960s to the late 1970s. In 1983, the pits were filled in with soil and covered with sparse vegetation. Groundwater on and off the site has been shown to be contaminated from past waste disposal practices and hazardous waste spills. Groundwater and surface water flow from the site toward Kingsland Creek, a tributary of the James River. There are 119 permanent residences on the site. About 3,500 people live within a mile of the area in a residential and suburban setting. Residential areas downgradient of the site rely on private wells and the municipal water system for drinking water. Kingsland Creek is used for recreational fishing.

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

NPL LISTING HISTORY
Proposed Date: 10/01/84
Final Date: 07/01/87

Threats and Contaminants



Groundwater is contaminated with volatile organic compounds (VOCs) such as chloroform, polycyclic aromatic hydrocarbons (PAHs), and chromium from former chemical wastes disposal practices. Sediments are contaminated with pesticides. The soil contains VOCs and pesticides, and the surface water on site is contaminated with metals and pesticides. Those who accidentally ingest or come in direct contact with contaminated groundwater, surface water, soil, or sediments may be at risk. In addition, recreational use of contaminated streams and water may pose a threat.

Cleanup Approach

The site is being addressed in four long-term remedial phases concentrating on cleanup of the open storage area, acid neutralization pit, area 50/source area, other source areas, and groundwater plumes.

Response Action Status

Open Storage Area: In 1987, an investigation began to determine the nature and extent of contamination at the open storage area. The investigation is expected to be completed in 1992, at which time a final cleanup remedy will be selected.

Acid Neutralization Pit: An investigation was completed in early 1992 focusing on cleanup of the soil and removal of the old treatment tank concrete structure. The remedy selected for this area is a vacuum extraction technology. The technical design phase is expected to begin in mid-1992.

Area 50/Source Area: A focused study began in 1990 and is scheduled for completion in 1994. The study will concentrate on identifying the nature and extent of contamination at the area 50/source area. Upon completion of the investigation, the EPA will determine the remedy to be used for final cleanup.

Other Source Areas: An investigation began in 1990 to determine the nature and extent of contamination at other source areas, including the Fire Training area and the National Guard area. The study is expected to be completed in late 1993.

Groundwater Plumes: An investigation began in late 1991 to address three groundwater plumes identified at the site and to conduct sampling of additional wells and the deeper aquifer. The study is scheduled for completion in 1994.

Site Facts: The Defense General Supply Center 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. A Federal Facility Agreement was negotiated in 1990 and became effective in 1991, governing site cleanup activities.

Environmental Progress

The Defense General Supply Center site does not pose an immediate threat to public health or the environment. As individual units at the site are identified and studied, cleanup actions will be separated out and conducted in an accelerated manner under the Federal Facility Agreement that was negotiated for the site.

Site Repository

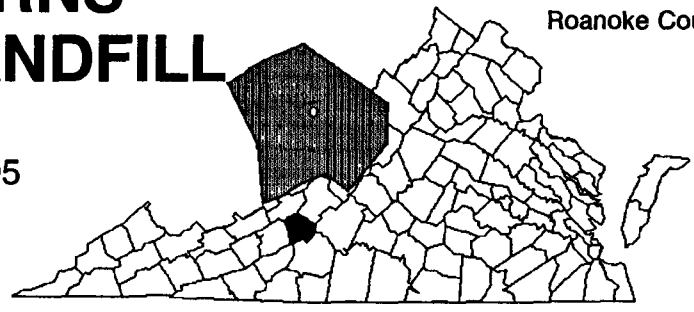
Not established.

DIXIE CAVERNS COUNTY LANDFILL

VIRGINIA

EPA ID# VAD980552095

EPA REGION 3



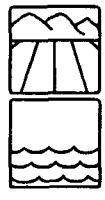
Site Description

This 27-acre site, known as the Dixie Caverns County Landfill, is located on a 62-acre property and was operated as an unlicensed landfill from 1965 to 1976. The landfill officially was closed in 1976, although it was never capped. The landfill had been used for disposal of municipal refuse, scrap metal, sludge, fly ash (emission control dust) from an electric arc furnace, and other unidentified industrial wastes. An intermittent stream on the site flowed through a large drum pile and fly ash pile and then emptied into the Roanoke River approximately 2 miles southeast of the landfill. The river is the main water supply source for the City of Salem. The nearest water intake is located in Glenvar, 4 1/2 miles downstream of the landfill. Within 3 miles of the site, an estimated 1,990 people reside in 525 dwellings which are served by private water supply wells. The closest residence is located approximately 1/2 mile south of the site. The Dixie Caverns, a local tourist attraction, is located a mile downstream of the site.

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

NPL LISTING HISTORY
Proposed Date: 01/22/87
Final Date: 10/04/89

Threats and Contaminants

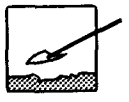


The on-site sludge pit soil was found to be contaminated primarily with aromatic and polycyclic aromatic hydrocarbons (PAHs) from former disposal practices. Organic chemical contamination also was found in the soils in the drum disposal area. Runoff water from the fly ash pile has contaminated the drainage area with metals. Contamination also has been found in stream sediments immediately downstream of the fly ash pile. Conditions at the site threaten groundwater and surface water. Those who accidentally ingest or come in direct contact with contaminated soil or sediments may be at risk.

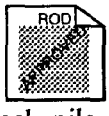
Cleanup Approach

The site is being addressed in three stages: immediate actions and two long-term remedial phases focusing on cleanup of the fly ash disposal area and the entire site.

Response Action Status



Immediate Actions: The EPA conducted a site inspection in 1983 and observed four potential sources of hazardous waste contamination: a drum disposal area, a sludge pit, a fly ash pile, and uncontrolled leachate from the site entering local streams. The County of Roanoke has cleaned two areas of the site. Drums and contaminated soils have been removed from the drum debris area and sludge and contaminated soils have been removed from the sludge pit. The County of Roanoke is also complying with an order from the Virginia State Water Control Board (SWCB) to eliminate leachate discharge from the site to the nearby intermittent stream.



Fly Ash Disposal Area: In 1991, a remedy was selected to address the 9,000 cubic yards of fly ash waste. The selected remedy is off-site treatment using a method known as high temperature metals recovery. Plans for cleanup of the fly ash pile area of the site were reviewed to assess compliance with Land Disposal Restrictions since this material is a waste listed under the Resource Conservation and Recovery Act (RCRA). The technical design phase of the remedy is scheduled to begin in late 1992.

Entire Site: The EPA currently is investigating the nature and extent of the remaining contamination at the site. The study will define the contaminants and will recommend alternatives for the final cleanup. Field work has been completed and the remedy is scheduled to be selected in 1992.

Site Facts: The EPA reached an agreement with the County of Roanoke to conduct removal actions at the site. The County agreed to clean up the sludge pit, the drum disposal area, and the fly ash pile.

Environmental Progress

The County of Roanoke cleaned up two areas of the site, and contaminated soil was removed from the drum debris area and the sludge pit. These immediate actions have reduced the potential of exposure to hazardous materials while the cleanup alternatives for the fly ash pile and remainder of the site are being planned.

Site Repository

Roanoke County Public Library, Glenvar Branch Library, 8917 Daugherty Road, Salem, VA 24153

FIRST PIEDMONT CORP. ROCK QUARRY (ROUTE 719)

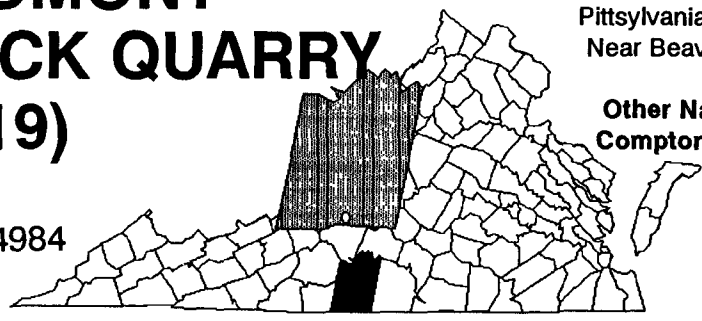
VIRGINIA

EPA ID# VAD980554984

EPA REGION 3

Pittsylvania County
Near Beaver Park

Other Names:
Compton Farm



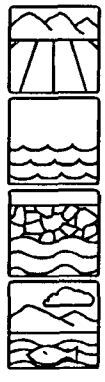
Site Description

The 4-acre First Piedmont Corp. Rock Quarry (Route 719), part of a 182-acre farm, was leased by First Piedmont Corp. in 1970. Between 1970 and 1972, First Piedmont Corp. disposed of 65,000 cubic yards of waste material into the quarry, including 15,000 gallons of liquid waste generated by Goodyear Tire & Rubber Company. The Virginia State Health Department ordered the site closed after a fire, possibly caused by spontaneous combustion of waste materials buried in the quarry. First Piedmont Corp. subsequently capped the site with 2 feet of local soil. The site is adjacent to a residential development of approximately 260 people. Approximately 380 people live within 1 mile of the site and an estimated 1,800 people are within 2 miles of the site. Contaminants in soils on site have the potential of migrating into surface water which drains the area.

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

NPL LISTING HISTORY
Proposed Date: 04/01/85
Final Date: 07/01/87

Threats and Contaminants



Early sampling has shown elevated levels of heavy metals including arsenic, chromium, lead, and zinc from former disposal practices in the soils on the site. Elevated levels of lead and zinc have been found in surface water. Iron and manganese were detected at low levels in two of the residential wells, both of which are located upgradient of the site. An initial investigation showed no immediate threats to residents. Potential risks to individuals exist through direct contact with or accidental ingestion of contaminated leachate, surface water, or soils. Nearby Lawless and Fall Creeks could potentially be affected by site contamination.

Cleanup Approach

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

Response Action Status

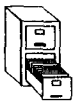
Entire Site: An investigation to determine the extent of contamination from a landfill in groundwater, domestic/residential wells, surface water, soils, and sediments was started in late 1987 by the parties potentially responsible for the site contamination. Based on the results of this investigation in 1991, a cleanup remedy was selected which includes capping a landfill on the site; collecting and treating leachate from the quarry; excavating and disposing of contaminated soils off site; and excavating, solidifying, and disposing of soils and sediments from the Northern Drainage Area, the Waste Pile, and the Carbon Black Pile off site. Design of these remedies is expected to begin in late 1992.

Site Facts: In December 1987, First Piedmont Corp., Corning Glass Works, and Goodyear Tire & Rubber Company signed a Consent Order to conduct an investigation into the extent of the contamination and to identify alternative technologies available for cleanup.

Environmental Progress

After adding the First Piedmont Corp. Rock Quarry (Route 719) site to the NPL, the EPA performed preliminary investigations and determined that no immediate threats to nearby residents or the environment exist while designs of the selected remedies are being planned.

Site Repository



Pittsylvania County Public Library, 24 Military Drive, Chatham, VA 24531

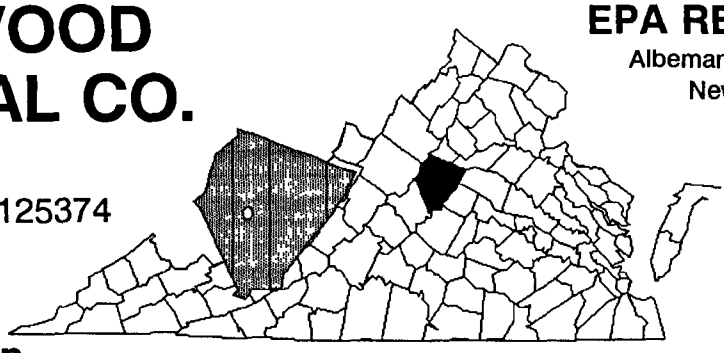
GREENWOOD CHEMICAL CO.

VIRGINIA

EPA ID# VAD003125374

EPA REGION 3

Albemarle County
Newton



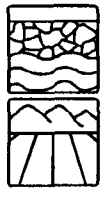
Site Description

The 15-acre Greenwood Chemical Co. site operated as a chemical manufacturing plant for 40 years. The now inactive facility manufactured specialty chemicals for the industrial, pesticide, and pharmaceutical trades. The facility ceased operation in 1985 after a toluene explosion and fire killed four workers. Waste disposal within the 10-acre site has included seven waste treatment lagoons, approximately 500 buried drums, 100 drums on the surface, and an unknown quantity of contaminated soil. Drums were broken, leaking, and uncapped; soils were stained; and vegetation was stressed. There are approximately 1,600 people living within 3 miles of the site. The site is surrounded by homes, farms, and community buildings. Private wells within 3 miles of the site are the sole source of drinking water for an estimated 1,600 people. The nearest well is within 600 feet of one of the site's lagoons. The site threatens an unnamed tributary to Stockton Creek, about 3,200 feet downslope from one of the lagoons and along the pathway of surface water migration. The tributary discharges into Stockton Creek, which is 1 mile downstream.

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

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

Threats and Contaminants

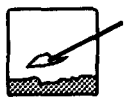


Specific contaminants detected in on-site groundwater include volatile organic compounds (VOCs) such as toluene and chloroform from former plant operations. On-site lagoon sludge contains VOCs, including toluene and benzene, as well as cyanide. Potential health threats include accidental ingestion of or direct contact with contaminated groundwater and sludges.

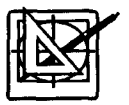
Cleanup Approach

This site is being addressed in four stages: emergency actions and three long-term remedial phases focusing on cleanup of soils, groundwater, and subsurface soils. Additional phases will be added as the clean up process continues.

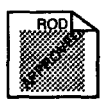
Response Action Status



Emergency Actions: Emergency actions performed by the EPA in 1987 included: excavation and disposal of an estimated 500 previously buried drums; removal and disposal of an estimated 100 surface drums; drainage and treatment of liquids from three lagoons; removal and stabilization of sludges and underlying soils from three lagoons; and removal and disposal of all shock-sensitive, explosive, highly flammable, or highly toxic materials. In 1992, the EPA began demolishing several existing structures and is currently storing the debris on site while awaiting off-site disposal. Abandoned chemicals will be properly contained and disposed of.



Soil: Based on the site investigations, the EPA selected a remedy to address contaminated soils and chemicals in buildings at the site. The remedy selected involves off-site incineration, stabilization/solidification, and/or disposal. The technical specifications for the cleanup are expected to be completed by 1992.



Groundwater: Upon completion of a study of the site in 1990, the EPA decided to treat contaminated groundwater and lagoon water through precipitation and UV/oxidation. An engineering design is scheduled to begin in 1992.

Subsurface Soils: An investigation is scheduled to begin in 1992 to determine the nature and extent of subsurface soil contamination. The study will identify alternative cleanup options from which a final remedy will be selected.

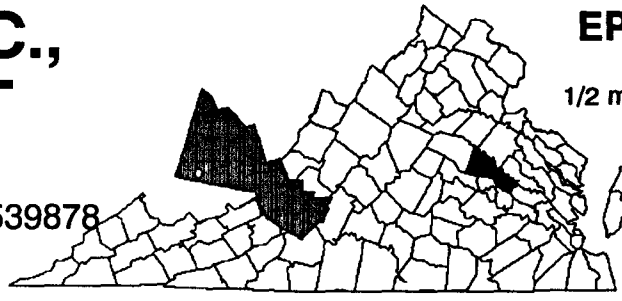
Environmental Progress

The numerous emergency actions performed by the EPA have eliminated immediate threats to nearby residents and the surroundings. After the design activities at Greenwood Chemical Co. site are completed, the remedies selected by the EPA will commence while investigations into the subsurface soil contamination are being planned.

Site Repository

Jefferson-Madison Regional Library, 201 East Market Street, Charlottesville, VA 22553

H & H INC., BURN PIT
VIRGINIA
EPA ID# VAD980539878



EPA REGION 3
Hanover County
1/2 mile south of Farrington

Other Names:
H & H, Inc.

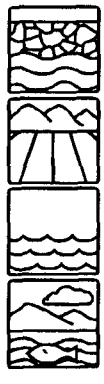
Site Description

The 1-acre H & H Inc., Burn Pit site was used by Haskell Chemical Company for the disposal of solvents containing printing inks and paint manufacturing wastes between 1960 and 1976. These materials were transported in drums from the Haskell Chemical Company in Richmond to the site and were emptied into a shallow unlined pit and burned. EPA sampling in 1984 indicated that polychlorinated biphenyls (PCBs) were being discharged off site through surface drainage. Approximately 600 people live within a mile of the site. The nearest residence is 1/2 mile away, and the nearest well is about 1,000 feet from the site. About 2,400 people draw drinking water from private wells within 3 miles of the site. Surface waters within 3 miles downstream of the site are used for fishing.

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

NPL LISTING HISTORY
Proposed Date: 01/22/87
Final Date: 03/31/89

Threats and Contaminants

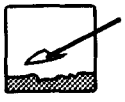


The groundwater is contaminated with pesticides and low levels of volatile organic compounds (VOCs) including benzene and toluene, as well as heavy metals including chromium, barium, and beryllium from former site activities. Soil is contaminated with PCBs, metals, and phthalates. Leachate is contaminated with VOCs including phthalates, vinyl chloride, toluene, and xylenes. Sediments are contaminated with PCBs and metals. Although the source of contamination has been removed, there is a potential that a contaminant plume may still affect private wells. The contaminated aquifer is the sole source of drinking water for residents in the area. Those who accidentally ingest or come in direct contact with contaminated groundwater, soil, leachate, or sediments may be at risk. The site runoff drains into an area designated by the U.S. Fish and Wildlife Service as a freshwater wetland within 3,000 feet of the pit.

Cleanup Approach

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

Response Action Status



Immediate Actions: In response to a State order, H & H, Inc. and the Haskell Chemical Company removed contaminated soil, installed monitoring wells, and took measures to control erosion and sedimentation in 1982.

Entire Site: The EPA currently is studying the nature and extent of groundwater, soil, and other contamination at the site. As a result of this study, the EPA will recommend alternatives for cleanup. The study is planned to be completed in late 1992. Once the study has been completed, the EPA will select a final cleanup method for the site.

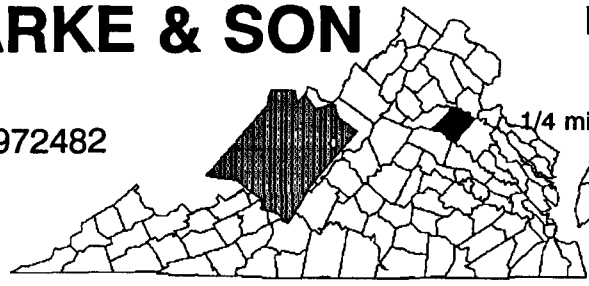
Environmental Progress

Immediate actions performed at the site, including the removal of contaminated soil, installation of monitoring wells, and erosion control, have greatly reduced the potential for exposure to contaminants at the H & H Inc., Burn Pit site while further investigations are being completed.

Site Repository

Farrington Fire Hall, Route 3, Glen Allen, VA 23060

L. A. CLARKE & SON
VIRGINIA
EPA ID# VAD007972482



EPA REGION 3
Spotsylvania County
Fredericksburg
1/4 mile north of Massaponax Creek

Other Names:
Clarke, L.A. & Son

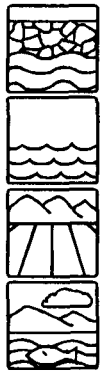
Site Description

L.A. Clarke & Son, a railroad tie and wood treatment plant, is located southeast of Fredericksburg. Wood preserving operations began at the site in 1937 and continued through 1988, with one inactive period lasting approximately 1 year from 1979 to 1980. The facility no longer is in operation. During the past 50 years, creosote contamination that resulted from facility operation spills, waste streams entering the drainage ditches, and on-site disposal has affected the soil, groundwater, surface water, and sediments. Historical aerial photography indicates that from at least 1953 through 1975, wastewater was disposed of in two concrete-lined pits. Also, an area north of the process facility received wastes. Overflow from the concrete pits was stored in an earthen pit. Excess water also was discharged to drainage ditches and was sprayed on the ground around the storage yard to control dust. Four additional wastewater pits, which date back to 1937, were filled in by 1979. In 1975, L.A. Clarke & Son was issued a National Pollutant Discharge Elimination System (NPDES) permit for outfalls from two on-site drainage ditches; these permits are still in effect. Sixty-three homes are located within a 4,000-foot radius of the site, and 1,500 people live within a mile of the site. The population within 3 miles of the site is 4,500. The shallow contaminated aquifer underlying the site only has limited use at the present time as a source of drinking water, but has the potential for wider use in the future, due to increased development in the area.

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



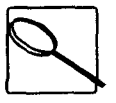
The shallow aquifer underlying the site is contaminated with creosote derivatives from former site activities. Sediments, soils, and surface water are contaminated with creosote compounds and by-products including polynuclear aromatics (PNAs) and benzene. Potential health risks exist if people inhale contaminated vapors or dust or accidentally ingest or come in direct contact with contaminated soil, sediments, or surface water. Exposure to contaminants also could occur from wading or swimming in Massaponax Creek, West Vaco Pond, or Ruffins Pond. Fish and waterfowl may be contaminated and could pose health risks to individuals who ingest them.

Cleanup Approach

The site is being addressed in two long-term remedial phases designed to clean up the soil and the groundwater and sediment.

Response Action Status

Soil: The EPA completed an investigation into the extent of the site contamination in 1988. Based on this study, cleanup plans for this phase will include in-place soil flushing and on-site landfarming (soil biodegradation) of contaminated soils and sediments. An estimated 118,000 cubic yards of contaminated soil will require treatment. Excavation, dredging, and on-site consolidation of contaminated sediment, subsurface soil, and buried pit materials also will be addressed in this phase of the site cleanup. In 1990, the Richmond, Fredericksburg, and Potomac (RF & P) Railroad began designing some of the technologies to be used in the cleanup. Cleanup work was completed on site containment in 1990 and the demolition of the wood treating facility is expected to be completed in 1992.



Groundwater and Sediment: In 1990, the parties potentially responsible for the site contamination began a study to determine the extent of groundwater and sediment contamination and to identify alternative technologies for cleaning up the site. This investigation is planned to be completed in late 1992. Future plans include monitoring the groundwater.

Site Facts: A Consent Decree was signed with RF & P Railroad to conduct the first phase of the cleanup work. The Decree became effective in 1989.

Environmental Progress

After placing the L.A. Clarke & Sons site on the NPL and fencing the site, the EPA performed a thorough investigation of site conditions and determined that the site presently does not pose an immediate threat to the public or the environment while the investigation to select the final remedy takes place.

Site Repository

County Administrator's Office, 9104 Courthouse Road, Spotsylvania, VA 22553

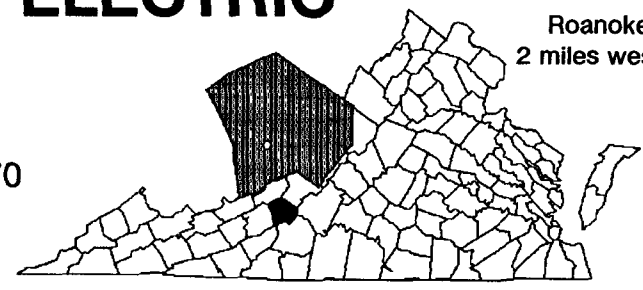
MATTHEWS ELECTRIC PLATING

VIRGINIA

EPA ID# VAD980712970

EPA REGION 3

Roanoke County
2 miles west of Salem



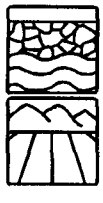
Site Description

From 1972 to 1977, the 1 3/4-acre Matthews Electric Plating site housed a facility that plated automobile bumpers with a process using chromium and nickel. Beginning in 1975, surface water and groundwater contamination associated with the electroplating operation was noted by area residents. Liquid waste from the operation had been discharged directly onto the ground and drained to a sinkhole beneath the property. The Virginia State Water Control Board (VSWCB) began residential monitoring of 30 wells. Subsequent investigations were performed by the VSWCB and the EPA to determine the extent of the contamination. In 1976, the VSWCB issued an Emergency Order that prohibited the further discharge of electroplating waste from the plant. The facility went out of business in 1977 and was used as a small-scale pig farming operation. The population within 3 miles of the site is approximately 3,000. One on-site well and ten local residential wells were contaminated.

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

NPL LISTING HISTORY
Proposed Date: 10/01/81
Final Date: 09/01/83
Deleted Date: 12/27/88

Threats and Contaminants



Groundwater was contaminated with chromium residues from the former electroplating operations. Soil was contaminated with chromium, nickel, and cadmium. Those who accidentally ingested or came in direct contact with contaminated groundwater or soil were at risk.

Cleanup Approach

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

Response Action Status

Immediate Actions: In 1979, the owner of the property removed waste materials, constructed diversion ditches, and covered parts of the area with clay. In 1988, the EPA removed approximately 1,500 gallons of waste solution and sludges.

Entire Site: The selected remedy included construction of an extension of the municipal water supply from the water treatment plant in Salem. The EPA constructed the water line, and 28 homes were connected in 1986. In 1987, the EPA conducted sampling, and results showed no further cleanup actions were needed. This site was deleted from the NPL in December 1988.

Site Facts: Potential public health and environmental hazards first were identified when concerned residents notified the VSWCB of discolored drinking water in November 1975.

Environmental Progress

By removing waste materials, constructing diversion ditches, covering the site with clay, and extending a municipal water supply to affected residences, the contamination at the Matthews Electric Plating site has been eliminated. Following subsequent site evaluations, the EPA, in conjunction with the Commonwealth of Virginia, determined that the site no longer posed a threat to public health or the environment and deleted the site from the NPL in 1988.

Site Repository

Information is no longer available.

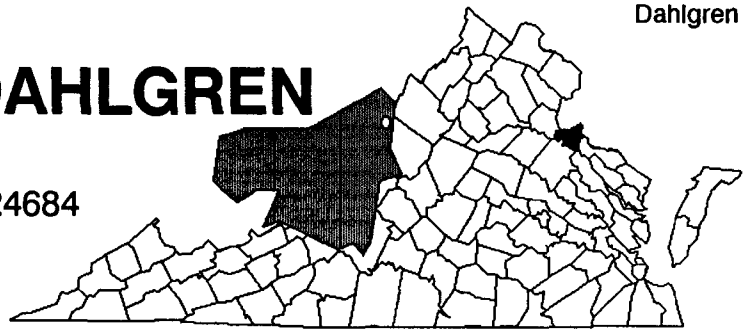
NAVAL SURFACE WARFARE CENTER-DAHLGREN

VIRGINIA

EPA ID# VA71700224684

EPA REGION 3

King George County
Dahlgren



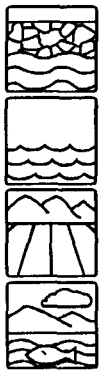
Site Description

The Naval Surface Warfare Center-Dahlgren (NSWC) is approximately 4,300 acres in size and located 40 miles south of Washington, D.C. along the Potomac River. This naval facility, established in 1918, conducts research, development, testing, and evaluation of surface ship weaponry for the Navy. The first of two areas that make up NSWC is known as the Main Site. Activities conducted at this 2,678-acre area include air operations and ordnance testing. Laboratories, computer facilities, administrative offices, and residences also are located at the Main Site. The Explosive Experimental Area (EEA), the second of the two areas, is an isolated testing range located on 1,614 acres. These two areas are separated by the Upper Machodoc Creek. In 1983, the Navy identified seven sources of contamination at the site, and in 1986 confirmed the need for additional studies at ten areas of the site. Three of these areas are identified as: the 1400 Area Landfill (Site 17), the Pesticide Rinse Area (Site 25), and the Transformer Draining Area (Site 19). The 1400 Area Landfill, 5 to 10 acres in size, received municipal waste for three years in the 1970s. Canisters of mercury also may have been disposed of in this area. Pesticide containers were drained and rinsed at the Pesticide Rinse Area while electrical transformer oil containing polychlorinated biphenyls (PCBs) was drained at the Transformer Draining Area. Two aquifers underlying NSWC serve as the drinking water source of the nearby population: the shallow Nanjemoy aquifer, which supplies a small number of private residences, and the deeper Potomac Group aquifer, which supplies the municipal and NSWC water systems. Wetlands along Gambo Creek, an unidentified drainage area, and the Potomac River are potential areas of environmental impact. Municipal and private wells within 4 miles of the site supply an estimated 6,900 people. There are 3,200 civilians and 100 military personnel on base as well as 154 housing units.

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

NPL LISTING HISTORY
Proposed Date: 02/07/92

Threats and Contaminants



Low levels of mercury were detected in groundwater underlying the 1400 Area Landfill and stream sediments in the vicinity of the landfill. Sediments and the fish of Hideaway Pond, located downstream from the landfill, also are contaminated with mercury. People could be at risk by accidentally ingesting or coming into contact with contaminated groundwater, sediments, surface water or soils. The Potomac River receives run-off from surface water in this area. PCBs were discovered in the soil of the Transformer Area to a depth of 4 feet.

Cleanup Approach

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

Response Action Status

Initial Actions: The Navy is considering taking initial cleanup actions at two areas of the site to remove the potential sources of contamination.

Entire Site: In 1993, the Navy is expected to begin investigations at ten areas of the NSWC site. These studies will explore the nature and extent of contamination at the site and will identify alternative cleanup options for final remedy selection. Additional areas will be evaluated once the initial investigations are underway.

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

Environmental Progress

The Navy is assessing the need for initial actions to remove potential sources of contamination. Initial investigations indicate the Naval Surface Warfare Center-Dahlgren site poses no immediate threat to the safety and health of the nearby population while additional investigations and activities are being planned for permanent cleanup of the site.

Site Repository 

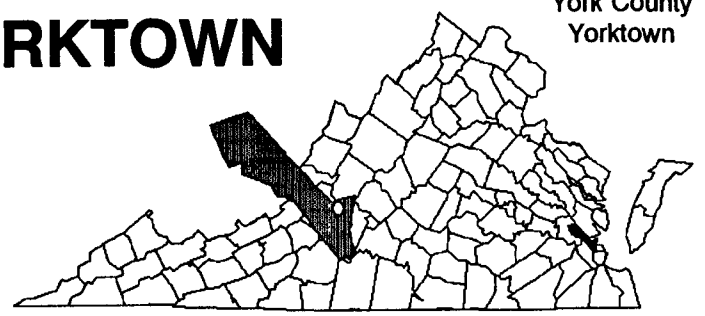
Not established.

NAVAL WEAPONS STATION-YORKTOWN

VIRGINIA

EPA ID# VA8170024170

EPA REGION 3



Site Description

The Naval Weapons Station-Yorktown site is 10,500 acres and located along the York River. Administrative facilities, personnel housing, and other operational support buildings are located on site. The Colonial National Historical Park, the Whiteman Swamp, and the Naval Supply Center-Cheatham Annex surround the area. This facility was established in 1918 to maintain, produce, and store ordnance for the Navy. Various explosives, including trinitrotoluene (TNT), metals, and organics, were used in past and current operations. Twenty-one sources of contamination were identified by a series of investigations conducted from 1983 to 1989. One source, the Turkey Road Landfill (Site 2), is a 5-acre wetland area reportedly used for disposal of mercury batteries, missile hardware, inert mines and bombs, construction rubble, and electrical shop hardware. Batteries from weapons, burning pad residues, fly ash from coal-fired boilers, mine casings, electrical equipment, and transformers were disposed of at the Burning Pad Residue Landfill (Site 4), another source of contamination. Wastewater containing volatile organic compounds (VOCs) and residues from explosives was discharged to the Explosive Contaminated Wastewater Impoundments (Site 6). Plant 3-Explosive Contaminated Wastewater Discharge Area (Site 7) used to be the point from which wastewater containing VOCs and explosives residues was discharged. These contaminants have migrated to surface water and sediments downstream from the site. The unlined drainage way used to transport wastewater from the impoundments to the discharge point, known as Plant 1-Site 9 of the Explosive Contaminated Wastewater Discharge Area, has led to contamination of surface soil. Contaminants from the explosives areas have been detected in Lee Pond, a fishery downstream from the site. Soil below a conveyor belt used to transport explosives is also contaminated. The York River receives surface water runoff from all these sources of contamination. Its drainage basin includes wetlands, endangered species, and fisheries. The York River joins the Chesapeake Bay 12 miles downstream from the site. The on-base population includes 3,200 military personnel and civilians as well as 47 housing units.

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

NPL LISTING HISTORY
Proposed Date: 02/07/92

Threats and Contaminants

Groundwater, surface water, and sediments in the Turkey Road Landfill area are contaminated with organics and heavy metals including arsenic. VOCs, explosive contaminants, and heavy metals have been detected in groundwater, surface water, and sediments near the Burning Pad Residue Landfill. Surface water and sediments downstream from the Explosive Contaminated Wastewater Discharge Areas are contaminated with VOCs and explosives residues. On-site soil is contaminated with TNT.

Cleanup Approach

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

Response Action Status

Initial Actions: The Navy is planning to remove contaminants from the Site-21 Battery Dump in 1993.

Entire Site: An investigation is expected to begin in 1993 to determine the nature and extent of contamination at the site. The study will identify alternative cleanup options and will result in the selection of a final remedy for the site.

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

Environmental Progress

Once contaminants are removed from the Site-21 Battery Dump, the Naval Weapons Station-Yorktown will no longer pose an immediate threat to the health and safety of the nearby population while additional investigations and activities are being planned for permanent cleanup of the site.

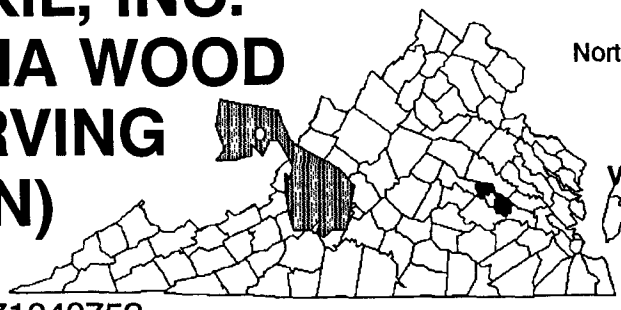
Site Repository

Not established.

RENTOKIL, INC. (VIRGINIA WOOD PRESERVING DIVISION)

VIRGINIA

EPA ID# VAD071040752



EPA REGION 3

Henrico County
Northwest of Richmond near I-95

Other Names:
Virginia Wood Preservers

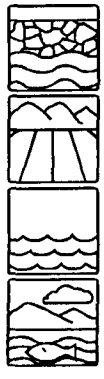
Site Description

The 10-acre Rentokil, Inc. (Virginia Wood Preserving Division) site was a wood preserving plant and ceased operations in 1990. Virginia Properties, Inc. owns 5 acres and leases the adjacent 5 acres from an affiliate of the RF&P Railroad. The original plant was built by the Virginia Wood Preserving Company in 1956. Since 1982, the operation used only the chromated copper arsenate (CCA) process to treat wood. In previous years, pentachlorophenol (PCP), creosote, chromated zinc arsenate, xylene, ammonium phosphates, and sulfates also were used. Preserving processes also required the plant to use mineral spirits and fuel oil. Operators disposed of chemical wastes in an unlined lagoon until 1974. In 1976 or 1977, workers buried 1,100 to 1,400 pounds of CCA at the site. They also improperly installed several wells, later abandoned, which may have spread groundwater contamination. The area is mixed light industrial and residential and is located on the outskirts of Richmond. The population within a 1-mile radius of the site is about 1,500. When the site was placed on the NPL, approximately 350 people used drinking water from wells drilled into the aquifers of concern. Runoff from the site enters nearby wetlands and an unnamed stream that flows into North Run. Occasionally, stormwater flows off site into the municipal storm sewer and the stream. North Run is used for swimming and is located within 1 1/2 miles of the site.

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

NPL LISTING HISTORY
Proposed Date: 01/22/87
Final Date: 03/31/89

Threats and Contaminants



The groundwater, soil, and surface water are contaminated with PCP, creosote, copper, chromium, arsenic, and dioxin from former wood preserving operations. Potential risks exist if individuals accidentally ingest or come in direct contact with contaminated groundwater, surface water, or soil. Contaminated surface water may have an effect on nearby livestock or crops if it is used for watering or irrigation. Site runoff entering nearby wetlands may adversely affect them.

Cleanup Approach

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

Response Action Status

Immediate Actions: In 1987, public water lines were extended to residents living next to the site, at Rentokil's expense. Later that year, the owner removed some contaminated organic sludge from an on-site, unlined surface impoundment and had the sludge incinerated.

Entire Site: The parties potentially responsible for the site contamination began an intensive study of the site in 1987. This investigation is exploring the nature and extent of water and soil pollution and will recommend the best strategies for final cleanup. A second phase of field work began in 1991. Once the investigations are completed, the EPA will evaluate the findings, recommend actions, and select a final remedy to clean up the contamination at the site, scheduled for late 1992.

Site Facts: In 1987, Rentokil and the EPA signed a Consent Order to conduct a study to determine the nature and extent of contamination and to identify alternatives for cleanup.

Environmental Progress

By extending public water lines and removing and incinerating contaminated sludges, immediate threats at the Rentokil Inc. (Virginia Wood Preserving Division) site have been eliminated while further investigations are taking place and cleanup activities are being planned.

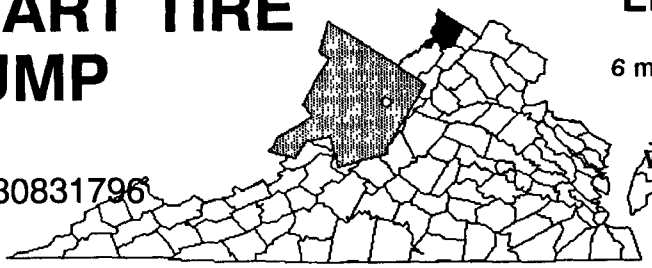
Site Repository

Henrico County Public Library, 1001 North Laburnum Avenue, Richmond, VA 23223

RHINEHART TIRE FIRE DUMP

VIRGINIA

EPA ID# VAD980831796



EPA REGION 3

Frederick County
6 miles west of Winchester

Other Names:
Winchester Tire Fire

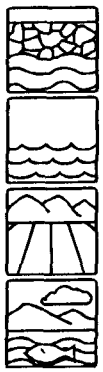
Site Description

The Rhinehart Tire Fire Dump site is located on Mt. Pleasant. It originally served as a storage area for 5 to 7 million tires, until they caught fire in October 1983. The smoke plume rose several thousand feet and spread a 50-mile long trail across four states. An EPA emergency team controlled the fire within a few days, but the fire continued to smolder for 6 months. Hot oil from the burning, melting tires quickly entered nearby Massey Run. The migrating oil and firefighting residues also have contaminated the site and local waters. The site is located in an agricultural area. Approximately 75 people live within a 1-mile radius of the site, and two people live on the site itself. Residences use private wells for drinking water. The site drains into Massey Run, which flows 4,000 feet downstream of the site to Hogue Creek, a trout stream that flows into the Potomac River. A municipal water supply intake is 22 miles downstream of the site. There are two ponds on site, the larger of which is unlined. The smaller 50,000-gallon lined pond collects runoff from 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

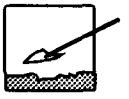


On-site groundwater is contaminated with slightly elevated levels of heavy metals including arsenic, cadmium, and lead, as well as volatile organic compounds (VOCs) including toluene and xylene. Sediments have been contaminated with oils and residues from the tire fire, in addition to heavy metals such as arsenic, cadmium, lead, and nickel. The soil is contaminated with metals and low levels of polycyclic aromatic hydrocarbons (PAHs) from tire burning. Massey Run and other surface waters are contaminated with various heavy metals and VOCs. Test results revealed these surface waters to be acutely and chronically toxic. Human exposure to contaminants may occur by inhaling, coming in direct contact with, or accidentally ingesting contaminated groundwater, surface water, sediments, and soils. Eating trout with bioaccumulated contaminants from Hogue Creek is a health threat.

Cleanup Approach

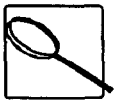
This site is being addressed in four stages: emergency actions and three long-term remedial phases focusing on surface water cleanup, cleanup of Dutchman's Pond, and cleanup of the entire site.

Response Action Status



Emergency Actions: EPA emergency workers extinguished the tire fire and removed more than 800,000 gallons of oily wastes released by the burning tires. A lined catch basin was installed to trap the oil and to provide water for firefighting, and a monitoring program was initiated to identify contaminant levels on and off site. The oily wastes were recycled into fuel oil and then sold. Under orders from the EPA, the owner was required to build dikes and ditches for drainage control and to collect and pump this water to minimize migration of wastes from the site. The owner also has undertaken extensive excavation and regrading activities and has restricted access to the site. These emergency activities have successfully controlled the immediate threats to the public and the environment.

Surface Water: The remedies selected for site cleanup in 1988 include: instituting soil erosion controls; raising the existing dam on the unlined pond by 13 feet; collecting and treating surface water runoff with gravity settling; collecting shallow groundwater oily seeps; and separating water from oil and transporting it to a wastewater treatment plant. The EPA completed the engineering designs for the selected remedies in 1989. Construction of the wastewater treatment plant was completed in 1990, and operation began in early 1991. Construction of all remaining remedies was completed in early 1992 and cleanup is underway. Operation and maintenance of the surface water treatment system are currently underway.



Dutchman's Pond: In mid-1992, the EPA is expected to complete a study exploring methods to remove another on-site pond, Duchman's Pond. The final cleanup remedy is expected to be selected by late 1992.

Entire Site: The EPA and the Army Corps of Engineers are conducting an intensive study to investigate the potential adverse impacts to groundwater and surface water and to select the actions needed to clean and restore the existing collection ponds and other off-site areas affected by the tire fire. This study, which will recommend the best strategies for final cleanup, is expected to be completed in late 1993.

Site Facts: The site owner agreed, under the terms of a 1984 Administrative Order, to install surface runoff controls and to perform other activities to control contaminant migration. In 1989, the EPA entered into an Administrative Consent Order with the site owners, which prevents them from altering site conditions and provides for site access and use of clean barrow material from the site to build the dam.

Environmental Progress

The numerous emergency actions performed by the EPA and the potentially responsible parties have reduced the potential for exposure to contaminated materials and for the further migration of contaminants while final investigations and cleanup activities are taking place at the Rhinehart Tire Fire Dump site.

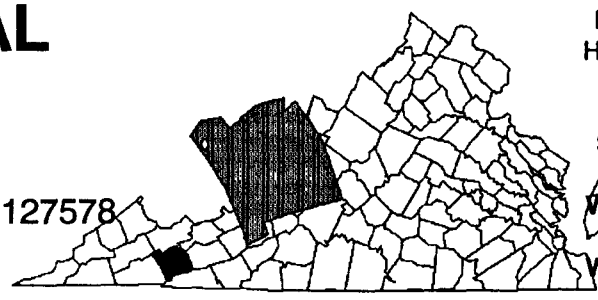
Site Repository

Handley Library, 100 West Piccadilly Street, Winchester, VA 22601

SALTVILLE WASTE DISPOSAL PONDS

VIRGINIA

EPA ID# VAD003127578



EPA REGION 3

Smyth County
Next to North Fork of the
Holston River near Saltville

Other Names:
Saltville Muck Pond #5
Olin Corp. Saltville Waste Disposal Pond #5
Olin Corp. Saltville Waste Disposal Pond #6

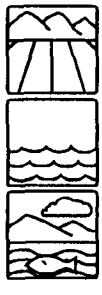
Site Description

The Saltville Waste Disposal Ponds site consists of two large ponds, 45 and 80 acres in size, and an empty lot next to the North Fork of the Holston River (NFHR). The empty lot once held a mercury cell chlor-alkali battery plant operated from 1951 to 1954 by Olin Mathieson Alkali Works and from 1954 to 1972 by Olin Chemicals Corp., the current site owner. The waste disposal practices at the plant resulted in as many as 100 pounds of mercury being lost daily to nearby soil and rivers adjacent to the site. Workers placed mercury-contaminated wastewater and process waste from soda ash manufacturing into the two large ponds, known as ponds #5 and #6. Mercury escaping from the site contaminated 80 miles of the NFHR. Approximately 1,140 people live within a mile of the site. The nearest residences are located 1,300 feet from the site. The community's drinking water is obtained from uncontaminated surface springs. Since 1970, people have been advised not to eat fish from the contaminated stretch of the river, although catch-and-release game fishing is permitted. Because the Holston River flows through both Virginia and Tennessee, a task force of the EPA, Virginia, Tennessee, and the Tennessee Valley Authority staff was organized to study the mercury contamination problem.

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

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

Threats and Contaminants



Mercury from the plant's waste disposal ponds has contaminated soils and surface water. Direct contact with or accidental ingestion of soil or surface water or eating contaminated fish from the Holston River pose a health risk. The NFHR is a habitat for two endangered species remaining in the river: the fine-rayed mussel and the spotfin chub. Six other endangered species have been eliminated from the river.

Cleanup Approach

The site is being addressed in four stages: immediate actions and three long-term remedial phases focusing on source control, cleanup of the groundwater, and biomonitoring.

Response Action Status

Immediate Actions: In 1982, the Olin Chemicals Corp. dredged 1,000 feet of the river to remove mercury-contaminated sediments and built a diversion ditch along the western edge of pond #5. In late 1991, contaminated soil was removed to facilitate construction of a new bridge.

Source Control: The results of an investigation of the site called for surface water diversions, construction of a treatment plant for pond #5 outfall, and future investigations. The cleanup activities selected for this site have been organized into two phases to facilitate the work. Phase 1 focuses on cleaning up the source of contamination and assessing its effects; Phase 2 focuses in more detail on groundwater and surface water contamination. The selected remedy features: building a diversion ditch around the eastern side of pond #5; building a facility that will treat pond #5's outfall to within the State levels for mercury; conducting a bioassessment of the NFHR to determine the extent of site effects on resident fauna and flora; and developing a groundwater monitoring system. The owner began the engineering design for this remedy in 1988. Phase 1 design work was completed in 1991. Cleanup activities for Phase 1 were completed later that same year. Phase 2 design work is expected to be completed in 1993.

Groundwater Cleanup: A study to determine the nature and extent of groundwater contamination and to identify alternatives for cleanup is underway. The owner will conduct an intensive study of the site that will assess groundwater contamination and the biological impact of contaminated groundwater discharge into the adjacent river systems. This investigation, started in 1988, will identify the best cleanup strategies and is scheduled to be completed in late 1992.

Biomonitoring: A study to determine the nature and extent of contamination and to identify alternatives for cleanup has begun. An extensive investigation will be conducted to determine the past, current, and future effects of the site on the NFHR. The study will focus on sediment and several species of biota. Selected cleanup strategies will be based on the extent of the effects. Completion of the study is expected in late 1992.

Site Facts: In 1982, the Olin Chemicals Corp. and the State signed a Special Order under which the owner was to dredge 1,000 feet of the river to remove contaminated sediments and to construct a diversion ditch along the edge of the western portion of pond #5. The order also required monitoring of the outfall, fish, and sediments until 1988. Under the terms of a 1988 Consent Decree, the Olin Chemicals Corp. will implement the remedy and conduct a site investigation that will assess groundwater contamination at the site and the effects on biological resources in the NFHR.

Environmental Progress

The immediate actions of dredging contaminants from the sediment of the NFHR, building the diversion ditch to prevent mercury-contaminated outfall from entering the river, and cleaning up the source of contamination have reduced the potential for exposure to contaminated materials at the Saltville Waste Disposal Ponds site while additional cleanup activities are being planned.

Site Repository

Saltville Town Hall, Town Hall Square on Main Street, Saltville, VA 24370

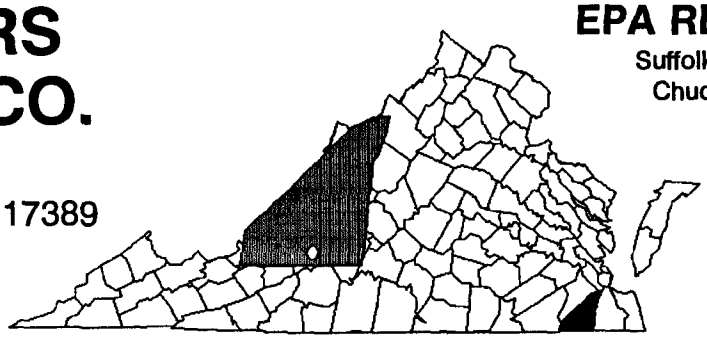
SAUNDERS SUPPLY CO.

VIRGINIA

EPA ID# VAD003117389

EPA REGION 3

Suffolk County
Chuckatuck



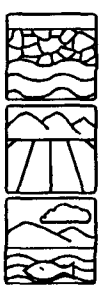
Site Description

The 7 1/3-acre Saunders Supply Co. site was a wood-treating plant, but ceased wood-treating operations in June 1991. The site, however, is still an active lumber yard. Between 1964 and 1984, workers used a mixture of pentachlorophenol (PCP) and fuel oil as a wood preservative. In 1974, they added a chromated copper arsenate process, which is still in use. Part of the spent PCP/oil mixture was disposed of by burning it in an unlined pit or in a conical burner on site, which resulted in the generation of dioxin compounds. EPA tests in 1984 detected elevated levels of chromium in Godwin's Mill Pond Reservoir, a source of drinking water for more than 30,000 people in Suffolk. The Suffolk water treatment plant, however, reported that levels in treated drinking water were well within safety limits. The tests also found PCP, chromium, and arsenic in the Columbia aquifer, which supplies private wells within 3 miles of the site. Approximately 1,300 people live within 3 miles of the site, and about 700 people are served by municipal water systems within a mile of the site.

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

NPL LISTING HISTORY
Proposed Date: 01/22/87
Final Date: 10/04/89

Threats and Contaminants



The groundwater is contaminated with arsenic, chromium, and PCP from wood-treating process wastes. The soil is contaminated with arsenic, chromium, copper, PCP, and dioxins. Workers or trespassers may be at risk from inhalation of contaminated dust and particles or through direct contact with contaminated soil. The groundwater flow is reported to be toward the reservoir, a primary drinking water source. A nearby freshwater wetland may be threatened by site contamination.

Cleanup Approach

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

Response Action Status

Immediate Actions: In 1983, the Saunders Supply Co. excavated some contaminated silt from the conical burn pit and transported it to a State-permitted landfill. The owner also installed a recovery well and pumped contaminated groundwater out of the well, recycling it back into the wood treatment system.

Entire Site: In mid-1991, the EPA completed an intensive study of contamination at the site to identify the best cleanup strategies for the situation. The EPA selected the final cleanup method in late 1991. The selected remedy includes dechlorination and off-site disposal of sediments from the wastewater pond and the former earthen separation pond; low temperature thermal desorption and off-site disposal of on-site soils and sediments from the storm sewer; treatment of groundwater during dewatering; stabilization, solidification, and off-site disposal of the top 1 inch of concrete pads and off-site disposal of the remaining pads; cleaning and sliplining of the storm sewer; groundwater monitoring; and deed use restrictions. The design phase for the remedy is expected to begin in 1992.

Environmental Progress

By excavating contaminated silt, installing a recovery well, and pumping contaminated groundwater out of the well, the potentially responsible parties at the Saunders Supply Co. site have reduced the potential for exposure to contaminated resources while the EPA is planning the remaining cleanup activities.

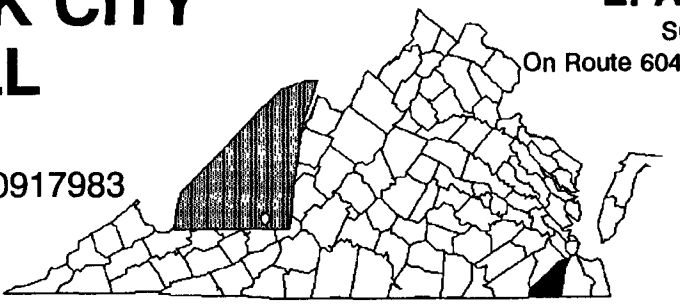
Site Repository

Suffolk Public Library, 443 West Washington Street, Suffolk, VA 23434

SUFFOLK CITY LANDFILL

VIRGINIA

EPA ID# VAD980917983



EPA REGION 3

Suffolk County

On Route 604 within the City of Suffolk

Site Description

The 67-acre Suffolk City Landfill is owned and managed by the City. The landfill, now closed, operated from 1967 to 1984. The City covered, graded, and replanted the landfill in 1988. The unlined landfill accepted primarily municipal solid wastes. On-site disposal of highly toxic pesticides is the primary concern. Dixie Guano Company disposed of 27 tons of chemicals in a portion of the landfill in 1970. The area is rural and agricultural. Approximately 2,500 people obtain drinking water from private wells within 3 miles of the site. Surface runoff from the site discharges into two unnamed tributaries to the Great Dismal Swamp, a major freshwater wetland.

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

NPL LISTING HISTORY
Proposed Date: 06/16/88
Final Date: 02/21/90

Threats and Contaminants

The groundwater, soil, and liquids in retention basins were contaminated with various pesticides from former disposal practices. Potential health hazards included accidentally ingesting or coming in direct contact with contaminated groundwater and soil. The potential existed for the contamination of the Great Dismal Swamp from the site runoff; however, contamination did not occur.

Cleanup Approach

This site is being addressed through an initial action; further investigations showed that no further actions are required.

Response Action Status

Initial Action: As part of the Administrative Order on Consent, the City of Suffolk installed a leachate collection and treatment system. Operations began in 1991.

Entire Site: Under orders from the State, the City of Suffolk agreed to conduct an intensive study of soil and groundwater contamination at the site to determine its nature and extent and to recommend strategies for its cleanup. The study, completed in 1992, showed that pesticide contamination no longer exists at the site. Scientific information on pesticides has shown that these substances are prone to degrading naturally over time. Therefore, no other actions are required at the sites; it is safe for people and the environment.

Site Facts: The City of Suffolk signed an Administrative Order of Consent with the State that required the City to perform studies and any cleanup actions at the site.

Environmental Progress

The installation of a leachate collection and treatment system has ensured that there are no threats to nearby residents or the surroundings at the Suffolk City Landfill site. Natural degradation of the remaining pesticides has occurred, ensuring the long-term safety of the site.

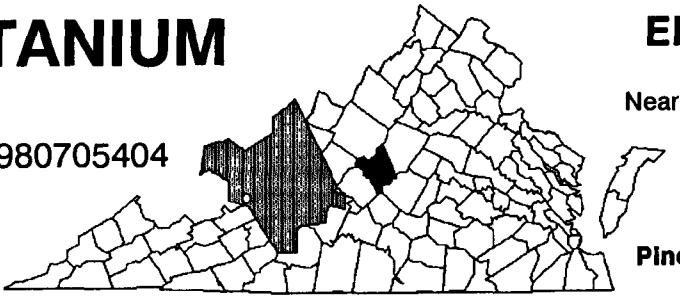
Site Repository

Suffolk Public Library, 443 West Washington Street, Suffolk, VA 23434

U.S. TITANIUM

VIRGINIA

EPA ID# VAD980705404



EPA REGION 3

Nelson County
Near the town of Piney River

Other Names:
Piney River Disposal Site

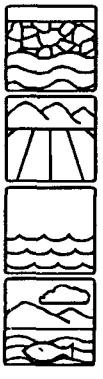
Site Description

The 50-acre U.S. Titanium site covers the northeastern portion of a parcel formerly occupied by an American Cyanamid Co. plant. Between 1931 and 1971, the company mined and refined titanium ore and manufactured titanium dioxide for paint pigments. A titanium processing plant, settling ponds, tailing ponds, lagoons, and a waste disposal area are located on site. Ferrous sulfate, a by-product of titanium dioxide manufacture, and heavy metals are the primary contaminants at the site. The site has been divided into seven separate contamination areas that require cleanup. Ferrous sulfate is highly acidic, and storm runoff from the site's waste piles contributed to six major fish kills in the Piney and Tye Rivers from 1977 to 1981. More than 200,000 fish died during these events. Although recent work has greatly improved conditions at the site, acidic runoff still threatens the Piney River. The closest residence is 1/4 mile from the site. Piney River, the town in which the site is located, has a population of approximately 100, and approximately 200 people live within a 1-mile radius of the site. Local residents use groundwater for their drinking water supply.

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

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

Threats and Contaminants

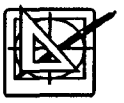


The groundwater is highly acidic as a result of former plant operations. Aluminum, iron, copper, nickel, zinc, and cadmium from site soils have contaminated the groundwater. These contaminants are found in both on-site seeps and off-site surface water. Ingestion of or direct contact with contaminated groundwater poses only a slight threat, since no well contamination has been detected, and municipal wells are located upstream from the site. The acidity of the water and waste seeps could be harmful, as well as increase the solubility of metals, which could enter water. This stream has not supported a viable recreational fishery due mainly to the impact from titanium operation over the last 40 years. The fishery has improved since plant operations were stopped in 1971, but is still affected by discharges from the site.

Cleanup Approach

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

Response Action Status



Entire Site: American Cyanamid Co. agreed in 1986 to begin an intensive study of site conditions and contamination. This work resulted in selection of final remedies for the site and the signing of the EPA final decision in 1989. Seven areas have been pinpointed for treatment. A passive system will collect and treat iron-bearing acidic groundwater. French drains and trenches will bear the water to an oxidation and settling pond, a constructed wetland, and a limestone treatment bed. The ferrous sulfate in Area 1 will be dissolved and treated. Drainage controls and revegetation will be implemented in Areas 2, 3, 4, and 5. Area 6 requires no action. Acidified soil in Area 7 will be neutralized with lime. Other features include monitoring, road maintenance, and deed and access restrictions. These strategies are deemed completely effective for reducing acidic and iron discharges to acceptable standards. The engineering design for these remedies started in 1991 and cleanup activities are scheduled to begin in late 1993. Completion of all cleanup activities is scheduled for 2001.

Site Facts: American Cyanamid Co. signed a Consent Agreement in April 1986, agreeing to conduct an investigation at the site.

Environmental Progress

After adding this site to the NPL, the EPA performed preliminary investigations and determined that there currently are no immediate threats to nearby residents or the environment. The potential for exposure to hazardous materials at the U.S. Titanium site is low while cleanup designs and activities take place.

Site Repository

Nelson County Memorial Library, Route 29, South Lovingston, VA 22949

GLOSSARY

Terms Used in the NPL Book

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

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

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

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

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

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

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

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

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

GLOSSARY

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Carbon Treatment: [see Carbon Adsorption].

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

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

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

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

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

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

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

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

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

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

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

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

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

Consent Order: [see Administrative Order on Consent].

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

General Notice Letter: [See Notice Letter].

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Mill Tailings: [See Mine Tailings].

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

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

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

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

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

Natural Attenuation: [See Attenuation].

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

RCRA: [See Resource Conservation and Recovery Act].

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Special Notice Letter: [See Notice Letter].

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Water Table: The upper surface of the groundwater.

Weir: A barrier to divert water or other liquids.

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

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

Some Common Contaminants at NPL Sites

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

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

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

*U.S. G.P.O.:1993-341-835:81018