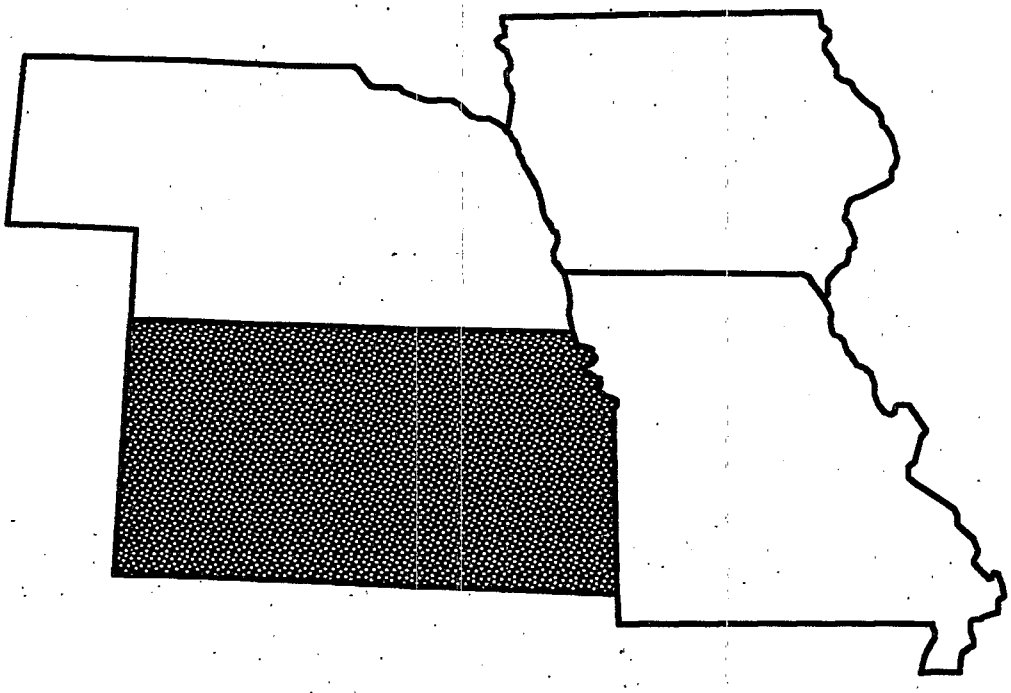
EPA

REGION 7

PROGRESS AT REGION 7 NATIONAL PRIORITIES LIST (NPL) SUPERFUND SITES



KANSAS

AUGUST, 1995

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A Brief Overview

WHY THE SUPERFUND PROGRAM?

As the 1970s came to a close, a series of headline stories gave Americans a look at the dangers of dumping industrial and urban wastes on the land. First there was New York's Love Canal. Hazardous waste buried there over a 25-year period contaminated streams and soil, and endangered the health of nearby residents. The result: evacuation of several hundred people. Then the leaking barrels at the Valley of the Drums in Kentucky attracted public attention, as did the dioxin-tainted land and water in Times Beach, Missouri.

In all these cases, human health and the environment were threatened, lives were disrupted, and property values were reduced. It became increasingly clear that there were large numbers of serious hazardous waste problems that were falling through the cracks of existing environmental laws. The magnitude of these emerging problems moved Congress to enact the Comprehensive Environmental Response, Compensation, and Liability Act in 1980. CERCLA — commonly known as Superfund — was the first Federal law established to deal with the dangers posed by the Nation's hazardous waste sites.

After Discovery, the Problem Intensified

Few realized the size of the problem until the Environmental Protection Agency (EPA) began the process of site discovery and site evaluation. Not hundreds, but thousands of potential hazardous waste sites existed, and they presented the Nation with some of the most complex pollution problems it had ever faced.

Since the Superfund program began, hazardous waste has surfaced as a major environmental concern in every part of the United States. It wasn't just the land that was contaminated by past disposal practices. Chemicals in the soil were spreading into the groundwater (a source of drinking water for many) and into streams, lakes, bays, and wetlands. Toxic vapors contaminated the air at some sites, while improperly disposed or stored wastes threatened the health of the surrounding community and the environment at others.

The EPA Identified More than 1,200 Serious Sites

The EPA has identified 1,245 hazardous waste sites as the most serious in the Nation. These sites comprise the National Priorities List; sites targeted for cleanup under Super-fund. But site discoveries continue, and the EPA estimates that, while some will be deleted after lengthy cleanups, this list, commonly called the NPL, will continue to grow by approximately 50 to 100 sites per year, potentially reaching 2,100 sites by the year 2000.

THE NATIONAL CLEANUP EFFORT IS MUCH MORE THAN THE NPL

From the beginning of the program, Congress recognized that the Federal government could

not and should not address all environmental problems stemming from past disposal practices. Therefore, the EPA was directed to set priorities and establish a list of sites to target. Sites on the NPL (1,245) thus are a relatively small subset of a larger inventory of potential hazardous waste sites, but they do comprise the most complex and compelling cases. The EPA has logged more than 35,000 sites on its national inventory of potentially hazardous waste sites and assesses each site within one year of being logged.

THE EPA IS MAKING PROGRESS ON SITE CLEANUP

The goal of the Superfund program is to tackle immediate dangers first and then move through the progressive steps necessary to eliminate any long-term risks to public health and the environment.

Superfund responds immediately to sites posing imminent threats to human health and the environment at both NPL sites and sites not on the NPL. The purpose is to stabilize, prevent, or temper the effects of a release of hazardous substances, or the threat of one, into the environment. These might include tire fires or transportation accidents involving the spill of hazardous chemicals. Because they reduce the threat a site poses to human health and the environment, immediate cleanup actions are an integral part of the Superfund program.

Immediate response to imminent threats is one of Superfund's most noted achievements. Where imminent threats to the public or environment were evident, the EPA has initiated or completed emergency actions that attacked the most serious threats of toxic exposure in more than 2,700 cases.

The ultimate goal for a hazardous waste site on the NPL is a permanent solution to an environmental problem that presents a serious threat to the public or the environment. This often requires a long-term effort. The EPA has aggressively accelerated its efforts to perform these long-term cleanups of NPL sites. More cleanups were started in 1987, when the Superfund law was amended, than in any previous year. By 1991, construction had started at more than four times as many sites as in 1986! Of the sites currently on the NPL, more than 500 — nearly half — have had construction cleanup activity. In addition, more than 400 more sites presently are in the investigation stage to determine the extent of site contamination and to identify appropriate cleanup remedies. Many other sites with cleanup remedies selected are poised for the start of cleanup construction activity. In measuring success by "progress through the cleanup pipeline," the EPA clearly is gaining momentum.

THE EPA MAKES SURE CLEANUP WORKS

The EPA has gained enough experience in cleanup construction to understand that environmental protection does not end when the remedy is in place. Many complex technologies — like those designed to clean up groundwater — must operate for many years in order to accomplish their objectives.

The EPA's hazardous waste site managers are committed to proper operation and maintenance of every remedy constructed. No matter who has been delegated responsibility for monitoring the cleanup work, the EPA will assure that the remedy is carefully followed and that it continues to do its job.

Likewise, the EPA does not abandon a site even after the cleanup work is done. Every five years, the Agency reviews each site where residues from hazardous waste cleanup still remain to ensure that public and environmental

health are being safeguarded. The EPA will correct any deficiencies discovered and will report to the public annually on all five-year reviews conducted that year.

CITIZENS HELP SHAPE DECISIONS

Superfund activities also depend upon local citizen participation. The EPA's job is to analyze the hazards and to deploy the experts, but the Agency needs citizen input as it makes choices for affected communities.

Because the people in a community where a Superfund site is located will be those most directly affected by hazardous waste problems and cleanup processes, the EPA encourages citizens to get involved in cleanup decisions. Public involvement and comment does influence EPA cleanup plans by providing valuable information about site conditions, community concerns, and preferences.

The State and U.S. Territories volumes and the companion National overview volume provide general Superfund background information and descriptions of activities at each NPL site. These volumes clearly describe what the problems are, what the EPA and others participating in site cleanups are doing, and how we, as a Nation, can move ahead in solving these serious problems.

USING THE STATE AND NATIONAL VOLUMES TOGETHER

To understand the big picture on hazardous waste cleanup, citizens need to hear about both environmental progress across the country and the cleanup accomplishments closer to home. Citizens also should understand the challenges involved in hazardous waste cleanup and the decisions we must make, as a Nation, in finding the best solutions.

The National overview, *Superfund: Focusing on the Nation at Large (1991)*, contains important information to help you understand the magnitude and challenges facing the Superfund program, as well as an overview of the National cleanup effort. The sections describe the nature of the hazardous waste problem nationwide, threats and contaminants at NPL sites and their potential effects on human health and the environment, vital roles of the various participants in the cleanup process, the Superfund program's successes in cleaning up the Nation's serious hazardous waste sites, and the current status of the NPL. If you did not receive this overview volume, ordering information is provided in the front of this book.

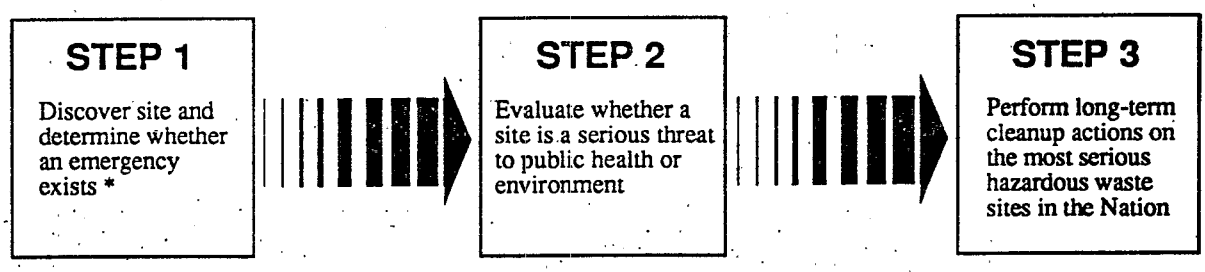
This volume compiles site summary fact sheets on each State or Territorial site being cleaned up under the Superfund program. These sites represent the most serious hazardous waste problems in the Nation and require the most complicated and costly site solutions yet encountered. Each book gives a "snapshot" of the conditions and cleanup progress that has been made at each NPL site. Information presented for each site is current as of April 1991. Conditions change as our cleanup efforts continue, so these site summaries will be updated annually to include information on new progress being made.

To help you understand the cleanup accomplishments made at these sites, this volume includes a description of the process for site discovery, threat evaluation, and long-term cleanup of Superfund sites. This description, *How Does the Program Work to Clean Up Sites?*, will serve as a reference point from which to review the cleanup status at specific sites. A glossary defining key terms as they apply to hazardous waste management and site cleanup is included as Appendix A in the back of this book.

How Does the Program Work to Clean Up Sites?

The diverse problems posed by hazardous waste sites have provided the EPA with the challenge to establish a consistent approach for evaluating and cleaning up the Nation's most serious sites. To do this, the EPA has had to step beyond its traditional role as a regulatory agency to develop processes and guidelines for each step in these technically complex site cleanups. The EPA has established procedures to coordinate the efforts of its Washington, D.C. Headquarters program offices and its front-line staff in ten Regional Offices, with the State and local governments, contractors, and private parties who are participating in site cleanup. An important part of the process is that any time during cleanup, work can be led by the EPA or the State or, under their monitoring, by private parties who are potentially responsible for site contamination.

THREE-STEP SUPERFUND PROCESS



** Emergency actions are performed whenever needed in this three-step process.*

The process for discovery of the site, evaluation of threat, and the long-term cleanup of Superfund sites is summarized in the following pages. The phases of each of these steps are highlighted within the description. The flow diagram above provides a summary of the three-step process.

Although this book provides a current "snapshot" of site progress made only by emergency actions and long-term cleanup actions at Superfund sites, it is important to understand the discovery and evaluation process that leads to identifying and cleaning up these most serious uncontrolled or abandoned hazardous

waste sites in the Nation. The discovery and evaluation process is the starting point for this summary description of Superfund involvement at hazardous waste sites.

STEP 1: SITE DISCOVERY AND EMERGENCY EVALUATION

How does the EPA learn about potential hazardous waste sites?

Site discovery occurs in a number of ways. Information comes from concerned citizens. People may notice an odd taste or foul odor in their drinking water or see half-buried leaking barrels; a hunter may come across a field where waste was dumped illegally. There may be an explosion or fire, which alerts the State or local authorities to a problem. Routine investigations by State and local governments and required reporting and inspection of facilities that generate, treat, store, or dispose of hazardous waste also help keep the EPA informed about actual or potential threats of hazardous substance releases. All reported sites or spills are recorded in the Superfund inventory (CERCLIS) for further investigation to determine whether they will require cleanup.

What happens if there is an imminent danger?

As soon as a potential hazardous waste site is reported, the EPA determines whether there is an emergency requiring an immediate cleanup action. If there is, they act as quickly as possible to remove or stabilize the imminent threat. These short-term emergency actions range from building a fence around the contaminated area to keep people away, or temporarily relocating residents until the danger is addressed, to providing bottled water to residents while their local drinking water supply is being cleaned up or physically removing wastes for safe disposal.

However, emergency actions can happen at any time an imminent threat or emergency warrants them. For example, if leaking barrels are found when cleanup crews start digging in the ground or if samples of contaminated soils or air show that there may be a threat of fire or explosion, an immediate action is taken.

STEP 2: SITE THREAT EVALUATION

If there isn't an imminent danger, how does the EPA determine what, if any, cleanup actions should be taken?

Even after any imminent dangers are taken care of, in most cases, contamination may remain at the site. For example, residents may have been supplied with bottled water to take care of their immediate problem of contaminated well water, but now it's time to determine what is contaminating the drinking water supply and the best way to clean it up. The EPA may determine that there is no imminent danger from a site, so any long-term threats need to be evaluated. In either case, a more comprehensive investigation is needed to determine if a site poses a serious, but not imminent, danger and whether it requires a long-term cleanup action.

Once a site is discovered and any needed emergency actions are taken, the EPA or the State collects all available background information not only from their own files, but also from local records and U.S. Geological Survey maps. This information is used to identify the site and to perform a preliminary assessment of its potential hazards. This is a quick review of readily available information to answer the questions:

- Are hazardous substances likely to be present?

- How are they contained?
- How might contaminants spread?
- How close is the nearest well, home, or natural resource area such as a wetland or animal sanctuary?
- What may be harmed — the land, water, air, people, plants, or animals?

Some sites do not require further action because the preliminary assessment shows that they do not threaten public health or the environment. But even in these cases, the sites remain listed in the Superfund inventory for record-keeping purposes and future reference. Currently, there are more than 35,000 sites maintained in this inventory.

If the preliminary assessment shows a serious threat may exist, what's the next step?

Inspectors go to the site to collect additional information to evaluate its hazard potential. During this *site inspection*, they look for evidence of hazardous waste, such as leaking drums and dead or discolored vegetation. They may take some samples of soil, well water, river water, and air. Inspectors analyze the ways hazardous materials could be polluting the environment, such as runoff into nearby streams. They also check to see if people (especially children) have access to the site.

How does the EPA use the results of the site inspection?

Information collected during the site inspection is used to identify the sites posing the most serious threats to human health and the environment. This way, the EPA can meet the requirement that Congress gave them to use Superfund monies only on the worst hazardous waste sites in the Nation.

To identify the most serious sites, the EPA developed the Hazard Ranking System (HRS). The HRS is the scoring system the EPA uses to assess the relative threat from a release or a potential release of hazardous substances from a site to surrounding groundwater, surface water, air, and soil. A site score is based on the likelihood that a hazardous substance will be released from the site, the toxicity and amount of hazardous substances at the site, and the people and sensitive environments potentially affected by contamination at the site.

Only sites with high enough health and environmental risk scores are proposed to be added to the NPL. That's why 1,245 sites are on the NPL, but there are more than 35,000 sites in the Superfund inventory. Only NPL sites can have a long-term cleanup paid for from Superfund, the national hazardous waste trust fund. Superfund can, and does, pay for emergency actions performed at any site, whether or not it's on the NPL.

Why are sites proposed to the NPL?

Sites proposed to the NPL have been evaluated through the scoring process as the most serious problems among uncontrolled or abandoned hazardous waste sites in the U.S. In addition, a site will be proposed to the NPL if the Agency for Toxic Substances and Disease Registry issues a health advisory recommending that people be moved away from the site. The NPL is updated at least once a year, and it's only after public comments are considered that these proposed worst sites officially are added to the list.

Listing on the NPL does not set the order in which sites will be cleaned up. The order is influenced by the relative priority of the site's health and environmental threats compared to other sites, and such factors as State priorities, engineering capabilities, and available tech-

nologies. Many States also have their own list of sites that require cleanup; these often contain sites that are not on the NPL and are scheduled to be cleaned up with State money. And, it should be noted again that any emergency action needed at a site can be performed by the Superfund, whether or not a site is on the NPL.

A detailed description of the current progress in cleaning up NPL sites is found in the section of the 1991 National overview volume entitled *Cleanup Successes: Measuring Progress.*

How do people find out whether the EPA considers a site a national priority for cleanup under the Superfund Program?

All NPL sites, where Superfund is responsible for cleanup, are described in the State and Territorial volumes. The public also can find out whether other sites, not on the NPL, are being addressed by the Superfund program by calling their Regional EPA office or the Superfund Hotline at the numbers listed in this book.

STEP 3: LONG-TERM CLEANUP ACTIONS

After a site is added to the NPL, what are the steps to cleanup?

The ultimate goal for a hazardous waste site on the NPL is a permanent, long-term cleanup. Since every site presents a unique set of challenges, there is no single all-purpose solution. A five-phase "remedial response" process is used to develop consistent and workable solutions to hazardous waste problems across the Nation:

1. *Remedial Investigation*: investigate in detail the extent of the site contamination
2. *Feasibility Study*: study the range of possible cleanup remedies
3. *Record of Decision or ROD*: decide which remedy to use
4. *Remedial Design*: plan the remedy
5. *Remedial Action*: carry out the remedy

This remedial response process is a long-term effort to provide a permanent solution to an environmental problem that presents a serious threat to the public or environment.

The first two phases of a long-term cleanup are a combined *remedial investigation and feasibility study* (RI/FS) that determine the nature and extent of contamination at the site and identify and evaluate cleanup alternatives. These studies may be conducted by the EPA or the State or, under their monitoring, by private parties.

Like the initial site inspection described earlier, a remedial investigation involves an examination of site data in order to better define the problem. However, the remedial investigation is much more detailed and comprehensive than the initial site inspection.

A remedial investigation can best be described as a carefully designed field study. It includes extensive sampling and laboratory analyses to generate more precise data on the types and quantities of wastes present at the site, the type of soil and water drainage patterns, and specific human health and environmental risks.

The result of the remedial investigation is information that allows the EPA to select the cleanup strategy that is best suited to a particular site or to determine that no cleanup is needed.

Placing a site on the NPL does not necessarily mean that cleanup is needed. It is possible for

a site to receive an HRS score high enough to be added to the NPL, but not ultimately require cleanup actions. Keep in mind that the purpose of the scoring process is to provide a preliminary and conservative assessment of *potential* risk. During subsequent site investigations, the EPA may find either that there is no real threat or that the site does not pose significant human health or environmental risks.

How are cleanup alternatives identified and evaluated?

The EPA or the State or, under their monitoring, private parties identify and analyze specific site cleanup needs based on the extensive information collected during the remedial investigation. This analysis of cleanup alternatives is called a *feasibility study*.

Since cleanup actions must be tailored exactly to the needs of each individual site, more than one possible cleanup alternative is always considered. After making sure that all potential cleanup remedies fully protect human health and the environment and comply with Federal and State laws, the advantages and disadvantages of each cleanup alternative are compared carefully. These comparisons are made to determine their effectiveness in the short and long term, their use of permanent treatment solutions, and their technical feasibility and cost.

To the maximum extent practicable, the remedy must be a permanent solution and must use treatment technologies to destroy principal site contaminants. Remedies such as containing the waste on site or removing the source of the problem (like leaking barrels) often are considered effective. Often, special pilot studies are conducted to determine the effectiveness and feasibility of using a particular technology to clean up a site. Therefore, the combined remedial investigation and feasibility study can take between 10 and 30 months to complete, depending on the size and complexity of the problem.

Does the public have a say in the final cleanup decision?

Yes. The Superfund law requires that the public be given the opportunity to comment on the proposed cleanup plan. Their concerns are considered carefully before a final decision is made.

The results of the remedial investigation and feasibility study, which also point out the recommended cleanup choice, are published in a report for public review and comment. The EPA or the State encourages the public to review the information and take an active role in the final cleanup decision. Fact sheets and announcements in local papers let the community know where they can get copies of the study and other reference documents concerning the site. Local information repositories, such as libraries or other public buildings, are established in cities and towns near each NPL site to ensure that the public has an opportunity to review all relevant information and the proposed cleanup plans. Locations of information repositories for each NPL site described in this volume are given in Appendix B.

The public has a minimum of 30 days to comment on the proposed cleanup plan after it is published. These comments can be written or given verbally at public meetings that the EPA or the State are required to hold. Neither the EPA nor the State can select the final cleanup remedy without evaluating and providing written answers to specific community comments and concerns. This "responsiveness summary" is part of the EPA's write-up of the final remedy decision, called the Record of Decision, or ROD.

The ROD is a public document that explains the cleanup remedy chosen and the reason it

was selected. Since sites frequently are large and must be cleaned up in stages, a ROD may be necessary for each contaminated resource or area of the site. This may be necessary when contaminants have spread into the soil, water, and air and affect such sensitive areas as wetlands, or when the site is large and cleaned up in stages. This often means that a number of remedies, using different cleanup technologies, are needed to clean up a single site.

If every cleanup action needs to be tailored to a site, does the design ofthe remedy need to be tailored, too?

Yes. Before a specific cleanup action is carried out, it must be designed in detail to meet specific site needs. This stage of the cleanup is called the *remedial design*. The design phase provides the details on how the selected remedy will be engineered and constructed.

Projects to clean up a hazardous waste site may appear to be like any other major construction project but, in fact, the likely presence of combinations of dangerous chemicals demands special construction planning and procedures. Therefore, the design of the remedy can take anywhere from six months to two years to complete. This blueprint for site cleanup includes not only the details on every aspect of the construction work, but a description of the types of hazardous wastes expected at the site, special plans for environmental protection, worker safety, regulatory compliance, and equipment decontamination.

Once the design is completed, how long does it take to actually clean up the site, and how much does it cost?

The time and cost for performing the site cleanup, called the *remedial action*, are as varied as the remedies themselves. In a few cases, the only action needed may be to remove drums of hazardous waste and to decontaminate them, an action that takes limited time and money. In most cases, however, a remedial action may involve different and expensive cleanup measures that can take a long time.

For example, cleaning polluted groundwater or dredging contaminated river bottoms can take several years of complex engineering work before contamination is reduced to safe levels. Sometimes the selected cleanup remedy described in the ROD may need to be modified because of new contaminant information discovered or difficulties that were faced during the early cleanup activities. Taking into account these differences, each remedial cleanup action takes an average of 18 months to complete and ultimately costs an average of $26 million to complete all necessary cleanup actions at a site .

Once the cleanup action is completed, is the site automatically "deleted" from the NPL?

No. The deletion of a site from the NPL is anything but automatic. For example, cleanup of contaminated groundwater may take up to 20 years or longer. Also, in some cases, *long-term monitoring* of the remedy is required to ensure that it is effective. After construction of certain remedies, operation and maintenance (e.g., maintenance of ground cover, groundwater monitoring, etc.), or continued pumping and treating of groundwater may be required to ensure that the remedy continues to prevent future health hazards or environmental damage and ultimately meets the cleanup goals specified in the ROD. Sites in this final monitoring or operational stage of the cleanup process are designated as "construction complete."

It's not until a site cleanup meets all the goals and monitoring requirements of the selected

remedy that the EPA can officially propose the site for *deletion* from the NPL, and it's not until public comments are taken into consideration that a site actually can be deleted from the NPL. All sites deleted from the NPL and sites with completed construction are included in the progress report found later in this book.

Can a site be taken off the NPL if no cleanup has taken place?

Yes. But only if further site investigation reveals that there are no threats present at the site and that cleanup activities are not necessary. In these cases, the EPA will select a "no action" remedy and may move to delete the site when monitoring confirms that the site does not pose a threat to human health or the environment.

In other cases, sites may be "removed" from the NPL if new information concerning site cleanup or threats show that the site does not warrant Superfund activities.

A site may be removed if a revised HRS scoring, based on updated information, results in a score below the minimum for NPL sites. A site also may be removed from the NPL by transferring it to other appropriate Federal cleanup authorities, such as RCRA, for further cleanup actions.

Removing sites for technical reasons or transferring sites to other cleanup programs preserves Superfund monies for the Nation's most pressing hazardous waste problems where no other cleanup authority is applicable.

Can the EPA make parties responsible for the contamination pay?

Yes. Based on the belief that "the polluters should pay," after a site is placed on the NPL, the EPA makes a thorough effort to identify and find those responsible for causing contamination problems at a site. Although the EPA is willing to negotiate with these private parties and encourages voluntary cleanup, it has the authority under the Superfund law to legally force those potentially responsible for site hazards to take specific cleanup actions. All work performed by these parties is closely guided and monitored by the EPA and must meet the same standards required for actions financed through the Superfund.

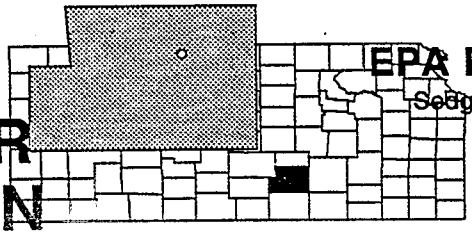
Because these enforcement actions can be lengthy, the EPA may decide to use Superfund monies to make sure a site is cleaned up without unnecessary delay. For example, if a site presents an imminent threat to public health and the environment or if conditions at a site may worsen, it could be necessary to start the cleanup right away. Those responsible for causing site contamination are liable under the law (CERCLA) for repaying the money the EPA spends in cleaning up the site.

Whenever possible, the EPA and the Department of Justice use their legal enforcement authorities to require responsible parties to pay for site cleanups, thereby preserving Superfund resources for emergency actions and for sites where no responsible parties can be identified.

29TH & MEAD GROUND WATER CONTAMINATION

KANSAS

EPA ID# KSD007241656



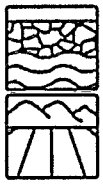
Site Description

The 29th & Mead Ground Water Contamination site covers approximately 1,440 acres at the intersection of 29th and Mead Streets in a highly industrialized area of Wichita. Studies conducted from 1983 to 1986 by the Kansas Department of Health and the Environment (KDHE) and the U.S. Geological Survey confirmed heavy metals and organic contamination in shallow wells on and around the site. The actual boundary and the extent of ground water contamination have not been clearly defined. There are several potential industrial sources of contamination in the area that include facilities currently in operation and facilities that have ceased operations. An estimated 3,300 people obtain drinking water from public and private wells drawing from the shallow aquifer within 3 miles of the site.

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

NPL LISTING HISTORY
Proposed Date: 06/24/88
Final Date: 02/21/90

Threats and Contaminants



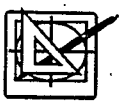
The ground water and soil are contaminated with volatile organic compounds (VOCs) including trichloroethylene (TCE), carbon tetrachloride, toluene, and vinyl chloride. People who come in direct contact with or ingest contaminated ground water may be at risk. Also, the contamination on site could pollute Chisholm Creek, which is used for recreational purposes.

Cleanup Approach

The site is being addressed in two long-term remedial phases focusing on cleanup of the entire site and the Coleman area.

Response Action Status

Entire Site: The parties potentially responsible for the ground water contamination are carrying out an investigation to determine the nature and extent of contamination and to identify cleanup alternatives. The investigation is expected to be completed by 1995.



Coleman Area: In 1991, the potentially responsible party began an investigation to determine the nature and extent of soil and ground water contamination and to identify cleanup alternatives at the Coleman area. The primary contaminant at this location is TCE. A remedy to address cleanup was selected in late 1992 and includes: ground water pump and treatment, air stripping, and soil vapor extraction. Design of the remedy began in 1994. Cleanup is scheduled to begin in 1996.

Site Facts: The Kansas Department of Health and the Environment (KDHE) has identified more than 70 parties potentially responsible for the wastes associated with ground water contamination at and in the vicinity of the site. In 1987, the parties organized a steering committee to negotiate future investigations and cleanup activities. In 1989, the steering committee signed a Consent Agreement with the KDHE to complete an investigation of the site. KDHE has signed several coordinate and cooperate type Administrative Orders with additional parties to investigate areas of potential sources that may contribute to the ground water plume.

Environmental Progress

While cleanup investigations for the entire site continue, the EPA has determined that the site currently does not pose an immediate threat to the neighboring communities or the environment as long as the contaminated wells are not used.

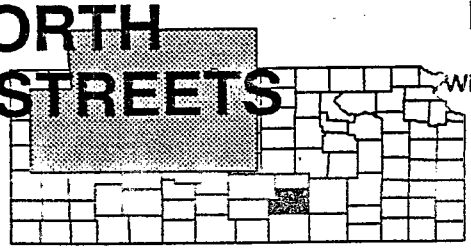
Site Repository

KDHE, District Office, 1919 Amidon, Wichita, KS 67203

57TH AND NORTH BROADWAY STREETS SITE

KANSAS

EPA ID# KSD981710247



EPA REGION 7
Sedgewick County
Wichita Heights, near Wichita

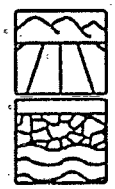
Site Description

The 57th and North Broadway Streets site is a mile long by ½ mile wide area that is both residential and commercial. The specific sources of contamination in this area are yet to be determined. Local and State officials were first alerted to the presence of contamination in 1983 when a resident complained about the poor quality of the drinking water. Subsequent investigations led to the detection of contamination in the soil, and in residential and industrial wells. In 1989, the Kansas Department of Health and the Environment (KDHE) identified four parties potentially responsible for site contamination in 1989: an oil refining plant, a trucking company, an abandoned gas station, and an abandoned paint factory which generated paint sludge and cooling water. Other potential sources of contamination are known to be present within the site.

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

NPL LISTING HISTORY
Proposed Date: 02/07/92
Final Date: 10/14/92

Threats and Contaminants



Volatile organic compounds (VOCs), including benzene, toluene, and xylene, and heavy metals, including arsenic, barium, cadmium, chromium, and lead, have been detected in on-site soil and residential and industrial wells. Exposure to contaminated soils or groundwater could pose a health risk.

Cleanup Approach

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

Response Action Status

Immediate Actions: In 1990, the EPA provided bottled water to residents and small businesses affected by site contamination. A water supply line was constructed in 1992.

Entire Site: An investigation into the nature and extent of groundwater contamination at the site began in 1995. Once the investigation is completed, scheduled for 1996, the EPA will select remedies for final cleanup of the site.

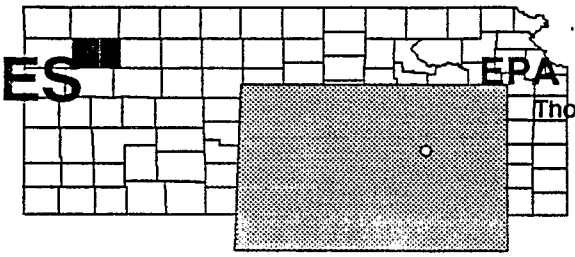
Environmental Progress

Immediate actions such as the provision of bottled water and the construction of a water supply line to affected residences and small businesses have reduced the risks posed to the safety and health of the nearby population while investigations are being completed by the EPA. Hook-ups to the new water system have been arranged and financed by private companies in the Wichita Heights area.

Site Repository

Not established.

ACE SERVICES
KANSAS
EPA ID# KSD046746731



EPA REGION 7
Thomas County
Colby

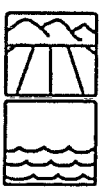
Site Description

The 2 1/2-acre Ace Services site is a former chrome plating facility where chrome plating was applied to farm implement parts. The facility operated from 1969 to 1989, and was permanently closed in early 1990. From 1969 to 1975, chrome plating wastewater generated during operations at the Ace Services facility was discharged directly to the ground surface immediately west of the unnamed tributary to Prairie Dog Creek. A local citizen filed a complaint with the Kansas Department of Health and Environment (KDHE) in early 1971. KDHE and EPA collected wastewater samples in 1971 and 1972 that showed the presence of chromium. In 1974 and 1975, concrete retention vats were installed at the Ace Services facility, and an evaporation lagoon was built immediately adjacent to the facility to receive discharged wastewater. The evaporation lagoon was not lined, however, and chromium-contaminated wastewater was allowed to contaminate soil and infiltrate into the ground. Chrome plating solutions, bulk hazardous wastes, and caustic acidic processing materials contained in vats and drums are present at the site. Groundwater from the Ogallala Aquifer is the sole source of municipal and private drinking water in and around Colby. The Colby public water supply well No. 8 is located 1/5 of a mile from the site. This well was closed by KDHE in 1980 due to chromium concentrations above Federal drinking water standards. Approximately 6,180 people are currently served by seven Colby municipal drinking water wells. All of these wells are located within a 4-mile radius of the site, and each draws water from the Ogallala Aquifer. The area is an agricultural community with a total population of 6,525, including college students and nearby rural residents. Residences and commercial property surround the site.

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

NPL LISTING HISTORY
Proposed Date: 02/25/95

Threats and Contaminants



Soils and sludge in the lagoon area were contaminated with chromium prior to removal by Ace Services. Surface wastewater was also contaminated with chromium prior to treatment and disposal by EPA. The groundwater in the Ogallala Aquifer is contaminated with chromium. Coming into direct contact with or ingesting contaminated groundwater is the primary threat to the public.

Cleanup Approach

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

Response Action Status

Initial Actions: In 1981, Ace Services excavated approximately 2,200 cubic yard of chromium-contaminated soil and sludge from the lagoon area and disposed of it at the Thomas County Landfill, a municipal sanitary landfill. In early 1992, KDHE removed the bulk hazardous liquid and solid wastes stored inside the Ace Services facility. In mid-1994, EPA removed residual contamination (mainly dusts) from the building interior, excavated the concrete trough and the underlying soil, installed additional building support columns near the trough, demolished the wastewater treatment building, excavated underlying soil, and excavated and stabilized the lagoon soil. All waste was shipped off site for disposal, except for approximately 3,000 gallons of wastewater, which were treated on site and discharged to a publicly-owned treatment works.

Groundwater: KDHE installed three groundwater monitoring wells at the site in 1990. The EPA and the KDHE are planning an investigation into the nature and extent of contamination of the groundwater in the vicinity of the site. Once this investigation is completed, a remedy for final cleanup will be selected.

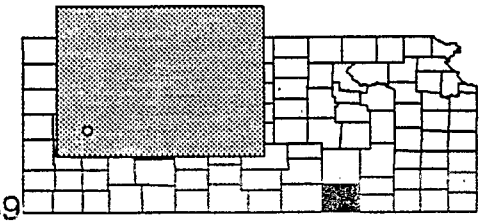
Environmental Progress

Removing and stabilizing contaminated soils, sludges, dust, and buildings, and treating contaminated wastewater have reduced threats at the Ace Service site while investigations into groundwater contamination are being planned.

Site Repository

Contact the EPA Region 7 Superfund Community Relations Section at (913) 551-7000.

ARKANSAS CITY DUMP
KANSAS
EPA ID# KSD980500789



EPA REGION 7
Cowley County
In southwest Arkansas City,
3 1/2 miles north of the
Oklahoma State Line

Other Names:
Millikin Refinery

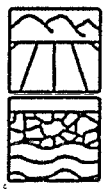
Site Description

The Arkansas City Dump is a 200-acre site in southwestern Arkansas City. From 1916 until the mid-1920s, an oil refinery on site created an acidic sludge waste. Operators disposed of about 1½ million cubic feet of sludge in the northern waste area. Municipal wastes were disposed of at the site after an explosion and fire in 1927 destroyed the oil refinery. Between 500,000 and 1 million gallons of residual oil product from the refinery operation were present in the subsurface soils which contain polynuclear aromatic hydrocarbons (PAHs). Much of the organic contamination was related to the release of petroleum products and could not be addressed under the Superfund program because the Superfund "Petroleum Exclusion" excludes cleanup of petroleum products. In addition, the organic contaminants do not present a threat to public health or the environment. The remainder of the wastes at the site consisted of domestic and municipal solid wastes. These wastes also do not appear to present a threat to public health or the environment. The site lies within the 100-year flood plain of the Arkansas River and is separated from the river by a levee. The surrounding land includes commercial and residential areas. Approximately 6,500 people live within a 3-mile radius of the site. About 60 homes are located within ½ mile of the eastern boundary. A city park lies to the west, and several nearby businesses employ up to 100 people. There are no known or suspected uses of groundwater near the site at risk of contamination by the site. Municipal drinking water, which is available to all homes or gullys near the site, is obtained from a well field on the other side of the Arkansas River, upriver of this site. The drinking water supply was not at risk of contamination by this site. The EPA has completed the remedial action at this site.

Site Responsibility: This site was addressed through Federal actions.

NPL LISTING HISTORY
Proposed Date: 10/23/81
Final Date: 09/08/83

Threats and Contaminants



The undisturbed sludge contained sulfuric acid, significant concentrations of PAHs, other organics, heavy metals, amonia and sulfur which could have been toxic to humans if exposed. Contaminants were not detected in the Arkansas River. Groundwater and sediments are contaminated with oil, but do not pose a risk to the public or environment. No drinking water wells were at risk of contamination.

Cleanup Approach

The site was addressed in a long-term remedial phase focusing on cleanup of the source of contamination. EPA completed the cleanup action and turned the site over to the State for operation and maintenance.

Response Action Status

Groundwater and Sediments: By 1991, the EPA had assessed the oil-contaminated sediments and groundwater, and determined that they did not pose a threat. Therefore, no further cleanup action was selected for these areas.

Source Control: In 1988, the EPA selected a remedy for the northern waste area to cleanup acidic sludges by neutralizing them with high pH materials and covering the area with soil after treatment was complete. Cleanup began in 1991 and was completed in 1992.

Site Facts: The EPA lacks jurisdiction to clean up petroleum-related problems under the Superfund program due to the "Petroleum Exclusion" clause in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

Environmental Progress

All construction has been completed at the Arkansas City Dump site and the EPA is considering deleting the site from the NPL. If EPA proceeds with deleting the site from the NPL, we will first invite public comments before making such a decision.

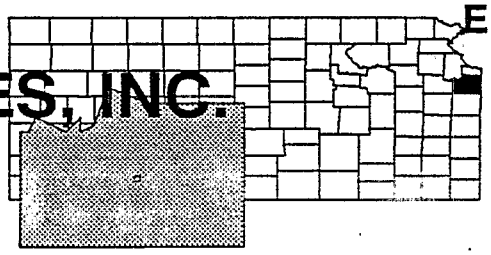
Site Repository

Arkansas City Public Library, 120 E. Fifth Ave., Arkansas City, KS 67005

CHEMICAL COMMODITIES, INC.

KANSAS

EPA ID# KSD031349624



EPA REGION 7
Johnson County
Olathe

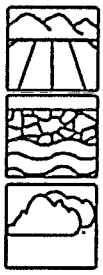
Site Description

The Chemical Commodities Inc. (CCI) site is located in a commercial and residential area of central Olathe, a suburb of Kansas City. The CCI site occupies approximately 1½ acres and borders the Burlington Northern railroad right-of-way, a vacant lot, and single family residences. CCI is an inactive chemical recycling facility that handled, stored, repackaged, and distributed a variety of chemicals. Before 1951, the site was occupied by an ice manufacturer. CCI operated the facility from 1951 to 1989. In 1980, CCI acquired a Resource Conservation and Recovery Act (RCRA) permit allowing the facility to generate and transport hazardous waste. During the facility's operation, poor housekeeping, inappropriate material handling and storage practices, and facility conditions that allowed materials to migrate off site were documented. Concerns for public health and the environment were raised during the facility's operation due to emanating odors, contaminated rain water runoff from the site, and fires. Investigations by CCI, the Kansas Department of Health and Environment, and the EPA have indicated that soil and groundwater are contaminated with a wide range of metals, volatile and semi-volatile organic compounds (VOCs), and pesticides. Other substances have migrated off site via air and surface water runoff. A covered mound of excavated, contaminated soil is also present at the site. Approximately 60,000 people live in the city of Olathe; about 7,100 live within one mile of the site. Groundwater is not used as a source of municipal drinking water; however, private wells are found within 3 miles of the site.

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

NPL LISTING HISTORY
Proposed Date: 01/18/94
Final Date: 05/31/94

Threats and Contaminants

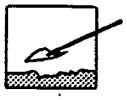


The soil and groundwater are contaminated with the following: various metals, including chromium; VOCs and semi-VOCs, such as trichloroethylene (TCE), carbon tetrachloride, and tetrachloroethylene; and pesticides. Groundwater also is contaminated with high concentrations of halogenated organic compounds. High concentrations of two hazardous wastes found in the soil were detected in an air sample collected downwind of the site. The site is secured to limit public access. Ingesting or touching contaminated soil or groundwater could pose a public health threat. Inhaling contaminated air is also a risk.

Cleanup Approach

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

Response Action Status



Immediate Actions: In 1989 the EPA began to dispose of chemicals and contaminated soil, decontaminate buildings, and assess and treat groundwater contamination. An interceptor trench was constructed to capture contaminated water from the groundwater table. The groundwater is then treated on-site prior to discharge.

Entire Site: The EPA is planning to begin an intensive investigation into the nature and extent of contamination at the site. Final cleanup actions will address subsurface soil and further groundwater contamination.

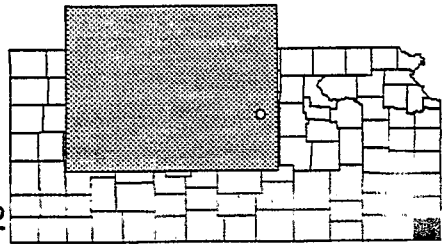
Environmental Progress

After investigating the site, EPA determined that the groundwater poses no immediate threat to the community due to its limited use. In addition, disposing of chemicals and contaminated soil, decontaminating buildings, and assessing and treating groundwater contamination has eliminated any likely threats while investigations leading to final cleanup of the site are underway.

Site Repository

Olathe City Library, 201 E. Park Street, Olathe, KS 66061

CHEROKEE COUNTY
KANSAS
EPA ID# KSD980741862



EPA REGION 7
Cherokee County
Galena

Other Names:
Tar Creek Area Site
Tri-State Mining District
Tar Creek-Cherokee County

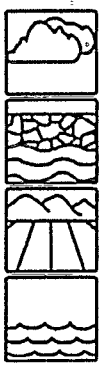
Site Description

The Cherokee County site is a mining area covering about 110 square miles. It is part of a larger area sometimes called the Tri-State Mining District, which encompasses Cherokee County in Kansas, Jasper County in Missouri, and Ottawa County in Oklahoma. One hundred years of widespread lead and zinc mining created piles of mine tailings, covering 4,000 acres in southeastern Cherokee County alone. The mine tailings, containing lead, zinc, and cadmium, have leached into the shallow groundwater. Runoff from the waste piles also moves contaminants into nearby streams. The EPA has divided this site into six subsites that correspond to six general mining locations. Cleanup work is further along at the Galena subsite, in the east-central portion of the entire site, than at the other subsites. This 25-square-mile area has large tracts of mine and mill wastes, water-filled craters where the ground has collapsed, open mineshafts, and pits. Wastes have affected the quality of the shallow groundwater, a primary drinking source for the residents of the area, and the surface water. Several heavy metals were found in water samples from private wells. Surrounding lands are used for residences, business, light industry, farming, and grazing. Of the 22,320 people living in Cherokee County, 3,600 of them reside in Galena. Galena's city water does not contain contaminants. Another 1,100 residents live outside the town and depend on groundwater from the contaminated aquifer for drinking supplies.

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

NPL LISTING HISTORY
Proposed Date: 12/30/82
Final Date: 09/08/83

Threats and Contaminants



Radon gas from the mining operations has been detected in the air around the Galena subsite. Private wells in Galena contain lead, cadmium, selenium, zinc, and chromium. Acidic waters in mine shafts throughout the site, tailing piles and surface waters in the mine pits, and streams across the site contain significant concentrations of lead, zinc, and cadmium. Risks to public health include accidentally ingesting soil or mine wastes; inhaling contaminated household dust; or ingesting contaminated surface waters, foodstuffs, or groundwater. Acid mine drainage containing dissolved heavy metals contributes to the transport of heavy metals into the Spring River, Short Creek, and Shoal Creek; analysts have found contamination in fish from local surface waters. Polluted mine water also surfaces in Oklahoma's Tar Creek.

Cleanup Approach

The site is being addressed in six stages: immediate actions and five long-term remedial phases; cleanup of the Spring River, Treece, and Baxter Springs subsites; cleanup of the Galena groundwater and surface water; an aleternate water supply; and cleanup of residential yards.

Response Action Status

Immediate Actions: The EPA installed water treatment units on eight contaminated wells in Galena in 1986. In 1987, the EPA conducted a county-wide study of wells and a water supply monitoring program for public and private sources of water. This study showed that two more homes needed the treatment units. These were removed upon completion of the alternate water supply.

Residential yards have been contaminated in Galena from an historic primary lead smelter. The EPA has performed a time-critical soil removal from three daycare centers and thirty residential yards. Additional remedial actions will be conducted on approximately 200 residential yards in the near future.

Alternate Water Supply: The EPA selected an approach for supplying an alternate source of water to Galena in 1987. It features: collecting clean groundwater through existing wells owned by the City; distributing that water through a pipeline network to the houses, businesses, and farms within the subsite, but outside the municipal water system; rehabilitating two wells needed for the project; and drilling a new well if the existing ones cannot be fixed. The remedy also includes construction and equipment necessary to establish an alternate water supply to the area. Based on public comments, the EPA decided to amend the cleanup actions to include construction of two deep aquifer wells to collect water and two water storage tanks. These wells will be maintained and operated independently of the City of Galena. Construction of the two deep aquifer wells and the two water storage tanks was completed in 1992. Water line easement acquisition activities began in 1991 and were completed in 1993.

Spring River Subsite: The Spring River runs through all of the other subsites and will be handled appropriately, pursuant to each respective subsite cleanup plan.

Treece Subsite: The EPA initiated investigation activities at the Treece subsite in 1988. The parties potentially responsible for contamination of this area took over the study in early 1990. This investigation explored the nature and extent of soil and water pollution at the subsite and will recommend the best strategies for final cleanup. The investigation was completed in the summer of 1994, and a remedy is expected to be selected in late 1995.

Baxter Springs Subsite: The EPA initiated an investigation at the Baxter Springs subsite in 1987. The parties potentially responsible for contamination of this area took over the study in conjunction with the Treece investigation in early 1990. This study explored the nature and extent of soil and water pollution at the subsite and will recommend the best strategies for final cleanup. As with the Treece subsite, a remedy is scheduled for selection in late 1995.

Galena Groundwater and Surface Water: In 1989, the EPA, with the agreement of the State, selected a remedy for cleaning up the groundwater and surface water in the Galena subsite. It includes: removing and selectively placing mine waste below the ground surface; diverting surface streams away from the contaminants; recontouring the land surface to control runoff and erosion; and investigating deep aquifer wells. The investigation and design of activities were completed in early 1993. Implementation of cleanup activities began in June 1993 and involved plugging four wells and cleaning up one well. The site clean up was completed in late 1994.

Site Facts: The EPA issued a Unilateral Administrative Order to the potentially responsible parties in May 1990 to design the groundwater and surface water cleanup activities at the Galena subsite. However, the EPA assumed control of the remedy design in July 1990, because the parties failed to comply with the Order. The EPA and the PRPs executed an Administrative Order on Consent in May 1990 for investigation of Baxter Springs and Treece subsites.

Environmental Progress

The alternate water supply for the Galena subsite has been completed and a rural water district was formed. Approximately 450 homes have been connected to the system. Cleanup of the surface mine wastes in Galena has been completed. These activities have reduced the potential for exposure to contaminants while cleanup investigations are underway.

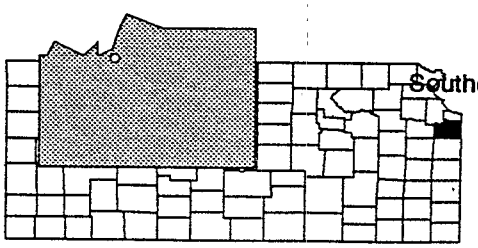
Site Repository

Galena Public Library, 315 W. Seventh, Galena, KS

Johnston Public Library, 210 West 10th, Baxter Springs, KS

DOEPKE DISPOSAL (HOLLIDAY) KANSAS

EPA ID# KSD980632301



EPA REGION 7

Johnson County
Southern bluffs of the Kansas River Valley

Other Names:
Doepke-Holliday Site

Site Description

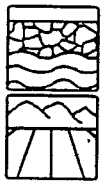
Between 1963 and 1970, the 80-acre Doepke Disposal (Holliday) site operated as a private industrial and commercial landfill and accepted unknown quantities of wastes such as paint sludges, solvents, pesticides, metal sludges, and fiberglass resins. Liquids seeping from the site flow through a culvert under Holliday Drive into the Kansas River. In the early 1960s, many wastes were burned and buried. Liquids were later stored in ponds on the site. In 1966, with County approval, 374 drums of various pesticides and solvents were placed with fire debris in a trench. When the State closed the site in 1970, it was covered. Approximately 150 people live within a mile of the site, and 2,500 live within 3 miles. Residents of Johnson County get drinking water from 21 wells in the Kansas River alluvial aquifer and from a river intake about 3/4 mile downstream of the site; 200,000 people are served by these systems. About 30 wells lie within 3 miles; the nearest is 1/2 mile away. Contaminants are not migrating off site in large enough concentrations to affect water quality in the Kansas River.

In 1987, Deffenbaugh Industries, Inc. entered into a Consent Agreement with the EPA to study site contamination and to develop cleanup options. An Administrative Order on Consent was signed with the potentially responsible parties in 1990 to design the remedy for the site.

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

NPL LISTING HISTORY
Proposed Date: 12/30/82
Final Date: 09/08/83

Threats and Contaminants



The groundwater, soil, and leachate are contaminated with volatile organic compounds (VOCs), pesticides, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), and heavy metals from former waste disposal activities. Subsurface soils and wastes contain significant concentrations of contaminants and could threaten people working or trespassing on the site. On-site contaminated groundwater is not being used, so exposure to contaminants is unlikely.

Cleanup Approach

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

Response Action Status

Entire Site: The EPA selected a remedy for this site in 1989 featuring: removal and off-site treatment of contaminated liquids currently ponded underground in the area of the former surface impoundments, if needed; construction of an impermeable multi-layer cap over the waste disposal area; collection and off-site treatment, if necessary, of significant groundwater seepage; extended groundwater monitoring of the effectiveness of the remedy; and deed and access restrictions. The potentially responsible parties have completed a pre-design hydrogeological study and the final design was approved by EPA on May 25, 1993. A Unilateral Administrative Order for Remedial Action (RA) was issued on February 16, 1995, to commence the cleanup activities. The RA onsite construction activities began May 11, 1995, when Deffenbaugh received the Official Notice to Proceed.

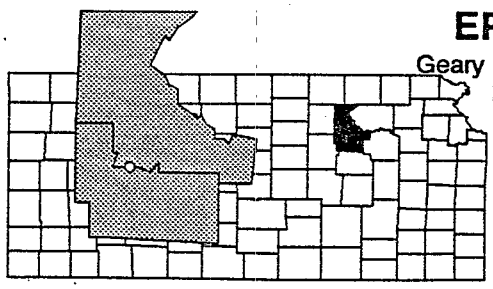
Environmental Progress

Following the listing of this site on the NPL, the EPA completed a site assessment and determined that the Doepke Disposal (Holliday) site poses no immediate threat to public health or the environment while site cleanup activities are being planned.

Site Repository

Johnson County Public Library, 8700 West 63rd Street, Merriam, KS 66201

FORT RILEY
KANSAS
EPA ID# KS6214020756



EPA REGION 7
Geary County and Riley County
Near Junction City

Site Description

The Fort Riley site is a 152-square-mile U.S. Army base. Fort Riley, established in 1853, has been a major fort since the Civil War. Its operations are diverse and involve seven landfills, numerous motor pools, burn and firefighting pit areas, hospitals, pesticide and mixing areas, dry cleaners, and shops. Volatile organic compounds (VOCs), pesticides, waste motor oils, chlorinated solvents, and mercury were deposited in landfills above and below the water table and were spilled or dumped on the ground near buildings. The most serious problems are groundwater contamination resulting from past operations at the former sanitary landfill at Camp Funston, groundwater contamination resulting from past and present operations at adjacent dry cleaning facilities in the Main Post cantonment area, and pesticide residues in soils in a maintenance yard in the Main Post area. Investigations in 1992 found vinyl chloride and other VOCs in shallow monitoring wells in proximity to the former Camp Funston Landfill. Groundwater along the Republican and Kansas Rivers is the sole source of drinking water for Fort Riley, Ogden, and Junction City. Fort Riley water supply wells are located approximately 3/4 mile upgradient of the dry cleaning facilities where tetrachloroethylene (PCE) was detected in groundwater sampling conducted in mid-1992. Municipal and Army wells within 3 miles of the base provide drinking water for approximately 47,800 people. Groundwater also is used for crop irrigation. People use the Kansas River along the site property for recreational activities.

Site Responsibility: This site is being addressed by the Army with oversite provided by EPA and the Kansas Department of Health and Environment.

NPL LISTING HISTORY
Proposed Date: 07/14/89
Final Date: 08/30/90

Threats and Contaminants

Monitoring wells in proximity to the former Camp Funston Landfill are contaminated with vinyl chloride and other VOCs. PCE has been detected in groundwater at the dry cleaning facility sites. The dry cleaning facilities are located downgradient of the Fort Riley well field. Groundwater near the installation boundary at the Marshall Army Airfield has been found contaminated with VOCs due to the operations of a former fire training pit. Landfill debris are reported to contain waste oils and degreasing solvents. The landfill is located within the flood plain of the Kansas River. Touching or ingesting contaminated groundwater or soil could pose a health risk.

Cleanup Approach

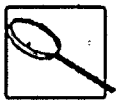
Three operable units have been identified to focus investigatory and remedial actions at sites where significant contamination has been identified: the former Camp Funston Landfill, the Dry Cleaning Facilities, and the former Pesticide Storage Facility. In addition, the Army is performing an Installation-wide Site Assessment to identify all potential areas of contamination at Fort Riley. As additional sites are identified from this assessment, preliminary investigations will be performed to evaluate the potential risk associated with each site and determine the need for more in-depth investigations or interim response actions.

Response Action Status

Camp Funston Landfill: The Remedial Investigation and Feasibility Study for the site was completed in mid-1994. An interim response action to stabilize the bank of the Kansas River along the landfill was completed in early 1994. An additional interim action to provide improvements to the surface cover of the landfill is currently underway and should be completed by mid-1995. The Record of Decision for the site will be completed by the fall of 1995.

Pesticide Storage Facility: The Remedial Investigation was completed in mid-1993. An interim response action to excavate and dispose of contaminated soils at the site was implemented in early 1994. The Feasibility Study will be completed to evaluate whether any further response actions will be required to complete site remediation.

Dry Cleaning Facilities: A Remedial Investigation to define the extent of PCE groundwater contamination and better define site geology has been completed. Supplemental investigations to address remedial investigation data gaps are being planned. A schedule for remaining CERCLA activities at the site, such as the Feasibility Study, Proposed Plan, and Record of Decision, will be established after the scope and schedule for supplemental remedial investigation activity is defined. A soil vapor extraction (SVE) system and a groundwater extraction system have been installed at the site as part of a pilot study. Operation of the SVE system resulted in removal of nearly 30 pounds of VOCs from site soils.



Entire Site: Investigations into the nature of contamination at a large number of potential sites began in the summer of 1993. Investigations have been prioritized such that the sites posing the greatest potential risk will be addressed first. As a result, lead-contaminated soils from a former firing range near an on-post housing area were excavated, stabilized, and disposed of off-post. Further, an SVE and groundwater extraction system pilot study will be evaluated at the Marshall Army Airfield VOC site. Investigations to identify the need for further response measures are planned through 1995.

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

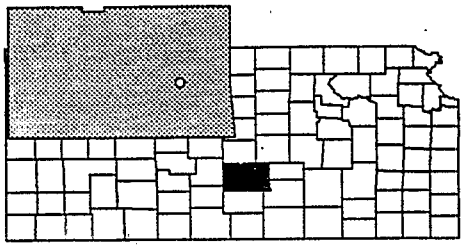
Environmental Progress

The EPA and the Army have agreed to utilize the Superfund Accelerated Cleanup Model (SACM) approach, to the extent practical, to address short-term cleanup objectives at Fort Riley. Several interim response actions have been implemented based on this strategy, with the opportunity for additional actions to be completed in the near future.

Site Repository

Manhattan Public Library, Juliette and Poyntz, Manhattan, KS 66502

OBEE ROAD
KANSAS
EPA ID# KSD980631766



EPA REGION 7
Reno County
Obeeville

Other Names:
Hutchison City Dump

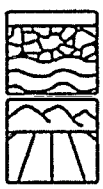
Site Description

The Obee Road site is a plume of contaminated groundwater located in Obeeville. An investigation in 1983 by the Kansas Department of Health and Environment (KDHE) was prompted by a citizen's concern over the taste and odor of his well water. Sampling by the KDHE showed volatile organic compounds (VOCs) in the shallow aquifer. The source of the contamination is suspected to be an old city landfill on the eastern edge of the Hutchinson Municipal Airport. Before closing in 1973, the landfill accepted unknown quantities of liquid wastes and sludges from local industries, as well as solvents from small metal-finishing operations at local aircraft plants. The landfill now is covered with vegetation. Septic tank systems in the area are another potential source of contamination. Approximately 1,900 people in Obeeville obtained drinking water from private wells that drew water from the contaminated aquifer before alternate water sources were provided. The area around the site is rural; some residents have farm animals on their property.

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: 07/22/87

Threats and Contaminants



Groundwater is contaminated with VOCs such as trichloroethylene (TCE), vinyl chloride, and chloroform. Soil is contaminated with VOCs including meta-xylene and toluene. Although the residences in the area now are connected to the public water supply, the private wells have not been plugged. Therefore, there is the possibility that the contaminated groundwater may be used for domestic purposes, such as watering gardens.

Cleanup Approach

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

Response Action Status

Initial Action: In 1985, the City of Hutchison constructed a water line extension to the residents affected by the contaminated well water. An alternate water supply also was provided to the Obee school system adjacent to the landfill, which was drawing water from a contaminated well.

Entire Site: In early 1990, the potentially responsible parties, under State supervision, began conducting a study to determine the extent of soil and groundwater contamination and to identify the sources responsible for contamination in the Obee Road Landfill subsite and the Airport Road subsite. This study was completed in 1994. The EPA selected the final cleanup remedy for the Obee Road Landfill subsite. The remedy calls for groundwater monitoring with a contingency for further action if contaminant concentrations rise above specified levels. The remedy also calls for institutional controls to limit access to the site as well as not allowing the disturbance of the landfill cover. An additional phase of investigation is needed to further characterize the groundwater plume contamination at the Airport Road subsite.

Site Facts: In March 1990, a group of the parties potentially responsible for site contamination signed a Consent Agreement with the KDHE in which the parties agreed to complete an investigation of the site. After reviewing data from the Obee Road Site investigation and data from the East Fourth Street Facility, a site bordering the Obee Road Site on the west, it became apparent that the site needed to be divided into two subsites. In March of 1993 an amendment to the State Administrative Order was signed and the Obee Road Landfill Subsite and the Airport Road Subsite were defined.

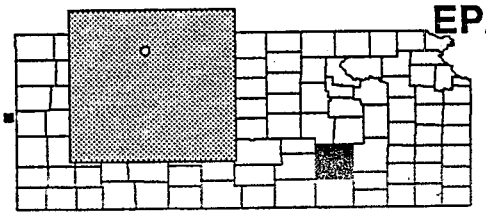
Environmental Progress

Providing an alternative water supply reduced the potential for exposure to contaminated well water. An interim pump and treat groundwater containment system is in operation at the East Fourth Street Facility. This system will contain and treat the groundwater contamination while cleanup of the Obee Road site is being planned.

Site Repository

Hutchison Public Library, 901 North Main, Hutchison, KS 67504

PESTER REFINERY CO.
KANSAS
EPA ID# KSD000829846



EPA REGION 7
Butler County
El Dorado

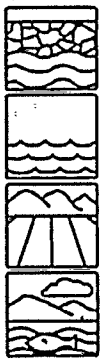
Site Description

The Pester Refinery Co. site occupies 10 acres in El Dorado. Refinery operations began in 1917. Refining wastes have been stored in a burn pond and these materials periodically were ignited through the mid-1970s. The burn pit is adjacent to the West Branch of the Walnut River, which is used for recreational activities. In 1987, the Kansas Department of Health and the Environment (KDHE) found seepage from the impoundment entering the river, and later the same year, confirmed contamination of the river. Seepage from the burn pond has been diked, forming a seepage pit. Rainwater and contaminated pond water, which have accumulated at the lagoon surface, have overflowed on occasion and discharged to the river and adjacent flood plain. An estimated 160 people obtain drinking water from private wells within 3 miles of the site.

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

NPL LISTING HISTORY
Proposed Date: 06/24/88
Final Date: 03/29/89

Threats and Contaminants

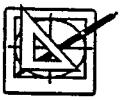


Groundwater contaminants include lead and volatile organic compounds (VOCs) such as vinyl chloride. Heavy metals, including lead and chromium, and VOCs have contaminated the burn pond sediments. The burn pond sludge and surface water are contaminated with heavy metals and VOCs. The soil is contaminated with heavy metals. Accidental ingestion of contaminated groundwater, soil, sediments, or surface water could pose a health risk. Since the site lies within the 100-year floodplain, flooding of the site area is a concern.

Cleanup Approach

The site is being addressed in two long-term remedial phases focusing on cleanup of the source of contamination and the groundwater.

Response Action Status



Source Control: In 1990, the potentially responsible parties began conducting an investigation into the nature and extent of the contamination at the site and defining alternatives for cleanup. In 1992, the EPA selected a remedy to address the source of contamination, including off-site removal of sludge in the burn pond and in-place bioremediation of soils. The remedial action for the source control is ongoing.

Groundwater: In 1994, the potentially responsible parties began conducting an investigation into the nature and extent of the contamination of the groundwater. Once this investigation is completed, scheduled for 1996, the EPA will select remedies to clean up the groundwater.

Site Facts: In 1986, the State issued an Administrative Order to Pester to conduct studies on how to close the impoundment. The owner demonstrated that he cannot afford to pay for the cleanup and filed for bankruptcy. In 1990, past owner, Fina, along with Pester, signed a Consent Order with the State to conduct a cleanup investigation and feasibility study. In September 1993, an Order was signed by the State and Fina for the cleanup design and action work for the source control. In December 1993, an Order was signed by the State and Fina for the cleanup investigation and feasibility study for groundwater.

Environmental Progress

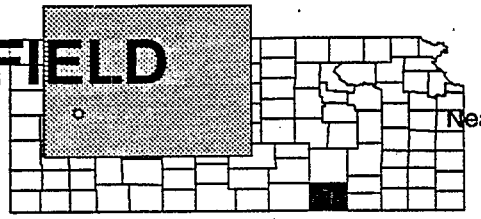
After performing preliminary investigations, the EPA determined that the Pester Refining Co. site does not pose an immediate threat to human health and the environment while final site cleanup activities are being planned.

Site Repository

Contact the Region 7 Superfund Community Relations Office.

STROTHER FIELD INDUSTRIAL PARK
KANSAS

EPA ID# KSD980862726



EPA REGION 7
Cowley County
Near Winfield and Arkansas City

Site Description

Strother Field Industrial Park is located near Winfield and Arkansas City and covers approximately 2 square miles. Until 1946, the site was a military facility. The site now consists of about 20 industrial and commercial businesses, as well as two inactive solid waste landfills. The landfills were used for the disposal of various industrial wastes. Groundwater is contaminated with volatile organic compounds (VOCs). Until 1983, the Strother Field Commission operated a water supply system, consisting of eight wells on the site. The contaminated groundwater no longer is used for drinking, but still is used for industrial processes. Drinking water was provided by trucks until the Commission installed two wells upgradient of the contaminant plume. Approximately 2,300 people live within a 3-mile radius of the site. The size of the worker population on the site is approximately 2,000. There are private and public wells located in the vicinity of the site; some private wells are in the industrial park.

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

NPL LISTING HISTORY
Proposed Date: 10/15/84
Final Date: 06/10/86

Threats and Contaminants

Samples collected and analyzed by the State indicated the presence of VOCs including trichloroethylene (TCE) in several wells used for industrial processes only. People who ingest or come in contact with contaminated groundwater may be at risk.

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: After the use of the industrial park wells as a source of drinking water was discontinued, water was brought in by tank trucks. The Strother Field Commission installed two wells upgradient of the contaminated plume to supply water. Two of the eight wells remained in use to supply process water for the industries located on the field. For the last several years, the Strother Field Commission has pumped these wells to contain groundwater contamination beneath the site. In 1985, General Electric, a potentially responsible party, installed groundwater extraction wells and air stripping towers to remove VOCs from the groundwater under an Administrative Order with the Kansas Department of Health and Environment (KDHE).

Entire Site: The State monitored an investigation by the potentially responsible parties that identified the types of contaminants remaining in the groundwater and other areas and has recommended remedies for final site cleanup upon its completion.

Site Facts: In 1985, the State issued an Administrative Order to General Electric Co., one of the parties potentially responsible for wastes in the northern zone of the site. The Order called for the company to sample soil; monitor groundwater; construct a groundwater flow model and use it to help locate, construct, and operate withdrawal wells under the guidance of the State; and submit a plan for a treatment and disposal system. The State issued another Administrative Order in January 1986 to each of the four potentially responsible parties associated with the southern zone of the site. The Order requires one potentially responsible party to treat the water from the public supply well, each of the companies to drill monitoring wells on the southern end of the field, and three of the parties to submit data on chemical use during the past 20 years. In March 1990, General Electric signed a Consent Agreement with the KDHE to complete an investigation of the site.

Environmental Progress

The Strother Field Commission and General Electric Co., in conjunction with the State and the EPA, have reduced the possibility of drinking contaminated groundwater by supplying a safe drinking water source and installing a treatment system while final cleanup remedies for the Strother Field Industrial Park site are being planned. Design of remedial systems started in 1995.

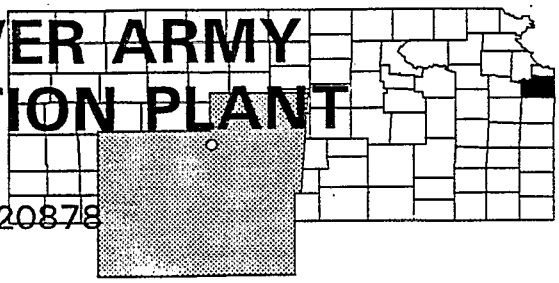
Site Repository

Strother Field Commission, Terminal Building, Fourth and "A" Street,
Cowley County, KS 67156

SUNFLOWER ARMY AMMUNITION PLANT

KANSAS

EPA ID# KS3213820878



EPA REGION 7

Johnson County
DeSoto,
25 miles southwest of
Kansas City

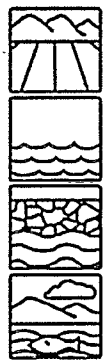
Site Description

The 9065-acre Sunflower Army Ammunition Plant is a government-owned, contractor-operated military installation. The installation began operations in 1942 to manufacture smokeless powder and propellants for small arms, cannons, and rockets. Additional facility operations included the manufacture and regeneration of nitric and sulfuric acids, and munitions proving. Since 1971, the majority of the installation has been in a standby, inactive status, with the last production operation ceasing in 1992. The nitroguanidine production area has been in operation since 1989. Most of the property has been leased to private individuals and companies for livestock grazing and hay production. Potential sources of contamination at the site include production line areas, magazine storage areas, and approximately 70 solid waste management units. The solid waste management units include surface impoundments, ditches, sumps, projectile ranges, burning grounds, and landfills. Throughout the history of the facility, various liquid discharges have been permitted under the federal Clean Water Act's National Pollutant Discharge Elimination System (NPDES). The majority of the industrial infrastructure remains at the site. Land use in this sparsely populated, rural area is primarily agricultural. The site is situated on a broad ridge, with most of the installation lying between two streams—Captain Creek on the west and Kill Creek on the east. People fish downstream of the site in Kill Creek.

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

NPL LISTING HISTORY
Proposed Date: 02/25/95

Threats and Contaminants



A wide range of hazardous substances have been found in the soil at the site, including inorganic compounds and explosives and nitrated compounds. Samples of surface water and sediment collected from Kill Creek downstream of the site revealed elevated levels of mercury and arsenic. In 1971, an accidental release of ammonia to Kill Creek resulted in a fish kill. In 1987 and 1988, the U.S. Army Environmental Hygiene Agency (AEHA) found that sources from the facility had released hazardous substance to the groundwater. Kill Creek is a habitat for the pallid sturgeon, an endangered species, and the flathead chub, a State-designated threatened species.

Cleanup Approach

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

Response Action Status

Immediate Actions: The EPA, under the authority of the Resource Conservation and Recovery Act (RCRA), has been monitoring groundwater, periodically inspecting and maintaining the facility, and developing a RCRA facility assessment.

Entire Site: AEHA and the EPA have begun a study of the nature and extent of the contamination throughout the site. This study will help EPA to define the various areas of contamination and to develop appropriate cleanup alternatives for each area.

Site Facts: In 1971, the EPA levied a fine against the facility for the accidental release of ammonia to Kill Creek that resulted in a fish kill. Sunflower Army Ammunition Plant 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

Monitoring the Sunflower Army Ammunition Plant under the EPA RCRA program is ensuring the safety of the public and the environment while studies leading to final cleanup remedies are underway.

Site Repository

Contact the Region 7 Superfund Community Relations Office

Glossary: Terms Used in the Fact Sheets

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.

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).

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 it 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.

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% or more of the drinking water of an area.

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

GLOSSARY

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

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 to 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. 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. 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.

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 and/or the costs incurred by the government that the parties will reimburse, as well as 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.

GLOSSARY

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.

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.

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.

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; and/or to obtain penalties or criminal sanctions for violations. Enforcement procedures may vary, depending on the specific requirements of different environmental laws and related regulatory requirements. Under CERCLA, for example, the EPA will seek to require potentially responsible parties to clean up a Superfund site or pay for the cleanup [see Cost Recovery].

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

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

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

Feasibility Study: The analysis of the potential cleanup alternatives for a site. The feasibility study usually starts as soon as the remedial investigation is underway; together, they are commonly referred to as the RI/FS [see 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.

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: Underground 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. It possesses at least one of four characteristics (ignitability, corrosivity, reactivity, or toxicity), or appears on special EPA lists.

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

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 and/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].

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

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

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

Mill Tailings: [See Mine Tailings].

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

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

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

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

which groundwater flows and the types and amounts of contaminants present.

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

Neutrals: Organic compounds that have a relatively neutral pH, complex structure and, due to their organic bases, are easily absorbed into the environment. Naphthalene, pyrene, and trichlorobenzene 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 within that period.

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 is 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.

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, including owners, who may have contributed to the contamination at a Superfund site and may be liable for costs of response actions. Parties are considered PRPs until they admit liability or a court makes a determination of liability. PRPs may sign a Consent Decree or Administrative Order on Consent to participate in site cleanup activity 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.

GLOSSARY

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 stones.

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. Together they are customarily referred to as the RI/FS [see Feasibility Study].

Remedial Project Manager (RPM): The EPA or State official responsible for overseeing cleanup actions at a 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 particulates remaining in air after the air passes through a scrubbing, or other, process.

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 to store waste.

Riparian Habitat: Areas adjacent to rivers and streams that have a high density, diversity, and productivity of plant and animal species relative to nearby uplands.

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

Scrubber: An air pollution 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 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.

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.