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NATIONAL PRIORITIES LIST SITES:
Missouri

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

If you wish to purchase copies of any additional State volumes or the National Overview volume, ***Superfund: Focusing on the Nation at Large***, contact:

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INTRODUCTION: 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, property values depreciated. 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 the 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 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.

In the 10 years 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 at others improperly disposed or stored wastes threatened the health of the surrounding community and the environment.

EPA Identified More than 1,200 Serious Sites

EPA has identified 1,236 hazardous waste sites as the most serious in the Nation. These sites comprise the "National Priorities List": sites targeted for cleanup under the Superfund. But site discoveries continue, and EPA estimates that, while some will be deleted after lengthy cleanups, this list, commonly called the NPL, will continue to grow by approximately 100 sites per year, 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 (1,236) are thus a rela-

tively small subset of a larger inventory of potential hazardous waste sites, but they do comprise the most complex and environmentally compelling cases. EPA has logged more than 32,000 sites on its National hazardous waste inventory, and assesses each site within one year of being logged. In fact, over 90 percent of the sites on the inventory have been assessed. Of the assessed sites, 55 percent have been found to require no further Federal action because they did not pose significant human health or environmental risks. The remaining sites are undergoing further assessment to determine if long-term Federal cleanup activities are appropriate.

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.

The 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 hazardous release, or the threat of one. 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 the Superfund 's most noted achievements. Where imminent threats to the public or environment were evident, EPA has completed or monitored emergency actions that attacked the most serious threats to toxic exposure in more than 1,800 cases.

The ultimate goal for a hazardous waste site on the NPL is a permanent solution to an environmental problem that presents a serious (but not an imminent) threat to the public or environment. This often requires a long-term effort. In the last four years, 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. And in 1989 more sites than ever reached the construction stage of the Superfund cleanup process. Indeed construction starts increased by over 200 percent between late 1986 and 1989! Of the sites currently on the NPL, more than 500 — nearly half — have had construction cleanup activity. In addition, over 500 more sites are presently 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. Measuring success by "progress through the cleanup pipeline," EPA is clearly gaining momentum.

EPA MAKES SURE CLEANUP WORKS

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.

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, 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 still being safeguarded. EPA will correct any deficiencies discovered and 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. EPA's job is to analyze the hazards and deploy the experts, but the Agency needs citizen input as it makes choices for affected communities.

Because the people in a community with a Superfund site will be those most directly affected by hazardous waste problems and cleanup processes, 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.

This State volume and the companion National Overview volume provide general Superfund background information and descriptions of activities at each State NPL site. These volumes are intended to clearly describe what the problems are, what 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 IN TANDEM

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. The public 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 volume — ***Superfund: Focusing on the Nation at Large*** — accompanies this State volume. The National Overview 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, the Superfund program's successes in cleaning up the Nation's serious hazardous waste sites, and the vital roles of the various participants in the cleanup process.

This State volume compiles site summary fact sheets on each State 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 State book gives a "snapshot" of the conditions and cleanup progress that has been made at each NPL site in the State through the first half of 1990. Conditions change as our cleanup efforts continue, so these site summaries will be updated periodically to include new information on progress being made.

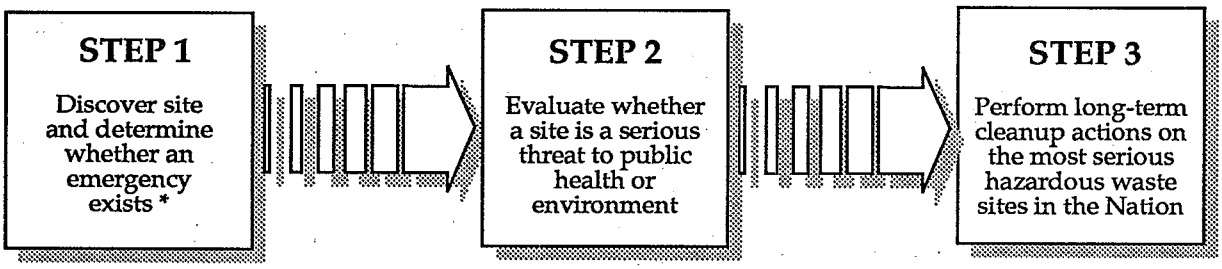
To help you understand the cleanup accomplishments made at these sites, this State volume includes a description of the process for site discovery, threat evaluation and long-term cleanup of Superfund sites. This description — ***How Does the Program Work to Clean Up Sites?*** — will serve as a good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

SUPERFUND:

How Does the Program Work to Clean Up Sites?

The diverse problems posed by the Nation's hazardous waste sites have provided EPA with the challenge to establish a consistent approach for evaluating and cleaning up the Nation's most serious sites. To do this, EPA 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. EPA has established procedures to coordinate the efforts of its Washington, D.C. Headquarters program offices and its front-line staff in 10 Regional Offices with the State 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 EPA or the State or, under their monitoring, by private parties who are potentially responsible for site contamination.

The process for discovery of the site, evaluation of threat, and 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 below provides a summary of this three step process.



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

FIGURE 1

Although this State 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 up to identifying and cleaning up these most serious uncontrolled or abandoned hazardous waste sites in the Nation. This discovery and evaluation process is the starting point for this summary description.

How does EPA learn about potential hazardous waste sites?

What happens if there is an imminent danger?

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

STEP 1: SITE DISCOVERY AND EMERGENCY EVALUATION

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. Or 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 EPA informed about either 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.

As soon as a potential hazardous waste site is reported, 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

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 figure out what is contaminating the drinking water supply and the best way to clean it up. Or

EPA may determine that there is no imminent danger from a site, so now 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 requires a long-term cleanup action.

Once a site is discovered and any needed emergency actions are taken, 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 like 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 don't 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 32,000 sites maintained in this inventory.

If the preliminary assessment shows that 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 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 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, EPA developed the Hazard Ranking System (HRS). The HRS is the scoring system 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 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 EPA's **National Priorities List (NPL)**. That's why there are 1,236 sites are on the NPL, but there are more than 32,000 sites in the Superfund inventory. Only NPL sites can have a long-term cleanup paid for from the national hazardous waste trust fund — the Superfund. But the Superfund can and does pay for emergency actions performed at any site, whether *or not it's on the NPL.*

How do people find out whether EPA considers a site a national priority for cleanup using Superfund money?

The public can find out whether a site that concerns them is on the NPL by calling their Regional EPA office at the number listed in this book.

The proposed NPL identifies sites that 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 added 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. Updated at least once a year, it's only after public comments are considered that these proposed worst sites are officially added to the NPL.

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

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. So a five-phase "remedial response" process is used to develop consistent and workable solutions to hazardous waste problems across the Nation:

1. Investigate in detail the extent of the site contamination: **remedial investigation,**
2. Study the range of possible cleanup remedies: **feasibility study,**
3. Decide which remedy to use: **Record of Decision or ROD,**
4. Plan the remedy: **remedial design,** and
5. Carry out the remedy: **remedial action.**

This remedial response process is a long-term effort to provide a permanent solution to an environmental problem that presents a serious, but not an imminent 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 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. But 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 is information that allows 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?

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 carefully compared. 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 use treatment technologies to destroy principal site contaminants. But remedies such as containing the waste on site or removing the source of the problem (like leaking barrels) are often 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 carefully considered 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. 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.

The public has a minimum of 30 days to comment on the proposed cleanup plan after it is published. These comments can either be written or given verbally at public meetings that EPA or the State are required to hold. Neither 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 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 of the 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 6 months to 2 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 complete, 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 decontaminate them — an action that takes limited time and money. In most cases, however, a remedial action may involve different and expensive 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, a remedial cleanup action takes an average of 18 months to complete and costs an average of $26 million per site.

Once the cleanup action is complete, 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 the **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 completed".

It's not until a site cleanup meets all the goals and monitoring requirements of the selected remedy that 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 can actually be deleted from the NPL. Deletions that have occurred are included in the "Construction Complete" category in the progress report found later in this book.

Can 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 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 EPA, and must meet the same standards required for actions financed through the Superfund.

Because these enforcement actions can be lengthy, 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 for repaying the money EPA spends in cleaning up the site.

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

HOW TO:

USING THE STATE VOLUME

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

The following two pages show a generic fact sheet and briefly describes the information under each section. The square "icons" or symbols accompanying the text allow the reader to see at a glance which environmental resources are affected and the status of cleanup activities.

Icons in the *Threats and Contaminants* Section

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

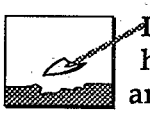
Contaminated **Surface Water and Sediments** on or near the site. (These include lakes, ponds, streams, and rivers.)

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

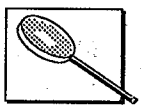
Contaminated **Soil and Sludges** on or near the site.

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

Icons in the *Response Action Status* Section



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



Site Studies at the site are planned or underway.

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

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

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

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

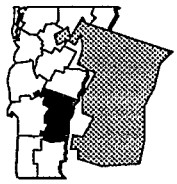
Site Responsibility

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

NPL Listing History

Dates when the site was Proposed, made Final, and Deleted from the NPL

SITE NAME
STATE
EPA ID# ABC00000000



EPA REGION
CONGRESSIONAL DIST
County Name
Location

Aliases:

Site Description

Site Responsibility:

NPL LISTING HISTORY

Threats and Contaminants

Cleanup Approach

Response Action Status

Site Facts:

Environmental Progress

Environmental Progress

A summary of the actions to reduce the threats to nearby residents and the surrounding environment; progress towards cleaning up the site and goals of the cleanup plan are given here.

WHAT THE FACT SHEETS CONTAIN

Site Description

This section describes the location and history of the site. It includes descriptions of the most recent activities and past actions at the site that have contributed to the contamination. Population estimates, land usages, and nearby resources give readers background on the local setting surrounding the site. Throughout the site description and other sections of the site summary, technical or unfamiliar terms that are *italicized* are presented in the glossary at the end of the book. Please refer to the glossary for more detailed explanation or definition of the terms.

Threats and Contaminants

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

Cleanup Approach

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

Response Action Status

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

Site Facts

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

How To

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

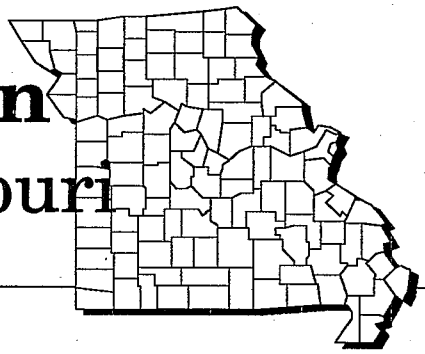
HOW CAN *YOU* USE THIS STATE BOOK?

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

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

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

NPL Sites in State of Missouri



Geographically near the center of the continental United States, Missouri is bordered by Iowa to the north, Arkansas to the south, Kansas to the west, and Illinois to the east. The State covers 69,697 square miles and consists of rolling hills, open, fertile plains, and well-watered praire to the north of the Missouri River and rough hilly terrain with deep, narrow valleys south of it. Missouri experienced a 4.6 percent increase in population through the 1980s and currently has approximately 5,141,000 residents, ranking 15th in U.S. populations. Principal State industries include manufacturing, agriculture, aerospace, and tourism. Missouri manufacturing produces transportation equipment, food and related products, electronic/electrical equipment, and chemicals.

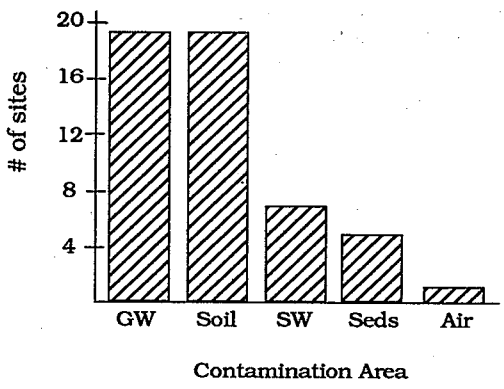
How Many Missouri Sites Are on the NPL?

Proposed	4
Final	20
Deleted	0
	24

Where Are the NPL Sites Located?

Cong. District 03, 04, 05	1 site
Cong. District 06	2 sites
Cong. District 08	4 sites
Cong. District 02, 07, 09	5 sites

How are Sites Contaminated and What are the Principal* Chemicals ?



Groundwater: Volatile organic compounds (VOCs) and heavy metals (inorganics).

Soil: Volatile organic compounds (VOCs), dioxins, heavy metals (inorganics), radiation, and polychlorinated biphenyls (PCBs).

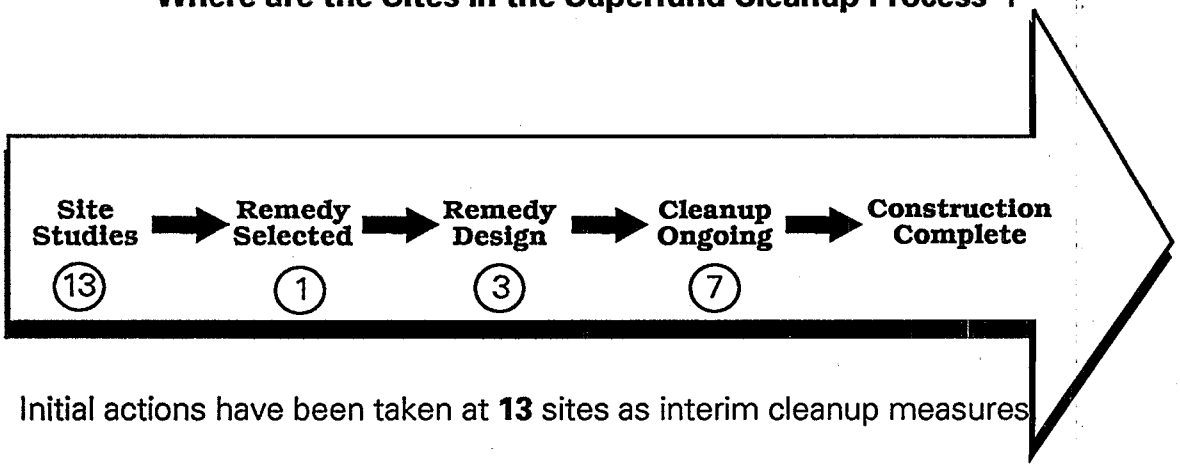
Surface Water and Sediments: Polychlorinated biphenyls (PCBs), dioxins, and volatile organic compounds (VOCs).

Air: Polychlorinated biphenyls (PCBs) and radiation.

*Appear at 15% or more sites

continued

Where are the Sites in the Superfund Cleanup Process*?



Initial actions have been taken at **13** sites as interim cleanup measures

Who Do I Call with Questions?

The following pages describe each NPL site in Missouri, providing specific information on threats and contaminants, cleanup activities, and environmental progress. Should you have questions, please call one of the offices listed below:

Missouri Superfund Office	(314) 751-3176
EPA Region VII Superfund Office	(913) 551-7052
EPA Public Information Office	(202) 477-7751
EPA Superfund Hotline	(800) 424-9346
EPA Region VII Superfund Public Relations Office	(913) 551-7003

*Cleanup status reflects phase of site activities rather than administrative accomplishments.

The NPL Progress Report

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

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

- ➨ An arrow in the "Initial Response" category indicates that an emergency cleanup or initial action has been completed or is currently underway. Emergency or initial actions are taken as an interim measure to provide immediete relief from exposure to hazardous site conditions or to stabilize a site to prevent further contamination.
- ➨ An arrow in the "Site Studies" category indicates that an investigation to determine the nature and extent of the contamination at the site is currently ongoing or planned to begin in 1991.
- ➨ An arrow in the "Remedy Selection" category means that the EPA has selected the final cleanup strategy for the site. At the few sites where the EPA has determined that initial response actions have eliminated site contamination, or that any remaining contamination will be naturally dispersed without further cleanup activities, a "No Action" remedy is selected. In these cases, the arrows in the Progress Report are discontinued at the "Remedy Selection" step and resume in the final "Construction Complete" category.
- ➨ An arrow at the "Remedial Design" stage indicates that engineers are currently designing the technical specifications for the selected cleanup remedies and technologies.
- ➨ An arrow marking the "Cleanup Ongoing" category means that final cleanup actions have been started at the site and are currently underway.
- ➨ A arrow in the "Construction Complete" category is used *only* when *all phases* of the site cleanup plan have been performed and the EPA has determined that no additional construction actions are required at the site. Some sites in this category may currently be undergoing long-term pumping and treating of groundwater, operation and maintenance or monitoring to ensure that the completed cleanup actions continue to protect human health and the environment.

The sites are listed in alphabetical order. Further information on the activities and progress at each site is given in the site "Fact Sheets" published in this volume.

Progress Toward Cleanup at NPL Sites in the State of Missouri

Page	Site Name	County	NPL	Date	Initial Response	Site Studies	Remedy Selected	Remedy Design	Cleanup Ongoing	Construction Complete
1	BEE CEE MANUFACTURING PLANT	DUNKLIN	Final	06/10/86		➡				
3	CONSERVATION CHEMICAL COMPANY	JACKSON	Final	10/04/89		➡	➡	➡	➡	
5	ELLISVILLE AREA	ST. LOUIS	Final	09/08/83	➡	➡	➡	➡	➡	
8	FINDETT CORPORATION	ST. CHARLES	Prop.	10/15/84	➡	➡	➡	➡		
10	FULBRIGHT LANDFILL	GREENE	Final	09/08/83		➡	➡	➡		
12	KEM-PEST LABORATORIES	CAPE GIRARDEAU	Final	10/04/89		➡	➡	➡		
14	LAKE CITY ARMY AMMUNITION PLANT	JACKSON	Final	07/22/87	➡	➡				
16	LEE CHEMICAL	CLAY	Final	06/10/86	➡	➡				
18	MINKER/STOUT/ROMAINE CREEK	JEFFERSON	Final	09/08/83	➡	➡	➡	➡	➡	
20	MISSOURI ELECTRIC WORKS	CAPE GIRARDEAU	Final	02/21/90	➡	➡				
22	NORTH U DRIVE WELL CONTAMINATN	GREENE	Final	06/10/86	➡	➡				
24	ORONOGO-DUENWIG MINING BELT	JASPER	Prop.	06/24/88		➡				
26	QUAIL RUN MOBILE PARK	FRANKLIN	Prop.	09/08/83	➡	➡	➡	➡	➡	
28	QUALITY PLATING	SCOTT	Final	06/10/86		➡				
30	SHENANDOAH STABLES	LINCOLN	Final	09/08/83	➡	➡	➡	➡	➡	
32	SOLID STATE CIRCUITS	GREENE	Final	06/10/86	➡	➡	➡			
34	ST LOUIS AIRPORT/HIS/FUTURA COAT.	ST. LOUIS	Final	10/04/89	➡	➡				
36	SYNTEX FACILITY-VERONA	LAWRENCE	Final	09/08/83		➡	➡	➡	➡	

Page	Site Name	County	NPL	Date	Initial Response	Site Studies	Remedy Selected	Remedy Design	Cleanup Ongoing	Construction Complete
38	TIMES BEACH	ST. LOUIS	Final	09/08/83		➡	➡	➡	➡	
41	VALLEY PARK TCE	ST. LOUIS	Final	06/10/86	➡	➡				
43	WELDON SPRINGS ORDNANCE WORKS	ST. CHARLES	Final	02/21/90		➡				
45	WELDON SPRING QUARRY/PLANT/PITS	ST. CHARLES	Final	07/22/87	➡	➡				
47	WESTLAKE LANDFILL	ST. LOUIS	Prop.	10/26/89		➡				
49	WHEELING DISPOSAL SERVICE CO, INC.	ANDREW	Final	10/04/89		➡				

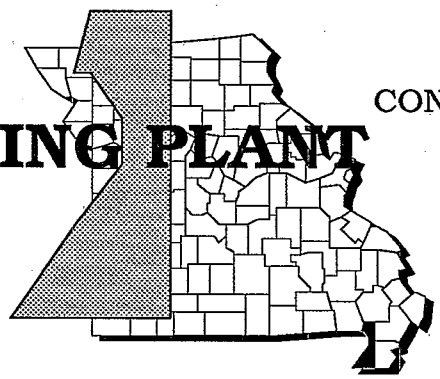
NPL:

Site Fact Sheets

BEE CEE MANUFACTURING PLANT

MISSOURI

EPA ID# MOD980860522



REGION 7

CONGRESSIONAL DIST. 08

Dunklin County

City of Malden

Site Description

The former owners of the Bee Cee Manufacturing Plant, a 2-acre site in Malden's industrial park, manufactured aluminum storm windows and doors from 1964 to 1983. Workers discharged chromium-contaminated wastewater directly onto the ground without any treatment or an EPA-approved permit. An area about 50 feet by 100 feet is visibly affected, possibly to a depth of 1 or 2 feet. In 1981, the State advised the owners that their disposal practices put them in violation of the Missouri Clean Water Law. Bankruptcy proceedings ended the State's efforts to have the owners install a wastewater treatment system. Another company now leases the building, and the City of Malden owns the contaminated ground. Four shallow wells and two deep wells in Malden supply drinking water for 11,500 people; one shallow well is about 1,000 feet southwest of the site. Approximately 8,500 people live within a 3-mile radius of the site; 60 live within 1 mile. The closest residence is 1/4 mile away from the site. Fifteen wells lie within 1 mile of the site, and 150 wells are within 3 miles. Of special concern is a low-income nursing home project located 1/2 mile south of the site.

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

NPL LISTING HISTORY

Proposed Date: 10/15/84

Final Date: 06/10/86

Threats and Contaminants

Off-site groundwater and on-site soils are contaminated with chromium and aluminum. Private wells in the vicinity used for watering livestock and irrigating crops have been contaminated since 1984. Groundwater contamination has been demonstrated in a shallow *aquifer* well about 1/2 mile from the site. The public wells 2 miles *downgradient* from the site may be connected to the contaminated aquifer. People who touch the contaminated soils or drink contaminated groundwater are at risk. Local soils are sandy, and this condition makes it easier for contaminants to enter the groundwater.

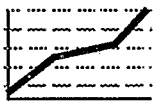
Cleanup Approach

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

Response Action Status

Entire Site: The State will begin an intensive study of soil and groundwater pollution at and around the site in an attempt to characterize its nature and extent, as well as the options for final cleanup. The study is scheduled to begin in 1990 and to be completed by late 1992.

Environmental Progress

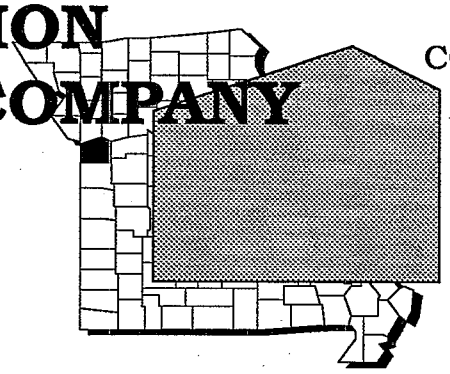


After adding the Bee Cee Manufacturing site to the NPL, the EPA performed a preliminary evaluation and determined that no immediate actions were necessary to protect the nearby population or the environment while the investigations leading to a final cleanup solution are taking place.

CONSERVATION CHEMICAL COMPANY

MISSOURI

EPA ID# MOD000829705



REGION 7

CONGRESSIONAL DIST. 05

Jackson County

3900 Front Street, Kansas City

Alias
CCC

Site Description

The Conservation Chemical Company site, located in eastern Kansas City, operated as a chemical storage and disposal facility from 1960 until 1980. The owners began waste disposal operations almost immediately after building chemical treatment basins, a process area, and a roadway ramp. Waste disposal basins, which were either unlined or poorly lined, were used to store and receive wastes, and also served as drying beds and containers for by-product *sludges*. Many operating records were destroyed in a 1970 fire; those records that survived listed organic chemicals, solvents, *acids*, caustics, metal hydroxides, and cyanide compounds as some of the materials accepted for disposal at the site. Reports also indicate that pesticides, herbicides, waste oils, organic solvents, *halogenated* compounds, arsenic, and elemental phosphorus were handled by the facility, as well as pressurized cylinders and other metal containers placed in the *lagoons*. Information is incomplete, but it is estimated that the facility handled at least 48,000,000 gallons of liquids and sludges and 1,144 tons of solids. About 93,000 cubic yards of materials including drums, bulk liquids, sludges, and solids, were buried at the site. By-products from any treatment processes used on the waste materials were also dumped on site. An attempt was made to neutralize hazardous chemicals by blending some wastes and to *stabilize* the upper waste layers on the site by mixing acidic metal finishing wastes with *fly ash* and certain sludges, which produced a mixture consisting largely of gypsum. In 1977, the Missouri Clean Water Commission ordered the site closed and covered, and the owner covered the soil *caps* with gypsum. The site is located in the 10-year floodplain of the Missouri River, about 500 feet away from its banks, and near its confluence with the Little Blue River. The site itself was raised about 10 feet above the surrounding area, but most of it would be immersed during a flood. Private wells provide drinking water to approximately 120 people within 3 miles of the property. The Courtney Bend well field is downstream from the site: it supplies drinking water to the City of Independence, which is 5 miles from the site.

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

NPL LISTING HISTORY

Proposed Date: 04/10/85

Final Date: 10/04/89

Threats and Contaminants

Groundwater both on and off the site contains heavy metals including arsenic, cadmium, chromium, and lead; cyanide; *phenolic* compounds and *volatile organic compounds* (VOCs) including benzene, chloroform, and toluene. Surface and subsurface soil on the site contain all of the above as well as dioxins and *polychlorinated biphenyls* (PCBs). Contaminants are entering the Missouri River via groundwater which feeds the river. The Missouri River is used locally and regionally for recreation, industry, irrigation, and as a municipal water supply. People on or near the site may be exposed by coming in direct contact with contaminated soils, eating food grown in contaminated soil, or game that fed on contaminated plants.

Cleanup Approach

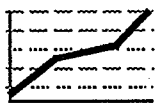
The site is being addressed in a single *long-term remedial phase* for the entire site.

Response Action Status

Entire Site: The EPA selected a remedy for this site in 1987. It features both source control and groundwater cleanup measures and includes: (1) surface cleaning including demolition and disposal of existing buildings, tanks, and debris and placing them in an on-site cap; (2) installing a withdrawal well system designed to keep groundwater from moving away from the site; (3) building a groundwater pump and treat system that will remove contaminants; and (4) monitoring the quality and level of off-site groundwater. The surface cleanup began in early 1989 and was completed by August 1989. Installation of the well networks was started in 1989 and completed in early 1990. Construction of the treatment plant began in 1989 and completed in March 1990. The groundwater extraction system is currently in operation, however no reasonable estimate can be made at this time as to how long the system must run.

Site Facts: In November 1982, the United States filed suit against the parties it deemed responsible for the site contamination; these defendants in turn sued a host of other potentially responsible parties in 1984. By August 1985, the defendants had agreed to design and conduct a cleanup on the site that included the construction of a *slurry wall*, and to reimburse the government for its costs to date. However, new information about the expense and construction difficulty associated with the slurry wall caused a delay in actions. After additional negotiations, the potentially responsible parties agreed to perform a cleanup based on hydraulic control through extraction wells.

Environmental Progress

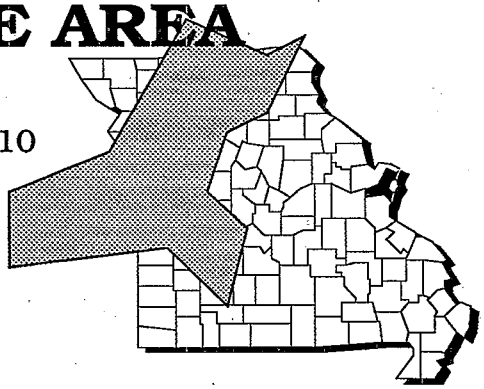


Most of the remedies selected by the EPA to clean up the Conservation Chemical site have been put into operation, with many of them completed. These actions have eliminated surface contamination and halted further pollution of surface and groundwater resources. The EPA and the potentially responsible parties are actively monitoring the effectiveness of the continuing groundwater cleanup.

ELLISVILLE AREA

MISSOURI

EPA ID# MOD980633010



REGION 7
CONGRESSIONAL DIST. 02
St. Louis County
Near Ellisville, 20 miles west of downtown St. Louis

Aliases:
Marlo Angelo Site
Rosalie Investment Co.
Mid-America Arena
Callahan Property
Bliss, Russel Site—Bliss Ranch

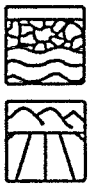
Site Description

The Ellisville Area site consists of three non-contiguous subsites. Initial investigations at the sites focused on these three properties. During the investigations, an additional four contaminated properties were discovered adjacent to one of the original subsites. The three subsites are the Bliss property, the Callahan property, and the Rosalie property. During the 1960s and 1970s, Russell Bliss owned and operated the Bliss Waste Oil Company, a business engaged in the transportation and disposal of waste oil products, industrial wastes, and chemical wastes. These wastes were disposed of in pits, drums, and on the surface of properties around the company's headquarters in Ellisville. The Bliss property subsite is located in western St. Louis County and covers 28 acres of land. Developed portions of the subsite include the Mid-America Arena and associated buildings and stables. The property is drained by Caulks Creek, which empties into a tributary to the Missouri River. Pits were dug at the site and were used for industrial waste disposal. Drums of wastes had been buried at the site, and liquid wastes had been dumped on the ground. The Callahan property is an 8-acre tract of land located approximately 1 mile from Ellisville. Drummed liquid and solid wastes were disposed of on the property during the 1970s. The Callahan subsite is situated on a steep-walled gully that drains into a tributary to the Missouri River. The Rosalie property is an 85-acre tract of land. Drummed liquid and solid wastes were disposed of on approximately 4 acres of the site. A housing development is now located on the Rosalie subsite. Approximately 1,000 people live within a 1-mile radius of the subsites; 5,000 live within 3 miles. Residents rely on drinking water drawn from private wells and the public distribution system. Roughly 265 wells exist within 1 mile, and 789 are within 3 miles of the sites.

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

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

Threats and Contaminants



There is evidence that the underlying groundwater is being contaminated by *leachate* from the subsites. Soil is contaminated with dioxin and *volatile organic compounds* (VOCs) at the Rosalie and Bliss properties. Soils at the Callahan properties contain VOCs. The major public health threats are direct contact with contaminated soil or drinking contaminated groundwater. Potential health risks exist through the airborne *migration* of contaminated fugitive dusts.

Cleanup Approach

The site is being addressed in three stages: immediate actions and two *long-term remedial phases* directed at cleanup of the Callahan and Rosalie subsites and the Bliss subsite, which includes four adjacent contaminated properties.

Response Action Status

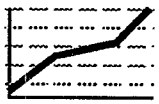
Immediate Actions: In 1981, the State removed, covered, and *overpacked* drums; took samples; and staged the drums from the Callahan subsite. Workers posted signs and the State maintained 24-hour security at the site. Excavation activities revealed up to 1,000 drums buried on the site. In early 1982, EPA emergency workers performed the following activities: posted additional warning signs; drained and sealed Farm Pond; built *runoff* control and leachate interception trenches; excavated and overpacked buried drums; sampled and sorted drums; built an on-site storage area; and removed and disposed of contaminated soil. In late 1984, drums and other wastes were delivered to the TWI incinerator in Illinois for disposal.

Callahan and Rosalie Subsites: The EPA selected a remedy for the Callahan and Rosalie properties in 1985. The Callahan property cleanup remedy includes: (1) controlling erosion and slippage of the fill area where drums had been excavated in 1980 to 1981 and removing what remained of that cleanup; (2) removing and disposing of the plastic cover and hold-down blocks from the fill area; (3) regrading the fill to a more stable slope, covering it with a compacted soil layer, and reseeding; and (4) removing and salvaging fences and gravel from the former drum-storage areas. The Rosalie subsite cleanup remedy includes: (1) excavating contaminated soil from two locations and removing it to an EPA-approved hazardous waste facility; (2) placing debris in drums; (3) excavating and overpacking buried drums and sampling and testing their contents; (4) disposing of drums at an EPA-approved disposal facility; (5) testing soil to verify the effectiveness of the cleanup; and (6) *backfilling* excavated areas with clean soil and reseeding disturbed areas. Under State supervision, cleanup at the Rosalie property began in 1986. The erosion-control actions have been finished, and the fence and gravel have been salvaged. The design of the technical specifications for the cleanup of the Callahan property subsite is under way. The excavation and disposal work at the Callahan property is scheduled to begin in 1990.

continued

Bliss and Adjacent Properties: During the investigation of the Bliss property subsite, contamination was discovered on four neighbouring parcels: the Dubman and Weingart property, Primm property, Wade and Mercantile Trust Company property, and the Russell, Evelyn and Jerry Bliss property. The EPA selected a remedy for these properties in 1986. The first part of the cleanup focuses on dioxin-contaminated soils; the second entails buried drums and materials contaminated with chemicals other than dioxin. The Bliss/contiguous properties soils cleanup remedy includes: (1) excavating dioxin-contaminated soils and containerizing them; (2) storing the containers of waste temporarily in a metal building on the site; and (3) maintaining security, controlling surface drainage at the site, and sampling the groundwater. The EPA has not yet selected a final disposal action for these soils. The drum and other cleanup remedies include: (1) excavating, sampling, and overpacking buried drums; (2) excavating hazardous wastes and contaminated soils and materials; (3) taking drums and waste mixtures suitable for land disposal to an appropriate EPA-approved facility; (4) incinerating drums and waste mixtures unsuitable for land disposal offsite at an EPA-approved facility; and (5) disposing of nonhazardous material and debris at a permitted sanitary *landfill*. For both components of this remedy, site restoration activities will include backfilling, regrading, and seeding, where needed. The EPA is designing the technical specifications for the cleanup at the Bliss/contiguous properties subsite.

Environmental Progress

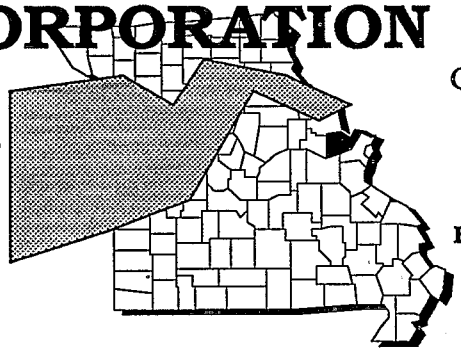


Numerous cleanup actions have been taken at the Callahan and Rosalie subsites that have reduced contaminant levels to make the areas safer to the surrounding communities and the environment. The EPA has selected the final remedies for the Bliss subsite, with cleanup activities scheduled to begin soon.

FINDETT CORPORATION

MISSOURI

EPA ID# MOD006333975



REGION 7

CONGRESSIONAL DIST. 09

St. Charles County

1 mile north of St. Charles

Alias:

Hayford Bridge Road Groundwater

Site Description

The Findett Corporation site is a 3-acre active manufacturing facility that is located approximately one mile north of St. Charles in the floodplain of the Mississippi River. The site is approximately 17 miles west of St. Louis. Until 1980, the operation reclaimed heat transfer fluids or oils, some of which contained *polychlorinated biphenyls* (PCBs), and received waste solvents for reclamation or recycling. The company has also custom-blended or manufactured organic chemicals for other firms. The owners stored some reprocessing wastes in a small pond on the site, contaminating it with PCBs. PCBs were subsequently found in on-site soils and on adjacent properties. The Elm Point well field supplies water for St. Charles; its nearest well is about 2,000 feet northeast of the site. Several homes are situated within 1,500 feet of the property. Approximately 50 people live within a mile of the site; 500 people live within 3 miles. Surrounding land use is primarily agricultural, and the site is located in a small industrial park with several other establishments. The land around the site may be used for hunting, although much of it is now farmed.

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

NPL LISTING HISTORY

Proposed Date: 10/15/84

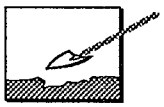
Threats and Contaminants

On-site groundwater contains *volatile organic compounds* (VOCs) including *trichloroethylene* (TCE) and vinyl chloride from process wastes. Off-site *sediments* contain PCBs. PCBs also have been detected in both on- and off-site soils. The soil is also contaminated with VOCs, including TCE. Human health may be adversely affected if people drink contaminated groundwater or come into direct contact with contaminated soils on the property. EPA studies have revealed contamination of shallow groundwater. Deeper groundwater is used as a source of municipal drinking water, although no contamination has been found in the municipal water supply. The site is in the Mississippi River floodplain, increasing the potential for spreading site contamination during flood events.

Cleanup Approach

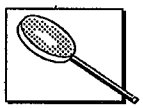
The site is being addressed in three stages: immediate actions and two *long-term remedial phases* focusing on groundwater and soil cleanup and the sources of contamination.

Response Action Status



Immediate Actions: Under monitoring by the EPA, Findett voluntarily cleaned up the contaminated pond area. In 1977, the company excavated and *backfilled* a portion of the pond. In 1979, however, the EPA found that the pond area was still contaminated with PCBs and required further excavation. Sampling after the work showed that PCBs had *migrated* beyond the immediate pond area and into subsurface areas. In 1982, the EPA ordered Findett to determine the nature and extent of PCB soil contamination, as well as the potential for groundwater contamination in the immediate vicinity of its facility. The company installed monitoring wells and analyzed groundwater for PCBs.

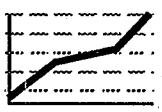
Groundwater and Soil: In 1987, the EPA completed the groundwater investigation. The EPA selected a remedy for this site in 1988. It focuses on groundwater cleanup, but also includes excavation of the soils contaminating the groundwater. The selected remedy includes: (1) installing extraction wells that will both remove the contaminated groundwater and provide hydraulic control; (2) *air stripping* the extracted groundwater; that is, evaporating off the volatile contaminants, and exposing the vapors to absorbent carbon, if necessary; (3) discharging the treated water to the municipal sewage treatment plant; and (4) removing the PCB-contaminated soil for off-site disposal or treatment. Under a *Consent Order,* the owner began the engineering design for the selected remedy in 1989. The cleanup is expected to begin in the summer of 1990.



Source Control: Although the EPA considers Findett Corporation to be a possible source of the VOCs in groundwater, other sources also may exist. The EPA will collect and analyze additional groundwater and soil samples to discover the source of this contamination.

Site Facts: The EPA issued an *Administrative Order* in 1980, and an Administrative Order on Consent in 1982, requiring Findett to conduct further excavation of the contaminated pond area and sampling and analysis to define the PCB contamination in the soil and groundwater. A party potentially responsible for the site contamination has signed a *Consent Decree,* agreeing to conduct cleanup activities.

Environmental Progress

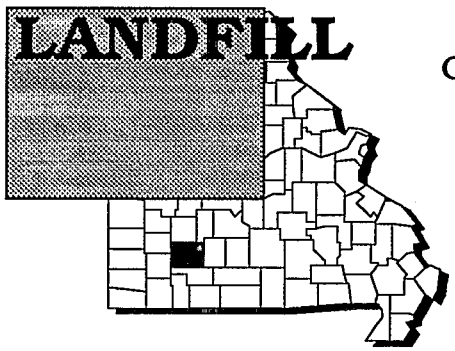


Much of the Findett Corporation site has already been cleaned up, but further work and investigation is required to ensure that the area is safe. Once the investigations on the sources of contamination have been completed, any required additional cleanup work will take place.

FULBRIGHT LANDFILL

MISSOURI

EPA ID# MOD980631139



REGION 7
CONGRESSIONAL DIST. 07
Greene County
3 miles north of Springfield

Aliases:
Springfield Fulbright Landfill
Sac River Landfill
Murray Landfill
Highway 13 Landfill

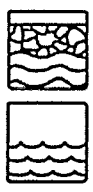
Site Description

The 212-acre Fulbright Landfill site consists of the Fulbright and Sac River *landfills* (formerly known as the Murray Landfill). The City of Springfield used these landfills, both of which are now closed, for the disposal of municipal and industrial wastes. The Fulbright Landfill, consisting of 98 acres, accepted waste from 1962 through 1968; the larger of the two, the Sac River Landfill, which consists of 114 acres, operated from 1968 until 1974. Industrial wastes disposed of in these landfills include cyanides, *acids*, plating and paint *sludges*, pesticide residues, waste oil, and solvents. The contents of between 1,200 and 2,600 drums were dumped into pits at the site with the empty 55-gallon drums left in the pits or in the general landfill areas. In 1967, a waste hauler died from toxic fume inhalation when he inadvertently dumped a drum of acid into a pit containing cyanide. A *sinkhole* on the bluff above the Fulbright Landfill contains a few dozen drums and waste residues. Approximately 400 people work or reside within a mile of the site; an estimated 10,000 people live within a 3-mile radius. The landfill lies in a semi-rural area in the floodplain of the Little Sac River. Surrounding land use includes a police shooting range, a dog pound, an active wastewater treatment plant, and an inactive wastewater treatment plant. The local drinking water supply is drawn from municipal wells. Groundwater is also used for crop irrigation and industrial processes. The nearest population and well are 1,000 feet *upgradient* of the landfills. Surface water in the area is used for recreation.

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

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

Threats and Contaminants



The groundwater contains a wide variety of *volatile organic compounds* (VOCs) and other organic chemicals, as well as heavy metals and cyanide from former waste disposal practices. Chromium was found in *sediments*. Contaminated groundwater flows into the adjacent Sac River, which also receives treated municipal wastewater. The remnants of the drummed waste in the sinkhole may present a direct contact health hazard. Since the landfill is in the floodplain of the Little Sac River, high waters may spread site contaminants.

Cleanup Approach

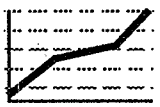
The site is being addressed in a single *long-term remedial phase* focusing on cleanup of the entire site.

Response Action Status

Entire Site: Under monitoring by the EPA, the parties potentially responsible for the site contamination completed an extensive study of the site in 1988. The following remedies were selected for the site: (1) removing drums and drum remnants from the sinkhole and the associated trench east of the Fulbright Landfill; (2) sampling drum contents to establish the hazardous nature of their contents; (3) disposing of the removed contents at an off-site EPA-approved facility; (4) performing groundwater and surface water monitoring for a 30-year maintenance period; (5) monitoring the *leachate* that occasionally *seeps* from the landfill during this period to determine if future action is warranted to curtail it; and (6) imposing deed restrictions to prevent future development on the site and groundwater use prohibitions. Under the EPA's guidance, the parties potentially responsible for contamination at the site are undertaking the engineering design for the cleanup. This design work began in 1989 and is expected to be completed in 1990. The preliminary design documents have been submitted to the EPA for review.

Site Facts: In March 1986, the EPA issued a *Consent Order* to the City of Springfield, Litton Industries, Inc., and Litton Business Systems, Inc., which had all been identified as potential responsible parties for the site contamination. The Order required them to conduct an extensive site investigation under EPA's oversight. In January 1990, the EPA issued a *Consent Decree* for the potentially responsible parties to design the selected cleanup remedies and to conduct cleanup activities at the site.

Environmental Progress

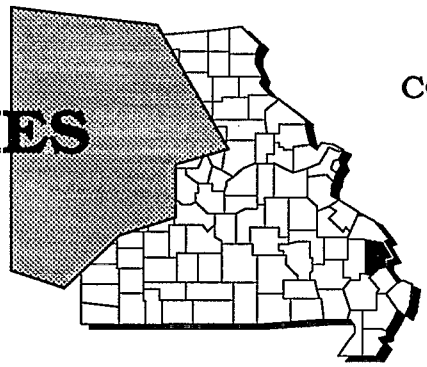


After adding the Fulbright Landfill site to the NPL, the EPA assessed site conditions and determined that there were no immediate actions needed while studies and long-term cleanup activities are taking place. The cleanup technologies for the Fulbright Landfill site have been selected by the EPA, and cleanup activities will be started by the potentially responsible parties as soon as the engineering designs have been completed.

KEM-PEST LABORATORIES

MISSOURI

EPA ID# MOD980631113



REGION 7

CONGRESSIONAL DIST. 08

Cape Girardeau County

Near Cape Girardeau

Site Description

The Kem-Pest Laboratories site covers 6 acres and is located near Cape Girardeau. Beginning in 1965, Kem-Pest formulated various pesticide products including liquid pesticides, granular insecticides, granular herbicides, and pesticide dust. The company suspended operations in 1975. There have been no production, treatment, or disposal activities at the site since 1977. A building on site has been used to store equipment and materials. A 1,250-square-foot *lagoon* at the facility was formerly used to dispose of plant waste and sewage. When the company closed the lagoon in 1981, it was filled with compacted clay. An EPA inspection in 1983 revealed that the lagoon cover was eroding and that no vegetation existed on the clay *cap*. Cape Girardeau, with a population of 60,925, draws drinking watyer from the Mississippi River, located less than 1 mile downstream of the site. Approximately 200 people live within 1 mile of the site, and 1,284 live within 3 miles. The site is adjacent to the floodplain of the Mississippi River. A freshwater *wetland* is located within a mile of the site.

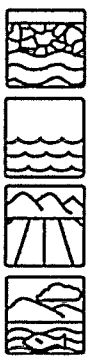
Site Responsibility: This site is being addressed through Federal and *potentially responsible parties'* actions.

NPL LISTING HISTORY

Proposed Date: 01/22/87

Final Date: 10/04/89

Threats and Contaminants



Sampling in 1984 and 1989 detected pesticides including heptachlor, chlordane, and endrin in the shallow *aquifer*. Drainage channel *sediments* contained pesticides including aldrin and dieldrin. Pesticides and various *volatile organic compounds* (VOCs) were detected in subsurface and surface soil samples. Potential risks may exist for those who come in direct contact with the contaminated building structures or the soil on the site.

Cleanup Approach

The site is being addressed in two *long-term remedial phases* focusing on cleanup of the soil and sediments and cleanup of the groundwater and the contaminated on-site structure.

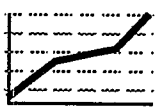
Response Action Status

Soil and Sediments: In 1984, the EPA installed five monitoring wells on site and collected groundwater, soil, and sediment samples. In 1988, the parties potentially responsible for site contamination sampled soils from the lagoon. The EPA will excavate approximately 4,050 cubic yards of contaminated soil and sediment and will dispose of them at a federally approved off-site land disposal facility. Sampling will be conducted to confirm that all contaminated soils are removed. Following excavation, clean soil will be placed in the excavated areas and will be compacted and graded. Vegetation or gravel will then be applied to the surface to minimize erosion. The design of the technologies to be used in the cleanup is scheduled to be completed in 1990.

Groundwater and On-Site Structure: In 1988, the parties potentially responsible for site contamination conducted sampling of the contaminated building structure. An intensive study was initiated in 1989 by the EPA to determine the extent of groundwater contamination and the extent of the contamination to the building on site. The EPA is currently considering options to decontaminate and demolish the building and is reviewing various groundwater treatment options.

Site Facts: Pursuant to an *Administrative Order on Consent* entered into in November 1988, the parties potentially responsible for the contamination conducted sampling of soils from the lagoon and the formulation building in December 1988.

Environmental Progress

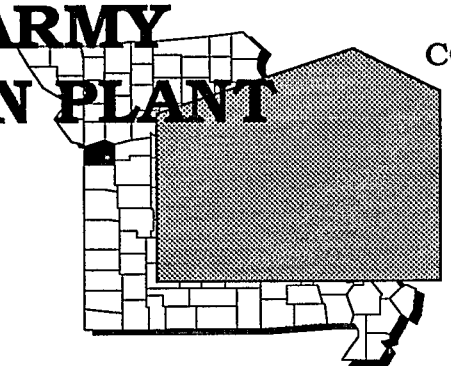


After adding the site to the NPL, the EPA performed a preliminary evaluation and determined that no immediate actions were necessary to protect the nearby population or the environment while investigations leading to a final cleanup solution are taking place.

LAKE CITY ARMY AMMUNITION PLANT

MISSOURI

EPA ID# MO3213890012



REGION 7

CONGRESSIONAL DIST. 04

Jackson County

Independence

Site Description

The Lake City Army Ammunition Plant (LCAAP) extends over 7 square miles. Except for a 5-year period following World War II, the government-owned but contractor-operated small arms ammunition plant has operated since 1941. Virtually all waste treatment and disposal activities have been conducted on site. LCAAP has relied heavily on *lagoons*, *landfills*, and burn pits for waste disposal. Industrial operations have generated large quantities of potentially hazardous waste including oils, greases, solvents, explosives, and metals. The Northwest Lagoon, the main area of contamination at the site, operated from the early 1950s until 1975. This lagoon received about 900 gallons of hazardous wastes that have been treated, covered, graded, and reseeded. Heavy metals have been detected in an on-site monitoring well, indicating that *closure* of the lagoon was not adequate. There are 11 residences on the grounds served by a series of on-site wells. Adjacent to the northern boundary of the site is Lake City, with a population of approximately 50 people. Almost all private residences off site use groundwater from private wells. There are 18 wells on site that supply water for base personnel. The Missouri River and Little Blue River, located near the site, are used for recreational activities. The population within a 3-mile radius is 3,100.

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

NPL LISTING HISTORY

Proposed Date: 10/15/84

Final Date: 07/22/87

Threats and Contaminants

Groundwater beneath the site, soil, and surface water are contaminated with *volatile organic compounds* (VOCs), as well as heavy metals including arsenic, zinc, and chromium from former waste disposal practices. Potential threats exist for those who accidentally touch or ingest contaminated groundwater, surface water, or soil.

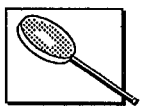
continued

Cleanup Approach

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

Response Action Status

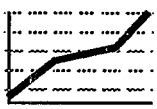
Immediate Actions: *Air strippers* are currently being installed in the plant's drinking water supply facilities to remove contaminants.



Entire Site: The Department of Defense initiated an investigation in 1987 to determine the extent and type of contamination on site and to identify alternative technologies for the cleanup. A second phase of the investigation was completed in 1989 that identified two additional contaminated areas. An *Interagency Agreement* (IAG) between the EPA, the Army, and the State of Missouri was signed in 1989 covering the remaining investigative, design, and cleanup activities throughout the installation.

Site Facts: The plant is participating in the *Installation Restoration Program* (IRP), the specially funded program established in 1978 under which the Department of Defense has been identifying and evaluating its past hazardous waste sites and controlling the *migration* of hazardous contaminants from these sites.

Environmental Progress

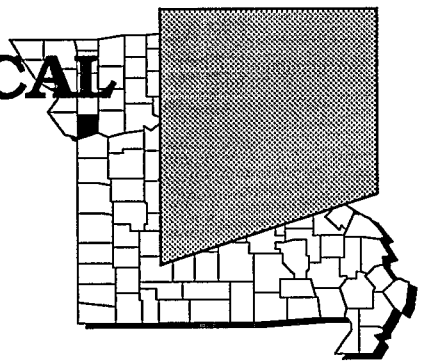


The installation of air strippers in the plant's drinking water supply has greatly reduced the potential for exposure to hazardous substances at the Lake City Army Ammo site while further investigations leading to final cleanup activities are taking place.

LEE CHEMICAL

MISSOURI

EPA ID# MOD980853519



REGION 7

CONGRESSIONAL DIST. 06

Clay County

3 miles southeast of Liberty

Alias:
Liberty Public Water Supply

Site Description

The 1-acre Lee Chemical site was used for packaging a variety of chemicals from 1966 to 1974, when Lee Chemical abandoned the facility. City officials found several hundred drums of chemicals on site in 1976, most of which were removed by the city in 1977. Although the city, which owns the property, has removed the building and visible contamination from the site and taken soil samples, analyses indicate that *trichlorethylene* (TCE) is still present on the site. During a drinking water study in 1980, the EPA sampled the city's water wells and found TCE. Since then, the most contaminated wells have not been used for drinking water. The water from the remaining wells is treated to remove the TCE. There are approximately 24,000 people living within a 3-mile radius of the site. The nearest residence is approximately 1/4 mile from the site. The City's drinking water supply wells are 1/4 mile away from the site; abandoned, unplugged drinking water supply wells are also on the site. There are several irrigation wells near the site. Industrial and commercial facilities near the facilities use groundwater for cooling or process water.

Site Responsibility: The site is being addressed through a combination of Federal, City, and State actions.

NPL LISTING HISTORY

Proposed Date: 10/15/84

Final Date: 06/10/86

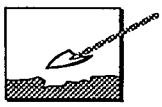
Threats and Contaminants

The groundwater, surface water, and soil are contaminated with TCE. Contaminated groundwater, surface water, and soil could adversely affect the health of individuals through direct contact or ingestion. In addition, *bioaccumulation* of contaminants in fish, water fowl, livestock, and commercial agricultural products may be another exposure pathway. The Town Branch of the Shoal Creek is located approximately 2,000 feet *downslope* from the site and receives contaminated water discharged from one city well and an on-site extraction well. The creek empties to the Missouri River about 1 mile downstream.

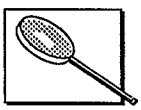
Cleanup Approach

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

Response Action Status

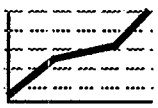


Immediate Actions: The City removed several hundred barrels of chemicals, and arranged to clear the land surrounding the old treatment plant left by Lee Chemicals. In 1983, a contractor working for the City demolished the plant, cleared the site, and disposed of the waste material. The City has monitored the well water and drinking water and managed the use of supply wells to minimize TCE in the drinking water. The City installed two new supply wells in 1982.



Entire Site: The City is studying the extent and nature of the contamination. The work is scheduled to be completed in 1990. The EPA continues to provide the City of Liberty with technical assistance in implementing temporary cleanup measures.

Environmental Progress

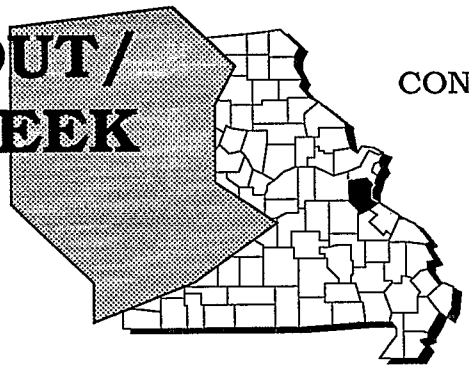


The immediate actions described above, including the removal of contaminated barrels from the site and the monitoring of well water, have greatly reduced the potential for exposure to hazardous substances at the Lee Chemical site while the City of Liberty continues further studies into the nature and extent of the contamination.

MINKER/STOUT/ ROMAINE CREEK

MISSOURI

EPA ID# MOD980741912



REGION 7

CONGRESSIONAL DIST. 03

Jefferson County

Near Imperial

Site Description

The Minker/Stout/Romaine Creek site covers about 10 acres of non-contiguous properties near Imperial. One of the properties, the Bubbling Springs Ranch horse arena, was sprayed with dioxin-contaminated oil for dust control. Afterward, several horses became ill, and seven died. The horse arena was excavated in 1972 and the dioxin-contaminated soil was used as fill material in residential areas, including the Minker, Stout, Cashel, and Sullins residences. Much of the fill from the Minker residence eroded into Romaine Creek. In 1983, the EPA detected dioxin in the soil on site and in *sediments* of Romaine Creek. Approximately 500 people live within 1 mile of the site. The sediments of Romaine Creek are contaminated as far as 6,000 feet downstream; however, the creek is not used as a drinking water source.

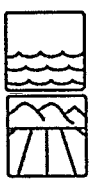
Site Responsibility: This site is being addressed through Federal actions.

NPL LISTING HISTORY

Proposed Date: 12/30/82

Final Date: 09/08/83

Threats and Contaminants

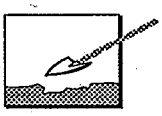


The sediments, soil, and surface water from Romaine Creek are contaminated with dioxin from the soil that was used as fill in the residential areas. People who come into direct contact with or accidentally ingest the contaminated soil or sediments may be at risk. The fish of Romaine Creek may pose a health hazard if eaten.

Cleanup Approach

This site is being addressed in five stages: immediate actions and four *long-term remedial phases* focusing on soil cleanup, cleanup of Romaine Creek, the Stout area, and relocation activities.

Response Action Status



Immediate Actions: Between 1985 and 1989, the EPA excavated about 1,200 cubic yards of soil at the Minker area, and at the Sullins and Cashel residences. The soil was placed in steel storage structures at the Minker area.

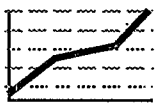
Soil: The EPA selected a remedy to clean up the soil which includes thermally treating previously excavated contaminated soils from this site at the Times Beach site, another dioxin-contaminated site. The soil will be incinerated, which permanently removes the contaminants. The ash from the incinerator will be disposed of on the Times Beach site. The excavated areas will be *backfilled* with clean soil. The design of the remedy is currently being prepared in coordination with the remedy design for the Times Beach site.

Romaine Creek: In 1987, the EPA selected a remedy to clean Romaine Creek which included excavating the contaminated soil and sediments and temporarily storing them in steel structures on site. The excavated areas were backfilled with clean material suitable for a natural creek. In 1989, the EPA completed all the cleanup work at Romaine Creek.

Stout Area: In 1987, the EPA selected a remedy to clean the Stout property which included excavating the contaminated soil and placing it in interim on-site storage. The EPA completed all cleanup activities at the Stout property in 1988.

Relocation: In 1983, the EPA permanently relocated 12 families; two other families were temporarily relocated during excavation of the Minker Area. The families will be returned to their residences once cleanup activities are completed at the sites.

Environmental Progress

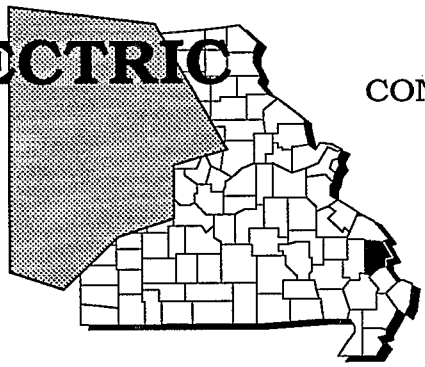


The relocation of affected residents and the excavation of contaminated soils and sediments from Romaine Creek and the Stout Area have greatly reduced the potential for exposure to hazardous materials at the Minker/Stout/ Romaine site while the EPA completes the remaining cleanup activities.

MISSOURI ELECTRIC WORKS

MISSOURI

EPA ID# MOD980965982



REGION 7

CONGRESSIONAL DIST. 08

Cape Girardeau County

Cape Girardeau

Site Description

The 6 1/2-acre Missouri Electric Works site, in operation since 1953, sells, services, and reconditions electric motors, transformers, and transformer controls. In addition, it recycles transformer oil and copper wire. The transformer oil was filtered and reused, with about 90% being salvaged. The remaining waste oil was either sold to local residents for dust control purposes, disposed of by a contractor, or simply allowed to leak or spill onto the ground around the facility. Some waste oil reportedly was burned on site. The total amount of waste oil generated was about 28,000 gallons. The facility has been issued an order prohibiting the company from accepting electrical equipment containing oil with high *polychlorinated biphenyls* (PCBs) levels. Approximately 37,800 people live within 3 miles of the site, while 1,000 people live within 1 mile of the site. The land around the site is used for industrial and commercial purposes. Prime agricultural land is less than a mile away. The Mississippi River, 2 miles from the site, is used for fishing, recreational and commercial boating, and swimming. The Cape La Croix Creek, which flows into the Mississippi, receives *runoff* from the site through a series of drainage ditches. Most of the water needs of the City of Cape Girardeau are provided for by the Mississippi River. However, groundwater from a public well 2 miles south of the site supplements river water during peak demand periods. A *wetland* area is located immediately south of the site.

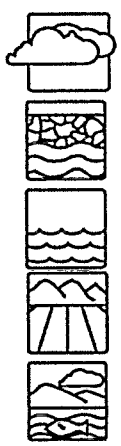
Site Responsibility: This site is being addressed through Federal and *potentially responsible parties'* actions.

NPL LISTING HISTORY

Proposed Date: 06/24/88

Final Date: 02/21/90

Threats and Contaminants



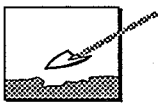
The EPA found PCBs from site operations in the air on and off the site in 1987. The soils in the area are permeable, and the bedrock is highly fractured. These conditions have made it easier for PCBs and *volatile organic compounds* (VOCs) such as *trichloroethylene* (TCE) to flow into the groundwater. VOCs have been found in the groundwater below the site. *Sediments* in channels draining the site and areas off site contain PCBs. PCB contamination of the soil is widespread and occurs to a depth of at least 5 feet from leakage and disposal of contaminated transformer oil. Residents who eat produce from gardens near the site could be at risk from the contaminated soil. Breathing contaminated airborne dust near the site could affect the health of those on or near the site.

continued

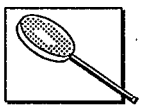
Cleanup Approach

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

Response Action Status



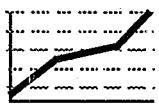
Immediate Actions: The potentially responsible parties erected barriers to stop PCBs from *migrating* off-site via drainage ditches and conducted sampling of a structure on site. When it was determined that the potentially responsible parties did not adequately perform these activities, the EPA resampled the structure and erected new barriers across the drainage ditches to reduce the migration of PCB-contaminated soil off site.



Entire Site: The EPA currently is monitoring a study by the parties potentially responsible for the site contamination regarding the nature and extent of contamination of the site. The EPA is planning to issue a final decision on the methods for cleanup in 1990. Some of the remedies that the EPA is considering include on-site incineration and treatment using micro-organisms to degrade the contaminants.

Site Facts: Over 100 parties potentially responsible for site contamination have signed an *Administrative Order on Consent* to study site contamination and the feasibility of various technologies for cleanup.

Environmental Progress

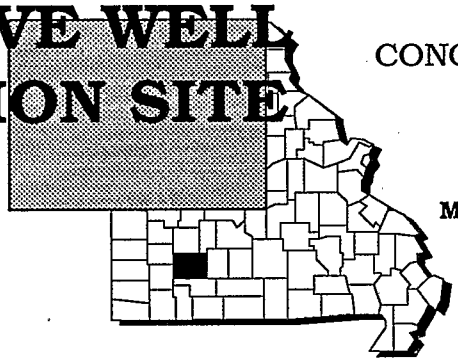


The immediate actions undertaken by the EPA and the potentially responsible parties have greatly reduced the potential for exposure to hazardous substances at the Missouri Electrical Works site while a complete site investigation is being conducted and long-term cleanup activities are started.

NORTH U DRIVE WELL CONTAMINATION SITE

MISSOURI

EPA ID# MOD007163108



REGION 7

CONGRESSIONAL DIST. 07

Greene County

North of Springfield

Alias:
Montgomery Metal Craft

Site Description

In 1983, the residents near the North U Drive Well Contamination site became concerned over the taste of their water. When the State investigated, it was discovered that seven private wells at five locations were contaminated with *volatile organic chemicals* (VOCs). The EPA extended public water supply lines to the affected homes. The source of the contamination is unknown; however, it is reported that *sinkholes* in the area were used for the disposal of waste petroleum products. There is no defined site boundary. This site is a rural residential area with approximately 300 people living within a 1/4 mile radius. The contaminated wells are 1,500 feet west of Fulbright Spring, a major water source for the City of Springfield, which has a population of 133,000.

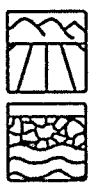
Site Responsibility: This site is being addressed through Federal and State actions.

NPL LISTING HISTORY

Proposed Date: 10/15/84

Final Date: 06/10/86

Threats and Contaminants

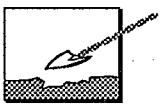


Soil and groundwater in the private wells are contaminated with VOCs including toluene and benzene. The majority of the private wells have been plugged and, therefore, do not pose a health threat. However, a few owners have refused to have their wells plugged, and people who use the contaminated drinking water may suffer adverse health effects. Although these wells are reportedly only used for lawn watering, their continued existence may provide a subsurface connection among the *aquifers* beneath the site. Because the bedrock is fractured, it allows contaminants to *migrate* from the immediate area, possibly in the direction of a source well for the Springfield community water supply.

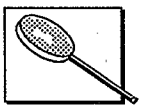
Cleanup Approach

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

Response Action Status

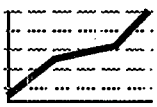


Immediate Actions: In 1985, the EPA extended the Springfield public water supply lines to North U Drive. In addition, 67 private wells were permanently plugged to prevent their use.



Entire Site: The State of Missouri is conducting an investigation to determine the extent of contamination at the site. Once the investigation is completed, alternatives for the cleanup will be reviewed and selected, and cleanup activities will begin.

Environmental Progress

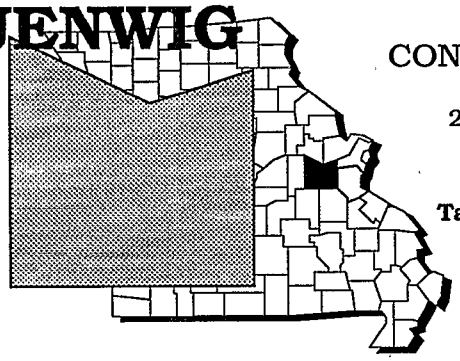


The immediate actions described above have eliminated the potential of exposure to hazardous substances in the drinking water, and will continue to protect households around the North U Drive Well Contamination site until the final cleanup remedies are selected and long-term cleanup takes place.

ORONOGO-DUENWIG MINING BELT

MISSOURI

EPA ID# MOD980686281



REGION 7

CONGRESSIONAL DIST. 07

Jasper County

2 miles northeast of Joplin

Aliases:

Tar Creek-Jasper Company

Tri-State Mining Area

Site Description

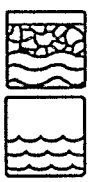
The Oronogo-Duenwig Mining Belt site, which covers 6,400 acres, is considered part of the Tri-State Mining District of Missouri, Kansas, and Oklahoma. Two other sites in the district, Cherokee County in Kansas and Tar Creek in Oklahoma, were placed on the NPL in 1983. Lead and zinc ores, as well as some cadmium ores, were mined from 1848 to the late 1960s, with the greatest activity occurring in an area between Oronogo and Duenwig, northeast of Joplin. Mining efforts were originally performed by independent operations that, in later years, were organized by several area mining companies. The site is honeycombed with underground workings, pits, shafts (open, closed, and collapsed), *mine tailings*, waste piles, and ponds holding tailing waters. An estimated 10 million tons of wastes or tailings are on the site. Throughout the mining era, groundwater had to be pumped to prevent the flooding of mines. When mining ceased, the shafts and underground workings filled with water. Tailing piles have been left uncovered and *unstabilized. Leachate* and *runoff* from the piles can enter open shafts and pits. Approximately 1,500 people obtain drinking water from private wells within 3 miles of the site.

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

NPL LISTING HISTORY

Proposed Date: 06/24/88

Threats and Contaminants



Tests conducted in 1977 by the U.S. Geological Survey found on-site groundwater and surface water to be contaminated with heavy metals including lead, zinc, and cadmium from the mining operations. Potential risks may exist through drinking contaminated surface water and groundwater or coming into direct contact with contaminated water.

Cleanup Approach

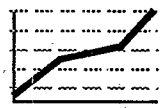
This site is being addressed in a single *long-term remedial phase* focusing on cleanup of the entire site.

Response Action Status

Entire Site: An investigation by the EPA into the extent and type of contamination at the site is scheduled to begin in 1990. Once the investigation is completed, alternatives for cleanup will be reviewed and selected, and cleanup work will begin.

Site Facts: This mining site is potentially eligible for cleanup funds from the State of Missouri's approved program under the Surface Mining Control and Reclamation Act of 1977. The EPA is developing a policy for listing such sites. This site was proposed for the NPL to avoid delay in starting cleanup activities.

Environmental Progress

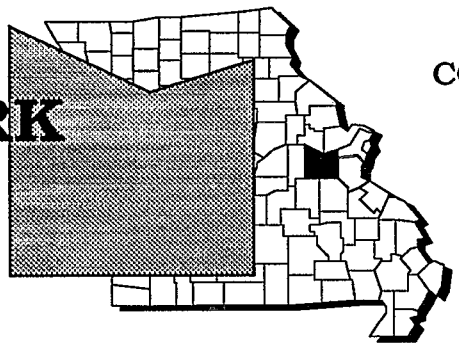


After adding this site to the NPL, the EPA performed preliminary investigations and determined that no immediate actions were needed at the Oronoga-Duenwig Mining Belt site while further studies are under way to determine the final cleanup remedy.

QUAIL RUN MOBILE PARK

MISSOURI

EPA ID# MOD980688634



REGION 7

CONGRESSIONAL DIST. 09

Franklin County

2 miles east of Gray Summit

Aliases:
Trailer Park in Gray Summit
Chalandra Property
Bell Mobile Home,
Gray Summit Trailer Park
Mahaney Residence

Site Description

Quail Run Mobile Manor is a 10-acre trailer park with 32 occupied units located 2 miles east of Gray Summit. In the early 1970s, the road through the park was sprayed with an unknown quantity of dioxin-contaminated waste oil. In 1983, the EPA identified high concentrations of dioxin in soil samples from many locations within the park. In 1974, some of the soil was excavated from the road and deposited in the area between the road and a *lagoon*, as well as on two nearby properties. In 1983, residents of Quail Run Mobile Manor were temporarily relocated to permit cleanup of the site. The excavation and *containment* of dioxin-contaminated soils were completed in fall 1986. The residents were allowed to return, and the mobile park was renamed Fox Creek. The dioxin-contaminated soil remains on the back portion of the property in EPA-approved storage facilities. The population within 1 mile of the residential area is estimated at 1,000 people, with approximately 10,000 people living within 3 miles of the site.

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

NPL LISTING HISTORY

Proposed Date: 09/08/83

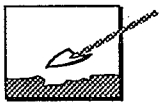
Threats and Contaminants

The soil is contaminated with dioxins. In 1983, the U.S. Center for Disease Control issued a health advisory warning that the residents were at risk of developing adverse health effects if they remained in their homes. The public and the residents were advised to avoid contact with or ingestion of contaminated soils.

Cleanup Approach

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

Response Action Status

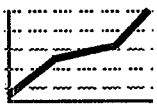


Immediate Actions: The EPA temporarily relocated 28 of 33 households. Cleanup action was begun by the EPA in early 1985. The EPA decontaminated mobile homes and excavated the dioxin-contaminated soil from Quail Run and the nearby Mahaney and Chlanda properties. The contaminated soil is currently being stored on site in an EPA-approved facility.

Entire Site: Because of the similarity of the dioxin contamination at the Quail Run site with the Times Beach site, the study has been included as part of the Times Beach site study. Soil stored at Quail Run will be incinerated at Times Beach.

Site Facts: Some of the residents in the Quail Run Mobile Park had previously moved from Times Beach, which also had a dioxin contamination problem.

Environmental Progress

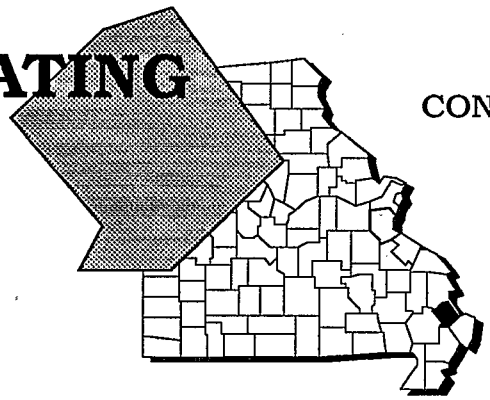


EPA has taken steps to protect local residents by relocating affected households and isolating the dioxin-contaminated soils. Additional cleanup activities will be required to transport soils presently stored on site to the Times Beach site for final destruction of dioxins by incineration.

QUALITY PLATING

MISSOURI

EPA ID# MOD980860555



REGION 7

CONGRESSIONAL DIST. 08

Scott County

Sikeston

Site Description

The Quality Plating Site covers approximately 5 acres in Sikeston. The site originally consisted of a 1-acre unlined *lagoon* and the manufacturing plant. From 1978 until the facility was destroyed by fire in early 1983, Quality Plating was engaged in contract electroplating of common and precious metals. Untreated wastewater originating from the flow-through rinse tanks, as well as *acid,* alkaline, and metal-plating batch solutions, was continuously discharged into the lagoon at a rate of at least 10,000 gallons per day. The State detected elevated levels of chromium and lead in an on-site well. The area is now used for agriculture and raising livestock. The present owner raises hogs and calves on the former property of Quality Plating. The population within 1 mile of the site is 120 people. Six residences within 1/4 mile of the site obtain drinking water from shallow wells.

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

NPL LISTING HISTORY

Proposed Date: 10/15/84

Final Date: 06/10/86

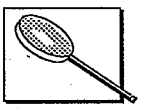
Threats and Contaminants

The groundwater is contaminated with metals such as lead and chromium from the former electroplating operations. The extent of the contamination is unknown. Drinking and bathing with the contaminated groundwater could potentially cause adverse health effects.

Cleanup Approach

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

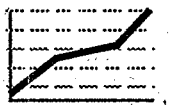
Response Action Status



Entire Site: Under monitoring by the EPA, the State will begin an investigation of the site and alternative cleanup methods in early 1991. It is expected to be completed by late 1992.

Site Facts: The State has repeatedly cited the company for discharging untreated plating waste into subsurface waters. This was in violation of the company's permit under the National Pollutant Discharge Elimination System. The EPA and the State have entered into a *Cooperative Agreement* to perform a study at the site led by the State.

Environmental Progress



After adding the Quality Plating site to the NPL, the EPA conducted a preliminary evaluation and determined that no immediate actions were needed to make the site safer while the investigations into the cleanup alternatives are taking place.

SHENANDOAH STABLES

MISSOURI

EPA ID# MOD980685838

REGION 7

CONGRESSIONAL DIST. 09

Lincoln County

Moscow Mills

Aliases:
Arena 1 - Shenandoah Stables
Highway 61 Fill
Slough Area

Site Description

The Shenandoah Stables site covers about 7 acres near Moscow Mills. In 1971, the horse arena became contaminated with dioxin when a St. Louis waste oil hauler sprayed it with approximately 2,000 gallons of contaminated oil for dust control. Afterward, numerous birds, rodents, and over 40 horses died. Several adults and children also became ill. In 1971, the top 6 to 8 inches of contaminated soil were excavated and used as fill material in a new highway. In 1972, more soil was removed from the arena and placed in a swampy area on site. EPA sampling in 1982 indicated that the top 30 inches of soil in the arena and soil in the slough is contaminated with dioxin. Approximately nine houses are located in the rural area within a 1/4-mile radius of the Shenandoah Stables. The adjacent properties are mostly agricultural. The nearest residence is approximately 330 feet east of 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

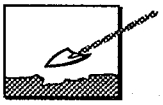
Threats and Contaminants

The soil in the arena and slough is contaminated with dioxin from the placement of contaminated oil on the site and from earlier cleanup attempts. Because cleanup activities have taken place, the site no longer poses a threat to human health or the environment.

Cleanup Approach

The site is being addressed in two stages: immediate actions and a *long-term remedial phase* directed at cleanup of the soil and solid waste.

Response Action Status

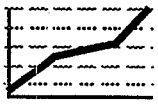


Immediate Actions: In 1988 the parties potentially responsible for the site contamination closed the stables, posted warning signs, and restricted access to the property. Sampling was also done at this time to determine the amount of contamination at the site.

Soil and Solid Waste: The EPA selected the method for cleanup of the site in summer 1988. These cleanup activities included: (1) excavating the soil to health-based standards; (2) placing the soil in plastic bags and storing the bagged soil on site in an approved facility; (3) decontaminating on-site structures; and (4) fencing and posting the area. The EPA completed the first phase of the remedial action in August 1988. A second cleanup action phase is planned in conjunction with the cleanup of Times Beach. At this time, the bagged soil will be transported to the Times Beach facility to be incinerated.

Site Facts: Pursuant to an EPA *Administrative Order* the parties potentially responsible for site contamination restricted public access to the site in 1983. The site was initially identified due to citizen complaints concerning illnesses in children who had visited the site.

Environmental Progress

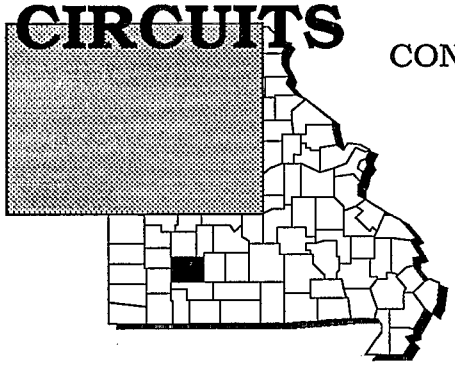


By closing the stables, restricting access to the site, and removing the contaminated soil, the Shenandoah Stables site no longer presents an immediate threat to the community or the environment. Contaminated soils from the site will be transported to the Times Beach Facility for final destruction of dioxins by incineration.

SOLID STATE CIRCUITS

MISSOURI

EPA ID# MOD980854111



REGION 7

CONGRESSIONAL DIST. 07

Greene County
Republic

Alias:
Republic Plant, SSC

Site Description

The Solid State Circuits, Inc. (SSC) site covers 1 acre in Republic. During a 1980 drinking water study, *trichloroethylene* (TCE), a volatile organic chemical, was detected in one of the City of Republic's public water supply wells. Further investigation by the State identified the site, at which SSC formerly manufactured printed circuit boards, as the source of the contamination. Allegedly, barrels of solvents, including TCE that was used as a copper residue stripper, and plating wastes were stored in a *sump* pit in the basement of the facility. The State learned that after a fire destroyed the building, the new property owner (not SSC) buried the remaining structure and its contents in the basement, where there also was an unplugged well. SSC excavated material from the basement and installed three monitoring wells in response to an order from the State. The Town of Republic, with an estimated population of 5,535, is potentially endangered by contaminated groundwater. There are private wells and community wells within a 3-mile radius of the site. One community well was closed as a result of the the contamination. Schuyler Creek is located *downgradient* from the site, approximately 2 miles away.

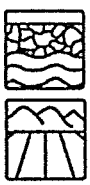
Site Responsibility: This site is being addressed through Federal, State, and *potentially responsible parties'* actions.

NPL LISTING HISTORY

Proposed Date: 10/15/84

Final Date: 06/10/86

Threats and Contaminants

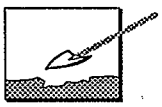


Groundwater on and off site is contaminated with *volatile organic compounds* (VOCs), including TCE, methylene chloride, and chloroform from the former site operations. TCE was measured in on-site soil prior to immediate response actions. Removal of contaminated surface and subsurface soils eliminated exposure. Sewer line and utility workers could be exposed to contaminated groundwater; however, standard safety procedures eliminate unacceptable risks.

Cleanup Approach

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

Response Action Status

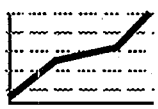


Immediate Actions: In 1985, following SSC's initial cleanup actions at the site, the EPA removed approximately 2,000 cubic yards of soil from the basement, the soil underneath the basement, and debris to further *stabilize* the site. The basement was sealed with a gravel and soil cover to bring it up to grade. The EPA plugged the abandoned well, and two wells were installed to extract contaminated groundwater.

Entire Site: Under the supervision of the State, SSC conducted an investigation at the site to determine the extent and nature of contamination and to identify alternative technologies for cleanup. As a result of the investigation, SCC will extract the contaminated groundwater by using new and existing wells; perform on-site treatment of extracted groundwater using two existing *air strippers*; discharge treated water to the city sewer system to receive further treatment at the publicly owned treatment works; and implement a city ordinance to prevent construction of drinking wells in or near the contaminated groundwater *plumes*. Monitoring of the groundwater will continue to ensure groundwater quality.

Site Facts: The Missouri Department of Natural Resources and Solid State Circuits signed a *Consent Decree* in November 1986 requiring SSC to conduct an investigation of the contamination at the site, under the supervision of the State. In November 1986, the EPA referred a case to recover costs for the 1985 immediate response action to the Department of Justice (DOJ). EPA and DOJ entered into settlement negotiations with SSC in early 1987, which were concluded in March 1988.

Environmental Progress

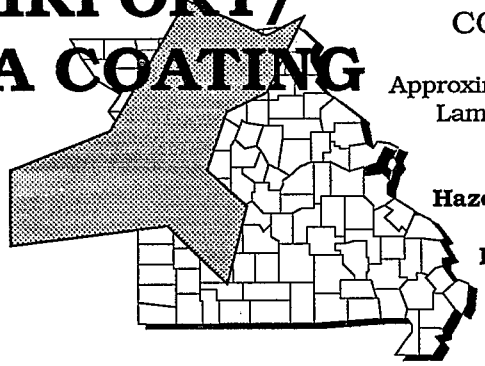


After the initial cleanup actions undertaken by Solid State Circuits, the EPA removed contaminated soil and debris, sealed the basement area, and installed wells to extract and treat the contaminated groundwater. Further investigations leading to the selection of a long-term remedy for the site have been completed and the final cleanup activities are scheduled to begin in 1991.

ST. LOUIS AIRPORT/ HIS/FUTURA COATING

MISSOURI

EPA ID# MOD980633176



REGION 7

CONGRESSIONAL DIST. 02

St. Louis County

Approximately 15 miles northwest of downtown Lambert/St. Louis International Airport

Aliases:
Hazelwood Interim Storage & Vicinity
Latty Avenue
Lambert-St Louis Intnl Airport

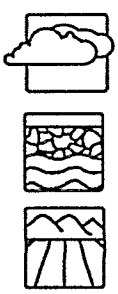
Site Description

The St. Louis Airport/Hazelwood Interim Storage/Futura Coatings Co. site consists of three areas covering approximately 32 acres. These areas were used for storing radioactive and other wastes resulting from uranium processing operations conducted in St. Louis. Radioactive scrap, drums of waste, and bulk waste were stored in the airport area in uncovered and *unstabilized* piles from 1947 to the mid-1960s, when they were transferred to the 9200 Latty Avenue area, later known as the Hazelwood Interim Storage (HIS) site. Buildings in the airport area were razed, buried, and covered with clean fill after 1967. In 1973, the land was conveyed to the St. Louis-Lambert Airport Authority. The HIS and the Futura Coatings Co. plant cover 11 acres adjacent to Coldwater Creek. In 1966, Continental Mining and Milling Co. acquired the property and recovered uranium from wastes purchased from AEC's St. Louis operations. In 1967, the company sold the property, and by 1973 most processing residues had been removed. Under the direction of the Nuclear Regulatory Commission (NRC), the present owner excavated contaminated soil and is storing it in two large piles in the eastern portion of the 11 acres. Since the 1970s, Futura Coatings, a manufacturer of plastic coatings, has leased the western portion of the site. A McDonnell Douglas office building housing 24,000 employees is within 1/2 mile of the airport area. An estimated 35,420 people reside within 3 miles of the site.

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

NPL LISTING HISTORY
Proposed Date: 04/28/89
Final Date: 10/04/89

Threats and Contaminants

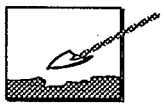


Radon-222 was present in the air near the airport area in the tests conducted by a U.S. Department of Energy contractor in 1986. High levels of uranium, thorium, and radium are present in groundwater near the airport area and in surface and subsurface soils. Direct contact with or accidental ingestion of contaminated soils or groundwater on or near the sites may pose risks to individuals.

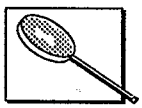
Cleanup Approach

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

Response Action Status

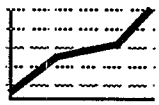


Immediate Actions: In 1984, The U.S. Department of Energy (USDOE) cleared the HIS and Futura Coatings areas, constructed a vehicle decontamination facility, installed a perimeter fence, excavated and *backfilled* the edges and shoulders of Latty Avenue, and consolidated the resulting contaminated soils into one storage pile. In 1986, during a city road improvement project, contaminated soil from roads leading to and from all three areas was excavated.



Entire Site: USDOE has investigated the site under its Formerly Utilized Sites Remedial Action Program (FUSRAP). In 1982, USDOE conducted preliminary studies of radioactive contamination in the ditches along the sides of the roads leading to and from the areas. In 1986, *boreholes* were drilled to continue the contamination study and to collect geological information. USDOE is continuing studies of all the site areas, which will lead to additional cleanup actions. A more comprehensive investigation began in 1990 to determine the full extent of groundwater and soil contamination and to identify alternative technologies for the cleanup.

Environmental Progress

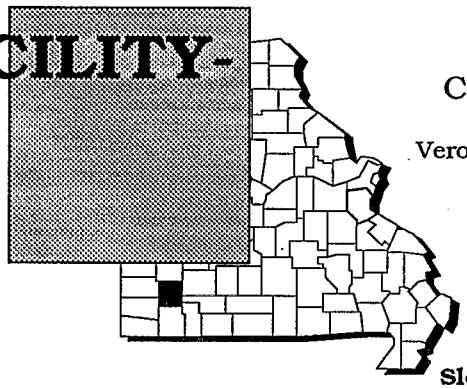


The USDOE is conducting intensive investigations into the cleanup alternatives for the St. Louis Airport site. Until these investigations are completed, the interim measures described above have reduced the potential for exposure to hazardous materials and further contamination at the site.

SYNTEX FACILITY-VERONA

MISSOURI

EPA ID# MOD007452154



REGION 7

CONGRESSIONAL DIST. 07

Lawrence County

Verona, 30 miles southwest of Springfield

Aliases:
Spring River Basin
Syntex Tank Spill Area
Hoffman-Taff Lagoons-Former
Syntex Detoxification Area
Syntex Trenches
Slough Area-Hoffman/Taff Lagoons

Site Description

Syntex Agribusiness, Inc. is a 180-acre site located in rural, predominantly agricultural Verona. Syntex acquired the plant in 1969 from the Northeastern Pharmaceutical Chemical Company (NEPACCO), and since 1971 has produced vitamins and prepared animal feeds and feed ingredients. From 1969 to 1971, NEPACCO leased a portion of the facility from Syntex and used it to manufacture hexachlorophene. The production of hexachlorophene generated the by-product dioxin. Dioxin residues were disposed of in five areas at the Verona facility. The major areas identified as being contaminated are: the slough area, *lagoon* area, spill area/irrigation area, burn area and trench area. In 1989, Syntex excavated and transported the lagoon wastes to a mobile incinerator to destroy the dioxin. The incineration was completed in 1989. The population within 3 miles of the Syntex Agribusiness, Inc. site is approximately 650 people. The active portion of the facility is located within the Spring River 100-year floodplain.

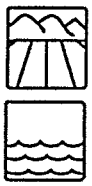
Site Responsibility: This site is being addressed through Federal and *potentially responsible parties'* actions.

NPL LISTING HISTORY

Proposed Date: 12/30/82

Final Date: 09/08/83

Threats and Contaminants



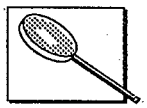
The fish in the Spring River were contaminated with dioxin up to 12 miles downstream. The soil, pools and puddles on the site are also contaminated with dioxin. Exposure to dioxin-contaminated soil, drinking contaminated water, and eating fish that have been contaminated by dioxin could present a health threat.

Cleanup Approach

The site is being addressed in two *long-term remedial phases* focusing on cleanup of dioxin-contaminated materials and cleanup of the groundwater.

Response Action Status

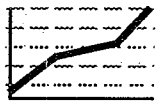
Dioxin-Contaminated Soils and Equipment: Syntex and the EPA reached an agreement on the cleanup methods to be used at the site. The selected cleanup methods include: (1) excavating and off-site thermal treatment of dioxin-contaminated soil that exceed a health-based criteria for an industrial site; (2) dismantling and decontaminating equipment with a series of solutions and water rinses; and (3) installing a clay *cap* with a *vegetative cover* over the trench area and portions of the slough area and revegetating areas contaminated with dioxin below the action level. Syntex removed contaminated soil and transported it off site for incineration. The ash residue was disposed of off site as well. This action also involved clay capping and revegetating over the trench area and all areas where waste levels were below 20 parts per billion (ppb). The final cleanup action will also include decontamination of the equipment at the site. Decontamination and dismantling of contaminated photolysis and old NEPACCO equipment was not initiated until March 1990 and is expected to continue through June 1991.



Groundwater: Syntex has begun an investigation of the site groundwater and will present potential remedial cleanup alternatives to the EPA in 1991 for review and selection of the final cleanup remedy.

Site Facts: In August 1982, Syntex signed a *Consent Order* with the EPA agreeing to study the disposal sites and Spring River under the Resource Conservation and Recovery Act (RCRA). On September 6, 1983, Syntex Agribusiness and the EPA entered into a *Consent Agreement* which outlined the plan for cleanup of the Syntex site.

Environmental Progress

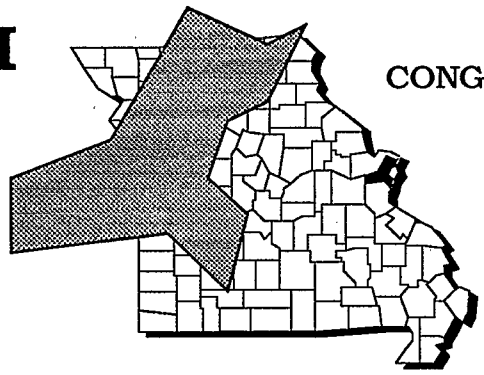


Much of the cleanup work at the Syntex site has been completed. Contaminated soils have been removed and areas of former contamination have been capped and revegetated, actions which have greatly reduced the potential for exposure to dioxin-contaminated soil or surface water at the site while further investigations into a cleanup remedy for groundwater are taking place. Dioxin levels in Spring River fish populations have steadily decreased over the past several years.

TIMES BEACH

MISSOURI

EPA ID# MOD980685226



REGION 7

CONGRESSIONAL DIST. 02

St. Louis County

City of Times Beach

Site Description

The Times Beach site comprises an area of 1 square mile and is located 20 miles southwest of St. Louis. The site is a formerly incorporated city whose road system was sprayed annually with waste oil for dust control in the early 1970s. The oil was later found to be contaminated with dioxin during an investigation by the EPA of the city's road systems in 1982. During the same period, the nearby Meramec River flooded the city, and residents were forced to evacuate their homes. Subsequently, the Centers for Disease Control (CDC) recommended that the residents who had been evacuated, as well as those who had returned following the 1982 flood, be permanently relocated. The EPA transferred funds to the Federal Emergency Management Agency (FEMA) for the permanent relocation of residences and businesses in 1983. By the end of 1986, all residents were permanently relocated. The buy-out of the remaining vacant parcels is anticipated to be completed in 1990. Upon completion of the permanent relocation, title to the site will be conveyed to the State of Missouri. Currently, the site is completely vacant and fenced. All roads leading into the city are blocked and posted with no trespassing signs. The on-site structures of the former city are deteriorating due to the lack of maintenance. Approximately 13,600 cubic yards of soil are contaminated at levels exceeding health-based standards. Approximately 105,000 cubic yards of non-contaminated structures and debris remain on site following the permanent relocation. The site is patrolled by security guards on a 24-hour basis. Most of the former community lies within the 5-year floodplain of the Meramec River. The population within a 1/2-mile radius of the site is approximately 2,000 and includes a trailer park, the community of Crescent, and a portion of Eureka. The site is located in a mixed-use residential and agricultural area.

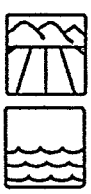
Site Responsibility: This site is being addressed through Federal actions.

NPL LISTING HISTORY

Proposed Date: 03/04/83

Final Date: 09/08/83

Threats and Contaminants



The on-site surface soils along the roadways are contaminated with dioxin. Human exposure to dioxin has been limited by the evacuation of the residents from Times Beach and the repaving of the contaminated road system. On-site workers, security guards, and trespassers could be exposed to dioxin through direct contact or accidental ingestion of dioxin-contaminated media. Fish in the Maremec River show elevated levels of dioxin. Area residents who consume these fish could be exposed to this contaminant. Data indicate that sources downstream of Times Beach are the primary contributors of dioxin into the Meramec River.

continued

Cleanup Approach

The site is being addressed in three *long-term remedial phases* focusing on *stabilization* of Times Beach and three nearby sites, excavation and treatment of the soil and other materials, and the permanent relocation of residents and businesses from the Times Beach area.

Response Action Status

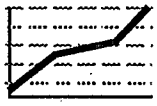
Stabilization: The remedies selected by the EPA in 1984 to stabilize Times Beach and three nearby sites include: (1) construction of an approximately 50,000-cubic-yard interim storage facility at Times Beach; (2) excavation of the dioxin-contaminated soil from the following sites: Minker/Stout/Romaine Creek, Quail Run Mobile Manor, and the Castlewood Area site. The contaminated soils will be transferred to the interim storage facility at Times Beach; (3) response to the contamination of mobile homes at Quail Run Mobile Manor within the guidelines provided in the Superfund's National Contingency Plan; and (4) construction of a series of spur levees to control water velocity during flooding to limit erosion of contaminated soils. In 1985, the EPA raised an existing levee constructed by the Missouri Highway Department as the first phase in the construction of a 3-phase spur levee. In 1989, the second and third phases of the spur levee were completed, including relocation of roadways.

Soil, Structures, and Debris: This phase of the cleanup includes excavation and thermal treatment of contaminated soil and the final disposal of structures and debris. Cleanup activities to be performed include: (1) demolition and disposal of uncontaminated structures and debris at Times Beach in a facility meeting solid waste disposal requirements; (2) construction of a ring levee to protect a temporary thermal treatment unit from a 100-year flood; (3) mobilization of a temporary transportable thermal treatment unit to Times Beach; (4) excavation of all dioxin-contaminated soils at Times Beach exceeding the levels for protection of human health and the environment; (5) thermal treatment of excavated soils to destroy contaminants; and (6) on-site disposal of treatment residue (ash), after receiving EPA approval of its chemical content, in a facility meeting solid waste management requirements. The engineering design for these cleanup activities is currently under way, and is expected to be completed in 1991.

Relocation: This third phase addresses the permanent relocation of residents and businesses and acquisition of all remaining properties. The State of Missouri plans to purchase all the remaining properties from their former owners in 1991. FEMA, the State of Missouri, the trustee for the former City of Times Beach, and St. Louis County have entered into a 4-party contract for permanent relocation. Upon completion of these activities, ownership of the properties will be conveyed to the State of Missouri.

continued

Environmental Progress

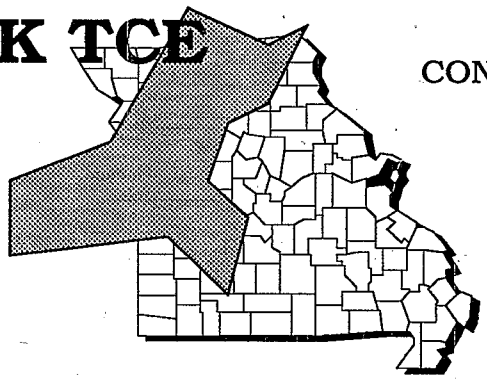


The Times Beach area has been stabilized and numerous cleanup actions have been completed. All residents and businesses have been permanently relocated and the purchase of the remaining parcels by the State of Missouri is scheduled to be completed in 1990. The demolition and disposal of the structures at Times Beach and the removal of dioxin - contaminated soils from other sites will begin soon.

VALLEY PARK TCE

MISSOURI

EPA ID# MOD980968341



REGION 7

CONGRESSIONAL DIST. 02

St. Louis County

Valley Park

Alias:
TCE Study

Site Description

The Valley Park TCE site is in Valley Park, a densely populated urban area. The site is a *plume* of contaminated groundwater in the Meramec River *alluvial aquifer.* In 1982, the Missouri Department of Natural Resources (MDNR) detected a number of *volatile organic chemicals* (VOCs), including *trichloroethylene* (TCE), tetrachloroethene (PCE), and trichloroethane in all three municipal water supply wells serving the community. Private wells within the vicinity of the site are also contaminated with VOCs. However, area private wells have been reported to be used only for industrial purposes. Possible sources of contamination include the large number of industries located in Valley Park, railroad spills which reportedly occurred years earlier, and illegal dumping that may have occurred in the vicinity of the site. There are approximately 3,000 people in the community who obtained drinking water from the impacted groundwater.

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

NPL LISTING HISTORY

Proposed Date: 04/10/85

Final Date: 06/10/86

Threats and Contaminants

The groundwater is contaminated with VOCs including TCE. Drinking water from the contaminated aquifer poses a potential health threat to area residents using polluted groundwater resources.

Cleanup Approach

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

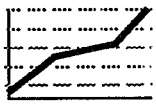
Response Action Status

Immediate Actions: In 1986, Valley Park installed *aeration* equipment at its water plant in order to remove the VOCs that had been detected in the drinking water. In 1989, Valley Park was connected to the St. Louis County public water system, which now supplies its drinking water. Since Valley Park was connected to the County public water system, the residents are no longer using contaminated water for domestic purposes.

Groundwater: Under supervision by MDNR, the parties potentially responsible for contamination are conducting the site investigation that will lead to the selection of a final cleanup remedy.

Site Facts: The MDNR is currently negotiating an agreement with the party potentially responsible for the site contamination, which would have them perform soil removal at the property to eliminate a potential source of contamination.

Environmental Progress

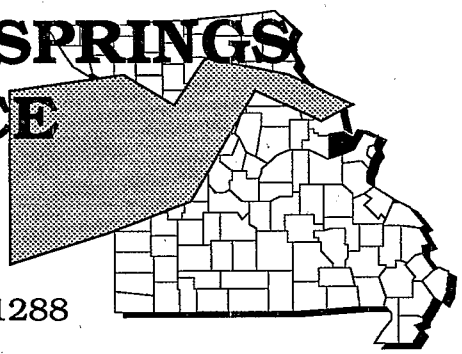


By connecting the affected residences to the public water system, the potential for exposure to contaminated drinking water has been significantly reduced while further investigation leading to the selection of long-term remedy for the groundwater contamination is taking place.

WELDON SPRINGS ORDNANCE WORKS

MISSOURI

EPA ID# MO5210021288



REGION 7

CONGRESSIONAL DIST. 09

St. Charles County

25 miles west of St. Louis

Aliases:
Weldon Springs National Guard Facility
US Army Training Center
Weldon Springs-Ex Army Ordnance Plant
Ft. Leonard Wood

Site Description

The Weldon Spring Ordnance Works site occupied more than 17,000 acres and operated from 1941 to 1944. During its operation, the site produced explosives including trinitrotoluene (TNT) and dinitrotoluene (DNT) for the U.S. Armed Services. A series of land transfers left the Army with 1,655 acres, which it has operated since 1959 for the Army Reserve as the Weldon Spring Training Area. Contaminated areas are spread throughout the 17,000 acres of the site, with the greatest concentration in the Training Area. Some of the transferred land that covered two small areas of the original Ordnance Works area are now owned by the U.S. Department of Energy (USDOE) and listed on the National Priorities List as Weldon Spring Quarry/Plant/Pits site. Investigations have identified a number of potentially contaminated areas, including seven unlined *lagoons* where TNT wastewater was stored; TNT production lines; a DNT production line; a drainage ditch below a TNT production line; and nine areas where explosive wastes were buried. Approximately 5,000 people live within 3 miles of the site and approximately 70,000 people obtain drinking water from St. Charles County wells within 3 miles of the hazardous substances at the site. Surface water in the area flows either to the Mississippi River *watershed* to the north or the Missouri River watershed to the south. Surface waters within 3 miles are used for recreational activities.

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

NPL LISTING HISTORY

Proposed Date: 07/14/89

Final Date: 02/21/90

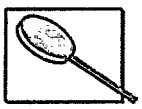
Threats and Contaminants

In 1987, a contractor to the USDOE found explosives such as TNT and DNT in monitoring wells near the lagoons. TNT, DNT, and lead have been identified in soil in several areas at the site, and TNT was detected in 1987 in surface water downstream of the lagoons. The Mississippi watershed, which supports *wetlands*, wildlife, and recreational activities, may be threatened by *runoff* from the site. The TNT and DNT contamination on the site represents a physical hazard with some potential for explosion. Ingestion of polluted surface water or groundwater and contaminated soil may pose human health threats. DNT is a known carcinogen and may be absorbed through direct contact.

Cleanup Approach

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

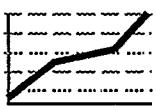
Response Action Status



Entire Site: The Department of Defense has identified a number of contaminated areas as mentioned previously. A complete investigation into the extent and type of contamination at the site began in 1989. The study will identify the nature and extent of contaminants and recommend cleanup technologies.

Site Facts: The entire site is being cleaned up under the *Installation Restoration Program* (IRP). Under this program, established in 1978, the Department of Defense seeks to identify, investigate, and clean up contamination from hazardous materials.

Environmental Progress

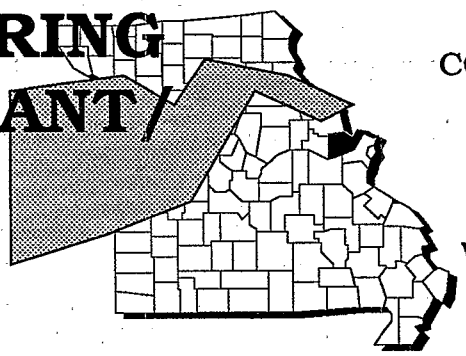


After adding this site to the NPL, the EPA, the USDOE, and the Department of Defense conducted preliminary investigations and determined that no immediate actions were needed at the Weldon Springs Ordnance Works site while further investigations continue.

WELDON SPRING QUARRY/PLANT/ PITS

MISSOURI

EPA ID# MO3210090004



REGION 7

CONGRESSIONAL DIST. 09

St. Charles County

25 miles west of St. Louis

Aliases:
Weldon Spring-Raffinate Pits
Weldon Springs Chemical Plant

Site Description

The Weldon Spring site covers 230 acres and is located between the Missouri and Mississippi Rivers. This site is closely associated with the nearby Weldon Springs Ordnance Works NPL site that the U.S. Army owns and operates. A series of land transfers in the 1950s gave the Atomic Energy Commission (AEC), later the U.S. Department of Energy (USDOE), 220 acres of the originial Ordnance Works area. The USDOE is now responsible for the various contamination, both radioactive and nonradioactive, they produced on the property. The site includes a 51-acre disposal area, a 169-acre abandoned uranium feed residue plant, various smaller properties and a 9-acre former limestone quarry located four miles from the plant. From 1941 to 1944, the Department of the Army operated an explosives production plant on the site. Due to frequent spills, wastewater containing sulfonate derivatives contaminated surface water and groundwater. The ordnance works was closed at the end of World War II, and the processing structures were demolished. In 1955, the AEC acquired a portion of the ordnance works for construction of a uranium feed materials plant. Mallinckrodt, Inc. operated the plant under a contract with the AEC from 1957 to 1966. The plant converted uranium concentrates to uranium tetrafluoride and uranium metal. Some thorium ore, also a radioactive metal, was processed. The residues from the processing were disposed of into four large open pits. During that period, the plant, buildings, equipment, soil surface, sewer system, and the drainage into the Missouri River became contaminated with uranium, thorium and their radioactive decay products. From 1943 until 1957, the U.S. Army used an abandoned limestone quarry located about 3 miles southwest of the plant site for the disposal of unknown quantities of materials contaminated with trinitrotoluene (TNT) and dinitrotoluene (DNT) residues. The AEC acquired the site in 1958 and used the quarry from 1959 to 1966 for disposing of uranium, thorium, and radium residues and contaminated materials and equipment. From 1966 to 1969, the Army deposited additional TNT-contaminated materials in the quarry. The quarry is located 3/4 of a mile from the St. Charles County well field, which is used as a drinking water source for approximately 70,000 people. The population living within 3 miles of the site is 5,000 people.

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

NPL LISTING HISTORY
Proposed Date: 10/15/84
Final Date: 07/22/87

Threats and Contaminants

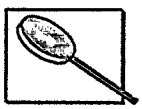
Off-site groundwater is contaminated with TNT, DNT, and other explosive materials. The soil is contaminated with *radionuclides*, TNT, DNT, *polycyclic aromatic hydrocarbons* (PAHs), *polychorinated biphenyls* (PCBs), and heavy metals. Off-site surface water is contaminated with uranium. Accidental ingestion of and direct contact with contaminated groundwater, surface water, and soil may cause a potential health hazard. Adjacent wildlife and recreational areas may be threatened due to off-site *migration* of the contaminants. Contaminant migration from the quarry to the adjacent Missouri River *alluvium* poses a potential threat to the County well field.

Cleanup Approach

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

Response Action Status

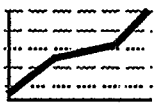
Immediate Actions: The USDOE undertook interim cleanup actions at this site in 1987 which, to date, have included removing overhead piping and asbestos, disposing of and storing chemicals, removing electric lines and poles, cleaning up radioactive soil from three Army Reserve properties, dismantling the steam plant and administration building, removing PCB transformers, and constructing a stormwater diversion dike to reduce off-site migration. The studies for the quarry bulk waste operable unit are also completed.



Remaining Site Areas: Site investigations focusing on other areas of the property are still under way. The studies are scheduled to be completed in 1992 and will result in final cleanup strategies for site contamination areas.

Site Facts: Under a 1986 agreement with the EPA, the USDOE will conduct cleanup actions at the quarry, as well as the plant area and nearby radioactive contaminated properties.

Environmental Progress

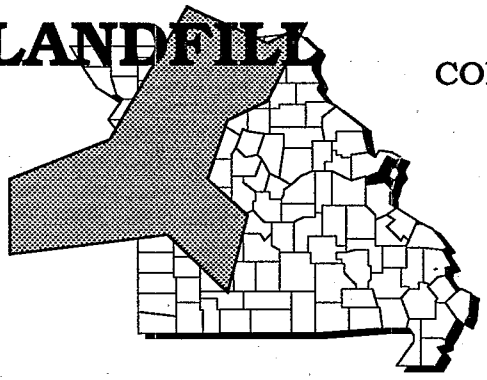


The interim response actions undertaken at this site described above have greatly reduced the potential for exposure to hazardous substances at the Weldon Spring Quarry/Plant/Pits site while the USDOE continues further cleanup activities.

WESTLAKE LANDFILL

MISSOURI

EPA ID# MOD079900932



REGION 7

CONGRESSIONAL DIST. 02

St. Louis County

Bridgeton

Site Description

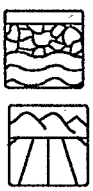
The 200-acre Westlake Landfill site is adjacent to prime agricultural land and is in the floodplain of the Missouri River. From 1939 to 1987, limestone was quarried on the site. Beginning in 1962, portions of the property were used for *landfilling* of solid and liquid industrial wastes, municipal refuse, and construction debris. In 1973, Cotter Corp. disposed of over 43,000 tons of uranium ore processing residues and soil in two areas covering a total of 16 acres of the site. In 1976, the Missouri Department of Natural Resources (MDNR) closed the unregulated landfill. Since then, MDNR has issued several permits for various portions of the site. Currently, an operating sanitary landfill has a permitted area of 52 acres, and an operating demolition landfill has a permitted area of 22 acres. A radiological survey completed by Radiation Management Corporation in 1981, and in 1982 radioactive wastes on site were documented. Approximately 60 people obtain drinking water from private wells within 3 miles of the site. Water from the public water utility is presently unavailable to these people. The nearest well is about 2,500 feet from the site. In addition, at least 480 acres of cropland are irrigated from wells within a 3-mile radius of the site.

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

NPL LISTING HISTORY

Proposed Date: 10/26/89

Threats and Contaminants



Significant levels of uranium from former dumping activities were detected in the groundwater and soil, which could adversely affect the health of individuals if these substances are accidentally ingested or touched. Additional environmental and health risks may result through surface drainage from the site, which flows through an unnamed tributary into the Missouri River. The Missouri River is used for irrigation, commercial fishing, and recreational activities.

Cleanup Approach

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

Response Action Status

Entire Site: An intensive investigation of on-site contamination is scheduled to begin soon. This study will explore the nature and extent of the contamination and will identify the best strategies for cleanup.

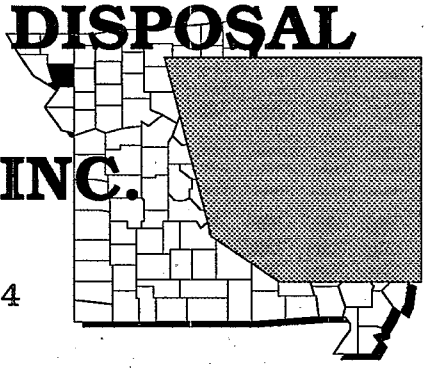
Environmental Progress

At the time that this summary was written, this site had just obtained NPL status, and it was too early to discuss environmental progress. The EPA will be performing a study to assess the need for any intermediate actions required to make the site safer while waiting for cleanup actions to begin. Results of this assessment will be described in our next edition.

WHEELING DISPOSAL SERVICE COMPANY, INC.

MISSOURI

EPA ID# MOD000830554



REGION 7

CONGRESSIONAL DIST. 06

Andrew County

1 mile south of Amazonia

Alias:
Wheeling Waste Disposal Site

Site Description

The Wheeling Disposal Service Company operated a *landfill* on two adjacent areas covering about 200 acres. The landfill was established in the early 1970s, and the facility received a State permit in 1975 to operate as an industrial waste disposal facility. Between 1980 and 1981, the company voluntarily ceased operations. The facility resumed operations under the authority of a special waste disposal permit issued by the State of Missouri unitl it voluntarily closed in 1986. The Missouri Department of Natural Resources (MDNR) periodically inspected the site and monitored groundwater when the landfill was in operation. Based on MDNR hazardous waste records, wastes containing pesticides, heavy metals, paint, solvents, and leather tanning *sludge* were disposed of at the landfill. In field investigations conducted by the EPA, contaminants were detected in monitoring wells and springs on the site. Drinking water is supplied to approximately 4,000 residents of Savannah through wells within 1 to 2 miles from the site that are 90 to 100 feet deep in the Missouri river *alluvial aquifer.* There are private wells in use within 1/4 mile of the site. The shallow groundwater below the site supplies water to the aquifer, possibly contaminating it.

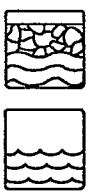
Site Responsibility: This site is being addressed through Federal and *potentially responsible parties'* actions.

NPL LISTING HISTORY

Proposed Date: 12/22/87

Final Date: 10/04/89

Threats and Contaminants

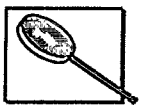


The groundwater on site has been contaminated with various *volatile organic compounds* (VOCs) and heavy metals including arsenic, chromium, nickel, and lead from the former waste disposal activities. Mace Creek, 4,000 feet *downslope* from the landfill, is threatened by drainage from the site. Local surface water could also be contaminated. On-site ponds have been covered with soil, and the area is now planted with crops. Therefore, eating crops grown in contaminated soil could expose people to contaminants from the site.

Cleanup Approach

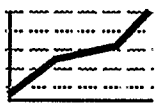
This site is being addressed in a single *long-term remedial phase* focusing on cleanup of the entire site.

Response Action Status



Entire Site: The EPA sampled on-site groundwater wells and springs in 1982 and 1983. The Missouri Department of Health (MDOH) sampled off-site private wells and creeks in 1986. In 1987, the EPA resampled existing on- and off-site wells and springs. These analyses confirmed the previous findings of on-site groundwater contamination. The parties potentially responsible for the site contamination have begun to evaluate the nature and the extent of the contamination. This work includes installation of monitoring wells, geophysical analysis, soil analysis, surface water analysis, mapping and surveying, groundwater analysis, and other tasks. The study is scheduled to be completed in 1990.

Environmental Progress



The samplings performed by the EPA and MDOH indicated that no immediate actions were needed at the Wheeling Disposal Service Company site while the potentially responsible parties complete further studies and begin cleanup activities.

GLOSSARY:

TERMS USED IN THE FACT SHEETS

This glossary defines the italicized terms used in the site fact sheets for the State of Missouri. The terms and abbreviations contained in this glossary are often defined in the context of hazardous waste management as described in the site fact sheets, and apply specifically to work performed under the Superfund program. Therefore, 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 may possibly 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 EPA and the parties potentially responsible for site contamination. Under the terms of the Order, the potentially responsible parties 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.

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

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.

Alluvial: An area of sand, clay, or other similar material that has been gradually deposited by moving water, such as along a river bed or the shore of a lake.

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.

Backfill: To refill an excavated area with removed earth; or the material itself that is used to refill an excavated area.

GLOSSARY

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.

Borehole: A hole drilled into the ground used to sample soil and groundwater.

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 is generally mounded or sloped so water will drain off.

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

Consent Decree: A legal document, approved and issued by a judge, formalizing an agreement between 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 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 ponds and lagoons, to prevent the migration of contaminants into the environment.

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

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.

Downslope: [see Downgradient].

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.

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.

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.

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

Lagoon: A shallow pond where sunlight, bacterial action, and oxygen work to purify wastewater. Lagoons are typically used for the storage of wastewaters, sludges, liquid wastes, or spent nuclear fuel.

Landfill: A disposal facility where waste is placed in or on land.

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.

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 a number of these phases.

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

Mine (or Mill) Tailings: A fine, sandy residue left from ore milling operations. Tailings often contain high concentrations of lead and arsenic or other heavy metals.

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.

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 and can make water taste and smell bad.

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.

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 emersion oils, and caulking compounds. PCBs are also produced in certain combustion processes. PCBs are extremely persistent in the environment because they are very stable, non-reactive, and highly heat resistant. Burning them produces even more toxins. Chronic exposure to PCBs is believed to cause liver damage. It is also known to bioaccumulate in fatty tissues. PCB use and sale was banned in 1979 with the passage of the Toxic Substances Control Act.

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. This means that PRPs may sign a consent decree or administrative order on consent [see Administrative Order on Consent] to participate in site cleanup activity without admitting liability.

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, which is the gaseous form of radium, decays to form alpha particle radiation, which can be easily blocked by skin. However, it can be inhaled, which allows alpha particles to affect unprotected tissues directly and thus cause cancer. Uranium, when split during fission in a nuclear reactor, forms more radionuclides which, when ingested, can also cause cancer. Radiation also occurs naturally through the breakdown of granite stones.

Runoff: The discharge of water over land into surface water. It can carry pollutants from the air and land into receiving waters.

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

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

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

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.

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.

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

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 also Volatile Organic Compounds].

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

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

Volatile Organic Compounds (VOCs): VOCs are made 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.

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

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