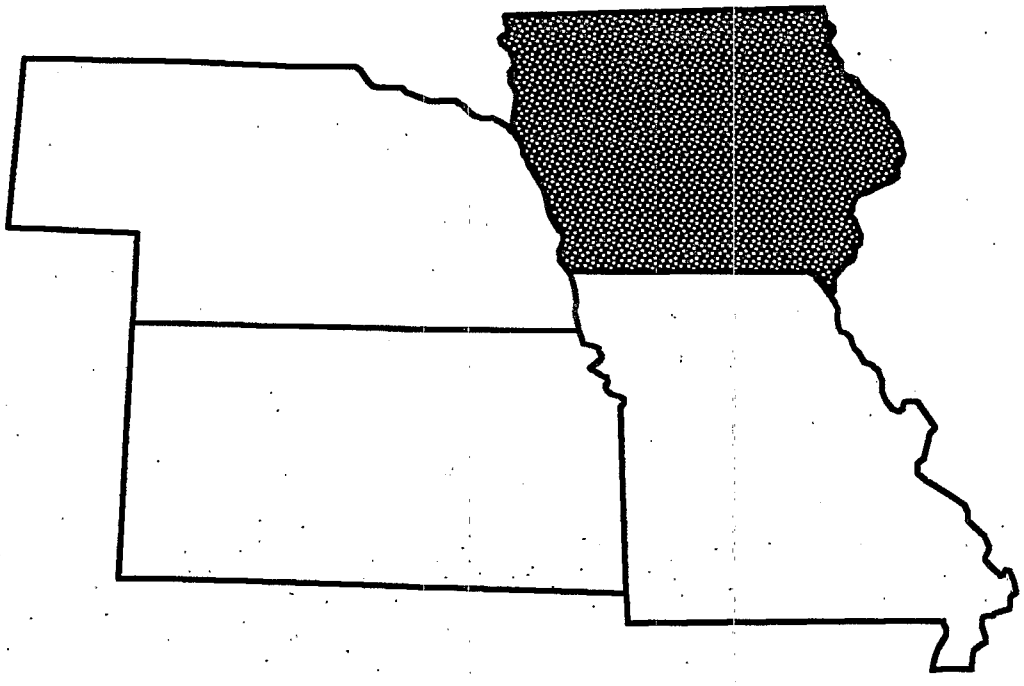
EPA

REGION 7

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



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AUGUST, 1995

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A Brief Overview

WHY THE SUPERFUND PROGRAM?

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

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

After Discovery, the Problem Intensified

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

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

The EPA Identified More than 1,200 Serious Sites

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

THE NATIONAL CLEANUP EFFORT IS MUCH MORE THAN THE NPL

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

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

THE EPA IS MAKING PROGRESS ON SITE CLEANUP

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

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

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

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

THE EPA MAKES SURE CLEANUP WORKS

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

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

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

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

CITIZENS HELP SHAPE DECISIONS

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

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

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

USING THE STATE AND NATIONAL VOLUMES TOGETHER

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

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

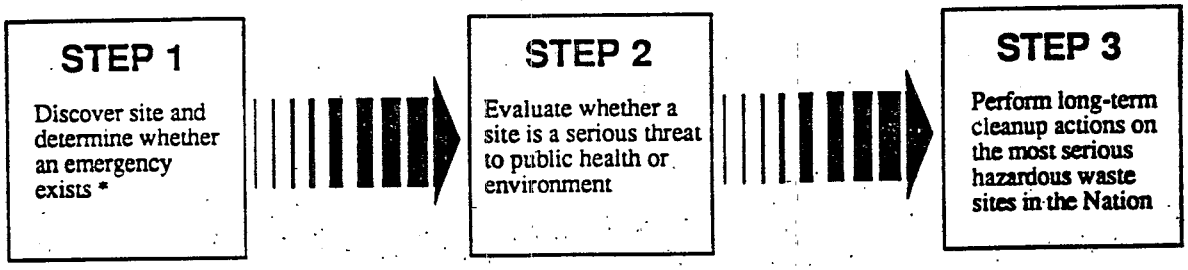
This volume compiles site summary fact sheets on each State or Territorial site being cleaned up under the Superfund program. These sites represent the most serious hazardous waste problems in the Nation and require the most complicated and costly site solutions yet encountered. Each book gives a "snapshot"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

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

How Does the Program Work to Clean Up Sites?

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

THREE-STEP SUPERFUND PROCESS



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

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

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

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

STEP 1: SITE DISCOVERY AND EMERGENCY EVALUATION

How does the EPA learn about potential hazardous waste sites?

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

What happens if there is an imminent danger?

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

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

STEP 2: SITE THREAT EVALUATION

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

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

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

- Are hazardous substances likely to be present?

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

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

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

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

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

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

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

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

Why are sites proposed to the NPL?

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

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

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

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

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

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

STEP 3: LONG-TERM CLEANUP ACTIONS

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

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

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

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

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

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

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

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

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

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

How are cleanup alternatives identified and evaluated?

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Can the EPA make parties responsible for the contamination pay?

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

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

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

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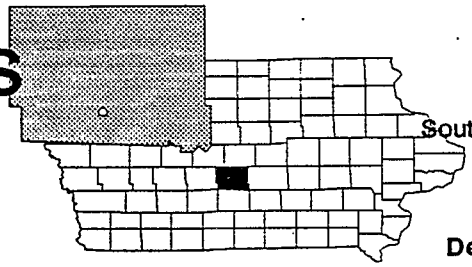


EPA REGION 7
Polk County
Southwest of downtown Des Moines

Other Names:
Tuttle Street Landfill
Des Moines Vocational School
Dichem
Dico Company

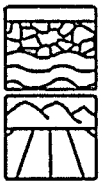
Site Description

The Des Moines TCE site is an area of contaminated groundwater located southwest of downtown Des Moines, in the flood plain of the Raccoon River. The surrounding area is industrial and commercial, with some recreational parklands. The city's public water supply, which serves approximately 260,000 people, was discovered to be contaminated with trichloroethylene (TCE) in 1976. The contamination was determined to be entering the water supply through the city's groundwater source. The Dico Company, who used and disposed of solvent wastes containing TCE on their property through early 1979, was determined to be a potential source of the contamination. In 1984, the Des Moines Water Works stopped using the contaminated portion of the groundwater supply. In 1986, the EPA ordered Dico to undertake the Agency's selected remedy to protect the city's public water supply. During cleanup activities, another plume (the North plume) of contaminated groundwater was discovered being drawn into the groundwater extraction system. An investigation was subsequently initiated to address the contamination apparently originating to the north and west of the Dico property. In addition, investigation on Dico's property revealed that past herbicide and pesticide formulation activities had left contamination in several Dico buildings and adjacent soils. Cleanup of these areas of contamination is underway or currently being planned.

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

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

Threats and Contaminants

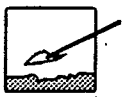


The groundwater and soil are contaminated with volatile organic compounds (VOCs), including tetrachloroethylene, TCE, and vinyl chloride, and pesticides and herbicides from former industrial operations and waste disposal practices. Accidentally ingesting or coming into contact with the contaminants poses a health risk.

Cleanup Approach

The site is being addressed in two stages: initial removal actions and three remedial actions focusing on site-wide groundwater cleanup including the North Plume and controlling the sources of contamination.

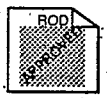
Response Action Status



Initial Removal Actions: Dico has cleaned several buildings on their property that were previously used to formulate and store pesticide and herbicide products. In addition, Dico has covered a large portion of their property with an asphalt cap to address the threat presented by the surface soil contamination.

Groundwater: The remedy for the protection of the Des Moines water supply features: isolating the northernmost section of the public groundwater supply system; collecting contaminated groundwater with extraction wells; treating the groundwater by an air stripper to remove contaminants; discharging the treated water to the Raccoon River; and operating the extraction wells until water collected from all monitoring wells meets EPA drinking water standards for four consecutive months. Dico, under EPA oversight, designed and built the groundwater extraction and treatment system, which included seven extraction wells and an air stripping system. Cleanup activities began in December 1987. Dico has and will continue to operate and maintain the groundwater treatment system until the specified clean up criteria are achieved.

Source Control: In 1989, Dico began an intensive study of the sources of the pollution on its property. This investigation showed that contamination by VOCs and pesticides are of significant concern at the site. The studies have identified various source areas as well as potential remedies. The initial removal actions discussed above have addressed many of the health concerns associated with the source areas. Remaining risks posed by the source areas will be addressed by additional actions planned for selection in 1995.



North Plume: In 1988, the EPA began investigating the potential sources of contaminated groundwater being drawn into the Dico groundwater extraction and treatment system. The EPA installed additional monitoring wells to the north and west of the Raccoon River near the Fleur Drive Bridge and north to about 25th and High Street. The wells have been monitored to determine the extent of contamination and its source(s) and to warn of any approaching danger to the public water supply. This investigation was completed in the spring of 1992, and concluded that no further action is warranted as the existing groundwater extraction and treatment system will capture and cleanup the contaminated groundwater plume.

Site Facts: In 1986, the EPA issued an Administrative Order requiring Dico to design, build, and operate a groundwater extraction system. Dico signed an Administrative Order on Consent with the EPA in August 1989 to conduct a study of how to control the potential sources of contamination at its property. A Unilateral Administrative Order (UAO) was

issued to Dico in March 1994 calling for a removal action to address threats inside several on-site buildings. A second UAO was issued to Dico in June 1994 calling for a removal action to reduce threats posed by on-site soils. A group of additional PRPs has been identified in association with the pesticide and herbicide contamination at the site. This group of PRPs has conducted sampling activities in on-site drainage areas and is expected to conduct a removal action to reduce the associated threats.

Environmental Progress

Groundwater cleanup at the Des Moines TCE site is currently underway which, along with the other initial actions, has reduced the potential for exposure to hazardous materials through drinking water while remaining cleanup actions are being planned. Pesticide and herbicide-contaminated dust has been removed from several on-site buildings and the interior surfaces have been sealed with urethane paint to prevent exposure to any remaining pesticide and herbicide residues. In addition, exposure to pesticide-contaminated soils have been eliminated through capping a large portion of the Dico property.

Site Repository

Des Moines City Library, 100 Locust, Des Moines, IA 50308

Cleanup Approach

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

Response Action Status

Initial Actions: In late 1991, DuPont removed contaminated surface material which could not be stabilized to an off-site, Federally approved disposal facility.

Entire Site: In 1985, the EPA installed three groundwater monitoring at the Baier subsite. Sampling in 1986 showed elevated concentrations of metals. Downstream water samples showed similar findings. When the McCarl subsite was studied in 1986, groundwater and soil samples again revealed metals. In 1989, the EPA ordered DuPont to perform a study of contamination at the site. DuPont completed the study in early 1991. Based on the results of this study, the EPA recommended stabilization and solidification of contaminated soil and monitoring of the groundwater as cleanup remedies. DuPont completed the design of these cleanup remedies in late 1992 and cleanup activities began shortly thereafter. Site cleanup activities were completed in 1993. The site should be delisted from the NPL in the summer of 1995.

Site Facts: On July 5, 1989, the EPA issued a Unilateral Order to DuPont requiring DuPont to undertake a study of site contamination and cleanup options at the Baier subsite. In late 1991, the EPA issued a Consent Decree requiring DuPont to design and conduct the site cleanup.

Environmental Progress

The removal of contaminated surface material, treatment of the contaminated soil, and monitoring of the groundwater has eliminated risks to public health or the environment from the site. All cleanup activities are complete. The EPA proposed the site for deletion from the NPL in the summer of 1994.

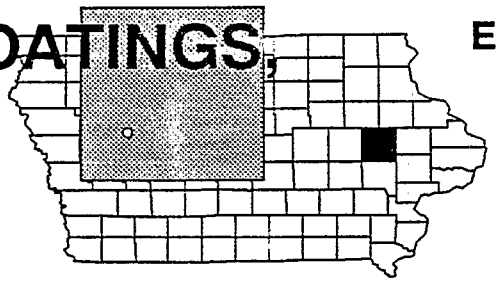
Site Repository

Idol Raschid Memorial Library, 3421 Avenue L., Fort Madison, IA 52627

ELECTRO-COATINGS, INC.

IOWA

EPA ID# IAD005279039



EPA REGION 7
Linn County
Cedar Rapids

Site Description

The 1-acre Electro-Coatings, Inc. site is a plating shop located in Cedar Rapids that has been in operation since 1947. The plant currently performs chromium, cadmium, nickel, and zinc plating. The site lies on the norther shore of Cedar Lake, a 150-acre impoundment owned by a utility company. The Cedar River is located just west of Cedar Lake. In 1976 high levels of chromium were discovered in water from a neighboring industrial well. The contamination was traced to a leaking tank containing chromic acid at the Electro-Coatings plant. Shortly after the discovery, Electro-Coatings began a series of actions to monitor the contamination and prevent further releases. The City of Cedar Rapids (pop. 108,772) obtains water from 46 shallow wells along the Cedar River. The closest city well is located about 2,000 feet west of the site.

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

NPL LISTING HISTORY
Proposed Date: 06/24/88
Final Date: 10/04/89

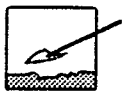
Threats and Contaminants

The primary groundwater contaminant is hexavalent chromium. Other heavy metals (i.e., cadmium and nickel) have been found at elevated levels in site groundwater. Volatile organic compounds (VOCs) have also been detected in site groundwater. However, most of the VOCs have been attributed to a neighboring industry. The contaminated groundwater has been found to be largely contained by the neighboring industrial well. Water from this industrial well is not used for drinking water purposes and the contaminants do not adversely impact its use. No groundwater contamination has been detected in the municipal drinking water wells. Potential for contamination of Cedar Lake has also been a concern. However, no significant impact to Cedar Lake has been observed.

Cleanup Approach

The site is being addressed in two stages: initial actions and long-term remedial actions.

Response Action Status



Initial Actions: In 1976, Electro-Coatings, Inc. removed the leaking deep-pit tank and initiated a leak prevention program throughout the plant. Electro-Coatings installed five monitoring wells which they sampled periodically in addition to the neighboring industrial well. In 1992 contaminated soils were discovered as a chromium dipping tank was being taken out of service. Chromium-contaminated soil and concrete were removed and disposed of as hazardous waste.

Long-Term Actions: A study to determine the nature and extent of contamination was initiated in 1990 and completed in 1994. The planned long-term action resulting from this study includes continued pumping of the contaminated groundwater with discharge to the sanitary sewer. Continued pumping of the neighboring industrial may provide adequate containment of groundwater contaminants. If not, a new recovery well (or wells) will be installed and operated to provide containment of contaminants. On-going groundwater monitoring will be conducted.

Site Facts: In June 1977, the State issued an Executive Order requiring Electro-Coatings to install monitoring wells to define the extent of the contaminated plume. In January 1990, Electro-Coatings entered into a Consent Order with the Iowa Department of Natural Resources (IDNR) to conduct a site investigation. A Consent Order for implementing the long-term actions is currently being negotiated between Electro-Coatings and IDNR.

Environmental Progress

As a result of initial actions, the Electro-Coatings site does not pose an immediate threat to public health or the environment. Significant declines in contaminant levels have occurred. Use of contaminated groundwater as drinking water will be prevented.

Site Repository

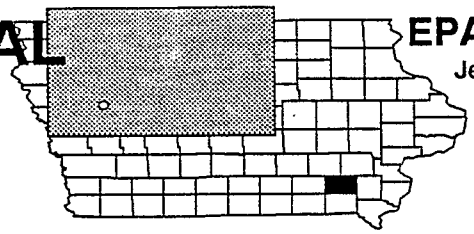
Cedar Rapids Public Library
500 First Street, S.E.
Cedar Rapids, IA 52401

Iowa Dept of Natural Resources
Records Center, 5th Floor
Wallace State Office Building
900 East Grand
Des Moines, IA 50319

FAIRFIELD COAL GASIFICATION PLANT

IOWA

EPA ID# IAD981124167



EPA REGION 7
Jefferson County
Fairfield

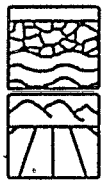
Site Description

The Fairfield Coal Gasification Plant site occupies one city block between West Burlington and West Washington Avenues in Fairfield. The plant produced a natural gas substitute from coal from 1878 until 1950. The plant has been owned and operated by Iowa Electric Light and Power since 1917. Since 1950, the utility has used the site as an operations facility. The main wastes are polycyclic aromatic hydrocarbons (PAHs) and volatile organic compounds (VOCs), which are found in the coal tar left over from the gasification process, and cyanide salts left in the iron oxide waste produced when the gas is purified. Operators sold some of the coal tar and buried some in an earthen pit on the site or dumped it in a nearby ditch. Disposal methods for the iron-cyanide waste are unknown, but it also may have been dumped on site. In 1985, the utility found that groundwater near the site was contaminated. The utility began a monitoring program to assure that private wells were unaffected. The EPA became involved in 1987 by conducting an expanded site investigation, installing and sampling on- and off-site monitoring wells, and conducting surface and subsurface soil sampling. In 1989, Iowa Electric found that the foundation for a gas holder was the main source of the groundwater contamination. The gas holder was removed and destroyed in the 1950s, and wastes were dumped or left in its place. An estimated 1,000 people live within 1 mile of the site; 9,000 live within 3 miles. The local drinking water supply depends on both surface water and groundwater and serves 11,000 people. There are 23 drinking water wells within a 3-mile radius of the site; the closest is 1,900 feet away. Shallow and deep groundwater wells are within 2 miles of the site. The closest well uses the shallow aquifer. Cedar Creek is less than 3 miles downslope of the site and is used for recreation.

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

NPL LISTING HISTORY
Proposed Date: 06/24/88
Final Date: 08/30/90

Threats and Contaminants

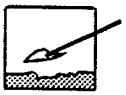


In 1985, the utility detected PAHs, including anthracene and pyrene from the coal gasification processes, in the groundwater near the site. On-site groundwater and soil contain VOCs such as benzene, toluene, and xylene, and the metals lead and mercury. Direct contact with contaminated soil and groundwater could pose a risk to public health.

Cleanup Approach

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

Response Action Status



Emergency Actions: Under EPA monitoring, the utility undertook an emergency cleanup action, installing a groundwater extraction system. Currently operational, it is designed to contain and treat the contaminated groundwater.

Groundwater and Soil: Also under the EPA's guidance, the utility completed an intensive study of groundwater and soil contamination at the site in 1990. The remedy selected includes excavating and incinerating contaminated soil and source areas, continuing the groundwater extraction and treatment system, and conducting a pilot study for possible in-place bioremediation of the contaminated groundwater. The potentially responsible party completed the technical design for the remedy in June 1992 and began excavation in June 1993. The bioremediation pilot study proved ineffective and was terminated in May 1993. The groundwater extraction system achieved health-based standards set by the EPA and the State in early 1993 and was shut down. The PRP completed excavation of contaminated soil and coal tar in May 1995 in accordance with the Record of Decision.

Site Facts: In 1989, Iowa Electric signed an Administrative Order on Consent with the EPA to conduct additional site investigations. The Utility signed a Consent Decree with the EPA in March 1991 to perform the technical design and undertake site cleanup activities.

Environmental Progress

Groundwater contamination has been addressed at the Fairfield Coal Gasification Plant site. Contaminated source material and soil have been excavated and transferred to Marshalltown, Iowa for eventual incineration.

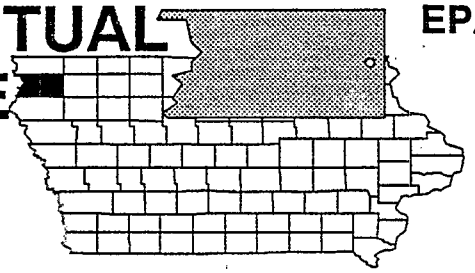
Site Repository

Fairfield Public Library, Court & Washington, Fairfield, IA 52556

FARMERS' MUTUAL COOPERATIVE

IOWA

EPA ID# IAD022193577



EPA REGION 7

Sioux County
Hospers

Site Description

The Farmers' Mutual Cooperative is an agricultural supply and service business (now under another name) that has operated at this 6-acre site since 1908. The site lies several hundred feet east of the Floyd River in the northwestern corner of the City of Hospers. Bulk fertilizer and pesticides were handled at the site until 1992. The site continues to be used for grain storage. In 1984 the State found herbicides and carbon tetrachloride in water from three shallow municipal wells located adjacent to the site. The State restricted, then prohibited, use of these three wells. This left the City with three deeper wells which yield highly mineralized water and the City installed a fourth such well. Investigations conducted by the Cooperative found groundwater contamination in the relatively small area between the site and the Floyd River. The herbicide contamination appears to be the result of incidental releases during normal operations throughout the site. The carbon tetrachloride contamination of groundwater appears to be the result of previous on-site and off-site use of carbon tetrachloride for grain fumigation.

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

NPL LISTING HISTORY
Proposed Date: 06/24/88
Final Date: 08/30/90

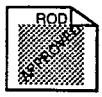
Threats and Contaminants

Groundwater contamination is the primary threat posed by the site. It has resulted in the closure of three city wells. A variety of common herbicides has been detected in the site groundwater including alachlor, atrazine, cyanazine, metolachlor, metribuzin, and trifluralin. Atrazine has been the most problematic as it has consistently been found above the drinking water standard. Carbon tetrachloride was initially found in groundwater well above drinking water standards. Recent studies have shown carbon tetrachloride contamination to have virtually disappeared. Herbicides have been detected in site soils, although not at levels of health concern. The site groundwater discharges to the Floyd River with no significant impact.

Cleanup Approach

The selected cleanup approach is natural attenuation and monitoring. The carbon tetrachloride contamination has already diminished significantly as the result of natural attenuation. Herbicide levels have also been decreasing. Handling of the chemicals at the site which caused the groundwater contamination has ceased. Contingency provisions are provided in the event the City wishes to regain use of their three shallow wells. This contingency would involve blending water from the City's shallow wells with water from their deep wells. Measures would be taken to reduce the level of contaminants in water from the shallow wells, if necessary, to meet drinking water standards.

Response Action Status



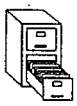
Entire Site: The Cooperative conducted investigations at the site in cooperation with the State beginning in 1984. In 1992 the fourth in the series of investigations was completed and the remedy was chosen. The Cooperative began additional testing in 1993 to assess the potential for use of the three shallow wells for blending by the City. This testing was completed in 1994. The City is currently planning to abandon their shallow wells and obtain water from a rural water system.

Site Facts: In 1986 the State ordered the Cooperative to determine the nature and threat of contamination and to identify cleanup alternatives. In 1987 the Cooperative entered into a Consent Order with the State in which they agreed to conduct this work. The Cooperative and the State are finalizing negotiations on a Consent Order for implementing the selected cleanup approach.

Environmental Progress

Natural attenuation has already resulted in significantly decreased levels of contaminants in groundwater. The State and EPA have determined that restricting use of contaminated groundwater has prevented, and will continue to prevent, any threat to public health from the site.

Site Repository



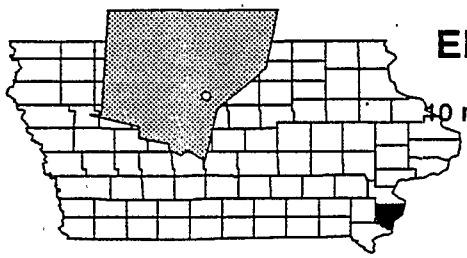
Hospers City Hall
Hospers, IA 51238

Iowa Department of Natural Resources
Records Center, 5th Floor
Wallace State Office Building
900 East Grand
Des Moines, IA 50319

IOWA ARMY AMMUNITION PLANT

IOWA

EPA ID# IA7213820445



EPA REGION 7
Des Moines County
10 miles west of Burlington

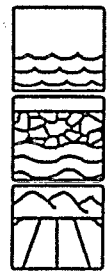
Site Description

The 19,127-acre Iowa Army Ammunition Plant (IAAP) site's primary activity since 1941 has been to load, assemble, and pack a variety of conventional ammunitions and fusing systems. Wastes currently produced at IAAP consist of various explosive-laden sludges, wastewater, and solids; lead-contaminated sludges; ashes from incineration and open burning of explosives; and waste solvents from industrial and laboratory operations. Past operations also generated waste pesticides; radioactive wastes, and incendiaries. The Army has identified a number of potentially contaminated areas, including an abandoned 4-acre settling lagoon, the Line 900 Pinkwater Lagoon, which received wastewater containing explosives from 1943 to 1955. The lagoon now holds an estimated 75,000 cubic yards of contaminated soils. A second area under investigation involves an earthen and concrete dam across Brush Creek, the former Line 1 impoundment, which was used from 1948 to 1957. Wastewater flowed through a 3½-acre sedimentation area where explosives settled out. The liquids subsequently overflowed the dam into Brush Creek. Approximately 100 people live within 3 miles of the site and obtain drinking water from private wells within 3 miles of the base. In the spring of 1993, the Army analyzed water samples from the wells of residences located just south of the IAAP. Two of the wells were found to contain explosives at levels exceeding health advisory limits. The Army has offered alternate water supplies to all potentially impacted residents south of the IAAP and provided connections for all residents who so desired. Surface water within 3 miles downstream of the site is used for recreational activities.

Site Responsibility: This site is being addressed by the Army with oversight by the EPA.

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

Threats and Contaminants



The Army conducted tests from 1981 to 1984 and detected explosives from former waste disposal practices in surface water and wells downgradient of the lagoon and dam. In 1984, the U.S. Army detected explosives and lead in creek sediments. People using Brush Creek for recreational purposes may be at risk due to contaminated waters and sediments. Two individuals living south of the IAAP along Brush Creek were placed on bottled water by the Army in the spring of 1993 due to the presence of explosives at levels exceeding health advisory limits in their water supply wells.

Cleanup Approach

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

Response Action Status

Entire Site: In 1990, the Army began a study to determine the nature and extent of contamination at the site and identified 43 individual areas requiring investigation. With the assistance of the EPA, samples were collected from these potential areas of contamination. After analyzing these samples, the EPA and the Army determined that approximately three-quarters of the sites needed further investigation. A site-wide Remedial Investigation was completed in 1994. The Army is scheduled to complete a supplemental field effort in the summer of 1995 to better define contaminant volumes for Feasibility Study purposes. The Army is planning to execute a non-time critical removal action to address significant contaminant volumes from the former Line 1 Impoundment Area and the Line 800 Pinkwater Lagoon. Response actions may begin in late 1995.

Site Facts: A Federal Facilities Compliance Agreement between the Army and the EPA was signed in 1988. The installation subsequently was proposed for the National Priorities List (NPL), and an Interagency Agreement was negotiated in late 1990. The IAAP site is participating in the Installation Restoration Program, a specially funded program established by the Department of Defense (DOD) in 1978 to identify, investigate, and control the migration of hazardous contaminants at military and other DOD facilities.

Environmental Progress

After adding this site to the NPL, the Army performed preliminary investigations and determined that no immediate actions were needed at the IAAP site while further studies leading to long-term cleanup activities are taking place. In the summer of 1995, the Army completed two interim response actions to address soil contamination at a former pesticide disposal pit and at numerous explosive-wastewater sump locations. An additional interim action is planned for late 1995, in which over 100,000 cubic yards of explosives-contaminated soils from the former Line 1 Impoundment Area and the Line 800 Pinkwater Lagoon will be excavated and disposed on-site. Soils will be segregated and disposed according to risk. The most highly contaminated materials will be temporarily stockpiled for eventual treatment, while potential biological treatment processes are evaluated. Mid-level waste materials will be landfilled on-site in a hazardous waste landfill which will be constructed adjacent to the installation's former inert disposal landfill. Low-level contaminated soils, those which do not pose a significant threat to human health due to direct exposure, but do pose a risk based on potential leaching to groundwater, will be used as fill material to bring the existing inert disposal landfill to grade prior to the installation of a synthetic cover. The excavated areas at Lines 1 and 800 will be transformed into wetland areas where in-situ phytoremediation of explosives-contaminated groundwater will be evaluated on a pilot scale. If the phytoremediation evaluation is successful, the Army may look to expand this concept to a site-wide groundwater remedy.

Site Repository

Main Administration Building, Iowa Army Ammunition Plant, Middletown, IA 52638
Danville Iowa City Hall, Danville, IA
Burlington Public Library, Burlington, IA

Response Action Status

Entire Site: Under EPA oversight, the John Deere Company began an investigation in 1990 to determine the type and extent of contamination. Field work was completed in late 1990, and the investigation was completed in late 1991. Based on the results of this investigation, the EPA selected a remedy requiring the John Deere Company to maintain the existing fence around the site, and to continue monitoring the groundwater to ensure that it remains safe. In addition, on the property and a State Highway right-of-way, deed restrictions now limit site use to non-residential activities.

Site Facts: In 1989, John Deere Company entered into an Administrative Order on Consent with the EPA to conduct an investigation to determine the type and extent of contamination at the site and to identify alternative technologies for the cleanup. On September 25, 1992, John Deere Company and the Iowa Department of Transportation signed a Consent Decree with EPA to implement the selected remedy.

Environmental Progress

Intensive investigations of site conditions have shown that the site does not pose a significant threat to people and the environment. To ensure that there are no future threats, groundwater monitoring and land-use restrictions have been put in place. The EPA will continue to monitor the groundwater at the John Deere (Ottumwa Works Landfills) site to ensure that site conditions remain safe. The EPA is moving the site towards deletion.

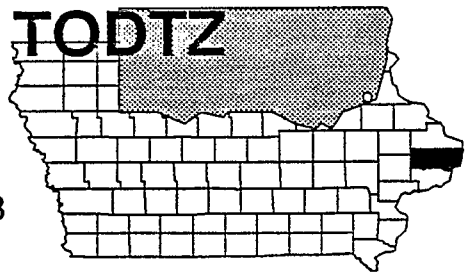
Site Repository

Ottumwa Public Library, 129 N. Court Street, Ottumwa, IA 52501

LAWRENCE TODTZ FARM

IOWA

EPA ID# IAD000606038



EPA REGION 7
Clinton County
1 mile west of Camanche

Other Names:
DuPont Company Landfill

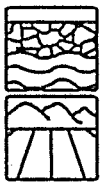
Site Description

The Lawrence Todtz Farm site is located in a predominantly agricultural area of Clinton and covers slightly over 6 acres. Municipal solid waste and industrial solid and liquid wastes were disposed of at the site from 1958 to 1975. The E.I. DuPont de Nemours Company, Inc.'s cellophane plant buried 4,300 tons of liquid waste at the site from 1972 to 1975. The wastes were reported to include strong acids and bases, plasticizers, resins, alcohols, inorganic salts, paints, and pigments. The site was closed in 1975 and capped with approximately 2 feet of "red sugar" clay and topsoil overlay. One hundred people live within 1 mile of the site. Within ¼ mile of the site are 10 farmhouses with private wells for drinking water and approximately 12 mobile homes. Murphy's Lake (formerly Willow Lake) and Bandixen Lake, located near the site, are used for recreational activities such as fishing and swimming. Two chemical industrial plants are located within a mile of the landfill. Evidence of deer, raccoon, and cattle has been seen on the site. Wild geese were observed on the site and the surrounding lakes.

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

NPL LISTING HISTORY
Proposed Date: 09/05/85
Final Date: 06/10/86

Threats and Contaminants



Groundwater samples from on-site monitoring wells detected heavy metals including arsenic, barium, and lead; sodium; and volatile organic compounds (VOCs) including tetrahydrofuran, benzene and toluene from the former waste disposal activities on the site. Sodium was detected at levels above health guidelines in groundwater samples collected from area residential wells. Contamination of surface water (on-site ponds and nearby lakes) could have occurred if there had been a release from the impoundment, because the lakes are hydraulically connected to the shallow sand and gravel aquifer.

Cleanup Approach

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

Response Action Status

Entire Site: The parties potentially responsible for the site contamination installed an alternate water supply that included drilling a new well to supply water to three area residents. This was completed in the summer of 1989. Under the EPA's oversight, the potentially responsible parties have graded the site area, constructed a 2-foot soil cover over the impoundment, and installed a groundwater monitoring system. These activities were completed in 1991. Monitoring of the impoundment and municipal landfill will continue to ensure the long-term effectiveness of the cleanup activities. Further actions, including cleanup of the impoundment and groundwater pumping and treating, will be implemented if groundwater monitoring detects contaminants exceeding specific action levels.

Site Facts: In November 1990, a Consent Decree between the EPA and the potentially responsible parties was entered in court. Under this Decree, the parties agreed to perform long-term cleanup of the site.

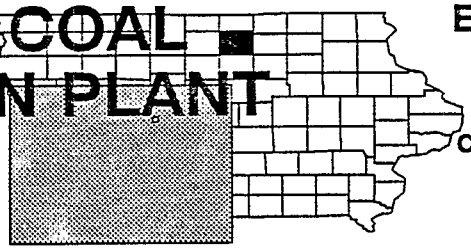
Environmental Progress

The installation of an alternate water source, the construction of a 2-foot soil cover, and the construction of a groundwater monitoring system with chemical-specific action levels have significantly reduced the potential for exposure to contaminated soil and groundwater at the Lawrence Todtz Farm site.

Site Repository

Clinton Main Library, 306 Eighth Avenue, South Clinton, IA 52732
Camanche Public Library, 102 12th Avenue, Camanche, IA 52730

MASON CITY COAL GASIFICATION PLANT
IOWA
EPA ID# IAD980969190



EPA REGION 7
Cerro Gordo County

OTHER NAMES:
Coal Gasification Plant

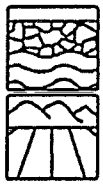
Site Description

The Mason City Coal Gasification Plant site is located on approximately 2 1/3 acres in a commercial and residential area of central Mason City, a north-central Iowa community of 29,000. Mason City Coal Gasification Plant operated from 1900 to 1951 and was demolished in 1952. An electrical substation and a small storage building are all that remain on the site. During a 1984 sewer installation, oily sludges were discovered in subsurface soil at the site. Investigations by the current site owner, Interstate Power Company (IPW), revealed three underground storage tanks containing oily sludge. The tanks and excavated soil were exhumed and stored on the southeast corner of the site and covered with a membrane cap. Contaminated soil is also present in the north-central portion of the site. The site is situated on fill material consisting of sand, gravel, and construction rubble and debris, and is in direct contact with bedrock. Although the level of the water table fluctuates seasonally, the water table in the fill material is typically present at depths ranging from 8 to 10 feet below the surface. A portion of the groundwater flows through the fill and empties into Willow Creek, which is used for public recreational fishing. Eight Mason City municipal drinking water wells are located within 2 miles of the site. Approximately 98 percent of Mason City is supplied by the municipal drinking water supply.

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

NPL LISTING HISTORY
Proposed Date: 01/18/94
Final Date: 12/12/94

Threats and Contaminants



The soil, on-site waste pile, bedrock, and groundwater are contaminated with polynuclear aromatic hydrocarbons (PAHs). Soil samples collected indicate that the soil is contaminated to a depth of 13 1/2 feet. A series of investigations between 1986 and 1993 by IPW identified high concentrations of PAHs in samples of groundwater taken from the uppermost aquifer and in samples of Willow Creek sediment downstream from the site. Ingesting or touching contaminated soil or groundwater could pose a public health threat.

Cleanup Approach

The site is being addressed in two stages: a non-time critical removal of source materials and a long-term remedial phase focusing on ground water.

Response Action Status

Initial Actions: In late 1988, the potentially responsible party excavated three underground storage tanks and surrounding contaminated soil, moved them to the southeast corner of the site, and covered them with a membrane cap.

Entire Site: In late 1991, the potentially responsible parties undertook a study of the nature and extent of site contamination. This study was completed in 1994. A non-time critical removal of source materials is scheduled to begin in late 1995. Remediation of ground water is pending completion of the removal action.

Site Facts: IPW signed an Administrative Order on Consent with the EPA in October 1991. Under this order, IPW agreed to determine the extent of contamination at the site and assist the EPA in evaluating cleanup options.

Environmental Progress

The removal of several storage tanks and the contaminated soil around them has made the Mason City Coal Gasification Plant safe while site studies are underway.

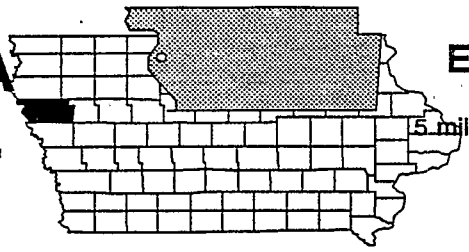
Site Repository

Mason City Public Library, 225 2nd Street S.E., Mason City, IA 50401

MID-AMERICA TANNING CO.

IOWA

EPA ID# IAD085824688



EPA REGION 7

Woodbury County

5 miles south of Sergeant Bluff

Site Description

The Mid-America Tanning Company site, located south of Sergeant Bluff, covers approximately 100 acres and has processed hides under several names since 1969. In 1979, the Mid-America Tanning Company discharged an estimated 1,000 cubic yards of tannery sludges containing chromium into two unlined trenches on the property. U.S. Tanning acquired the operation in 1985. Wastes were treated on site. Solids were settled out in concrete-lined basins and unlined impoundments, while liquids were chemically treated and then discharged into an oxbow lake. The site is in the Missouri River flood plain. Approximately 85 people live within a mile of the site, and 850 people live within 3 miles.

Site Responsibility: This site is being addressed through Federal and Potentially Responsible Party's actions.

NPL LISTING HISTORY
Proposed Date: 06/24/88
Final Date: 03/30/89

Threats and Contaminants

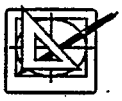
Monitoring wells on site show that the groundwater is contaminated with heavy metals including arsenic, barium, chromium, lead, and cadmium from the former process waste disposal practices. The sediments and surface water of the oxbow lake contain elevated levels of heavy metals. The groundwater, used by local residents as a drinking water supply, may be polluted with heavy metals; drinking such tainted water could be hazardous to public health. About 2 miles south of the site is a wetland used as a nesting site for the piping plover, an endangered species. Impoundment sludges produce dangerous levels of hydrogen sulfide gas.

Cleanup Approach

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

Response Action Status

Initial Actions: In 1990, the EPA excavated approximately 1,300 cubic yards of contaminated soil and sludge from on-site burial pits. This material later will be immobilized as part of the final cleanup remedy. The EPA also removed any raw materials found on site and recycled them, where possible. These initial actions were completed in late 1991.



Entire Site: Due to financial difficulties encountered by the potentially responsible party in early 1990, the EPA had to initiate studies into the nature and extent of contamination at the site. The EPA completed these investigations in late 1991 and chose the following remedy: on-site immobilization of heavily contaminated soil and sludge and capping of contaminated areas. Design of these cleanup remedies began in 1992 and were completed in September 1993. Cleanup activities are expected to begin in 1995.

Site Facts: The EPA issued a Unilateral Administrative Order to a potentially responsible party in late 1989. Due to financial difficulties, the party did not comply with the initial actions specified in the Order. Another responsible party was ordered to secure site buildings, remove drummed wastes, and clean two buildings. This work was completed in April 1995.

Environmental Progress

The EPA has completed initial actions to address elevated levels of cadmium, arsenic, barium, and lead in the groundwater by excavating and consolidating buried sludges, abandoned chemicals, and tanning solutions. These actions will contain the source of contamination and will reduce the potential for direct contact with hazardous wastes on site until final cleanup is conducted. The additional threat of hydrogen sulfide gas was discovered during site investigations conducted in November 1992.

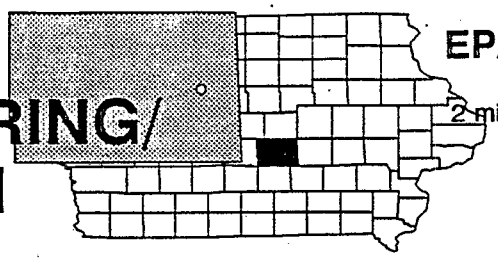
Site Repository

Sergeant Bluff City Hall, 401 Fourth Street, Sergeant Bluff, IA 54054

MIDWEST MANUFACTURING/ NORTH FARM

IOWA

EPA ID# IAD069625655



EPA REGION 7

Jasper County
2 miles north of Kellogg

Other Names:
North Farm
Smith-Jones

Site Description

The Midwest Manufacturing/North Farm site consists of two areas: North Farm, which is an unlined disposal cell located 2 miles from the plant; and Midwest Manufacturing, which is the plant facility. The two areas were combined into the same site because they contain the same types of wastes and affect the same population. From 1973 to 1981, under Smith-Jones ownership, the plant was engaged in electroplating special-order stamped metal pieces, a process that involved using various heavy metals, such as nickel, zinc, and cadmium. Prior to a wastewater treatment plant being brought on line in 1977, the electroplating waste from the plant was discharged directly into the North Skunk River. From 1977 to 1978, the sludge produced by this process was disposed of in an unlined cell at the North Farm area. From 1979 to 1981, trenches at the Midwest Manufacturing area near the plant received the sludge produced by the treatment process. In 1982, the EPA collected sludge samples from the disposal trenches at both areas. Cadmium was the only metal which was found to be present in the soils above naturally-occurring levels. No elevated metals were present in soil samples taken from the North Skunk River downgradient from the plant. A groundwater sample collected from Well #1 was found to contain levels of zinc less than the proposed level for lifetime exposure. During the EPA's 1987 site visit, a man-made drainage ditch was discovered to the west of the disposal trench at the plant. The sediments in this ditch were covered with a black, oily substance that had a petroleum odor. Stressed vegetation and an oily substance floating on top of the water were observed in a marshy area located on the western end of the plant property. In a 1989 site visit, it was noted that the drainage ditch had been covered and a plastic drain pipe had been placed in bottom of the ditch. The plant currently manufactures high-speed flywheel ring gears and assemblies for automobiles. Approximately 700 people depend on wells located within 3 miles of the site for their drinking water supply.

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

NPL LISTING HISTORY
Proposed Date: 09/05/85
Final Date: 06/10/86

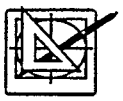
Threats and Contaminants

During sampling in 1982, the Midwest Plant city well #1 showed elevated levels of zinc from the former waste disposal activities. Groundwater samples from plant site monitoring wells found elevated levels of volatile organic compounds (VOCs) such as vinyl chloride, trichloroethylene, and dichlorothylene and the heavy metals cadmium and nickel. Surface soils at both areas contain elevated levels of heavy metals. Adverse health effects could result from ingesting vegetables grown on contaminated soils or watered with contaminated groundwater. In the event that contaminated groundwater were to be consumed, the site may pose a health risk to area residents.

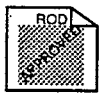
Cleanup Approach

This site is being addressed by Smith & Jones, the PRPs, in two long-term remedial actions focused on the cleanup of the Midwest Manufacturing Area and the North Farm Area. EPA and Smith & Jones, Inc. signed a consent decree in December 1994 for all future site response activities.

Response Action Status



Midwest Manufacturing Area: The EPA concluded a study of the nature and extent of contamination of the area in 1990. The 1991 remedy included installation of a groundwater extraction and treatment system and capping of the plant site disposal trench. The EPA conducted a pump test in preparation for the cleanup design and determined that the aquifer was less permeable than previous data indicated, which lengthens the cleanup time and increases the site cleanup costs. Subsequently, the EPA amended the remedy to include deed restrictions, installation of groundwater monitoring wells, perimeter fencing and regular groundwater sampling of both monitoring wells and supply wells within a 1 mile radius of the plant site. Design of the cleanup was completed in early 1992. Cleanup activities are expected to begin in 1995 by the PRPs with the installation of one monitoring well. Deed restrictions have been placed on the property.



North Farm Area: The EPA concluded a study of the nature and extent of contamination of the area in 1988. The 1988 remedy included removal of soils containing cadmium above the concentration of 13 mg/kg. The EPA has re-evaluated risk data and determined that the site, in its present conditions, poses no current risk to human health and the environment. Future risks can be prevented by using institutional controls which would prohibit certain future land use, such as vegetable gardening and prevent the installation of a water supply well. EPA amended the remedy selection to include deed restrictions and groundwater monitoring of the three existing monitoring wells. Design of the cleanup was completed in mid-1991. Cleanup activities began in 1995 with deed restrictions placed on the property. Ground water monitoring will begin in 1995 and will last until 1997.

Environmental Progress

The EPA has determined that the site required no immediate actions to reduce the potential for exposure to contaminants while final cleanup remedies are being planned. The EPA will monitor the progress of the cleanup actions to determine whether they remain protective of human health and the environment.

Site Repository

Kellogg City Library, Kellogg City Hall, Kellogg, IA 50135

Cleanup Approach

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

Response Action Status

Initial Actions: The State ordered the NWSPCC to stop discharges into Calmus Creek, and the company complied by installing a system that intercepts the flow and pumps the water back into the quarry. In 1987, the company began treating the surface water before discharging it into the creek.

Entire Site: The NWSPCC has pumped most of the water from the quarry. The NWSPCC also conducted an investigation, under State supervision, to determine the extent of contamination at the site. The investigation was completed in 1990. Based on the results of the investigation, EPA selected a cleanup remedy. Along with pumping the water from the quarry, the remedy includes construction of a permanent drain system in the quarry to collect precipitation runoff and groundwater inflow; installation of a cap over the quarry area filled with waste kiln dust to minimize infiltration through to kiln dust; installation of bedrock dewatering wells to collect contaminated groundwater to prevent migration of contaminated groundwater, and to maintain groundwater levels; installation of kiln dust dewatering wells, if necessary; treatment of contaminated waters and final discharge into Calmus Creek; and continued operation of a dewatering system. The design of these technologies by the NWSPCC began in 1991 and was completed in late 1992. Construction of site remedies was completed in 1993, and the site was proposed for delisting from the NPL in the fall of 1994. Final delisting should be completed in the summer of 1995.

Site Facts: In 1985, the State issued an Administrative Order to the NWSPCC to stop discharges into Calmus Creek. In addition, the Order instructed the company to conduct a study, under State supervision, to determine the effect of the quarry on the environment. This study was completed in 1987. In 1989, the State issued an Administrative Order to the NWSPCC to conduct an additional site study, which was completed in 1990.

Environmental Progress

Pumping the water from the quarry and treating surface water prior to release to Calmus Creek has reduced the potential for exposure to contaminated water and sediments at the Northwestern States Portland Cement Co. site while operation of the dewatering system continues.

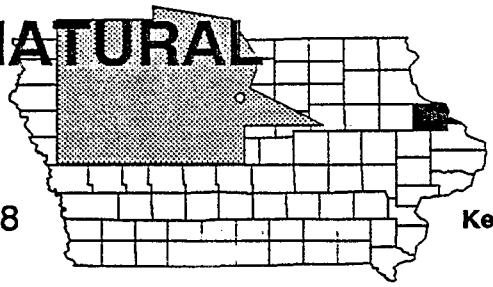
Site Repository

Mason City Public Library, 225 Second Street, Mason City, IA 50401

PEOPLES NATURAL GAS CO.

IOWA

EPA ID# IAD980852578



EPA REGION 7

Dubuque County
East Dubuque

Other Names:
Key City Coal Gasification Plant

Site Description

The Peoples Natural Gas Co. site is located in Dubuque and covers approximately 5 acres. From 1890 until 1954, the Key City Gas Company owned and operated this gas plant, where a natural gas substitute was produced from coal. In 1954, the North Central Public Service Company took over operations until 1957, when Peoples Natural Gas Company assumed ownership of the site. Peoples used the site as a storage and maintenance area and did not manufacture gas. It later sold a portion of the site to the City of Dubuque, which operates the Dubuque Municipal Garage on the site. The Iowa Department of Transportation owns the remainder of the site. Two waste products resulting from coal gasification are of primary concern: coal tar sludges and spent iron oxide. Coal tar sludges were produced during the coal or coke combustion and during the oil injection processes, and spent iron oxide wastes were produced during the gas purification process. Spent iron oxide wastes, removed from the three gas cleaning boxes (purifiers), were dumped behind two gas holding tanks on the site at least twice a year. Spent iron oxide and other wastes were deposited in the northeastern section of the site. Coal tars were removed from the gas in the wash box and condenser. These wastes either were sold or disposed of in pits or holding tanks. Two coal tar waste storage tanks were used at the Key City plant, one aboveground and one below. Both tanks have been removed. Evidence of materials left in the underground tank, as well as migration of waste out of the tank, is supported by a study done by the Iowa Department of Transportation in 1983 while conducting a right-of-way survey for the proposed extension of U.S. 61. An estimated 60,000 people obtain drinking water from municipal wells within 3 miles of the site. Approximately 2,400 people live within a mile of the site, and 21,000 people live within 3 miles. The Mississippi River is approximately 500 feet east of the site. Surface water downstream is used for industrial and recreational activities. A wildlife and fish refuge is 2 miles downstream, and wetlands are within ½ mile 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: 08/30/90

Threats and Contaminants

Phenols, polycyclic aromatic hydrocarbons (PAHs), and inorganic chemicals from the gasification process wastes were detected by the State in on-site wells. Soil samples collected at the site in 1983 also contained phenols, PAHs, and inorganic chemicals. Accidental ingestion of or direct contact with contaminated soil or groundwater may pose potential health threats to individuals. No private drinking water wells have been identified in the area. The wetlands and the wildlife and fish refuge may be threatened by runoff from the site.

Cleanup Approach

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

Response Action Status

Immediate Actions: Under EPA oversight, potentially responsible parties for the site contamination removed the contaminated coal tar sludges and soils containing contaminants above human-health standards from within the construction corridor for U.S. Highway 61. Off site incineration of these soils has been completed.

Soil and Groundwater: A study of the extent and type of groundwater and soil contamination also was completed by the potentially responsible parties. A remedy that requires excavation and incineration of contaminated soils, and pumping and treating contaminated groundwater, was selected in 1991. Restrictions on land and groundwater use also will be implemented. Design of the remedy was completed in early 1994. Excavation of contaminated soils for the remaining portion of the site was initiated in the spring of 1995 and is scheduled to be completed in late 1996.

Site Facts: The EPA signed an Administrative Order on Consent with Midwest Gas (of Iowa Public Service, a successor corporation of Key City Gas Co.), the Iowa Department of Transportation, and the City of Dubuque in 1989. The Order required the parties to remove or treat any contaminated soil. It also required completion of an investigation to determine the need for treatment of residual soil and for groundwater treatment. The EPA signed a Consent Decree with Midwest Gas, the Iowa Department of Transportation, the City of Dubuque, and Enron on December 28, 1992, which requires the parties to conduct the design of the remedy and cleanup activities.

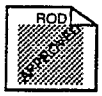
Environmental Progress

By removing contaminated coal tar sludges and soils, the potential for exposure to hazardous materials at the People's Natural Gas Co. site has been reduced while final cleanup activities are underway.

Site Repository

Carnegie Stout Public Library, Eleventh and Bluff, Dubuque, IA 52001

Response Action Status



Entire Site: The investigative work to determine the extent and nature of the contamination on site originally was begun by the EPA and then taken over by the potentially responsible parties. This investigation was completed in July 1992, which resulted in the EPA choosing capping of the landfill as the preferred remedy in 1993. Design activities are scheduled to begin in 1994.

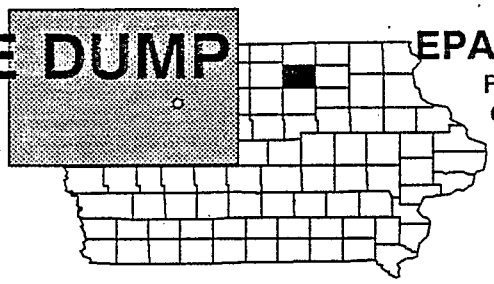
Environmental Progress

After placing the Red Oak Landfill site on the NPL, the EPA determined, after a preliminary assessment of site conditions, that no immediate actions were required while final site cleanup activities are being planned.

Site Repository

Red Oak Public Library, Second and Washington, Red Oak, IA 51566

SHAW AVENUE DUMP
IOWA
EPA ID# IAD980630560



EPA REGION 7
Floyd County
Charles City

Site Description

The Shaw Avenue Dump site, an 8-acre city dump, is located in southeastern Charles City, approximately 500 feet east of the Cedar River. The City owns the site and operated it as a municipal waste dump without a permit. Two areas in the northern half of the site were used from 1949 to 1953 to dispose of 14,000 to 28,000 cubic feet of arsenic-contaminated solid waste generated by Salsbury Laboratories in the production of animal pharmaceuticals. Sludge from the Charles City wastewater treatment plant, which received liquid wastes discharged from Salsbury, was placed in the northern waste cells and in an undefined area on the southern portion of the site. The northern disposal area no longer is in use and has been covered with soil and vegetated. Between the southern and northern areas, trenches were used for disposing of lime sludges from the drinking water treatment plant. The City and the public used this area for open burning of wastes. The site is within a large residential area. A high school is located approximately 1,000 feet north of the site. Students use a stadium within 500 feet of the northern waste disposal cells. One residence, 1,500 feet southeast of the site, uses a private well for domestic purposes. The Charles City municipal water supply system, within 2 miles uphill of the site, serves 8,800 people. The Cedar River flows through Charles City and is used for recreational fishing, swimming, and canoeing.

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

NPL LISTING HISTORY
Proposed Date: 09/05/85
Final Date: 07/22/87

Threats and Contaminants

The groundwater and soils are contaminated with arsenic from the disposal site. The Cedar River also is contaminated with arsenic. Direct contact with contaminated soil, groundwater, and surface water may pose a health risk. The site is surrounded by a fence with no-trespassing signs and a locked gate.

Cleanup Approach

The site is being addressed in two long-term remedial phases focusing on cleanup of chemical fill and contaminated soil, and cleanup of the groundwater.

Response Action Status

Chemical Fill and Contaminated Soil: The EPA began an investigation of the site and its cleanup alternative in 1987. The parties potentially responsible for site contamination took over the investigation in 1988 and completed it in late 1991. In early 1992, the potentially responsible parties began cleanup activities. The remedy initially called for stabilization of chemical fill and contaminated soil, however, treatability tests indicated that stabilization would not be effective. All contaminated materials have now been removed off site to a federally-approved landfill as described in the contingency remedy. Cleanup of the contaminated soil and chemical fill was completed in early 1994.

Groundwater: An investigation of the nature and extent of groundwater contamination is expected to begin in 1997, and will result in the selection of final cleanup remedies.

Site Facts: In March 1987, the EPA sent letters notifying Salsbury Laboratories and Charles City of their potential responsibility and requested information about their use of the site. A Consent Order was completed on May 26, 1988. Under this Order, the potentially responsible parties were required to conduct an investigation to determine the type and extent of contamination on the site.

Environmental Progress

The removal of contaminated soils from the Shaw Avenue Dump site has reduced the risk of exposure to hazardous materials pending the start of investigations that will lead to the selection of a groundwater remedy.

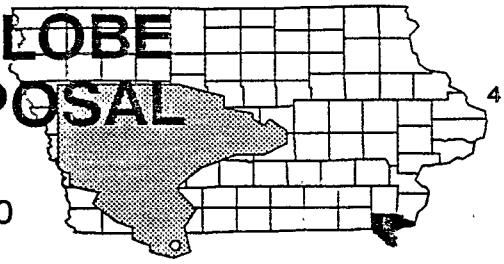
Site Repository

Charles City Public Library, 106 Milwaukee, Charles City, IA 50616

SHELLER-GLOBE CORP. DISPOSAL

IOWA

EPA ID# IAD980630750



EPA REGION 7

Lee County
4 miles northwest of Keokuk

Other Names:
Grimes Property

Site Description

Sheller-Globe Corp. operated an industrial landfill and solvent burning area from 1947 to 1970. The 5-acre site was filled in and sold in 1980 to an individual who built a home on it and drew water from a 300-foot-deep on-site well. The water from the well contains lead and zinc, possibly from the distribution lines. The homeowner permanently relocated in the fall of 1991. The site is no longer used for residential purposes. In the past, the Sheller-Globe Corporation manufactured rubber products, including automobile weather stripping, at a facility located in Keokuk. Liquids, sludges, and rubber stripping from the operation were deposited on site with no system for diverting surface runoff. According to the company, among these wastes were at least 1,000 drums of paint sludge, volatile organic compounds (VOCs), isopropyl alcohol, and resins containing fluorocarbons. Waste material, including solvents was routinely burned in the open and buried. In 1987, the EPA found heavy metal and VOC contamination in soil, groundwater, and surface water during testing. Previously, an estimated 1,125 people obtained their drinking water from private wells within 3 miles of the heavily wooded rural site. Most people now obtain drinking water recently made available from one of two rural water districts.

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

NPL LISTING HISTORY
Proposed Date: 05/05/89
Final Date: 08/30/90

Threats and Contaminants

On site soils are contaminated with heavy metals including arsenic, chromium, lead, nickel, and zinc and organics from the former disposal activities. Accidental ingestion of contaminated soil may cause a potential health threat.

Cleanup Approach

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

Response Action Status

Entire Site: In 1990, an investigation of the site and the possible cleanup alternatives was started by the potentially responsible parties. Investigations to date have included sampling of surface and subsurface soils, surface water, glacial till groundwater, and bedrock groundwater. Field work was completed in 1993. A Proposed Plan for the site was released on August 1, 1995. EPA's preferred alternative for addressing site-related risks includes, demolition of the on-site residence, placement of clean soil over exposed ash material, and a deed restriction limiting future use of the site to non-residential.

Site Facts: An Administrative order on Consent, requiring the potentially responsible parties to conduct site studies, was signed October 18, 1990.

Environmental Progress

Following listing of the Sheller-Globe Corp. Disposal site on the NPL, the EPA determined, after an initial evaluation of the site conditions, that the site did not require any immediate actions while studies leading to the selection of a final cleanup remedy are taking place.

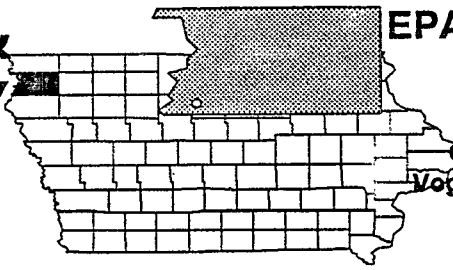
Site Repository

Contact the Region 7 Superfund Community Relations Office.

VOGEL PAINT & WAX COMPANY

IOWA

EPA ID# IAD980630487



EPA REGION 7

Sioux County
Orange City

Other Names:
Vogel Disposal Site

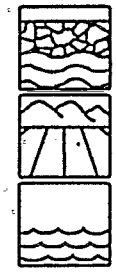
Site Description

From 1971 to 1979 the Vogel Paint and Wax Company disposed of paint, sludge, resins, solvents and other solid wastes at a 2-acre disposal site in rural Sioux County, Iowa. The disposal site is part of an 80-acre parcel located about 2 miles southwest of the City of Maurice (pop. 288), 3 miles north of the City of Struble (pop. 59) and 2 miles northwest of a rural water system well field. The rural water system serves about 3,000 people. Two shallow private wells lie several hundred feet west of the disposal site. The company has conducted numerous investigations beginning in 1979 in conjunction with the Iowa Department of Natural Resources (IDNR) to determine the extent of contamination. A shallow groundwater contamination plume was found to extend about 1,000 feet south and east of the disposal area which is within the 80-acre parcel owned by the company.

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



The primary groundwater contaminants are the volatile organic compounds (VOCs) benzene, ethylbenzene, methyl ethyl ketone, toluene, and xylenes. In addition to the VOCs, soils in the disposal area contain elevated levels of heavy metals, particularly chromium and lead. No current or past significant exposure to site contaminants has been identified. Potential for future exposure to contaminated groundwater is the principal threat associated with the site.

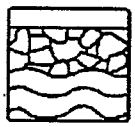
Cleanup Approach

Initial action was taken to mitigate contamination at the site. Long-term cleanup action is currently being conducted consisting of source control and cleanup of groundwater.

Response Action Status

Initial Action: A 2-foot thick clay cap was placed over the disposal area shortly after the site was identified as a problem. In addition, floating VOCs were removed from the groundwater table on a regular basis.

Source Control: After evaluating cleanup methods, the IDNR and EPA selected a remedy for source control. Source control operations were initiated in 1991. The source control remedy involves excavating the previously disposed wastes and surrounding contaminated soils. Solid and liquid waste are sorted from the excavated soils for off-site incineration, recycling, or disposal. Contaminated soils are being treated on-site by bioremediation and volatilization. An estimated 30,000 to 50,000 cubic yards of contaminated soils will be treated. After treatment the soils will be placed back into the excavated area and covered. Soil cleanup standards have been established including a leaching standard for metals. If excessive levels of metals are encountered, soils will be stabilized prior to final placement.



Groundwater: To address groundwater contamination, the IDNR and EPA chose pumping and air stripping contaminated groundwater, with discharge to the nearby stream. VOCs from the groundwater treatment process are released to the atmosphere. Modeling of contaminants in air from the soil treatment was performed prior to implementing long-term cleanup actions. This modeling indicated that air contamination would not pose a significant problem which has since been verified by air monitoring. Health-based standards have been established for treated groundwater prior to discharge. The groundwater pump and treat action was initiated in 1992. Facilities have been added for the removal floating VOCs (primarily xylenes). The area of groundwater contamination has decreased since implementation of groundwater cleanup actions. Recently treated groundwater has been infiltrated back into the ground to enhance removal of floating VOCs.

Site Facts: The company is conducting cleanup actions in accordance with a 1990 Consent Order with the IDNR. The site is listed on the state Registry of Hazardous Waste or Hazardous Substance Disposal Sites. Substantial changes or transfer of property on this registry is prohibited without written approval of the Director of the IDNR.

Environmental Progress

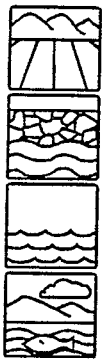
Initial response actions at the site prevented any immediate threat. The current source control actions are expected to be completed in two to four years. The groundwater response actions will continue as long as necessary to prevent any threat from groundwater contamination.

Site Repository

Orange City Public Library
112 Albany Avenue, S.E.
Orange City, IA 51041

Iowa Department of Natural Resources
Records Center, 5th Floor
Wallace State Office Building
900 East Grand
Des Moines, IA 50319

Threats and Contaminants



Polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), and cyanide have been detected in on-site surface and subsurface soils. PAHs, VOCs, and cyanide have also been detected in shallow groundwater samples collected from on-site monitoring wells. Accidental ingestion of or direct contact with contaminated soil or groundwater may pose potential health threats to individuals. The potential also exists for adverse impacts on wetlands and associated wildlife due to contaminant migration from the site to the Cedar River.

Response Action Status

Initial Actions: Midwest Gas agreed to develop the necessary work plans and conduct a removal action to identify, excavate, process, and incinerate or dispose of all coal tar, visibly contaminated coal tar-impacted soils and source material. EPA will review the documents prepared by Midwest Gas and provide oversight during certain stages of on-site activities. A comprehensive public and private well survey also will be conducted by Midwest Gas. Site preparation, test trenching, excavation and soil processing activities were initiated in the summer of 1994. Cleaned structural debris will be disposed of at the Blackhawk County Sanitary Landfill. The processed soil will be transported to the George Neal Electrical Generating Station in Sioux City, Iowa for incineration. The majority of the source material is expected to be excavated, processed, and transported off-site during the fall of 1994 and the spring of 1995.

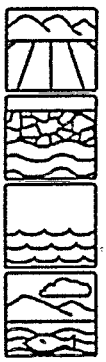
Entire Site: Additional work is anticipated at the site after the source materials have been removed. The EPA and Midwest Gas signed an Administrative Order on Consent on May 30, 1995. The AOC requires Midwest Gas to conduct a Remedial Investigation/Feasibility Study to determine the nature and extent of contamination in groundwater and soil.

Site Facts: This site is being addressed under the Superfund Accelerated Cleanup Model (SACM) approach. EPA and Midwest Gas signed an Administrative Order on Consent (AOC) on December 29, 1993 to perform removal actions at the site.

Environmental Progress

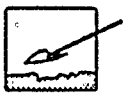
Initial actions being under taken at the Waterloo Coal Gasification Plant site are protecting the health of the nearby population and the integrity of the environment while a full-scale study into site conditions is being planned.

Threats and Contaminants



Polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), and cyanide have been detected in on-site surface and subsurface soils. PAHs, VOCs, and cyanide have also been detected in shallow groundwater samples collected from on-site monitoring wells. Accidental ingestion of or direct contact with contaminated soil or groundwater may pose potential health threats to individuals. The potential also exists for adverse impacts on wetlands and associated wildlife due to contaminant migration from the site to the Cedar River.

Response Action Status



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Entire Site: Additional work is anticipated at the site after the source materials have been removed. The EPA and Midwest Gas signed an Administrative Order on Consent on May 30, 1995. The AOC requires Midwest Gas to conduct a Remedial Investigation/Feasibility Study to determine the nature and extent of contamination in groundwater and soil.

Site Facts: This site is being addressed under the Superfund Accelerated Cleanup Model (SACM) approach. EPA and Midwest Gas signed an Administrative Order on Consent (AOC) on December 29, 1993 to perform removal actions at the site.

Environmental Progress

Initial actions being under taken at the Waterloo Coal Gasification Plant site are protecting the health of the nearby population and the integrity of the environment while a full-scale study into site conditions is being planned.

Cleanup Approach

The site is being addressed in a long-term remedial phase directed at cleanup of the entire site.

Response Action Status

Entire Site: One of the parties potentially responsible for the contamination investigated the nature and extent of contamination. The investigation included characterization of waste in the landfill, determination of contamination spread by rainwater runoff, detection of contamination spread by air, detection of contamination spread by dissolved metal, and determination of groundwater movement and evaluation of possible connections between the shallow aquifer and the drinking water aquifer. The EPA chose a compacted soil and vegetative layer cap as the cleanup measure in 1990. The potentially responsible parties began cleanup actions in mid-1994 and completion is scheduled for June 1995.

Site Facts: In 1989, the EPA and two parties potentially responsible for the contamination signed an Administrative Order on Consent. In that Order, one of the parties agreed to take responsibility for the site investigation to determine the nature and the extent of the contamination. In 1991, a Consent Decree was signed by the party to design and perform site cleanup. The Consent Decree required sampling of groundwater. The initial round of sampling indicated no contamination in the groundwater. A second round of sampling confirmed the original results.

Environmental Progress

After adding the site to the NPL, the EPA determined that no immediate actions were required. Remedial action was completed in June 1995.

Site Repository

Charles City Public Library, 106 Milwaukee, Charles City, IA 50616

Glossary: Terms Used in the Fact Sheets

Terms Used in the NPL Book

This glossary defines terms used throughout the NPL Volumes. The terms and abbreviations contained in this glossary apply specifically to work performed under the Superfund program in the context of hazardous waste management. These terms may have other meanings when used in a different context.

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

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

Administrative Order [Unilateral]: A legally binding document issued by the EPA, directing the parties potentially responsible to perform site cleanups or studies (generally, the EPA does not issue Unilateral Orders for site studies).

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

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

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

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

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

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

GLOSSARY

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Carbon Disulfide: A degreasing agent formerly used extensively for parts washing. This compound has both inorganic and organic properties, which increase cleaning efficiency. However, these properties also cause chemical reactions that increase the hazard to human health and the environment.

Carbon Treatment: [see Carbon Adsorption].

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

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

Characterization: The sampling, monitoring, and analysis of a site to determine the

extent and nature of toxic releases. Characterization provides the basis for acquiring the necessary technical information to develop, screen, analyze, and select appropriate cleanup techniques.

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

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

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

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

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

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

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

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

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

Consent Order: [see Administrative Order on Consent].

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

GLOSSARY

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Good Faith Offer: A voluntary offer, generally in response to a Special Notice letter, made by a potentially responsible party, consisting of a written proposal demonstrating a potentially responsible party's qualifications

and willingness to perform a site study or cleanup.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Interagency Agreement: A written agreement between the EPA and a Federal agency that has the lead for site cleanup activities,

setting forth the roles and responsibilities of the agencies for performing and overseeing the activities. States often are parties to interagency agreements.

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

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

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

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

Leachate [n]: The liquid that trickles through or drains from waste, carrying soluble components from the waste. **Leach, Leaching [v.t.]:** The process by which soluble chemical components are dissolved and carried through soil by water or some other percolating liquid.

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

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

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

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

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

Mill Tailings: [See Mine Tailings].

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Potentially Responsible Parties (PRPs): Parties, including owners, who may have contributed to the contamination at a Superfund site and may be liable for costs of response actions. Parties are considered PRPs until they admit liability or a court makes a determination of liability. PRPs may sign a Consent Decree or Administrative Order on Consent to participate in site cleanup activity without admitting liability.

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

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

GLOSSARY

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

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

RCRA: [See Resource Conservation and Recovery Act].

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

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

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

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

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

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

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

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

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

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

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

Resource Conservation and Recovery Act (RCRA): A Federal law that established a regulatory system to track hazardous substances from the time of generation to disposal. The law requires safe and secure

procedures to be used in treating, transporting, storing, and disposing of hazardous substances. RCRA is designed to prevent new, uncontrolled hazardous waste sites.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Soil Gas: Gaseous elements and compounds that occur in the small spaces between particles of soil. Such gases can move through

or leave the soil or rock, depending on changes in pressure.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Trichloroethylene (TCE): A stable, colorless liquid with a low boiling point. TCE has many industrial applications, including use as

a solvent and as a metal degreasing agent. TCE may be toxic to people when inhaled, ingested, or through skin contact and can damage vital organs, especially the liver [see Volatile Organic Compounds].

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

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

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

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

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

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

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

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

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

Water Table: The upper surface of the groundwater.

Weir: A barrier to divert water or other liquids.

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

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