



Citizen Handbook on

GI-14 (Rev. 3/08)

# **SUPERFUND IN TEXAS**





Citizen Handbook on  
**SUPERFUND IN TEXAS**



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## About the Superfund Program

You may have heard about the Superfund, but do you know what this program does and how it works? This handbook will help you understand how the Superfund program can protect the health and safety of you and your family.

In this publication, questions are written as you might ask them. In the answers to these questions, “we” and “us” means the TCEQ. Superfund terms that appear in italics are defined in Chapter 6.

*Superfund* is the nickname for the law that authorizes state and federal environmental agencies to take care of contaminated sites that have releases or potential releases of *hazardous substances* into the environment. The law gives the environmental agencies the legal power to clean up sites and to recover *cleanup* costs from those who are responsible for the hazardous substances.

In Texas, the state and federal governments cooperate to investigate and clean up contaminated sites. The state agency is the Texas Commission on Environmental Quality (TCEQ), which administers the state’s Superfund program. The *U.S. Environmental Protection Agency* (EPA) is in charge of the federal Superfund program.

### What are hazardous substances?

Hazardous substances are made up of toxic or harmful materials that can pose a potential hazard to human health if not handled or disposed of properly. Many familiar products contain hazardous substances. Improper use or disposal of these products can result in a situation requiring cleanup.

Hazardous substances can pollute the environment and harm people. A place where these substances have been allowed to be released into the environment may become a *Superfund site* when the degree of contamination is severe enough.

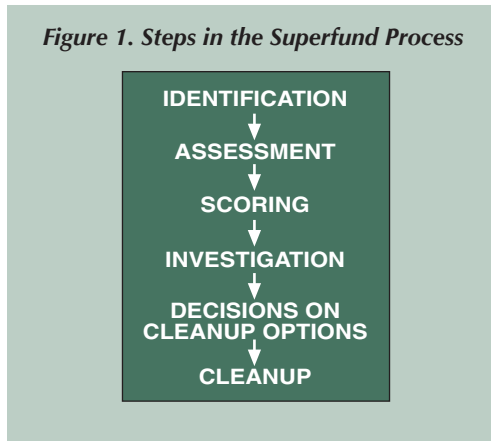
### Is there a list of Superfund sites in Texas?

Yes, there are two lists that include Texas Superfund sites. One list is called the *National Priorities List* (NPL), which is a list of the federal Superfund sites. The EPA decides which sites should be NPL sites.

The other list is the *State Superfund Registry*, or the Registry. The TCEQ decides which sites should be on the state Superfund list. In the following pages, we will explain how sites are evaluated and how they get on one of these lists.

## What are the steps in the Superfund process?

The following steps apply to both the federal and state Superfund programs (see Figure 1, Steps in the Superfund Process).



### Step 1: Identification

Finding the hazardous substance sites is an important first step. Private citizens and local or state agencies discover these sites. A report is made to the TCEQ or the EPA.

### Step 2: Assessment

Deciding if the site is a danger to human health or the environment is the next step. The TCEQ and the EPA review data from tests of the air, soil, and water to determine if there is a problem or a potential problem.

### Step 3: Scoring

Assigning a score to a site is a way to determine if a site could be a candidate for the NPL or the state Superfund program. Both the TCEQ and the EPA use a scoring guide from 0 to 100 called the *Hazard Ranking System* (HRS).

The HRS score is a numerically based screening system used to evaluate the relative potential of a site to pose a risk to public health and the environment. Generally, if the site data scores 28.5 or higher, it is eligible for consideration for the NPL. If the site data scores 5.0 or greater, the site is eligible for the state Superfund program administered by the TCEQ.



If the site score is below 5.0, the site is not eligible for investigation and remediation under Superfund. However, during the development of the HRS, a determination is made concerning endangerment to human health and the environment. If it is determined that there is a risk to human health or the environment, action will be initiated to eliminate the threat and to remediate the site under the state rules established in the Texas Risk Reduction Program.

Sites are scored based on factors that may be grouped into three categories:

- likelihood that a site has released or has the potential to release hazardous substances into the environment;
- characteristics of the substance (how toxic it is and the quantity); and
- people or sensitive environments (both are known as targets) that are affected by the release.

#### **Step 4: Investigation**

Determining the nature of the threat to human health and the environment is the focus of the fourth step. Investigators from either the TCEQ or the EPA or both conduct inspections, take samples, and perform tests at all Superfund sites. They find out what kinds of hazardous substances are at each site. Investigators also identify the hazards that may exist for people and the environment.

#### **Step 5: Cleanup options**

The next step involves deciding which kind of cleanup is appropriate. The TCEQ and the EPA look at *cleanup options* and consider which will be the most efficient for each site. Cleanup methods depend on the amount to be cleaned up, the cost, and the likelihood that the method will protect public health and the environment in and around the site.

A proposed cleanup method is presented to residents of the communities near the site. The public is given an opportunity to comment on the remedy. After hearing from the public, a cleanup decision is made. The part of the process that involves determining the best cleanup option usually takes 12 to 18 months.

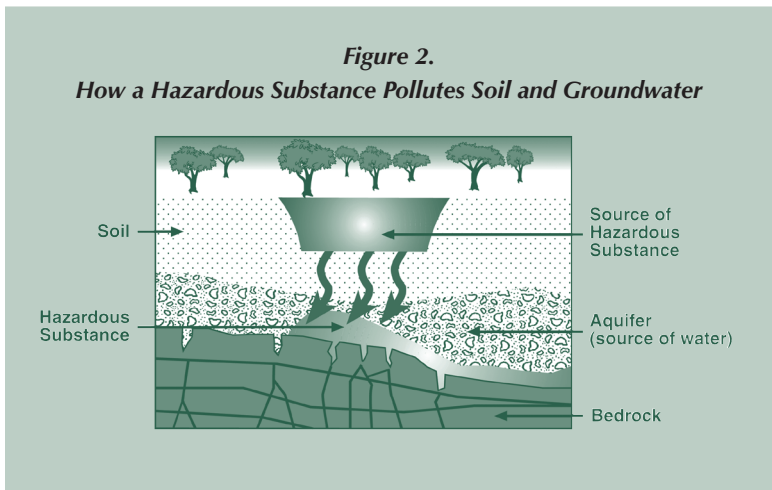
#### **Step 6: Cleanup begins**

As the final step, cleanup begins. A cleanup remedy plan is developed, reviewed, and put into action. Cleanup methods can include off-site disposal, treatment, or containment of the contamination. Many new cleanup methods are being developed. A combination of technologies is often used. A site cleanup may take from 2 to 10 years or more to complete.

## What types of hazardous substances are found at Superfund sites?

Each site is different. The site may be small or large. There may be many different types of substances at a site. One site may have polluted water. Another may have toxic substances in the soil. A third may release harmful substances into the air. Some sites have all three types of problems.

Figure 2 shows how a hazardous substance can contaminate the soil and pollute the groundwater in an aquifer, or source of water.



You can get a list of Superfund sites that may be in your area from the TCEQ or from its “Texas Superfund” Web page (see “Contact Information” in Chapter 5).

## What if there is an emergency?

If the substances at a site could cause a severe human health threat, steps are taken right away to keep people and the environment safe. Either the TCEQ or the EPA or both agencies will take immediate action. To report an emergency, see the telephone numbers in Chapter 5, “Contact Information.”

## When is the public involved?

Superfund activities may generate intense public interest and involvement. Since public participation is an important part of the Superfund program, the TCEQ’s goal is to give citizens the opportunity to clearly understand the program and to voice their views and concerns.

The TCEQ has a community relations program to help inform residents and local officials about Superfund activities in their area. Similarly, information that citizens provide about a site can be very valuable to the program.

To provide an opportunity for citizen input, public meetings are announced at three points in the Superfund process:

- when a site enters the program,
- when a remedy is selected, and
- when the site is removed from the program.

## **Who pays for cleaning up a Superfund site?**

Both the TCEQ and the EPA try to get the *responsible party* or parties to perform the necessary investigation and cleanup **before** spending public money. If the responsible parties cannot or will not perform the necessary cleanup activities, or if the responsible parties cannot be identified, the TCEQ and the EPA will perform the cleanup using funds from their Superfund program.

The agencies then try to recover the costs of the cleanup from the parties who are responsible for the pollution. For federal Superfund sites, the EPA enlists the assistance of federal attorneys and the U.S. Department of Justice. For the TCEQ, such collection efforts may include requesting assistance from the Office of the Texas Attorney General.

## **Is there an alternative to the traditional Superfund process?**

Yes. The Voluntary Cleanup Program (VCP) provides a streamlined investigation and cleanup process for parties who are willing to voluntarily conduct these activities with TCEQ oversight. In order to be eligible for the VCP, these parties must reimburse the state for eligible Superfund costs that are spent, must not be a permitted facility, and must not be under a TCEQ order.

VCP participants are protected from enforcement while cleanup actions are being performed. Future owners, lessees, and operators also receive protection from any residual liability for cleanup after it is completed. You can find information about the VCP on the TCEQ Web site (see “Contact Information” in Chapter 5).

Participants in the VCP sign an agreement that outlines the dates for submittal of reports to document that cleanup is achieved. They also agree to pay for VCP oversight costs. In return, VCP participants gain the advantage of controlling contractors and costs, while eliminating many of the legal expenses that could be necessary for a party in a legal case involving Superfund issues.



## How a Superfund Site Is Cleaned Up

Superfund cleanups can be very complicated. They require the know-how of experts from many fields, including science, engineering, law, and public health.

### What is site remediation?

Site remediation is the cleanup of a Superfund site. In a site cleanup, hazardous substances are removed or made less dangerous.

### What cleanup procedures are used?

To clean up a site, any of the following three ways, or a combination of these three ways, can be used.

#### Containment

The hazardous substance is left in place at the site. *Containment* involves taking steps to prevent exposure to the substance and to keep it from spreading any farther through air, soil, or water.

#### Off-site disposal

With *off-site disposal*, the hazardous substance is removed and sent to a permitted disposal facility, such as a landfill.

#### Treatment methods

A variety of *treatment methods* can be used to make the hazardous substances less toxic to humans and the environment. The method used depends on the type of substance. Some of these treatment methods are described in the following section.

### What are some treatment methods?

Following are some of the treatment methods that are used to make the hazardous substance less toxic.

#### Activated carbon treatment

With *activated carbon treatment*, special carbon filters are used to collect the hazardous substance. This method is used to treat polluted air and water.

## Air stripping

*Air stripping* is used to treat water polluted with volatile constituents that may easily evaporate or become unstable. Air is forced through the polluted water to pick up those constituents. They can then be removed from the air with carbon filters or other controls.

## Bioremediation

*Bioremediation* uses tiny organisms, such as bacteria, to clean up oil spills or other substances from soil, water, or wastewater.

## Immobilization

This treatment holds hazardous substances in place. *Immobilization* involves treating the substance with a material, such as concrete, which

### *Cleanup of a State Superfund Site: Houston Scrap*



#### BEFORE:

Empty acid containers were found among 7,500 cubic yards of waste at a 20-acre lead-acid battery recycling site.



#### DURING:

Garbage and trash were removed to an approved landfill before soil testing could begin.



#### AFTER:

Remedial action is complete after waste has been consolidated into this specially engineered containment cell that is capped, sodded, and fenced.



binds up the hazardous substances. It keeps the substances from moving through air, soil, or water.

### **Incineration**

With the *incineration* treatment method, soil and hazardous substances are burned at high temperatures. The substances are converted to less dangerous substances, or they are destroyed. Incineration is also known as thermal decomposition.

### **Soil washing**

With *soil washing*, the first step is to dig up the polluted soil and sift it to remove large objects, like rocks and debris. Then the sifted soil is placed in a scrubbing unit. Water, and sometimes detergents, are added to the polluted soil in the scrubbing unit. Some of the pollution dissolves or floats to the top. Soil washing alone may not be enough to clean polluted soil. This method is used most often with other methods that finish the cleanup.

### **Solvent extraction**

*Solvent extraction* is similar to soil washing. After the polluted soil is dug up, it is sifted to remove large objects, like rocks and debris. The sifted soil is placed in a machine called an extractor, where the soil is mixed with a solvent, or cleaning agent. Some substances, like oil and grease, do not dissolve in water. Solvents can dissolve these substances and remove them.

### **Thermal desorption**

*Thermal desorption* uses heat to remove substances from the soil. Substances that become gases at slightly elevated temperatures are collected and treated.

### **Vacuum extraction**

This method is similar to air stripping. *Vacuum extraction* removes hazardous substances in the soil through a vacuum, or suction process. The suction removes the air and the gases in the spaces between the soil particles.

### **Vitrification**

*Vitrification* is a process that uses high temperatures to melt hazardous substances into melted glass. After the melted glass has cooled into solid blocks of material, the hazardous ingredients are unlikely to dissolve, or leach, into water that percolates through the material.

## Why do cleanup workers wear special clothes?

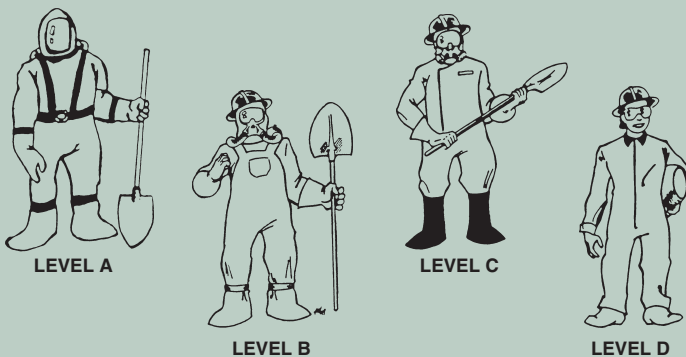
When a Superfund site near you is being cleaned up, you may see cleanup workers in the area. They might have on different types of clothing and equipment. You may wonder why they wear these special clothes.

Workplace safety laws require that site workers wear special protective clothes, since these workers are usually dealing directly with contaminated materials for extended periods of time. Substance exposures of site workers are different than exposures for the general public, so extra safety steps are taken. Worker safety laws are made and enforced by OSHA.

## What is OSHA?

OSHA is the *Occupational Safety and Health Administration*, an office in the U.S. Department of Labor. OSHA writes workplace safety and health rules and makes sure that workers have a safe place to do their jobs. OSHA laws ensure that the rules are followed.

**Figure 3. Protection Gear for OSHA Levels A to D**



**Level A** protection is needed when there are many hazardous substances at a site.

**Level B** is used when hazardous substances are not thought to be as harmful to the skin as at Level A.

**Level C** is used when hazardous chemicals in the air, water, or soil will not harm any exposed skin.

**Level D** is used only when there is little or no known hazard at a site.



## What does OSHA law do to protect workers?

OSHA laws require special clothing for all workers at any hazardous site. The kind of clothing depends on different factors:

- What hazardous substances are at the site?
- What kind of work is being done there?
- Is the site pollution in the air, soil, or water?

## How do workers know what to wear at a site?

Workers must be trained before they can work at these sites. They must take training courses that meet OSHA requirements. A site-specific Health and Safety Plan is required. The plan specifies the procedures that are sufficient to protect on-site personnel and surrounding communities from the hazards of the site. Each worker is required to read and become familiar with the plan. The on-site health and safety officer ensures that all workers follow the plan.

OSHA has established four levels of protection for the clothing site workers are required to wear: A, B, C, and D. Each level requires different clothing and protective gear, as you can see in Figure 3. Level A requires the highest amount of protective gear, and Level D requires the least.

Levels A and B require that workers wear a *self-contained breathing apparatus* (SCBA). An SCBA is an air tank with a breathing mask. The tank is carried on the worker's back and inside the protective clothing.



CHAPTER 3:

## Learning about Health Effects

Learning more about the health effects that could be caused by hazardous substances in your community will help you take an active role in protecting your health and the health of your family.

### How do substances get into my body?

Substances must find a way into a person's body before they can have a toxic effect. Even the most toxic substance may pose little risk if there is no way for a person to be exposed to it. The way in which exposure could occur is called an *exposure pathway*.

### What are the exposure pathways?

Substances can get into our bodies through three general exposure pathways, or routes:

- Air and breathing (inhalation exposure).
- Eating or drinking (ingestion, or oral exposure).
- Skin contact (dermal exposure).

These exposure pathways are shown in Figure 4 and discussed in more detail in the following sections.

#### Air

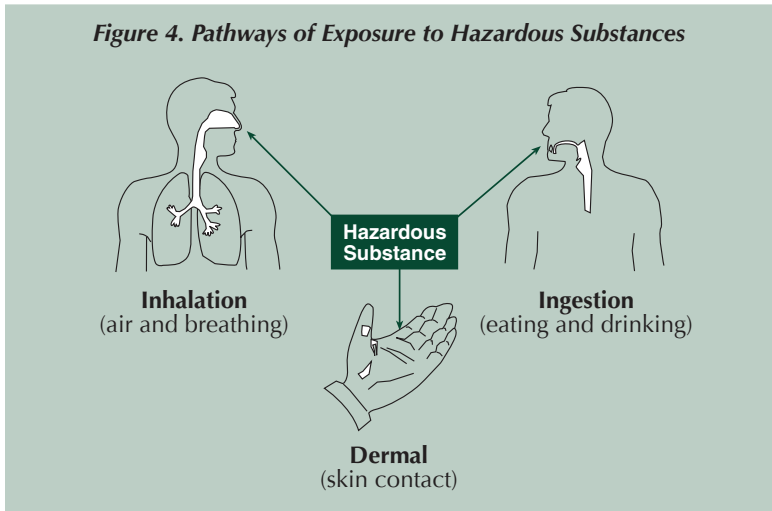
Substances can enter our bodies through the air we breathe. Airborne substances can come in the form of vapors, dust, mist, or fumes. Some substances stay in the lungs and damage lung cells. Other substances can pass through lung tissue and enter the blood. These substances can travel in the blood and affect other parts of our bodies.

#### Ingestion of soil, food, or water

We can get hazardous substances into our bodies by absorbing them from the foods we eat, such as crops grown on certain contaminated soils. Substances can also enter our bodies in the water that we drink, in the dust we breathe and swallow, and in the soil we might accidentally ingest. These substances can enter our bloodstream and be transported to other parts of our bodies, where they can cause a health effect.

## Skin

Substances can enter our bodies through our skin. One way is by washing with water polluted by substances. Contact with polluted soil is another way. Some substances pass through our skin and then into our blood. From there, substances can affect other parts of our bodies.



## When can health effects begin?

Potential health effects vary from one person to another, depending on several factors:

- the particular substance,
- the concentration of the substance,
- the degree of exposure, and
- the attributes of the person who is exposed.

In some cases illness may occur after only a limited amount of exposure. This type of *acute exposure* can lead to immediate health effects.

Other types of health effects are observed only after long-term *chronic exposure*. Increased risks of cancer or other long-term health effects, such as liver or kidney disease, may be associated with this type of exposure. However, the potential for any particular health effect is very specific to both the substance and the site circumstances.

## Who evaluates potential health risks?

A toxicologist is a professional who evaluates health risks that may be present at a Superfund site. *Toxicology* is the study of the harmful effects of substances, and what the chances are for those effects to occur.

Toxicologists look at the dose of a substance and the likely way a body may respond to that exposure. A *dose* is the amount of substance a person

is exposed to over a given amount of time, and it is typically expressed as a function of body weight. The dose of a substance depends on the amount, *duration*, and frequency in which exposure occurs.

At a Superfund site, potential exposure pathways are considered in estimating likely doses of a particular substance of concern. Where there are areas of uncertainty, precautions are taken to avoid underestimating exposures.

Toxicologists compare these doses with established toxicity criteria, which are developed from studies of animals or humans, to gain some perspective on the likelihood of any adverse health effects. This information is used to make decisions about actions at a contaminated site that are necessary to ensure the protection of public health.

## **Why is it hard to link substance exposures to health effects?**

Some people may wonder why health surveys or health records cannot be used to evaluate health risks to residents living near a hazardous substance site. In some cases this type of health information is available and may be useful for characterizing health risks.

However, most often such surveys and health records do not provide conclusive answers about the potential for substance exposure to result in health effects. This is due to a number of factors. One problem is that some diseases, such as cancer, may occur at a relatively high rate, whether or not a hazardous site is present in a community.

In some cases, citizens in a community may not feel that remedial actions are necessary. This perception may be most common with a person who has lived in a community for a number of years without experiencing any health problems.

However, it is important to understand that remedial actions are often necessary to address the **potential** for adverse health effects, even though current risks may be limited by existing conditions. For example, high levels of lead in soil that is covered by a healthy lawn may need to be remediated due to concerns about exposures that might occur if the lawn were not present.

## **How can I protect my family?**

There are many steps you may take to protect yourself from hazardous substances. Following are some of those steps.

### **Stay off the site**

If signs are posted to keep off a site, do not enter it. The TCEQ and the EPA put up these signs to protect public health and safety.

### **Do not allow children to play on a site**

In some cases, children can be harmed by toxic substances more easily than adults. Children have habits that put them at greater risk, such as eating dirt or putting their hands and fingers in their mouths. Substances from soil may enter their bodies this way. Also, because children weigh less than adults, children may be exposed to greater amounts of pollutants, relative to adults.

### **Have your water tested**

This is important if you own and use a private water well. Toxic substances may enter the groundwater that supplies your well (see Figure 2). You can get information on different types of water testing and costs from the TCEQ regional office nearest you. Check the TCEQ Web site for locations and telephone numbers of TCEQ regional offices (see Chapter 5).

### **Become informed**

First, find out what types of substances have been found at a Superfund site in your community by calling the TCEQ or by checking the TCEQ's "Texas Superfund" Web page (see Chapter 5).

Second, find out what actions have been taken at a site. Call 1-800-633-9363 for the community relations coordinator (CRC), who can answer questions about a site and put you in contact with a TCEQ toxicologist for questions about health risks. Also look at records in the site file, which is kept in a public place, usually a library near each Superfund site.

### **Learn about the health effects of substances**

You can get information on specific substances from TCEQ toxicologists, and also from the *Agency for Toxic Substances and Disease Registry* (ATSDR). The ATSDR has prepared fact sheets, toxicological profiles, and medical case studies on many substances. ATSDR materials may be at your local public library in the section for federal documents. If not, get in touch with the ATSDR Division of Toxicology (see Chapter 5).

You can also get information from the Environmental Epidemiology and Toxicology Division of the Texas Department of Health (TDH). This program coordinates with the TCEQ, the ATSDR, and the EPA to provide technical support and advice on the toxicological implications of exposure to hazardous substances. In addition, the TDH investigates unusual health complaints suspected of being caused by exposure to hazardous substances and harmful physical agents. For TDH contact information, see Chapter 5.

### **See your doctor**

If you think you have an illness that may be from substances at a Superfund site near your home, tell your health care provider.

## How to Get Involved

You can be a part of the Superfund process by getting involved.

### What can I do?

Following are some of the ways to become involved in the Superfund process.

#### Report toxic substance releases

- If you see substance releases that could be harmful, you should report them. To report toxic substance releases, call National Response Center's 24-hour hot line at 1-800-424-8802; or
- Texas 24-hour Emergency Spill Reporting Hot Line at 1-800-832-8224.

**In any life-threatening situation, always call your local emergency medical service (EMS) or 911 first.**

#### Learn more about the Superfund site where you live

Being informed about the Superfund site in your community will help you be more effective in making your concerns known.

#### Attend public meetings

The TCEQ conducts public meetings to provide information to the public and to provide an opportunity for the public to share information, express concerns, and raise issues. (See "When is the public involved?" in Chapter 1 and "How does the TCEQ involve the public?" in the following section.) Notices regarding the public meetings are provided in the local newspaper.

#### Start a mailing list

You can share ideas with other concerned people in your community through newsletters and brochures. You can develop a mailing list from the following sources:

- public meeting sign-in sheets,
- maps with addresses,
- newspaper articles, and
- other action groups.



## **How does the TCEQ involve the public?**

The TCEQ wants to keep you, the public, informed about Superfund issues. Listed below are some opportunities for involvement provided by the TCEQ:

- Small meetings where people can share ideas with TCEQ staff, one-on-one.
- Large meetings where the public can get facts about a site, raise issues, express concerns, and ask questions.
- News releases about a site that are given to radio, TV, and newspapers. These reports give details on progress at a site and let people know about meetings.
- Public fact sheets about a site.

## **Where can I get information on Superfund actions?**

When action at a Superfund site begins, the TCEQ will set up a *site file* in the local community. These files contain general facts about the Superfund process, as well as site-specific information. Notes from public meetings and other information are added to this file on an ongoing basis.

One part of this file is called the *community relations plan* (CRP). The CRP provides a record of citizens' concerns about the site, along with a list of ways the TCEQ plans to deal with those concerns. The CRP also suggests ways the public can be involved.

## **Where can I find Superfund site files?**

Site files are kept in a public building with easy access. Most of the time, this is the local public library. A community relations coordinator (CRC) is assigned to the site to make sure the files are maintained.

## **How much can the public affect TCEQ cleanup choices?**

It is important for you to be active and involved in Superfund site actions. Agencies working on a site need to hear from you. This can help them make better decisions.

Public comment is an important consideration in choosing a site cleanup method. In addition to public concern, the TCEQ must also consider public safety and cost, and at the same time follow applicable statutes and rules.



CHAPTER 5:

## Contact Information

### Texas Commission on Environmental Quality

By mail: Superfund Community Relations, MC 225  
Texas Commission on Environmental Quality  
PO Box 13087  
Austin, TX 78711-3087

By phone: Texas Superfund Information and  
Community Relations Line 1-800-633-9363  
Texas Spill Reporting Hot Line 1-800-832-8224  
Toxicology Section 512/239-1795  
Voluntary Cleanup Program 512/239-5891  
Publications 512/239-0028

Web site: Go to [www.tceq.state.tx.us](http://www.tceq.state.tx.us). Follow the “Compliance, Enforcement & Cleanups” navigation link to “Cleanups,” then “Texas Superfund” or “Voluntary Cleanup Programs.”

For a list of TCEQ regional offices, follow the “About TCEQ” navigation link to “Directory” and “Regional Offices.”

### Texas Department of State Health Services (DSHS)

Environmental Epidemiology & Toxicology 1-800-588-1248  
or  
DSHS Web site: [www.dshs.state.tx.us/epitox](http://www.dshs.state.tx.us/epitox) 512/458-7269

### Agency for Toxic Substances and Disease Registry (ATSDR)

ATSDR Web site: [www.atsdr.cdc.gov](http://www.atsdr.cdc.gov) 1-888-422-8737

### National Response Center

(report toxic substance spills) 1-800-424-8802

### U.S. Environmental Protection Agency (EPA)

EPA Superfund Hot Line 1-800-533-3508  
(for Region 6—Texas, New Mexico, Louisiana, Oklahoma, Arkansas)  
EPA Region 6 Environmental Emergencies 1-866-372-7745  
EPA Web site: [www.epa.gov](http://www.epa.gov)



CHAPTER 6:

## Superfund Terms

The following brief explanations of terms are provided as a convenience for readers of this handbook, who are nonspecialists. The explanations here do not take the place of any full, formal definition in state or federal laws and regulations.

**activated carbon treatment** A cleanup process using special filters to collect substances. This method is used to treat polluted air and water.

**acute exposure** A short-term exposure to a substance typically present at high levels. Acute exposures may result in immediate health effects.

**Agency for Toxic Substances and Disease Registry (ATSDR)** The federal public health agency located in Atlanta, Georgia. It is part of the U. S. Department of Health and Human Services. The program deals with health effects from toxic substances in the environment.

**air stripping** A cleanup method that is used to treat water polluted with volatile constituents that may easily evaporate or become unstable. Air is forced through the polluted water to pick up the substances. The substances can then be removed from the air with carbon filters or other controls.

**bioremediation** A cleanup method that uses tiny organisms, such as bacteria, to clean up oil spills or other pollutants from soil, water, or wastewater.

**chronic exposure** Long-term exposure to a substance, typically present at relatively low levels.

**cleanup** Also called site remediation. A process to remove substances from a site or change them into a form that is not as harmful to humans.

**cleanup options** Methods of cleaning up hazardous substance sites. The type of option depends on such factors as the amount to be cleaned up, effects on the environment, costs, and public concerns.

**community relations plan (CRP)** The CRP records public concerns about a site and lists ways the TCEQ plans to deal with those concerns. The plan lists ways the public can be involved in the Superfund process.

**containment** A cleanup method that keeps hazardous substances in place at a site. Steps are taken to prevent exposure to the substances and to keep them from continuing to spread farther through air, soil, or water.

**dose** The amount of a substance a person's body takes in over time.

**duration** The amount of time a person is exposed to a substance.

**exposure pathway** The way substances can be transferred into a person's body from air, water, soil, or other environmental media.

**Hazard Ranking System (HRS)** A numerically-based scoring system used to evaluate the relative potential risk posed by a site to public health and the environment.

**hazardous substances** Toxic materials that, if not disposed of properly, can pollute air, water, and soil. They also may cause harm to humans, plants, and animals.

**immobilization** A cleanup method that holds substances in place. It involves treating the substance with a material, such as concrete, which binds up the contaminants. It keeps the substances from moving through air, soil, or water.

**incineration** A cleanup method, which is also called thermal decomposition, that involves burning soil and toxic materials at high temperatures. Substances are converted and made less dangerous or are destroyed.

**National Priorities List (NPL)** A list of contaminated sites that the EPA has determined are the worst, or need to be cleaned up first. They are also called federal Superfund sites.

**Occupational Safety and Health Administration (OSHA)** The federal agency in charge of worker health and safety laws, which is an office in the U.S. Department of Labor.

**off-site disposal** Contamination is dug up and moved to an approved disposal facility, such as a landfill.

**responsible party** A person or business that is responsible for a hazardous substance site. Whenever possible, the EPA and the TCEQ require responsible parties, through administrative and legal actions, to clean up the sites they have contaminated.

**self-contained breathing apparatus (SCBA)** A special air tank with a breathing mask. This unit is used to protect the lungs of workers at contaminated sites. An SCBA is similar to a SCUBA (self-contained underwater breathing apparatus) that is used by divers.

**site file** Documents about a contaminated site, as well as general facts about the Superfund process and environmental laws. The file is maintained in a public building near the site.

**soil washing** A cleanup method that first involves digging up the polluted soil and sifting it to remove large objects, like rocks and debris. The sifted soil is placed in a scrubbing unit. Water, and sometimes detergents, are added to the polluted soil in the scrubbing unit. Some of the pollution dissolves in the water or floats to the top. Soil washing alone may not be enough to clean polluted soil. It is used most often with other methods that finish the cleanup.

**solvent extraction** A cleanup method that involves digging up the polluted soil and sifting it to remove large objects, like rocks and debris. The sifted soil is placed in a machine called an extractor, where it is mixed with a solvent, or cleaning agent. Some substances, like oil and grease, do not dissolve in water. Solvents can dissolve these substances and remove them.

**State Superfund Registry** Also called the Registry. A list of facilities within Texas which may constitute an imminent and substantial endangerment to public health and safety or to the environment due to a release or threatened release of hazardous substances into the environment, but do not qualify for the federal National Priorities List.

**Superfund** A program set up by the U.S. Congress and carried out by the TCEQ and the EPA. Part of the program's function is to study and clean up hazardous sites.

**Superfund site** A property listed on the State Superfund Registry or the EPA National Priorities List (NPL).

**thermal desorption** A cleanup method that uses heat to remove substances from the soil. Substances that become gases at slightly elevated temperatures are collected and treated.

**toxicology** The study of harmful effects of substances on people's health. This includes: the harmful effects of substances; the chances of these effects occurring; the amount, or dose, of a substance; the response a person's body has; how long a person has been exposed; and how often a person has been exposed.

**treatment methods** Ways that hazardous substances are made less toxic to humans and the environment. The method used depends on the type of substance.

**U.S. Environmental Protection Agency (EPA)** The federal agency that is in charge of the federal Superfund program. The EPA studies and cleans up Superfund hazardous substance sites on the National Priorities List (NPL).

**vacuum extraction** This cleanup method is similar to air stripping. It removes substances in the soil through a vacuum, or suction process.

**vitrification** This cleanup method is a process that uses high temperatures to melt hazardous substances into melted glass. After the melted glass has cooled into solid blocks of material, the hazardous ingredients are unlikely to dissolve, or leach, into water that percolates through the material.