



What is hazardous waste?

Is it really a problem?

Where does it come from?

How does it harm our  
soil, air or water?

How can we stop it?

What can you do?

# Answering your questions about hazardous waste sites

# Mission of the Florida Department of Health

To promote and protect the health and safety of all people in Florida through the delivery of quality public health services and the promotion of health care standards.

## Table of Contents

<b>What can this booklet do for you?</b>	<b>1</b>	<b>Why do DEP and DOH have different cleanup target levels?</b>	<b>6</b>	<b>Does a community have to wait a year to find out if they were exposed to a chemical at a hazardous waste site?</b>	<b>12</b>
<b>What is hazardous waste?</b>	<b>2</b>	<b>Who should you contact at DEP and EPA if you have questions regarding hazardous waste?</b>	<b>7</b>	<b>Does anyone tell your doctors about the problem?</b>	<b>12</b>
<b>How should hazardous waste be disposed?</b>	<b>2</b>	<b>How can you protect yourself from hazardous waste?</b>	<b>7</b>	<b>How can you get involved in the PHA process?</b>	<b>12</b>
<b>What is a hazardous waste site?</b>	<b>2</b>	<b>When do public health agencies get involved?</b>	<b>7</b>	<b>What happens after the PHA process is complete?</b>	<b>12</b>
<b>Why is hazardous waste a problem?</b>	<b>2</b>	<b>Florida Department of Health (DOH)—State</b>	<b>7</b>	<b>What is a cancer cluster investigation?</b>	<b>13</b>
<b>How does the government find out about hazardous waste sites?</b>	<b>3</b>	<b>U.S. Agency for Toxic Substances and Disease Registry (ATSDR)—Federal</b>	<b>7</b>	<b>Does the Florida DOH do them?</b>	<b>13</b>
<b>Is hazardous waste a problem in your neighborhood?</b>	<b>3</b>	<b>What is an exposure pathway?</b>	<b>8</b>	<b>How do cleanup agencies cleanup a site?</b>	<b>13</b>
<b>Can contamination from leaking underground storage tanks at gas stations affect your drinking water?</b>	<b>3</b>	<b>How can hazardous waste harm people?</b>	<b>8</b>	<b>How can you protect your family from hazardous waste?</b>	<b>13</b>
<b>What should you do if you suspect hazardous waste is in your neighborhood?</b>	<b>4</b>	<b>Fish consumption advisories</b>	<b>9</b>	<b>What are some of the chemicals often found at Florida hazardous waste sites?</b>	<b>13</b>
<b>How do people living near a site find out about them?</b>	<b>4</b>	<b>More about pathways</b>	<b>9</b>	<b>How can you help?</b>	<b>back cover</b>
<b>It is important that people know two things about the way that agencies work</b>	<b>4</b>	<b>Does everyone get sick when exposed to hazardous waste or toxic chemicals?</b>	<b>9</b>	<b>Contacts</b>	<b>back cover</b>
<b>How can you find out if you live near a hazardous waste site?</b>	<b>4</b>	<b>How is an exposure measured?</b>	<b>9</b>		
<b>How is a hazardous waste site determined?</b>	<b>4</b>	<b>When do health effects begin after an exposure?</b>	<b>10</b>		
<b>How does the cleanup process proceed at a hazardous waste site?</b>	<b>5</b>	<b>What kind of health effects might occur from a chemical exposure?</b>	<b>10</b>		
<b>How do the different agencies work together?</b>	<b>5</b>	<b>What is the role of the Florida DOH at hazardous waste sites?</b>	<b>10</b>		
<b>Florida Department of Environmental Protection (DEP)—State</b>	<b>5</b>	<b>What is Public Health Assessment (PHA)?</b>	<b>10</b>		
<b>U.S. Environmental Protection Agency (EPA)—Federal</b>	<b>5</b>	<b>What is a petitioned PHA?</b>	<b>11</b>		
<b>What is a National Priorities List (NPL) site?</b>	<b>6</b>	<b>What is a Health Consultation (HC)?</b>	<b>11</b>		
<b>Local Environmental Agencies—Local</b>	<b>6</b>	<b>How does the Florida DOH decide the possible levels of danger from a site?</b>	<b>11</b>		
<b>What if there is a public health threat at a hazardous waste site?</b>	<b>6</b>	<b>What is an Exposure Investigation (EI)?</b>	<b>11</b>		
<b>What is a cleanup target level?</b>	<b>6</b>	<b>Is there any way to check your body to see if you have chemicals in you?</b>	<b>11</b>		

# Answering your questions about hazardous waste sites

Florida Department of Health, Bureau of Community Environmental Health

and the Agency for Toxic Substances and Disease Registry

## Evaluation Form

1. Do you intend to use this material as a reference?  Yes  No

2. What do you like most about the booklet? (Please check all that apply.)

Format  Content  Ease of use

Other (Please list.) \_\_\_\_\_

3. What do you like least about the booklet? (Please check all that apply.)

Format  Content  Ease of use

Other (Please list.) \_\_\_\_\_

4. Are there any topics you would like added to the booklet or do you have any other comments? (Please list.)

---

---

---

---

---

---

---

---

---

---

5. Do you have any questions that were not answered in this booklet? (Please list.)

---

---

---

---

---

---

---

---

---

---

Please fax to 850-487-0864. Or mail to: Florida Department of Health, Bureau of Community Environmental Health, Health Assessment Team; 4052 Bald Cypress Way, Bin A-08; Tallahassee, FL 32399-1712; Attn.: Lu Grimm.

# What can this booklet do for you?

This booklet tells you about the various agencies that work on hazardous waste sites. The better you understand what each agency does, the more easily you will have your questions answered. The more you know about hazardous waste, the better prepared you are to protect your family's health.

The Florida Department of Health (DOH) designed this booklet to inform Floridians about hazardous waste:

- Its sources,
- Environmental and health problems that comes from it,
- Current ways to clean up sites, and
- Ideas on how people can better protect themselves and their families.

The Department wants to:

- Help people affected by a site understand exposure risks, and
- Encourage people to get involved to solve problems more effectively.



## What is hazardous waste?

**Hazardous waste is chemicals that can be harmful.** Such waste can be dangerous if it has not been disposed of properly. An example is a chemical used to make a product that has gotten into the groundwater when a disposal tank it was stored in leaked. It is not harmful unless certain amounts (levels) of the chemicals are present and people can come into contact with it.

Hazardous waste can come from making a product. That is called industrial waste. It can be leftover fuel in tanks or cleaning solvents. It can be fertilizers or pesticides from farms. Hazardous chemicals are also in our homes. They are in our household cleaners, our pesticides and our lawn care products.

In Florida, chemicals that threaten human health usually come into contact with people by getting into our water supply. Over 90 percent of Florida's drinking water comes from underground. When chemicals get onto the ground, they can get into our underground supply of water. Floridians must protect our groundwater more carefully than other states do because our water supply is easily affected.

Florida's groundwater (underground water) is stored in the limestone, under a thin layer of sandy soil in most of the state. Fluid can sink through the sandy soil and limestone, into the water below. This includes most, but not all, chemicals in liquid form. Because of this, agencies ask people not to dump paint, used oil, and other fluids onto the ground.

Many households and businesses use hazardous materials in their daily activities. Examples are paint products, solvents, some kinds of batteries, household cleaners and pesticides. Hazardous waste must be handled in special ways to keep from harming people or the environment.

## How should hazardous waste be disposed?

The hazardous waste produced by many businesses is regulated by the Florida Department of Environmental Protection (DEP). These wastes must be disposed of in special landfills or other facilities created just for that purpose. This disposal protects the environment as much as possible.

Household hazardous waste is not regulated. Many of the

items we use to clean our homes and cars are considered hazardous waste. When simply thrown into our garbage cans and taken to the local landfill, these items may harm the environment. Check with your local county government about the proper way to dispose of these items to help protect the environment.

## What is a hazardous waste site?

**During much of the last century, people were less aware of dangers from polluting the environment than they are now.** They didn't know how dumping chemicals might affect health. People and cities put garbage and worn-out items in dumps. They dug large holes and filled them in with wastes and debris without any liner beneath to prevent chemicals from seeping down into the groundwater.

In the past, people and industries released leftover chemicals onto the ground or into waterways. Sometimes they were stored in drums or tanks and left onsite. Over time, chemicals may have leaked out of the drums or tanks. People also junked items made of chemicals, such as old tires and plastic.

Chemicals that go into the air can return to our soil, lakes, creeks and rivers. They can harm our surface water, as well as the fish and other creatures that live in it. The chemicals can affect the air we breathe. Almost all of these chemicals over time will sink through Florida's thin and sandy soil to the porous limestone where most of our groundwater is stored.

All of these practices resulted in the creation of places where hazardous waste is now. We call them **hazardous waste sites**. A hazardous waste site may be a field, a landfill, a place where an industry used to operate, or any place where someone has thrown away chemicals and other wastes. Thousands of hazardous waste sites exist in the United States, some in Florida.

## Why is hazardous waste a problem?

Hazardous waste has become a problem because we produce over 700,000 tons of it in the United States every day. We have to find safe ways to dispose of it without harming people or the environment.

Most Florida cities and counties face this problem. Many landfills are full. Some are leaking. There is less land available for additional landfills than there once was. The



cost of taking garbage farther away to a landfill costs more than ever. Moreover, no one wants a landfill in his or her neighborhood.

Each of us can help by finding out more about the problem and getting involved in finding solutions. This booklet is a good place for you to start to learn more about the problem and helping to solve it.

## How does the government find out about hazardous waste sites?

DEP learns of contaminated and hazardous waste sites in one of three ways: (1) on a site visit to a DEP permitted property; (2) through a report submitted by a DEP permitted business as required by law when possible contamination has occurred; or (3) through a resident report to local authorities.

## Is hazardous waste a problem in your neighborhood?

In the past, most hazardous waste sites were in poor communities. These included neighborhoods near industrial sites and other places that produced hazardous waste. These industrial properties cost less to buy than other areas. As a result, it was often the poor who are affected by hazardous waste. People, who were able, lived elsewhere.

Today in Florida, we are beginning to see hazardous waste sites in the midst of more wealthy communities. As an area grows, developers use clean soil to cover old landfills, built long before such dumps followed laws requiring liners to protect the groundwater. Later, builders construct homes, schools and playgrounds on top of or near old landfills.

## Can contamination from leaking underground storage tanks at gas stations impact my drinking water?

In 1986, the Florida Legislature created the State Underground Petroleum Environmental Response Act (SUPER Act) Program in response to groundwater contamination resulting from leaking underground petroleum storage tanks. The primary authority for the SUPER Act Program was given to the Florida Department of Environmental Protection (DEP), Bureau of Petroleum Storage Systems. DEP oversees the clean-up activities around petroleum facilities that have leaked petroleum product.s

The Florida Department of Health's SUPER Act Program was given authority under Florida Statutes to provide field and laboratory services, toxicological risk assessments, investigations of drinking water contamination complaints and education of the public. Field services include sampling of private drinking water wells. Lab services include analysis of well water for many things, including volatile organic solvents (VOCs), metals and pesticides. These types of risk assessments include determining safe levels for chemicals in drinking water. These are called Health Advisory Levels (HALs). Other assessments concern potential health effects from chemicals in drinking water. These include both acute and chronic illness, as well as looking at how someone might be exposed to the chemicals.

Knowing the large number of petroleum contaminated facilities and the related threat to drinking water, the legislature gave the Department of Health responsibility to find drinking water wells around these sites. In addition, some drinking water wells near each site are sampled for petroleum contamination. Citizens are encouraged to request that their wells be sampled for petroleum if they suspect a contamination problem exists. Since the program's inception, county health departments have investigated contaminated sites statewide and sampled many thousands of drinking water systems under the direction of the state Health Office. For more information please see the SUPER Act website at [superact.org](http://superact.org) or call 850-245-4544.

In many places, we use old farming land now for building homes. Chemicals from fertilizers and pesticides affect land, years later. Some chemicals can take many years to break down. These include dioxins and polychlorinated biphenyls (PCBs). They are still a problem; even years after agencies banned them from use.

When someone discovers a possible danger nearby, almost all of us react strongly. It is human nature. We become upset because we had thought we were safe. Now we find out we may not be. We worry because we are afraid of what could happen to us, or to our children. Hazardous waste sites can affect a neighborhood. Community concerns about a site can seem to get lost. This, too, is upsetting. All of it can cause stress.

DOH has seen that the more we can tell communities about the problem, the better they can cope. We explain the roles of the different agencies at work at a site. This helps communities know which agency does what job. We tell them about the chemicals at a site. We also tell about whether a chemical at a site is likely to make someone living nearby sick or not.

There are over 100,000 chemicals in production today, but scientists have studied the health effects of only a few hundred of them. Almost no studies have been made on how these chemicals might affect health when they are mixed together, such as at a landfill. In addition, most studies have been on animals after coming into contact with a chemical. It is hard to know if the effects on people would be the same as in animals.

## What should you do if you suspect hazardous waste is in your neighborhood?

If you suspect that you live near a contaminated or hazardous waste site that is not under DEP's regulation, please call the Florida DEP office nearest you.

Northwest District (Pensacola) (850) 595-8360

Northeast District (Jacksonville) (904) 807-3300

Central District (Orlando) (407) 894-7555

Southwest District (Tampa) (813) 744-6100

Southeast District (West Palm Beach) (561) 681-6600

South District (Ft. Myers) (941) 332-6975

## How do people living near a hazardous waste site find out about them?

Someone or an agency learns about a waste problem. At some sites, someone alerts local environmental officials. The local agency might work on it, or report it to the Florida DEP as described above.

One of the agencies, or a single citizen, can request a Public Health Assessment (PHA). (Note: We'll describe a PHA further on in this booklet.) This request goes directly to the federal Agency for Toxic Substances and Disease Registry (ATSDR). Sometimes ATSDR investigates a request directly. Usually, the ATSDR gives the request to the Florida DOH to address.

In many communities, the first time you might know about a hazardous waste site, is when you see workers in protective body suits in the neighborhood. This can be frightening for most people. What you see suggests there might be a dangerous situation nearby, but you might not know what it is. When you aren't sure what the danger is, it is difficult to protect yourself and your family. The concern that most people feel is natural. It is a normal reaction to what might be an abnormal situation. Likewise, it can be frightening that the government response to a concern at a site seems slow since it takes a long time to study the issue and take care of it.

## It is important that people know two things about the way that agencies work:

1. When the health risk from waste is *imminent*, meaning likely to occur right now or very soon, the agencies move quickly. Agencies might either notify people or order an evacuation.
2. When agencies do not move quickly, there is no hazard to people or the threat is *not imminent*. That usually means cleanup agencies don't need to take care of the site immediately.

We set out the word *imminent*. It is the key word. *Imminent* means the threat of harm is right now or in the near future. Some hazardous waste is not an imminent problem. This is because it will not spread out or rise to the surface to contact people or sink into the drinking water within the next few years. Just because chemicals are at a site, it doesn't mean they are a threat. They can be present and still pose no health threat. Remember the threat is only when there is a certain level of chemicals present and when someone is likely to have an exposure.

When there is no threat, or the threat is not imminent, agencies may take a long-term approach to cleanup.

## How can you find out if you live near a hazardous waste site?

Contact the DEP district office nearest you (as mentioned above) or visit the U.S. Environmental Protection's website at [www.epa.gov](http://www.epa.gov).

Starting in the spring of 2005, DEP will notify Florida residents if there is contamination on or under their property. This notification will occur even if there is little risk that someone could be exposed to the contamination.

## How is a hazardous waste site determined?

The first step is to make sure a hazardous waste site exists. Registered and licensed professionals review the site. The review includes an environmental assessment. Soil and water samples from the site itself (onsite) and areas surrounding the site (offsite) are collected. The samples are analyzed to determine the type of contamination. How far the contamination extends beyond a site is also determined. Recommendations are then made as to how to proceed to clean up the site.

## How does the cleanup process proceed at a hazardous waste site?

The recommendations from the environmental assessment report typically include a proposed remedial action. Remedial refers to how a site should be cleaned up to remove contamination. Site characteristics both above and below ground can be very complex. These features may dictate what cleanup will work best. At some sites, where the chance for exposure to contamination is very small, it may be possible to simply monitor while natural processes clean up the site. In other cases, active cleanup may be necessary to remove or treat contaminated soil and/or water.

The cleanup approach proposed in the environmental assessment report must be approved by DEP. Then registered and licensed professionals develop a cleanup action plan. This plan includes the way to clean up the site and how to determine the site is cleaned up to certain standards. The plan also outlines what kind of equipment will be needed for cleanup, how much it will cost to clean up and how to make sure it is properly cleaned up. In addition, the plan gives a time frame for how long it should take to complete the project.

## How do the different agencies work together?

The mission of DEP is to protect, conserve and manage Florida's environment and natural resources. The mission of the Department of Health (DOH) is to promote and protect the health and safety of all Floridians. DEP and DOH work together to protect the health of Florida's citizens and to restore Florida's environment.

Different agencies have different tasks. Often there are several agencies working at a hazardous waste site. Agencies have several different departments. Each department, with different staff, may work on the site at one time or another.

For example, sometimes Florida DEP's Emergency Removal section begins work on a site first. After they complete their emergency work, they leave and go on to another site. Then another section of the Florida DEP comes in. That might be the Solid Waste Removal section or the Water section, depending on the site and what the Florida DEP needs to do at the site.

Another example would include the Florida DOH. The Health Assessment Team usually starts Florida DOH action at a waste site. They work with the community to get more information and data on the waste from the Florida DEP or the U.S. Environmental Protection Agency (EPA). Then the Florida DOH Water Toxics Team may join the Health Assessment Team. They work with the county health department (CHD) staff or with the Florida DEP in taking samples from private drinking water wells.

Along with the agencies listed above are others that might be involved at a site, depending on the situation. Here are some of them:

- Water Management District for the area—State
- U.S. Occupational Safety and Health Agency (OSHA)—Federal
- Various local environmental protection agencies (in some Florida counties)—Local
- U.S. Environmental Protection Agency (EPA)—Federal

## Florida Department of Environmental Protection (DEP)—State

As the state's principal environmental agency, DEP regulates businesses that produce and use hazardous materials, thereby also producing hazardous wastes. These businesses must be in compliance with all DEP rules and regulations. If for any reason a business violates DEP regulations, the agency has the authority to take enforcement action against the company. Enforcement action can include requiring the company to clean up any contamination and/or pay fines for violations. When a contaminated or hazardous waste site is identified, DEP is responsible for overseeing, and in some cases carrying out, the environmental assessment and clean up of a site.

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

The U.S. EPA regulates hazardous waste under the Resource Conservation and Recovery Act (RCRA). RCRA's goals are to:

- Protect citizens from the hazards of waste disposal,
- Conserve energy and natural resources by recycling and recovering materials,
- Reduce or eliminate waste, and
- Clean up waste that may have spilled, leaked or been improperly disposed.

Information about the U.S. EPA's role at hazardous waste sites may be found on their website at <http://www.epa.gov/epaoswer/osw/mission.htm>. The U.S. EPA partners with the State of Florida in the environmental assessment and cleanup of certain qualified sites, known as Superfund sites. In Florida, we currently have 51 known hazardous waste sites serious enough to fall into the Superfund National Priorities List (NPL) category. For more information, visit [www.epa.gov/superfund](http://www.epa.gov/superfund).

### What is a National Priorities List (NPL) site?

The U.S. EPA creates a list of the most serious hazardous waste sites identified for possible long-term cleanup action under the Superfund. The list is based primarily on the score a site receives from the Hazard Ranking System. The Hazard Ranking System is the principal screening tool used by the U.S. EPA to evaluate risks to public health and the environment associated with such sites. The system requires a score of a certain number of site-ranking points. These points come from threats to:

- a) Surface water
- b) Groundwater
- c) Air
- d) Sediments or
- e) Endangered or protected animal or plant species

The U.S. EPA is required to update the NPL at least once a year. A site must be on the NPL to receive money from the U.S. EPA's Trust Fund for cleanup. The trust fund is set up under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) to help pay for cleanup of hazardous waste sites. It also funds legal action to force those responsible for the sites to clean them up.

### Local Environmental Agencies—Local

Local government agencies may be at the city or county level. One of their functions is to work with state and federal agencies to address concerns at hazardous waste sites. Because they are aware of local area needs, they can help design ways to meet the specific needs of the people in their area.

### What if there is a public health threat at a site?

If it is determined that there is an imminent health threat at a hazardous waste site, then necessary steps will be taken to remove any risk of exposure to the waste. If the groundwater contains substances of concern, DEP can provide bottled drinking water, a drinking water filter or a connection to municipal water.

Sometimes the U.S. EPA actually moves people out of their homes. The move can be for a short time or for much longer. These agencies do most cleanups needed at waste sites. At many sites, the potentially responsible party (PRP) or the person or company—including owners, operators, transporters or generators—potentially responsible for, or contributing to a spill or other contamination at a Superfund site is determined. In some cases, this party addresses health threats, conducts a cleanup, provides filters, etc. Whenever possible, through administrative and legal actions, the U.S. EPA requires these parties to clean up hazardous sites they have contaminated.

If you have questions about cleanup, or filters for drinking water wells, or relocation, or any other questions, you can call or e-mail these agencies directly. Please call DEP's Bureau of Solid and Hazardous Waste, at 850-245-8707 for the appropriate district office nearest you to get the information desired. Or at the U.S. EPA, call toll-free 800-241-1754 for Region 4, the region of EPA that includes the state of Florida.

### What is a cleanup target level?

The DEP sets thoroughly researched and science-based cleanup target levels for contaminants found on sites. The DEP or the party responsible for pollution must demonstrate that these levels have been met at the site before it can be considered "clean." Florida leads the nation in creating strict standards for site cleanup.

### Why do DEP and DOH have different cleanup target levels?

DEP and DOH work together to protect Florida's health and environment. DEP protects and restores the environment. DOH determines the public health risk. DEP has set goals for cleaning up the environment. In some cases, levels slightly above DEP cleanup goals may not pose a health threat.



## Who should you contact at DEP and EPA if you have questions regarding hazardous waste?

Call DEP's Bureau of Waste Cleanup at 850-245-8927 to be connected to the appropriate person or district office. At U.S. EPA, call toll-free: 1-800 EPA-WISE (372-9473).

## How can you protect yourself from hazardous waste?

Protection from hazardous waste starts with you. Families are most likely to come in contact with hazardous wastes in their own homes. Be careful when you use cleaners and other chemical agents. Take the time to dispose of these items properly.

If you live on or near a contaminated or hazardous waste site, follow the advice of DEP and DOH to limit your exposure to harmful waste.

## When do public health agencies get involved?

Environmental agencies protect all elements of the environment, including people, animals, and plants. The difference between them and the public health agencies is that the health agencies focus solely on protecting human health. The health agencies, including the federal ATSDR, the Florida DOH, and the county health departments, usually get involved at sites **after** environmental agencies have done their initial testing and taken samples. It is the health agencies' responsibility to determine when the levels of chemicals and exposure pathways pose a potential health threat to people and to find that a way for people to come into contact with them exists.

## Florida Department of Health (DOH)—State

The federal ATSDR funds a team at the Florida DOH to assess results of testing by the Florida DEP, the U.S. EPA and other agencies. The Florida DOH Health Assessment Team looks at the test results in terms of any threat to human health.

The Florida DOH Health Assessment Team writes a *Public Health Assessment* (PHA) for each National Priorities List (NPL) site as defined earlier in this booklet. PHAs are comprehensive reports that look at a site as a whole. It

includes a review of all the known data for air, soil and water to determine if a chemical at a site poses a health risk or not. The team also writes PHAs for other sites when requested by other agencies.

In some cases, the team writes more focused reports called a *Health Consultation* (HC), which answer a particular question about a site. These are shorter reports, so the Florida DOH writes them in a shorter period of time than a Public Health Assessment.

The team works closely with the affected community and informs them and their health care workers of their findings in the reports we write. The team also works closely with local county health departments on sites. For the address and phone number for your local county health department, please check the DOH website at: [www.doh.state.fl.us/chdsitelist.htm](http://www.doh.state.fl.us/chdsitelist.htm)

## U.S. Agency for Toxic Substances and Disease Registry (ATSDR)—Federal

ATSDR is the federal health agency set up to work on hazardous waste sites across the nation. Their major tasks are:

1. To **ANALYZE** sample data from environmental agencies in terms of human health;
2. To **INFORM** communities and their health care workers of their findings; and
3. To **RECOMMEND** environmental agencies take steps to protect human health at a site.

ATSDR funds some states to do PHA reports. We call those states cooperative agreement states, or ATSDR partner states. Florida is one of about 30 states that ATSDR funds.

ATSDR also sometimes funds special investigations, such as health studies. Health studies are investigations of illnesses in a community. An example would be a disease and symptom prevalence study. These look at rates of disease and symptoms in a community compared to the average elsewhere in a similar community or to state rates.

In some cases, ATSDR investigates Florida sites and informs Florida DOH of their findings. Mostly, this occurs with petitioned health assessments. These are reports a community member has directly requested ATSDR do. ATSDR also assesses federal military sites in Florida.

ATSDR also researches health effects of chemicals. They furnish guidelines for amounts of chemicals considered safe

in air, soil and water. ATSDR updates these guidelines periodically. This means that as ATSDR verifies new research, it adds the information to existing guidelines or values.

## What is an exposure pathway?

To harm you, chemicals must have a way to get into your body. We call this an *exposure pathway*. It includes all the links between a chemical source and the people who are exposed. The links are:

1. A source of a chemical,
2. A way for the chemical to move,
3. A place for human contact,
4. A route of exposure, and
5. People who have been, are being, or are likely to be exposed to the chemical.

A source of a chemical can be in air, water or soil.

Chemicals cannot harm you unless they have a way to contact you. Chemicals from toxic hazardous waste can get into our bodies three different ways:

- **Inhaling (breathing)**
- **Ingesting (drinking or eating)**
- **Skin contact (touching)**

**Inhalation (breathing):** Some chemicals can enter our bodies through the air we breathe. They can come in the form of dust, mist, or fumes. Some chemicals stay in the lungs and damage lung cells. Other chemicals can pass through lung tissue and enter the blood. In blood, they can travel to other parts of the bodies and affect them.

**Ingestion (eating or drinking):** We can get some chemicals into our bodies from the foods we eat and the things we drink. Chemicals can be in the dust that gets on our hands or lips and then into our mouths. These chemicals can damage the digestive system. They can enter our blood and travel to other parts of our bodies.

**Dermal (skin contact):** Some chemicals can enter our bodies through our skin. We can touch polluted soil or get contaminated dust on us. We can wash or bathe with polluted water. Some chemicals pass through our skin and get into our blood. In the blood, they can travel to other parts of our bodies.

**Direct pathways** occur when we come directly into contact with the chemical. This occurs when someone splashes themselves with chemicals on the job, walks through a spill, or something similar.

**Indirect pathways** occur when we contact a chemical through something that it has contaminated. An example could be chemicals on work clothes someone wears home. A person could unknowingly touch these chemicals while putting the clothes in the washer or by hugging someone with the chemicals on their clothing. Another example of an indirect pathway would be if someone drinks water that has chemicals in it. Yet another example would be if someone eats vegetables from a plant that took up a chemical from the soil.

## How can hazardous waste harm people?

The Florida DOH health scientists assess how exposure to chemicals at a site can affect people's health. Many chemicals are not very harmful if we are exposed to them one way, while they can be harmful if we are exposed to them in another way.

Take lead for example. If we get lead dust on our skin, it probably won't hurt us at all. That's because lead doesn't go through skin very well. However, eating small amounts of lead-contaminated soil can cause illness. This is because lead is most harmful if eaten. If a pregnant woman is exposed to lead, it can be very harmful to her unborn child.

If young children digging in dirt with lead dust in it put their dirty hands into their mouths, then the lead can enter their body that way. This is what we call "accidental eating" or *ingestion*.

Our every day life exposes us to chemicals. Any chemical could become toxic if a person gets a high enough dose. In order for hazardous waste to harm you, it has to be present in a high enough level or amount to hurt you. We know that for most chemicals, very small amounts usually do not harm us. We also know that very large amounts of almost anything can cause harm. The human body can usually handle small amounts or repair the small amount of damage done.

A good example of this is ordinary table salt. It is a mixture of the chemicals sodium and chloride. Salt is good for us in small amounts and makes our food taste good. However, if you get too much, it no longer makes food taste good. At a certain level, it can also be harmful to our health.

The Florida DOH's role at hazardous waste sites is to look at sample data from other agencies. We look at the level or amount of each chemical in each sample of air, soil or water



from a site. We look to see if chemical levels are high enough to risk human health.

There are separate guidelines for how much of a chemical is okay for adults and how much is okay for children. Children have smaller bodies, so the same amount of chemical that won't hurt an adult, could harm a child. The Florida DOH always considers the amount for children that is likely to harm their health. We base this on a lower weight and a higher rate of ingestion, inhalation or absorption. This is called "*calculating a dose.*" It determines if a health threat exists at a site. We use the amount likely to harm a child to decide if a chemical at a site poses a health threat. We do this to be extra protective of human health. We also consider the effects on special populations, such as the elderly and the ill.

## Fish consumption advisories

Because of what they eat, certain kinds of fish contain high levels of chemicals. However, other kinds of fish do not.

A common example of an *indirect pathway* is mercury, pesticides or dioxins in fish. When these chemicals get into our waterways, they can contaminate the water and the sediments. Worms and insects get small amounts in them. Small fish eat many worms and insects. The chemicals build up in their muscles or fat. Bigger fish eat many smaller fish. The bigger fish get higher amounts of chemicals built up in their bodies. We call the process where small amounts of chemicals increase in the food chain *bioaccumulation*. Because of it, many states put out *fish consumption advisories*. These advisories tell the fishing public what waterways have contaminated fish. They also tell how much of a certain kind of fish someone can eat without expecting any health effects.

The Florida Fish and Wildlife Conservation Commission (Florida FWCC) regularly samples Florida fish caught around the state in many locations for mercury. In addition,

## More about pathways

**The Florida DOH must find out whether or not people are likely to come into contact with a chemical at a site.** We call the way chemicals can get into people a *complete exposure pathway*. An example of a completed pathway would be chemicals that got into a water supply, and then people drank the water. The pathway would be the underground water (or groundwater) that supplies the well.

An example of not having a pathway would be if a chemical were 10 feet below the surface of soil, is not near the groundwater and not ever expected to move. Perhaps the chemical is one that doesn't tend to move enough underground to get into the groundwater. In that case, the Florida DOH health scientists would say it is an *incomplete exposure pathway*. There is no pathway for the chemical to reach people.

On the other hand, the buried chemical may be underground at the site of a planned home. As they build the home, workers might be exposed to a chemical. The workers might even spread the chemical into the air that might blow around the area. We would then say this chemical has a *potential pathway*. In the future, a way exists for people to be exposed to the chemical.

the FWCC checks for other chemicals in fish if the Florida DEP or the Florida DOH requests the testing for a certain water body.

A chemical in a lake and the process of bioaccumulation explains why a fish from one lake is contaminated, while the same kind of fish in a nearby river is not. People who go fishing and people who eat locally caught fish can learn what kinds of fish are okay to eat by checking [www.myfloridaeh.com/community/fishconsumptionadvisories/Index.html](http://www.myfloridaeh.com/community/fishconsumptionadvisories/Index.html)

## Does everyone get sick when exposed to hazardous waste or toxic chemicals?

**No.** We know that when someone is exposed to chemicals, how people react depends on many things. For example, these include:

- Age
- Gender
- Weight
- Past chemical exposures
- Smoking, drinking alcohol, taking certain medications or drugs
- Current health status
- Sensitivity or allergies
- Family health history

The way a person reacts to a chemical can vary due to any of these factors and more. You may be exposed to a chemical, but not long enough to make you sick. If an exposure occurs to a very small amount of a chemical, there might not be enough of it to make you sick. People's reactions to chemicals vary from person to person.

## How is an exposure measured?

Four things affect an exposure:

- The way a chemical contacts a person (*exposure pathway*),
- How much chemical a person is exposed to (*dose*),
- How often an exposure occurs (*frequency*), and
- How long the exposure lasts (*duration*).

## When do health effects begin after an exposure?

If a person has health effects soon after exposure to a chemical, we call it an *immediate health effect*. Illness can occur after a single exposure.

A *delayed health effect* may not show up for weeks, months, or even years after the exposure occurred.

Both immediate and delayed health effects can range from minor to serious or even death, depending on many factors described above.

## What kind of health effects might occur from a chemical exposure?

Health effects may include:

1. Allergies
2. Birth defects
3. Cancer
4. Changes to the immune system (the body's ability to fight illness)
5. Kidney disease
6. Liver disease
7. Lung disease
8. Nervous system problems
9. Reproductive system changes
10. Skin disease
11. Other effects

Chemicals can mix and have different health effects. They can add up to cause health effects. We call this *additive*. One chemical can make the health effect of another chemical much worse than one alone. We call this *synergistic*. Chemicals can also combine to decrease health effects. We call this *antagonistic*. In that case, there is less of an effect in combination, than each chemical alone would cause.

## What is the role of the Florida DOH at hazardous waste sites?

As mentioned previously, the Florida DOH does three types of health assessment activities:

- Public Health Assessment (PHA),
- Health Consultation (HC), and
- Exposure Investigation (EI).

## What is Public Health Assessment (PHA)?

A *Public Health Assessment* (or PHA) is a comprehensive report reviewing chemicals found in environmental samples of air, soil and water. The Florida DEP or the U.S. EPA gather these samples.

A PHA also looks to see if there is a way for the chemicals to reach people (exposure pathway). These reports determine if a chemical (or chemicals) at a site poses a health risk or not.

For a PHA, a Florida DOH health scientist (or health assessor) does the following:

- Gathers data (sampling results for chemicals in air, soil, and/or water at a site)
- Analyzes the data (compares it to guidelines for the chemicals found at a site)
- Determines if any more data is needed for a complete review of a site, and if so, requests it
- Writes a draft report on the review of the data.

At this point, the Florida DOH asks for community input. We usually do this at a public meeting. We tell the community what we found and distribute copies of the draft Public Health Assessment or a summary of its findings. The Florida DOH relies on people living in a community near a site to tell us their health concerns. We address these concerns in the final assessment

The PHA estimates whether a health threat exists for people living near a site. The Florida DOH also estimates if past exposures are likely to affect people's health now. We gauge if people are apt to become sick in the future from chemicals at the site. The Florida DOH also recommends steps cleanup agencies need to take to protect public health in the future.

The Florida DOH writes a draft Public Health Assessment within one year after the U.S. EPA proposes a site to the National Priorities List (NPL). The PHA helps state and federal agencies answer community health concerns.

From start to final report, the PHA process usually takes about a year.

A public health assessment is NOT. . .

- physical examination or a medical evaluation of an individual
- a door-to-door medical survey or an in-depth health study of a group of people
- a cancer cluster investigation
- medical care



- cleanup level determination or the best way to cleanup or treat a site
- investigation or evaluation of the effects on the environment itself.

## What is a petitioned Public Health Assessment (PHA)?

Citizens may ask the federal ATSDR to look at sites through the petition process. Sometimes ATSDR in turn tasks the Florida DOH to look at these sites.

## What is a Health Consultation (HC)?

The *Health Consultation* (HC) is similar to a Public Health Assessment, but has a more narrow focus. While the PHA looks at an entire site and many issues, the HC usually answers a single question or looks at just one issue. For example, HCs have reviewed whether chemicals from a site are washing off into storm water and onto a nearby schoolyard.

The HC process takes about six months.

## How does the Florida DOH decide the possible levels of danger from a site?

After considering all health and environmental data, a conclusion is reached in both PHAs and HCs about the possible levels of danger from a site. We call these *Public Health Hazard Levels*. This category rates how much of a threat to human health chemicals at a site are likely to pose. The levels of public health hazard include:

1. **URGENT HEALTH HAZARD** This level is for sites that pose a serious risk to the public health from short-term exposures (less than 1 year) to site chemicals. This category requires timely intervention to reduce exposure. The cleanup agencies must do something right away to reduce risks to public health.
2. **PUBLIC HEALTH HAZARD** This level is for sites that pose a risk of long-term exposures (more than 1 year) to site chemicals that could cause adverse health effects. The cleanup agencies must take action to protect public health.
3. **POTENTIAL/INDETERMINATE PUBLIC HEALTH HAZARD** This level is for sites when there is not enough information to make a conclusion. The Florida DOH must gather more data to make a decision. Sometimes we may request more sampling and testing.
4. **NO APPARENT PUBLIC HEALTH HAZARD** This level is for sites where human exposure to contamination is occurring or has

occurred in the past, but it is not at a level that is a threat to human health.

5. **NO PUBLIC HEALTH HAZARD** This level is for sites that pose no threat or public health hazard.

## What is an exposure investigation (EI)?

In an *Exposure Investigation* (EI), the Florida DOH looks for chemicals in peoples' bodies or in food from near a hazardous waste site. An example is the testing of children's blood to see if they have high lead levels in their blood when a nearby site has high soil lead levels. The Florida DOH may coordinate fish testing with the Florida FWCC to see if fish in a nearby pond contain site-related chemicals. The Florida DOH also coordinates the testing of homegrown vegetables and fruit.

## Is there any way to check your body to see if you have chemicals in you?

Yes, when appropriate the Florida DOH *Exposure Investigation* (EI) program coordinates testing of blood and/or urine. Blood or urine tests are the best way to see if chemicals are in the body.

Only a few chemicals stay in the human body long enough to detect. (The first four are metals.) The chemicals we can test for include:

- Arsenic
- Cadmium
- Lead
- Mercury
- Pesticides
- Dioxins
- Polychlorinated biphenyls (PCBs), and
- Volatile organic compounds (VOCs).

One example of a chemical's not staying in the body long is mercury. After exposure, mercury only stays in urine for one to three days. Therefore, testing must occur shortly after an exposure. County health departments can collect blood and urine samples.

Once the Florida DOH receives the results from an EI, we notify the residents who were tested and we explain what the results mean. However, guidelines to interpret blood and urine test results only exist for a limited number of chemicals.

Although we may be able to test for a chemical, we may not

know exactly what a certain level of a chemical in the human body may mean. We do not have guidelines for all chemicals.

We also know that everyone has background levels of many chemicals in their bodies. This is because people are exposed to small amounts of chemicals every day. The air we breathe, the food we eat, and the water we drink exposes all of us to tiny amounts of chemicals each day. Therefore, if anyone has their blood or urine tested for chemicals, it is likely the lab will find chemicals.

Exposure investigations require the following:

1. Recent exposure to one of the chemicals listed above
2. Sampling of air, soil or water at a site to determine levels of chemicals at a site
3. Results must be useful to help make a public health decision. Examples would be recommending that the Florida DEP cleanup or remove soils in a neighborhood's yards or that residents see their doctor for health care, or recommending additional testing be done.

### Does a community have to wait a year to find out if they were exposed to a chemical at a hazardous waste site?

No, if the Florida DOH finds an imminent health threat at any point in the Public Health Assessment process, we notify the community immediately. We also inform other agencies. These agencies put any needed remedies into place. An example would be keeping contaminated dust from blowing into a neighborhood by putting down sod at a site. How long it takes to hear the results of an EI depends on how quickly results are back from the lab for soil, water, air, fish, or blood/urine sampling.

### Does anyone tell your doctors about the problem?

Yes. The Florida DOH sends information to area doctors about sites we are working on. We send them information about the chemicals of concern. We also provide copies to residents who attend our public meetings to take directly to their doctors. You can also call the Florida DOH toll free at 1-877-798-2722 during business hours to get information to take to your doctor.

The Florida DOH sometimes holds educational meetings for doctors and nurses. Sometimes these meetings are at a

local hospital or county health department.

When the Florida DOH does an Exposure Investigation for residents living near a hazardous waste site, we send copies of the blood/urine results to their doctors. We also send information about the chemicals found in the blood/urine.

### How can you get involved in the PHA process?

The PHA process requires community involvement. The Florida DOH health assessment team includes a community involvement coordinator (CIC) for this purpose. This person sets up public meetings as well as creates and distributes updated site fact sheets to inform the community about the site. The coordinator makes sure community concerns are gathered and addressed. Input from the community helps the team learn many things, including:

- How the site might have affected people in the past
- What health problems people are worried about
- Whether the team is meeting the community's public health and information needs
- Other concerns they have about the site.

Actions at hazardous waste sites can affect the community. It is important for them to get involved. It is important that the community makes their voices heard.

### What happens after the Public Health Assessment process is complete?

**Public health protection:** If a public health hazard exists at a site, then the U.S. EPA or the Florida DEP or local environmental and health agencies will take steps to reduce the danger. This can include fencing off an area, removing the contaminants, or covering the ground to reduce dust. Sometimes people need water supplies from a different source. Public health actions depend on the type of chemical at a site and how much danger it poses to the public.

**Public outreach and education:** The Florida DOH site team continues to work with the community throughout the process. This work might include updating the community residents on public health protections, writing educational flyers, holding public meetings, or providing training or distributing educational materials to health care workers. If the process requires more than one report, the federal ATSDR and the Florida DOH continues to work with the community.

**Research:** Sometimes the Public Health Assessment process

uncovers more questions. This might lead to more research and testing. Testing can be for chemicals in the air, soil or water. It might include health studies, such as exposure investigations or health outcome investigations of nearby residents.

### What is a cancer cluster investigation?

A cancer cluster investigation is a review of specific cancers occurring near a site.

### Does the Florida DOH do them?

Yes, in some cases, the Florida DOH reviews rates of specific cancers occurring near a site. The Florida DOH then compares them with the statewide rate for that kind of cancer. For more information about cancer cluster investigations, please see our booklet *Cancer Cluster Investigations: What are they? What do they mean?*

You can get a copy of the booklet online at: [www.myfloridaeh.com/community/SUPERFUND/pdf/cancer-cluster.pdf](http://www.myfloridaeh.com/community/SUPERFUND/pdf/cancer-cluster.pdf) There is also a Spanish version online at: [www.myfloridaeh.com/community/SUPERFUND/pdf/cancer-clusterSPAN.pdf](http://www.myfloridaeh.com/community/SUPERFUND/pdf/cancer-clusterSPAN.pdf). Or call us, toll-free at 877-798-2772 during regular business hours to request a copy.

The Florida DOH also conducts health studies for some site communities. An example is a disease and symptoms prevalence survey. This type of survey asks community residents to report certain kinds of diseases and symptoms. The diseases and symptoms of concern are those associated with certain chemicals of concern at a site.

### How do cleanup agencies cleanup a site?

In a site cleanup, the environmental agency or agencies:

1. REMOVE THE CHEMICALS FROM THE SITE. For instance, in off-site disposal, cleanup agencies dig up polluted soil and move it to a safer place elsewhere.
2. MAKE THE CHEMICALS LESS DANGEROUS. One example is containment, in which cleanup agencies leave the waste where it is. The agencies take steps to see that the chemicals don't move offsite. A second example is treatment, in which cleanup agencies make the waste at a site less toxic. There are many ways to do this. Which way is used usually depends on the type of chemical in the waste.

3. REDUCE EXPOSURES. An example is when a site is fenced off and posted so no one goes on the site and people cannot be exposed to chemicals there.

### How can you protect your family from hazardous waste?

You can take many steps to protect yourself and your family from the toxic substances found in hazardous waste. Here are some of them.

1. STAY OFF THE SITE. If you see signs posted warning you to keep off a site, do not enter it. The U.S. EPA and the Florida DEP put those signs up to protect public health and safety.
2. DO NOT ALLOW CHILDREN TO GO ONTO A SITE. In some cases, toxic chemicals can harm children more easily than adults. Because children are small, even small amounts of a chemical may have an effect. Children also are more likely to put dirty hands into or near their mouths. They also tend to forget to wash their hands before eating. Chemicals from soil can enter their bodies this way. If there are signs posted at a site, explain to your children why they are there and tell them it is serious. Be sure to tell them they should not climb fences to be "cool."
3. HAVE YOUR WATER TESTED. This is important if you use a private well. You can get information about testing from your county health department. For the address and phone number for your county health department, please check the DOH website at: [www.doh.state.fl.us/chdsitelist.htm](http://www.doh.state.fl.us/chdsitelist.htm) . If you have an irrigation well, do not drink from it. If you are on a municipal water system, they are required to check their water quality regularly. You can request a report from the system.
4. HAVE YOUR SOIL TESTED. If you live near a site, stormwater from rain can sometimes run off from it into your yard. This run-off may carry chemicals. Call your environmental agency for information on soil testing.
5. CLOSE YOUR WINDOWS IF DUST MOVES OFF A NEARBY SITE. Some sites do not have grass, plants or pavement covering the soil. On dry days, those sites may be dusty. If wind blows dust from the site, you can close your windows. This cuts down on chemicals in the dust coming into your home.
6. BECOME INFORMED. Find out what types of chemicals are on the site near you. Get a copy of any documents put out by the agencies. Contact numbers for the agencies are in this booklet. The U.S. EPA and the Florida DOH usually place documents in a nearby public library. You can read documents there or make copies to take with you. You can also call the Florida DOH at

877-798-2772 to request copies or go online to download reports and fact sheets at: <http://www.myfloridaeh.com/hsee/SUPERFUND/index.html>

7. LEARN ABOUT THE HEALTH EFFECTS OF THE CHEMICALS AT THE SITE. ATSDR has a special website where you can look up the health effects of over 200 chemicals. The website is: <http://www.atsdr.cdc.gov/toxfaq.html> Each fact sheet answers the following questions about a particular chemical:

- a. What is (the chemical)?
- b. What happens to the chemical when it enters the environment?
- c. How can the chemical affect your health?
- d. How likely is the chemical to cause cancer?
- e. How does the chemical effect children?
- f. How can families reduce exposure to the chemical?
- g. Is there a medical test to show someone has been exposed to the chemical?
- h. Has the federal government made recommendations to protect public health from the chemical?
- i. How can someone get more information?

8. SEE YOUR DOCTOR IF YOU HAVE HEALTH CONCERNS. If you think you have an illness from chemicals at a hazardous waste site near your home, tell your doctor. It is always best to seek medical attention if you are ill. It is also important to have a medical record of any illness possibly caused by chemicals at a site.

## What are some of the chemicals often found at hazardous waste sites?

- Arsenic
- Cadmium
- Dioxins
- Lead
- Mercury
- Organochlorine pesticides
- Polycyclic Aromatic Hydrocarbons (PAHs)
- Polychlorinated Biphenyls (PCBs)
- Volatile Organic Compounds (VOCs)

Each hazardous waste site is different. Some sites are quite small. Others are very large. There may be different types of toxic chemicals at a single site. Some sites might only have one chemical that is of concern. At one site, we might find polluted water. Another might have toxic chemicals in the soil. A third might release hazardous waste into the air. A few sites might have all three types of concerns.

## How can you help?

Talk with others in your neighborhood about what you have learned.

Educate your children about the site.

Attend public meetings and tell the Florida DOH your health concerns.

Become more informed by calling the Florida DOH and asking your questions.

Learn about the chemicals at a site and their potential health effects.

## Contacts

### Florida DOH Health Assessment Team

Call 877-798-2772 toll-free during business hours in Florida or visit us online at:

<http://www.myfloridaeh.com/community/SUPERFUND/index.html>

For more information on related topics of interest, please refer to our Toxic Substances Health Effects Resource Directory, available on line at:

[http://www.myfloridaeh.com/community/SUPERFUND/pdf/2004\\_Toxic\\_Subs\\_Res\\_Dir.pdf](http://www.myfloridaeh.com/community/SUPERFUND/pdf/2004_Toxic_Subs_Res_Dir.pdf)

Or call us, at 877-798-2772 toll-free during regular business hours to request a copy.

