

# Health Consultation

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FISH TESTING

LONG'S OLD POND

BAKER LANDFILL, OKALOOSA COUNTY, FLORIDA

SEPTEMBER 22, 2006

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
Public Health Service  
Agency for Toxic Substances and Disease Registry  
Division of Health Assessment and Consultation  
Atlanta, Georgia 30333

## **Health Consultation: A Note of Explanation**

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

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HEALTH CONSULTATION

LONG'S OLD POND

BAKER LANDFILL, OKALOOSA COUNTY, FLORIDA

Prepared by:

Florida Department of Health  
Bureau of Community Environmental Health  
Under Cooperative Agreement with the  
U.S. Department of Health and Human Services  
Agency for Toxic Substances and Disease Registry

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## Foreword

This health consultation report evaluates mercury levels found in largemouth bass and bluegill collected by the Florida Fish and Wildlife Conservation Commission (FFWCC) in June 2004 from Long's Old Pond east of Baker Landfill near Baker, Okaloosa County, Florida.

*Evaluating exposure:* Florida Department of Health (FDOH) scientists begin by reviewing available information about environmental conditions at the site. The first task is to find out how much contamination is present, where it is on the site, and how people might be exposed to it. Usually, Florida DOH does not collect its own environmental sampling data. We rely on information provided by the Florida Department of Environmental Protection (DEP), the U.S. Environmental Protection Agency (USEPA), and other government agencies, businesses, and the public.

*Evaluating health effects:* If evidence is found that people are being exposed—or could be exposed—to hazardous substances, Florida DOH scientists will take steps to determine whether that exposure could be harmful to human health. Their assessment focuses on public health; that is, the health impact on the community as a whole, and is based on existing scientific information.

*Developing recommendations:* In an evaluation report—such as this exposure investigation report—Florida DOH outlines its conclusions regarding any potential health threat posed by a site, and offers recommendations for reducing or eliminating human exposure to contaminants. The role of Florida DOH in dealing with hazardous waste sites is primarily advisory. For that reason the evaluation report will typically recommend actions to be taken by other agencies—including the EPA and Florida DEP. If, however, the health threat is immediate, Florida DOH will issue a public health advisory warning people of the danger and will work to resolve the problem.

*Soliciting community input:* The evaluation process is interactive. Florida DOH starts by soliciting and evaluating information from various government agencies, the organizations or individuals responsible for cleaning up the site, and from community members who live near the site. Any conclusions are shared with the organizations and individuals who provided information. Once an evaluation report has been prepared, Florida DOH seeks feedback from the public. *If you have questions or comments about this exposure investigation report, we encourage you to contact us. Please write to:*

*Please write to:* Susan Skye / Health Assessment Team  
Bureau of Community Environmental Health  
Florida Department of Health  
4052 Bald Cypress Way, Bin # A-08  
Tallahassee, FL 32399-1712

*Or call us at:* (850) 245-4299, or toll-free during business hours: (877) 798-2772

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## **Summary and Statement of Issues**

This health consultation evaluates mercury levels found in largemouth bass and bluegill collected by the Florida Fish and Wildlife Conservation Commission (FFWCC) in June 2004 from Long's Old Pond east of Baker Landfill near Baker, Okaloosa County, Florida.

Baker Landfill East operated from 1968 to 1980. From 1993 to 1998, the Okaloosa County Public Works Department used a borrow pit east of Baker Landfill East for disposal of construction and demolition debris. There are three privately owned ponds east of this borrow pit. One of these ponds southeast of the borrow pit is known as Long's Old Pond from which FFWCC collected fish for this investigation.

The Florida Department of Environmental Protection (DEP) assisted the FFWCC with the fish investigation and requested that Florida DOH review mercury data from largemouth bass, bluegill, and catfish. FFWCC collected too few catfish to assess the health risk.

The Florida DOH advises that consumption limits are advisable for people eating fish from Long's Old Pond. The average mercury level of the 12 largemouth bass collected from this pond was 0.36 parts per million (ppm). Using Florida DOH's mercury fish consumption guidelines, women of childbearing age and young children should only eat one 6-ounce largemouth bass meal per month from Old Long's Pond. All other individuals can eat one 6-ounce largemouth bass meals per week from this pond. The average mercury level of the 12 bluegill collected from this pond was 0.044 ppm. Using Florida DOH's mercury guidelines, all individuals should eat only two 6-ounce meals of bluegill per week from this pond.

Mercury levels in fish prior to 2004 are unknown so the Florida DOH can not determine past exposures to mercury in fish from Long's Old Pond.

## **Purpose and Health Issues**

In August 2004, the Florida DEP requested the Florida DOH review mercury in 12 largemouth bass, 12 bluegill and one catfish from privately owned Long's Old Pond. Long's Old Pond is fed by a ground water discharge "seep" near the Baker Landfill.

## **Background**

### **Site Description and History**

Baker Landfill is two miles southeast of Baker, Okaloosa County, Florida (Figure 1 and 2). The landfill is separated into eastern and western portions by State Road 4 (Figure 3). Baker Landfill East was developed as a landfill in 1968 and was used until 1980 (HDR 2004). An undetermined quantity of residential, commercial, and agricultural waste was placed in this 5.4-acre area consisting of unlined trenches. Final closure of Baker Landfill East included a synthetic top liner and vegetative cover.

There are three privately owned ponds east of Baker's Landfill. One of these ponds is known as Long's Old Pond from which the Florida Fish and Wildlife Conservation Commission (FFWCC) collected fish for this investigation. This pond is southeast of the borrow pit, east of Baker Landfill and is located in a fenced pasture area (Figure 4). The owner purchased his property and

this pond in 1966. According to the owner of this pond, only he, his family and friends recreationally fish from this pond. He said on the average someone might eat a fish every two weeks from the pond. The owner uses this property as his second home and only visits his property on the weekends. He has two deep wells in the Floridan aquifer on his property. His neighbors are on city water. The owner's property is 240 acres and is set too far back to have access to city water.

Between 1993 and 1998, the Okaloosa County Public Works Department disposed of construction and debris in a 10 acre borrow pit east of Baker Landfill East (Figure 3). The borrow pit is on County property east of the area that was used as the landfill cell.

Since 1997 the Florida Department of Environmental Protection (DEP) has found mercury in the groundwater near the Baker Landfill at levels both below and slightly above standards.

Since 2000 the Florida DEP has sporadically found low levels of mercury in the groundwater discharge ("seep") that feeds Long's Old Pond east of Baker Landfill. Since 2005, levels of mercury in Long's Old Pond have been below standards.

## **Demographics**

Approximately 191 people reside within one mile of the Baker Landfill site. Of this population, 95 % are white, 3 % are black, and 2% are Hispanic or from other racial/ethnic groups (Census 2000). However, only about fifteen people have access to the fishing ponds on Long's property.

## **Community Health Concerns**

Florida DEP and Florida DOH are unaware of any community health concerns.

## **Discussion**

Since mercury can bioaccumulate in fish and people ingest fish, this health consultation addresses the ingestion pathway only. Other than the fish data from 2004, there is no past fish data. The owner informed the Florida DOH that he purchased the property in 1966, and people have fished from the pond for the last 50 years.

## **Fish Testing Background and Collection**

On June 10, 2004, the Florida DEP and the FFWCC collected 12 largemouth bass, 12 bluegill and one catfish from Long's Old Pond. They were unable to launch their boat or collect fish from Long's Pond which is closer to the Baker Landfill.

Also on June 10, 2004, the Florida DEP met Okaloosa County personnel and collected surface water samples from the ponds near the site. The entire field trip took three hours.

FFWC personnel filleted the fish at the FFWCC laboratory and sent the fish to the DEP lab in Tallahassee for mercury analysis.

In August 2004, the Florida DEP submitted bluegill, catfish and largemouth bass fish results to the Florida DOH for review.

In September 2004, the Florida DOH advised the Florida DEP that mercury consumption limits should apply to fish from Long's Old Pond.

In 2006, the owner of Long’s Old Pond turned down DEP’s subsequent request for additional fish testing.

In April 2006, the Florida DEP informed the Florida DOH that they would not be collecting additional fish from Long’s Old Pond because the owner did not agree to further fish testing.

**Fish Testing Results and Interpretation**

The average mercury level of the 12 largemouth bass collected from Old Long’s Pond was 0.36 parts per million (ppm)(Table 1). Using Florida DOH’s mercury guidelines, women of childbearing age and young children should only eat one 6-ounce largemouth bass meal once a month from Old Long’s Pond. All other individuals can eat one 6-ounce largemouth bass meal per week from this pond (Table 2).

The average mercury level of the 12 bluegill collected from Long’s Old Pond was 0.044 ppm (Table 1). Using Florida DOH’s mercury guidelines, all individuals should eat only two 6-ounce meals of bluegill per week from this pond (Table 2).

**Table I. Long’s Old Pond Fish Size and Mercury Concentrations**

Fish Species	Average Mercury Concentration (ppm)	Length (mm)	Weight (g)
12 largemouth bass	0.36	210 – 357	103 – 535
12 bluegill	0.044	185 – 255	122 – 434

ppm = parts per million mm=millimeter g=grams

The table below includes the Department of Health’s updated mercury guidelines for eating fish from freshwater bodies. People eating fish from all water bodies in Florida are advised to use these mercury guidelines. Florida DOH guidelines are also available at <http://www.doh.state.fl.us/environment/community/fishconsumptionadvisories/newadvisories.html>. Since Long’s Old Pond is a private pond, it is not listed on DOH’s website.

**Table II. Florida DOH Fish Mercury Consumption Guidelines**

Number of Meals	Women of Childbearing Age and Young Children	All Other Individuals
2 per week	<0.1 ppm	<0.3 ppm
1 per week	<0.2 ppm	<0.6 ppm
1 per month	<0.85 ppm	<1.5 ppm
Do not Eat	≥ 0.85 ppm	≥ 1.5 ppm

ppm= parts per million



Because largemouth bass and bluegill are more like to have higher levels of mercury than catfish and the pond is privately owned, DOH did not pursue asking the owner for access for additional fish sampling.

In a June 2006 letter, the Florida DOH advised the owner of Long's Old Pond that women of childbearing age and young children should only eat one 6-ounce largemouth bass meal per month from Old Long's Pond. All other individuals can eat one 6-ounce largemouth bass meals per week from this pond. For bluegill, all individuals should eat only two 6-ounce meals of bluegill per week from this pond.

### **Other Health Based Standards for Mercury**

The Food and Drug Administration (FDA) action level for mercury in the edible portion of fish is 1.0 parts per million (ppm) (DHHS 2000). The highest levels of mercury found in the bluegill and largemouth bass from Long's Old Pond are less than 1.0 ppm (Table I).

### **Consideration of Biological Testing**

Florida DOH considered biological testing (urine or blood) for people eating fish from Long's Old Pond. Based on the 2004 fish data for this site, the levels of mercury found in these fish do not warrant biological testing if people eating fish from Long's Old Pond follow the guidelines.

### **Child Health Considerations**

This health consultation considers that children could eat fish from Long's Old Pond near Baker Landfill. Pregnant woman, women of child-bearing age and children can be more sensitive to the effects of mercury in fish. Children can be exposed to various forms of mercury in a variety of ways, including eating fish and wildlife. A child's mercury exposures can differ substantially from an adult's exposure because children drink more fluids, eater more food, and breathe more air per kilogram of body weight than do adults. Children have a larger skin surface in proportion to their body volume. A child's diet—that often differs from that of an adult's—and a child's behavior and lifestyle can also influence exposure. Children, especially small children, are closer to the ground than are adults. They crawl on the floor, put things in their mouths, and might ingest inappropriate items such as dirt or paint chips. Children also spend more time outdoors than do adults. Finally and perhaps most importantly, children do not have the judgment of adults for avoiding hazards (ATSDR 1999). Finally, children are dependent on adults for access to housing, for access to medical care, and for risk identification. Thus adults need as much information as possible to make informed decisions regarding their children's health.

Based on the levels of mercury found in the the bluegill and largemouth bass from Long's Old Pond, the Florida mercury fish consumption guidelines should be followed. Women of childbearing age and young children should only eat one 6-ounce largemouth bass meal per month from Old Long's Pond. All other individuals can eat one 6-ounce largemouth bass meals per week from this pond.

All individuals should eat only two 6-ounce meals of bluegill per week from Long's Old Pond.

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## **Conclusions**

Levels of mercury in largemouth bass and bluegill from 2004 in Long's Old Pond exceed Florida's fish consumption advisory. The average mercury level of the 12 largemouth bass was 0.36 parts per million (ppm). The average mercury level of the 12 bluegill was 0.044 ppm.

Fish from Long's Old Pond are a no current apparent public health threat if people follow the Florida DOH mercury fish consumption guidelines.

Mercury levels in fish prior to 2004 are unknown so the Florida DOH can not determine past exposures to mercury in fish from Long's Old Pond.

## **Recommendations**

- 1) Women of childbearing age and young children should only eat one 6-ounce largemouth bass meal per month from Old Long's Pond. All other individuals can eat one 6-ounce largemouth bass meals per week from this pond.
- 2) All individuals should eat only two 6-ounce meals of bluegill per week from Old Long's Pond.

## **Public Health Action Plan**

### ***Past Actions:***

- 1) In a September 2004, the Florida DOH advised the Florida DEP that mercury consumption limits should apply to fish from Long's Old Pond.
- 2) In a July 2006 letter and an updated August 2006 letter, the Florida DOH advised the owner of Long's Old Pond that women of childbearing age and young children should only eat one 6-ounce largemouth bass meal once a month from Old Long's Pond. All other individuals can eat one 6-ounce largemouth bass meals per week from this pond. For bluegill, all individuals should eat only two 6-ounce meals of bluegill per week from this pond. The July 2006 letter also included the Florida DOH's fish consumption advisories web site (<http://www.doh.state.fl.us/environment/community/fishconsumptionadvisories/newadvisories.html>). The letter included Table II and stated that people eating fish from all water bodies in Florida are advised to use these mercury guidelines. Since the owner's pond is a private pond, however, it is not listed on this web site.

### ***Planned Actions:***

In the future, if Florida DEP collects fish from Long's Old Pond, the Florida DOH will review any additional fish test data from Long's Old Pond.

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## References

[ATSDR] Agency for Toxic Substances and Disease Registry. 1999. ATDSR Toxicological Profile for Mercury.

[Census] U.S. Census Bureau. 2000. Landview 5 on DVD. U.S. Department of Commerce Economics and Statistics Administration. U.S. Census Bureau, Washington, D.C.

[DHHS] Department of Health and Human Services. August 2000. Action Levels for Poisonous or Deleterious Subsistence in Human Food and Animal Feed.

[FDEP] Florida Department of Environmental Protection. August 2004 Letter from Mike Kennedy to Susan Bland requesting review of fish data.

[FDOH] Florida Department of Health. 2004. Letter from Susan Bland to Mike Kennedy dated September 29, 2004 evaluation of fish data.

[HDR] HDR Engineering, Inc. December 2004. Contamination Evaluation Report Addendum.

## Appendix A. Figures

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**FIGURE 1**  
**Okaloosa County Map**



SOURCE: FLORIDA DOI PUES

**FIGURE 2**  
**Site Location Map**



Source: Okaloosa County Highway Map Florida Dept of Transportation

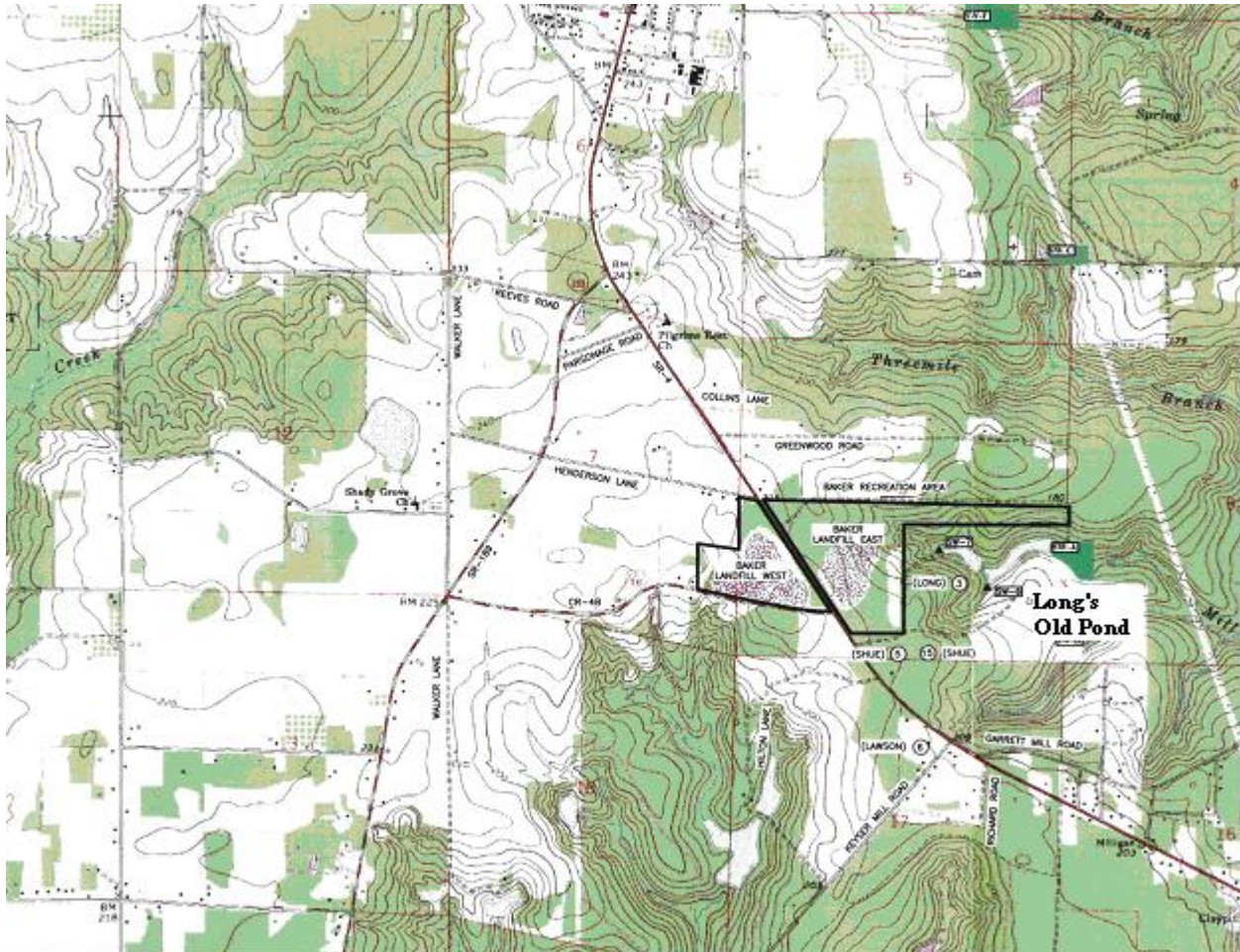
**FIGURE 3**  
**Baker Landfill Aerial Map**



Source: Okaloosa County GIS Division

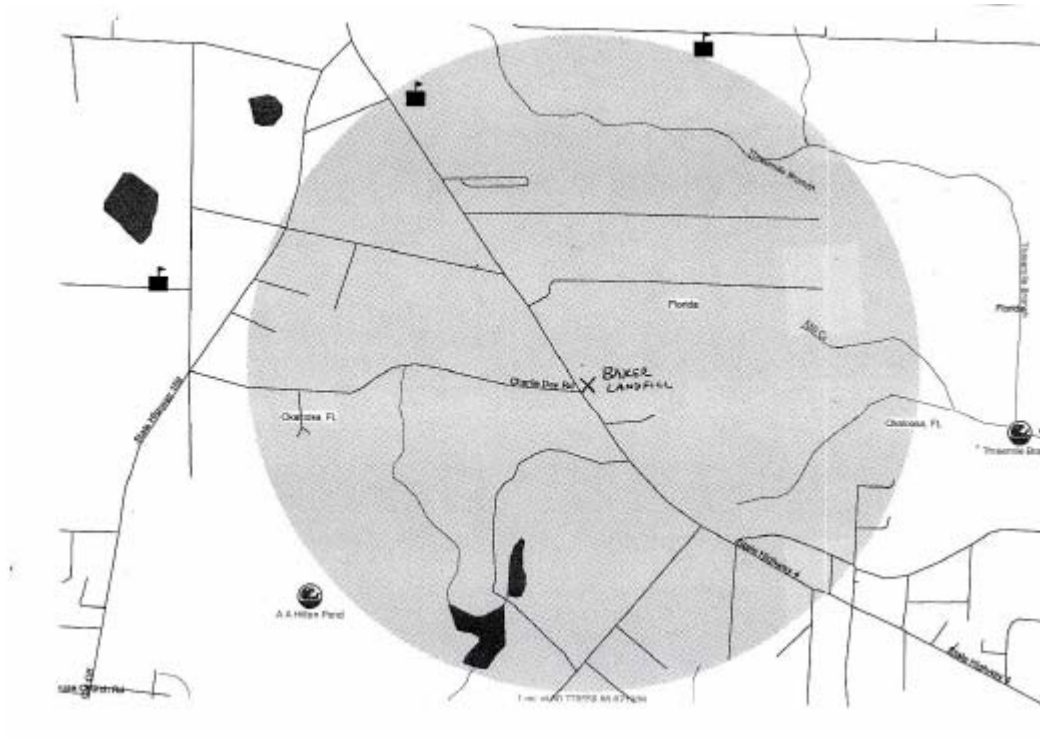


**FIGURE 4**  
**Topographical Map of Baker Landfill and Surrounding Area**



Source: 2005 DEP Contamination Assessment Addendum Well Survey Map

**FIGURE 5**  
**Site Map - One Mile Radius Surrounding Baker Landfill**



Source: Landview 5/Census 2000 U.S. Census Bureau

## APPENDIX A

### ATSDR Glossary of Environmental Health Terms

This glossary defines words used by the Agency for Toxic Substances and Disease Registry (ATSDR) in communications with the public. It is not a complete dictionary of environmental health terms. If you have questions or comments, call ATSDR's toll-free telephone number, 1-888-422-8737.

#### **Absorption**

The process of taking in. For a person or an animal, absorption is the process of a substance getting into the body through the eyes, skin, stomach, intestines, or lungs.

#### **Acute**

Occurring over a short time [compare with chronic].

#### **Acute exposure**

Contact with a substance that occurs once or for only a short time (up to 14 days) [compare with intermediate duration exposure and chronic exposure].

#### **Additive effect**

A biologic response to exposure to multiple substances that equals the sum of responses of all the individual substances added together [compare with antagonistic effect and synergistic effect].

#### **Adverse health effect**

A change in body function or cell structure that might lead to disease or health problems

#### **Aerobic**

Requiring oxygen [compare with anaerobic].

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

The Agency for Toxic Substances and Disease Registry (ATSDR) is a federal public health agency with headquarters in Atlanta, Georgia, and 10 regional offices in the United States. ATSDR's mission is to serve the public by using the best science, taking responsive public health actions, and providing trusted health information to prevent harmful exposures and diseases related to toxic substances.

#### **Ambient**

Surrounding (for example, *ambient* air).

#### **Anaerobic**

Requiring the absence of oxygen [compare with aerobic].

#### **Analyte**

A substance measured in the laboratory. A chemical for which a sample (such as water, air, or blood) is tested in a laboratory. For example, if the analyte is mercury, the laboratory test will determine the amount of mercury in the sample.

#### **Analytic epidemiologic study**

A study that evaluates the association between exposure to hazardous substances and disease by testing scientific hypotheses.

#### **Antagonistic effect**

A biologic response to exposure to multiple substances that is **less** than would be expected if

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the known effects of the individual substances were added together [compare with additive effect and synergistic effect].

**Background level**

An average or expected amount of a substance or radioactive material in a specific environment, or typical amounts of substances that occur naturally in an environment.

**Biodegradation**

Decomposition or breakdown of a substance through the action of microorganisms (such as bacteria or fungi) or other natural physical processes (such as sunlight).

**Biologic indicators of exposure study**

A study that uses (a) biomedical testing or (b) the measurement of a substance [an analyte], its metabolite, or another marker of exposure in human body fluids or tissues to confirm human exposure to a hazardous substance [also see exposure investigation].

**Biologic monitoring**

Measuring hazardous substances in biologic materials (such as blood, hair, urine, or breath) to determine whether exposure has occurred. A blood test for lead is an example of biologic monitoring.

**Biologic uptake**

The transfer of substances from the environment to plants, animals, and humans.

**Biota**

Plants and animals in an environment. Some of these plants and animals might be sources of food, clothing, or medicines for people.

**CAP** [see Community Assistance Panel.]

**Cancer**

Any one of a group of diseases that occur when cells in the body become abnormal and grow or multiply out of control.

**Cancer risk**

A theoretical risk for getting cancer if exposed to a substance every day for 70 years (a lifetime exposure). The true risk might be lower.

**Carcinogen**

A substance that causes cancer.

**Case study**

A medical or epidemiologic evaluation of one person or a small group of people to gather information about specific health conditions and past exposures.

**Case-control study**

A study that compares exposures of people who have a disease or condition (cases) with people who do not have the disease or condition (controls). Exposures that are more common among the cases may be considered as possible risk factors for the disease.

**Central nervous system**

The part of the nervous system that consists of the brain and the spinal cord.

**CERCLA** [see Comprehensive Environmental Response, Compensation, and Liability Act of 1980]

**Chronic**

Occurring over a long time [compare with acute].

**Chronic exposure**

Contact with a substance that occurs over a long time (more than 1 year) [compare with acute exposure and intermediate duration exposure]

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**Cluster investigation**

A review of an unusual number, real or perceived, of health events (for example, reports of cancer) grouped together in time and location. Cluster investigations are designed to confirm case reports; determine whether they represent an unusual disease occurrence; and, if possible, explore possible causes and contributing environmental factors.

**Community Assistance Panel (CAP)**

A group of people from a community and from health and environmental agencies who work with ATSDR to resolve issues and problems related to hazardous substances in the community. CAP members work with ATSDR to gather and review community health concerns, provide information on how people might have been or might now be exposed to hazardous substances, and inform ATSDR on ways to involve the community in its activities.

**Comparison value (CV)**

Calculated concentration of a substance in air, water, food, or soil that is unlikely to cause harmful (adverse) health effects in exposed people. The CV is used as a screening level during the public health assessment process. Substances found in amounts greater than their CVs might be selected for further evaluation in the public health assessment process.

**Completed exposure pathway** [see exposure pathway].**Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)**

CERCLA, also known as Superfund, is the federal law that concerns the removal or cleanup of hazardous substances in the environment and at hazardous waste sites. ATSDR, which was created by CERCLA, is responsible for assessing health issues and supporting public health activities related to hazardous waste sites or other environmental releases of hazardous substances. This law was later amended by the Superfund Amendments and Reauthorization Act (SARA).

**Concentration**

The amount of a substance present in a certain amount of soil, water, air, food, blood, hair, urine, breath, or any other media.

**Contaminant**

A substance that is either present in an environment where it does not belong or is present at levels that might cause harmful (adverse) health effects.

**Delayed health effect**

A disease or an injury that happens as a result of exposures that might have occurred in the past.

**Dermal**

Referring to the skin. For example, dermal absorption means passing through the skin.

**Dermal contact**

Contact with (touching) the skin [see route of exposure].

**Descriptive epidemiology**

The study of the amount and distribution of a disease in a specified population by person, place, and time.

**Detection limit**

The lowest concentration of a chemical that can reliably be distinguished from a zero concentration.

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**Dose (for chemicals that are not radioactive)**

The amount of a substance to which a person is exposed over some time period. Dose is a measurement of exposure. Dose is often expressed as milligram (amount) per kilogram (a measure of body weight) per day (a measure of time) when people eat or drink contaminated water, food, or soil. In general, the greater the dose, the greater the likelihood of an effect. An “exposure dose” is how much of a substance is encountered in the environment. An “absorbed dose” is the amount of a substance that actually got into the body through the eyes, skin, stomach, intestines, or lungs.

**Dose (for radioactive chemicals)**

The radiation dose is the amount of energy from radiation that is actually absorbed by the body. This is not the same as measurements of the amount of radiation in the environment.

**Dose-response relationship**

The relationship between the amount of exposure [dose] to a substance and the resulting changes in body function or health (response).

**Environmental media**

Soil, water, air, biota (plants and animals), or any other parts of the environment that can contain contaminants.

**Environmental media and transport mechanism**

Environmental media include water, air, soil, and biota (plants and animals). Transport mechanisms move contaminants from the source to points where human exposure can occur. The environmental media and transport mechanism is the second part of an exposure pathway.

**EPA**

United States Environmental Protection Agency.

**Epidemiologic surveillance** [see Public health surveillance].**Epidemiology**

The study of the distribution and determinants of disease or health status in a population; the study of the occurrence and causes of health effects in humans.

**Exposure**

Contact with a substance by swallowing, breathing, or touching the skin or eyes. Exposure may be short-term [acute exposure], of intermediate duration, or long-term [chronic exposure].

**Exposure assessment**

The process of finding out how people come into contact with a hazardous substance, how often and for how long they are in contact with the substance, and how much of the substance they are in contact with.

**Exposure-dose reconstruction**

A method of estimating the amount of people’s past exposure to hazardous substances. Computer and approximation methods are used when past information is limited, not available, or missing.

**Exposure investigation**

The collection and analysis of site-specific information and biologic tests (when appropriate) to determine whether people have been exposed to hazardous substances.

**Exposure pathway**

The route a substance takes from its source (where it began) to its end point (where it ends), and how people can come into contact with (or get exposed to) it. An exposure pathway has

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five parts: a source of contamination (such as an abandoned business); an environmental media and transport mechanism (such as movement through groundwater); a point of exposure (such as a private well); a route of exposure (eating, drinking, breathing, or touching), and a receptor population (people potentially or actually exposed). When all five parts are present, the exposure pathway is termed a completed exposure pathway.

**Exposure registry**

A system of ongoing follow up of people who have had documented environmental exposures.

**Feasibility study**

A study by EPA to determine the best way to clean up environmental contamination. A number of factors are considered, including health risk, costs, and what methods will work well.

**Groundwater**

Water beneath the earth's surface in the spaces between soil particles and between rock surfaces [compare with surface water].

**Hazard**

A source of potential harm from past, current, or future exposures.

**Hazardous Substance Release and Health Effects Database (HazDat)**

The scientific and administrative database system developed by ATSDR to manage data collection, retrieval, and analysis of site-specific information on hazardous substances, community health concerns, and public health activities.

**Hazardous waste**

Potentially harmful substances that have been released or discarded into the environment.

**Health investigation**

The collection and evaluation of information about the health of community residents. This information is used to describe or count the occurrence of a disease, symptom, or clinical measure and to evaluate the possible association between the occurrence and exposure to hazardous substances.

**Indeterminate public health hazard**

The category used in ATSDR's public health assessment documents when a professional judgment about the level of health hazard cannot be made because information critical to such a decision is lacking.

**Incidence**

The number of new cases of disease in a defined population over a specific time period [contrast with prevalence].

**Ingestion**

The act of swallowing something through eating, drinking, or mouthing objects. A hazardous substance can enter the body this way [see route of exposure].

**Inhalation**

The act of breathing. A hazardous substance can enter the body this way [see route of exposure].

**Intermediate duration exposure**

Contact with a substance that occurs for more than 14 days and less than a year [compare with acute exposure and chronic exposure].

**In vitro**

In an artificial environment outside a living organism or body. For example, some toxicity

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testing is done on cell cultures or slices of tissue grown in the laboratory, rather than on a living animal [compare with in vivo].

**In vivo**

Within a living organism or body. For example, some toxicity testing is done on whole animals, such as rats or mice [compare with in vitro].

**Lowest-observed-adverse-effect level (LOAEL)**

The lowest tested dose of a substance that has been reported to cause harmful (adverse) health effects in people or animals.

**Medical monitoring**

A set of medical tests and physical exams specifically designed to evaluate whether an individual's exposure could negatively affect that person's health.

**Metabolism**

The conversion or breakdown of a substance from one form to another by a living organism.

**Metabolite**

Any product of metabolism.

**mg/kg**

Milligram per kilogram.

**mg/cm<sup>2</sup>**

Milligram per square centimeter (of a surface).

**mg/m<sup>3</sup>**

Milligram per cubic meter; a measure of the concentration of a chemical in a known volume (a cubic meter) of air, soil, or water.

**Migration**

Moving from one location to another.

**Minimal risk level (MRL)**

An ATSDR estimate of daily human exposure to a hazardous substance at or below which that substance is unlikely to pose a measurable risk of harmful (adverse), noncancerous effects. MRLs are calculated for a route of exposure (inhalation or oral) over a specified time period (acute, intermediate, or chronic). MRLs should not be used as predictors of harmful (adverse) health effects [see reference dose].

**National Priorities List for Uncontrolled Hazardous Waste Sites (National Priorities List or NPL)**

EPA's list of the most serious uncontrolled or abandoned hazardous waste sites in the United States. The NPL is updated on a regular basis.

**National Toxicology Program (NTP)**

Part of the Department of Health and Human Services. NTP develops and carries out tests to predict whether a chemical will cause harm to humans.

**No apparent public health hazard**

A category used in ATSDR's public health assessments for sites where human exposure to contaminated media might be occurring, might have occurred in the past, or might occur in the future, but where the exposure is not expected to cause any harmful health effects.

**No-observed-adverse-effect level (NOAEL)**

The highest tested dose of a substance that has been reported to have no harmful (adverse) health effects on people or animals.



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**No public health hazard**

A category used in ATSDR's public health assessment documents for sites where people have never and will never come into contact with harmful amounts of site-related substances.

**NPL** [see National Priorities List for Uncontrolled Hazardous Waste Sites]

**Plume**

A volume of a substance that moves from its source to places farther away from the source. Plumes can be described by the volume of air or water they occupy and the direction they move. For example, a plume can be a column of smoke from a chimney or a substance moving with groundwater.

**Point of exposure**

The place where someone can come into contact with a substance present in the environment [see exposure pathway].

**Population**

A group or number of people living within a specified area or sharing similar characteristics (such as occupation or age).

**Potentially responsible party (PRP)**

A company, government, or person legally responsible for cleaning up the pollution at a hazardous waste site under Superfund. There may be more than one PRP for a particular site.

**ppb**

Parts per billion.

**ppm**

Parts per million.

**Public availability session**

An informal, drop-by meeting at which community members can meet one-on-one with ATSDR staff members to discuss health and site-related concerns.

**Public comment period**

An opportunity for the public to comment on agency findings or proposed activities contained in draft reports or documents. The public comment period is a limited time period during which comments will be accepted.

**Public health action**

A list of steps to protect public health.

**Public health advisory**

A statement made by ATSDR to EPA or a state regulatory agency that a release of hazardous substances poses an immediate threat to human health. The advisory includes recommended measures to reduce exposure and reduce the threat to human health.

**Public health assessment (PHA)**

An ATSDR document that examines hazardous substances, health outcomes, and community concerns at a hazardous waste site to determine whether people could be harmed from coming into contact with those substances. The PHA also lists actions that need to be taken to protect public health.

**Public health hazard**

A category used in ATSDR's public health assessments for sites that pose a public health hazard because of long-term exposures (greater than 1 year) to sufficiently high levels of hazardous substances or radionuclides that could result in harmful health effects.

**Public health hazard categories**

Public health hazard categories are statements about whether people could be harmed by

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conditions present at the site in the past, present, or future. One or more hazard categories might be appropriate for each site. The five public health hazard categories are no public health hazard, no apparent public health hazard, indeterminate public health hazard, public health hazard, and urgent public health hazard.

**Public health statement**

The first chapter of an ATSDR toxicological profile. The public health statement is a summary written in words that are easy to understand. The public health statement explains how people might be exposed to a specific substance and describes the known health effects of that substance.

**Public health surveillance**

The ongoing, systematic collection, analysis, and interpretation of health data. This activity also involves timely dissemination of the data and use for public health programs.

**Receptor population**

People who could come into contact with hazardous substances [see exposure pathway].

**Reference dose (RfD)**

An EPA estimate, with uncertainty or safety factors built in, of the daily lifetime dose of a substance that is unlikely to cause harm in humans.

**Remedial investigation**

The CERCLA process of determining the type and extent of hazardous material contamination at a site.

**RfD** [see reference dose]

**Risk**

The probability that something will cause injury or harm.

**Risk reduction**

Actions that can decrease the likelihood that individuals, groups, or communities will experience disease or other health conditions.

**Risk communication**

The exchange of information to increase understanding of health risks.

**Route of exposure**

The way people come into contact with a hazardous substance. Three routes of exposure are breathing [inhalation], eating or drinking [ingestion], or contact with the skin [dermal contact].

**Safety factor** [see uncertainty factor]

**SARA** [see Superfund Amendments and Reauthorization Act]

**Sample**

A portion or piece of a whole. A selected subset of a population or subset of whatever is being studied. For example, in a study of people the sample is a number of people chosen from a larger population [see population]. An environmental sample (for example, a small amount of soil or water) might be collected to measure contamination in the environment at a specific location.

**Sample size**

The number of units chosen from a population or an environment.

**Source of contamination**

The place where a hazardous substance comes from, such as a landfill, waste pond, incinerator, storage tank, or drum. A source of contamination is the first part of an exposure pathway.

**Special populations**

People who might be more sensitive or susceptible to exposure to hazardous substances because of factors such as age, occupation, sex, or behaviors (for example, cigarette smoking). Children, pregnant women, and older people are often considered special populations.

**Statistics**

A branch of mathematics that deals with collecting, reviewing, summarizing, and interpreting data or information. Statistics are used to determine whether differences between study groups are meaningful.

**Substance**

A chemical.

**Superfund** [see Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and Superfund Amendments and Reauthorization Act (SARA)]

**Superfund Amendments and Reauthorization Act (SARA)**

In 1986, SARA amended the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and expanded the health-related responsibilities of ATSDR. CERCLA and SARA direct ATSDR to look into the health effects from substance exposures at hazardous waste sites and to perform activities including health education, health studies, surveillance, health consultations, and toxicological profiles.

**Surface water**

Water on the surface of the earth, such as in lakes, rivers, streams, ponds, and springs [compare with groundwater].

**Surveillance** [see public health surveillance]

**Survey**

A systematic collection of information or data. A survey can be conducted to collect information from a group of people or from the environment. Surveys of a group of people can be conducted by telephone, by mail, or in person. Some surveys are done by interviewing a group of people [see prevalence survey].

**Synergistic effect**

A biologic response to multiple substances where one substance worsens the effect of another substance. The combined effect of the substances acting together is greater than the sum of the effects of the substances acting by themselves [see additive effect and antagonistic effect].

**Teratogen**

A substance that causes defects in development between conception and birth. A teratogen is a substance that causes a structural or functional birth defect.

**Toxic agent**

Chemical or physical (for example, radiation, heat, cold, microwaves) agents that, under certain circumstances of exposure, can cause harmful effects to living organisms.

**Toxicological profile**

An ATSDR document that examines, summarizes, and interprets information about a hazardous substance to determine harmful levels of exposure and associated health effects. A toxicological profile also identifies significant gaps in knowledge on the substance and describes areas where further research is needed.

**Toxicology**

The study of the harmful effects of substances on humans or animals.

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**Tumor**

An abnormal mass of tissue that results from excessive cell division that is uncontrolled and progressive. Tumors perform no useful body function. Tumors can be either benign (not cancer) or malignant (cancer).

**Uncertainty factor**

Mathematical adjustments for reasons of safety when knowledge is incomplete. For example, factors used in the calculation of doses that are not harmful (adverse) to people. These factors are applied to the lowest-observed-adverse-effect-level (LOAEL) or the no-observed-adverse-effect-level (NOAEL) to derive a minimal risk level (MRL). Uncertainty factors are used to account for variations in people's sensitivity, for differences between animals and humans, and for differences between a LOAEL and a NOAEL. Scientists use uncertainty factors when they have some, but not all, the information from animal or human studies to decide whether an exposure will cause harm to people [also sometimes called a safety factor].

**Urgent public health hazard**

A category used in ATSDR's public health assessments for sites where short-term exposures (less than 1 year) to hazardous substances or conditions could result in harmful health effects that require rapid intervention.

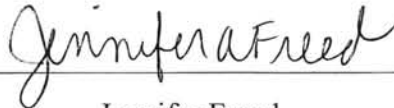
**Volatile organic compounds (VOCs)**

Organic compounds that evaporate readily into the air. VOCs include substances such as benzene, toluene, and methylene chloride.

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## CERTIFICATION

The Florida Department of Health, Bureau of Community Environmental Health prepared this Health Consultation under a cooperative agreement with the Agency for Toxic Substances and Disease Registry. It followed approved methodology and procedures existing at the time it began. The Cooperative Agreement Partner completed editorial review.

A handwritten signature in cursive script, reading "Jennifer Freed", is positioned above a horizontal line.

*Jennifer Freed*

Jennifer Freed  
Technical Project Officer  
CAT, SPAB, DHAC

The Division of Health Assessment and Consultation, ATSDR, has reviewed this health consultation, and concurs with its findings.

A handwritten signature in cursive script, reading "Alan Yarbrough", is positioned above a horizontal line.

*Alan Yarbrough*

Alan Yarbrough  
Team Lead  
CAT, SPAB, DHAC, ATSDR