

## 1. PUBLIC HEALTH STATEMENT

This public health statement tells you about toxaphene and the effects of exposure.

The Environmental Protection Agency (EPA) identifies the most serious hazardous waste sites in the nation. These sites make up the National Priorities List (NPL) and are the sites targeted for long-term federal cleanup activities. Toxaphene has been found in at least 58 of the 1,430 current or former NPL sites. However, it's unknown how many NPL sites have been evaluated for this substance. As more sites are evaluated, the sites with toxaphene may increase. This information is important because exposure to this substance may harm you and because these sites may be sources of exposure.

When a substance is released from a large area, such as an industrial plant, or from a container, such as a drum or bottle, it enters the environment. This release does not always lead to exposure. You are exposed to a substance only when you come in contact with it. You may be exposed by breathing, eating, or drinking the substance or by skin contact.

If you are exposed to toxaphene, many factors determine whether you'll be harmed. These factors include the dose (how much), the duration (how long), and how you come in contact with it. You must also consider the other chemicals you're exposed to and your age, sex, diet, family traits, lifestyle, and state of health.

### 1.1 WHAT IS TOXAPHENE?

Toxaphene, also known as camphechlor, chlorocamphene, polychlorocamphene, and chlorinated camphene, is a manufactured insecticide containing over 670 chemicals. Toxaphene is usually found as a solid or gas. In its original form, toxaphene is a yellow to amber waxy solid that smells like turpentine. It does not burn and evaporates when in solid form or when mixed with liquids.

## 1. PUBLIC HEALTH STATEMENT

Toxaphene was one of the most heavily used insecticides in the United States until 1982. It was used primarily in the southern United States to control insect pests on cotton and other crops.

Toxaphene was also used to control insect pests on livestock and to kill unwanted fish in lakes.

### 1.2 WHAT HAPPENS TO TOXAPHENE WHEN IT ENTERS THE ENVIRONMENT?

Toxaphene enters the environment after it is applied to a crop or poured into a lake. Toxaphene can enter the air (by evaporation), the soil (by sticking to soil particles), and the water (from runoff after rains). Toxaphene may also enter the environment from hazardous waste sites or when it accidentally spills or leaks during storage or transport. It does not dissolve well in water, so it is more likely to be found in air, soil, or the sediment at the bottom of lakes and streams. If toxaphene is found in surface water or groundwater, it is usually at very low levels. Once toxaphene is in the environment, it can last for years because it breaks down very slowly. This means there is still the chance of being exposed to toxaphene in the United States even though it has not been widely used for over 10 years. Because toxaphene breaks down slowly, exposure will probably be to the original material. For more information on the chemical and physical properties of toxaphene, refer to Chapter 3.

Levels may be high in some predatory fish and mammals because toxaphene accumulates in fatty tissues. For example, when a raccoon eats a contaminated fish, some of the toxaphene in the fish is transferred to the raccoon. The more contaminated fish the raccoon eats, the more toxaphene it acquires. This means that even when toxaphene levels are low or confined to a certain area, they could be high in individual animals. For more information on toxaphene in the environment, see Chapter 5.

## 1. PUBLIC HEALTH STATEMENT

### 1.3 HOW MIGHT I BE EXPOSED TO TOXAPHENE?

Since the use of toxaphene is banned in the United States, you can probably only be exposed to it in areas where it is concentrated (such as a waste site). In those areas, there is a greater chance of breathing or directly contacting the chemical. People may also be exposed to toxaphene by eating contaminated soil. Infants and toddlers have the greatest risk because they are likely to put things in their mouths. People who eat large quantities of fish and shellfish, or game animals such as raccoons taken in areas contaminated by toxaphene may experience somewhat higher intakes of toxaphene because those animals tend to concentrate toxaphene in their fatty tissues. You can also be exposed to toxaphene by breathing contaminated air, but concentrations in outdoor air are very low so you are not likely to be exposed to unhealthy levels in air. For more information on human exposure to toxaphene, see Chapter 5.

### 1.4 HOW CAN TOXAPHENE ENTER AND LEAVE MY BODY?

Toxaphene can enter the body through eating contaminated food or soil, through the skin after direct contact with contaminated substances, and through the lungs after breathing its vapors. Once toxaphene enters the body, it rapidly spreads to all organs. Toxaphene is quickly broken down in the body and excreted in urine and feces. Nearly all (approximately 90%) of the toxaphene is eliminated from the body within 24 to 36 hours after entering the body. However, studies in animals show that low levels of toxaphene may remain in fat for months. Chapter 2 contains more detailed information on how toxaphene enters and leaves the body.

### 1.5 HOW CAN TOXAPHENE AFFECT MY HEALTH?

Breathing, eating, or drinking high levels of toxaphene has been reported to damage the lungs, nervous system, liver, and kidneys, and can cause death. Of course, how severe the effects are depends on how much toxaphene is absorbed. Because toxaphene is no longer used, the chances of high-level exposure are small. However, exposure to low levels can occur in some places because it may last a long time in the environment. For this reason, if exposure occurs, it is likely to be to environmental or low levels and probably over a long time (that is, more than

## 1. PUBLIC HEALTH STATEMENT

1 year). Scientists have no information about how low-level exposure for a long time affects humans; however, animal studies have been conducted to try to answer that question.

Studies in animals show that long-term exposure (1-2 years) to toxaphene can damage the liver, kidneys, adrenal glands, and immune system, and may cause minor changes in fetal development. Toxaphene may also cause cancer in laboratory animals. The results of studies where animals were exposed to relatively high levels of toxaphene for most of their lives show that the thyroid gland in some of the animals developed cancerous cell types. The EPA has determined that toxaphene is a probable human carcinogen. The National Toxicology Program also concludes that there is a reasonable chance that toxaphene is a human carcinogen.

However, most people will never be exposed to toxaphene for a long time (more than 1 year), and not everyone exposed to it will develop cancer. In fact, there is no evidence that toxaphene has caused cancer in people, but animal evidence suggests that it may cause cancer in humans. See Chapter 2 for more information on toxaphene and cancer.

### **1.6 IS THERE A MEDICAL TEST TO DETERMINE WHETHER I HAVE BEEN EXPOSED TO TOXAPHENE?**

Toxaphene and its breakdown products can be detected in blood, urine, breast milk, and body tissues. Because samples are easy to take, urine and blood tests are the most common way to tell if a person has been exposed to toxaphene. Neither of these tests is routinely available at a doctor's office because special equipment is needed to detect toxaphene, but your doctor can send samples to a special laboratory that performs those tests. The tests cannot determine how much toxaphene you have been exposed to. Toxaphene leaves the body quickly, so the tests can only detect it within several days after exposure. Also, if you are exposed to other chemicals at the same time, the test results could be misinterpreted.

Blood and urine tests can confirm that a person has been exposed to toxaphene, but these tests cannot yet predict the kind or severity of any health effects that might occur. See Chapters 2 and 6 for specific information about the tests used to detect toxaphene in the body.

## 1. PUBLIC HEALTH STATEMENT

**1.7 WHAT RECOMMENDATIONS HAS THE FEDERAL GOVERNMENT MADE TO PROTECT HUMAN HEALTH?**

In 1990, the EPA banned all uses of toxaphene in the United States or any of its territories because of scientific evidence that it harms humans and animals. In 1993, the EPA banned the importation of food containing toxaphene residues into the United States or any of its territories. The federal government has developed regulatory standards and guidelines to protect individuals from the potential harmful health effects of toxaphene in drinking water and food. The EPA concludes that the amount of toxaphene in drinking water should not exceed 0.005 parts of toxaphene per million parts (ppm) of water and that any release to the environment greater than one pound should be reported. The EPA has also established limits on how much toxaphene can be released from a factory into waste water. The limit is set at 0-1 .5 milligrams (mg) of toxaphene per liter (approximately a quart) of water. The EPA has determined that toxaphene is a “hazardous air pollutant” under the Clean Air Act, but the agency has not yet established standards for it. For short-term exposures, EPA concludes that drinking water levels should not exceed 0.5 ppm for 1 day or 0.04 ppm for 10 days. The Food and Drug Administration has set a limit of 6 ppm of toxaphene in crude soybean oil, and EPA has set limits that range from 0.1 to 7 ppm for other raw agricultural products such as sunflower seeds, soybeans, grains, cottonseed, vegetables, and fruits (including bananas and pineapples). Since the EPA has banned the importation of all food containing toxaphene residues, and toxaphene can no longer be used in the United States or its territories, the likelihood of eating contaminated food is small.

The Occupational Safety and Health Administration (OSHA) has set a legally enforceable limit (permissible exposure limit or PEL) of 0.5 milligrams of toxaphene per cubic meter of air in workroom air to protect workers during an 8-hour shift over a 40-hour workweek. For more information on criteria and standards for toxaphene exposure, see Chapter 7.

## 1. PUBLIC HEALTH STATEMENT

**1.8 WHERE CAN I GET MORE INFORMATION?**

If you have any more questions or concerns, please contact your community or state health or environmental quality department or:

Agency for Toxic Substances and Disease Registry  
Division of Toxicology  
1600 Clifton Road NE, E-29  
Atlanta, Georgia 30333  
(404) 639-6000

This agency can also provide you with information on the location of occupational and environmental health clinics. These clinics specialize in the recognition, evaluation, and treatment of illness resulting from exposure to hazardous substances.