

1. PUBLIC HEALTH STATEMENT

This Statement was prepared to give you information about 1,3-dichloropropene and to emphasize the human health effects that may result from exposure to it. The Environmental Protection Agency (EPA) has identified 1,177 sites on its National Priorities List (NPL). 1,3-Dichloropropene has been found at 3 of these sites. However, we do not know how many of the 1,177 NPL sites have been evaluated for 1,3-dichloropropene. As EPA evaluates more sites, the number of sites at which 1,3-dichloropropene is found may change. The information is important for you because 1,3-dichloropropene may cause harmful effects and because these sites are potential or actual sources of human exposure to 1,3-dichloropropene.

When a chemical 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 as a chemical emission. This emission, which is also called a release, does not always lead to exposure. You can be exposed to a chemical only when you come into contact with the chemical. You may be exposed in the environment by breathing; eating, or drinking substances containing the chemical or from skin contact with it.

If you are exposed to a hazardous substance such as 1,3-dichloropropene, several factors will determine whether harmful health effects will occur and what the type and severity of those health effects will be. These factors include the dose (how much), the duration (how long), the route or pathway by which you are exposed (breathing, eating, drinking, or skin contact), the other chemicals to which you are exposed, and your individual characteristics such as age, sex, nutritional status, family traits, life style, and state of health.

1.1 WHAT IS 1,3-DICHLOROPROPENE?

1,3-Dichloropropene is a colorless liquid with a sweet smell. It dissolves in water and evaporates easily. There are two kinds of 1,3-dichloropropene, cis-1,3-dichloropropene and trans-1,3-dichloropropene, which are very closely related. These different forms of the same chemical behave very much alike and are usually combined in different amounts to form mixtures. The mixtures are mainly used in farming to kill tiny pests called nematodes that eat the roots of important crops. Sometimes, these mixtures also have small amounts of other chemicals that are very similar to 1,3-dichloropropene.

When 1,3-dichloropropene is used in farm fields, it is sprayed into the ground. Once in the soil, some of it is likely to be broken down into smaller chemicals by either water or living things. These smaller chemicals may also pose a health hazard. Some of it may be carried deeper into the ground and may reach underground water supplies. However, in high crop-producing states like California where it has been used often, very little 1,3-dichloropropene has actually been found in groundwater. 1,3-Dichloropropene, however, may be

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a problem at hazardous waste sites, where a variety of different chemicals are often buried in the ground together. These other chemicals can stop 1,3-dichloropropene from breaking down. Therefore, it is possible for 1,3-dichloropropene to reach groundwater from a hazardous waste site.

Some of the 1,3-dichloropropene sprayed onto the ground will evaporate into the air. In the air, 1,3-dichloropropene will be broken down into smaller chemicals by sunlight. Some of the 1,3-dichloropropene in air may be washed down into the ground, lakes, or streams by rain. In water, 1,3-dichloropropene is expected to break down into small chemicals. Some of the 1,3-dichloropropene in water will also go back into the air.

You will find more information on the chemical properties of 1,3-dichloropropene in Chapter 3. The uses of 1,3-dichloropropene are described in Chapter 4. More information on how 1,3-dichloropropene will behave in the environment is given in Chapter 5.

1.2 HOW MIGHT I BE EXPOSED TO 1,3-DICHLOROPROPENE?

You can breathe 1,3-dichloropropene from the air. It can also get on your skin. The people most likely to breathe air containing 1,3-dichloropropene or to get it on their skin are workers who use it for farming or make it in factories. Small amounts of 1,3-dichloropropene can form in your drinking water when chlorine is added to the water supply. (Chlorine is added to kill germs in the water.)

Crops that are grown in fields treated with 1,3-dichloropropene are most likely to contain it. However, food grown in 1,3-dichloropropene treated fields has not been shown to contain 1,3-dichloropropene. We do not know if this is because 1,3-dichloropropene is rapidly removed or broken down in the environment, or the treated crops break it down.

Very small amounts of 1,3-dichloropropene from sewage treatment facilities, electrical power stations, and industrial facilities that use water to cool high-temperature furnaces may go into streams, rivers, and lakes. Some may go into the air.

People who live near garbage dumps or places where chemicals are stored or buried, including hazardous waste sites, may breathe 1,3-dichloropropene if it escapes into the air or have 1,3-dichloropropene in their well water. They may drink some 1,3-dichloropropene in the tap water. They may also be exposed through skin contact with soil containing it. 1,3-Dichloropropene has been discovered at only three hazardous waste sites and in only a few underground water supplies. Again, we do not know if this is because 1,3-dichloropropene is not at other sites, or because it has not been looked for at other sites. In general, very little information is available about how much 1,3-dichloropropene is in the environment. We do not know the levels in soil, water, and air.

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You can find more information on how much 1,3-dichloropropene has been found in the environment and how you can be exposed to it in Chapter 5.

1.3 HOW CAN 1,3-DICHLOROPROPENE ENTER AND LEAVE MY BODY?

1,3-Dichloropropene can enter your body if you breathe air that contains it, if you drink water that is contaminated with it, or even if you touch it. Studies with animals have shown that if you breathe air that has 1,3-dichloropropene in it, most of the chemical will get into your bloodstream. Of course, the longer you breathe air with 1,3-dichloropropene in it, the more of it will enter your body. Also, the more water you drink with 1,3-dichloropropene in it, the more will pass into your bloodstream from your stomach or intestines. The longer 1,3-dichloropropene is in contact with your skin, the more of it will get into your body. If you live or work near a hazardous waste site where 1,3-dichloropropene is stored, you might breathe it if it escapes into the air. 1,3-Dichloropropene can get into the groundwater and into wells that supply drinking water, so you could drink water contaminated with it. You can also get 1,3-dichloropropene on your skin if you come into contact with soil contaminated with it. People who live in farming communities where 1,3-dichloropropene is used as a pesticide are also likely to come into contact with this chemical.

Your body can get rid of 1,3-dichloropropene fairly quickly. Studies with animals have shown that most 1,3-dichloropropene leaves the body within 2 days. Most 1,3-dichloropropene leaves your body in urine, and smaller amounts leave in feces and the air you breathe out. For more information on how 1,3-dichloropropene gets into and leaves your body, see Chapter 2.

1.4 HOW CAN 1,3-DICHLOROPROPENE AFFECT MY HEALTH?

The main health effects seen in humans who breathed 1,3-dichloropropene are: nausea; vomiting; irritation of the skin, eyes, nose, and throat; breathing difficulties; coughing; headache; and fatigue. Some people who breathed 1,3-dichloropropene could smell it when the amount reached 1 part 1,3-dichloropropene per million parts of air (ppm), but you may be able to smell it at even lower amounts. We do not know if 1,3-dichloropropene causes cancer in humans; however, three men who breathed 1,3-dichloropropene during the cleanup of a spill or during field spraying developed similar kinds of cancer, but we cannot be sure if 1,3-dichloropropene was the cause. Mice and rats that swallowed 1,3-dichloropropene got cancer. We do not know whether 1,3-dichloropropene can cause birth defects in humans. Although 1,3-dichloropropene did not cause birth defects in animals, pregnant rats that breathed it gave birth to fewer rat pups.

Rats had lung damage and eye irritation and rabbits had difficulty getting on their feet and walking after they breathed high levels of 1,3-dichloropropene for short periods of time. Some rats even died. Rats and mice had damage to the lining of the nose, and mice had damage to the lining

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of the bladder after breathing lower levels of 1,3-dichloropropene for longer periods of time. Rats that swallowed single high doses of 1,3-dichloropropene had damage to the lining of the stomach, lung congestion, and difficulty walking. These effects were worse in rats that swallowed even higher doses, and included bleeding of the stomach, intestines, liver, and lungs. Some of the rats died. Rats had increased liver and kidney weights, which may indicate harmful effects in these organs, after swallowing lower doses every day for longer periods of time. Rats had damage to the lining of the stomach and some had cancer of the stomach and liver after swallowing low doses for most of their lives. Mice that swallowed low doses of 1,3-dichloropropene for most of their lives had stomach and kidney damage, and some had cancer of the stomach, urinary bladder, and lungs. Rabbits had irritated skin and hair loss, and guinea pigs had irritated skin and became allergic to 1,3-dichloropropene after a small amount was painted onto their backs. Rats that had large amounts of 1,3-dichloropropene painted onto their backs had skin irritation, difficulty breathing and walking, and bleeding from the lungs, stomach, and under the skin, and some even died. Rabbits had muscle bleeding, open sores and hair loss, and some even died after a large amount of 1,3-dichloropropene was painted onto their backs.

You can find a more complete discussion of the health effects of 1,3-dichloropropene in humans and animals in Chapter 2.

1.5 IS THERE A MEDICAL TEST TO DETERMINE WHETHER I HAVE BEEN EXPOSED TO 1,3-DICHLOROPROPENE?

It is possible to measure 1,3-dichloropropene or its breakdown products in blood and urine. The presence of 1,3-dichloropropene or its breakdown products in blood and urine, however, could also mean you were exposed to some other chemical that breaks down to 1,3-dichloropropene. In humans, the blood levels of breakdown products from 1,3-dichloropropene could be used to predict how much 1,3-dichloropropene has been breathed. However, tests for 1,3-dichloropropene in the blood and urine would only be useful for recent exposures, because 1,3-dichloropropene leaves the body within 1-2 days. You can find more information about these tests in Chapters 2 and 6.

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

EPA has set 100 pounds as the limit of 1,3-dichloropropene that can be released into the environment at any particular site; releases of more than that must be reported. EPA has also set a limit of 87 micrograms 1,3-dichloropropene per liter of water (87 $\mu\text{g}/\text{L}$ or 87 parts per billion [ppb]) for the amount of 1,3-dichloropropene that can be in lakes and streams. The Occupational Safety and Health Administration (OSHA) has set a limit of 1 ppm of 1,3-dichloropropene in the air you breathe at work. For more information on the regulations for 1,3-dichloropropene, see Chapter 7.

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1.7 WHERE CAN I GET MORE INFORMATION?

If you have any more questions or concerns not covered here, please contact your state health or environmental department or:

Agency for Toxic Substances and Disease Registry
Division of Toxicology
1600 Clifton Road, E-29
Atlanta, Georgia 30333

This agency can also provide you with information on the location of the nearest occupational and environmental health clinic. Such clinics specialize in recognizing, evaluating, and treating illnesses that result from exposure to hazardous substances.

