



# PUBLIC HEALTH STATEMENT

## 1,1-DICHLOROETHANE

CAS#: 75-34-3

Division of Toxicology

December 1990

This Public Health Statement is the summary chapter from the Toxicological Profile for 1,1-Dichloroethane. It is one in a series of Public Health Statements about hazardous substances and their health effects. A shorter version, the ToxFAQs™ is also available. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present. For more information, call the ATSDR Information Center at 1-888-422-8737.

This Statement was prepared to give you information about 1,1-dichloroethane 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). 1,1-Dichloroethane has been found at 189 of these sites. However, we do not know how many of the 1,177 NPL sites have been evaluated for 1,1-dichloroethane. As EPA evaluates more sites, the number of sites at which 1,1-dichloroethane is found may change.

The information is important for you because 1,1-dichloroethane may cause harmful health effects and because these sites are potential or actual sources of human exposure to 1,1-dichloroethane. 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 to it 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 1,1-dichloroethane several factors will determine whether harmful health effects will occur and that 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 1,1-DICHLOROETHANE?

1,1-Dichloroethane is a colorless, oily, man-made liquid. It evaporates quickly at room temperature and has an odor like ether. 1,1-Dichloroethane burns easily. When 1,1-dichloroethane is released to the environment, it usually exists as a vapor rather than a liquid. It is used primarily to make 1,1-trichloroethane and a number of other chemicals. It is also used to dissolve other substances such as paint, varnish and finish removers, and to remove grease. 1,1-Dichloroethane was used as a surgical anesthetic, but is no longer.

Almost all of the 1,1-dichloroethane from industrial sources that is released goes into the air. 1,1-Dichloroethane can also be found in the environment as a breakdown product of 1,1,1-trichloroethane in landfills where air comes in contact with 1,1,1-trichloroethane. 1,1-Dichloroethane not dissolve easily in water. The small amounts released to water can evaporate easily into the air. 1,1-Dichloroethane remains as a vapor in the air for about 2 months and dissolved in water for about 5 days. The vapor in air can be

DEPARTMENT of HEALTH AND HUMAN SERVICES, Public Health Service  
Agency for Toxic Substances and Disease Registry



# PUBLIC HEALTH STATEMENT

## 1,1-DICHLOROETHANE

CAS#: 75-34-3

Division of Toxicology

December 1990

washed out by rain or broken down by sunlight. 1,1-Dichloroethane in water will evaporate. Small amounts of 1,1-dichloroethane released to soil can also evaporate into the air or move through the soil to enter groundwater. It is not known how long 1,1-dichloroethane remains in the soil.

Although it does not dissolve easily in water, low levels can be found in water.

### 1.2 HOW MIGHT I BE EXPOSED TO 1,1-DICHLOROETHANE?

You can be exposed to 1,1-dichloroethane by breathing air containing its vapors in the outdoor air or in your workplace, or by drinking water contaminated with it. Releases from industrial processes are the main source of this chemical in the air. Some members of the general population may be exposed to low levels of 1,1-dichloroethane from this source (0.08-0.14 parts per billion [1 part 1,1-dichloroethane per 1 billion parts of air, or ppb]).

Levels in this range have been measured around industrial plants in Magna, Utah (0.082 ppb); Iberville, Louisiana (0.12 ppb); Deer Park, Texas (0.14 ppb); and Baton Rouge (0.058 ppb) and Geismary, Louisiana (0.14 ppb). You may be part of a much smaller population of workers who could be exposed to higher levels of 1,1-dichloroethane in your workplace, if you are employed in the chemical, rubber and plastic, electrical, or oil and gas industries. However, since current levels of production and use are not known, it is difficult to predict how often exposure might occur from these sources of 1,1-dichloroethane.

Exposure can also occur near sites where the chemical was improperly disposed of or spilled on the ground. The average concentration of 1,1-dichloroethane in the air across the United States is reported to be 55 parts of 1,1-dichloroethane per one trillion parts of air (ppt). These ambient levels may be from chlorinated water or building materials.

The air levels of 1,1-dichloroethane are usually lower in rural areas and higher in industrialized areas. Higher levels have been found in the air around some small sources of release, such as hazardous waste sites.

1,1-Dichloroethane has been found in drinking water (that is, water that has usually been treated and that comes out of your tap) in the United States at levels that range from trace amounts to 4.8 parts of 1,1-dichloroethane per one billion parts of water (ppb). 1,1-Dichloroethane has not been detected in any surface water samples from rivers, lakes, or ponds. No information is available on background levels of 1,1-dichloroethane in soil or food.

### 1.3 HOW CAN 1,1-DICHLOROETHANE ENTER AND LEAVE MY BODY?

1,1-Dichloroethane can enter your body if you breathe contaminated air or drink contaminated water. 1,1-Dichloroethane is believed to rapidly enter your body when it is breathed or swallowed. It is not known what factors affect how quickly 1,1-dichloroethane enters your body. Studies in animals show that it is likely that 1,1-dichloroethane can also enter your body through your skin.

The most common way you could be exposed to 1,1-dichloroethane released from hazardous waste

DEPARTMENT of HEALTH AND HUMAN SERVICES, Public Health Service  
Agency for Toxic Substances and Disease Registry



# PUBLIC HEALTH STATEMENT

## 1,1-DICHLOROETHANE

CAS#: 75-34-3

Division of Toxicology

December 1990

sites would be by breathing contaminated air around the site. Soil and water in and around hazardous waste sites are not likely to contain high concentrations of 1,1-dichloroethane because it escapes quickly into the air. Therefore, though this route of exposure cannot be ruled out, exposure of the skin from soil or water contaminated with 1,1-dichloroethane is much less likely.

Experiments in animals indicate that the 1,1-dichloroethane that is inhaled or swallowed may go to many organs of the body, depending on the amount taken in. However, most of the 1,1-dichloroethane taken in is usually removed unchanged from the body in the breath within 2 days. A small part of the 1,1-dichloroethane taken in is broken down, and these breakdown products are quickly removed in the breath or urine.

### 1.4 HOW CAN 1,1-DICHLOROETHANE AFFECT MY HEALTH?

Reliable information on how 1,1-dichloroethane affects the health of humans is not available. Because brief exposures to 1,1-dichloroethane in the air at very high levels have caused death in animals (16,000 ppm), it is likely that exposure to such high levels of 1,1-dichloroethane in the air can also cause death in humans.

Some studies in animals have shown that 1,1-dichloroethane can cause kidney disease after long-term, high-level exposure in the air. 1,1-Dichloroethane caused cancer in animals given very high doses (over 3,000 mg/kg/day) by mouth for a lifetime. Delayed growth was observed in the offspring of animals who breathed high concentrations of 1,1-dichloroethane during pregnancy.

The severity of these effects may increase when people or animals are exposed to increased levels of 1,1-dichloroethane. Since these effects were seen in animals at high doses, it is also possible that they could occur in humans exposed to high levels of 1,1-dichloroethane. However, we have no information to indicate that these effects do occur in humans.

### 1.5 WHAT LEVELS OF EXPOSURE HAVE RESULTED IN HARMFUL HEALTH EFFECTS?

There is no reliable information on what levels of exposure to 1,1-dichloroethane have resulted in harmful health effects in people.

In animals, birth defects were seen in the offspring of rats exposed to high levels (1,750 parts per million [ppm]) in air.

### 1.6 IS THERE A MEDICAL TEST TO DETERMINE WHETHER I HAVE BEEN EXPOSED TO 1,1-DICHLOROETHANE?

Tests are available that measure 1,1-dichloroethane in urine, blood, breath and body tissues. Because urine, blood, and breath samples are easily obtained, these samples are examined to determine if a person has been exposed to 1,1-dichloroethane. These tests are not routinely available at a doctor's office and would require special equipment for sampling and detection of the compound. Since most of the 1,1-dichloroethane that is taken into the body leaves within two days, these tests must be done soon after exposure occurs.

Although these tests can confirm that a person has been exposed to 1,1-dichloroethane, it is not yet possible to use the test results to predict the type or

DEPARTMENT of HEALTH AND HUMAN SERVICES, Public Health Service  
Agency for Toxic Substances and Disease Registry



# PUBLIC HEALTH STATEMENT

## 1,1-DICHLOROETHANE

CAS#: 75-34-3

Division of Toxicology

December 1990

severity of any health effects that might occur or the level of exposure that may have occurred. Because exposure to 1,1-dichloroethane at hazardous waste sites is likely to include exposure to other similar chemicals at the same time, levels of 1,1-dichloroethane measured through these types of medical tests may not reflect exposure to 1,1-dichloroethane alone.

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

There are no regulatory standards or advisories for 1,1-dichloroethane in drinking water and food. The Environmental Protection Agency (EPA) has determined that any release to the environment in excess of 1,000 pounds should be reported. Rules and regulations have been developed to protect individuals from the potential health effects of 1,1-dichloroethane in air. The American Conference of Governmental Industrial hygienists (ACGIH) has set a threshold limit value (TLV) of 810 mg/m<sup>3</sup> (200 ppm) 1,1-dichloroethane in workroom air to protect workers during an 8-hour shift over a 40-hour work week. The Occupational Safety and Health Administration (OSHA) has issued a permissible exposure limit (PEL) of 400 mg/m<sup>3</sup>, (98.9 ppm).

The federal recommendations have been updated as of July 1999.

### 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, Mailstop F-32  
Atlanta, GA 30333

#### Information line and technical assistance:

Phone: 888-422-8737  
FAX: (770)-488-4178

ATSDR can also tell you the location of occupational and environmental health clinics. These clinics specialize in recognizing, evaluating, and treating illnesses resulting from exposure to hazardous substances.

#### To order toxicological profiles, contact:

National Technical Information Service  
5285 Port Royal Road  
Springfield, VA 22161  
Phone: 800-553-6847 or 703-605-6000

#### References

Agency for Toxic Substances and Disease Registry (ATSDR). 1990. Toxicological profile for 1,1-dichloroethane. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

DEPARTMENT of HEALTH AND HUMAN SERVICES, Public Health Service  
Agency for Toxic Substances and Disease Registry