

## 1. PUBLIC HEALTH STATEMENT

This Statement was prepared to give you information about bromomethane 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). Bromomethane has been found in at least 12 of these sites. However, we do not know how many of the 1,177 NPL sites have been evaluated for bromomethane. As EPA evaluates more sites, the number of sites at which bromomethane is found may change. This information is important for you to know because bromomethane may cause harmful health effects and because these sites are potential or actual sources of human exposure to bromomethane.

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 chemical such as bromomethane, 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 BROMOMETHANE?

Bromomethane (also called methyl bromide) is a colorless gas without much smell. Some bromomethane is formed in the ocean, probably by algae or kelp. However, most is made by humans to kill various pests (rats, insects, fungus, etc.) that might be present in homes, foods, or soil. Some bromomethane is also used to make other chemicals.

Bromomethane is usually stored in sealed containers to keep it from evaporating. If leaking containers of bromomethane are put in a waste site, most of the bromomethane will probably escape into the air. Small amounts might leak into the soil or pass through the soil and dissolve in underground water. Bromomethane has been found in underground water at two hazardous waste sites on the NPL.

Bromomethane breaks down in the environment to other chemicals. In air, it usually takes about 11 months for half the bromomethane that was released to disappear. In underground water, it usually takes about 1 month for half the bromomethane to break down.

More information on the properties and use of bromomethane and how it behaves in the environment may be found in Chapters 3, 4, and 5.

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### 1.2 HOW MIGHT I BE EXPOSED TO BROMOMETHANE?

Because bromomethane is a gas, you are most likely to be exposed by breathing it in air. In most places around the world, levels in air are usually less than 0.025 parts of bromomethane per billion parts of air (ppb). Some cities have higher levels (up to about 1-2 ppb) because of releases from chemical factories and automobile exhausts. You will probably not be exposed to high levels unless you are near a place where bromomethane is being used for fumigation. Workers who fumigate homes or fields may be exposed to very high levels if proper safety precautions are not followed. Because bromomethane evaporates so quickly, it is usually not found in food, surface water, or soil.

More information on how you might be exposed to bromomethane is given in Chapter 5.

### 1.3 HOW CAN BROMOMETHANE ENTER AND LEAVE MY BODY?

If bromomethane is present at a waste site, you are most likely to be exposed to it by breathing the vapors in contaminated air. You might also be exposed by drinking water from contaminated wells, although this is less likely. If you breathe in bromomethane, about half of it will pass through your lungs and enter your blood. Studies in animals suggest that if you swallow bromomethane in water, nearly all of it will pass through your stomach or intestines and enter your body. Bromomethane that enters your body either from your lungs or stomach is quickly spread throughout your body by your blood. Most bromomethane in your body is broken down into other chemicals, and these chemicals leave your body in the urine or in the air you breathe out. This usually begins happening within minutes, and is usually nearly complete within several days. We do not know how much bromomethane can enter your body through the skin, but the amount is probably small.

More information on how bromomethane enters and leaves your body is given in Chapter 2.

### 1.4 HOW CAN BROMOMETHANE AFFECT MY HEALTH?

If you breathe bromomethane, you may develop a headache and begin to feel weak and nauseated several hours later. If you breathe a large amount, fluid may build up in your lungs and it may be hard to breathe. You may have muscle tremors, and sometimes even seizures. Your kidneys may also be injured, and urine production may slow or stop. In severe cases, these effects can lead to death. In less serious cases, most of these effects usually disappear after several weeks, but some of the effects may never go away.

Studies in animals suggest that if you swallow bromomethane, you might experience stomach irritation but would probably not experience lung, kidney, or brain injury. Bromomethane that gets on your skin can cause itching, redness, and blisters.

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Studies in animals also suggest that bromomethane does not cause birth defects and does not interfere with normal reproduction except at high exposure levels. Animals that breathed bromomethane for 2 years did not develop cancer. Animals that swallowed bromomethane for 25 weeks had changes in their stomachs that could have been an early sign of cancer, but we do not know if swallowing bromomethane for a longer time would cause cancer. Both the International Agency for Research on Cancer and the EPA have determined that bromomethane is not classifiable as to its carcinogenicity in humans.

More information on the health effects of bromomethane in humans and animals can be found in Chapter 2.

### **1.5 IS THERE A MEDICAL TEST TO DETERMINE WHETHER I HAVE BEEN EXPOSED TO BROMOMETHANE?**

Several tests are available to tell whether you have been exposed to bromomethane, but each has limitations. The most direct test measures bromomethane in your blood or in the air you breathe out. However, this test is not usually used because most bromomethane does not stay in the body very long (see Section 1.3) and special measuring equipment is needed. More often, the main breakdown product of bromomethane (bromide) is measured in blood samples. Bromide is normally present in the blood of all people, but the levels of bromide increase when people are exposed to bromomethane. The amount of increase depends on the level of exposure. Tests for bromide are only useful if done within 1-2 days following exposure, and are not very helpful in predicting if exposed persons will have health effects or how serious the effects will be, because not all people respond to bromomethane the same way.

More information on how bromomethane can be measured in exposed humans is presented in Chapters 2 and 6.

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

Concentrated bromomethane can be very dangerous, so the EPA allows only licensed professional fumigators to buy or use bromomethane. The government does not have any regulations at present about how much bromomethane can be present in outdoor air or water, but EPA requires water companies to test for this chemical in their water. The Food and Drug Administration (FDA) has set limits of 125-400 parts of bromide per million parts of food (ppm) for how much bromide may remain in food after the food is treated with bromomethane. The Occupational Safety and Health Agency (OSHA) limits the average level of bromomethane in workplace air to 5 ppm, and recommends that exposures be reduced to the lowest level feasible.

More information on government rules regarding bromomethane can be found in 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.