

## **Appendix II: TCE in Drinking Water Information Sheet**

## TCE in Drinking Water

*Trichloroethylene (TCE) is a commonly-used chemical that can be found in air, soil, and drinking water. Exposure to trichloroethylene (also known as trichloroethene) in large amounts or over a long period of time can be harmful to people. This information sheet discusses trichloroethylene and its health effects, including the results of a new draft health risk assessment conducted by the U.S. Environmental Protection Agency (EPA).*

### What is TCE?

Trichloroethylene, or TCE, is a colorless solvent with a slightly sweet odor. TCE is used primarily in industrial processes to remove grease from metal parts. Some household and consumer products – such as typewriter correction fluid, paint removers, adhesives, and spot removers also contain TCE. Because of the extent of its use, it is one of the more common man-made chemicals found in the environment.

Because TCE is very volatile (it evaporates quickly), it is not usually present in surface soils or in open water. But TCE can migrate down through the soil and into groundwater where it can contaminate private and public drinking water wells.

### Is TCE harmful?

Any substance or chemical that enters your body can be harmful if you take in too much. Whether your health will be affected by a chemical to which you are exposed to depends on several factors:

- How much of the substance you take in;
- How long you are exposed to it;
- Whether you are eating, drinking, breathing, or touching it;
- Your age, general health, and other individual traits that determine how susceptible you are to any adverse effects;
- Other exposures you have to the same or similar substances; and
- How toxic the substance is.

If a volatile chemical such as TCE is present in drinking water, you may be exposed to it through several routes. The TCE in the water will tend to evaporate during such activities as bathing, doing dishes, or flushing a toilet. As the TCE evaporates into the air, it can be inhaled. This exposure can be significant when considered along with drinking water with TCE in it.

## **What are the health effects from exposure to TCE?**

People may experience headaches, drowsiness and eye, nose, or skin irritation from exposure to high levels of TCE. At very high levels, people can lose consciousness. Behavior changes have been observed in animals after exposure to high levels of TCE. These types of exposures in people are typically only seen in industrial accidents or intentional exposures.

Long-term exposure to high levels of TCE in drinking water can damage the liver, kidney, immune system, and the nervous system. TCE may also harm a developing fetus if the mother consumes water containing high levels of TCE. Some studies suggest that exposure to low levels of TCE over many years may also be linked to an increased risk of several types of cancer. It is likely that the adverse health effects that can result from exposure to TCE come not from the TCE itself, but from other compounds that are produced when the body breaks down TCE. These same breakdown products can be produced when the body is exposed to other chemicals, such as dry cleaning solvent.

The scientific information we have about the health effects of TCE comes from people exposed to high levels in the course of their work and from studies of animals. The most current available scientific information was recently evaluated by EPA. As a result of this evaluation, EPA concluded that TCE may be more toxic than previously considered. EPA has issued an updated draft health risk assessment for TCE. This draft assessment takes into account the most current studies of TCE toxicity, and incorporates several recent developments in risk assessment methods. The EPA draft health risk assessment proposes a range of toxicity values that is lower than the value previously published for TCE.

In response to the draft EPA health risk assessment for TCE, the Minnesota Department of Health (MDH) is recommending that an exposure limit of five micrograms of TCE per liter of water (5 µg/L) be used in place of the existing MDH Health Risk Limit (HRL) of 30 µg/L for drinking water from private wells. A HRL is the highest concentration of a groundwater contaminant that can be safely consumed daily for an average lifetime of 70 years and daily consumption of 2 liters of water. If you drink less water, or drink it for a shorter period of time, the risk is correspondingly lower.

This exposure limit should be considered an interim value. While the EPA health risk assessment is still in draft form, MDH considers the document as representing the best available toxicological information on TCE. Changes to the draft assessment may occur because it incorporates a number of newer risk assessment techniques. EPA has asked for comments on its risk assessment from the scientific community and other interested people. MDH will be reviewing the comments as they are made available. In the meantime, the value of 5 µg/L should be used. It is at the conservative (lower) end of the range of toxicity values proposed by EPA, and is consistent with the current federal Maximum Contaminant Level (MCL) for public drinking water supplies. MDH is in the process of revising the HRL rule, and will consider all new information when it updates the HRL for TCE as a part of the rule revision process.

### **What can I do if I have TCE in my drinking water?**

Water that has less than 5 micrograms of TCE per liter is very unlikely to pose any long-term health concerns. However, if people consume water that contains much higher levels of TCE over a long period of time, their risk of cancer or other health effects may increase. MDH recommends that women who are pregnant or may become pregnant limit their exposure to TCE. If you are concerned about your exposure to TCE or other chemicals, see your physician. You may also want to take steps to minimize your exposure.

To minimize exposure, it is best to obtain your drinking water from a clean, reliable source. This can be accomplished by connecting to a public water supply system, or by drilling a new well (assuming that a clean underground source of water is available). If these options are not feasible, the most effective method for removing TCE from a drinking water supply is treatment with a granular activated carbon (GAC) filtration system. These systems are commonly available from water treatment contractors, or home supply stores and come in two types: those that serve one sink or appliance (such as a refrigerator) and those that are capable of filtering all of the water that enters the home.

Use of filters that are installed beneath a sink (usually a kitchen sink) or in a refrigerator will help to minimize exposure to TCE from drinking or cooking with the water only from that source. A whole-house system filters all of the water coming into the home, not just the water from one sink or appliance. This type of system, while more expensive and difficult to install, has the added benefit of ensuring that bathing and other activities will not serve as an additional source of TCE exposure through inhalation of TCE that evaporates from the water. Both types of systems need to be maintained regularly. Use of bottled water for drinking and cooking can also help minimize exposure on a short-term basis, as can running a vent fan while bathing.

### **How can I get more information?**

For more information about TCE and its health effects, contact the Minnesota Department of Health at the address listed above, or call (651) 215-0916, or call toll-free at 1-800-657-3908. Press "4" on your touch-tone phone to leave a message, or wait to speak to an operator if you have a rotary phone.