

## Health Questions and Answers about the Groundwater Contamination in Tylerville

### BACKGROUND

This fact sheet has been written to give you information about chemical contamination that has been found in some drinking water wells in the Tylerville section of Haddam. Information in this fact sheet should help answer your health-related questions about the contamination.

Testing has found that some drinking water wells have organic chemicals at levels near or above drinking water standards and/or guidelines. The main chemicals that have been found in drinking water are trichloroethylene (TCE), methyl tertiary-butyl ether (MTBE), 1,1-dichloroethene (1,1-DCE) and cis-1,2-dichloroethene (cis-1,2-DCE). The CT Department of Environmental Protection (DEP) and the Chatham Health District are working to identify the source(s) and extent of the contamination, monitor drinking water wells and ensure that treatment is provided and maintained, as necessary.



### WHAT ARE THE CHEMICALS TCE, MTBE AND DCE?

The main chemicals found in drinking water in Tylerville are TCE, MTBE, 1,1-DCE and cis-1,2-DCE.

- TCE is a solvent used to remove grease from metal parts. It can also be found in some household products, including adhesives and spot removers.
- MTBE is a gasoline additive designed to create a cleaner burning fuel. MTBE has been phased out and is no longer present in gasoline.
- 1,1-DCE is an industrial chemical used in making certain plastics and flame-retardant coatings.
- cis-1,2-DCE is an industrial chemical most commonly used as an ingredient in making other industrial chemical mixtures. Both 1,1-DCE and cis-1,2-DCE are breakdown products of TCE.

## WHAT ARE THE DRINKING WATER STANDARDS FOR THESE CHEMICALS? HOW ARE THE STANDARDS SET?

The U.S. Environmental Protection Agency sets enforceable standards for chemicals in public drinking water. These standards are called maximum contaminant levels (MCLs). When public drinking water contains contamination at concentrations consistently greater than the MCL, it means that the water does not meet EPA's health-based standard and actions are needed to reduce concentrations or find an alternative water supply.

There are no enforceable standards for chemicals in private drinking water wells. However, in CT we generally use MCLs (when available) as guidelines for private well water. We also have Drinking Water Action Levels for many of the contaminants found in private well water. Action Levels are set by the CT Department of Public Health (DPH) and are used by DEP to decide when to provide bottled water or drinking water treatment for residents with contaminated private wells.

MCLs and Action Levels are set at concentrations well below the level observed to cause health effects in people or animals. Thus, if a person has a chemical in their drinking water at a concentration above the MCL or Action Level, their exposure is still likely to be much lower than the level that would cause health effects.

- The Action Level for TCE is 5 micrograms per liter (ug/L), or parts-per-billion (ppb). The MCL is also 5 ug/L.
- The Action Level for MTBE is 70 ug/L. There is no MCL for MTBE. However, EPA has set a public drinking water advisory of 20-40 ug/L, based on the level at which some people notice an unpleasant odor or taste.
- There is no Action Level for cis-1,2-DCE but there is an MCL of 7 ug/L.
- The Action Level for 1,1-DCE is 7 ug/L. There is no MCL.

## HOW DOES EXPOSURE TO THESE CHEMICALS HAPPEN?

If a chemical is present in your water, the most obvious way you can be exposed is through drinking the water (ingestion). The chemicals found in Tylerville are volatile chemicals, which means they easily evaporate into the air. Thus, another way you can be exposed is through breathing. During activities such as bathing, doing dishes, or flushing a toilet, volatile chemicals can evaporate into the air and can be inhaled into the body. The chemicals found in groundwater in Tylerville can also be absorbed through the skin, but this is a less significant way of exposure than drinking or inhalation.



## IS EXPOSURE TO THE CHEMICALS 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 depends on several factors:

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

The paragraphs below summarize what we know about the health effects from exposure to TCE, MTBE, cis-1,2-DCE and 1,1-DCE. Based on the recent well test data we have available, we do not believe that contaminant levels in Tylerville well water are high enough to cause the harmful health effects described below. Also, when a well has a treatment filter that is working properly, there will be no exposure and no risk from ingestion because the contaminants are being removed from the water.

### **TCE**

Our general understanding of TCE health risks comes from studies of laboratory animals, studies of humans exposed to TCE in their workplace and studies of humans exposed to TCE in drinking water. If TCE exposure levels are very high and the exposure period is long, the major health concern would be an increased risk of kidney and liver cancer and possibly leukemia. With regard to non-cancer health effects, exposure to high levels of TCE over many years can damage the liver, kidney, immune system and nervous system. Studies have not clearly shown whether high levels of TCE in drinking water can harm a developing fetus.

### **MTBE**

Most of what we know about the toxicity of MTBE comes from studies in animals and reports of eye and respiratory irritation in people that inhaled MTBE when it was an ingredient in gasoline. Animal studies tell us that exposure to high levels of MTBE for a long time can cause kidney and liver damage and an increase in tumors. The animal tests indicate that MTBE does not alter reproduction and is unlikely to cause birth defects. Several regulatory bodies have reviewed MTBE cancer issues and concluded that MTBE is not a major cancer concern.

### **Cis-1,2 DCE**

Most of what we know about the risks from exposure to cis-1,2-DCE comes from animal studies. High levels of cis-1,2-DCE given to animals cause harmful effects on their blood and livers. The long-term human health effects after exposure to low concentrations of cis-1,2-DCE are not known. One animal study suggested that an exposed fetus may not grow as quickly as one that hasn't been exposed. Exposure to cis-1,2-DCE has not been shown to affect fertility in people or animals. We do not know enough about cis-1,2-DCE to classify it as a cancer concern.

**1,1-DCE**

We know that people who breathed high levels of 1,1-DCE in their workplace had liver and kidney damage as well as nervous system effects. We have no information on health effects in people who ate food or drank water contaminated with 1,1-DCE. Animals fed food containing high levels of 1,1-DCE developed liver and kidney disease. We do not know whether exposure to 1,1-DCE increases the risk of cancer in people because the cancer studies in workers are not conclusive. Animal cancer studies have mixed results. Some studies report an increase in tumors and other studies report no such effects.

### IS THERE A MEDICAL TEST TO SHOW WHETHER I HAVE BEEN EXPOSED?

TCE, MTBE, cis-1,2-DCE and 1,1-DCE (and their breakdown products) can all be measured in blood and urine. However, these medical tests:

- cannot easily detect low amounts of the chemical in the body;
- cannot necessarily prove you were exposed; and
- will not tell you about exposure you may have received in the past.

These medical tests are best at detecting very high amounts of chemicals in the body (much higher than you would have from drinking water exposure). Also, many of the breakdown products that can be measured in the body are not unique to a specific chemical. In other words, exposure to other things can produce the same breakdown products so finding them in blood or urine is not proof of exposure to TCE, MTBE, cis-1,2-DCE or 1,1-DCE. Finally, these chemicals break down quickly in the body so urine or blood tests provide no information about exposures you may have received more than a few days ago.

### WHAT IF I HAVE MORE QUESTIONS?

**For health questions:**

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