Trihalomethanes

Private Wells and Public Water Systems

Water safety has been in the news again in recent months. This time it is due to trihalomethanes, a water byproduct thought to be a possible carcinogen. However, that doesn't mean all homeowners who use a water well for their daily water supply are at risk.

Water well owners should always try to have a working knowledge about their well, its parts, and possible water contaminants. What follows is information about trihalomethanes. However, if questions arise, the best solution is to contact a professional water well contractor and seek his advice.

What are trihalomethanes?

Trihalomethanes are a group of four chemicals—chloroform, bromodichloromethane, dibromochloromethane, and bromoform—formed, along with other disinfection byproducts, when chlorine or other disinfectants used to control microbial contaminants in drinking water react with naturally occurring organic and inorganic matter in water.

How are trihalomethanes formed?

Chloroform—the trihalomethane often found in the highest concentration—is formed by a reaction of chlorine with certain compounds in water. Formation occurs during chlorination and can continue to occur as long as chlorine is available. The other trihalomethanes are formed by a reaction of bromine and iodine with the same certain compounds.

Is chloroform always the most common trihalomethane in water?

Depending on the characteristics of the water, the other three trihalomethanes may be formed at a higher concentration than chloroform.

Are trihalomethanes more prevalent in public water systems than in private settings?

Trihalomethanes are much more prevalent in public water systems because most use chlorination as a disinfection technology. However, while trihalomethanes are more common in public water systems, they are a threat to any water supply that uses chlorine—including private water wells.

How dangerous are trihalomethanes?

High levels of trihalomethanes can be dangerous. In fact, in December 2000, the U.S. Environmental Protection Agency lowered the maximum allowable annual average level for large surface water public water systems from 100 parts per billion (ppb) to 80 ppb. The 80 ppb limit went into effect for small surface water and all groundwater systems in December 2003.

What health problems can occur because of exposure to trihalomethanes? Are certain groups of people at a greater risk than others?

Some studies have suggested a small increase in the risk of bladder and colorectal cancers. Other investigations have found that chlorination byproducts may be linked to heart, lung, kidney, liver, and central nervous system damage.

Of the different trihalomethanes, dibromochloromethane has been most closely associated with cancer, followed in order by bromoform, chloroform, and bromodichloromethane.

Pregnant women appear to be at the greatest risk, as some studies have linked trihalomethanes to reproductive problems, including miscarriage.

Are solid chlorine forms just as likely to form trihalomethanes as the liquid form?

Yes. Either form of chlorine—the liquid or hypochlorites (a salt)—can form a free chlorine residual in water, and any free residual can react with compounds to form trihalomethanes.

Are there treatment methods for trihalomethanes?

There are several methods that people can use in their homes to reduce the trihalomethanes. Water well owners should always discuss these methods with a professional water well contractor before deciding to use one. Among the methods are:

- Filters
- Aeration or boiling
- Distillation
- Activated carbon.

Where can I get more information?

For more information on your private water well, contact your local contractor. Also, visit the website of the National Ground Water Association, *www.ngwa.org*, and its site just for well owners, *www.wellowner.org*.