



Methane in Groundwater

This fact sheet provides answers to questions about methane in drinking water. It will explain what methane is, how it can enter groundwater, how it can affect your health, and what you can do to prevent or reduce exposure to it.

Methane (CH₄) is a colorless, odorless, flammable gas used as a fuel to heat homes. Methane is produced in nature by the decay of organic matter and the digestion process of various organisms. Elevated levels of methane can be found naturally in groundwater in some areas of Illinois. Methane in groundwater also may be the result of contamination caused by leaks from underground methane storage fields or landfills. Elevated levels of methane released into a building may lower oxygen levels and produce a fire or explosion hazard.

HOW MIGHT I BE EXPOSED TO METHANE?

Methane, also called "natural gas", is delivered by pipelines throughout Illinois to homes as a fuel for heating and cooking. Because it has no odor, a chemical that smells like rotten eggs is added at low levels so residents can detect a leak. If you smell this odor and note a hissing sound of gas being released, leave the premises immediately and contact your gas company.

Methane from nature and leaks from underground storage fields will not have the rotten egg odor. Methane that has entered groundwater and comes into a home dissolved in well water may be noticeable as bubbles in the water. Dissolved methane readily leaves the water when open to the air, so the highest levels of methane gas will typically be in enclosed spaces where large amounts of water are used, such as bathroom showers, dishwashers, and laundry rooms.



HOW DOES METHANE GET INTO MY DRINKING WATER?

There are two main ways methane can get into your drinking water. Methane can be naturally produced by subsurface bacteria and the decay of organic matter. Methane also can leak from deep underground storage fields or landfills. As the methane works upward from the source to the surface it may dissolve in groundwater. If this groundwater is used as a source of well water, then the dissolved methane can enter your home.

HOW CAN METHANE AFFECT MY HEALTH?

Methane is not toxic itself; however, the release of methane indoors can lower oxygen levels and make it difficult to breathe. Methane in groundwater is not explosive, but when water with dissolved methane comes into contact with air, the methane escapes from the water. If this occurs indoors or in a confined space and the level methane in the indoor air reaches 5%, there is a danger of fire or explosion. Although these levels are rare from dissolved methane alone, the risk is real. Testing well water for methane is recommended if extensive bubbling in the water is observed.

HOW CAN I GET MY WELL WATER TESTED FOR METHANE?

Testing dissolved methane takes a special collection method that collects the water in a vacuum-sealed bag. The Illinois Department of Public Health (IDPH) recommends using a laboratory certified by Illinois EPA. A list of these can be found here: <http://www.epa.illinois.gov/Assets/iepa/certification-training/labs/accredited-labs-condensed.pdf>. Be sure to confirm that the laboratory can test for dissolved methane using USEPA Method RSK-175. Contact your local health department or a regional IDPH office for information and assistance.

IS THERE AN ACCEPTABLE LEVEL OF METHANE IN MY WATER?

No drinking water standard exists for methane in drinking water. The U.S. Department of Interior has established a warning level of 10 milligrams of methane per liter (mg/L) of water. Levels of dissolved methane greater than 28 mg/L could release potentially flammable amounts of methane inside a confined space.

HOW CAN I REDUCE METHANE LEVELS IN MY WATER?

If elevated levels of methane are found in your well water, the Illinois Water Well Construction Code requires a wellhead vent. Methane is lighter than air, so a vent can allow dissolved methane to be released from the well to the atmosphere without entering your home. If you choose to install a water treatment unit designed to remove dissolved methane, the Illinois Plumbing Codes requires it be installed by a licensed plumber, comply with designs approved by IDPH prior to installation, and be constructed from approved materials. Filtration is not an effective means of removing methane. Methane removal systems should be properly vented to the outdoor air independent of a building's drain and waste vents. Operation of any approved water treatment unit should follow the manufacturer's recommendations and requirements.



WHERE CAN I GET MORE INFORMATION?

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