

wellcare[®] information for you about Uranium & Groundwater

What is Uranium?

Uranium is a naturally-occurring element found at low levels in virtually all rock, soil and water. It is both radioactive and a toxic metal. Concentrations vary across the United States, depending on the types of minerals in the soil or bedrock. For example, in granite bedrock, the average concentrations can be higher.

Uranium dissolves as water passes through soil and bedrock. Groundwater is likely to contain higher levels of uranium than surface water. The amount of uranium in well water varies with the concentration of uranium in the bedrock. Wells most likely to have high levels of uranium are those in areas with granite or alkaline sandstone and shale bedrock.

The U.S. Environmental Protection Agency (EPA) reports that most parts of the United States have very low "average radionuclide occurrence," including uranium, in drinking water sources. In general, average uranium levels throughout the United States are very low compared to the EPA's maximum contaminant level for the substance.

What are the health effects of Uranium?

Most ingested uranium is eliminated from the body, but a small amount is absorbed in the bloodstream and carried into the kidneys. As a result, the greatest health risk from large intakes of uranium is damage to the kidneys. Over time, uranium exposure can also increase your risk of getting cancer due to its radioactivity.

The EPA's maximum contaminant level for uranium in public water systems is 30 parts per billion (ppb). Canada and some states, such as Vermont, have gone further and set a maximum contaminant level of 20 ppb.

How do I test for Uranium?

First, contact your state or local health department to determine if you are in a high-risk area for uranium or other radioactive compounds, and to obtain a list of state-certified laboratories in your area. Ask if high levels of uranium have been documented in other wells in your community.

The initial test should be a lower-cost screen for alpha radiation, to determine whether your water contains any radioactive elements. If the result of an alpha radiation screen is 15 picocuries per liter (abbreviated to "pCi/liter") or greater, then a test for uranium and other radioactive substances, such as radium or radon, is recommended.

What are the treatments for Uranium in drinking water?

Uranium can be removed from drinking water by several treatment methods. The two most common methods for homeowners are anion exchange and reverse osmosis.

Anion exchange is a treatment system in which the well water flows through a tank with a resin that "exchanges" uranium for a safer compound – in most cases, chloride. Periodically, a backwash pump flushes the uranium and other wastes away from the resin into the household wastewater. The clean and recharged resin is then reused.

Reverse osmosis uses a semi-permeable membrane to capture any uranium in the water. The device uses water pressure as a force against the membrane, and only water is able to pass through, which leaves the uranium behind. The membrane is continually rinsed. The rinse water containing uranium is discarded. This method of treatment can be slow and uses several gallons of water for each gallon of household drinking water produced.

Both anion exchange and reverse osmosis require that the treatment device be properly maintained and operated. Other water quality factors may determine which method is the best choice for treatment. Special wastewater disposal precautions may be necessary in some instances.

For more information about Uranium and Groundwater

U.S. Environmental Protection Agency (EPA). Basic Information about Radionuclides in Drinking Water. Retrieved on May 4, 2007 from www.epa.gov/safewater/radionuclides/basicinformation.html

U.S. Environmental Protection Agency (EPA). EPA Facts About Uranium. Retrieved on May 4, 2007 from www.epa.gov/superfund/resources/radiation/pdf/uranium.pdf

Vermont Department of Health. Uranium. Retrieved on May 4, 2007 from healthvermont.gov/enviro/rad/Uranium.aspx

For more information on your drinking water

Contact your local water well professional or health department for information on ground water in your area. The following websites provide up-to-date information on efforts to protect drinking water supplies and steps you can take as a private well owner. In addition, you may contact the **wellcare®** hotline at 1-888-395-1033.

Underwriters Laboratories Inc. Drink Well™ Well Water Testing www.uldrinkwell.com
U.S. Environmental Protection Agency www.epa.gov
Water Quality Association www.wqa.org

For more information about wells and other wellcare® publications

wellcare® is a program of the **Water Systems Council (WSC)**. WSC is a national nonprofit organization dedicated to promoting the wider use of wells as modern and affordable safe drinking water systems and to protecting ground water resources nationwide. This publication is one in a series of **wellcare®** information sheets. There were more than 60 available at the time this document was published. They can be downloaded FREE from the WSC website at www.watersystemscouncil.org. Well owners and others with questions about wells or ground water can also contact the **wellcare®** hotline at 1-888-395-1033 or visit www.wellcarehotline.org



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