

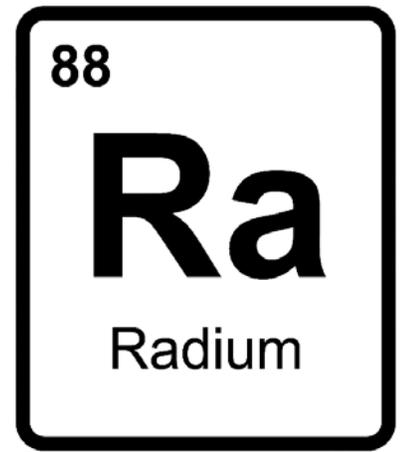


Radium in Drinking Water: What Iowa Private Well Users Should Know

- ✓ Radium is a chemical with the symbol Ra
- ✓ Radium was discovered in 1898 by Madam Curie
- ✓ Radium is naturally present in the environment
- ✓ Radium is a radioactive element
- ✓ Radon is produced from the decay of radium-226
- ✓ High levels of radium is associated with anemia, cataracts, dental problems, and different types of cancer
- ✓ Bathing in water with radium is not a health risk.
- ✓ Radium can be removed from drinking water.

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What is Radium? Radium is naturally present in the environment in two different forms, radium-226 and radium-228. Radium-226 is produced from the decay of uranium. This form is also responsible for producing radon gas as it decays. Radium-228 is produced from the decay of another element, thorium, in rocks. Both kinds of radium naturally dissolve from rocks deep in the ground and enter groundwater that supplies private drinking water wells.



Why is my well being sampled for radium? The State Hygienic Laboratory at the University of Iowa is working with counties across Iowa to test private wells for various potential contaminants as a way of helping homeowners understand and address exposures that could be harmful to their health. In partnership with the Iowa Geological Survey (IGS) and the University of Iowa Center for Health Effects of Environmental Contamination (CHEEC), several counties in Iowa have been identified as being potentially vulnerable to radium contamination in water due to naturally occurring deposits in the ground. For these counties, we are prioritizing private well testing to characterize the amount of radium in wells and inform private well users that may have high levels of radium in their drinking water. Well water samples will be analyzed at the University of Iowa, and results should be available within 14 business days.

Why should I be concerned about radium in groundwater? The primary human exposure pathway for radium is ingestion via drinking water. Radium is invisible, odorless, and tasteless in water. Drinking or cooking with water with high levels of radium is associated with anemia, cataracts, dental problems, and different types of cancer. Radium is a radioactive element that produces "ionizing radiation" because it can release electrons from atoms and molecules and turn them into ions. Ionizing radiation damages DNA. Radium is not removed from water by boiling and requires special treatment techniques. Bathing in water with radium is not a health risk.



CHEEC was established through the 1987 Iowa Groundwater Protection Act.

CHEEC focuses its research efforts on drinking water contaminants

CHEEC's mission is "to determine the levels of environmental contamination which can be specifically associated with human health effects."



For more information on well testing, please contact:

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What levels of radium are safe in drinking water? Radium is a radioactive element that produces harmful ionizing radiation. The U.S. Environmental Protection Agency (EPA) has classified all ionizing radiation as “**known to cause cancer in humans,**” and has set a health guideline of zero for all radioactive elements, including radium, in drinking water. The EPA has established an acceptable level of radium that is safe for drinking water at 5 pCi/L and this level is used to regulate public water systems that serve communities. A pCi/L is a measure of radioactivity per liter of water. In Iowa, some public water systems have exceeded the safe level even after treating source water. Because of this history, some private wells in Iowa that rely on the same groundwater as these public water systems may also have elevated levels of radium.

When will I receive my results? Testing for radium is being conducted at the University of Iowa through CHEEC. Results should be available within 6 weeks of sample collection and will be shared with homeowners in a report separate from the results of testing conducted by State Hygienic Laboratory for other water quality parameters.

What should I do if high levels of radium are found in my well? If levels of radium above the EPA limit of 5 pCi/L are found, well users are recommended to either use available treatment technologies to remove radium or identify an alternative water supply. Multiple kinds of in-home treatment options, like ion exchange, water softening, and reverse osmosis systems, can be installed to help remove radium in drinking water.



Is radium in water related to radon in indoor air? Possibly. Radon is produced from the decay of radium-226 in natural underground deposits. It can enter buildings through their foundations. Radon is an invisible gas in air that is the top cause of lung cancer among non-smokers in the U.S. Iowa has some of the highest radon concentrations in indoor air in the United States. If your test for radium is elevated, you should also test for radon. Contact your local county health department to purchase a low-cost radon testing kit. Iowa's Department of Public Health (<http://idph.iowa.gov/radon/resources>) also provides a list of resources for finding a specialist to test and, if needed, mitigate radon levels in your home.

