

Have Radionuclides Been Detected in Texas Groundwater?

Radionuclides are types of atoms that are radioactive. The most common radionuclides in drinking water are radium, radon, and uranium. Most of the naturally occurring radionuclides emit alpha particles as they decay, so the overall amount of radioactivity is typically measured as gross alpha radiation.

In 1974, the United States Congress passed the Safe Drinking Water Act. This law requires the U.S. Environmental Protection Agency (EPA) to determine the safe levels of contaminants in U.S. drinking water. EPA conducts research of drinking water to determine the level of a contaminant that is safe for a person to consume over a lifetime and the amount that a water system can reasonably be required to remove from it given present technology and resources. This safe level is called the maximum contaminant level (MCL). Some treatment technologies include reverse osmosis, ion exchange, and aeration.

Radionuclides have been found in some Texas aquifers. The U.S. EPA has set the MCL of gross alpha radiation in drinking water at 15 picocuries per liter (pCi/L). From 2004 through 2023, the Texas Water Development Board collected 3,787 samples from 2,415 unique sites for gross alpha radiation. Concentrations of gross alpha radiation above the MCL were found in 23 of the 31 major and minor aquifers in Texas. The highest numbers of unique sites with detections above the MCL are in the Gulf Coast, Ogallala, and Edwards-Trinity (Plateau) aquifers. The highest gross alpha concentrations were found in the Ogallala, Gulf Coast, and Hickory aquifers, with concentrations greater than 100 pCi/L. Other aquifers that contained significant numbers of wells with gross alpha detections above the MCL were the Hickory, Dockum, and Seymour aquifers. Although contamination from human activity can be a source of radionuclides, most of the radionuclides found in Texas groundwater occur naturally within the aquifer's geologic formation.

Resources and Useful Links

- *Water for Texas 2007, State Water Plan*, Texas Water Development Board, pages 228 – 229, <https://www.twdb.texas.gov/waterplanning/swp/2007/>
- Major and Minor Aquifers of Texas maps, <https://www.twdb.texas.gov/groundwater/aquifer/index.asp>
- *Drinking Water Problems: Radionuclides*, Texas AgriLife Extension Service, B-6192 (English), <https://twon.tamu.edu/wp-content/uploads/sites/3/2021/06/drinking-water-problems-radionuclides.pdf>
 - *Problemas del agua potable: Los radionuclidos*, Texas A&M AgriLife Extension Service, B-6192S (Spanish), <https://agrilifelearn.tamu.edu/s/product/problemas-del-agua-potable-los-radionuclidos/01t4x00004OUhKAAW>

- **Radionuclides**, U.S. EPA, <https://www.epa.gov/radiation/radionuclides>
- **Radionuclides**, USGS, <https://www.usgs.gov/mission-areas/water-resources/science/radionuclides>
- **Safe Drinking Water Act**, U.S. EPA, <https://www.epa.gov/sdwa>
- **Radiochemicals and Drinking Water**, Texas Commission on Environmental Quality, <https://www.tceq.texas.gov/drinkingwater/chemicals/radionuclides>

Other Frequently Asked Questions (FAQs)

To find additional FAQs visit the Texas Groundwater Protection Committee's FAQ webpage at <https://tgpc.texas.gov/frequently-asked-questions-faqs>.