

Recommendations for water quality testing of private and semipublic drinking water wells

Sub-group to State Water Plan Implementation Workgroup

June 2021

This group met monthly from October 2020 through May 2021. Members included the following:

Don Carew (ACT Labs)
Jay Cohen (CT Dept. of Consumer Protection)
Michael Dietz, chair (Univ. of CT)
Gene Fercodini (CT Realtors Assoc.)
Meredith Metcalf (Eastern CT State Univ.)
John Mullaney (USGS)
Gary Robbins (Univ. of CT)
Tiziana Shea (CT Dept. of Public Health)
Thomas Stansfield (Torrington Area Health District)
Veronica Tanguay (CT Dept. of Energy and Environmental Protection)
Ryan Tetreault (CT Dept. of Public Health)

Summary

This workgroup has reviewed current available scientific data to determine what, if any, changes should be made to current water quality testing requirements for new and existing private and semipublic wells in the State of Connecticut. Our unanimous, consensus-based recommendations are as follows:

1. Add arsenic and uranium to the list of standard potability requirements for new private drinking water wells and semipublic wells.
2. Require that the standard potability tests (including arsenic and uranium) be performed for all real estate transactions where a private or semipublic well is in use.

To accomplish these changes, regulations of Connecticut State agencies Section 19-13-B101 and state Statute 19a-37 need to be amended. The recommended language for Statute 19a-37 and Sec. 19-13-B101 can be found in Attachments A and B, respectively.

Justification for changes

The CT DPH, Environmental & Occupational Health Assessment (EOHA) program establishes drinking water Action Levels that are protective of public health and also feasible based upon analytical detection and treatment technology. If well contamination exceeds an [Action Level](#), the DEEP is authorized under CT General Statutes Section

22a-471 to take further action in addressing groundwater contamination at the site. **Additionally, the list provides guidance to local health departments and citizens when evaluating the potability of water.** The Action Level list includes the most common groundwater contaminants.

Both arsenic and uranium have carcinogenic and other health impacts to humans. Impaired kidney function from long-term ingestion of drinking water with high levels of uranium has been documented in Connecticut (Magdo, et al., 2007), High arsenic concentrations in northern New England have been linked to bladder cancer (Baris et al., 2016). It is good public health practice to protect people from exposure and the potential health outcomes of exposure to dangerous elements.

Although public water suppliers are required to test for arsenic and uranium per federal drinking water regulations, testing for arsenic and uranium has not been widely performed in private wells in Connecticut. However recent studies confirm that both arsenic and uranium are present in private drinking water wells in the state (Gross & Brown, 2020). Key findings of this recent report include:

1. 45% of samples analyzed had detectable uranium
2. 3.9% of samples had arsenic concentrations that were greater than the U.S. EPA maximum contaminant level (MCL) of 10 micrograms/liter ($\mu\text{g/L}$)
3. 4.7% of samples had uranium concentrations that were great than the EPA MCL of 30 $\mu\text{g/L}$

Although local health districts may have awareness of areas with high arsenic or uranium, most homeowners do not. Homeowners also may not fully understand the risks or implications of not testing for these parameters. Therefore, adding these two parameters to the list for required testing will reduce unnecessary exposure and health risks for residents of our state.

Real estate transactions

The Connecticut Department of Energy and Environmental Protection (CT DEEP) has received complaints from homeowners who found elevated uranium and radon in their private wells, after a real estate transaction occurred. There was no prior knowledge of these constituents in that area, so no suggestion was made by any party to test for them. Most banks require a standard potability test when they will be holding a mortgage for a property, but these tests are not otherwise required. If someone were to purchase a home without a mortgage, they would not be required to test their drinking water at all. To better protect public health, and prevent a portion of home buyers from “falling through the cracks”, we recommended making the potability test (plus arsenic and uranium) required for all real estate transactions where a private well is in use.

Other implications

The financial implications of these changes are expected to be minimal. Arsenic analysis costs \$25/sample, and uranium costs approximately \$100/sample. When

factored into the costs associated with installing a new well or selling a home with an existing well, the extra burden of these tests is essentially non detectable. Most residents are paying for a standard potability test (~\$150) already. No additional effort will be required on the part of a homeowner or home inspector when performing these tests; it will just be two extra parameters that get added to the list for a sample that is already being collected.

References

Baris, D. Waddell, R., Beane Freeman, L.E., Schwenn, M., Colt, J.S., Ayotte, J.D., Ward, M.H., Nuckols, J., Schned, A., Jackson, B., Clerkin, C., Rothman, N., Moore, L.E., Taylor, A., Robinson, G., Hosain, G.M., Armenti, K.R., McCoy, R., Samanic, C., Hoover, R.N., Fraumeni Jr. J.F., Johnson, A., Karagas, M.R., and Silverman, D.T. 2016. Elevated Bladder Cancer in Northern New England: The Role of Drinking Water and Arsenic. *Journal of the National Cancer Institute*, Vol. 108(9), pp. 1-5. <https://doi.org/10.1093/jnci/djw099>.

Gross, E.L. and Brown, C.J. 2020. Arsenic and uranium occurrence in private wells in Connecticut, 2013–18—a spatially weighted and bedrock geology assessment: U.S. Geological Survey Open-File Report 2020–1111 (ver. 1.1, November 2020), 13 p., <https://doi.org/10.3133/ofr20201111>.

Magdo, H.S., Forman, J., Graber, N., Newman, B., Klein, K., Satlin, L., Amler, R.W., Winston, J.A., and Landrigan, P.J. 2007. Grand Rounds: Nephrotoxicity in a Young Child Exposed to Uranium from Contaminated Well Water. *Environmental Health Perspectives*, Vol. 115(8), pp. 1237-1241. <https://doi.org/10.1289/ehp.9707>

Attachment A
Statute Change: 19a-37 (suggested amendments in bold: deletions are [bracketed], insertions are underlined)

Sec. 19a-37. (Formerly Sec. 19-13a). Regulation of water supply wells and springs. Definitions. Information and requirements re testing of private residential wells or semipublic wells. Transportation of water in bulk by bulk water hauler. (a) As used in this section:

(1) "Laboratory or firm" means an environmental laboratory registered by the Department of Public Health pursuant to section 19a-29a;

(2) "Private well" means a water supply well that meets all of the following criteria: (A) Is not a public well; (B) supplies a population of less than twenty-five persons per day; and (C) is owned or controlled through an easement or by the same entity that owns or controls the building or parcel that is served by the water supply well;

(3) "Public well" means a water supply well that supplies a public water system;

(4) "Semipublic well" means a water supply well that (A) does not meet the definition of a private well or public well, and (B) provides water for drinking and other domestic purposes; and

(5) "Water supply well" means an artificial excavation constructed by any method for the purpose of obtaining or providing water for drinking or other domestic, industrial, commercial, agricultural, recreational or irrigation use, or other outdoor water use.

(b) The Commissioner of Public Health may adopt regulations in the Public Health Code for the preservation of the public health pertaining to (1) protection and location of new water supply wells or springs for residential or nonresidential construction or for public or semipublic use, and (2) inspection for compliance with the provisions of municipal regulations adopted pursuant to section 22a-354p.

1) At a minimum, all private wells and semipublic wells constructed after (the effective date of this amendment) shall be tested for: total coliform, nitrate, nitrite, sodium, chloride, iron, manganese, hardness, turbidity, pH, sulfate, apparent color, odor, arsenic, and uranium.

(c) The Commissioner of Public Health shall adopt regulations, in accordance with chapter 54, for the testing of water quality in private residential wells and semipublic wells. Any laboratory or firm which conducts a water quality test on a private well serving a residential property or semipublic well shall, not later than thirty days after the completion of such test, report the results of such test to (1) the public health authority of the municipality where the property is located, and (2) the Department of Public Health in a format specified by the department, provided such report shall only be required if the party for whom the laboratory or firm conducted such test informs the laboratory or firm identified on the chain of custody documentation submitted with the test samples that the test was conducted in connection with the sale of such property. No regulation may require such a test to be conducted as a consequence or a condition of the sale, exchange, transfer, purchase or rental of the real property on which the private residential well or semipublic well is located.

(d) Prior to the sale, exchange, purchase, transfer or rental of real property on which a private well or semipublic well is located,

1) The owner shall provide the buyer or tenant notice that educational material concerning private well testing is available on the Department of Public Health web site. Failure to provide such notice shall not invalidate any sale, exchange, purchase, transfer or rental of real property. If the seller or landlord provides such notice in writing, the seller or landlord and any real estate licensee shall be deemed to have fully satisfied any duty to notify the buyer or tenant that the subject real property is located in an area for which there are reasonable grounds for testing under subsection (g) or (j) of this section.

2) Testing for the following contaminants shall be required at time of sale for all properties supplied by a private or semipublic well: total coliform, nitrate, nitrite, sodium, chloride, iron, manganese, hardness, turbidity, pH, sulfate, apparent color, odor, arsenic, and uranium. Such testing will be the responsibility of the buyer.

(e) The Commissioner of Public Health shall adopt regulations, in accordance with chapter 54, to clarify the criteria under which the commissioner may issue a well permit exception and to describe the terms and conditions that shall be imposed when a well is allowed at a premises (1) that is connected to a public water supply system, or (2) whose boundary is located within two hundred feet of an approved community water supply system, measured along a street, alley or easement. Such regulations shall (A) provide for notification of the permit to the public water supplier, (B) address the quality of the water supplied from the well, the means and extent to which the well shall not be interconnected with the public water supply, the need for a physical separation, and the installation of a reduced pressure device for backflow prevention, the inspection and testing requirements of any such reduced pressure device, and (C) identify the extent and frequency of water quality testing required for the well supply.

(f) No regulation may require that a certificate of occupancy for a dwelling unit on such residential property be withheld or revoked on the basis of a water quality test performed on a private residential well pursuant to this section, unless such test results indicate that any maximum contaminant level applicable to public water supply systems for any contaminant listed in the public health code has been exceeded. No administrative agency, health district or municipal health officer may withhold or cause to be withheld such a certificate of occupancy except as provided in this section.

(g) The local director of health may require a new or replacement private residential well or semipublic well to be tested for [arsenic], radium, [uranium], radon or gross alpha emitters, when there are reasonable grounds to suspect that such contaminants are present in the groundwater. For purposes of this subsection, “reasonable grounds” means (1) the existence of a geological area known to have naturally occurring arsenic, radium, uranium, radon or gross alpha emitter deposits in the bedrock; or (2) the well is located in an area in which it is known that arsenic, radium, uranium, radon or gross alpha emitters are present in the groundwater.

(h) The local director of health may require new or replacement private residential wells and semipublic wells to be tested for pesticides, herbicides or organic chemicals when there are reasonable grounds to suspect that any such contaminants might be present in the groundwater. For purposes of this subsection, “reasonable grounds” means (1) the presence of nitrate-nitrogen in the groundwater at a concentration greater than ten milligrams per liter, or (2) that the private residential well or semipublic well is located on land, or in proximity to land, associated with the past or present production, storage, use or disposal of organic chemicals as identified in any public record.

(i) Except as provided in subsection (i) of this section, the collection of samples for determining the water quality of private residential wells and semipublic wells may be made only by (1) employees of a laboratory or firm certified or approved by the Department of Public Health to test drinking water, if such employees have been trained in sample collection techniques, (2) certified water operators, (3) local health departments and state employees trained in sample collection techniques, or (4) individuals with training and experience that the Department of Public Health deems sufficient.

(j) Any owner of a residential construction, including, but not limited to, a homeowner, on which a private residential well is located or any general contractor of a new residential construction on which a private residential well is located may collect samples of well water for submission to a laboratory or firm for the purposes of testing water quality pursuant to this section, provided (1) such laboratory or firm has provided instructions to said owner or general contractor on how to collect such samples, and (2) such owner or general contractor is identified to the subsequent owner on a form to be prescribed by the Department of Public Health. No regulation may prohibit or impede such collection or analysis.

(k) Any water transported in bulk by any means to a premises currently supplied by a private well or semipublic well where the water is to be used for purposes of drinking or domestic use shall be provided by a bulk water hauler licensed pursuant to section 20-278h. No bulk water hauler shall deliver water

without first notifying the owner of the premises of such delivery. Bulk water hauling to a premises currently supplied by a private well or semipublic well shall be permitted only as a temporary measure to alleviate a water supply shortage.