Pomperaug River Watershed Coalition

Connecticut Department of Public Health
Environmental Health Section

Private Well Program

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October 23, 2018

Why Should I Test My Well Water?

- Ensure the water you use everyday is safe for you and your family!
- Identify problems; if you find a problem you can do something about it!
- Ensure that your treatment is working properly
- Water quality can change!

Private Well Testing, What Should I Test For?

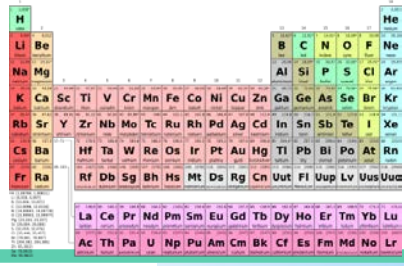
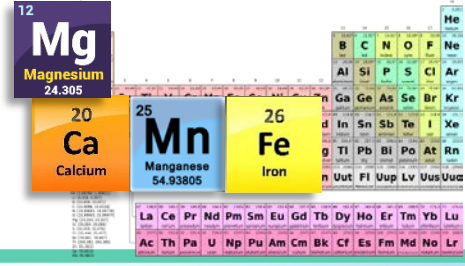


Table 1. Recommended Test for All Private Wells

Type of Test	When?	Why?
Basic Indicators *(See table 2 below)*	**Every Year** Also test after repair or replacement of your well, pump or water pipes.	Provides a general indication of water quality. Required for all new wells. Some basic indicators above their acceptable limit are associated with health concerns.
Lead *(2 samples; a first draw sample and a flushed sample should be collected when testing for lead in drinking water)*	**At Least Once** Also when planning a pregnancy or have a child under 6 years old in the home. *If your water is considered corrosive, test every 3-5 years.*	Lead can leach from your home's plumbing (pipes, faucets, valves, etc.) system. Corrosive water leaches lead more readily. Lead above the acceptable limit is associated with health concerns. Young children are especially susceptible to harmful effects from lead exposure.
Arsenic, Uranium, Radon	**At Least Once** Ideally, repeat test every 5 years	Arsenic, uranium and radon are naturally occurring in groundwater in some areas of CT and are associated with health concerns above their acceptable limit. Private wells with high levels have been found sporadically around CT, and levels may fluctuate.
Volatile Organic Compounds (VOCs)	**At Least Once** More often if a problem is identified or suspected	Gasoline, oil, solvents or industrial chemicals spilled or leaked on the ground could get into your well water. VOCs above their acceptable limit are associated with health concerns.
Fluoride	**Every 5 years when a child under 12 is present**	Fluoride can occur naturally in wells throughout CT. A child's permanent teeth can become discolored from excess fluoride. Too little fluoride can increase risk of tooth decay. Your child's dentist will likely ask you about the fluoride level in your well water.

Private Well Testing: Basic Indicators Test



Total coliform bacteria: Indicator organism, a potential pathway exists (E. Coli)

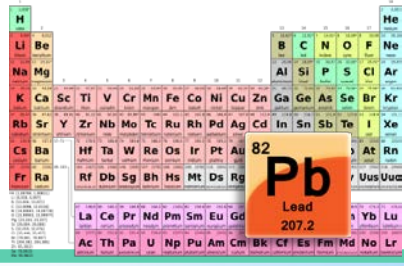
"blue baby syndrome," blood lacks ability to carry sufficient oxygen to cells. Infants, pregnant women, elderly at greater risk

May cause corrosivity, staining on fixtures and clothes, taste and odor issues, scale on fixtures, some potential health effects

Table 2. Basic Indicators Test

Parameter	Applicable Drinking Water Standard*
Total Coliform Bacteria	None Present
Nitrate-Nitrogen	10 milligrams/liter (mg/L)
Nitrite-Nitrogen	1 mg/L
pH	6.4 - 8.5 standard units (SU)
Odor	Less than 2
Chloride	250 mg/L
Hardness	150 mg/L
Apparent Color	Less than 15 SU
Sulfate	250 mg/L
Turbidity	Less than 5 SU
Iron	0.3 mg/L
Manganese	0.05 mg/L (Aesthetic based) 0.5 mg/L (Health based)

Private Well Testing: Lead



Recommended testing frequency:

- At least once
- Pregnancy, or a child under 6 years of age in the home
- Every 3-5 years if your water is corrosive

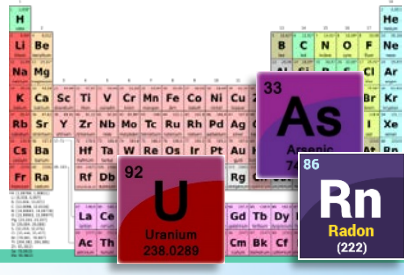
Potential health effects to:

- The brain, kidneys, nervous system, red blood cells, blood pressure
- Severity depends on concentration of lead and developmental stage at the time of exposure

Lead sources in water:

- Plumbing components (pipes, faucets, valves, etc.)

Private Well Testing, Arsenic, Uranium & Radon



Recommended testing frequency:

- At least once (Ideally, repeated every 5 years)

Potential health effects to:

- **Arsenic**: Skin, cardiovascular, immune, neurological systems, may increase risk of bladder, lung, liver & skin cancer
- **Uranium**: Kidneys
- **Radon**: Increased risk of lung cancer, and potentially stomach cancer

Arsenic, Uranium, Radon sources:

- Naturally occurring in bedrock and the environment
- Arsenic: also past/present industrial & agricultural uses

Private Well Testing: Volatile Organic Compounds (VOCs)

Recommended testing frequency:

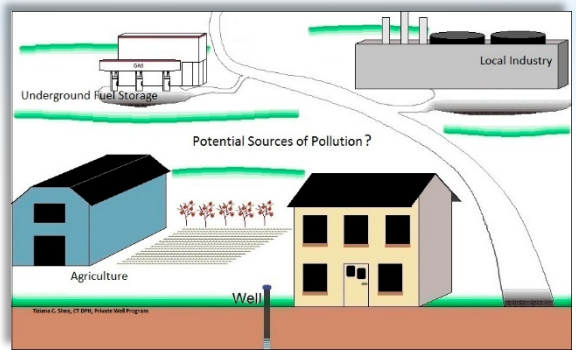
- At least once (More often if a problem is identified or suspected)

Potential health effects:

- Vary depending on specific compound
- Some may increase risk of certain cancers

VOC sources:

- Gasoline, oil, solvents, industrial chemicals, paint thinner



Private Well Testing: Fluoride

Recommended testing frequency:

- Every 5 years when children under 12 are present

Potential health effects to:

- Teeth and bones

  (Positive, sometimes negative at high levels)

Fluoride sources:

- Naturally occurring in bedrock and the environment

Private Well Testing, What Should I Test For

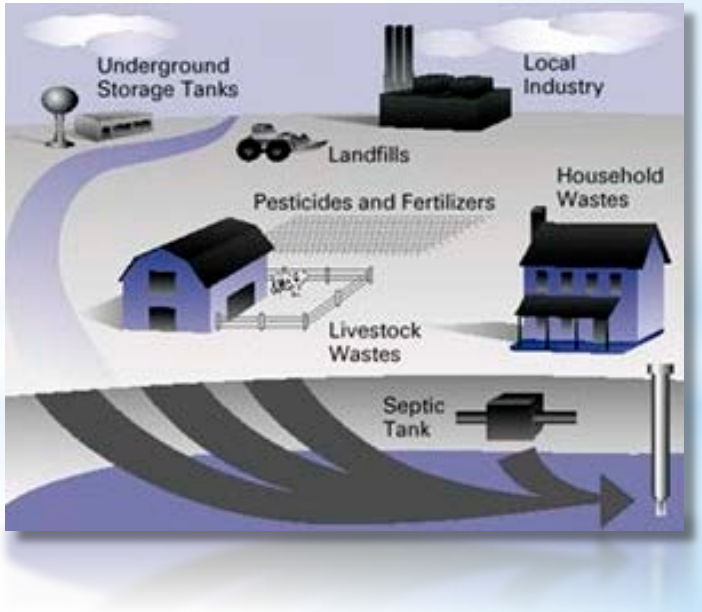
- What about other contaminants…
  - Think potential risks specific to your area
  - Pesticides? …

- Understanding Your Water Quality Test Results
- What to do if You Find a Problem
- Measures You Can Take to Help Avoid Some Problems

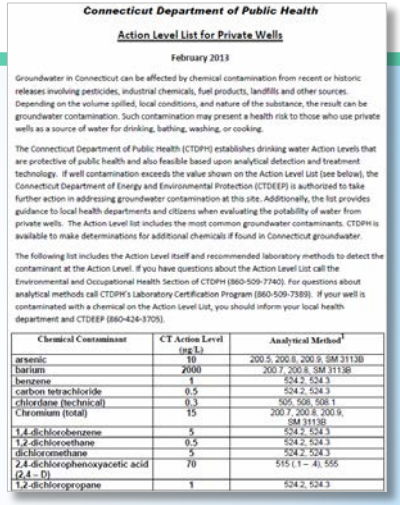
Understanding Contaminants: Naturally Occurring & Manmade

- Some contaminants are naturally occurring, and others may be caused by manmade activity.

  - ✓Local Health & Neighbors
  - ✓Surrounding Land Use
    - ✓ Past
    - ✓ Present
  - ✓Local Geology



Interpreting Private Well Test Results



Connecticut Department of Public Health

Action Level List for Private Wells

February 2013

Groundwater in Connecticut can be affected by chemical contamination from recent or historic releases involving pesticides, industrial chemicals, fuel products, landfills and other sources. Depending on the volume spilled, local conditions, and nature of the substance, the result can be groundwater contamination. Such contamination may present a health risk to those who use private wells as a source of water for drinking, bathing, washing, or cooking.

The Connecticut Department of Public Health (CTDPH) 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 the value shown on the Action Level List (see below), the Connecticut Department of Energy and Environmental Protection (CTDEEP) is authorized to take further action in addressing groundwater contamination at this site. Additionally, the list provides guidance to local health departments and citizens when evaluating the potability of water from private wells. The Action Level list includes the most common groundwater contaminants. CTDPH is available to make determinations for additional chemicals if found in Connecticut groundwater.

The following list includes the Action Level itself and recommended laboratory methods to detect the contaminant at the Action Level. If you have questions about the Action Level List call the Environmental and Occupational Health Section of CTDPH (860-509-7740). For questions about analytical methods call CTDPH's Laboratory Certification Program (860-509-7389). If your well is contaminated with a chemical on the Action Level List, you should inform your local health department and CTDEEP (860-424-3705).

Chemical Contaminant	CT Action Level (ug/L)	Analytical Method[1]
arsenic	10	200.5, 200.8, 200.9, SM 3113B
barium	2000	200.7, 200.8, SM 3113B
benzene	1	524.2, 524.3
carbon tetrachloride	0.5	524.2, 524.3
chlordane (technical)	0.3	505, 508, 508.1
Chromium (total)	15	200.7, 200.8, 200.9, SM 3113B
1,4-dichlorobenzene	5	524.2, 524.3
1,2-dichloroethane	0.5	524.2, 524.3
dichloromethane	5	524.2, 524.3
2,4-dichlorophenoxyacetic acid (2,4 – D)	70	515.(1 – 4), 555
1,2-dichloropropane	1	524.2, 524.3

Standards:

- Maximum Contaminant Level (**MCL**)
- Action Level (**AL**)
- Guidance Level
- Secondary MCL (**SMCL**)

- ✓ Risk to health?
- ✓ Risk to plumbing?
- ✓ Risk of staining?
- ✓ Unpleasant taste/odor?

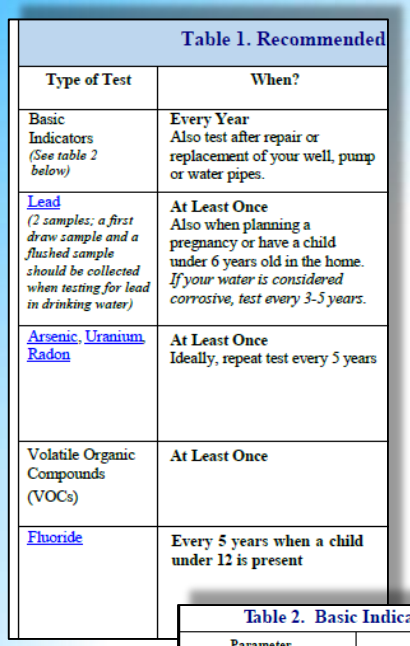


Table 1. Recommended

Type of Test	When?
Basic Indicators *(See table 2 below)*	**Every Year** Also test after repair or replacement of your well, pump or water pipes.
Lead *(2 samples; a first draw sample and a flushed sample should be collected when testing for lead in drinking water)*	**At Least Once** Also when planning a pregnancy or have a child under 6 years old in the home. *If your water is considered corrosive, test every 3-5 years.*
Arsenic, Uranium, Radon	**At Least Once** Ideally, repeat test every 5 years
Volatile Organic Compounds (VOCs)	**At Least Once**
Fluoride	**Every 5 years when a child under 12 is present**

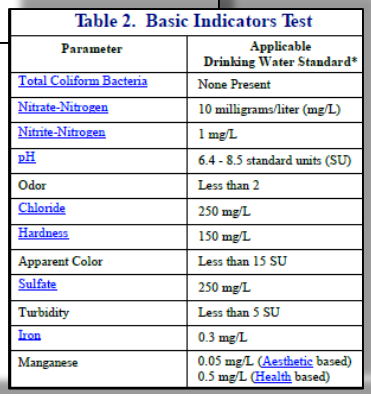


Table 2. Basic Indicators Test

Parameter	Applicable Drinking Water Standard*
Total Coliform Bacteria	None Present
Nitrate-Nitrogen	10 milligrams/liter (mg/L)
Nitrite-Nitrogen	1 mg/L
pH	6.4 - 8.5 standard units (SU)
Odor	Less than 2
Chloride	250 mg/L
Hardness	150 mg/L
Apparent Color	Less than 15 SU
Sulfate	250 mg/L
Turbidity	Less than 5 SU
Iron	0.3 mg/L
Manganese	0.05 mg/L (Aesthetic based) 0.5 mg/L (Health based)

Max Contaminant Level: **MCL**

Private Well Action Level: **AL**

Secondary MCL: **SMCL**

***All in mg/L (*ppm*)**

Guidance levels (*as indicated*)

	MCL*	AL*	SMCL*	GUIDANCE
Total Coliform	0			
Nitrate	10	10		
Nitrite	1	1		
Sodium				100 mg/L
Chloride	250			
Iron			0.3	
Manganese		0.5	0.05	
Hardness				0-60 61-120 121-180 >181
pH				6.5-8.5: EPA 6.4-10: CT
Sulfate				25 mg/L
Color				15 CU
Odor				3 TON
Turbidity				
Lead		0.015		
Arsenic	0.01	0.01		
Uranium	0.03			
Radon				5,000 pCi/L
Fluoride	4.0			
VOCs	MCLs and ALs, varies per individual contaminant			
Pesticides	MCLs and ALs, varies per individual contaminant			

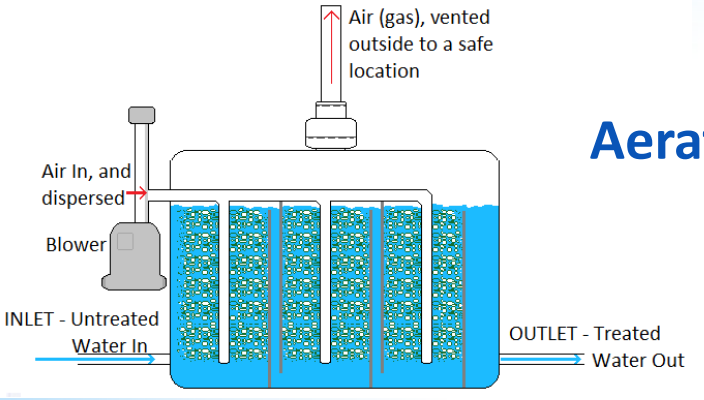
Options When a Water Quality Issue is Identified

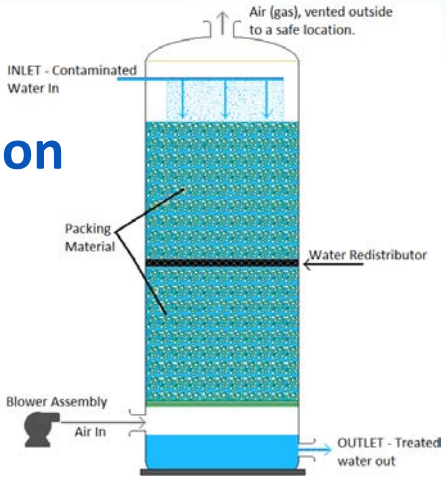
- **Alternate Sources**
  - Bottled water (*sometimes an interim measure*)
  - Utilize a new source when available or appropriate:
    - ✓Drill a new well
    - ✓Connect to a Public Water Supply
- **Remove or mitigate the contaminant source, dependent on contaminant type**
  - Identify the likely sources and mitigate any problems
- **Treatment**

Private Well Water Treatment

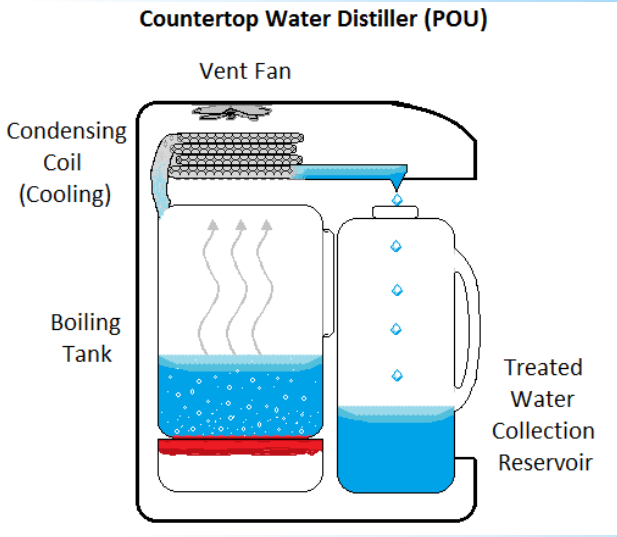
- Many treatment options are available, the type and size will depend on:
  - ✓ The contaminant that needs to be treated for
  - ✓ The levels at which it is or they are present
- No single water treatment option can provide protection against all water quality problems
- It is possible to need more than one treatment option, especially when multiple water quality issues are discovered

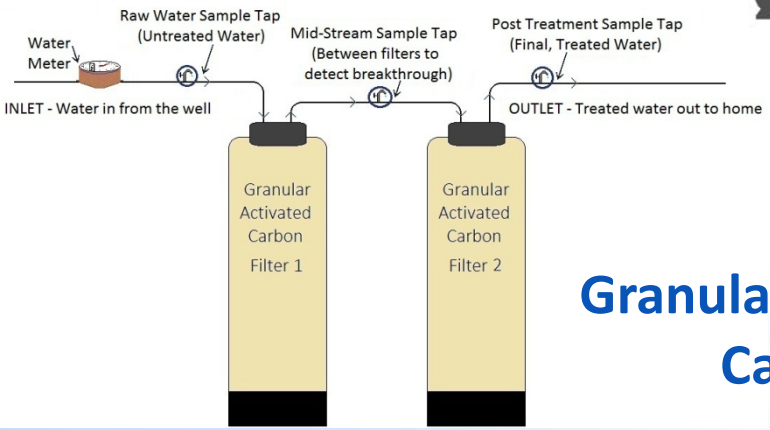
Aeration



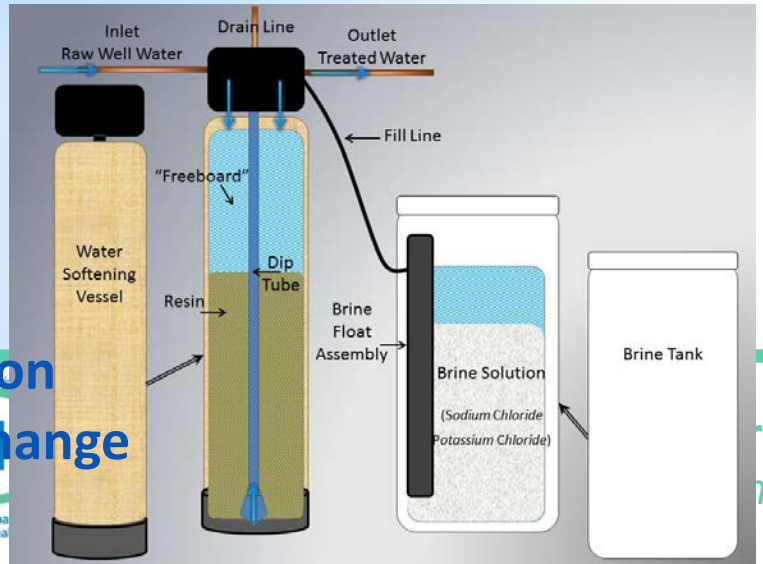


Distillation



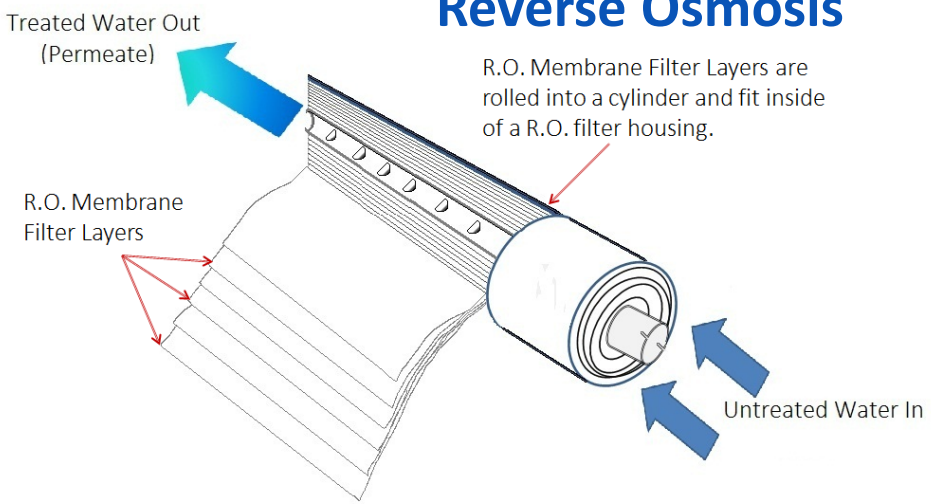


Granular Activated Carbon



Ion Exchange

Reverse Osmosis

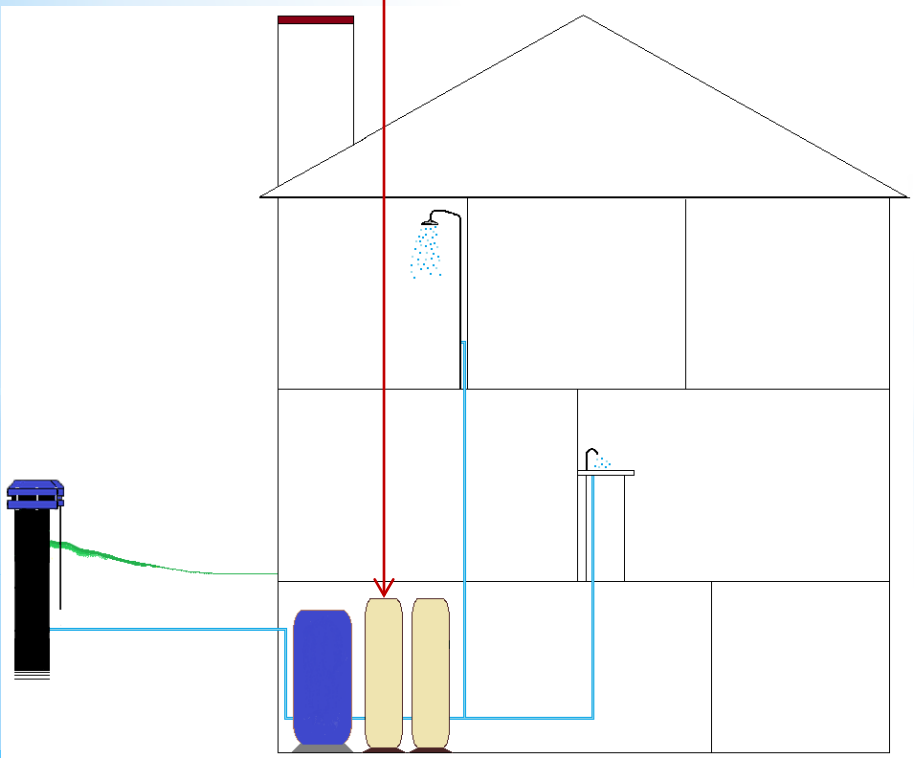


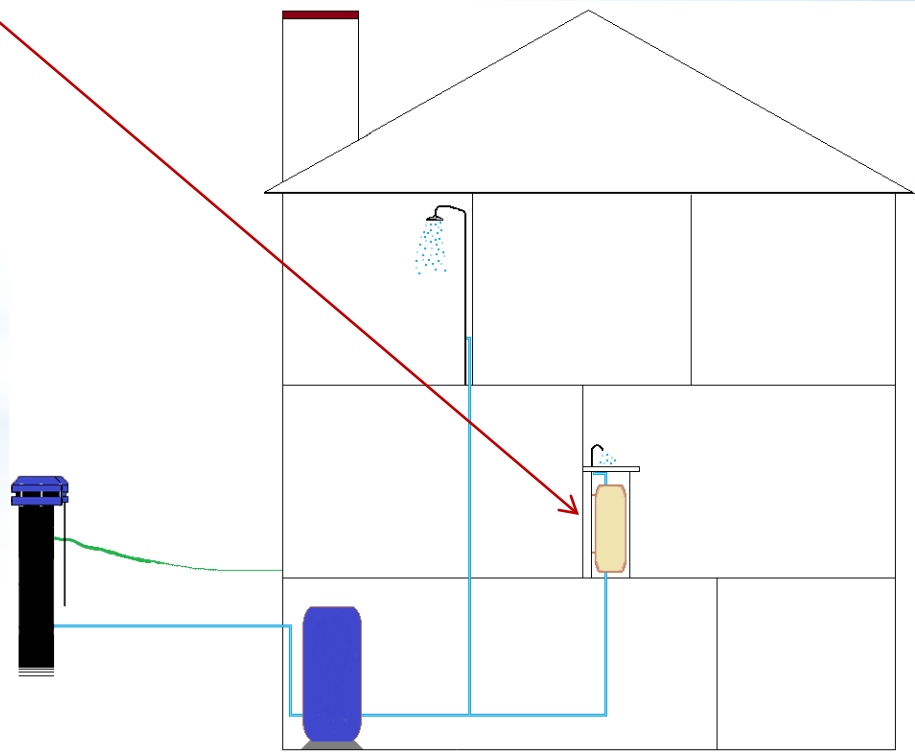
Whole House or Point of Use?

- Does all the water in the house need to be treated, or just the water being consumed (*drinking and cooking*)?

✓ **Point Of Entry (POE)**, treats the whole house; or,

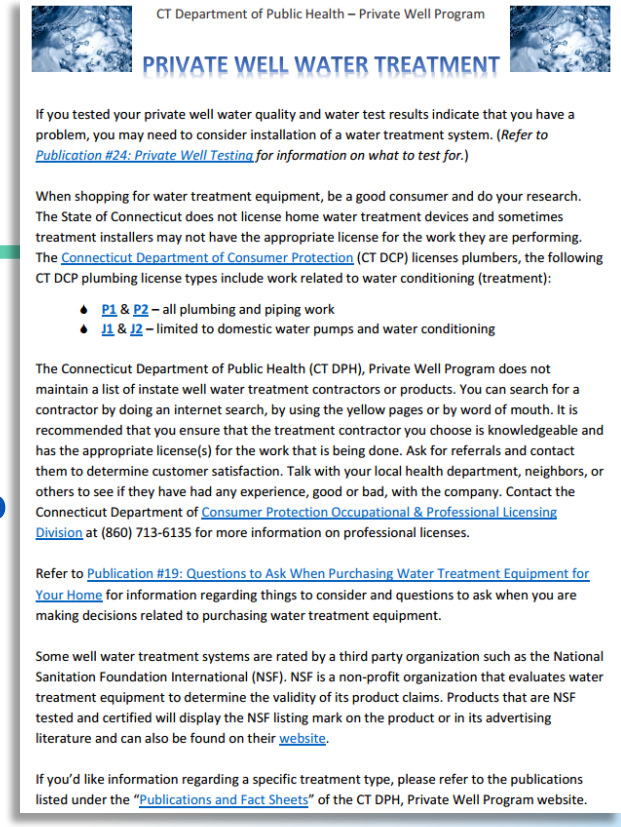
✓ **Point Of Use (POU)**, treats at a specific tap





Private Well Water Treatment: FAQs

- I have several quotes for treatment, which one is best?
- What questions should I ask the contractor?
- What are maintenance & operation needs? Pros & cons?
- Does the treatment system backwash? How do I properly dispose of the backwash wastewater?
- How can I find a well water treatment professional?
  - ✓ Private Well Water Treatment guidance: under ‘Helpful Resources’
  - ✓ Internet search, word of mouth
  - ✓ Check referrals, check for proper licenses



CT Department of Public Health – Private Well Program

PRIVATE WELL WATER TREATMENT

If you tested your private well water quality and water test results indicate that you have a problem, you may need to consider installation of a water treatment system. (*Refer to Publication #24: Private Well Testing for information on what to test for.*)

When shopping for water treatment equipment, be a good consumer and do your research. The State of Connecticut does not license home water treatment devices and sometimes treatment installers may not have the appropriate license for the work they are performing. The Connecticut Department of Consumer Protection (CT DCP) licenses plumbers, the following CT DCP plumbing license types include work related to water conditioning (treatment):

- P1 & P2 – all plumbing and piping work
- J1 & J2 – limited to domestic water pumps and water conditioning

The Connecticut Department of Public Health (CT DPH), Private Well Program does not maintain a list of instate well water treatment contractors or products. You can search for a contractor by doing an internet search, by using the yellow pages or by word of mouth. It is recommended that you ensure that the treatment contractor you choose is knowledgeable and has the appropriate license(s) for the work that is being done. Ask for referrals and contact them to determine customer satisfaction. Talk with your local health department, neighbors, or others to see if they have had any experience, good or bad, with the company. Contact the Connecticut Department of Consumer Protection Occupational & Professional Licensing Division at (860) 713-6135 for more information on professional licenses.

Refer to Publication #19: Questions to Ask When Purchasing Water Treatment Equipment for Your Home for information regarding things to consider and questions to ask when you are making decisions related to purchasing water treatment equipment.

Some well water treatment systems are rated by a third party organization such as the National Sanitation Foundation International (NSF). NSF is a non-profit organization that evaluates water treatment equipment to determine the validity of its product claims. Products that are NSF tested and certified will display the NSF listing mark on the product or in its advertising literature and can also be found on their website.

If you’d like information regarding a specific treatment type, please refer to the publications listed under the “Publications and Fact Sheets” of the CT DPH, Private Well Program website.

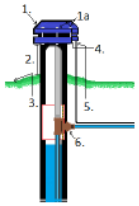
Well Water System Maintenance

Private Well Water Systems in Connecticut: Best Management Practice Checklist

In Connecticut, there are currently no maintenance requirements for private well water systems. Private well owners are responsible for the quality of their private well water and maintenance of their well water systems. Poorly maintained well water systems can act as a conduit for pollutants to enter your home drinking water.

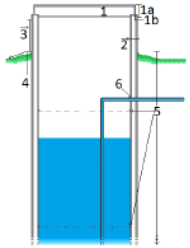
Proper maintenance and operation of your well water system is an essential component to protecting the water quality supplied by your well. Even with proper maintenance, well water system equipment will eventually need repair or replacement. Consider performing the following items to be proactive in promoting the health and longevity of your well water supply and system:

- Test the quality of your well water; refer to Publication #24: Private Well Testing
- Keep the area around your well accessible
- Limit activities around your well that may contaminate your water supply, such as over applying fertilizers, pesticides and herbicides and store these products in watertight containers or in secondary containment
- Keep hazardous chemicals, such as paint, lawn chemicals, or other chemicals away from your well and store these products in watertight containers or in secondary containment
- Be aware of local land use activities that may affect your well water quality
- At least annually, inspect the exposed well casing and the area around it:
  - ✓ Is the exposed well steel casing in good shape?
    - Look for cracks, holes or signs of corrosion
  - ✓ Is the well cap watertight?
    - Check Bolts, rubber gasket, seals
  - ✓ If there is an electrical conduit at the well cap, is it watertight?
  - ✓ Is the top of your well casing at least six inches above the ground?
  - ✓ Does the ground around the well casing slope away from the casing?



DRILLED WELLS:

1. Well cap condition and watertight seal to the well casing; 1a. check bolts and rubber gasket
2. Top of the well casing is at least 6" above ground
3. Ground is sloping away from the well casing
4. Well cap air vent is accessible and screened
5. Watertight connection from the cap to the electrical conduit
6. Pitless adaptors provide an underground connection below the frost line to bring water pumped from the well into your home



DUG WELLS:

1. Well cap is in good condition and watertight to the well casing; 1a. 4-inches thick, 1b. 2-inch overlap
2. Dug well casing or side wells, made of 4-inch thick watertight concrete, or other CT DPH approved material
3. Top of the well casing is at least 6-inched above ground
4. Ground should slope away from the well casing
5. Watertight joints between well casing tiles or other approved material to a minimum depth of 10-feet below the ground surface
6. Water line from the well to the home should be sealed watertight

- Take precautions to prevent the well from being struck by motorized machinery, such as lawnmowers or vehicles
- Prevent cross connections by installing hose bibb vacuum breakers on outdoor spigots
- Never place a water hose inside any type of container when mixing chemicals or solutions
- If there are old unused wells on your property, have them properly abandoned by a registered well driller
- If your well, well pump or water system requires repair or maintenance be sure to use an appropriately licensed individual
- Have your well water system inspected every five to ten years by a licensed professional
  - ✓ Well pump and its components
  - ✓ Well tank and its components
  - ✓ Well head integrity
- Keep all well records, such as well completion and water quality reports in a safe, accessible place

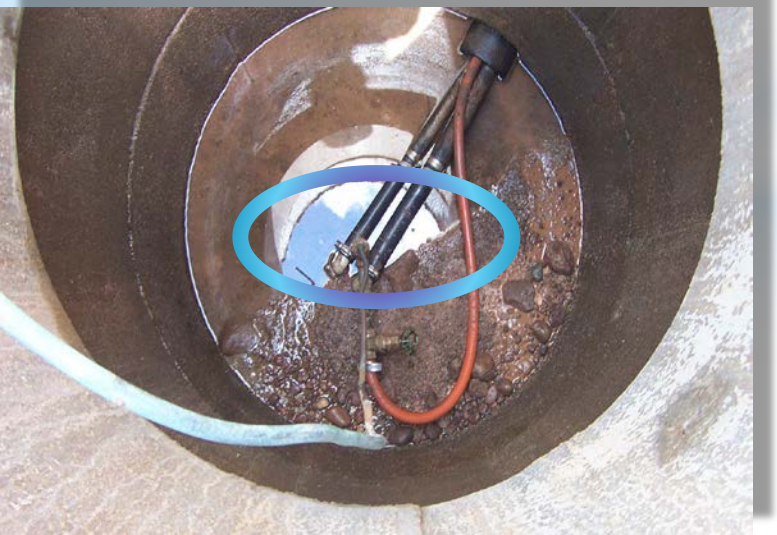
Remember that private well owners are responsible for their private well water systems. When you routinely care for your well water system you improve your chances of avoiding a catastrophic problem in the future.

For more information regarding private wells please contact:
CT Department of Public Health, Private Well Program, (860) 509-8401

Proper water system maintenance can help make your water quality less vulnerable!

Also; well pumps, storage tanks, treatment devices, plumbing, well caps, hot water heaters, will all need attention at some point

Well Water System Maintenance



www.ct.gov/dph/privatewells

Resources

Ct.gov Connecticut's Official State Website

Search Connecticut Government...

Connecticut State Department of Public Health

CT.GOV HOME / DEPARTMENT OF PUBLIC HEALTH / PRIVATE WELLS

- Services and Programs
- Regulation & Licensure
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- Forms

Search Department of Public Health

by Keyword

Private Wells

There are approximately 322,578 private residential wells in Connecticut that serve about 23% of the State's population, more than 820,000 people (based on 2010 census). Private wells supplying residential homes for domestic use are not currently regulated by the United States Environmental Protection Agency (EPA). Private well owners are responsible for testing the quality of their own drinking water and maintaining their own wells. However, CT Local Health Departments and Districts have authority over private wells in their respective towns for proper siting and approval before construction.

For technical assistance on well construction, mainter
contact the CT Department of Public Health – Private
Local Health Department/District.

What's New!

2018 Connecticut Private Well Conference, Present

DROUGHT STATUS

For information on the current drought status for Connecticu

https://testyourwell.ct.gov

DPH Connecticut Department of Public Health

CT TRACKING PORTAL

CT PRIVATE WELLS

QUIZ

Take the quiz to learn more about keeping your private well water safe for you and your family.

MAKE YOUR PRIVATE WELL WATER SAFE.

In Connecticut, **it's your responsibility as a homeowner to ensure the safety of your private well water.** See the list of state-approved laboratories certified to test drinking water as well as other helpful links and resources. All to help protect your private well water and your family.

Contact a state-approved lab in your area certified to test your drinking water. Find out what's in your water.

First of all, don't panic. There are ways to mitigate a problem and some of them are reasonable to implement.

Be proactive in keeping your well water safe. See our checklist of the best practices on proper maintenance and operation of your private well water system.

https://testyourwell.ct.gov/

CT DPH
Environmental Health Section
Private Well Program

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Direct: (860) 509-8049

www.ct.gov/dph/privatewells