

PRIVATE DRINKING WATER IN CONNECTICUT

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The water treatment industry has been put into the forefront for treating drinking water that is both a health hazard and a nuisance to the household. Home water treatment service and supply companies and products promise to deliver drinking water that is safe and contaminant free. The individual is left to sift through advertising claims and technical data to select the appropriate treatment method. Connecticut does not have a state-licensing program for home water treatment devices or installers at this time.



The first step in choosing a water treatment device is to have your water tested for those contaminants and characteristics that you suspect are causing a problem. Most people are alerted to potential problems due to objectionable taste, odor, color, or presence of sediments and staining. You should rely on independent water tests conducted by a state certified lab to identify and evaluate specific contaminants. Refer to Publication #24 *Residential Well Water Testing*.

If the water test indicates that you have a problem, installation of a treatment system may be necessary to remedy it. Be aware that water treatment equipment has tradeoffs.

- There is routine maintenance
- Some systems may need to be periodically back-flushed, which will increase the wastewater load to your septic system or may require another method for waste disposal.
- The treatment may remove one contaminant; yet add something else to your water. For example, an ion exchange system installed to remove iron and manganese, may add sodium to your drinking water, causing a potential problem for people with high blood pressure or on sodium-restricted diets.



When shopping for water treatment equipment, be a good consumer and do your research. The following are questions you can ask a water treatment professional or the well contractor who installed the well to determine the type of system needed. Background information follows many of the questions. The extent of which the manufacturer or distributor is willing to provide answers can assist the consumer in making an informed choice.



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1. What exactly does the water analysis performed by the treatment professional show? Are health hazards indicated? Should more testing be done?



Many water treatment companies include free in-home water testing in their services. Not all contaminants can be evaluated this way. For example, many man-made chemicals, which have been associated with serious health problems, must be analyzed in a laboratory with sophisticated equipment. The consumer must be wary of companies that claim that their home analyses determine more than basic water quality constituents such as hardness, pH, iron, and sulfur. Ideally, you should verify in-home test with a water test conducted by a state certified laboratory.

Once you've accurately determined what contaminants and characteristics your drinking water has, the level detected will dictate the type of treatment systems, if any, is most effective. Factors to consider include whether the water presents a health hazard and how the levels detected compare to Federal and/or State Drinking Water Quality Standards. Refer to the fact sheets about specific contaminants or characteristics that may be present in your drinking water. You can also consult with local health and state health officials and the Connecticut Cooperative Extension Program for assistance with reviewing water test results and their implications. Further information can be found on the Internet at sites such as the Environmental Protection Agency's Office of Groundwater and Drinking Water, which can be found at <http://www.epa.gov/ogwdw/>.

2. How long has the company been in business, and is there a list of referrals the consumer can contact?

Make sure the company is reputable and established. Ask the company for referrals and contact the referrals to find out customer satisfaction. Talk to your local health department to see if they have had any experience, good or bad, with the company.

3. Has the product and the manufacturer been rated by the NSF International or other third party organization? Was the product tested for the specific contaminant in question, and over the advertised life of the treatment device under household conditions (tap water, actual flow rates, and pressures)?



NSF, International is a non-profit organization whose function is to set performance standards for water treatment equipment and evaluates test results of the treatment device to determine if claims are realistic. Products that have been tested and certified by NSF and meet their minimum requirements are entitled to display the NSF listing mark on the products or in advertising literature for products. Manufacturers and models that meet the applicable standard are included in a listing published twice a year. NSF has developed standards for the following types of treatment units.

ANSI/NSF 42: Drinking Water Treatment Units – Aesthetic Effects

ANSI/NSF 44: Cation Exchange Water Softeners

ANSI/NSF 53: Drinking Water Treatment Units – Health Effects

ANSI/NSF 55: Ultraviolet Microbiological Water Treatment Systems

ANSI/NSF 58: Reverse Osmosis Drinking Water Treatment Systems

ANSI/NSF 62: Drinking Water Distillation Systems

For more information contact NSF at: 800-NSF-MARK or <http://www.nsf.org/>



Ask the sales representative which standards the product meets. Also, ask for test results showing removal of the specific contaminant (s) you need or want to remove. Tests by third party organizations (those neutral to and trusted by all interest served) should provide extra confidence.

4. Is a second opinion on treatment procedures and equipment necessary?

Consider a second opinion on recommended water treatment equipment. Check with at least one additional dealer to see what treatment procedure and equipment is recommended, and ask questions. Compare at least two brands, and consult other references.

5. How can I tell whether the dealer knows the home water treatment business?

The Water Quality Association (WQA) is an organization of manufacturers, distributors, and dealers that sets minimum acceptable levels of knowledge for water treatment businesses, sales and equipment installers. Ask if the dealer is a member of WQA and if any employees are WQA-certified water specialists, sale representatives, or installers.



WQA is a voluntary organization, so non-members are not implied to be less competent. However, persons who have attended training sessions and taken tests to demonstrate their knowledge should know their business. The Association's web page is www.wqa.org.

6. Does the water quality problem require whole-house treatment or will a single-tap device be adequate.



Depending on the type of contaminant and its concentration, you may need to treat all the water entering the house or only the water used for drinking and cooking. If the contaminant is only a problem when you drink it, such as lead, you may only need point-of-use (POU) treatment. POU treatment devices are typically installed at the kitchen faucet to treat water for drinking and cooking. However, if the contaminant is also hazardous when you get it on your skin or inhale it, for example a volatile organic compound or radon, you will need to treat all the water entering the house, point-of-entry (POE). POE treatment devices are typically installed in the basement after the water pressure tank. Many treatment units are available in both POU and POE models, including granular activated carbon filters, reverse osmosis, and microfiltration units.

7. Will the unit produce enough treated water daily to accommodate household usage?

The consumer must be certain that enough treated water will be produced for everyday use. For example, distillation units produce 3-12 gallons of treated water daily depending on the model. In addition, the maximum flow rate of the treatment device should be sufficient for the peak home use rate. Consider installing a flow water meter to help determine what the peak home water use is.



8. What are the total purchase price and expected maintenance costs of the device? Will the company selling the device install it and service it? Will there be a fee for labor? Can the consumer perform maintenance tasks or must the water treatment professional be involved?



The consumer must watch for hidden costs such as separate installation fees, monthly maintenance fees, or equipment rental fees. Additionally, the disposal of waste materials, such as spent cartridges from activated carbon units and used filters, can add to the cost of water treatment and should be figured into the purchase price. You may be able to install some treatment devices on your own. Ask the dealer for all costs involved in the installation and maintenance of the treatment system.

9. What are the service intervals and the costs involved with this equipment?

Regardless of whether you or your dealer provides the service, there is a cost. Filter cartridges must be changed, materials added as needed, and the water tested regularly to be sure things are working properly. Un-serviced equipment may contribute to increased levels of some contaminants. Find out what supplies and equipment are needed, and the expected costs. Determine how often a filter membrane, ultraviolet light, or media will need to be changed and who is responsible for doing this. Ask the dealer if there are any other water quality conditions, like pH or sediments that can affect the effectiveness of the treatment system.

10. Will the unit substantially increase electrical usage in the home?

The costs of treated water in the home will vary depending upon the cost of electricity and the amount of energy required to operate the treatment unit. Ask about the average monthly electrical use for the system you are interested in purchasing.



11. Is there an alarm or indicator light on the device to alert the consumer of a malfunction?

Many units have backup systems or shutoff valve functions to prevent consumption of untreated water.

12. Will the manufacturer include follow-up water testing in the purchase price to ensure the equipment is working properly after a month or two?



Testing the water a month after the equipment is installed will assure the homeowner that the unit is accomplishing the intended treatment. Have the test completed at a state certified laboratory. Additionally, water used for outside purposes should not have to be treated. This will provide you with a raw water tap, which can be periodically tested to compare the effectiveness of your treatment system. Water test results from the raw water tap will also help you to assess changes in your water quality.

13. What is the expected lifetime of the product? What is the length of the warranty period and what does the warranty cover?

The warranty may cover only certain parts of a device. The consumer should be aware of the warranty conditions.

14. What potential secondary effects will the treatment unit have on your water quality?

The consumer should be aware that some water treatment equipment works by adding something to your drinking water to remedy the problem at hand. For example, some water softening units will replace the iron removed from the water with sodium.

Quick Reference to Water Treatment Devices



These guidelines are directed at individuals planning to consult a water treatment industry representative. It must be emphasized that treatment can be for aesthetic as well as health factors. If drinking water poses a health risk, the consumer should consider the cost of purchasing bottled water or tying into a public water system, if available, as an alternative to treatment.

<u>Device</u>	<u>Primary Use</u>	<u>Limitations</u>
Activated Carbon Filter	Removes chlorine, Volatile Organic Compounds (VOCs), radon, some Synthetic Organic Compounds (SOCs), and general taste and odor problems	<ul style="list-style-type: none"> • Does not remove nitrate, bacteria or inorganic compounds. • Periodic replacement of activated charcoal required to prevent saturation of the charcoal and prevent bacteria buildup.
Reverse Osmosis	Removes more contaminants than any other treatment system except distillation, some organic chemicals (not volatile or semi volatile), pesticides, bacteria, viruses, uranium and radium.	<ul style="list-style-type: none"> • Does not remove all organic chemicals, such as chloroform. • Does not remove 100 percent of most chemicals. • Uses large amounts of water. • Not recommended for bacteria and dissolved gases.
Ion Exchange	<p><u>Cation Exchange Units</u> Removes positively charged ions, Inorganic compounds, such as iron and manganese ions, arsenic, chromium, and hard water minerals – calcium and magnesium.</p> <p><u>Anion Exchange Units</u> Removes negatively charged ions such as nitrates, bicarbonate, selenium, and sulfate.</p>	<ul style="list-style-type: none"> • Removal of one type of ion replaced with another, for example iron removed may be replaced with sodium. • Periodic backwashing and regeneration required.
Microfiltration	Removes small particles and suspended solids such as ferric iron, clay, silt and sand, and some pathogens such as bacteria and viruses and colloids (suspended matter)	<ul style="list-style-type: none"> • Filter replacement based on concentration of contaminant, pressure head loss and water usage in the home.

<u>Device</u>	<u>Primary Use</u>	<u>Limitations</u>
Distillation	Removes dissolved minerals, trace amounts of metals, and some toxic organic chemicals.	<ul style="list-style-type: none"> • Might produce bland-tasting water. • Small capacity units produce limited quantity for drinking, cooking. • Large units require kitchen or adjoining space or small diameter plastic plumbing can be run to the faucet location from a basement unit. • Not effective against most volatile and semi-volatile chemicals and some bacteria.
Aeration	Dissolved gases like radon, carbon dioxide, methane, and hydrogen sulfide, as well as volatile organic compounds, like MTBE or industrial solvents. Aeration can be used for the precipitation and removal of dissolved iron and manganese.	<p>If iron and manganese are present in solid form, pre-treatment of the water to remove these particles before entering the aeration treatment and post-treatment maybe necessary.</p> <p>Waste air must be vented from house in such a way as to prevent contamination of indoor air quality.</p>
Ultraviolet Radiation	Efficient at inactivating vegetative and sporous forms of bacteria, viruses, and other pathogenic microorganisms.	Not recommended if the untreated water contains high levels of total coliform bacteria, substantial color or turbidity. Does not improve the taste, odor, or clarity of water.
Ozone	Pathogenic (disease-causing) organisms including bacteria and viruses, phenols (aromatic organic compounds), some color, taste, and odor problems, iron and manganese, and turbidity	Not effective for large cysts and some other large organisms, inorganic chemicals, heavy metals
Activated Alumina	Used primarily for removing fluoride and arsenic	May require a post-treatment system for bacteria removal. And pretreatment to oxidize ‘arsenite” to filterable “arsenate”.

Adapted from *Household Water Treatment* by Annette Bach and Darnell Lundstrom. 25 HF & E-2. MDSU Extension Service, North Dakota State University, Fargo, ND 58105. June 1988.

Summary

The purchase of water treatment equipment is a decision that must be carefully considered. Whether the purchase is being made to improve the aesthetic characteristics of the water or to address health consideration, many factors must be determined. You may want to keep a logbook, allowing you to keep track of all maintenance and repairs on your treatment system.



The following are some key steps to use in selecting equipment.

1. Correctly identify the problem to be addressed using appropriate tests performed by state certified laboratories. Also, inquire about the history of the groundwater in your neighborhood to help determine if any water quality problems exists. If so, test your drinking water for these contaminants.
2. Identify options for correcting the problem.



3. Decide whether whole house (point-of-entry) or single-tap (point-of-use) treatment is needed.
4. Determine if the system will treat enough water to meet your needs.
5. Select a reputable dealer.
6. Obtain second opinions.
7. Check to see if proposed equipment has been tested or validated by independent organizations such as NSF International or the Water Quality Association.
8. Talk with others who have the same equipment you may purchase.
9. Be sure to know all the costs of the equipment: purchase price, installation, operating, and routine required maintenance.
10. Understand what maintenance will be required and who will be responsible for doing it.
11. Understand how to determine if the equipment is operating satisfactorily.
12. Determine the expected life of the equipment and components.
13. Understand any warranty provided with the equipment.

For more information please click on the following links:

EPA Office of Groundwater and Drinking Water

<http://www.epa.gov/ogwdw/>

EPA New England

<http://www.epa.gov/region01/>

Adapted from *Healthy Drinking Waters for Rhode Islanders*, University of Rhode Island Cooperative Extension, April 2003.