

Healthy Drinking Waters

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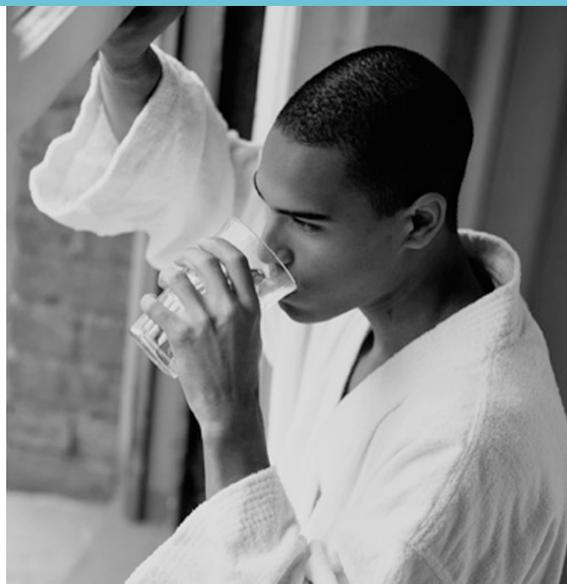
M A S S A C H U S E T T S

Safe and healthy lives in safe and healthy communities

Sodium Chloride in Private Drinking Water Wells

Private well owners are responsible for the quality of their drinking water. The U.S. Environmental Protection Agency (EPA) does not regulate private wells. Homeowners with private wells are generally not required to test their drinking water, although local Boards of Health or mortgage lenders may require well water testing. While there is also no state requirement to have your well water tested, the Massachusetts Department of Environmental Protection (MassDEP) recommends that all homeowners with private wells do so, and use a state certified testing laboratory. Homeowners can use the public drinking water standards as guidelines to ensure drinking water quality.

There is no standard set for sodium in water. However, EPA has recommended that sodium levels in water not exceed 20 milligrams per liter (mg/L) for individuals on “no salt diets.” In addition, EPA has established guidelines for specific contaminants, known as Secondary Maximum Contaminant Level (SMCL) to assist public water systems in managing their drinking water for aesthetic considerations, such as taste, color and odor. These contaminants are not considered to present a risk to human health at the SMCL. Secondary standards are set to give public water systems some guidance on removing these chemicals to levels that are below what most people will find to be noticeable. The SMCL



for chloride is 250 milligrams per liter (parts per million).

Summary

Sodium and chloride occur naturally in groundwater. However, sources such as road salt storage and application, industrial wastes, sewage, fertilizers, water softeners, and proximity to saltwater are usually the cause of elevated levels in drinking water supplies. This can be a concern for people on low-sodium diets. Elevated levels of sodium and chloride can also interfere with taste, the watering of certain plants, and increase the corrosivity of water, which in turn can affect the household plumbing. Identifying and eliminating the source of contamination is the first step. Installing a new well or purchasing bottled water may be appropriate solutions. Home treatment options include reverse osmosis and distillation.



Potential Health Effects

Sodium in our diets results mainly from eating table salt. Sodium in drinking water normally presents no health risks, as about 99 percent of the daily salt intake is from food and only about one percent from water. However, elevated sodium in well water may be considered a health concern for those on salt-restricted diets. The treatment for certain heart conditions, circulatory or kidney diseases, or cirrhosis of the liver may require a sodium-restricted diet. Individuals on a low sodium diet due to high blood pressure or other medical problems are often restricted to water containing less than 20 milligrams per liter of sodium. Consult your physician if your drinking water exceeds 20 milligrams per liter of sodium.

Some ion exchange treatment systems (water softeners) will increase the amount of sodium in water. If this type of treatment system is installed in the home, and people in the household are on low-salt diets, arrange to test the treated tap water for sodium levels. Some of these units use potassium rather than sodium. It is also important to monitor potassium levels in the treated water. Consult your physician.

Indications of Sodium Chloride in Drinking Water

High chloride levels cause corrosion and shorten the life of pipes, pumps, hot water heaters, and fixtures. Chloride concentrations in excess of about 250 milligrams per liter usually produce a noticeable taste in drinking water. An increase in chloride content in well water may indicate possible pollution from sewage sources, particularly if the normal chloride content in surrounding wells is known to be low. In this case, also have your water tested for bacteria. In addition, you may also want to conduct a detergent test.



Sources of Sodium Chloride in Drinking Water

Sodium and chloride occur naturally in the environment. These elements combine chemically to form the common, stable substance known as “salt.” Salt readily dissolves in water, however, natural background levels of sodium and chloride in drinking water are not usually elevated. Sources that usually contribute to increased levels include ion exchange units in homes (a type of home water softening treatment system); and road salt storage and application on roads, fertilizers, industrial wastes, sewage, and saltwater intrusion along coastal areas that may mix with ground water in the vicinity of your well.

Testing for Sodium Chloride in Private Drinking Water Wells

To determine if sodium or chloride is present, arrange to test your drinking water at a



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state certified laboratory. Follow laboratory instructions carefully to avoid contamination and to obtain a good sample. Home test kits may not provide accurate results. Refer to the fact sheet *Home Water Testing* for more information.

Corrective Action

If chloride is present in well water at concentrations above the SMCL, arrange to test the water periodically to determine if any upward trend exists. If concentrations are clearly increasing with time, an effort should be made to define the source of contamination and take steps to eliminate the source. If you cannot locate and remove the contamination source, consider using bottled water for infants in the household. A new well may be the best solution over the long term.

Treatment methods for sodium and chloride include reverse osmosis and distillation. If sodium levels in your water supply are moderately high (over 100 milligrams per liter) available small treatment units will produce three to ten gallons of water per day, enough for the usual drinking and cooking needs. For more information on these treatment options, please see factsheets entitled: *Reverse Osmosis Treatment of Drinking Water Supplies* and *Distillation Treatment of Drinking Water Supplies*.

When choosing a treatment method, consider both the initial cost and the operating costs. Operating costs include the energy needed to operate the system, additional water that may be needed for flushing the system, consumable supplies and filters, repairs, and general maintenance.

Regardless of the quality of the equipment purchased, it will not operate well unless maintained in accordance with the manufacturer's recommendations. Keep a logbook to record equipment maintenance and repairs.

Equipment maintenance may include periodic cleaning and replacement of some components. Also consider any special installation requirements that may add to the equipment cost. For more information, refer to the fact-sheet *Questions to Ask When Purchasing Water Treatment Equipment*.

Bottled water is an alternative. Read the label to determine the sodium content in the bottled water. See the factsheet *Frequently Asked Questions about Bottled Water* for more information.

If you live adjacent to a state maintained roadway, and suspect that your well may have been contaminated by sodium chloride due to road salting application or storage practices, you should contact the MassHighways Road Salt Contamination Program at 508-687-3590 concerning your well. If they determine that they are responsible for the sodium chloride contamination, they will assist you in implementing a remedial action for your well contamination.

Protection of Private Drinking Water Supplies

You can protect your private well by paying careful attention to what you do in and around your home as well as your neighbor's activities near your well. Regular testing and adopting practices to prevent contamination can help ensure that your well supplies you and your family with good quality drinking water. For more information on well protection see the factsheet entitled *Drinking Water Wells*.



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Resources

UMass Extension

This fact sheet is one in a series on drinking water wells, testing, protection, common contaminants, and home water treatment methods available on-line at the University of Massachusetts website:

http://www.umass.edu/nrec/watershed_water_quality/watershed_online_docs.html
and Cape Cod Cooperative Extension:
508-375-6699
<http://www.capecodextension.org>

MA Department of Environmental Protection, Division of Environmental Analysis

Offers assistance, information on testing and state certified laboratories: 617-292-5770
For a listing of MassDEP certified private laboratories in Massachusetts:
<http://www.mass.gov/dep/service/compliance/wespub02.htm>

U.S. Environmental Protection Agency, New England Office

Information and education on where drinking water comes from; drinking water testing and national laws; and how to prevent contamination:
<http://www.epa.gov/ne/eco/drinkwater>

US Environmental Protection Agency

For a complete list of primary and secondary drinking water standards:
<http://www.epa.gov/safewater>

MA Department of Conservation and Recreation, Division of Water Supply Protection

Maintains listing of registered well drillers, information on well location and construction: 617-626-1409
<http://www.mass.gov/dcr/waterSupply/welldrill/index.htm>

NSF International

The NSF International has tested and certified treatment systems since 1965. For information on water treatment systems: 800-NSF-MARK (800-673-6275)
<http://www.nsf.org/consumer/>

Water Quality Association

The Water Quality Association is a not-for-profit international trade association representing the household, commercial, industrial, and small community water treatment industry. For information on water quality contaminants and treatment systems:
<http://www.wqa.org>



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