ENVIRONMENTAL
Fact Sheet

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

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Disinfecting a Private Well

This fact sheet provides instruction for the disinfection of a **private** drinking water well which are typically dug or drilled wells. If ***E.coli*** bacteria has been detected, DO NOT DRINK or use for any consumptive uses unless the water has been boiled for at least 2 minutes.

PRIOR TO DISINFECTION

1. **Water System Inspection**. Carefully inspect the well and other water system components to identify and correct potential pathways that may have allowed bacteria to enter the water system. See the NHDES fact sheets concerning Dug Well Design (WD-DWGB-1-4) or Bedrock Well Design (WD-DWGB-1-2) for information on proper well construction.
2. **Flush the System.** Chlorine cannot reach bacteria entrapped within mud, rust or other solids. Therefore, all components of the system including the well source, tanks and distribution piping should be flushed to a clean condition prior to disinfection. For dug wells, scrub the walls with a long handle brush, wash down, and flush to waste until water is clear. For drilled wells, pump to waste until water is clear. Flush until the water runs clear through an outside tap~~s~~ to avoid overloading your septic system. **NEVER** discharge to a wetland, brook or pond. Choose a dry area or a drainage swale where water can percolate naturally through the soil.
3. **Treatment Systems.** Verify with the manufacturer's instructions **BEFORE** bleaching a treatment system of any type. Some resins, gaskets and filter membranes may be damaged by chlorine.

DISINFECTION PROCEDURE

Chlorine is the standard chemical used to disinfect all components of a water system. ☠ **CAUTION**: Chlorine is a hazardous material. Read all warnings before use. Wear suitable clothing, gloves and eye protection. Do not leave in plumbing longer than overnight or maximum 24 hours.

Type of Chlorine. Household bleach is available as 8.25 percent. In solid form, seek calcium hypochlorite pellets with 70 percent active chlorine. Liquid bleach will more effectively treat the upper portions of the well. A combination of liquid bleach and pellets are recommended for drilled wells deeper than 200 feet because the pellets sink to the bottom providing better chlorine contact at the bottom of the well. Disinfectant should not contain algaecides, stabilizers, conditioners or fragrances. **DO NOT** use pool bleach additives as these are not certified for drinking water use. The solid calcium hypochlorite pellets are available through a water well industry retail supplier, a licensed water well contractor, or web search for Chlorine Pellets Calcium Hypochlorite, certified under NSF-60.

Amount of Chlorine. The recommended initial dosage for shock disinfection is **10 mg/L**, though up to 50 mg/L can be applied if contamination persists. Note that higher doses require excessive flushing to remove residual chlorine. Use the following tables to estimate the required chlorine for your well.

Approximate Chlorine Volume for 15 mg/L
(Rounded for ease of application)

Water Depth (Feet)	Bedrock Well	
	6 Inch	8 Inch
50	¼ cup	½ cup
100	½ cup	1 cup
150	¾ cup	1 ¼ cups
200	1 cup	1 ½ cups

Water Depth (Feet)	3 Foot Dug Well
5	¾ cup
10	1 ½ cups
20	3 cups

Use liquid bleach to treat wells less than 200 feet deep, and for the upper 200 feet of deeper wells. For wells deeper than 200 feet, also add pellets directly to the well to treat the lower portions of the well. Pellets should be reduced in size by placing them in a heavy bag and breaking with a hammer. For a 6 inch diameter well, add 9 pellets of 0.70 percent hypochlorite pellets (0.79 g/pellet) for each 100 feet of depth below 200 feet. An eight inch diameter well will require 16 pellets for each 100 feet of depth below 200 feet. Check the instructions on your bag for dosage as pellets or tablets may be a different size than the standard pellet size we are referencing.

Adding the Disinfectant. Disinfection must be carried out upstream or at the point where bacteria entered the system. If the cause of contamination has not been located, the entire system starting from the well to distribution must be disinfected. For a typical residential well, a simple procedure is as follows:

1. Run a garden hose from an outside faucet to the well and turn the water on to promote mixing in the borehole.
2. Add the prescribed chlorine amount in accordance with the tables and instructions above, and allow the chlorinated water to recirculate and mix evenly throughout the well depth until you smell chlorine from the hose water. Wash chlorine particles off wires and other parts of the well interior as chlorine is very corrosive and will damage wiring and fittings.
3. Run each faucet to draw disinfectant through distribution until you smell chlorine and then turn off.
4. Take the hose out of the well, reinstall the cover and let the system sit minimum overnight and maximum 24 hours.
5. Over the next few days, flush the well by running an outside faucet. Direct discharge to a dry area *away* from plants, streams or ponds, and leach field.
6. Continue flushing until you can no longer smell any chlorine - this may take several hours, or repeated flushing over several days. Test with chlorine strips to verify there is no residual.
7. Re-sample water for bacteria analysis.
8. Repeat steps 1-7 if bacteria persist even though the source of contamination has been addressed. If the source of contamination has not been identified, re-inspect the system and/or seek professional help.

Permanent Disinfection
If ***E.coli*** bacteria persists after all sources of contamination have been corrected, install a new well. If TOTAL COLIFORM bacteria persist in the well after all sources of contamination have been corrected, a UV disinfection system can be installed. Please see our fact sheet on "Ultraviolet Water Disinfection" (WD-DWGB-4-5) for additional guidance.

FOR MORE INFORMATION

- Contact NHDES Drinking Water and Groundwater Bureau at (603) 271-2513 or dwgbinfo@des.nh.gov
- Visit www.des.nh.gov/organization/-divisions/water/dwgb/index.htm for additional factsheets.

Note: This fact sheet is accurate as of April 2015. Statutory or regulatory changes or the availability of additional information after this date may render this information inaccurate or incomplete.