



WATER WELL DISINFECTION

(Adapted from Michigan Department of Environmental Quality, *Well Water Disinfection Manual*)

This disinfection procedure is a “simple chlorination” wherein a small volume of chlorine solution is added into the top of the water well, followed by circulating the chlorine into the water supply’s distribution system. This simplified procedure is used to disinfect the upper portion of a well casing, the well pump, the drop pipe, the water service line, the pressure tank, and the building distribution system. As the pump is operated, the chlorine is drawn to the pump intake and from there into the distribution system.

With simple disinfection, there is no assurance that the chlorine will get to the bottom of the well or into the aquifer around the well. Water is flowing from the bottom of the well up to the pump intake, minimizing the chance that any portion of the well below the pump intake will be exposed to the chlorine. If simple chlorination is unsuccessful at disinfecting the well, the bulk displacement method of well chlorination should be performed by a knowledgeable water well contractor.

Simple Chlorination Procedures

The following simple chlorination procedures are recommended for treating a typical 4- to 6-inch diameter home water well system with a submersible pump.

1. **Remove Turbidity** - If the well water is not clear, pump it to waste until it clears up before starting the chlorine treatment. Turbidity (cloudiness) in the water can reduce the effectiveness of the chlorine.
2. **Bypass Cartridge Filters** - If the water system has a cartridge filter, place its valve in the “bypass” position and remove the cartridge housing and cartridge. Discard the old cartridge. Rinse the housing with a solution of one tablespoon of bleach and a cup of water. Drain the housing and insert a new filter cartridge. Reinstall the cartridge housing and filter, but leave the cartridge filter valve in the bypass position until the chlorine has been completely flushed from the water supply after treatment.
3. **Bypass Other Water Treatment Units** - Bypass water treatment units, such as water softeners, reverse osmosis (RO) systems, and iron removal systems. Follow manufacturer’s recommendations pertaining to disinfection of treatment units. Leave the units in the by-pass position until all chlorine has been flushed. High concentrations of chlorine can damage softener resin and reverse osmosis membranes.
4. **Remove Well Cap - Caution** should be taken when removing the well cap, as bare wires may be exposed posing an electrical hazard. You may consider shutting off the power to the well pump while handling the cap.
5. **Measure Chlorine Solution.** Pour out a quantity of chlorine solution using the table below. Any brand of unscented liquid household bleach that contains 5¼ to 6 percent available sodium hypochlorite may be used. Swimming pool chlorine and scented products should be avoided. If you don’t know the well depth, you might obtain it from your well maintenance contractor or possibly from local health department records.

Chlorine Solution Table	
Well Diameter	Bleach per 25 feet of well depth
4 inch	1 cup
5 inch	1½ cup
6 inch	2 cup

Example: A 4-inch diameter well 150 feet deep would require 6 cups of bleach for treatment.

3 RESEARCH DRIVE - WOODBRIDGE, CONNECTICUT 06525
141 BOSTON POST ROAD - OLD SAYBROOK, CONNECTICUT 06475
77 KREIGER LANE #908 - GLASTONBURY, CONNECTICUT 06033

6. **Mix.** Mix the bleach (from above chart) with 5 gallons of clean water in a clean plastic or glass container and add an additional 2 cups of bleach (to assure sufficient chlorine for disinfection of the pressure tank, water heater, and distribution system).

Example: From the chart above, a 4-inch diameter well 150 feet deep would need 6 cups of bleach to treat the well and an additional 2 cups for the distribution system. Therefore, a total of 8 cups of bleach will be mixed with the 5 gallons of water.

7. **Pour.** Slowly pour the mixture into the top of the well.
8. **Circulate.** After the chlorine has been applied to the well, attach a hose to an outside tap and run the water to waste (discharge onto the ground surface) until a chlorine smell can be detected in the water and the water is clear. Do not discharge the water into a septic disposal system.
9. **Recirculate.** Use the garden hose to recirculate the chlorinated water back into the top of the well. Wash down the inside of the casing for at least 30 minutes. During this process, water circulates from the pump, through the drop pipe, service line, pressure tank, distribution piping, and hose back into the top of the well. This recirculation of the chlorinated water will help assure a uniform distribution of chlorine between the top of the water column in the well and the pump intake.
10. **Reinstall the Well Cap.** After the recirculation period, turn off the water to the hose and cap the well.
11. **Open Taps.** Open each tap within the home, one at a time, starting closest to the pressure tank, and run water until a strong chlorine smell is present. Close the tap. Include shower-heads as well as bathtub taps and flush each toilet once. Run chlorinated water through all other lines including washer, icemaker, and dishwasher.
12. **Contact Period.** Allow the chlorine to remain in the water supply for at least 12 hours, preferably 24 hours. Contact time is important; the longer the chlorine is allowed to remain in the water supply system, the better the chance that the chlorine will contact and kill microorganisms that may be present. Water use during the contact time should be minimized to assure that a chlorine residual remains in the well.
13. **Flush Well.** After the contact period, pump to waste to remove the chlorine from the water supply. Use a hose connected to an outside tap, discharging into the yard, a roadside ditch, etc. Avoid running the water into the septic system or onto grass or plants that you do not wish to be damaged by the chlorine. The outside tap should be allowed to run in the fully open position to maximize the pumping rate.

Flush until the chlorine smell can no longer be detected. After the chlorine smell can no longer be detected, it is recommended that flushing be continued for an additional 1 to 2 hours. This will help assure that all traces of chlorine have been removed. The total length of time for flushing depends on the concentration of chlorine, depth of the well, formation type, the pH, etc. It will usually take 4 to 8 hours to flush the well after a standard well chlorination.
14. **Reactivate Treatment Systems.** If present, place the disinfected water treatment units back online.
15. **Flush Distribution System.** Flush all cold water faucets, one at a time, until no chlorine odor is detected. Water may be colored or turbid due to the effect of the chlorine on minerals in the water such as iron and biofilms that may be present. Extended flushing normally clears the water of color and turbidity. After all cold water taps are running clear, colorless and chlorine free, flush hot water taps in a similar manner.
16. **Bacteria Test Sample.** Obtain a bacteriological water sample bottle and associated requisition sheet from one of the Aquatek facilities indicated on the bottom front of this sheet. Obtain a sample of your water according to the instructions furnished and deliver to the laboratory immediately following collection. **Note:** To save time and expense be absolutely certain your water has no residual chlorine odor before collecting test sample! Your sample will be tested for trace chlorine at the laboratory. If chlorine is detected the bacteriological testing cannot be done and you will be instructed to resample after additional flushing.
17. **Test Results:** If a positive bacteriological result is returned from the laboratory, a certified well contractor should be consulted regarding additional action. A negative test result should be followed up with a retest approximately three months after the first to demonstrate continued sterility of the water supply.