



Shock Chlorination: A Step-by-Step Guide to Shock Chlorinating Wells and Home Water Supply Systems

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This fact sheet explains how to shock chlorinate a well and home water supply system. It describes how to add chlorine bleach to a well and the cold water part of a home water supply system and how to ensure that shock chlorination is successful and safe. For background about shock chlorination of wells and home water systems, including information about testing water to determine if shock chlorination is needed, see “Shock Chlorination: Background and Principles (FS-06-68).” For information about how much disinfectant to use and preparations that are important prior to shock chlorination, see “Shock Chlorination: Estimating the Amount of Bleach Needed (FS-06-69).”

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INTRODUCTION

Shock chlorination is usually accomplished with liquid household bleach that has no colors or scents added. It can be an effective and safe way to remove bacteria from a domestic well and the cold water part of a household water supply system, but should be done with care to ensure that the dose of chlorine is adequate and that bleach and harmful chemicals are purged from the system before it is used for drinking water supply again.

HOW SHOCK CHLORINATION IS DONE

Typically, shock chlorination involves circulating water with bleach from the well through the cold water part of household plumbing and back to the well. For information about disinfecting the hot water part of the household plumbing, see “Shock Chlorination: Disinfecting the Hot Water Portion of Household Plumbing (FS-06-71).” The chlorine should be present in a concentration that is lethal to bacteria and



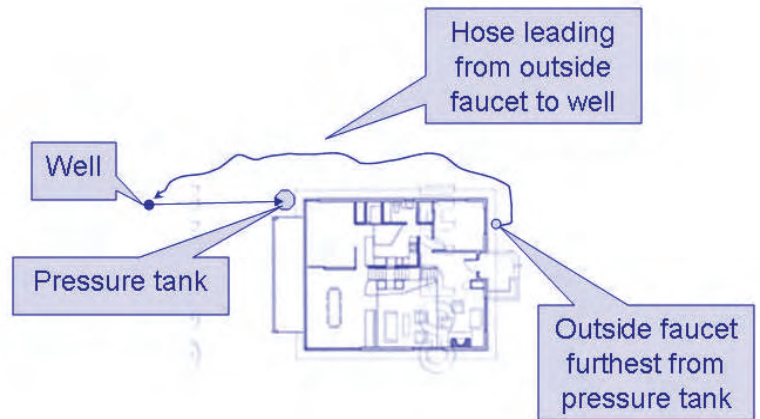
Be sure to have all of the items that you need when you start. This includes gloves and goggles to protect against splashes of bleach solution when pouring and mixing

disinfection should take place long enough to ensure that all bacteria are killed. The steps that follow dem-

onstrate how this is accomplished. For information about adding enough bleach to raise concentrations lethal to bacteria, see “Shock Chlorination: Estimating the Amount of Bleach Needed (FS-06-69).”

SHOCK CHLORINATION, STEP-BY-STEP

1. Remove, bypass, shut off or disconnect activated carbon filters and reverse osmosis systems. If there is a water softener in the system be sure that the resin is fully recharged.
2. Remove the well sanitary cap. The well casing contains wiring for the pump. Before adding chlorine or water inspect the wiring for cracks in



Connect a hose to a faucet that is farthest in the water supply system from the well head. This hose feeds water back to the well to help mix chlorine bleach in the entire system.

the insulation or splices with wire nuts that are not waterproof. **If you have any doubts about whether you can safely wet wiring with a hose or bleach, stop immediately and seek advice from a licensed electrician.**

3. Run a clean garden hose from the faucet on the house furthest from the pressure tank to the well. Be sure the garden hose does not lay on the ground before inserting it into the well.
4. Wearing gloves and suitable eye protection, pour the appropriate amount of liquid, un-scented, household bleach in a plastic bucket. Always do this in an open, ventilated area.



5. Pour the bleach in the well taking care to thoroughly wet the inside of the well casing. This will help to disinfect portions of the well that are



The sanitary cap for a home water supply well, in place (left) and removed (right). The cap can be removed by loosening the screws and lifting the cap off. Always place the cap on a clean surface, away from sources of contamination that could be introduced into the well.



The sanitary cap for this well has been removed and a hose has been inserted to circulate the water and bleach mixture.

above the water line.

6. Run a hose from the faucet furthest from the pressure tank (see step 3) to the well, and place the end of the hose in the well.



The hose need not reach the bottom of the well, but should be deep enough to avoid having water splash or spray out of the well when the hose is running. Use a clean hose nozzle that will wet as much of

the inside of the well casing as possible.

7. Turn on the outside faucet and allow water to flow through the hose into the well until water from the hose has a strong chlorine odor. This signals that the bleach solution is thoroughly mixed with well water. You can use inexpensive test strips to check that the concentration of bleach in water is adequate.



8. Flush all toilets in the house and allow cold water taps to run until the water has a strong smell of chlorine. When the chlorine odor is noticeable, turn off the tap. By doing this all of the household cold water plumbing will be shock chlorinated and treated with the rest of the system. Be sure to remove the hose and securely replace the well cap before proceeding with the next steps.

9. For a 250 ppm concentration of sodium hypochlorite (as indicated in "Shock Chlorination: Estimating the Amount of Bleach Needed (FS 06-69)) allow at least 12 hours



for the system to be effectively treated. During this period the water will be unfit for domestic use or for irrigation because of its high hypochlorite content. If the toilet facilities are used during this period please be aware that the toilet will release a strong chlorine odor after flushing.

10. Redirect the hose that was used to circulate chlorinated water to an area where water will not come in contact with, pets, children, landscaping, gardens or aquatic habitats. Chlorinated water can kill vegetation or aquatic species and it can damage clothing.

11. Allow the outdoor faucet to run until water from the hose no longer smells of chlorine. Then continue to run the water for an additional hour to remove disinfection by-products such as trihalomethanes. Trihalomethanes are produced when chlorine reacts with chemicals and organic substances in the aquifer and water. If enough water is pumped to waste, such chemicals should be completely flushed from plumbing and the well.

12. When discharge water from the outside faucet no longer smells of chlorine, run each water tap in the household until the chlorine odor goes away. In order to avoid overloading the septic system with sodium hypochlorite or flooding it, wait until after the vast majority of the hypochlorite solution has been discharged outside of the home (step 11).

13. Restore all water treatment equipment that was taken out of service. If any activated carbon cartridges or reverse osmosis membranes were accidentally left in the system they should be replaced by new ones.

The steps above should be followed closely. It is important to get further information if the well or water supply system is complicated or if you cannot locate the parts described in steps 1-13. If you have doubts or questions, seek advice from a plumber, county health department, or educator from Cooperative Extension before proceeding.



Be sure to purge chlorinated water away from animals and plants. Pump until you can no longer detect the scent of chlorine. Purging the well is important for removing chemicals created by reactions between bleach and materials in the aquifer and water.

Harmful Chemicals and Shock Chlorination:

Recent research (see the publication by R. Seiler, under “Additional Resources”) has shown that shock chlorination may temporarily increase the concentration of some chemicals in water, such as lead and arsenic. The increases should return to levels that were present before chlorination took place, after the well is adequately purged of chlorinated water. It is important to purge the well and the water system of treated water and bleach before using the water supply for drinking. At a minimum, be sure to pump water from the well until the odor of chlorine is gone. Also, be sure to run faucets, especially those that are used for drinking water, until the odor of chlorine is gone. If you have difficulty smelling chlorine in water, even at high concentrations, consider checking the concentration with inexpensive test strips. These are available from many companies and detect free chlorine in water in a wide range of concentrations.

For further information please contact:

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Additional Resources:

- Shock Chlorination: Background and Principles (FS-06-68)
- Shock Chlorination: Estimating the Amount of Bleach Needed (FS-06-69)
- Shock Chlorination: Disinfecting the Hot Water Portion of Household Plumbing (FS-06-71)
- Water Testing for Private Well Owners (SP-00-02: www.unce.unr.edu/publications/SP00/SP0020.pdf)
- Matching Drinking Water Quality Problems to Treatment Methods (SP-00-19: www.unce.unr.edu/publications/SP00/SP0019.pdf)
- Drinking Water Quality in Nevada (FS-00-46: www.unce.unr.edu/publications/FS00/FS0046.pdf)
- Seiler, R. 2006. Mobilization of lead and other trace elements following shock chlorination of wells. Science of the Total Environment 367(2-3):757-768



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