

wellcare[®] information for you about **Disinfecting Your Well**

Chlorination disinfects your well by destroying unhealthy bacteria and microorganisms and removing dissolved iron, manganese and hydrogen sulfide. It can be managed easily at home with common household bleach.

Shock chlorination uses concentrations of chlorine that are 100 to 400 times the amount found in municipal water supplies. The highly chlorinated water is held in the pipes of your well system before it is flushed out and the system is ready again for use.

When to Chlorinate Your Well

You should test for bacteria each year, usually in the spring, or if there is any change in the taste, color or odor of your drinking water. Any positive test result requires disinfection.

But other well maintenance activities can also threaten your water supply. Chlorinate your well when:

- the well is new. Chlorinate before using.
- the well has been repaired, reconstructed, or new pumps or pipes have been added to the water system.
- the well has been flooded or exposed to bacterial contamination in another manner, such as a crack in the well cap.

How to Use Shock Chlorination to Disinfect Your Well

Chlorine granules, tablets and liquid chlorine in the form of household bleach can all be used to disinfect your well. Don't use stabilized swimming pool chlorine products or non-chlorinated "pool shock" products, as they are not effective enough to clean your drinking water.

Follow directions on the package of granules and tablets. With household bleach, try to use a new bottle of bleach, as it can lose potency over time. Also, don't use perfumed bleach, as it is not healthy to ingest the scented ingredients.

Step 1 Determine the well diameter. This information should appear on the well log. Measure how much water is standing in the borehole of the well.

Step 2 Prepare a solution using unscented liquid household bleach or chlorine granules. Chlorine pellets are not recommended because they do not dissolve quickly enough.

The tables included in this information sheet will help you to calculate how much liquid chlorine bleach you will need, based on the depth of your well. Table 1 applies to drilled wells, and table 2 applies to dug/bored wells. Other

guidance on the amount of liquid or granulated chlorine that can be used based on gallons of water in the well are also available. Contact the [wellcare®](#) hotline for information on these alternative methods of calculation.

Note. Be careful when handling concentrated chlorine solutions. Wear rubber gloves, goggles and a protective apron. If chlorine accidentally gets on your skin, flush immediately with clean water. Mix chlorine solutions in a well-ventilated area. Never mix chlorine solutions with other cleaning agents or ammonia or toxic fumes will form.

Table 1: Procedure for Disinfecting Drilled Wells
Quantities¹ of Liquid Chlorine Bleach (5.25% chlorine) Required for Water Well Disinfection

DEPTH OF WATER IN WELL (ft.)	WELL DIAMETER (in.)															
	2	3	4	5	6	8	10	12	16	20	24	28	32	36	42	48
5	1C	1C	1C	1C	1C	1C	1C	1C	2C	4C	1Q	2Q	3Q	3Q	4Q	5Q
10	1C	1C	1C	1C	1C	1C	2C	2C	1Q	2Q	3Q	4Q	4Q	6Q	8Q	2.5 G
15	1C	1C	1C	1C	1C	2C	3C	4C	2Q	2.5 Q	4Q	5Q	6Q	2G	3G	4G
20	1C	1C	1C	1C	1C	2C	4C	1Q	2.5 Q	3.5 Q						
30	1C	1C	1C	1C	2C	4C	1.5 Q	2Q	4Q	5Q						
40	1C	1C	1C	2C	2C	1Q	2Q	2.5 Q	4.5 Q	7Q						
60	1C	1C	2C	3C	4C	2Q	3Q	4Q								
80	1C	1C	2C	4C	1Q	2Q	3.5 Q	5Q								
100	1C	2C	3C	1Q	1.5 Q	2.5 Q	4Q	6Q								
150	2C	2C	4C	2Q	2.5 Q	4Q	6Q	2.5 G								

¹Quantities are indicated as: C = cups; Q = quarts; G = gallons
Source: *Manual of Individual and Non-public Water Supply Systems* published by the U.S. EPA Office of Groundwater and Drinking Water, EPA-570/9-91-004, Washington, DC, May 1991.

Table 2: Procedure for Disinfecting Dug/Bored Wells
Quantities of 5.25% Calcium Hypochlorite – Household Bleach

Casing	Depth of Water in Well (Feet)													
	5	10	15	20	25	30	40	60	80	100	150	200	250	300
6"	1C	1C	1C	1C	1C	1C	1.5C	1.5C	2C	2C	1Q	1Q	1.5Q	2Q
12"	1C	1.5C	1.5C	2C	2C	3C	1Q	1Q	2Q	2.5Q				
24"	2C	1Q	1.5Q	2Q	2.5Q	1G	1G	1G	2G	2G				
36"	1Q	2.5Q	1G	1G	1.5G	1.5 G								

To determine feet of water, measure the height of the water in the well.
C = cups; Q = quarts; G = gallons

- Step 3** Make sure the electrical power to the pump is OFF.
- Step 4** Place any water softening equipment in to the bypass mode. Failure to do so could result in a breakdown of the softening media.
- Step 5** Remove the cap on the top of the well and pour or pump the solution into the well in one rapid, continuous flow, avoiding all electrical connections.
- Step 6** Turn the power back ON.
- Step 7** Attach a clean hose to a nearby outside faucet and place the other end into the top of the well. Open the faucet and recirculate the chlorinated water for one hour, washing down the entire inside of the well casing and the pump piping to remove any excess chlorine residue.
- Step 8** Open each indoor faucet and any outdoor garden-type faucets one by one and let the water run until a strong odor of chlorine is detected. Shut off faucets.
- Step 9** Allow the chlorine solution to remain in the well and plumbing system. WSC and NSF International recommend that the chlorine remain in the system for at least 30 minutes. For a dug/bored well, WSC recommends a minimum of 8 hours, or overnight. Some health departments recommend that chlorine remain in the well system for 12-24 hours. Contact your state or local health department to find out the length of time it recommends.
- Then flush the entire system until you can no longer smell chlorine. First, run the chlorinated water outdoors, but be careful to avoid areas that drain into lakes or streams because it can kill fish and other aquatic life. The solution can, likewise, kill grass and shrubs, as well as disrupt septic systems. A good choice may be a backyard ditch or side area that will partially contain the solution while it is absorbed by the soil, but make sure the ditch is not connected to a lake or stream.
- Step 10** After the chlorine is out of the system, turn off the outside faucets and turn on the remaining faucets inside the home or distribution system to flush them. Rusty water may come from the faucets, so flush until the water is clear and no chlorine smell is easily noticed. This should only take a few minutes.
- Step 11** When all water lines have been flushed out, use a hose to run fresh water back down the well along the casing sides to flush out any chlorine residue. This prevents the equipment from corroding by chlorine oxidation. If the hose has a chlorine smell, run the water away from plants.
- Step 12** After the entire system has been flushed out, shut down all faucets. Then put any water conditioning equipment into service. Chlorination of the well and distribution system is now complete.

Retest your water supply for bacteria at least 2 days after disinfection. If shock chlorination has not eliminated the bacteria problem, you may need a continuous disinfection system or could have a problem with the well construction or its location. Call a well professional for guidance.

Emergency Chlorination

In the event of a flood, hurricane or other natural disaster, you will need clean drinking water well in advance of the time it takes to shock chlorinate your well. It is best to keep bottled water on hand for such emergencies. Boiling water is another option for killing some disease-causing organisms that could be present in water following a natural disaster, but is not ideal in all situations. See the [wellcare®](#) information sheet, "What You Need to Know if You are Told to Boil Your Drinking Water" for more information.

Household bleach will disinfect water for more immediate use. Look for the percentage of chlorine listed on the bleach label and mix as follows:

- 1 percent chlorine – Use 10 drops per quart of clear water
- 4 to 6 percent chlorine – Use 2 drops per quart
- 7 to 10 percent chlorine – Use 1 drop per quart
- Strength unknown – Use 10 drops per quart
- Double the amount of chlorine if the water is cloudy or colored or if the water is extremely cold.

Mix the chlorine solution and let stand, covered, for 30 minutes before using. The water should have a mild chlorine smell. If it is too strong, let it stand another 15 minutes without a cover.

For more information about disinfecting your well

NSF International. Drinking Water and Emergency Preparedness. Retrieved January 9, 2007 from www.nsf.org/consumer/natural_disasters/disaster_water_safety.asp

U.S. Department of Health and Human Services, Centers for Disease Control and Prevention Disaster Recovery Information. (September 1, 2005). Disinfecting Wells Following an Emergency. Retrieved December 29, 2006 from www.bt.cdc.gov/disasters/wellsdisinfect.asp

U.S. Environmental Protection Agency. Emergency Protection of Drinking Water. Retrieved December 28, 2006 from www.epa.gov/safewater/faq/emerg.html

Water Systems Council. (2006). Chapter 2: Water Quality Assurance. In Book V of the *Water Systems Handbook* (12th Edition).

For more information on your drinking water

The following websites provide up-to-date information on efforts to protect drinking water supplies and steps you can take as a private well owner. In addition, you may contact the wellcare® hotline at 1-888-395-1033.

Underwriters Laboratories Inc. Drink Well™ Well Water Testing
U.S. Environmental Protection Agency
Water Quality Association

www.uldrinkwell.com
www.epa.gov
www.wqa.org

Other information about wells and well water can be found in the following wellcare® information sheets:

General Information about Wells:

- Determining the Depth of a Well
- Determining the Yield of a Well
- Ground Water
- Selecting a Well Contractor
- Sizing a Pressure Tank
- Sizing a Well Pump
- Wells
- Your Well & Septic System
- Coping with Low Water Levels
- Managing a Flooded Well
- Protecting Your Wellhead
- Protecting Your Well
- Well Maintenance
- Wells and Fire Protection
- Wells: What to do When Power Fails
- What To Do if the Well Runs Dry
- Boiling Your Drinking Water
- Disinfecting Your Well
- Drinking Water Testing
- Drinking Water Treatments
- Home Drinking Water Treatment Devices
- Testing Water for Gardening and Lawn Irrigation
- Understanding Drinking Water Test Results
- Buying a Home with a Well
- Closing an Abandoned Well
- Dillon's Rule
- Ground Water Withdrawals
- Real Estate Professionals: Buying or Selling a Home with a Well
- Sanitarians – Closing a Well
- Sanitarians – Inspecting a Well
- Sanitarians – Wells & Septic Systems
- Shared Well Agreement
- Sharing a Well
- Water Conservation
- Who Owns the Water

Well Components:

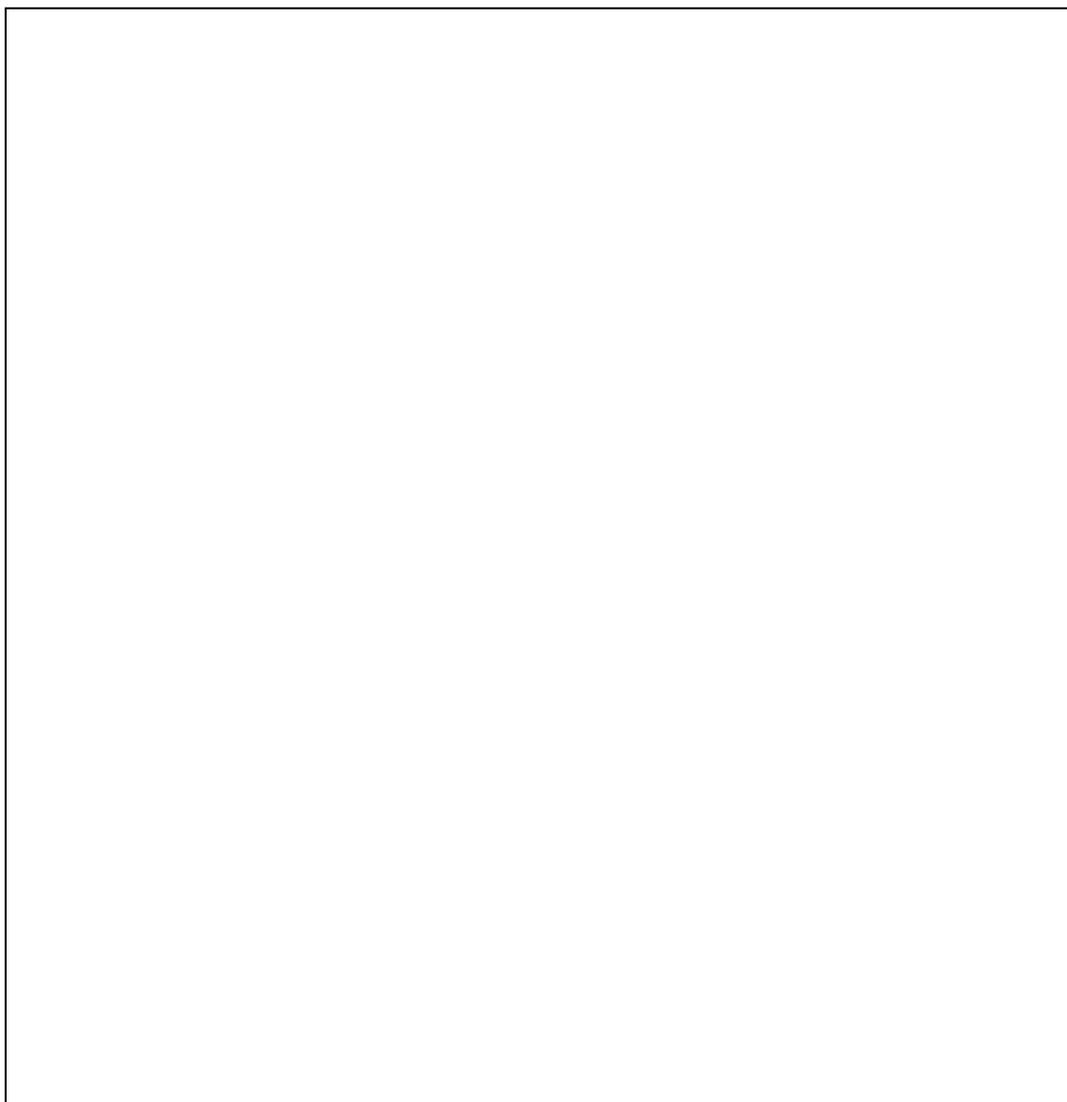
- Your Pitless Adapter
- Valves
- Your Well Cap
- Your Well Casing
- Your Well Pump
- Your Well Tank

Possible Contaminants You May Find in Your Well Water:

- Arsenic
- Bacteria
- Benzene
- Chlorine Disinfectants & Their Byproducts
- Chromium
- Copper
- Emerging Water Contaminants
- Hardness in Drinking Water
- Iron
- Lead
- Mercury
- MTBE
- Nitrate and Nitrite
- Perchlorate
- Pesticides
- pH in Drinking Water
- Radium
- Radon
- Sodium
- Sulfur
- Trichloroethylene (TCE)
- Total Dissolved Solids (TDS)
- Turbidity in Drinking Water
- Uranium
- Volatile Organic Compounds (VOCs)

For more information about wells and other wellcare® publications

wellcare® is a program of the **Water Systems Council (WSC)**. WSC is a national nonprofit organization dedicated to promoting the wider use of wells as modern and affordable safe drinking water systems and to protecting ground water resources nationwide. This publication is one in a series of wellcare® information sheets. There were more than 60 available at the time this document was published. They can be downloaded FREE from the WSC website at www.watersystemscouncil.org. Well owners and others with questions about wells or ground water can also contact the wellcare® hotline at **888-395-1033** or visit www.wellcarehotline.org



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