Questions/Contact Information

If you have any questions about disinfecting your well, please call the Aquifer Protection Section Regional Office for your area.
The following is a list of Regional Offices.

Asheville Regional Office
2090 U.S. Highway 70
Swannanoa, NC 28778 • Phone: (828) 296-4500

Fayetteville Regional Office
225 Green Street, Suite 714
Fayetteville, NC 28301 • Phone: (910) 433-3300

Mooresville Regional Office
610 East Center Ave. • Suite 301
Mooresville, NC 28115 • Phone: (704) 663-1699

Raleigh Regional Office
3800 Barrett Drive, Suite 101
Raleigh, NC 27609 • Phone: (919) 791-4200

Washington Regional Office
943 Washington Square Mall
Washington, NC 27889 • Phone: (252) 946-6481

Wilmington Regional Office
127 Cardinal Drive Extension
Wilmington, NC 28405 • Phone: (910)-796-7215

Winston-Salem Regional Office
585 Waughtown Street
Winston-Salem, NC 27107 • Phone: (336) 771-5000

Water well disnfection procedures are outlined in Title 15A North Carolina Administrative Code, Chapter 2C, Section .0111. The information in this pamphlet is a summary of those requirements. To get complete copies of these rules you may download them from our web page at www.ncwaterquality.org or contact us at the following address:

DWQ, Aquifer Protection Section
1636 Mail Service Center
Raleigh, NC 27699-1636

Phone (919)733-3221 • Fax (919)715-0588
www.ncwaterquality.org

North Carolina

HOW TO DISINFECT YOUR WATER WELL

NC DENR
Division of Water Quality

Water Well Disinfection or Chlorination

For many of us, a water supply well represents the sole source of water for our home. Disinfecting your water supply well and piping system is an effective way to ensure that your water is sanitary and safe to drink.

Disinfection of a water supply well is necessary if test results indicate bacterial contamination. Chlorination of your well, piping system, and water heater is also necessary if your well is contaminated by flood water. Disinfection may be used to control iron and sulfur bacteria to a limited degree. You may also wish to chlorinate your well as part of an annual well maintenance practice. In addition, all water wells are required to be disinfected upon completion of construction, maintenance, repairs or pump installation and testing.

The standard method of disinfection is to produce a 100 parts per million (or 100 milligrams per liter) chlorine concentration in your water. Another type of chlorination termed "shock chlorination" uses the same methods to introduce chlorine but achieves at least a 200 parts per million residual chlorine or more. Shock chlorination is typically recommended when test results indicate the presence of bacteria.

North Carolina Department of
Environment & Natural Resources

NCDENR

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How to Chlorinate Your Water Supply Well

To safely chlorinate your well, you should use safety goggles, gloves and appropriate clothing. Follow chlorine product manufacturer's instructions. Concentrated chlorine can produce holes in clothing and skin burns. You should use only a solution made from high test calcium hypochlorite containing 65% - 75% available chlorine. Do not use household bleach. High test calcium hypochlorite, including trade names HTH and Chlor-Tabs, is available from home improvement stores, swimming pool product suppliers, and drill shops. Do not use stablized chlorine tablets or any chlorine product that contains fungicides, algaecides or other disinfectants; read the product label carefully. You may wish to ask the well contractor that installed your well if they have these products available.

To determine the amount of chlorine or calcium hypochlorite needed to produce a 100 parts per million residual chlorine solution, you must follow the four steps below (use the available worksheet to record your answers to each step):

1) Determine the thickness of the water column in your well. To accomplish this, you must determine the depth to water from the ground surface and subtract this number from the total depth of the well. These numbers should be recorded by the driller on the well tag located on the well casing. If not, you can contact the drilling company that drilled the well. Example: The total well depth is 150 ft. and the water level is 20 ft. below ground surface. Therefore, the thickness of the water column is 130 ft.

2) Determine the volume of water in the well. Use table 1 below to determine the gallons per foot of water in your well.

Table 1

Well Casing Diameter	Gallons per foot
2	0.163
4	0.65
6	1.47
8	2.61
10	4.08
24	23.5
30	36.72
36	52.87

Multiply the gallons per foot of water in your well by the thickness of the water column determined in Step 1. Our example in Step 1 had 130 ft of water in the well. Our example well has a 6-inch casing diameter so it has 1.47 gallons of water per foot of water column (see Table 1). Therefore, 130 ft x 1.47 gallons per foot = 191.1 gallons of water in the well.

3) Estimate the amount of water in the house plumbing system. One estimate for a house would be close to 100 gallons. Add this to the answer from Step 2. For our example from Step 2: 191.1 gallons of water in well + 100 gallons in plumbing system = 291.1 gallons of water needing to be disinfected.

4) Determine the amount of calcium hypochlorite to add to the system. When using hypochlorite that is listed as 65% to 75% available chlorine, you would add 3 ounces of high test calcium hypochlorite per 100 gallons of water in the system. For our example from Step 3: Divide 291.1 gallons by 100 gallons and multiply by 3 ounces = 8.73 ounces of calcium hypochlorite. To use the shock chlorination method, multiply the total system volume by 6 ounces per 100 gallons of water.

Your worksheet:

Step 1: a) Total well depth_____ft
b) Depth to water_____ft
Thickness of water column: subtract answer (b) from answer (a) = _____ft

Step 2: Using Table 1, determine your well diameter and record the gallons per foot_____. Multiply your gallons per foot by the answer from Step 1. This equals the water volume in the well. Record answer here_____.

Step 3: Add to the result of Step 2 the estimated amount of water in the piping system such as 100 gallons. Step 2 answer + 100 gallons =_____ total gallons in system and well.

Step 4: Divide Step 3 answer by 100 (Step 3/100). Take this number and multiply by 3 ounces for 100 ppm solution or 6 to shock chlorinate the well. This equals the amount of high test calcium hypochlorite you are to add and mix in the 5 gallon bucket. Answer_____ounces.

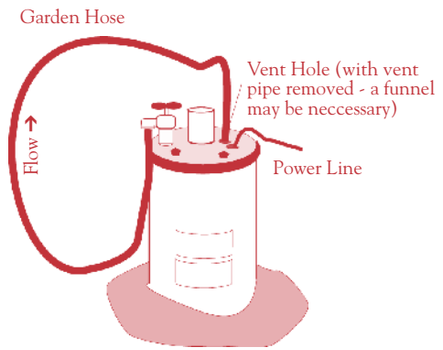
*Follow manufacturers directions for storing, transporting, and using calcium hypochlorite.

Begin by attaching a garden hose to the well's hose bibb or an outside faucet closest to your well. Fill a five gallon bucket about 3/4 full with water. Loosen the well seal at the top of your well. This is typically accomplished with a wrench and it may be necessary to bump the seal with a rubber mallet to loosen it. If you are unable to remove the well seal, you can introduce the chlorine solution through the vent hole using a funnel. The vent pipe is easily unscrewed. However, it is better to pour the chlorine solution directly into the well in order to wash down the sides of the casing with the chlorine solution.

Add the calculated amount of calcium hypochlorite to the five gallon bucket of water and mix to dissolve. Pour the chlorine solution into the vent opening using a funnel or in through the top of the well casing after removing the well seal. Special provisions will be required for introducing the chlorine solution into artesian wells (flowing well). Contact the appropriate regional office for more information.

Place the end of the garden hose so the discharging water will flow into the well either through the top of the well casing or slowly through the funnel positioned in the vent hole. Turn the hose on and allow the water to run until a strong chlorine odor is noticed coming from the hose. Allow the hose to run water into the well for about an hour or enough time to thoroughly circulate the chlorinated water.

Wellhead set up to circulate chlorine solution within well. Adequate circulation within the well is needed prior to turning on faucets in the house.



DIVISION OF WATER QUALITY DWQ

Once the chlorine has been placed in the well, turn on each discharge point of the system (faucet etc.) until a strong chlorine odor is noted then turn off the faucet. Let the chlorine solution sit in the system for at least 24 hours. Do not use the system during this time as chlorine will be flushed to your septic system.

Before resuming use of your water system, you must rid the system of the chlorinated water. To flush the system, run water from an outside faucet until the chorine odor no longer remains. When flushing the system, drain the chlorine water away from plants and animals. **Do not allow the chlorine rich water to enter any surface water body or storm sewer.**

After Disinfection

If your well tested positive for bacteria before, it is important to get the water retested after disinfection. You can retest the well for bacteria about seven-to-ten days after disinfection. Remember that you must identify and remedy the source of the bacteria to keep the problem from recurring. The presence or absence of "indicator" bacteria such as total coliform determines if your water supply well is sanitary. Usually a properly constructed well can be effectively disinfected. However, if tests indicate that bacteria remain, you may need to have the well inspected. Foreign matter in the well such as animals, insects or bits of wood will have to be manually removed and the well disinfected again. Make sure the wellhead is properly sealed at all entry points. Cracks in the well casing will also allow bacteria to enter the well. If your well is in disrepair, it may be a good idea to drill a new well in accordance with the current regulations. If you have questions about disinfection or other well issues, please call your regional office.