Franklin County Environmental Health Department

6955 Hwy. 145, Carnesville, GA 30521 Phone: 706-384-5575 Fax: 706-384-4217

Water Sample Application

WATER TESTING FEES	
Water Sample	$40.00
Re-sampling	$25.00

Date: _____

Owner's Name: _____

Owner's Address: _____

Phone: _____ **Fax:** _____ **Email:** _____

Contact Name: _____ **Phone:** _____

Sample Address _____

Directions: _____

_____

Send results to: _____

Address: _____

Phone: _____ **Fax:** _____ **Email:** _____

Is the well protected with a slab around the casing? □ **Yes** □ **No** **Type of well:** **Bored** **Drilled**

Reason for sample: _____

Well location: _____

Comments: _____

Sketch location of well in relation to house

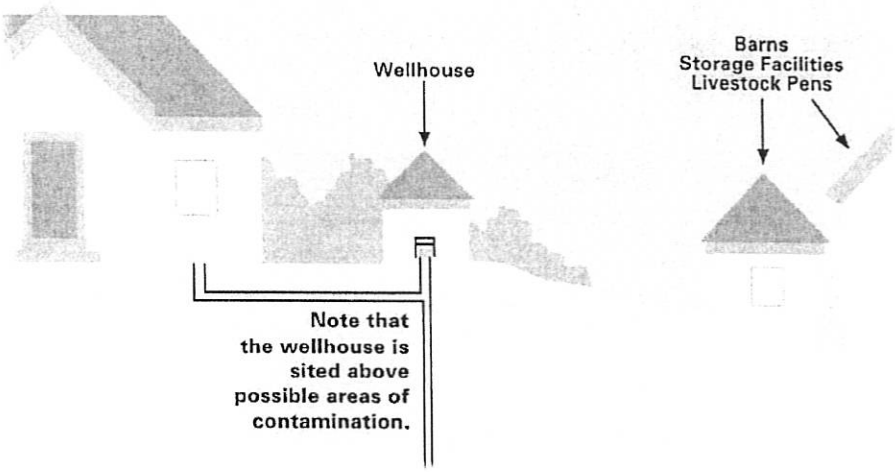
Note: Environmental Health only tests individual wells for two types of bacteria—Coliform and E. Coli. Public water supplies are not tested by this Department. The sample must be collected and returned to the Health Department by the Environmental Health Specialist. Testing then takes at least 24 hours. Results and additional information will be provided initially by phone to the person indicated above. A letter will be subsequently mailed, emailed or faxed as requested. Protection and Disinfection Instructions are attached and should be followed if results are positive.

HOUSING & ENVIRONMENT

THE UNIVERSITY OF GEORGIA
COOPERATIVE EXTENSION SERVICE
JORGE H. ATILES
PAUL F. VENDRELL

PROTECTING YOUR WELL AND WELLHEAD

If you are one of the many Americans who use groundwater, the proper protection of your well and wellhead is essential for the health of your family, yourself, and your neighbors. Groundwater is susceptible to contamination from a variety of sources, including septic tanks, pesticides, and household chemicals. As hundreds of wells often tap into the same aquifer (large underground water supply), it is essential to prevent contamination from reaching these vital underground resources. In addition, properly protecting your wellhead is often an easier and less expensive means of ensuring the safety of your water supply than is a water treatment system.



SIX PRINCIPLES OF WELLHEAD PROTECTION

The following principles were developed at the University of Georgia. Using these guidelines will help ensure the safety of your well water.

1. Proper Well Siting

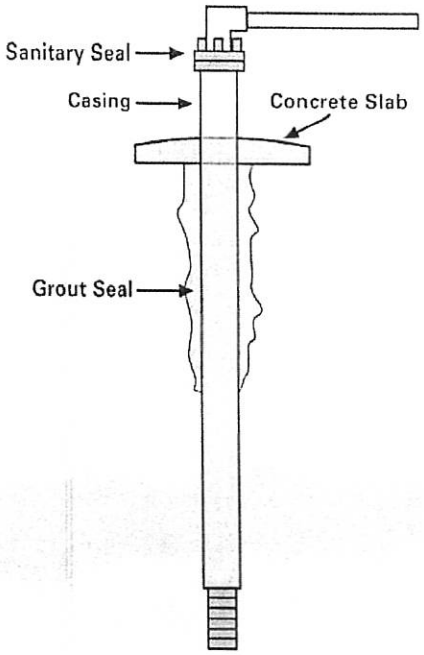
Safety, rather than convenience or economy, should be the first priority when selecting a location for your well. Ideally, a well should sit high in the landscape so surface water drains away from it. The well should not sit in a flood-prone location. Also, be sure to site the well uphill from runoff that may include contamination such as pesticides.

2. Proper Well Construction

A properly constructed and sealed well greatly reduces the risk of contamination. Be sure to examine the following:

- The casing, a plastic or steel pipe that runs the depth of the well, should be sealed with a tight-fitting, vermin-proof well cap.
- The space between the casing and the sides of the hole should be sealed with grout to prevent pollutants from flowing down the well.
- The well casing should extend 1 to 2 feet above the surrounding land to prevent surface water from running down the casing.

HOUSEHOLD WATER QUALITY SERIES 1



3. Keep Contaminants Away From Your Well

To prevent contamination from accidental spills or seepage, possible sources of contamination should be kept away from the well. These include:

- Septic tanks and waste lagoons (cesspools)
- Dead animal burial pits
- Animal enclosures
- Pesticide, fertilizer, or petroleum storage facilities

Keep in mind the following tips:
NEVER store chemicals in your wellhouse.
NEVER dispose of household chemicals by flushing them down the toilet.
NEVER dispose of motor oil by dumping it on the ground. Call a local auto repair shop or service station for information on disposal.

4. Backflow Prevention

Backflow can occur in a variety of ways. If your well pump unexpectedly stops while a hose is submerged in chemicals, the backflow could vacuum those chemicals directly into your well. Lawn sprinklers in low areas can also funnel pollutants into your well. To help prevent backflow:

- Never submerge a hose into any potential contaminating material.
- Install a simple atmospheric vacuum breaker on each outside faucet (these can be purchased at a nearby hardware or home supply store).
- Install a double check valve backflow preventer between a well and an irrigation system.

5. Sealing Abandoned Wells

Abandoned wells are common throughout rural areas. They present a variety of health hazards, including allowing a way for pollutants to access groundwater. Make sure that any abandoned wells on your property are filled, sealed, and plugged. Such precautions will insure against pollution and against the possibility of someone falling into the well. Abandoned wells should never be used for the disposal of garbage or other contaminants!

Remember that a poorly constructed well provides direct access for contaminants on the surface to pollute your groundwater and make you sick!

6. Testing Well Water

It is the responsibility of the user of the well to have their private water supply tested, particularly for bacteria and nitrates. Testing should be carried out routinely to ensure the safety of your well water. Also remember that testing should be done any time there is a change in the taste, clarity, or smell of your water. To have your water tested, contact either your county extension agent or a certified private laboratory.

The University of Georgia offers an opportunity for well owners to assess the risk associated with their wells through the HOME*A*SYST / FARM*A*SYST program. These self-assessments will allow you to determine the risks associated with your well. For more information, contact your county agent or visit www.fcs.uga.edu/housing. Click on water.

Sources:
Tyson, Anthony W. *"Wellhead Protection for Private Domestic Wells,"* The University of Georgia College of Agricultural and Environmental Sciences.
"Wells and Well Head Protection," Clemson Extension, Clemson University.
"Eliminating an Unnecessary Risk: Abandoned Wells and Cisterns," Missouri Department of Natural Resources.
"BMPs for Wellhead Protection," University of Idaho Cooperative Extension System.
Risse, Mark & Williams, Tina. FARM*A*SYST Wellhead Protection, University of Georgia.
Reviewers: Julia Gaskin, David Kissel, Mark Risse, Penny Thompson, and Carl Varnadoe, The University of Georgia; Jane Perry, Georgia Department of Human Resources; Calvin Sawyer, Clemson University
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COLLEGE OF FAMILY AND CONSUMER SCIENCES
and the
COLLEGE OF AGRICULTURAL AND ENVIRONMENTAL SCIENCES
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Gale A. Buchanan, Dean and Director

DISINFECTING YOUR WELL WATER: SHOCK CHLORINATION

A standard treatment for sanitizing your well system is shock chlorination. Guidelines for using this treatment safely and effectively are listed below.

THE UNIVERSITY OF GEORGIA
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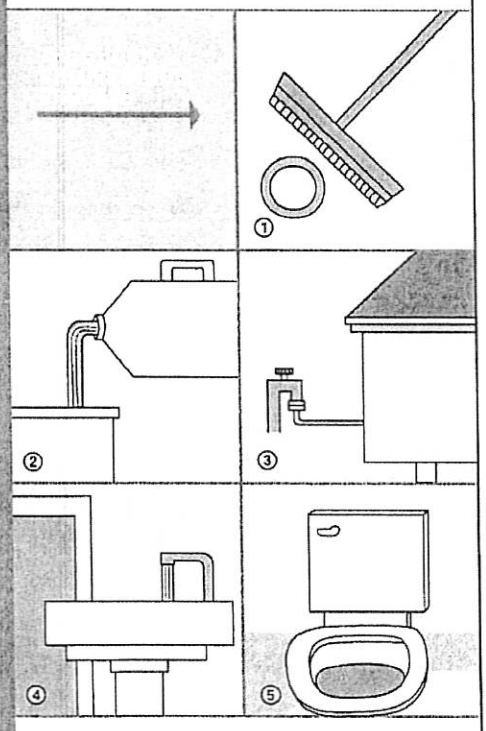


WHAT IS SHOCK CHLORINATION?

Shock chlorination is the process by which home water systems such as wells, springs, and cisterns are disinfected using household liquid bleach (or chlorine). Shock chlorination is the most widely recommended means of treating bacterial contamination in home water systems.

WHEN SHOULD SHOCK CHLORINATION BE USED?

Shock chlorination is recommended:

- upon completion of a new well or when an unused well is returned to service
- if annual water test results indicate the presence of bacteria
- if a well system is opened for any installation, repair or maintenance
- whenever the well is surrounded by flood waters (standing water around or covering the well casing)
- if well water becomes muddy or cloudy after a rain
- if the well has iron bacteria or sulfur-reducing bacteria symptoms like slime (biofilm) or odor

IS SHOCK CHLORINATION ALWAYS EFFECTIVE?

After shock chlorination, bacterial contamination may reoccur if a source of contamination persists, such as:

- a nearby malfunctioning septic system
- a pathway for surface water entry to a well, such as:
  - an improper well location
  - absence of a well cap or an improperly placed or loose well cap
  - inadequate grouting or other faults during well construction
  - a cracked well casing

Shock chlorination is NOT a recommended method for treating recurring bacteria problems. The source(s) of such contamination should be identified and eliminated by a licensed well driller/contractor. Another option is to install a continuous disinfection treatment system.

SHOCK CHLORINATION AND TEMPORARY ARSENIC RELEASE

Although shock chlorination will sanitize wells, it may temporarily increase the arsenic levels of water in areas where aquifer sediments contain high levels of arsenic (WDNR, 2008). Arsenic occurs naturally in some bedrock and aquifer sediments in the southern coastal plain (SCP) region of Georgia, and it has been found in drinking water from some private wells in this region. When the water table is lowered due to pumping of groundwater, the sediments in groundwater are exposed to oxygen. Oxygen helps in dissolving some of the arsenic contained in sediments. Similarly, because chlorine is a strong oxidant, it could dissolve arsenic from sediments and release it into the groundwater.

HOUSEHOLD WATER QUALITY SERIES 4

If well owners have detectable levels of arsenic in water, the following steps may be useful:

1. Do not use either acid or alkaline bleach solution. Solution with pH 6-7 is best.
2. Do not leave chlorine solutions inside well casings for longer times than prescribed (12-24 hours).
3. Well casings, holding tanks and pipes should be flushed thoroughly until no residual levels of chlorine are found.
4. Well water for drinking should be tested for arsenic after shock chlorination to make sure the arsenic concentration is at a safe level (less than 10 ppb).

WHAT PRECAUTIONS SHOULD BETAKEN PRIORTO SHOCK CHLORINATION?

Shock chlorination is used to remove bacterial contaminants from well water, well casings, holding tanks and the whole water supply system. A licensed well driller is trained to shock chlorinate. Should you decide to shock chlorinate your well yourself, take the following precautionary measures:

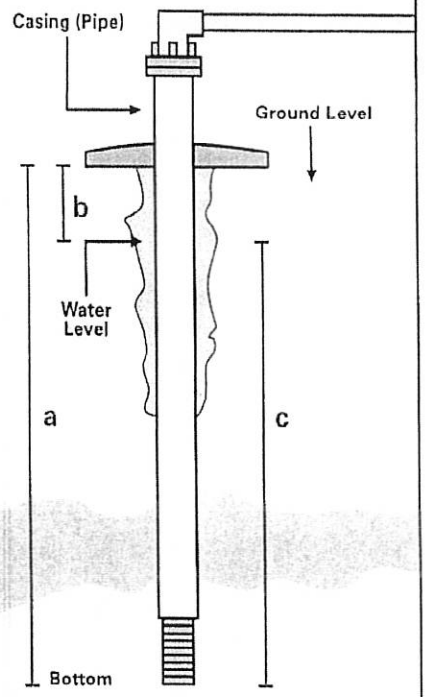
- **Concentrated chlorine solutions for shock chlorination can be dangerous.** Because of the volatile and corrosive nature of the concentrated chlorine solution, it is important to wear appropriate clothing, including goggles, a protective apron, and rubber gloves and boots. Mix and add chlorine solution in a well-ventilated area.
- **High chlorine levels in water after shock chlorination.** Arrange for an alternative source of drinking water. Make sure that children and older adults do not consume tap water during treatment.
- **Chlorine should have enough contact time to kill the bacteria.** Make sure that no one in your home uses the water for any purpose during the 12 to 24 hour treatment.
- **Preventing electric shock from the water pump.** Before removing the well cap or cover, turn the pump circuit breaker off. In Step 3 of the shock chlorination process below, you will need to turn the power back on, but be sure to turn the pump circuit breaker off again before replacing the well cap or cover (Step 6). Wear waterproof rubber boots.
- **Protecting components of water supply and treatment devices.** Shock chlorinating a water supply system can potentially damage components such as pressure tanks, some filters and filter media, and other treatment devices. Before you begin, disconnect all carbon filters and reverse osmosis units attached to your household water lines. The strong chlorine solution can damage these filters. However, some water softeners, iron filters and sand filters may not be damaged. Check with component manufacturers before shock chlorinating your water supply system to determine how to bypass or protect this equipment if necessary.

WHEN WILL THE WATER BE DRINKABLE AGAIN AFTER SHOCK CHLORINATION?

Wait one to two weeks after shock chlorinating the water supply system to re-test for total coliform and E. coli bacteria. Follow sample collection instructions carefully. If the test results show the absence of coliform bacteria, the water is safe to drink. However, if test results show the presence of coliform bacteria, the source(s) of contamination should be identified and eliminated through a licensed well driller/contractor or a continuous disinfection treatment system should be installed.

WHAT KIND OF CHLORINE BLEACH SHOULD BE USED?

Use the plain (and generally least expensive) unscented household chlorine bleach with at least 5% sodium hypochlorite found in supermarkets; do NOT buy fresh scent, lemon or other scented chlorine products.



HOW MUCH CHLORINE DO I USE?

When using ordinary laundry bleach, 3 pints should be added for every 100 gallons of water in the well. To determine the amount of standing water in your well, follow the steps below.

1. Determine the depth of water in your well, which is the distance from the bottom of the well to the water level. To find this information, measure the distance from the ground level to the water level (distance "b" in the diagram). Subtract "b" from the well depth "a" to find the total depth of the water: a - b = c. If you do not know the depth of your well, but you know the well drilling company who constructed it, contact that company. Well drillers often keep records of all the wells they drill. If you can't find any records about your well, contact a licensed well driller to assist you in taking the appropriate measurements.

2. Determine your well's storage per foot of water. This number is based on the diameter of your well. Generally, there are two types of wells: drilled and bored. The inside diameter of the casing (well pipe) of a drilled well is typically between 4 and 10 inches. Bored wells are larger, ranging from 12 to 36 inches. Refer to the following table to determine your well's storage per foot of water.

Drilled Well/Pipe		Bored Well	
Diameter (inches)	Storage per foot of water (gal/ft)*	Diameter (inches)	Storage per foot of water (gal/ft)
4"	0.653	12"	5.88
5"	1.02	16"	10.5
6"	1.47	20"	16.3
7"	2.00	24"	23.5
8"	2.61	28"	32.0
9"	3.30	32"	41.8
10"	4.08	36"	52.9

* If your well diameter is not listed in the above table, or if you use a cistern or reservoir, you will need to contact your local Extension office for more information.

3. Multiply your total depth of water "c" times your storage per foot of water "s." For this example we will assume that "c" is 204 ft. The product will be the volume of water in your well: 204 x 1.47 = 300 gal.

4. Pour 3 pints of bleach into your well for every 100 gallons of water and add 3 extra pints to treat the household plumbing such as the pressure tank, hot water heater and pipes. If the volume of water in your well is 300 gallons, you will add 9 pints of bleach to treat the well and 3 extra pints for the plumbing for a total of 12 pints or 1.5 gallons:

$$\frac{300 \times 3}{100} + 3 = 12\ pts = 1.5\ gal$$

If the depth of the water in the well is unknown, use a volume of bleach equal to two times the 150 ft water depth for the appropriate casing diameter. For example, an 8-inch casing diameter with 150 ft water depth would require 1.85 gallons of household bleach. If the water depth is unknown, the required amount of bleach will be 1.85 x 2 = 3.7 gallons. Do not use bleach in excess of the recommended amount because it is not necessary and will require additional flushing before household use.

THE SHOCK CHLORINATION PROCESS

1. **CLEAN:** Remove all loose or foreign debris from the well house, spring house or storage tank. Turn the pump circuit breaker off and remove the well cap or cover. Then scrub the accessible interior surface with strong chlorine solution (1/2 gallon chlorine bleach per 5 gallons clean water). If the well does not have a sanitary cap in good condition it must be replaced with a new one to avoid recontamination.
2. **CALCULATE AND POUR:** Pour 3 pints of chlorine bleach per 100 gallons of water plus an additional 3 pints into your well as described above.
3. **MIX:** Attach a clean garden hose to the outdoor faucet nearest the well and place the end of the hose inside the well. Turn the faucet on, then turn the pump back on and let water run until you smell chlorine coming out of the hose. Using the hose, wash down the interior of the well casing for about 15 minutes and close the outdoor faucet.
4. **CIRCULATE:** Allow the solution to circulate throughout the system. Open each faucet, first outside, then inside the house (both hot and cold), one at a time, and let the water run. Close each faucet after a strong chlorine odor is detected. Flush the toilets one at a time. If a strong chlorine odor cannot be detected at each faucet and toilet, pour an additional 3 pints of bleach into the well and try again.
5. **FLUSH AND FINISH:** Turn the pump circuit breaker off, return the well cap or put the cover back in place. Allow chlorinated water to remain in the system for 12 to 24 hours. Turn the pump circuit breaker on. Rid the system of the remaining chlorine by turning on outside faucets, one at a time, and letting them run until you no longer smell chlorine. Finally, run the indoor faucets, one at a time, until water is clear and the chlorine smell is gone. Flush each toilet. Do not run more than 100 gallons of chlorinated water into your septic system or allow it to drain into a stream, pond or lake through a drainage ditch. To conserve the water, you may run it into a storage tank and use it to water vegetation after the chlorine dissipates.

Sources:

"Shock Chlorination of Home Wells, Springs and Cisterns," University of Georgia Cooperative Extension.

"Shock Chlorination of Domestic Water Supplies," Cooperative Extension Service, University of Nebraska-Lincoln.

Virginia Household Water Quality Program: Shock Chlorination: Disinfecting Private Household Water Supply Systems. Virginia Cooperative Extension, Virginia Polytechnic Institute and State University.

WDNR. 2008. Well Chlorination in Arsenic Sensitive Areas. PUB-DG-069 2002 Wisconsin Department of Natural Resources. Available online at: http://dnr.wi.gov/org/water/dwg/wellchlorination.pdf

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