

Disinfecting Private Wells

Editor's Note:

Technical specialists with the National Environmental Services Center (NESC) field hundreds of calls each year. One topic that comes up on a regular basis is how to disinfect a private well. The following information is based on advice we give to callers with this question.

The National Ground Water Association recommends that private well owners have their water tested on an annual basis. A common water quality test will note the presence (or absence) of a group of bacteria called coliform.

Members of the coliform group are found in the intestinal tract of warm-blooded animals, as well as in soil. Coliform bacteria in a drinking water supply indicates that contamination may be present, and the water is not safe for human consumption. For private well owners, a common and fairly simple solution to this problem is to shock chlorinate the well.

Disinfecting Your Well

Shock chlorination is a method of sanitizing a well with chlorine (most often household bleach). The table at the right shows the amount of chlorine needed for disinfecting various well sizes.

For a common, six-inch diameter well with 150 feet of water, use three quarts of bleach added to four gallons of water. Pour this solution directly into the well.

In the house, open one faucet at a time and run them until you detect the smell of chlorine, then turn the faucet off. If you

do not smell chlorine at each tap, add more chlorine solution to the well.

Let the chlorinated water sit in the well and lines for 12 to 24 hours. Flush the system by letting each faucet run until the smell of chlorine dissipates. If your home has an onsite wastewater system, open outside faucets first and let the water run on the ground to reduce the load on the septic system.

Retest the well water after waiting one to two weeks. If the bacteria problem persists, you may need to have continuous disinfection.

Upgrade Your Well

To protect your well from contamination, proper construction is essential. (See the Tech Brief titled “Preventing Well Contamination” in the fall 2003 *On Tap*—available online at www.nesc.wvu.edu—for more information about well construction.)

According to “Shock Chlorination of Wells and Springs,” an Ohio State University Cooperative Extension Services

it on the grass to work on it, and returning it to the well is enough to contaminate the well with bacteria.”

What about springs?

“Shock chlorination of a spring is more difficult,” states OCES. “If possible, divert spring water away from the spring box. Mix about 1/2 cup of household bleach in five gallons of water and scrub the walls of the spring box or holding tank or both. Return the flow of spring water back into the spring box and let the fresh water

carry the chlorine through the pipeline to disinfect the plumbing.”

Other Considerations

Chlorine is a potentially dangerous material. Wear rubber gloves, eye protection (such as goggles), and a protective apron when disinfecting the well.

Never mix chlorine with other cleaning materials, particularly ammonia, because toxic gases will form. Do not use scented bleaches; use only the plain kind.

In addition to the well, it is important to disinfect water treatment equipment

such as water softeners, iron filters, and sand filters. However, do not chlorinate carbon or charcoal filters; doing so will use up their capacity. Check the manufacturer’s literature before chlorinating any treatment units.

For More Information

If you have a question about drinking water matters, including shock chlorination, call NESC’s technical staff toll free at (800) 624-8301 and select option “3.”

NESC also has several products related to well care, operations, and maintenance:

EPA’s *Manual of Individual and Non-Public Water Supply Systems*. (Product # DWBKDM06)

EPA’s *Manual of Water Well Construction Practices*. (Product # DWBKDM01)

Amount of chlorine needed for shock chlorination.

Laundry bleach (about 5.25% Hypochlorite)

Depth of water in well	Casing diameter				
	4-inch	6-inch	8-inch	10-inch	12-inch
10 feet	1/2 cup	1 cup	1 1/2 cups	1 pint	2 pint
25	1 cup	1 pint	2 pints	3 pints	4 1/2 pts
50	1 pint	1 quart	2 quarts	3 quarts	1 gal
100	1 quart	2 quarts	1 gal	1 1/2 gal	2 gal
150	3 pints	3 quarts	1 1/2 gal	2 gal	3 gal

High-Test Hypochlorite (HTH 65-75% Hypochlorite)

Depth of water in well	Casing diameter				
	4-inch	6-inch	8-inch	10-inch	12-inch
10 feet	–	–	–	–	–
25	–	–	–	1/4 lb	1/2 lb
50	–	–	1/3 lb	1/2 lb	3/4 lb
100	–	1/3 lb	3/4 lb	1 lb	1 1/2 lb
150	1/4 lb	1/2 lb	1 lb	1 1/2 lb	4 lb

Source: <http://ohioline.osu.edu/aex-fact/0318.html>

(OCES) fact sheet, “although well pits were the common method of construction several years ago, they are no longer considered sanitary construction. The well casing of a properly protected well extends above the surface of the ground. The ground slopes away from the well to prevent water from collecting around the casing.” (See the diagram on page 40.)

“Develop a properly protected spring underground and channel the water to a sealed spring box. At no time should the water be exposed to the ground surface,” the OCES publication continues. “It is important to keep the plumbing system clean to maintain a sanitary water supply. Each time work is done on the plumbing or pump, the entire water system should be disinfected with chlorine. Simply pulling the pump out of the well, setting

The brochure “Iron Bacteria Problems in Wells.” (Product # DWBROM28)

The factsheet “Shock Chlorination of Wells and Springs.” (Product # DWBLOM05)

To order any of these products, call NESc at (800) 624-8301, fax (304) 293-3161, or e-mail info@mail.nesc.wvu.edu.

Please indicate the product number, title, and quantity needed. Be sure to include your name, organization, address, and phone number with each order.

The Water Systems Council provides information about

private wells. Call their Wellcare hotline at (888) 395-1033 or visit their Web site at www.watersystemscouncil.org.

In October 2004, the U.S. Environmental Protection Agency (EPA) launched a Web site devoted to private drinking water wells at www.epa.gov/OGWDW/privatewells/index2.html.

Figure 1: General Resource Protection Well—Cross Section

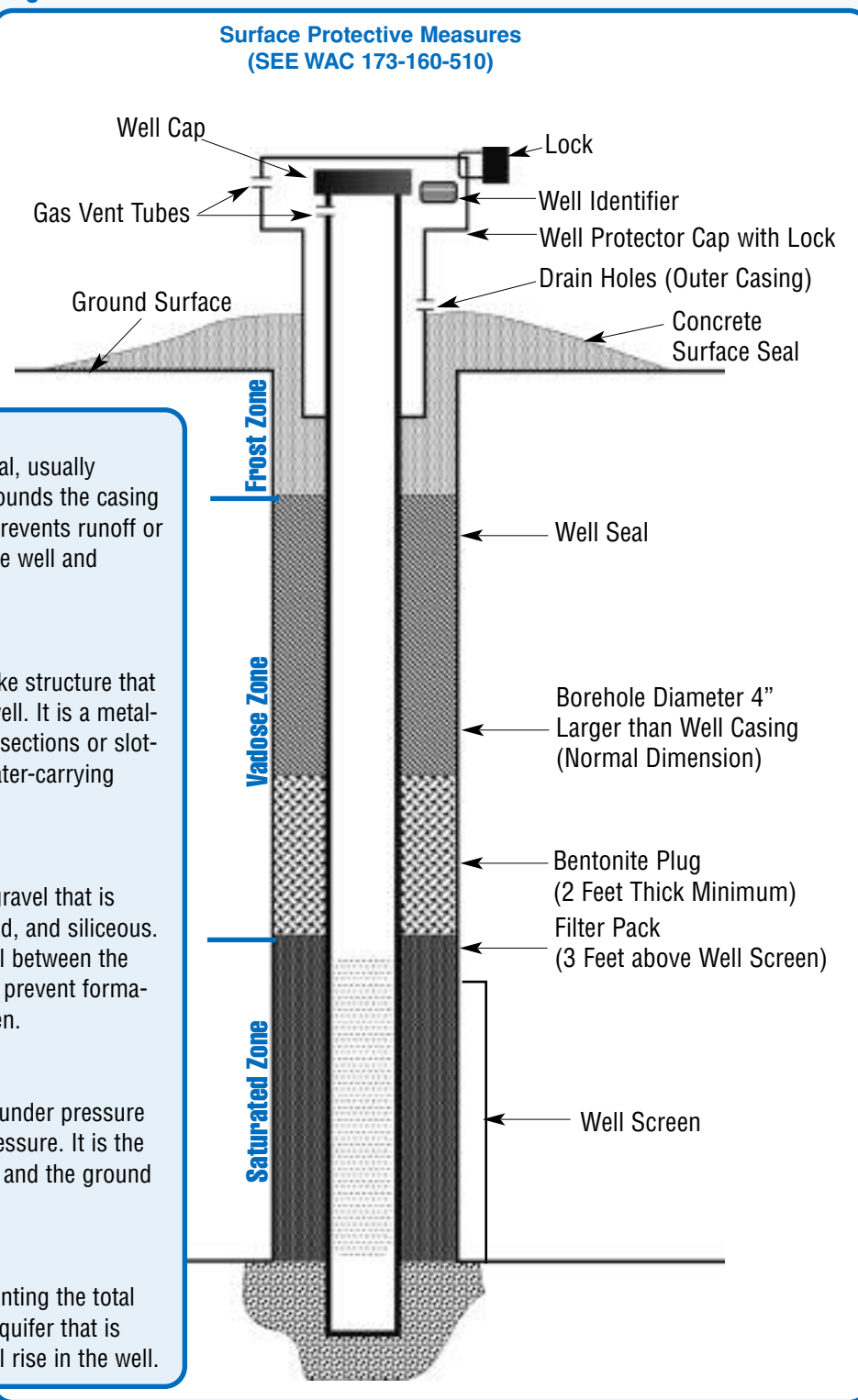


Figure 1: Definitions

Well seal:

A seal is a cylindrical layer of material, usually cement, bentonite, or clay, that surrounds the casing up to a certain depth in the well. It prevents runoff or other contaminants from entering the well and serves to further protect the casing.

Well Screen:

A well screen is a cylindrical sieve-like structure that serves as the intake portion of the well. It is a metallic pipe that has holes or perforated sections or slotted sections that is placed on the water-carrying zones of the aquifer.

Filter pack:

A filter pack is made up of sand or gravel that is smooth, uniform, clean, well-rounded, and siliceous. It is placed in the annulus of the well between the borehole wall and the well screen to prevent formation material from entering the screen.

Vadose Zone:

This is the zone that contains water under pressure less than that of the atmospheric pressure. It is the layer of soil between the water table and the ground surface.

Potentiometric surface:

This is an imaginary surface representing the total head of groundwater in a confined aquifer that is defined by a level to which water will rise in the well.

Adapted from *Groundwater and Wells, Second Edition* by Fletcher G. Driscoll, Ph.D.