



## Disinfection of a Public Water System Well

*The following instructions are intended to assist public water systems with the process of disinfecting their public water system well.*

### Requirements

In accordance with Ohio Administrative Code (OAC) Rule 3745-9-08, all public water system wells are to be properly disinfected by chlorination before being placed into service or returned to service after completion of construction, installation, development, alteration, or repair. The following instructions include a summary of the well disinfection procedure specified in the rule as well as additional information to assist with completing the procedure. The procedure for disinfecting an artesian well is included at the end of this document. Instructions on how to disinfect a well and a distribution system are included in the “Disinfection of a Public Water System Well and Distribution System” document.

### Procedure

1. It is recommended to remove all loose debris, sediment, mineral encrustation and bacterial slime from the well prior to disinfection. This can be done through physical and/or chemical cleaning. A state-registered well driller can assist with this process.
2. **Determine the type of disinfectant to add.** The calculations in these instructions apply to 6% unscented sodium hypochlorite (e.g., household bleach). Do not use bleach with fragrance additives. When using calcium hypochlorite tablets or granules, the tablets or granules shall be completely dissolved prior to placing them into the well.
3. **Determine the amount of disinfectant (e.g., bleach) to add.** The disinfectant concentration in the well shall initially be at least 100 mg/L chlorine. Table 1 can be used to determine the amount of bleach necessary.

**Table 1. Amount of Bleach (6% Sodium Hypochlorite) Needed**

Well Diameter (inches)	Depth of Water in the Well <sup>1</sup>					
	1-50 ft.	51-100 ft.	101-150 ft.	151-200 ft.	201-250 ft.	251-300 ft.
4	1 cup	2 cups	3 cups	3.5 cups	4.5 cups	1.5 quarts
4.5	1 cup	2.5 cups	3.5 cups	4.5 cups	1.5 quarts	0.5 gal.
5	1.5 cups	3 cups	4 cups	1.5 quarts	0.5 gal.	0.5 gal.
6	2 cups	4 cups	1.5 quarts	0.5 gal.	2.5 quarts	3 quarts
7	3 cups	1.5 quarts	0.5 gal.	3 quarts	1 gal.	1 gal.
8	3.5 cups	0.5 gal.	3 quarts	1 gal.	1 gal.	1.5 gal.
9	1.5 quarts	0.5 gal.	1 gal.	1 gal.	1.5 gal.	1.75 gal.
10	1.5 quarts	3 quarts	1 gal.	1.5 gal.	1.75 gal.	2 gal.
11	0.5 gal.	3 quarts	1.25 gal.	1.75 gal.	2 gal.	2.5 gal.
12	0.5 gal.	1 gal.	1.5 gal.	2 gal.	2.5 gal.	3 gal.

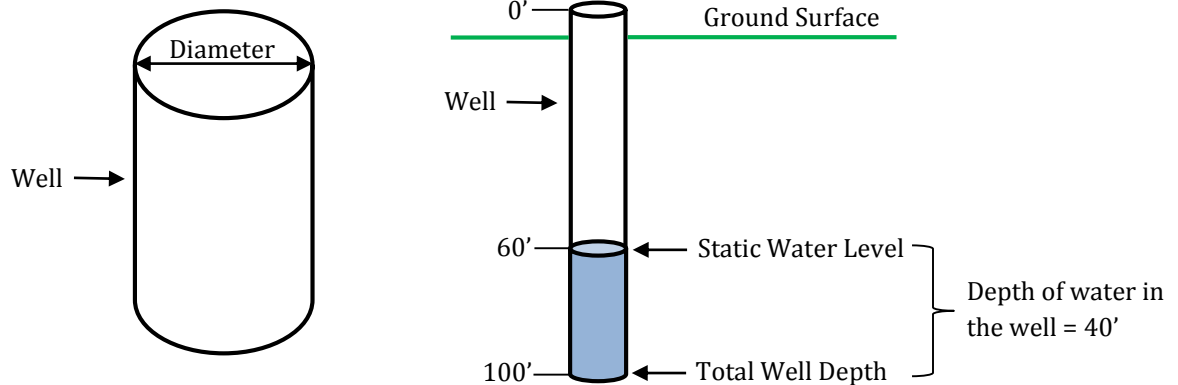
The depth of water in the well can be determined using the well log and the following formula:

$$^1\text{Depth of water in the well} = \text{Total well depth} - \text{Static water level}$$

The **well log** is a record of the construction, depth, and geologic material encountered in the well. Well logs can be searched for here: <https://apps.ohiodnr.gov/water/maptechs/wellogs/appNew/Default.aspx>

**If the static water level or total well depth are unknown, contact the Ohio EPA District Office for assistance.**

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### **EXAMPLE:**

You have a 6-inch diameter well. According to the well log, the static water depth is 60' and the total well depth is 100'. Therefore, the depth of water in the well =  $100' - 60' = 40$  feet of water in the well. Using Table 1, a 6-inch diameter well with 40 feet of water would need 2 cups of bleach (6% sodium hypochlorite).

4. It is recommended to mix the bleach with water prior to pouring it down the well to ensure there is enough disinfectant available to adequately disinfect the well and its components. For example, fill a new 5-gallon bucket (or a clean one reserved for this purpose) halfway with water and add the necessary amount of bleach.
5. **Remove the well cap and add the chlorine solution to the well.** Slowly pour the disinfectant into the well by wetting the inside casing walls, drop pipe, and electrical cable.
6. **Agitate or surge the water in the well.** Water in the well must be agitated or surged to ensure even distribution of the disinfectant throughout the entire water column. Recirculating water back into the well casing from an outside spigot may distribute chlorine throughout the water column if the well pump is located at the bottom of the well. To do so:
  - a. Run a food grade hose from a nearby spigot directly into the well. A food grade hose looks similar to a garden hose, but meets ANSI/NSF Standard 61 for drinking water system components.
  - b. To circulate water through the well, turn on the spigot for approximately 15-30 minutes from the time you smell chlorine from the food grade hose.
  - c. During this process, debris can slough off the sides of the well casing and iron and manganese deposits can begin to form. If you notice a significant amount of debris or discoloration in the water during the agitation/surging process, you can pull the hose out of the well and run it to waste until there is a decrease in the amount of debris and/or discoloration. If this occurs, you may need to repeat steps 4 through 6 by adding more bleach solution and repeating the agitation/surging process. Never discharge chlorinated water into any water body, wetland, or drainage ditch because it is extremely toxic to fish.
7. **Cap the well and allow it to stand without pumping for at least eight hours.**
8. **Flush the well.** After disinfection, a well shall be flushed for a minimum of 15 minutes and total chlorine shall be undetectable before sampling for total coliform.
9. **Collect total coliform samples.** The well may be placed into service when 2 consecutive samples collected from the well at least 30 minutes apart are total coliform negative. Microbiological and total chlorine samples shall be analyzed in accordance with OAC Chapter 3745-89 and Rule 3745-81-27.
10. **Proceed as follows based on the total coliform sample results:**
  - a. **At least one sample is positive ("unsafe").** If any of the bacterial samples taken from the well in step 9 are reported as total coliform positive, then do one of the following:
    - i. Repeat steps 8 and 9 by thoroughly flushing the well, then collecting 2 additional samples at least 30 minutes apart; or
    - ii. Repeat steps 4 through 9. If either total coliform sample is still positive ("unsafe") after a second chlorination, contact the Ohio EPA district office.
  - b. **Both samples are negative ("safe").** The well may be placed back into service.

# Disinfection of a Public Water System Well

## Procedure for Disinfecting a Flowing Artesian Well

Flowing artesian wells generally do not require disinfection. If a flowing well is testing positive for bacteria, the following protocol may be used to disinfect the well:

Chlorine should be applied at or below the lowest aquifer formation producing the artesian condition in an amount that will produce a chlorine concentration of at least 25 mg/L in the flowing water. The chlorine may be introduced through a weighted tube discharging a solution with a high concentration of chlorine (such as 15,000 mg/L) or using calcium hypochlorite tablets confined in a perforated container.

## Contact

For more information, contact your inspector in the appropriate District Office:

**Northwest:** 419-352-8461

**Northeast:** 330-963-1200

**Central:** 614-728-3778

**Southwest:** 937-285-6357

**Southeast:** 740-385-8501