Is Your Well Flooded? Disinfect It before You Drink It!

If your private well is flooded, do not use water from it before:

1. The floodwaters have receded from the well and your plumbing system.
2. You have disinfected the well and your plumbing.
3. You have sampled your water and received a lab report confirming that the disinfected water contained no harmful organisms.

In these instructions we tell you how to disinfect your well and your household plumbing system and then how to sample the water for analysis by a bacteriological laboratory.

You can use these steps any time you suspect that your well has become contaminated by harmful bacteria or other organisms, not just after a flood.

Before You Begin

Know the Hazards

First, be aware of the possible hazards involved in disinfecting your well:

- You will be working with water and electricity. Use the appropriate precautions to avoid electrical shock.
- You will be using liquid bleach or solid calcium hypochlorite. These chemicals can burn your skin and eyes and whiten your clothing if handled improperly. Read the manufacturer's warnings on the label and take the recommended precautions.

If you are careful, you should come to no harm.

Find Another Source of Water

Before you start, make sure you have enough drinking water from another source for all the drinking, cooking, and bathing you will need to do for at least 12 to 24 hours.

Consider these options for other sources:

- Bottled water
- Water from some other source that is known not to be contaminated
- Water that you boil before use. If you choose to boil water, heat it to the boiling point and let it continue at a full boil for two minutes. Let it cool before using it for drinking or bathing.
- Water that you have disinfected another way. Find information online about disinfecting water at <www.epa.gov/safewater/faq/emerg.html>.

You also need to have some extra water available to flush toilets, but that does not have to be drinking water.

Know How Long You Need

First, you need time for the three steps of disinfecting your well and plumbing system. Then, you need time for sampling and analysis:

1. **Disinfect the well itself:** about an hour and a half.
2. **Disinfect the rest of your plumbing:** 12 to 24 hours.
3. **Flush the system:** varies; about 5 to 10 minutes a faucet
4. **Sample the water and send it to the lab:** perhaps 15 minutes
5. **Get the results back from the lab:** about two days

Sampling the water is very important. To be on the safe side, don't drink or cook with water from your well until a bacteriological lab confirms that the water is free of harmful germs.

How to Disinfect Your Well and Plumbing System

Start by gathering the information and materials you will need.

Find out where these are:

- The power switch to your well pump
- The power to your water heater
- The wellhead (This is the concrete pad on top of the well. It might be in your pumphouse or just outside somewhere. It generally has a pipe sticking out that goes to your pressure tank.)
- The faucet nearest to the wellhead (This should be a water tap that you can hook a garden hose to.)
- If your well is pressurized, the pressure release valve (it might look like a faucet)
- The well access plug (it might look like a large bolt)

A typical wellhead.

Gather these materials:

- Liquid chlorine bleach ("bleach," in the rest of these instructions) or solid calcium hypochlorite

Table 1. How much disinfectant will I need?

If your well is this deep:	Use this much bleach:	Or use this much solid hypochlorite:
Less than 100 feet	1 quart	1/8 cup
100 to 200 feet	2 quarts (1/2 gallon)	1/4 cup
200 to 300 feet	3 quarts	1/8 cup
More than 300 feet	4 quarts (1 gallon) or more	1/2 cup or more

- A wrench that fits the well access plug
- A funnel (wide-mouthed if you use calcium hypochlorite)
- A garden hose long enough to reach the wellhead from the nearest faucet

Where to get liquid chlorine bleach
Liquid chlorine bleach is sold as a cleaning product, but not all bleaches in the store will work for your well:

- **Don't** get bleach that is scented or odorless—it should have a sharp chlorine odor.
- Find a list online of approved brands online at <www.tceq.state.tx.us/goto/bleach/>.
- You may use a bleach that is not on this list if it either has an NSF seal or says "meets NSF Standard 60" on the label.

The NSF seal. NSF International certifies products for specific uses—for example, bleaches for safety in treating drinking water. If you have any questions about whether a particular disinfectant is safe to use in your well, call the NSF at 1-800-NSF-8010.

Where to get calcium hypochlorite
Calcium hypochlorite is sold for chlorinating swimming pools. Because it contains more chlorine than bleach, it might be easier to work with, especially if you follow these tips:

- Make sure the calcium hypochlorite you use either has an NSF seal or says "meets NSF Standard 60" on the label.
- Get a granular or powdered form, not the large tablets. (They can be hard to break into pieces small enough to get into the well, and they can be slow to dissolve.)
- If you get a powdered form, be sure it's fresh. (The powder can lose its disinfecting power on the shelf.)

What not to use
Don't use other disinfectants in your well. After all, you want to drink this water! Especially avoid these:

- Scented (or "scentless") laundry bleaches
- Chlorine-free bleaches
- Disinfectants designed for hot tubs

Disinfect the Well
The time needed for this part of the process depends on whether or not you have a pressurized well. If your well has a screened vent at the wellhead, or if you have not had to use an air compressor to maintain water pressure, your well probably is not pressurized.

Disinfecting a Pressurized Well
This process takes at least 12 hours:

1. Turn off the power to the well pump and air compressor.
2. At the wellhead or pumphouse, find the pressure release valve. Before you open it, be sure that you are in the open and breathing fresh air, not the vented air. The vented air may contain hydrogen sulfide, methane, or other gases that sometimes can build up in wells.
3. Open the pressure release valve to release all the pressure in the well.
4. Remove the access plug. (Set it somewhere that you will not lose it.)
5. Put the funnel in the opening where you removed the access plug.
6. Pour in the bleach or calcium hypochlorite. (See Table 1 for the right amount to add.)
7. Replace the access plug. Let the well sit for at least 12 hours. During this waiting period:
   - Following the manufacturer's directions, turn off the power to your water heater and drain it.
   - Drain any other water-storage tanks that are connected to your plumbing system.
   - If you can, collect at least some of this water (for example, in 5-gallon buckets) to use whenever anyone needs to flush a toilet during the rest of the disinfection process.
   - Read the rest of these instructions—especially "How to Sample Your Water and Understand the Results" on page 9. You can save yourself some time later by finding a water-sampling kit now.
8. When this waiting period is over, turn on the power to your well pump and air compressor.

If you are not comfortable doing this process, you can call a local water-well driller and pay them to do it.

Disinfecting a Nonpressurized Well

1. Turn off the power to the pump.
2. Remove the access plug.
3. Put the funnel in the opening where you removed the access plug.
4. Pour in the bleach or calcium hypochlorite. (See Table 1 for the right amount to add.)
5. Connect the garden hose to the faucet nearest the wellhead.
6. Turn the power to the pump back on.
7. Turn on the faucet and run water through the funnel into the well for one hour. By circulating the

chlorinated well water, you will expose all fittings and equipment in the well to the chlorine solution and improve the germ-killing action.

8. During this hour:
   - Following the manufacturer's directions, turn off the power to your water heater and drain it.
   - Drain any other water-storage tanks that are connected to your plumbing system.
   - If you can, collect at least some of this water (for example, in 5-gallon buckets) to use whenever anyone needs to flush a toilet during the rest of the disinfection process.
   - Read the rest of these instructions—especially "How to Sample Your Water and Understand the Results" on this page. You can save yourself some time later by finding a water-sampling kit now.
9. After the hour is up, remove the garden hose and funnel and, right away, replace the access plug.

Disinfect Your Plumbing

To disinfect the rest of your plumbing system, you will fill the pipes with chlorinated water from the well and let everything sit for at least overnight—if you can, let it sit for 24 hours. For the best results, do it this way:

1. Working away from the well, go to the next available outside faucet. Turn it on, run the water until you can smell the sharp odor of bleach (chlorine), and then turn it off.
2. Repeat step 1 until you have reached all the outside faucets.
3. Refill the water heater, but don't turn the heat on yet.
4. Refill any water-storage tanks.
5. Go inside and flush each toilet until the water coming in smells chlorinated.
6. Repeat step 1 on each inside faucet. Be sure to include bathtubs, showers, and other faucets and to do the hot-water faucets as well as the cold.
7. If you have a chilled-water line on your refrigerator, run it until you smell the odor of bleach.
8. Now that your plumbing system is full of chlorinated water, let everything stand at least overnight or, if you can, for 24 hours to kill germs in your plumbing. During this time:
   - Don't use this water for drinking, cooking, bathing, washing clothes, or washing dishes.
   - You can use this water for flushing toilets, or you could use water collected from draining your water heater. If the toilet isn't clogged, it will flush if you pour in two or three gallons of water from a bucket.
   - If you have an icemaker, let it run, but throw out all the ice it produces.
   - Run your dishwasher and your clothes washer through a full cycle while they are empty.

Flush the System

After the chlorinated water has stood in your plumbing system for 12 to 24 hours, it has probably done all the germ-killing it can do. It's time to flush the system. This process will take about the same amount of time it took to fill the system with chlorinated water—perhaps 5 to 10 minutes per faucet, on average:

1. While you are carrying out the rest of these steps, drain your water heater and any other water-storage tanks connected to your plumbing system.
2. Starting with the outside faucet farthest from your well, open the faucet and run it until you no longer smell chlorine and the water is clear of any debris or color.
3. Working your way back toward the well, continue step 2 with each outside faucet. Don't do any inside faucets until you have finished outside—otherwise, you might flood the septic system.
4. Flush each toilet once.
5. Repeat step 2 with each inside faucet.
6. If you have a chilled-water line, run it until you no longer smell bleach. Throw out all of this water.
7. Refill the water heater and any other water-storage tanks.
8. Following the manufacturer's directions, turn the power to your water heater back on.
9. Run at least a rinse cycle on your dishwasher and your washing machine.

Your water should now be safe to use for bathing, washing clothes, and washing dishes, **but don't drink it or use it for cooking yet!** Before you do, there's one more important step: confirming that the water is safe to drink by taking a sample and having it tested.

More Than You Can Do?

If this process for disinfecting a well seems like more than you can handle, call a plumber or licensed water-treatment specialist and pay them to have it done for you. It's really not that complicated, but it's important to have the job done right.

How to Sample Your Water and Understand the Results

Now that you have disinfected the well and your plumbing system, there are four steps to getting a valid sample and a meaningful test result:

1. Get the right container and form
2. Collect the sample
3. Send the sample to the lab for analysis
4. Read the lab report and understand the results

In the meantime, protect yourself and your family from waterborne disease. Until you are sure that your water is not contaminated, don't use it for drinking, cooking, bathing, washing dishes, washing clothes, or household cleaning.

Get a Container and Form

You have to use a special container to collect a drinking-water sample and complete a special form to send with the sample to a lab for analysis:

- If your area is recovering from a hurricane, flood, or other natural disaster, recovery teams may be distributing water-sampling kits. Check with the recovery coordinator in your area to see if they can provide you with the container and form you need.

- If not, read “Public Health Laboratories in Texas” on pages 5 and 6. Call a lab near you and ask them to send you a kit for collecting a water sample for bacteriological testing. If you can’t reach a lab near you, it’s okay to use a lab that is farther away. The important thing is to find a lab that can serve you quickly.

Collect the Sample

Start by finding a good sampling location. The best site is an outside faucet that is in the open and does not leak:

- Take the sample at the faucet, not through a hose.
- Avoid sampling from fire hydrants, dirty areas, and areas behind bushes.
- Do not take samples from kitchen or bathroom sinks.
- Try not to sample in high or gusty winds or when it is raining.
- Handle samples carefully! It is easy to contaminate the samples. Contaminated samples give meaningless results.

Follow these steps to take the sample:

1. Do not open the sample container yet. Open the faucet to full flow for three minutes to clear the line.
2. Reduce the flow to a slow, steady, sprayless stream—about the thickness of a pencil (¼ inch).
3. Now, making sure not to touch the inside of the container, open it.
4. Do not rinse the container out—just fill it without splashing.
5. Close and seal the container. Make sure it doesn’t leak—leaking samples cannot be accepted for analysis.
6. Note the time. (You will need to enter this on the form you send in with the sample.)

Send the Sample to the Lab

Don’t delay! Your sample must arrive at the laboratory no more than 30 hours after you collect it. But first complete the form and pack the sample properly. If you have questions about this, ask the lab.

Fill Out the Submission Form

With your sampling container, there will be a bacteriological submission form. Here’s how to complete it for a private well:

- For “Name of Water System” item, write “Private.”
- For “County,” write in the name of your county.
- For “Send Results To:” enter your name and mailing address.
- Enter the date and time that the sample was taken.
- For “Type of System,” write “Individual.”
- For “Water Source,” give as much information as you can—for example, the location, diameter, and depth of the well. If you know the aquifer that the well is drilled into, enter that information, too.

Pack and Send In the Sample

Enclose the sample container in a plastic bag, seal it, and wrap the bag securely in bubble wrap or some other suitable padding. Put it and the form in a box or envelope and send it by express delivery to the lab for analysis.

Check Out the Results

It should take about two days for the lab to complete its tests and return the results to you. The most important part of the results is the part about coliform organisms. There are three possible outcomes:

- **Coliform organisms not found.** This is good news: As far as levels of harmful bacteria are concerned, your water is considered safe to drink at the time of sampling.
- **Coliform organisms found**. This is not good news. Coliform organisms are present in your water, and it might not be safe to drink. Here is what to do:
  - Don’t touch the water. Don’t use it for drinking, bathing, cooking, preparing food, making ice, washing dishes, or cleaning.
  - Instead, use bottled water, get water from another source, or boil your water or disinfect your water before you use it.
  - If you choose to boil your water, heat it to the boiling point and let it continue at a full boil for two minutes. Let it cool before using it for drinking or bathing.
  - To find out how to disinfect water, go online to <www.epa.gov/safewater/faq/emerg.html>.
  - Disinfect the well and repeat the test.
  - Until you get a test result of “coliform organisms not found” from the lab, continue to boil or disinfect your water, use bottled water, or use water from another source.
  - If repeated tests continue to show coliform organisms are present, consider adding continuous disinfection equipment to your well.
- **Unsuitable for analysis.** This is a gray area: The lab could not draw a conclusion, perhaps because of a sampling error. For example, if you rinse out the container before you collect the sample, the result might be “unsuitable for analysis.” (So don’t rinse out the container!) If you get this result, consider disinfecting the well again and repeating the test.

Public Health Laboratories in Texas

These public health laboratories can provide you with sampling kits and test water samples for you. Contact the laboratory to find out when they are open and how much analysis will cost.

Abilene–Taylor County Public Health District
850 North 6th
Abilene TX 79601
325-692-5600

City of Amarillo Department of Health
4001 S. Osage Street
Amarillo TX 79118
806-342-1549

Angelina and Neches River Authority
210 Lufkin Avenue
Lufkin TX 75901-0310
936-633-7527

Brazoria County Health Department
434 E. Mulberry
Angleton TX 77515-4736
979-864-1628

Brazos County Health District
201 N. Texas Avenue
Bryan TX 77803-5317
979-361-4440

Corpus Christi–Nueces County Public Health District
P.O. Box 9727
1702 Horne Road
Corpus Christi TX 78416-1902
361-826-7213

City of El Paso Department of Public Health
222 Campbell Street, Suite 102
El Paso TX 79901-2897
915-771-5707

Galveston County Health District
1205 Oak Street
La Marque TX 77568
409-938-2449

Greenville–Hunt County Health Department
2700 Johnson Street
Greenville TX 75401-4206
903-408-4140

Houston Department of Health and Human Services
1115 S. Braeswood
Houston TX 77030-1715
713-558-3400

Laredo City Health Department
2600 Cedar Street
Laredo TX 78040-4040
956-795-4908

Lower Colorado River Authority
3505 Montopolis Drive
Austin TX 78744- 1499
512-356-6022

Lubbock City Health Department
1902 Texas Avenue
Lubbock TX 79411-2117
806-775-2908

Midland Health Department
3303 W. Illinois
Space 22
Midland TX 79703-6232
432-681-7618

Nova Biologicals, Inc.
1775 North Loop 336 East
Suite 4
Conroe TX 77301-1516
936-756-5333

Port Arthur City Health Department
431 Beaumont Avenue
Port Arthur TX 77640
409-983-8835

City of San Angelo Water Treatment Plant Laboratory
1324 Metcalfe Street
San Angelo TX 76903-0757
325-481-2722

San Antonio Metropolitan Health District
332 West Commerce, Room 201
San Antonio TX 78205-2489
210-207-8887

Northeast Texas Public Health District
815 North Broadway Avenue
Tyler TX 75702-4507
903-535-0090

Department of State Health Services South Texas Laboratory
1301 South Rangerville Road
Harlingen TX 78552-7610
956-364-8746

Sweetwater–Nolan County Health Department
301 E. 12th Street
Sweetwater TX 79556-2317
325-235-5463

Tarrant County Public Health Department
1101 South Main Street, Suite 1700
Fort Worth TX 76104-4802
817-321-4758

Texarkana Water Utilities Lab
2700 New Boston Road
P.O. Box 2008
Texarkana TX 75501-3263
903-798-3850

Department of State Health Services, Laboratory Section
1100 West 49th Street
Austin TX 78756-3199
512-458-7318

Trinity River Authority Lake Livingston Project
5170 South FM 1988
P.O. Box 360
Livingston TX 77351-7340
936-365-2292

Trinity River Authority Central Regional Lab
6500 W. Singleton Blvd.
P.O. Box 531196
Dallas TX 75212-3038
972-263-2251

Victoria City-County Health Department
2805 North Navarro Street
Victoria TX 77901-3946
361-578-6281 Ext. 41

Waco–McLennan County Health District
2905 Mount Carmel
Waco TX 76710
254-750-1662

Wichita Falls–Wichita County Public Health District
1700 Third Street
Wichita Falls TX 76301-2113
940-761-7873