



Well Owner's Guide



Having a private water source can be a wonderful thing, but there's lots to know about the water that comes from your well and your responsibilities.

What's in my well?

Well, the obvious answer is....**WATER!** However, there's more to it than that.

People on the outskirts of cities, in small communities, and in rural areas depend on wells for their drinking water. If a well is located and constructed correctly, it can be a source of good drinking water for decades.

However, unlike water supplies in large municipal and urban centers, there are often no regulations regarding the quality of private water supplies like a well. Often, the only requirement for testing is in the event of a real estate transaction, for insurance purposes, or for other administrative reasons. Beyond this, and unless there is unexplained illness, the majority of well owners never even think to test their well for contaminants that could be present in every glass of water. Microbiological contaminants in well water, such as *E.coli*, *Giardia*, or *Cryptosporidium*, are invisible to the naked eye. Clear water does not always mean safe water!



How do contaminants get into my well?

Contamination of groundwater wells can occur from both above and below the surface. Heavy rainfall, spring runoff, or flooding events can overwhelm even well-constructed, newer wells, and introduce surface water (such as agricultural run-off) into the aquifer below.

If you have an older well, there is greater potential for contamination from surface water. Your well was likely constructed to less stringent requirements and may not include elements that have since been demonstrated to provide better protection, such as a sanitary well cap, proper grout seals, or a well casing that extends above the surface. And with every passing year, there is more risk from structural deterioration.

Your local well drilling professional can conduct a thorough assessment of your well and help you to minimize the risks of bacterial contamination in your drinking water.

Septic

The majority of homes using a private water supply will also be relying on a private wastewater (septic) system. According to the EPA, improperly used or maintained septic systems can be a significant source of ground water contamination that can lead to waterborne disease outbreaks and other adverse health effects.

“Cross-connections” between a well or plumbing system and the septic or sewage system can also occur. Make sure your septic system is checked annually and well-maintained to avoid contaminating your water.

It’s your well but not your aquifer!

Even if you know your own well is in good shape and not contaminating the aquifer – and your drinking water – you can’t be sure that’s true of all wells drilled into that same aquifer. Aquifers can be connected through fissures and cracks in the bedrock, and water can flow through from one to another, taking contaminants with it. So neighboring wells and septic systems also present risk to your drinking water. Since these circumstances are out of your control, one option is to proactively treat the water coming into your home to ensure any potential contamination is removed before the water is used.

Abandoned wells

Giardia and Cryptosporidium are usually considered surface water issues and are not usually part of a well water test. However, this does not mean that they can’t or won’t be present in your well water. Both of these microbes live in the intestines of warm-blooded animals, and can be present wherever there is fecal contamination or surface water infiltration into a well or aquifer.



In long-established rural areas, many generations have built homes and drilled wells over the years. Back in the day, there was no requirement to register wells when put into or taken out of service. Abandoned or improperly decommissioned wells can be a problem in many rural areas. They can be a significant conduit for surface water to infiltrate and contaminate aquifers and, as a result, any wells currently in use.

The importance of water testing

Have you ever been sick and weren't sure why? Felt like you had the flu, or had stomach problems, or just felt awful? Sure. But sometimes, it's not the flu – it's the water. In fact, according to a recent study in the US, as many as 19.5 million cases of illness every year can be attributed to contaminated drinking water.

Unless you do a water test, you can't know that your water isn't going to make you or your family sick. Unfortunately, beyond the times when a water test is required, like when selling your home, remarkably few well owners test their water annually as recommended by public health authorities. You can't deal with a problem you aren't aware is even there. Having your water tested can confirm any issues and allow you to take the necessary actions to protect yourself and your family.

For your own peace of mind, water testing is a good idea. It's also an important part of responsible well stewardship. Check your local regional health authority website or other municipal resources for local regulations, sampling procedures, water testing facilities (accredited testing labs), and any associated fees.

What do these numbers mean?

Water test results can be confusing, but they don't have to be difficult to interpret. Presentation of results may vary by lab or locale. Regarding microbiological contamination, the most important measurement result is Total Coliform Bacteria (TC).

Coliform bacteria occur naturally in soil and decaying vegetation. They are associated with the presence of human or animal fecal contamination. While many coliform organisms are completely harmless, some like *E.coli*, can make people sick and can even be deadly. *E.coli* is found in the intestines of warm-blooded animals like cattle, dogs, and humans. When a water test indicates a high "Total Coliform" count, it may or may not include illness-causing strains such as *E.coli*. But, when present, coliforms are a strong indicator that your water source has already or can easily become contaminated with fecal matter.

Table 1: Total Coliforms

Total coliforms	Interpretation
0 or ND (not detected)	Your water is safe for drinking.
1–5*	Your water is safe for drinking if it tests negative for fecal coliform or E.coli.
6 or higher*	Your water is not safe for drinking unless you boil it.
O/G	Your water is not safe to drink unless you boil it. Sometimes, your test results will say “O/G” or “overgrown” instead of listing the number of total coliforms. This means there are so many other types of bacteria in your water sample, the lab technicians couldn’t see whether there were any coliform bacteria.

*If you see “est.” or “estimate” next to your test results, it means there were coliform bacteria in your water. However, because there were so many other bacteria as well, the lab technicians couldn’t accurately count the number of coliform bacteria. Your water is not safe to drink unless you boil it.

When to worry?

Most labs will have call-outs at the bottom of the test report that indicate if you should be concerned about a particular result. Use Table 1 as a guideline regarding Total Coliforms and determining if follow up actions are required.

Uh-oh! My water test results came back positive for bacteria. What now?

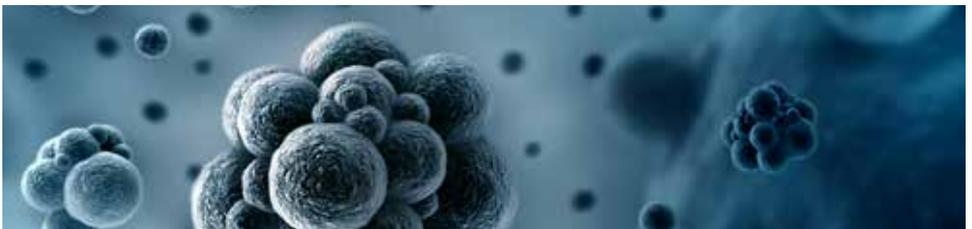
The first line of defense is to “shock” the well with a high dose of chlorine. Specific instructions detailing the amount of chlorine needed for the depth of your well, the pH of the water, and the presence of slime or biofilm are available online. If you do it yourself, keep in mind that chlorine is corrosive and should be handled with care. Leave the chlorine in the well for at least 12 hours and then purge the water. Highly chlorinated water is not safe to drink!

Better yet, call in a water treatment professional. An expert will know exactly how to proceed and can also identify deficiencies in your well that may contribute to contamination.

It’s important to remember that shocking your well doesn’t offer a long-term solution for ongoing contamination issues. It’s a quick fix that is best paired with long-term disinfection.

Phew – glad that’s over with. Now I don’t have to worry, right?

If you’ve shocked your well, re-tested, and received a clear test, you would think you shouldn’t have to worry about it again. Think again! If a well has been contaminated once, it means it can become contaminated again. Water quality is NOT static and changes throughout the year. Unless you’re willing to restrict yourself to bottled water for cooking and drinking, which can be expensive and creates waste, you’ll want to consider continuous disinfection of your water supply.





What are my options?

There are various approaches to disinfect your water, and your options will depend on whether you want to treat all your water as it enters the home (Point of Entry or POE), or if you want to have a disinfection system under your sink or on top of the counter (Point of Use or POU).

A water treatment professional can help you determine which disinfection system is best suited to your water conditions and assess any need for pre-treatment (reducing hardness, ferric iron, etc.), which is very important for thorough disinfection.

Table 2: Different Treatment Technologies

POU/ POE	Benefits	Drawbacks	Maintenance	Disinfects
Ultraviolet Light (UV)				
POE/ POU	<ul style="list-style-type: none"> Requires no chemicals No disinfection by-products Easy installation Effective against Cryptosporidium Does not alter the taste or odour of your water* 	<ul style="list-style-type: none"> Usually requires pre-treatment (e.g. softeners in hard-water areas) Some viruses require high UV dose 	<ul style="list-style-type: none"> Yearly lamp replacements Occasional quartz sleeve cleaning or replacement 	Yes

POU/ POE	Benefits	Drawbacks	Maintenance	Disinfects
Chlorine				
POE	<p>Reduces some disagreeable taste/odour</p> <p>Provides residual disinfection</p> <p>Can help remove iron/ manganese from water</p>	<p>Requires storage/use of noxious chemicals</p> <p>Requires ongoing monitoring of chlorine levels</p> <p>Cryptosporidium and Giardia are highly resistant</p> <p>Often requires contact tank</p> <p>Requires professional installation</p> <p>Can alter taste/odour of water</p> <p>Corrosive</p> <p>Can produce harmful by-products</p>	<p>Checking for loose, worn, missing, or broken parts</p> <p>Cleaning the entire system semi-annually</p> <p>Cleaning all surfaces showing corrosion</p> <p>Refilling chlorine supplies</p> <p>Cleaning any clogged injectors</p>	Yes
Filters				
POU/ POE	Can remove some disagreeable tastes/odours	Not a stand-alone solution	Periodic changes	No – Filters can remove some large microbes, but do not thoroughly disinfect
Ozone				
NOT PRACTICAL FOR HOME USE				
Reverse Osmosis (RO)				
POU	<p>Filters many contaminants from water</p> <p>No chemicals required</p>	<p>Can produce 2–4 gallons of waste water for every gallon of treated water</p> <p>Can demineralize water</p> <p>Reduces pH</p> <p>Can require pre-treatment</p> <p>Often requires professional installation</p>	<p>Filter replacement</p> <p>Membrane replacement</p>	<p>Maybe – Most RO units are not specified to remove microbiological contaminants.</p> <p>Check the manufacturer’s specifications</p>
Softeners				
POE	Used as pre-treatment for hard water or other water treatment conditions	Requires professional installation	Salt replacement as required	No – Softeners are used as pre-treatment solutions for other disinfection methods

* In rare circumstances, low levels of sulphur in source water may become detectable due to the UV system.

About VIQUA

VIQUA is proud to be the world's leading supplier of residential UV systems, providing disinfected water without the use of chemicals. Whether you choose a point-of-entry or a point-of-use system, your VIQUA UV system will disinfect your drinking water, helping to protect your water from microbiological contaminants.

For more information, visit www.viqua.com.



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