



Water Testing for Private Well Owners

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Water from private wells is not monitored for quality by government agencies. This means you, the homeowner, are responsible for the safety of the drinking water you and your family use. Water testing helps ensure that your water is safe. Don't depend on the results of your neighbor's water analysis to describe your well's water quality because even wells that are close together may draw water from separate aquifers.

Remember, when you take a sample of your water, you are relying on a very small amount of water to give you accurate information about the entire source of water-- for example, an aquifer. If the sample is not taken correctly, you could have either of two kinds of problems. First, if you add contaminants to the sample that weren't there, you could have a false positive, which might lead to unnecessary further sampling or treatment. Second, if you take the sample incorrectly, or do not conform with shipping and storage instructions, you could change the concentration of contaminants, possibly leading to a false negative. In this case, you would miss critical information about the presence of contaminants that could affect your health.

In either case, your sample will only provide you with useful, accurate information if you follow collection, storage and shipping instructions with great care. This publication provides some general guidelines for sample collection, but well owners should discuss collection, storage and shipping directly with the laboratory that will carry out the analysis before collecting the sample.

How often should a water test be done?

A broad range of water tests, such as the routine domestic analysis performed by the Nevada State Health Laboratory, should be done every 5 to 10 years. Additionally, test well water quality every year for nitrate, pH, total dissolved solids (TDS) and total coliform bacteria. Test more frequently if levels of these constituents are close to the drinking water standards.

You should also test your water if any of the following occur:

- Water has an undesirable taste or smell
- Water leaves scaly residues and soap scum, or stains plumbing fixtures or laundry
- Water is cloudy or colored
- Pipes show signs of corrosion
- Water supply equipment wears out rapidly, including pumps or water heaters
- You are considering the purchase of water treatment equipment
- You want to check the performance of existing water treatment equipment
- Anyone in the household has recurrent gastrointestinal illnesses
- You are purchasing a new home, and want to know if the water supply is of good quality
- You have drilled a new well, and want to know if the water is safe to drink
- You are pregnant, are planning a pregnancy or have an infant less than 6 months old
- Your well does not meet construction codes
- Your well is in or close to a livestock confinement area, such as a corral or feeding area

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- You have mixed or used pesticides near the well, or have spilled pesticides or fuel near the well
- You have a heating oil tank near the well that you know has leaked
- Backsiphoning has occurred
- Your well is located near a gas station or fuel storage tank, retail chemical facility, gravel pit, mining operation, oil or gas drilling operation, dump, landfill, junkyard, factory, dry-cleaning business, road-salt storage area or heavily salted road
- Your septic system absorption field or your neighbor's is close to the well (within 100 feet)
- The area around the wellhead has been flooded or submerged

Where can I get my water tested?

Water may be analyzed by the Nevada State Health Laboratory, or by private labs. If you choose a private lab, it is recommended that only those certified by Nevada Division of Environmental Protection be used when testing water for drinking purposes. See <http://ndep.nv.gov/bwqp/lab/labservice.htm> for the Nevada Certified Lab List. Click on the SWDA tab to view certified drinking water labs. Cost of the routine analysis will vary with private labs, so ask for rates and turnaround times in advance.

Analysis requires completion of a form from the laboratory. Contact the Nevada State Health Laboratory at 775-688-1335 for information and a form. Water samples may either be delivered or mailed to the lab. Ask the laboratory about the best way to ship the samples so that the quality is not affected.

Sampling procedure for water chemistry analysis

The proper collection, handling and preservation of a water sample is **crucial** for an accurate water test. To get an accurate reading of your water's chemical make-up, follow these steps:

1. Contact the laboratory and request an appropriate sample collection bottle.
2. Label the bottle with your name, address and phone number. Use a permanent marker.
3. To ensure an accurate reading, operate your water system long enough to remove water from within the well casing prior to sampling. The

length of time needed to clear the casing will vary by the depth and diameter of the well, but generally running the outside irrigation system for 2 to 4 hours is sufficient. Running water outside the house rather than inside will prevent overloading of the septic system. New wells or water systems not in use for several weeks may require longer pumping periods prior to collecting a water sample.

4. After 2 to 4 hours, shut off the outside water. Remove any aerators or screens in the kitchen faucet, and run your tap water for 5 to 6 minutes.
5. Now you're ready to take the sample. Fill the container with tap water according to the instructions from the laboratory and close it tightly.
6. Ship or bring the water sample to the lab. Be sure to include the standard form and mark the types of contaminants you want tested. Also, be sure to follow shipping and storage instructions from the laboratory exactly.

Testing for total coliform bacteria

Testing for total coliform bacteria should be done at least once annually, or:

- If there is any noticeable change in water color, odor or taste. However, don't depend on changes in color, odor or taste to indicate bacterial contamination! Water contaminated with bacteria will often smell, look and taste normal.
- If flooding occurs near a well or the wellhead has been flooded for any reason.
- If anyone who has consumed the water becomes ill from a suspected water-borne disease.
- If there has been any maintenance of the water supply system.

This test measures contamination of drinking water by fecal material from humans and other warm-blooded animals. It may also indicate the presence of soil and plant material contamination. Bacteria in water can be a serious health problem. If the test confirms the presence of coliform bacteria, it indicates the supply is unsanitary and may contain disease-causing organisms. At a minimum, you should re-test your water to be sure that the results of the test are accurate and bacteria are present. In any case, take action to decontaminate and re-test your well before drinking coliform-positive water.

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Sampling procedures for total coliform bacteria

1. Prior to taking a sample, contact the lab and obtain a sterile sampling bottle.
2. To prepare for sampling, follow steps 3 and 4 for a routine water analysis as described above.
3. The sample vial contains a preservative. Do not open the bottle until you are ready to take the sample, and do not rinse the bottle prior to collecting the sample. Wash your hands before taking the sample.
4. When you are ready to take your sample, carefully twist off the lid of the vial, fill with water above the indented fill line on the shoulder of the bottle, but not to the very top of the bottle's lip. If you do not fill the bottle to above the indented fill line, the lab cannot run the analysis. Hold the lid by the outer surface while filling the sample container to avoid contamination.
5. Re-cap the vial tightly, label it and keep the sample refrigerated or in a cooler for transportation to the lab. Whenever possible, get samples to the lab immediately.

Interpreting your water analysis results

Congress passed the Safe Drinking Water Act in 1974. It requires the U.S. Environmental Protection Agency (EPA) to set limits or standards for contaminant concentrations that may pose a health hazard in public drinking water. There are two categories of drinking water standards: Primary or Maximum Contaminant Level and Secondary or Secondary Maximum Contaminant Level. Primary standards (**Table 1**) are the highest allowable concentrations of contaminants based on health considerations. Secondary standards (**Table 2**) regulate contaminants that cause offensive taste, odor, color, corrosivity, foaming and staining.

Primary and secondary standards do not apply to individual private wells, but serve as a guide to ensure safe drinking water for these systems. **Table 3** provides the "action" levels for lead and copper, which are guidelines to trigger preventive measures. Additional information included on the lab analysis form is shown in **Table 4**. These values are obtained during laboratory testing procedures. They provide information about the water's suitability for a particular use.

Table 1. Primary Standards Approved by the Nevada Division of Health

Contaminant	Maximum Contaminant Level
Arsenic (As)	0.01 ppm ¹
Barium (Ba)	2.0 ppm
Fluoride (F)	4.0 ppm
Mercury	0.002 ppm
Nitrate (N)	10.0 ppm
Turbidity	1.0 turbidity units
Coliform/Fecal Coliform/E.coli	cannot be present

¹ ppm = parts per million

Table 2. Secondary Standards Approved by the Nevada Division of Health

Contaminant	Maximum Contaminant Level
Chloride (Cl)	250.0 ppm ¹
Color	15.0 color units
Copper (Cu)	1.0 ppm
Fluoride (F)	2.0 ppm
Iron (Fe)	0.3 ppm
Magnesium (Mg)	150.0 ppm
Manganese (Mn)	0.05 ppm
pH	6.5 -8.5
Sulfate(SO ₄)	250.0 ppm
Total Dissolved Solids (TDS)	500.0 ppm
Zinc (Zn)	5.0 ppm

¹ ppm = parts per million

Table 3. Lead/Copper Action Levels

Contaminant	Action Level ¹
Copper (Cu)	1.3 ppm ²
Lead	0.015 ppm

¹ If your first-draw sample exceeds these levels, consider the need to take preventive action.

² ppm = parts per million

To learn more about individual contaminants, go to the EPA's drinking water Web site at www.epa.gov/safewater/

Table 4. Additional Water Characteristics

Characteristic	Consideration
Bicarbonate (HCO ₃)	
Calcium (Ca) ^{1 2}	High levels increase pH in water and soils
EC (Electrical Conductivity)	Measures salt concentration of water in umhos/cm
	0 to 400 excellent
	400-8,500 satisfactory
Hardness	over 8,500 objectionable
	0 to 75 ppm ³ soft
	75 to 150 ppm moderately hard
	150 to 300 ppm hard
over 300 ppm very hard	
Magnesium (Mg) ^{1 2}	Laxative effect, quickly adjusted to by newcomers
Potassium (K) ²	Plant nutrient, adds to TDS. Consult personal physician for health application
Sodium (Na)	Consult personal physician for health application

¹ Used to calculate hardness

³ ppm = parts per million

² Required for plant growth. Influence on humans or livestock from concentration in water not available. No known health risk.

Finding a Certified Water Testing Laboratory

Nevada Division of Environmental Protection, Bureau of Safe Drinking Water oversees the certified drinking water laboratory certification program. A list of certified labs can be found at <http://ndep.nv.gov/bsdw/labservice.htm>.

. Click on the Nevada Certified Lab List link or call 775-687-9507. For more information about safe drinking water, call the Bureau of Safe Drinking Water at 775-687-9520 or see <http://ndep.nv.gov/bsdw/wells.htm>.

When you call a laboratory, be sure to ask about proper sampling technique, including sampling containers, sample storage and shipping procedures, cost and turnaround times. For help in interpreting results, see UNR's Water Test Interpreter, <http://ag.unr.edu/water/interpreter/>.

References

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