How Can I Get More Information?

For a list of other water tests available from the Laboratory Services Division, and test fees charged, go to http://www.cdphe.state.co.us/lr/Services/Lab-Services.htm on the internet, or you can call one of the telephone numbers listed below.

You will find links to water testing and information at the bottom of the Laboratory Services Division home page at http://www.cdphe.state.co.us/lr.

Laboratory Services Division – (303) 692-3090
Fax: (303) 344-9989
Chemistry Laboratory – (303) 692-3048
Microbiology Laboratory – (303) 692-3490
Bottle Order Line (Menu driven)
(303) 692-3074

Colorado Department of Public Health and Environment
Laboratory Services Division
8100 Lowry Boulevard
Denver, CO 80230

Colorado Department of Public Health and Environment

Laboratory Services Division

When to Test Your Well

Chemistry Laboratory
(303) 692-3048
Microbiology Laboratory
(303) 692-3490

When Should I Test My Well?

As a private well owner or well-water consumer, you will probably use groundwater from your well for doing your family's laundry, drinking, cooking, bathing and watering your garden. Municipalities are required to test their water supplies regularly to ensure the water is safe to drink. However, since there is no requirement to test a private well, except when it is first drilled or the pump is changed, you are responsible for making sure your water is safe.

While most private wells provide a clean, safe supply of water, contaminants can pollute private wells. Because you cannot see, smell or taste most contaminants, you should test your water on a regular basis. The types of land uses near your well determine which tests you need to have performed on your water supply.

This fact sheet gives information about several common contaminants found in private wells. It should help you decide when to test your well and how often, how to find a certified laboratory, and whom to call for help.

What tests should be done on my water?

Total Coliform Bacteria and E. coli

Coliform bacteria live in soil, on vegetation and in surface water. Some strains of coliform bacteria can survive for long periods in soil and water and can be carried into well casings by insects. Bacteria washed into the ground by rainwater or snowmelt are usually filtered out as the water seeps through the soil, but they sometimes enter water supplies through cracks in well casings, poorly sealed caps, fractures in the underlying bedrock, and runoff into sinkholes. Coliform bacteria are the most common contaminants found in private water systems. Most coliform bacteria do not cause illness, but their presence indicates a breach in the water system.

Coliform bacteria found in the intestines of warm-blooded animals and their feces are called E. coli. Since E. coli bacteria are found in fecal material, they may indicate contamination with bacteria, viruses and parasites that can cause flu-like symptoms such as nausea, vomiting, fever, and diarrhea. Other bacteria may not cause illness, but can produce odors, slimy substances, or changes in water color. Private wells should be tested for bacteria several times a year as the seasons change. Test again if there is a change in the taste, color, odor or appearance of your water. The coliform test is one of the most important tests you should have done on your well water.

A negative bacteria test result is good news, but does not mean your well is free of other contaminants, such as chemicals and metals. A few of the more common chemical and metal contaminants are listed below.

Nitrate

Nitrate forms when nitrogen from fertilizers, animal wastes, septic systems, municipal sewage sludge, decaying plants and other sources combines with oxygenated water.

In infants under six months of age, nitrate exposure can cause a serious condition called methemoglobinemia or "blue-baby syndrome." Infants with this condition need immediate medical care because it can lead to coma and death. Nitrate ingested by pregnant women may reduce the amount of oxygen available to the growing fetus. Test for nitrate if a pregnant woman or infant will be drinking the water.

Everyone should have well water tested for nitrate at least once. Have your well tested if you live within one-fourth mile of a cultivated or planted field, or if your well is located near an area where fertilizers are manufactured or handled, or near an animal feed lot or manure-storage area. In general, shallow wells and wells with short or cracked casings have the highest risk of contamination, although deep wells are also at risk in some areas.

Pesticides

Pesticides are chemicals used to control weeds and insects. Pesticides washed from farm fields enter groundwater. Other pesticides have been found in groundwater following spills and improper disposal. Long-term use of drinking water that contains pesticide residues may increase your risk of developing cancer or other serious health problems.

You should test your well water for pesticides if your well is located within one-fourth mile of a cultivated or planted field; or if it is within one-fourth mile of an area where pesticides are manufactured, stored, mixed or loaded into application equipment. Well owners who are uncertain about the use of pesticides in their area also may consider having their water tested at least once.

Lead

Lead was a component of plumbing solder that was used in homes with copper plumbing installed before 1985. It also has been used in brass fixtures. When water is naturally soft or acidic, lead can leach from solder or brass into drinking water. Chronic exposure to lead can damage the brain, kidneys, nervous system, and red blood cells. Preschool-aged children are particularly sensitive to the toxic effects of lead. Exposure during pregnancy can affect the developing fetus. Consider testing at least once, even if your water comes from a water system.

Copper

Copper is present in plumbing lines in most households. Homes that have new copper plumbing or a naturally soft water supply are more likely to have copper-contaminated water. Symptoms caused by excessive copper exposure include stomach upsets, abdominal cramping, diarrhea and headaches. Because copper is also very toxic to fish, avoid using water containing high levels of copper to fill aquariums.

If your home has copper plumbing, consider testing at least once, even if your water comes from a water system. Consider testing if someone shows the symptoms mentioned above or test before a baby comes home.

Solvents, Gasoline, and Fuel Oil

Household and industrial solvents, gasoline and fuel oil are examples of volatile organic chemicals or VOCs. Some volatile organic chemicals are relatively non-toxic, while others can cause cancer, birth defects and reproductive problems.

Fuel oil and gasoline can enter groundwater as a result of a leaking storage tank or a spill. An active or abandoned gasoline station may contaminate wells up to one-fourth mile away. These wells should be tested at least once for volatile organic chemicals. Paint thinners, dry cleaning chemicals

and industrial solvents can enter groundwater from spills, improper disposal, leaking storage tanks and landfills, so wells that are located within one-fourth mile of a landfill, dry cleaner, auto repair shop or industrial site where solvents have been used should be tested for volatile organic chemicals.

Because solvents, gasoline and fuel oil are common in our environment, all owners of private wells should consider having their water tested for volatile organic chemicals at least once. If you notice a solvent-like or gasoline taste or odor in your water, you should use an alternate, safe source of drinking water until your water can be tested for volatile organic chemicals.

PCBs

PCBs (polychlorinated biphenyls) are suspected cancer-causing agents that were manufactured and used between 1930 and 1979. Some submersible well pumps that were built before 1979 contain PCB-containing oils, and have the potential to contaminate drinking water supplies if they fail. If your well has a submersible pump that was installed before 1979, you should contact a licensed pump installer to help you determine whether it contains PCBs. If you notice an oily sheen or petroleum odor in the water, switch to an alternate, safe source of drinking water and call a pump installer for assistance.

Minerals and radioactivity

In some regions of Colorado, groundwater contains high levels of toxic minerals and radioactivity. The location and depth of your well determine its susceptibility to these contaminants. You can find more information at http://www.cdphe.state.co.us/lr.

Arsenic

Arsenic occurs at low levels in soil and bedrock, but has been found at levels above drinking water standards in wells in the San Luis Valley. Exposure to arsenic at high levels can result in nervous and digestive system problems. Long-term exposure to arsenic has been linked to skin cancer.

Uranium and Radium

Uranium and radium are radioactive elements that can be released into groundwater. Elevated radioactivity levels have been detected where wells draw water from granite formations. Exposure to high levels of uranium and radium over a period of several years can increase your risk of developing bone cancer. Consider a uranium test if your well is in Boulder, Clear Creek, Gilpin, Gunnison, Jefferson or Park county.

Radon

Radon is a colorless, odorless gas that is found in air, soil, and groundwater. It can enter the air in a home through cracks in the foundation. Radon also can be present in groundwater and may escape into your home from your water supply. Deep bedrock wells are most susceptible.

Breathing air that contains radon can significantly increase your chance of developing lung cancer. If you live in a newer, energy-efficient home or have a floor in your basement or crawl space that is dirt or is not completely sealed, you should test the air in your home. Techniques exist to lower radon levels in your home.

Because only a small portion of the radon gas found in a home comes from the water supply, it is not necessary to test your water unless other remedies fail to reduce radon levels in the air. For more information about radon in the air in your home, call 303-692-3301 or 1-888-569-1831. Or on the internet, go to http://www.cdphe.state.co.us/hm/rad/radon/radon.asp. If you have not found radon in the air in your home, you don't need to be concerned about radon in your water. However, if you want more information about radon in your water, call 303-692-3046. The Environmental Protection Agency (EPA) has a web site with extensive information about radon. You can find it at http://www.epa.gov/radiation/radionuclides/radon.htm.

Fluoride

Water consumed by infants and preschool-aged children should be tested for fluoride. Discuss your test result with your child's doctor or dentist to decide whether fluoride supplements are needed or if your test results indicate a high concentration of fluoride. You may be advised to switch to an alternate source of water for drinking if the fluoride concentration exceeds four (4) parts per million. If your well is in Alamosa, El Paso, Teller or Douglas county, consider fluoride testing.

How Can I Have My Well Tested?

Laboratories

Use a certified laboratory to test your drinking water for possible contaminants. A list of certified laboratories, including the Colorado Department of Public Health and Environment Laboratory, can be found online at: http://www.cdphe.state.co.us/lr/Certification/SDWLIST.pdf.

Sample Collection

Water collection procedures vary depending on the type of test being done. For a reliable test result, use a sample bottle from your testing laboratory and follow the laboratory instructions exactly. To obtain supplies and bottles to use for testing at the Laboratory Services Division, call (303) 692-3074 and follow the menu.

Glossary

Coliforms are a group of closely related bacteria that are (with few exceptions) not harmful to humans. Coliform's presence in drinking water may indicate contamination by disease-causing microorganisms.

A **contaminant** is any physical, chemical, biological, or radiological substance or matter that has an adverse effect on air, water, or soil. For a list of potential contaminants of groundwater, go to http://www.epa.gov/safewater/kids/wsb/pdfs/9122.pdf, and go down to page 44 (shift control N, enter page number, then click on OK or press the Enter key).

E. coli is a type of fecal coliform bacteria commonly found in the intestines of animals and humans. E. coli is short for Escherichia coli. The presence of E. coli in water is a strong indication of recent sewage or animal waste contamination that could contain many types of disease-causing organisms.

Ground water is water that fills wells from aquifers (natural reservoirs below the earth's surface).

Methemoglobulinemia or **"blue baby" syndrome**, is a pathological condition where the skin of infants (or other sensitive groups) turns blue because of nitrates bonding with red blood cells. This bonding prevents the transport of oxygen throughout the body. Methemoglobulinemia can be caused by nitrate contamination in drinking water.

Nitrates and **nitrites** are nitrogen-oxygen chemical units that combine with various organic and inorganic compounds. Once taken into the body, nitrates are converted into nitrites. Nitrates are used primarily as fertilizer. Excessive levels of nitrate in drinking water have caused serious illness and sometimes death. The serious illness in infants is due to the conversion of nitrate to nitrite by the body, which can interfere with the oxygen-carrying capacity of the child's blood. This can be an acute condition in which health deteriorates rapidly over a period of days. Symptoms include shortness of breath and blueness of the skin.

Radon is a colorless, naturally occurring, radioactive, inert gas formed by radioactive decay of radium atoms in soil or rocks. It may be found in the ground, drinking water and indoor air. A person who is exposed to radon in drinking water may have increased risk of getting cancer (especially lung cancer) over the course of his or her lifetime. Radon in soil under homes is the biggest source of radon in indoor air, and it presents a greater risk of lung cancer than radon in drinking water. To learn more about radon in the air, ground or water, you will find A Citizen's Guide to Radon at http://www.epa.gov/iaq/radon/pubs/citguide.html.

A **volatile organic compound (VOC)** is any organic compound that participates in atmospheric photochemical reactions except those designated by EPA as having negligible photochemical reactivity.

A **well** is an artificial excavation constructed for the purpose of exploring for or producing ground water.

Contaminant	Which wells or homes should be tested?	How often should I test?
Coliform Bacteria	All wells	Test annually, or when there is a change in taste, color or odor.
Nitrate	All newly-constructed wells with no testing history	Two tests spaced six months apart
	Wells within 1/4 mile of fertilized fields or animal feed lots	Test annually
	Wells used by pregnant women	Test before pregnancy
	Wells that had levels close to 10 parts per million previously	Test annually
Pesticides	Wells within 1/4 mile of agricultural fields, or pesticide manufacturing, storage or mixing facilities	Test once every five to 10 years.
Lead	Homes with copper plumbing installed before 1985 or brass fixtures and naturally soft water	Test once
PCBs (Polychlorinated Biphenyls)	Water with an oily sheen or petroleum odor, and a submersible pump installed before 1979.	Test once if needed
Arsenic and Uranium (Gross alpha/beta)	Wells in specific areas of Colorado	Test once if needed

Contaminant	Which wells or homes should be tested?	How often should I test?
Copper	If water is used to prepare infant formula or if any resident in the home experiences repeated symptoms of nausea, diarrhea or abdominal cramps.	Test before the baby comes home if the infant will consume water from the well. Test if symptoms indicate possible contamination (see left). Homes at risk should be retested in 6 months.
Volatile Organic Chemicals or VOCs	Wells within 1/4 mile of a landfill, underground fuel or gasoline tank and wells within 1.4 mile of where solvents have been used (drycleaners, automotive garages, or body shops, etc.)	Test once every five to 10 years or when solvent or gasoline taste or odor is noticed.
Radon	Homes with high radon levels in the air that are not reduced by mediation techniques.	Test once if needed
Fluoride	Wells used by infants and preschool-age children	Test when infant is born
	Wells in specific areas of Colorado	Test once if needed
Chloride, Sodium, Barium, and Strontium	Wells near gas drilling operations	Test once if needed