

Private Wells for Home Use

Fact Sheet No. 6.700

Natural Resources Series | Water

by E. Marx, R. Waskom and D. Wolfe*

Ground water wells are the principle source of water for most homeowners in rural areas of Colorado. There are over 200,000 permits for ground water wells currently issued in our state and approximately 11,000 new permits are requested annually. Most of these wells are used for households and are considered “exempt” from the administration within the water rights priority system. They require a permit from the State Engineer, and are limited to 15 gallons of water per minute. Some exempt wells are further limited to in-house use only when lot sizes are smaller than 35 acres.

Wells for most other uses, such as irrigation, are considered “non-exempt” and are administered within the priority system. Their use is limited by the terms of the permit, and since they are junior in priority, they must have augmentation plans to replace water to the stream system in over-appropriated basins.

Ground water is found in formations called aquifers that occur throughout the state. An aquifer is a geologic formation made up of porous material such as sand, gravel, and unconsolidated rocks. It may also consist of spaces or fractures between subterranean rocks that are saturated with water. Aquifers may be as shallow as a few feet, or as deep as thousands of feet below the ground surface. Wells in mountainous areas of the Front Range typically average 350 feet deep; while in eastern Colorado, over the Ogallala aquifer, they average less than 300 feet deep. Ground water originates as precipitation that moves downward from the earth’s surface until it reaches the water-saturated zone and becomes ground water. Aquifers may spread hundreds of miles or may be in small, localized areas. Alluvial or tributary ground water moves through the aquifer, where it eventually joins a surface stream.

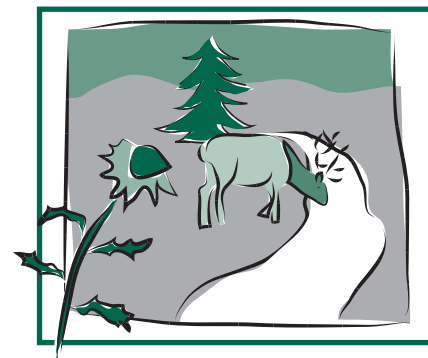


Figure 1: Rural domestic well in the foothills.

Other aquifers are classified as non-tributary because the ground water neither contributes to, nor draws from, a natural stream.

The quantity and quality of available ground water is usually difficult to determine prior to drilling because underground geology varies and because local ground water supplies and quality differ. Ground water quality in Colorado ranges from excellent in some of the deep aquifers to poor in some of the alluvial aquifers where surface and ground water have been contaminated from agriculture, industry, or urban development. The only reliable way to determine the suitability of a water supply for drinking water is through a laboratory analysis for bacteria and chemical constituents.

The amount of water obtained from a well can vary tremendously over a short distance due to changes in subsurface geology. In addition, wells can go dry during times of drought or when an aquifer is over-pumped. As a rule of thumb, each person in the household requires 75 gallons of water per day to satisfy the basic human needs. For a typical household, that means the well should produce a minimum of one-half gallon per minute (0.5 gpm) or 30 gallons per hour to be acceptable as a water supply. Wells that are low producing (<1 gpm) often need an additional storage tank to buffer high water use periods, even though



Quick Facts

- Prior to drilling a ground water well in Colorado, you must have a permit from the Colorado Division of Water Resources, also known as the State Engineer’s Office.
- Most private domestic wells in Colorado are “exempt” from administration in the priority system and do not require augmentation.
- Wells for most other uses, such as irrigation, are considered “non-exempt” and are administered within the priority system.

© Colorado State University Extension. 7/02. Revised 1/06.

www.ext.colostate.edu



*E. Marx, Colorado State University Extension agriculture specialist, Larimer County; R. Waskom, Extension water specialist; and D. Wolfe, Office of the State Engineer. 1/2006

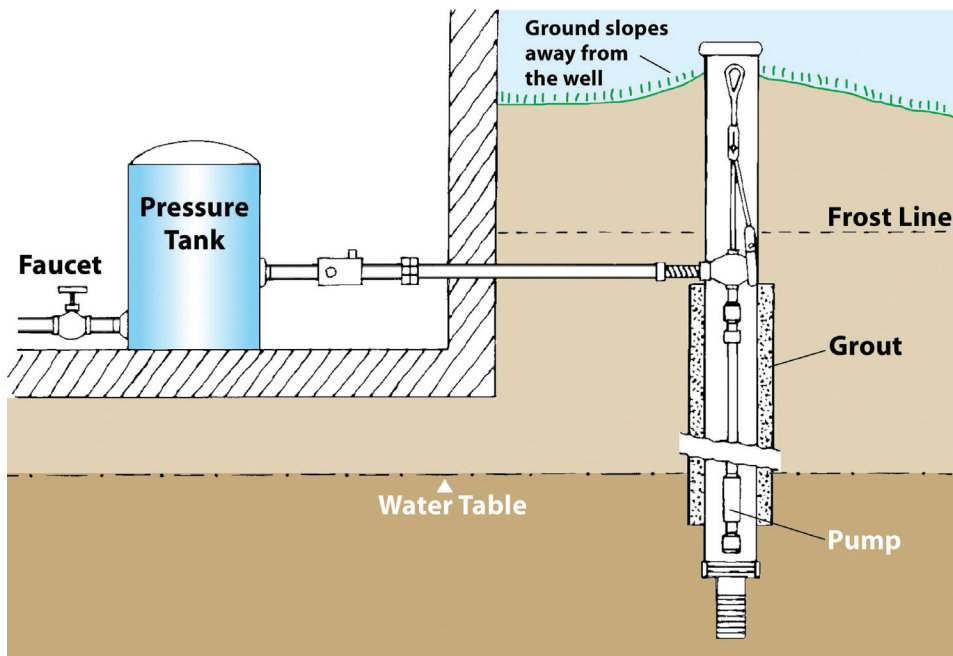


Figure 2: Cutaway of a typical private well and water supply system.

a typical 6 inch well bore hole will store about 1.5 gallons of water per linear foot of water depth.

The uncertainty of ground water quality and quantity, coupled with the complexity of the water laws and management in Colorado, is often disconcerting to new homeowners. This fact sheet answers some basic questions on the rules that govern the use of private wells for home water supplies in Colorado. If you rely on a private well for your water supply or if you are in the process of purchasing property where a well will have to be drilled, the following questions may be helpful in understanding your situation.

How do I get a well permit for my property?

Contact the Office of the State Engineer to apply for a permit. Forms are available online at <http://water.state.co.us/pubs/wellforms.asp>. In most cases, a licensed water well driller will help you fill out and submit the required paperwork. Once the form is completed and construction reports are filed with the State Engineer, most well permits are good for the life of the well and do not need to be renewed.

What is the difference between “exempt” and “non-exempt” wells?

In simple terms, exempt wells *do not* require an augmentation plan, while most non-exempt wells *do* require an augmentation plan.

Most homeowner wells in Colorado are exempt. Exempt wells are not administered under the “first in time, first in right” priority system used to allocate water in our state. Exempt wells are generally limited to 15 gpm and require non-evaporative wastewater systems such as septic tanks and leach fields. It is generally presumed that these non-evaporative wastewater systems consume about 10 percent of the total water pumped. The rest of the water is returned to the hydrologic system via percolation back to the ground water.

Are there different types of exempt wells?

Yes. The two most common types of exempt wells for homeowners are *Household-Use Only Wells* and *Domestic and Livestock Wells*.

Household-Use Only Wells: Most private wells drilled on or after May 8, 1972 on properties less than 35 acres are permitted for exempt household-use only. Water can be used only inside the home. Water cannot be used to irrigate lawns, gardens, windbreaks, livestock, or any other outside use.

Domestic and Livestock Wells: If you own property that is 35 acres or larger, you can usually get a domestic and livestock well. Only one of these wells is allowed per parcel. The well may serve up to three single-family dwellings, irrigate one acre or less of lawn and garden, and provide water for domestic animals and livestock.

Water use from exempt, residential wells within designated ground water basins, the Denver Basin, and limited areas on the Western Slope, may be less restrictive than indicated above.

What is a non-exempt well?

Most non-exempt wells require an augmentation plan. An augmentation plan is a plan to replace depletions from water pumped from a non-exempt well. *Most wells on single-home residential properties are exempt and do not require an augmentation plan.* Water systems on multi-home subdivisions often are non-exempt and require an augmentation plan.

Why do non-exempt wells require an augmentation plan?

If you are a new water user, your water rights are “junior” to existing “senior” water rights. Under Colorado law, senior rights have priority (first in time, first in right). Junior rights cannot remove water from the system if the removal will impair the supply available to a senior right.

Ground water and surface water are hydraulically connected. Pumping water from a new well could reduce the amount of water available to senior water rights holders, even if the senior right is using surface water and the junior right is using ground water. To prevent this “injury” to the senior right, junior water users must have an augmentation plan. An augmentation plan is a plan to replace depletions from water pumped from the well to prevent injury to senior rights. Depletions must be replaced in time, amount, and location.

If you wish to install a non-exempt well, you will need an augmentation plan approved by the water court. Augmentation water often must be purchased, so typically water user organizations are formed to develop and review augmentation plans. Most likely, you will need to hire a water attorney and a water resource engineer to help with the design and approval of an augmentation plan.

I am purchasing a property with an existing well that is not registered. What kind of use is allowed?

Unregistered exempt wells in use prior to May 8, 1972 can be permitted for historic uses, that is, those uses that were in place before May 8, 1972, if those uses are no

greater than those allowed for a domestic and livestock well permit.

Exempt wells installed on or after May 8, 1972 must have a permit. Wells drilled without permits after this date were installed illegally.

I am purchasing a property with an abandoned well. What should I do?

The State Engineer's Office has rules that require old wells that are no longer used to be properly plugged and abandoned. The existing owner has the responsibility to comply with these regulations.

The Division of Water Resources issued me a "household-use only" permit, but the neighbors have permits that allow livestock water. Why can't I get a domestic and livestock well permit?

The most likely reason is that the neighbor's well was installed prior to May 8, 1972 and the livestock use was already in existence.

Are these rules the same everywhere?

These are general rules that are in place and apply to much of Colorado, but there are many exceptions. Exceptions include designated ground water basins in eastern Colorado and the Denver Basin along the Front Range. The Colorado Ground Water Commission administers water use in the designated basins.

How can I get a copy of my well permit?

To get a copy of a well permit, contact the records section of the Colorado Division of Water Resources at (303) 866-3447 between the hours of 10:00 a.m. and

3:30 p.m. For best service, have the well permit number, location of well (quarter section, township, and range), original owner who constructed the well, other prior owners, or the subdivision lot and block ready for the staff member so they can easily locate your well in the database.

How do I select a drilling contractor?

Ask your neighbors and your homebuilder for recommendations. Be sure the contractor is licensed in Colorado and find out if recent customers are satisfied with the service provided. If you are still uncertain on how to proceed, you can check with the nearest Colorado Division of Water Resources branch office, or staff for the Colorado Board of Examiners, at (303) 866-3581.

Questions to ask when buying rural property:

If a well is present:

1. When was the well drilled?
2. Is the well registered with the Colorado Division of Water Resources?
3. If drilled on or after May 8, 1972, was the well properly permitted?
4. May I see the well permit, well completion report, and pump installation report?
5. Is the permit for "household-use only" or for "domestic and livestock use"?
6. Who installed the well?
7. How deep is the well?
8. Do you have a copy of the water quality tests performed on the well water?
9. How many gallons per minute (gpm) does the well produce?
10. Is the well at least 100 feet from a septic system leach field?

If a well is not present:

1. Has anyone tried to get a well permit for the property?
2. If a permit has been issued but a well has not been drilled, is the permit still valid?
3. How deep have neighbors had to drill to get water?
4. Have neighbors had problems with water quality?
5. Is there room on the property to install a well and a septic system separated by 100 feet?

Additional Information

Contact Ground Water Information at the Colorado Division of Water Resources at (303) 866-3587 between 9:00 a.m. and 4:00 p.m. A great deal of information is also available online at <http://water.state.co.us/groundwater/groundwater.asp>.

Other useful fact sheets include:

- 0.513, *Domestic Water Quality Criteria*
- 0.520, *Selecting an Analytical Laboratory*
- 4.717, *Glossary of Water Terminology*
- 9.307, *Drinking Water Quality and Health*

CSU Cooperative Extension bulletin XCM-179, *BMPs for Private Well Protection* is another useful resource.