

# **Graywater Systems and Rainwater Harvesting in Colorado**

## **Graywater Systems**

Graywater refers to the re-use of water from baths, showers, washing machines, and sinks (household wastewater excluding toilet wastes) for irrigation and other water conservation applications. Domestic graywater use replaces potable water used for landscape irrigation. Graywater is most suitable for subsurface irrigation of nonedible landscape plants.

Practically speaking, the use of graywater systems is not viable for most homeowners in Colorado. Currently, the treatment, disposal, and potential use of graywater is regulated by the State of Colorado Guidelines On Individual Sewage Disposal Systems and applicable county Individual Sewage Disposal System (ISDS) regulations. The Colorado Department of Public Health and Environment (CDPHE) does not currently separate graywater from blackwater in its regulations. Consequently, surface applications require permitting and monitoring. Application of graywater from systems discharging 2,000 gallons or more per day requires a permit from the CDPHE; smaller systems require permits from your local health department.

If graywater is discharged below the soil surface and below the root zone in the manner of a leach field, a permit from the local health department is all that is required. If graywater is used to irrigate below the soil surface, but within the root zone (above frost line), a local permit plus monitoring is required. Many county ISDS regulations prohibit the issuance of any type of individual sewage disposal system permit for a lot within 400 feet of service by a municipal or community sewage treatment facility. Many municipalities have similar connection and usage requirements that technically prohibit the use of graywater in urban areas.

Graywater can be distinguished from warm-up water, or wasted potable water allowed to run down the drain before it reaches a desired temperature. Warm-up water that has not been used for bathing or dishwashing is generally free from bacteria and other pathogens if it is captured before it reaches the drain. Amounts of wasted warm-up water can be significant in homes where water heaters are located a considerable distance from showers or tubs and where no recirculation system is installed. Catching this water in a bucket and using it to water plants can contribute to home water conservation savings.

If graywater systems are used in conjunction where the source of water is from wells, other issues must be considered. Well permits are issued pursuant to Colorado statutes. The Colorado Division of Water Resources regulates well water permits to prevent well pumping from injuring other water users. Graywater use may not be a permissible use of water under a well permit and this must be clarified prior to installation of a graywater system. In some cases, the conditions of approval under which a permit was issued would not prohibit the capture and use of graywater. In other cases, the permit conditions would not allow it. Specifically, if the permit was issued for ordinary household purposes inside a single-family dwelling, with no outside uses, the capture and use of graywater for any use outside the dwelling (including lawn and garden irrigation) would not be allowed.

Well permits that were issued in areas of the state where the stream system is not over-appropriated by senior vested water rights, may qualify for use of a graywater system. Old wells that are unregistered and were constructed prior to laws being enacted that required a well permit, may qualify for graywater systems if the historical uses included lawn and garden irrigation and

they can be late registered pursuant to section 37-92-602(5), CRS (2002). For wells operating under court-approved plans for augmentation, the terms and conditions of the decrees entered would have to be evaluated to see whether or not graywater systems would be allowed. In most cases, these plans for augmentation rely in part on the return flows generated by the individual well. In such cases, graywater systems might not be allowed.

Many of the permits issued throughout the state on parcels of less than 35 acres contain restrictions that would disallow the use of graywater. Permits issued on tracts of 35 acres or more with a return flow requirement could possibly utilize a graywater system if it could be demonstrated that the actual depletion to the stream system was not increased.

## **Rainwater Harvesting**

Rainwater harvesting is the process of intercepting storm-water runoff and putting it to beneficial use. Rainwater is usually collected or harvested from rooftops, concrete patios, driveways and other impervious surfaces. The diversion and use of rainwater is subject to the Constitution of the State of Colorado, state statutes and case law.

Water rights in Colorado are unique compared to parts of the eastern United States. The use of water in this state and other western states is governed by what is known as the prior appropriation doctrine. This system of water allocation controls who uses how much water, the types of uses allowed, and when those waters can be used. A simplified way to explain this system is often referred to as the priority system or "first in time, first in right." An appropriation is made when an individual physically takes water from a stream or well (when legally available) and puts that water to some type of beneficial use. The first person to appropriate water and apply that water to use has the first right to that water within a particular stream system. This person, after receiving a court decree verifying their priority status, then becomes the senior water right holder and that water right must be satisfied before any other water rights are filled. In Colorado, the State Engineer has the statutory obligation to protect all vested water rights. The process of allocating water to various water users is traditionally referred to as water rights administration, and is the responsibility of the Division of Water Resources.

Of course, the appropriation system is much more complicated than this. Some priorities on major stream systems in Colorado date back to the 1850's, and most of the stream systems have been over-appropriated, meaning that at some or all times of the year, a call for water by a senior appropriator is not being satisfied. Practically speaking, it means that in most river drainages, a person cannot divert rainwater and put it to a beneficial use without a plan for augmentation that replaces the depletions associated with that diversion.

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