

GRAYWATER

June 2014



City of Santa Cruz Water Conservation Department

Laundry-to-Landscape Systems

This document provides an overview of the steps and considerations involved with installing laundry-to-landscape systems—the most accessible source of graywater. This document summarizes information described in the *Monterey County Business Council: A Homeowner's Guide to Conserving Water* (November 2012) and from the *City of Santa Cruz Graywater Informational Handout* (March 2014). Furthermore, the [Central Coast Greywater Alliance](#)¹ has many helpful tips about installing a system properly.

Laundry-to-landscape systems do not require a building permit if the requirements outlined in [Chapter 16 of the 2013 California Plumbing Code](#) are followed, in addition to being [registered](#) with City of Santa Cruz Public Works Department.

Note: Graywater can NOT be stored for later use; graywater becomes septic and can be harmful to animals and humans. Graywater can NOT be applied at the surface; it must percolate through a subsurface mulch basin, and NO runoff can occur.

Step 1: Estimate your Graywater Production

1. How many loads of laundry are done in a typical week?
2. How many gallons of water are used per load?
 - Older top-loading machines use about 40 gallons/load
 - Front-loading machines use about 20 gallons/load
(Some EnergyStar machines are top loading. Front-loading EnergyStar machines use about 15 gallons/load. Today's current standard load is about 25 gallons/load.)
3. Are there future changes to consider, such as installing a new washing machine, increases or decreases in the number of occupants, or changes in landscape?

Weekly Graywater Produced = Loads per Week x Gallons per Load

Step 2: Decide What Plants to Irrigate

Plants with larger root zones do better with graywater-irrigation. The plants stay happier and healthier with consistent laundry water patterns.

Best for Graywater-Irrigation

Trees (especially fruit trees!)
Shrubs/bushes
Vines
Perennials
Large annuals

Not Appropriate for Graywater-Irrigation

Lawns
Drought Established (e.g. Never irrigated)
Small Plants, Sensitive Plants (e.g. Ferns)
No root vegetables
Not For Use in Raised Beds



<http://backyard-homestead.com/how-to-grow-apples>

For those with existing irrigation systems, identify a zone/valve that can be shut off and replaced with graywater.

Step 3: Estimate Plant Irrigation Requirements

Does Your Graywater Production = Your Plant Irrigation Requirements? Pick the right amount of plants based on your graywater output. Irrigation requirements depend on whether the plants being irrigated are water intensive (e.g. fruit trees) or drought-tolerant. Plants usually have an estimated water demand factor that can be determined through online research or through contacting a local nursery.

Step 4: Plan the Path of Travel

Laundry-to-landscape systems have limitations that affect the graywater's path of travel through a landscape, including topography, number of distribution points (i.e. mulch basins), and piping placement. Importantly, these systems should not be installed at properties with high water tables.

¹ "Graywater" has the same meaning as "greywater", "grey water", and "gray water".

Topography: Irrigate flat areas or the closest downhill area to the washer.

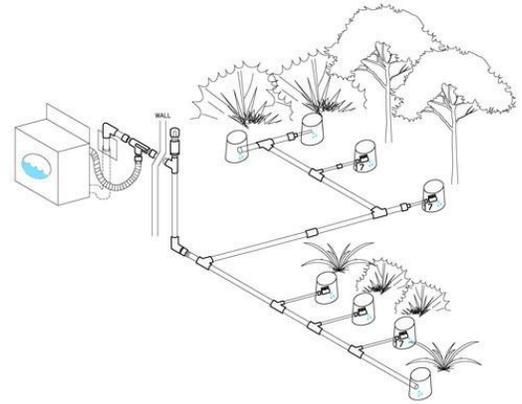
- In a flat yard, distribution should be within 50 feet of the washing machine.
- If the site slopes downward to distribution points, there is no rule on distance—however, it is recommended to use tubing that curves to slow gray-water flow on downhill slopes.
- Try to maintain a downward slope whenever possible.

Number of distribution points:

- Top-loading machines can irrigate up to 12 mulch basins, and
- Front-loading machines can irrigate up to 8 mulch basins.

Piping to landscape must be:

- 1.5 feet from buildings and property lines.
- 100 feet from wells, creeks and storm drains.
- Piped around obstacles—go under, around, remove, or cut a strip from hardscapes (e.g. patios or walkways).



http://sustwatermgmt.wikia.com/wiki/Greywater_Use_in_Santa_Barbara?file=6784a2da2884370c17018c1156e7308a.jpg

Step 5: Installation

Please refer to online literature about how to correctly install the:

- 3-way valve, which allows the user to direct graywater into either the existing sewer line or the new graywater-irrigation pipelines;
- Auto vent anti-syphon, which prevents formation of a vacuum within the new pipeline; and
- Proper 1" poly tubing and mulch-basin distribution points, which carry the graywater from the laundry to the root zones of plants within the landscape.



Photo credit: Central Coast Greywater Alliance and Greywater Action

Step 6: Product Choices

Avoid using products that can harm soils and plants. These products include but are not limited to:

- Salts or sodium compounds;
- Boron, borax, or borate;
- Peroxygen, petroleum distillate or alkyl benzene;
- Chlorine bleach (hydrogen peroxide bleach is okay);
- Water softeners that use sodium chloride (potassium chloride is okay); and
- Antibacterials, which alter the biology of natural occurring bacteria in the ground and groundwater.

Step 7: Registration

All Laundry-to-Landscape systems within city limits **MUST** be registered with the City of Santa Cruz Public Works Department by submitting an [Installation and Maintenance Agreement](#) form.

Step 8: Safety and Maintenance

Each system must have its own Homeowner's Maintenance and Operations Manual, detailing the working parts, layout of system, and maintenance requirements. The 3-way valve must have a label directly above it, detailing the direction of flow. This manual must stay with the operational graywater system in the event that the homeowner(s) or tenant(s) cease to live at the property. Furthermore, the following steps must be adhered to:

1. Do not eat plants or vegetables that have come in *direct* contact with graywater (e.g. root vegetables).
2. Water used to clean soiled material (e.g. diapers, oily rags, etc.) must be diverted to the sewer using the 3-way valve.
3. Graywater must be diverted to the sewer during the rainy season, typically October 1 through April 1, to eliminate ponding or runoff.
4. Do not store it—graywater must be diverted into the landscape or sewer immediately.

More information and links can be found at www.cityofsantacruz.com/graywater