

Laundry to Landscape Greywater System Owner's Manual for XXX, Berkeley, CA 94708

Congratulations on your new greywater system! This manual will help you maintain your system as a well-functioning, water-saving greywater irrigation system for years to come.

This manual is to remain with the house throughout the life of the system. Upon change of ownership or occupancy, the new owner or tenant must be notified that the structure contains a greywater system. A map showing the location of all greywater system components is attached to this owner's manual.

(put in specifics for your system here) Design criteria were for the Laundry to Landscape system to be able to handle 5 to 6 loads of wash per week at 22 gallons per load for a total of 110 to 132 gallons/week. These loads were assumed to be split between two separate washing events during the week. Each of 10 fruit tree should ideally receive at least 10 gallons per week.

How do I turn off my greywater irrigation system and direct the greywater back to the sewer?

The brass 1" three way valve on the basement wall behind the washing machine controls the **Laundry to Landscape greywater**. This type of greywater system uses the pump in the washing machine itself to push the greywater out to the garden through 1" PVC pipe. The PVC transitions to 1" HDPE irrigation tubing after the PVC crosses under the brick patio and reaches the grey control box just past the brick pathway. Ten fruit trees throughout the garden are watered by this laundry greywater. The 1" main extending to the rear fence waters the persimmon, plum, plum, lemon, fuji apple, and lemon. The 1" branch extending to the west waters the two citrus trees, the pineapple guava, and the apple.

The three way valve must have a clear label permanently posted next to it so that anyone attempting to wash clothes would understand how to operate the valve in order to send greywater either to the garden or to the sewer. At time of installation, signage was posted on the wall above the valve and must remain there.





Handle horizontal to left directs greywater to sewer~ Handle vertical directs greywater to garden (The tiny arrow on the red handle indicates direction of flow.)

These are times you'll need to turn off your system and direct the greywater back to the sewer:

- During the rainy season if the ground water table has risen above 3 feet
- Anytime you notice that the greywater isn't infiltrating into the mulch basin and you see pooling or runoff in the landscape
- If you think the trees are receiving too much water
- When washing dirty diapers or anything with chemicals, such as oily rags
- Anytime you use products that are harmful to plants (like bleach or harsh cleaners)
- If you haven't directed the washing machine greywater to the sewer connection for a while you may notice sewer gas smells emitting from the drain standpipe attached to the ejector pump. The water in the trap may have evaporated allowing sewer gas to enter the basement. The trap just needs to be refilled by running a load of wash directed to the sewer.

2. What products can I use in my greywater system?

Plant friendly products are key when reusing your greywater in the garden. All products should be biodegradable and non-toxic. In addition, they should be **free of salt (sodium) and boron (borax)**, two common ingredients that are non-toxic to people but are harmful to plants and/or the soil.

Chlorine bleach is also harmful to plants and should be diverted with any other harmful products to the sewer by switching the 3-way valve. **Hydrogen peroxide bleaches are less harmful and can be used instead of chlorine.**

A consideration with laundry products is their effect on the pH of the greywater. Check for labeling on your detergent that indicates that it is "PH Neutral".

Certain acid-loving plants (like ferns, azaleas, camelias, rhododendrons, and blueberries) may not be

happy with alkaline water. If you're uncertain whether the pH is being effected choose plants that are not acid-loving to irrigate.

Products we recommend for the Laundry (they are salt and boron free, and pH neutral): Oasis, Ecos, and Biopac liquid detergents. There are also soap alternatives that are greywater friendly, like soap nuts, and "wonder balls".

Bath: Dr. Bronners products, Aubrey Organics

3. How do I maintain my greywater system?

The main thing you'll need to do to in order to maintain this system is to periodically check the mulch basins (the mulched trough that the greywater flows into) and make sure the greywater is being absorbed into the mulch/soil and there is no pooling or runoff. If you notice any pooling or runoff you should dig out the composted/compacted mulch and replace it with new mulch (wood chips or bark). This typically needs to be done once every one or two years depending on how coarse the mulch was to begin with. The coarser the mulch, the longer it takes to break down or compact.

At the beginning of the irrigation season and periodically thereafter, look inside the mulch shields to check whether greywater is coming out all of the outlets evenly. If you notice uneven distribution of greywater you should check the outlets for clogs and manually remove the debris causing the obstruction.

Sometimes, if the soil or mulch level has risen around the greywater outlet tubing, roots may colonize the inside of the tube in eagerness to get at the water. Dig out any excess soil or mulch that may have filled the mulch shield. The greywater needs to freefall out of the tubing or pipe onto mulch at the bottom of the shield. Soil or mulch should not accumulate so that they are in contact with the actual tubing or pipe.

To “flush” the system and remove any clogs:

In the garden near the Japanese maple tree just beyond the brick pathway there is a grey control box dug into the soil.



Inside the box is a PVC union.

Unscrew the union nut

Insert the fitting into the garden side



It will look like this--don't push in too far or it may be difficult to remove!

Then attach the hose to the swivel nut on the inserted fitting and flush lint or any blockages from the irrigation tubing with water pressure from the hose. Then turn the water off, disconnect the hose, remove the insert fitting and reconnect the union. Make sure the "O ring" on the face of the union doesn't get dislodged.



Flushing the laundry greywater system this way will remove any lint and a check can easily be made to confirm that water is coming out of all of the outlets. You may want to open the balancing ball valves in some of the mulch shields all the way so that lint can more easily be blasted out, then re-adjust them for desired flow.

Any time you use a garden hose to temporarily flush the system, make sure you have an anti-siphon valve or vacuum breaker on your garden hose-bib.

The “auto-vent” or “air admittance valve” that prevents washer refill water from being siphoned out into the garden should be checked periodically to confirm that it is working and not leaking. In the event of failure, the valve can be easily unscrewed and replaced.



4. What are the minimum requirements that I need to follow for my greywater system to comply with the code?

The California greywater code in effect at the time of this system’s installation in October 2013, (CPC Title 24, Part 5, Chapter 16A), states that **washing machine greywater systems do not require a permit as long as the installer complies with the following minimum requirements:**

1. If required, notification has been provided to the Enforcing Agency regarding the proposed location and installation of a greywater irrigation or disposal system. *Note: A city, county, or city and county or other local government may, after a public hearing and enactment of an ordinance or resolution, further restrict or prohibit the use of greywater systems.*
2. The design shall allow the user to direct the flow to the irrigation or disposal field or the building sewer. The direction control of the greywater shall be clearly labeled and readily accessible to the user.
3. The installation, change, alteration or repair of the system does not include a potable water connection or a pump (other than the one already in the washing machine) and does not affect other building, plumbing, electrical or mechanical components including structural features, egress, fire-life safety, sanitation, potable water supply piping or accessibility.
4. The greywater shall be contained on the site where it is generated.
5. Greywater shall be directed to and contained within an irrigation or disposal field. (Mulch basins are defined by the code as acceptable irrigation fields.)
6. Ponding or runoff is prohibited and shall be considered a nuisance.
7. Greywater may be released above the ground surface provided at least two (2) inches (51 mm) of mulch, rock, or soil, or a solid shield covers the release point. Other methods which provide equivalent separation are also acceptable. (The mulch shield lids provide a “solid shield” covering the greywater outlets.)
8. Greywater systems shall be designed to minimize contact with humans and domestic pets.
9. Water used to wash diapers or similarly soiled or infectious garments shall not be used and shall be diverted to the building sewer. Greywater shall not contain hazardous chemicals

derived from activities such as cleaning car parts, washing greasy or oily rags, or disposing of waste solutions from home photo labs or similar hobbyist or home occupational activities.

10. Exemption from construction permit requirements of this code shall not be deemed to grant authorization for any greywater system to be installed in a manner that violates other provisions of this code or any other laws or ordinances of the Enforcing Agency.
11. An operation and maintenance manual shall be provided. Directions shall indicate the manual is to remain with the building throughout the life of the system and indicate that upon change of ownership or occupancy, the new owner or tenant shall be notified the structure contains a greywater system. (This document shall serve as that manual.)

System images





1" HDPE main originates in box



1" main heads to rear of garden, waters persimmon R plum L, plum R, lemon L, fuji apple R and lemon R



1" branch to left just before the plum tree waters 2 citrus, guava, apple



1" main is open at end at apple tree to make certain any other clogs in the system don't put back pressure on the washer pump

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