



Story: Ruth Czermak

Reusing household water for garden irrigation is no longer considered such a grey area

Most people now recognise that this sunburnt country of ours is in the grip of an unprecedented water shortage. Dams and rivers are running dry, cities and towns face restrictions and farmers confront an uncertain future.

Summers spent running under a garden sprinkler or jumping on a waterslide in the backyard are now only a distant memory, as is the tick, tick, tick of an impulse irrigation system and the luxury of a long, hot steamy shower. Now it's three-minute showers, dusty

cars and fingers crossed that our rainwater tanks will arrive before it rains again.

The issue seems to be on everyone's mind and the marketplace is responding: you can now buy waterless handwash, waterless car wash and waterless urinals! You can also do something about the water that goes down the drain during your three-minute shower — and that "something" doesn't involve spending billions of dollars on energy-hungry desalination plants. At a household level, there are many ways we can use a lot less water and

use what we have much more efficiently.

Why not use waste(-d) household water for other purposes? Let's face it, we hardly need to be flushing the toilet or watering the garden with high-quality drinking water. Instead, we can use greywater. Put simply, greywater is household waste-water from the bath, basin, shower and laundry. Although greywater has a pretty drab name, it's worth getting excited about as, not only would its use reduce demand on drinking supplies, it would also decrease the amount of sewage discharged to the environment.



A reliable water source

Greywater is also produced reliably and consistently throughout the year as inside use of water remains constant regardless of the season; summer or winter, we still need to wash our clothes and take showers. Rainwater, on the other hand, can be unpredictable and

1. Instead of sending shower, bath and hand basin water down the drain, you can reuse it for irrigating the garden or flushing your toilets. Photo courtesy of Reece.
2. The Greywater Gardener 230 diverter system sends water to a compact surge capsule, which is then gravity-fed to the garden for irrigation. For more information: www.waterwisesystems.com.
3. This innovative home greywater plant filtration system shows greywater use and great garden design can go hand in hand. Photo courtesy of Sydney Water.



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Types of greywater systems

Greywater systems can be divided into two main groups: simple diverter systems and treatment systems. Simple diverter systems capture the water and then reuse it without any form of treatment. Treatment systems capture the greywater and divert it through a number of intermediate steps to improve the quality of the water.

When deciding which greywater system best suits your household, a number of factors need to be considered. The first is the quality of the

greywater you produce. The characteristics and quantity of greywater produced will depend on the number of people in the house, their ages, lifestyle, health status and use pattern.

You will also need to think about what you want to use the greywater for and what sort of budget you have to work with. In many situations, the available space and your existing pipework will impact on the type of system that can be installed.

Diverted greywater: Untreated greywater can contain contaminants such as salts, →

is not available when needed. If treated correctly, greywater can be used for garden irrigation and even for clothes washing and toilet flushing.

A typical Australian household produces around 100 litres of greywater a day; that's the same volume as 100 milk cartons. This means an average household could save between 100,000 and 150,000 litres of water a year by effectively capturing and reusing the water they produce.

One of the simplest methods of using greywater is to capture it in buckets and use it in the garden. This has the added benefit of costing nothing but a bit of time and muscle. Another option is to install a permanent greywater system. The installation and use of permanent greywater systems is regulated by different regulations depending on your state or territory and the rules can vary from place to place. There are only two regulations common to the whole of Australia. First, a licensed plumber is the only person who can alter the sewer line; second, diverting greywater away from the sewer system may need a permit from your local water authority or council. Each state and territory has differing regulations on storage of greywater and the uses of this greywater. The regulations are also updated on a regular basis, so you should contact your state environmental protection authority, local council or plumber for up-to-date information.



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detergents, soaps, petrochemicals, oil, bacteria, fungi and viruses. The important thing to remember is that everything you put down the drain ends up in your greywater.

In Victoria, Queensland and the ACT, untreated greywater can be diverted from the house and used for subsurface garden irrigation. It must be used as it is produced, should not be applied to the garden in any manner that allows ponding and cannot be stored for longer than 24 hours.

Legally, it should be applied to the garden through irrigation pipes run below the surface of the soil. It should not be used in aboveground irrigation systems (microsprays, pop-up or shrub sprays) or in the house (including for flushing toilets).

The benefit of using a greywater diverter system is it's a relatively cost-effective way of diverting greywater to the garden in the driest periods of the year, when it has the greatest need.

Treatment systems: Greywater treated to a Class A standard can be stored indefinitely



and used in all types of irrigation systems. In Victoria, Class A water can be used for flushing toilets and, in some cases, to wash clothes. In Queensland, Class A+ can also be used to wash vehicles and hose down paths.

Class A greywater can easily be used in multi-zone, fully automatic irrigation systems, which means you can irrigate as needed rather than lightly and many times a day, which occurs with simple diverter systems.

Greywater treatment systems can include mechanical, biological, ultraviolet, bromine, chlorine, carbon, alumina and membrane treatment processes. The benefit of a greywater treatment system is it improves the quality of water, allowing multiple uses of the water inside and outside the house and allows the treated water to be stored until needed.

Greywater use in the garden

Mains water consumption in the garden varies depending on the location. While people in Adelaide consume, on average, about 15 per cent of their water in the garden, households in Sydney and Melbourne use about 26 per cent. Keeping this in mind, recycling household greywater for use in the garden is an excellent way of saving water and your conscience. Unlike rainwater, which

is seasonally available, greywater is available every time you shower or wash.

There are two main contaminants to focus on when using greywater in the garden: salts and detergents. Most of the salts in greywater come from laundry detergents, which are often also alkaline. The two main salts are phosphorus and sodium. Phosphorus is a major waterway pollutant, causing algal blooms and having a detrimental effect on some native plants.

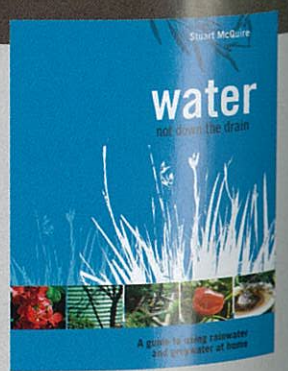
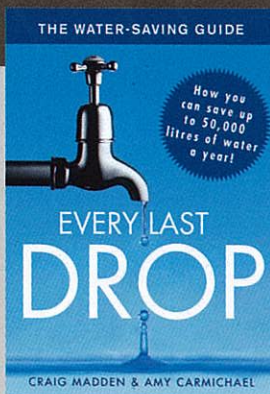
In Australia, we have a labelling system for laundry detergent: NP means no phosphorus is added to the product and P means the level of phosphorus in the product is below the maximum phosphorus level set by an agreed Australian standard. Choosing laundry detergents labelled NP will mean the least amount of phosphorus is in the water to begin with.

Another option is to change to a liquid form →

4. The Nubian Oasis QT600 greywater treatment system is accredited for use in NSW, Queensland, ACT and Victoria. For more information: www.nubian.com.au
5. The laundry is another source of greywater. You can reuse water from the final rinse cycle of the washing machine or the sink. Photo courtesy of IKEA.

Read all about it!

If you'd like to learn more about choosing and using greywater systems, *Water Not Down the Drain* by Stuart McQuire (published by the Alternative Technology Association, RRP \$29.95) covers the subject comprehensively. It also talks you through everything you need to know about collecting rainwater, managing stormwater and generally reducing your dependence on mains water. The author, an environmental scientist and past president of the Alternative Technology Association, draws on his own experience of reducing his household water consumption and includes examples of how he uses rainwater, greywater and stormwater. Another useful reference source is *Every Last Drop: The Water Saving Guide* by Craig Madden & Amy Carmichael (published by Random House, RRP \$24.95), which promises to show you how to cut your water usage and water bills in half.



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of detergent. Typically, these contain fewer salts and also will not form sediments that can block below-ground irrigation hoses. Soap also causes problems as it is made up of caustic products and either animal or plant fat/oil. When it cools, it has the potential to congeal in irrigation lines and the soil making it water-repellent.

Some common problems

Continual garden reuse of laundry water containing high levels of sodium and phosphorus can lead to salt accumulations in reuse areas. In clay soils, where greywater is used for extended periods of time, the salts will build up very quickly and not leach away.

Many of the treatment systems available reduce the amount of salts in the water. However, if using untreated greywater, care should be taken to irrigate only when it's actually needed and to alternate the areas irrigated to help reduce the chance of salt build-up in the soil.

In addition to choosing washing detergents and bathroom products that are low in salts, you can also help protect your soil by mulching and adding compost to it.

Most plants prefer to grow in neutral soil, but in certain circumstances the pH of greywater can alter the pH of your garden soil. If the pH of the greywater is very acidic or alkaline it may change chemical relationships in the soil and impact on the absorption of nutrients by plants. In alkaline situations phosphorus and boron become so easily absorbed by plants that they may take up toxic amounts, while other nutrients such as iron and nitrogen, although present in the soil, cannot be absorbed by the plants.

Remember that plants like azaleas and camellias prefer acidic conditions, so watering with alkaline greywater may harm them. You can test the pH of greywater by using an aquarium dye-based pH test kit.

Another common problem is the use of antibacterial and antifungal cleaners. These should not be diverted to the garden as they will kill beneficial soil bacteria and fungi. A complex relationship exists between soil fungi and bacteria, nutrient availability and soil structure.

Chlorine in bleach is another problem as it's

a general biocide. An environmentally friendly option to chlorine bleach is to use hydrogen peroxide, which breaks down quickly to hydrogen and water in the environment.

It's important to remember that the leaves of plants are coated with waxes that prevent the leaves from drying out. Plants control moisture loss through stomata — special pores on the leaves that open and close in response to the environment. Detergents are very good at dissolving oil and waxes in the home and your washing and also do a very good job of it on plant leaves. Once the protective wax layer is dissolved, the plant is unable to retain water and will soon dehydrate and, in extreme cases, die.

Home building or renovating

Although your house can be retrofitted to maximise the use of greywater, if you are planning a new house or a major home renovation, make sure your property is greywater-ready by separating all your greywater pipes from your blackwater pipes and specifying a single greywater collection point.

Also ensure that as much of your pipework as possible is easily accessed so that treated greywater can be plumbed back into the house for clothes washing and toilet flushing. One day it could prove to be one of the best decisions you ever made. ■

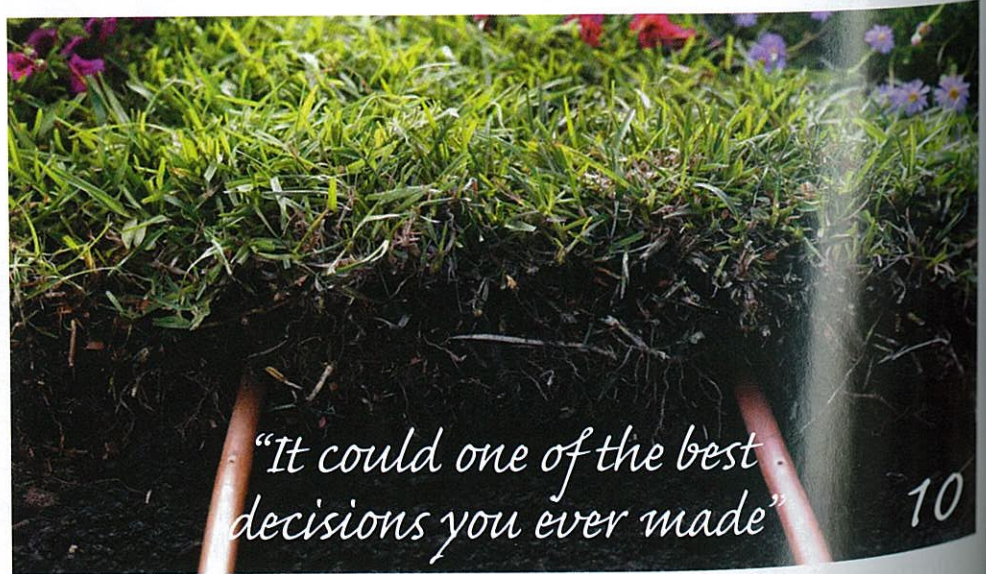
6&7. If you want to use grey water on the garden use washing powder with the lowest phosphorus count. Also consider switching to liquid detergents as these have fewer salts, or buy a garden-friendly brand from your supermarket or online.

8. The highly efficient Greymate diverter system has a high-volume pump, which only runs when the tank is full or when activated by the timer. For more information: www.everwater.com.

9. The Nylex Greywater Diverta system is gravity-fed so requires no pump. It can be positioned inside a laundry cupboard or placed outside. For more information: www.nylex.com.au.

10. In some states, untreated greywater can be diverted and used on the garden as long as it is via a subsurface garden irrigation, so check what's allowed in your area. Photo courtesy of Dural Irrigation.

Ruth Czermak is the principal designer at Botanical Traditions, a landscape design office based in Melbourne that specialises in sustainable landscape design. All information in this article is of a general nature only and specific advice should be obtained from your local environmental protection authority, council and licensed plumber.



"It could one of the best decisions you ever made"

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