

## GREY OR RECYCLED WATER (NON-DRINKING WATER SUPPLY)



### AIM

The aim of this technical solution is to clarify some of the plumbing issues associated with the range of water supplies that may be classified as “Non-drinking”.

### Note:

- > Rainwater is not classified as either drinking or non-drinking as it depends on its intended use. For further information relating to rainwater for drinking purposes, refer to [www.health.vic.gov.au](http://www.health.vic.gov.au)

### PLUMBING REGULATIONS 2008

The *Plumbing Code of Australia* (PCA) is adopted by and forms part of the *Plumbing Regulations 2008*. Part B3 of the PCA specifies the objectives and performance requirements related to the installation of non-drinking water services. *AS/NZS 3500.1: Plumbing and drainage Part 1: Water Services* is a “deemed to satisfy” document listed in Part B3 of the PCA and contains sections on Non – Drinking Water Services and Water Supply from Rainwater tanks.

### RECYCLED WATER

#### DESCRIPTION OF THE CLASSES OF RECYCLED WATER.

- > There are four classes of recycled water: A, B, C, & D. The main difference between the classes is the measure of E.coli in the water. E. coli is a bacterium found in the gut of warm blooded animals that indicates faecal contamination. The four classes of recycled water represent four minimum standards of biological treatment and pathogen reduction. Table 1 is a guide to the classes and appropriate uses of recycled water.
- > Recycled Water has been introduced in numerous housing estate developments to provide for toilet flushing and garden irrigation. The recycled water is generally treated to Class A standard, and reticulated to individual properties by a Water Authority or Provider. This creates what is commonly referred to as a “Dual Pipe System”.

The Plumbing Industry Commission (PIC) publication, “Recycled Water Plumbing Guide, Dual Pipe Plumbing Systems” is available on the PIC website at [www.pic.vic.gov.au](http://www.pic.vic.gov.au). The guide has been developed to ensure that Plumbing Practitioners properly install and commission the dual pipe system (see Figure 1).

A recycled water supply system can also be from a privately owned and maintained treatment plant.

Examples of applications for a privately owned treatment plant may include:

- > An owners corporation multi-unit development
- > An owners corporation high rise apartment building
- > Industrial process plant water reclamation
- > Agricultural processes
- > Surface stormwater capture and re-use.

### MAINS

- > The recycled water main is purple coloured, generally of plastics material but may be ductile iron wrapped in a purple sleeve (see Figure 2).

### METERS

- > Meters, where required, are purple colour
- > Meters have different inlet and outlet couplings to prevent interchange.
- > Purple sleeved copper is required for the meter up-stands (see Figure 3).

### APPROVED MATERIALS (PIPES ETC.)

- > Plastics pipe materials must comply with *AS/NZS 4020: Testing of products for use in contact with drinking water* and coloured purple.
- > Copper pipe must be purple sheathed.
- > By agreement, larger size pipes may be wrapped in purple tape, sleeved or painted and labelled “Do not drink” (see Figure 4).

### INSTALLATION

- > Underground recycled water pipe must have identification tape installed.
- > 300mm minimum separation from the drinking water service below ground.
- > 100mm minimum separation from the drinking water service above ground.

### EXTERNAL RECYCLED WATER TAPS

- > Non standard inlet thread.
- > Purple colour.
- > Removable handle.
- > Prohibition sign required (see Figure 5).

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**TABLE 1 - CLASSES AND APPROPRIATE USES OF RECYCLED WATER**

Class	E.coli measure	Appropriate uses
A	<10 E.coli org/100ml	Residential garden watering Toilet flushing Food crop irrigation Parks, gardens, sports ground irrigation Industry processes
B	<100 E.coli org/100ml	Urban uses with restricted public access Livestock drinking water Closed industrial systems Irrigation of dairy cattle grazing fodder
C	<1000 E.coli org/100ml	Urban uses with restricted public access Cooked/processed human food crops Some crops not exposed directly to water (e.g. apples)
D	<10000 E.coli org/100ml	Non food crops. e.g. woodlots, turf, flowers

### INSPECTIONS

- > The PIC is conducting inspections of all recycled water installations in three stages
- > Meter assembly to building
- > Rough in
- > Fit off & Commissioning

### COMMISSIONING PROCEDURE

- > The commissioning procedure as outlined on pages 9 and 10 of the Recycled Water Plumbing Guide must be used to ensure there are no cross connections with the drinking water system.

### BACKFLOW PREVENTION (FOR PROPERTIES WITH CLASS A RECYCLED WATER)

As recycled water and drinking water are delivered to properties through a dual pipe arrangement, it is essential that adequate backflow prevention measures are in place.

The Water Authority supplying the drinking water will require a dual check valve as the backflow prevention device on the drinking water meter assembly.

Any external drinking water taps must also be fitted with a hose connection vacuum breaker. It is the responsibility of the installing plumbing practitioner to ensure that the commissioning measures outlined in the Recycled Water Plumbing Guide are followed to ensure no cross connection with the drinking water has occurred.

#### Note:

- > The PIC will be maintaining the three stage inspection process to ensure compliance with the Guide.

In other cases of a privately owned and maintained recycled water treatment system, individual and zone backflow prevention protection must be assessed and provided in accordance with Section 4 of *AS/NZS 3500.1*. The requirements for containment protection at the outlet of the main drinking water meter vary depending on the relevant Water Authority. However, the containment protection hazard rating is generally considered “high” requiring a testable device such as a RBT or RPZD.

### GREY WATER

Grey water is generally defined as waste water from non toilet household fixtures such as baths, basins, showers, washing machines and laundry troughs. Kitchen sinks are not considered an acceptable source of direct grey water reuse due to the presence of grease and food particles. Kitchen sink waste may be suitable if an approved treatment system is used.

### APPROVED GREY WATER TREATMENT SYSTEMS

- > Permanent grey water treatment systems (see diagram below) must be approved for installation by the EPA. There is a list of approved systems on the EPA website. (see [www.epa.vic.gov.au](http://www.epa.vic.gov.au)) The maintenance of the systems must comply with the requirements of the Local Government authority.
- > Systems are also available that divert and collect untreated grey water and pump it to sub surface garden irrigation. These systems are also approved by the EPA and carry plumbing product approval.
- > The installation of permanent grey water systems is regulated plumbing work (see Figure 6).

### TEMPORARY GREY WATER DIVERSION

- > For a simple temporary grey water diversion system, local government and EPA approval is not required however it must be installed by a licensed plumber.
- > The EPA publication no. 884.1 “Grey water use around the home” should be read by the home owner and installer before considering temporary grey water diversion. See [www.epa.vic.gov.au](http://www.epa.vic.gov.au)
- > If there are concerns regarding any temporary grey water diversion system, the Local Government Environmental Health Officer must be consulted. This will ensure compliance with the requirements of local government and EPA.

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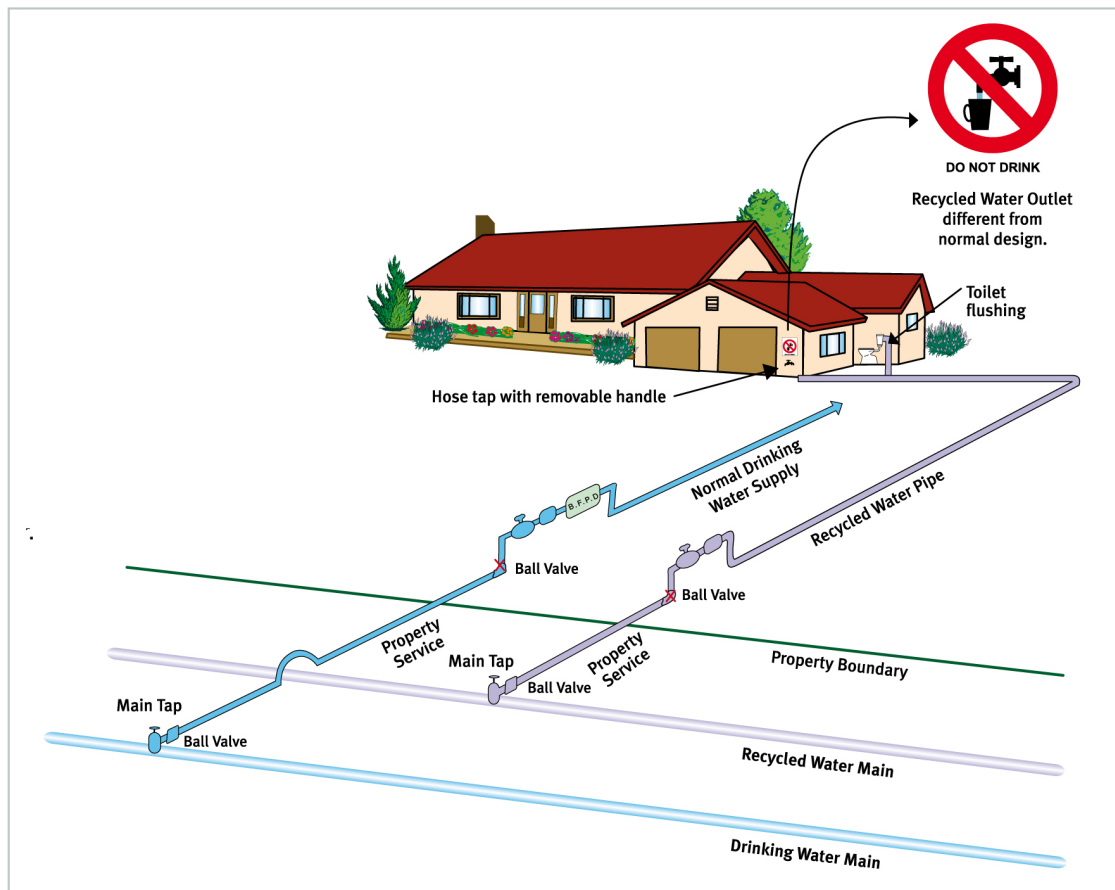
### SOME ISSUES RELATED TO GREY WATER RE-USE INCLUDE:

- > Grey water must be confined to within the property boundary.
- > Grey water must not leak into the stormwater system.
- > Untreated grey water must not be stored longer than 24 hours.
- > Any overflow from a grey water system must discharge to sewer or a septic tank in accordance with the *Plumbing Regulations 2008*.
- > Salts, sodium, chloride and boron can exist in grey water that can harm or kill plants.
- > Nutrient uptake in some plants may be affected by grey water.

### REDUCE HEALTH RISKS WHEN USING GREY WATER (REFERENCE: [WWW.BETTERHEALTH.VIC.GOV.AU](http://WWW.BETTERHEALTH.VIC.GOV.AU))

- > Use lower risk sources of grey water, such as water from the shower, bath and laundry rinse cycle.
- > Don't use grey water on vegetable gardens.
- > Don't use grey water if any member of your family is suffering from gastroenteritis.
- > Don't irrigate your garden with grey water in wet weather or if the soil is already sodden.
- > Don't allow grey water to form pools or ponds in your garden. The microbes will thrive, creating an offensive stink and a health hazard.
- > Don't allow your pets to drink grey water.
- > Take all steps to reduce public access to areas irrigated with grey water.
- > Keep children away from garden areas irrigated with grey water.

FIGURE 1 - DUAL PIPE SYSTEM



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- > Make sure your swimming pool and any other water features, like ponds and birdbaths, are safe from grey water runoff.
- > Encourage all the family to wash their hands before eating.

### BACKFLOW PREVENTION

Grey water reuse systems should not have any form of cross connection with the drinking water supply. If there was a cross connection, the hazard rating would be considered at least medium and the appropriate backflow prevention requirements as outlined in AS/NZS 3500.1 Water Services would apply. Containment protection is considered to be at least medium. Even if there were no cross connection, a testable containment backflow device would be required at the water meter.

### TREATED GREY WATER AND BLACK WATER

Treated effluent from an onsite aerated wastewater treatment plant or septic tank is not considered to be recycled water. The options for disposal onsite depend on the level of treatment and the approval conditions imposed by the EPA and Local Government authority.

*FIGURE 2 - RECYCLED WATER MAIN AND PROPERTY SERVICE*



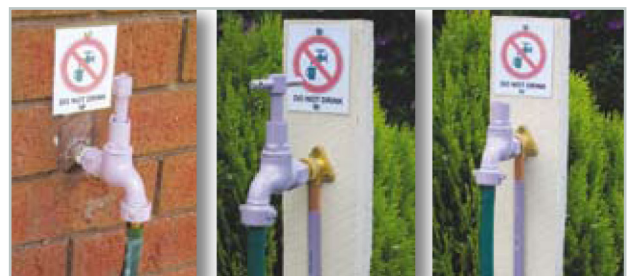
*FIGURE 3 - RECYCLED WATER AND DRINKING WATER METER ASSEMBLIES*



*FIGURE 4 - SOME EXAMPLES OF APPROVED PIPE MATERIALS*



*FIGURE 5 - EXTERNAL HOSE BIB TAPS WITH PROHIBITION SIGN AND REMOVABLE HANDLE*





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FIGURE 6 - APPROVED GREY WATER TREATMENT SYSTEM

