

## Draft guidelines for greywater system product approvals

Devices that divert, treat or reuse greywater must be approved by the Department of Health before they are marketed in South Australia. Approval from the relevant authority is also required for the installation of greywater devices. Applications must be accompanied by the required information as detailed in this guideline.

### What is greywater?

Domestic wastewater is made up of 'Greywater' and 'Blackwater'.

Greywater is wastewater generated from bathrooms (showers, baths, spas, and hand basins), kitchens (sinks and dishwashers), and laundries (washing machines, troughs).

Greywater from kitchens should not be used for greywater systems due to potential for solids to cause odour issues.

Blackwater is wastewater generated from toilets and urinals, and is contaminated with faeces and urine.

On average, each person generates approximately 150 L of wastewater per day. Of this, greywater flow constitutes approximately 100 L, 10% of which is generated in the kitchen, 35% in the laundry, and 55% in the bathroom.

### Greywater contaminants

The quality of greywater is highly variable due to factors such as water source, efficiency of appliances and fixtures, individual habits, associated products (soaps, shampoos, detergents etc.) and other site specific characteristics.

It is assumed by many that greywater is "clean" and "safe for reuse" as it does not contain blackwater. However, greywater may contain high levels of the following substances:

- Disease causing organisms (such as bacteria, viruses, protozoa, helminths).
- Suspended matter, organic matter, fats and oils, including but not limited to dirt, lint, food, hair, body cells and fats, and traces of faeces, urine, and blood.
- Chemicals derived from soaps, shampoos, dyes, mouthwash, toothpaste, detergents, bleaches, disinfectants, caustic dishwashing powders and other products (such as boron, phosphorus, sodium, ammonia and other nitrogen based compounds).

Management of greywater systems is essential to remove disease causing organisms, suspended and organic matter, as well as excess nutrients.

Greywater systems can be separated into two types: Domestic Greywater Diversion Devices (DGDD), which divert greywater without storage or treatment, and Domestic Greywater Treatment Systems (DGTS), which collect and treat greywater to a higher quality, often with storage.

### Approvals

#### Product approvals

Product approvals are required for devices that divert, treat or reuse greywater before they are sold and/or marketed in South Australia.

Approvals are issued by the Department of Health.



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## Installation approvals

Approved devices that divert, treat or reuse greywater require an installation approval from the relevant authority, incorporating product approval requirements, instructions provided by the product manufacturer, and any additional requirements (such as SA Water plumbing requirements). An application fee is charged by the Department of Health for installation approvals and for inspections as required by the relevant authority.

**Note:** *Installation of greywater systems must take into account the relevant authority's requirements for setback distances.*

*For information on the temporary use of greywater including manual bucketing, see the fact sheet 'Manual Bucketing and Temporary Diversion of Greywater' on our [Alternative Onsite Systems](#) web page.*

## Product approval requirements

### Design criteria for greywater treatment and diversion systems

The system must be designed to treat / divert all nominated greywater streams arising from the domestic premises.

- Where it is intended to install a system in a sewer (or other reticulated system) area, the system shall be capable of connection to the sewer (or other reticulated system) such that:
  - Approval is obtained from the owner/operator of the sewerage system;
  - An overflow to the environment will not occur should there be a failure of the greywater system. The system (and any associated storage tanks) must be designed to provide automatic overflow to sewer (or other reticulated system); and
- The operator may manually direct greywater to the sewer (or other reticulated system) during periods of rain or other circumstances adverse to the discharge of treated greywater.
- Where it is intended to install a greywater system in a non-sewered area, it shall be capable of connection to an effluent disposal system, as agreed in discussion with the relevant authority.
- The system must be designed to perform continuously and without any interventions between specified servicing intervals, performed by the maintenance contractor.
- The system must be structurally sound for all intended loads and operating environments, and meet requirements of AS/NZS 3500 and ATS 5200.460.
- The system must be constructed / installed in accordance with the design specifications, the relevant authority's approval conditions, and in accordance with good trade practices so as to allow efficient performance and ease of access for maintenance, with regard to the health and safety of users, operators and persons maintaining the system.
- The greywater treatment/diversion system must be constructed so as to make appropriate provision for access to and removal of contents in a safe and sanitary manner (Refer AS/NZS 1546.1, Clauses 2.4.6 and 2.4.7 of 1998 version).
- Cross connection prevention controls shall be installed in accordance with AS/NZS 3500.1.
- An in-line strainer/filter is required and must be designed for easy removal of lint, hair and other larger particles.

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- The system shall be capable of venting through the educt vent pipe on the house drainage system, or be separately vented in accordance with AS/NZS 3500.2.
- All components shall be securely fixed to withstand all loads encountered during the transportation, installation and normal operation.
- Untreated greywater must not be stored for more than 24 hours.

## Plumbing and other SA Water requirements

- All greywater products must be certified in accordance with the Plumbing Code of Australia (WaterMark certification).
- All greywater systems which are connected to SA Water's sewerage system must be approved by SA Water prior to installation.

## Specific criteria for domestic greywater treatment systems (DGTS)

- The DGTS must be designed to treat the greywater stream for a minimum of 6 EP based on 100L/p/d (mains water supply).
- All tanks and/or vessels and their lids shall be accompanied by technical information supporting the design to the satisfaction of the Department of Health.
- Treated greywater storage tanks must not exceed a capacity of 1000L. Larger tanks may be considered on a case by case basis.
- Installation instructions are to be provided on each unit for sale including approval requirements from the relevant authority.

## Specific criteria for domestic greywater diversion devices (DGDD)

- The DGDD must carry a WaterMark certification.

- No kitchen waste is to be diverted into the DGDD.
- The manufacturer must nominate the minimum required subsurface irrigation area and also provide a recommended irrigation design for the system.
- Installation instructions are to be provided on each unit for sale including irrigation requirements, and approval requirements from the relevant authority.

## Product compliance and testing criteria for domestic greywater treatment systems (DGTS)

*Note: The product compliance and testing requirements will depend on the treatment technology and proposed uses of treated effluent. Proposals should be discussed with the Department of Health prior to application.*

- Treatment processes and onsite controls are to be designed so as to achieve sufficient pathogen reduction (assessed as log reductions) of bacteria, protozoa and viruses. Other water quality parameters such as BOD<sub>5</sub> and suspended solids may also apply.
- The required water quality for a specific use must be determined in accordance with the Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 1).
- Product approval of DGTS where treated greywater is to be used for irrigation of a dedicated landscaped area or subsurface irrigation must meet the product compliance and testing criteria listed in Appendix A.
- The requirements in Appendix A are based on a single domestic onsite greywater system. Note that specific or additional criteria may be applied for certain treatment trains or processes. The Department of

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Health should be contacted to determine appropriate testing requirements.

- Criteria for communal systems or a series of connected onsite systems from different dwellings will be assessed by the Department of Health separately.

**Note:** Requirements for accreditation of a DGTS where the treated effluent is to be used for toilet flushing, car washing, washing machines or unrestricted garden watering shall be in accordance with Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 1).

*This will include demonstration of process/technology validation and continuous monitoring and verification monitoring requirements. Specific log reductions of Viruses, Protozoa and Bacteria will be required along with other effluent quality parameters such as BOD<sub>5</sub>, suspended solids etc.*

*The Department of Health will determine the requirements for such systems on case to case basis depending on technologies used by the systems and proposed end use(s).*

## Treated greywater disposal and irrigation options

### For a DGDD:

- Land application is to be via a dedicated subsurface disposal or subsurface irrigation.
- A soil report from an engineer or soil scientist must be provided for each installation;

### For a DGTS achieving secondary treatment with disinfection:

- Land application can be via a dedicated surface or shallow subsurface irrigation, or subsurface disposal in accordance the relevant authority's requirements.

## Irrigation requirements

- Subsurface disposal and surface irrigation systems are to be designed in accordance with the SAHC Code 'Waste Control Systems- Standard for the Construction, Installation and Operation of Septic Tank Systems in South Australia' and its 'Supplement B - Aerobic Wastewater Treatment Systems' (see our [Standard Onsite Systems](#) web page).
- Sub-surface irrigation systems are to be designed in accordance with the system manufacturer's, soil engineer's and the relevant authority's requirements.
- AS/NZS 1547 may be followed for other soakage, or spray and drip irrigation systems as accepted by the relevant authority.
- Irrigation of vegetable patches and other plants used for human consumption is not permitted. Irrigation of fruit and nut trees is allowed in some circumstances.

## Installation

All greywater treatment and diversion systems must be installed by a licensed plumber.

The greywater system must be installed in accordance with the manufacturer's recommendations, Department of Health product approval, and the relevant authority's installation approval.

## Operation and maintenance

The greywater system shall be operated and maintained in accordance with the manufacturer's recommendations, Department of Health product approval, and the relevant authority's installation approval.

## Appendix A

### Product compliance and testing criteria for domestic greywater treatment systems (DGTS)

These requirements apply to DGTS intended for irrigation of a dedicated landscaped garden area. Note that specific or additional criteria may be applied for certain treatment trains or processes. The Department of Health should be contacted in order to determine appropriate test requirements.

#### Test criteria

- The test DGTS site shall be on a premise that is representative of a domestic greywater source, including all intended greywater source components such as laundry, kitchen, bath, shower and hand basins.
- Approval for installation and operation of the DGTS test site shall be obtained from the Department of Health.
- Test water is to be diverted to sewer (or other wastewater system) immediately after treatment and all required samples / tests have been undertaken. Permission must be obtained from the owner/operator of the sewerage (or other reticulated) system.
- The following are to be considered and included when selecting and setting up a test site:
  - Minimum flow requirements are continually received over at least the 26 week monitoring program. Average flows are to be +/- 20% of the nominated hydraulic capacity.
  - Greywater to the DGTS is not to be absent for more than 3 consecutive days.
  - Premises are to be occupied full time and on continual basis over the 26 week monitoring period.
  - Premises and residents shall not be employees of, or associated with, the manufacturer, nor in any way connected with any company or individual associated with the manufacturer.
  - The greywater influent to the DGTS shall be metered and readings recorded weekly.
  - Appropriate diversion plumbing is made available in the case of DGTS failure, to either the sewer or other appropriate available wastewater system.
  - The manufacturer shall ensure that the premises are returned to its original condition, or to the satisfaction of the owner of the premises and the Department of Health, once testing has been completed.
  - The test period for the DGTS shall be 26 weeks from the date of commissioning. The DGTS shall be commissioned in accordance with the manufacturer's recommended procedure.
  - The grab samples shall be collected over the 26 week monitoring period.

#### Compliance criteria

- Treatment processes and onsite controls are to be designed so as to achieve sufficient pathogen reduction (assessed as log reductions) in accordance with the Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 1).

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Reduction of other effluent quality parameters such as BOD<sub>5</sub>, suspended solids, etc will also be required.

- The following criteria are based on a single domestic onsite greywater system.
- Due to the large variability in microbial variations in greywater, the use of mean values is considered to provide a balanced assessment of microbial contamination. Compliance criteria therefore have been based on mean values for all parameters.
- The compliance criteria for accreditation of DGTS where treated greywater is to be used for irrigation of a dedicated landscaped area or subsurface irrigation must meet the effluent quality requirements as required by AS/NZS 1546.3.
- Table 1 lists the sampling requirements.

**Table 1: Frequency of sampling**

Parameter	Influent	Effluent
<b>Required</b>		
<i>E.coli</i> (or Thermotolerant coliforms)	every 12 days	every 6 days
BOD <sub>5</sub>	every 12 days	every 6 days
SS	every 12 days	every 6 days
Free Chlorine (where used)	every 12 days	every 6 days
Turbidity (where necessary)	every 12 days	every 6 days
<b>Optional (manufacturer to nominate)</b>		
TKN	every 12 days	every 6 days
TN	every 12 days	every 6 days
TP	every 12 days	every 6 days

Other data to be recorded at a minimum interval of every 6 days includes:

- DGTS inflow reading;
- Types of detergents and chemicals used at the premises;
- Site notes and comments (including reuse and irrigation area); and
- Service records for servicing undertaken during the monitoring period.
- Sample locations: The final effluent grab samples shall be taken from the outlet chamber or point from the DGTS prior to disposal. The influent samples shall be taken upstream of all process units associated with the DGTS, including coarse filters.
- The samples for BOD<sub>5</sub>, TKN, SS, turbidity, total nitrogen, total phosphate and *E.coli* (or thermotolerant coliforms) shall be directly transported and delivered to a NATA registered laboratory, registered to carry out analyses for the parameters specified. Analyses of total chlorine or other chemical disinfectant concentration shall be tested onsite immediately after sampling.
- Nutrient removal testing criteria must be discussed with the Department of Health prior to testing.
- All DGTS are required to have an audible and visual alarm system to warn of failure in accordance with the SAHC Code 'Waste Control Systems- Standard for the Construction, Installation and Operation of Septic Tank Systems in South Australia' and its 'Supplement B - Aerobic Wastewater Treatment Systems' (see our [Standard Onsite Systems](#) web page).

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Last revised August 2008

