



Government of **Western Australia**  
Department of **Health**

# Code of Practice for Product Approval of Onsite Wastewater Systems

October 2013

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## 1 Scope

The Code of Practice for Product Approval of Onsite Wastewater Systems (OWS), (the Code), sets the minimum requirements for manufacturers to obtain approval by the Chief Health Officer to produce or sell their OWS in Western Australia (WA). The Code defines the documentation that applicants need to submit to the Department of Health (DoH) as well as the application process to obtain approval for their systems.

The Code also set out the requirements for the design, manufacture, quality assurance, installation, operation and maintenance of OWS serving individual allotments. The Code is performance based and systems will have to demonstrate compliance with the corresponding Australian Standards or relevant regulations to obtain approval.

Commercial OWS applications are assessed and approved on a case by case situation by the DoH. However, many concepts within this Code are relevant to commercial OWS. For requirements for commercial OWS please refer to the “Guidance on applying for approval of installation of a commercial onsite wastewater system” document.

The Code adopted several Australian/New Zealand Standards (AS/NZS) and is in line with national standards. This Code needs to be read in conjunction with the relevant standard(s).

## 2 Introduction

Manufacturers of OWSs or “apparatus for the treatment of sewage and/or disposal of effluent” are required to obtain approval to produce and/or sell these systems in WA.

An OWS is a system that collects treats and disposes of or reuses domestic wastewater within an individual allotment. This includes land application of treated wastewater which is to be on the same allotment. The Code applies to septic tanks, aerated treatment units, composting toilets, leach drains, soak wells, greywater systems temporary site toilets and any apparatus for the treatment or disposal of sewage.

All such products must be of sound construction and adequate design to ensure that sewage is effectively collected, treated, contained and disposed of or reused without risk to public health or the environment.

The assessment process and documentation requirements may vary, depending on the nature of the product. There is currently no DoH charge for this service, but manufacturers are responsible for any costs associated with product trials, quality assurance requirements or in providing engineering certification and structural test reports.

The status of manufacturers and various products can be easily checked in the DoH Public Health web site: [www.public.health.wa.gov.au](http://www.public.health.wa.gov.au)

All OWS shall be approved by the Chief Health Officer before they can be sold to the public or used for the treatment and disposal of sewage in order to:

- Minimise the risk of pathogens in wastewater and the spread of enteric disease
- Reduce the risk of environmental degradation
- Ensure product compliance with regulations and relevant standards.

Applicants must apply to the DoH for product approval and to register their mark or distinguishing brand. Every article used in the construction of an apparatus for the treatment and disposal of sewage and effluent is required to be marked with the manufacturer's name or brand.

### **3 Legislation and Standards**

#### *3.1 Health Act (Miscellaneous Provisions) 1911 and Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974*

This Code operates under the authority of Health Act (Miscellaneous Provisions) 1911 subsequent amendments to this Act or its Regulations. The main legislative requirements concerning OWS are contained in the Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974. These Regulations detail the requirements to be satisfied with regard to the manufacture, installation and operation of wastewater systems. This Code should be read in conjunction with these Regulations.

All onsite wastewater systems are an "Apparatus for the Treatment of Sewage" as defined under Section 3(1) of the Health Act (Miscellaneous Provisions) 1911, and as such their design, manufacture and use must be approved by the Chief Health Officer.

### *3.2 Plumbing Code of Australia and Plumbing & Drainage Standards AS/NZS 3500*

The essentials of good plumbing and drainage are simple design, sound materials and good workmanship. All materials, fittings and fixtures used must be according to a standard approved for sanitary plumbing and drainage.

All sanitary plumbing and drainage work including the installation of fixtures and connection to the OWS via traps, waste pipes and drains shall be carried out in accordance with the Plumbing Code of Australia (Section A “General Provisions,” Part B3 “Non Drinking Water Services,” Section C “Sanitary Plumbing and Drainage Services,” Section F “Onsite Wastewater Management Systems” and Section G “Materials and Products Certification) and the Plumbing and Drainage Standards AS/NZS 3500.

### *3.3 Australian / New Zealand Standards Adopted*

The following Australian/New Zealand Standards (AS/NZS) are adopted in this Code:

- AS/NZS 1546.1 On-site domestic wastewater treatment units Part 1: Septic tanks;
- AS/NZS 1546.2 On-site domestic wastewater treatment units Part 2: Waterless composting toilets;
- AS/NZS 1546.3 On-site domestic wastewater treatment units Part 3: Aerated wastewater treatment systems;
- AS/NZS 1547 On-site domestic wastewater management;
- AS/NZS 3000 Electrical installations (known as the Australian/New Zealand Wiring Rules);
- AS/NZS 3500.2 Plumbing and drainage Part 2: Sanitary plumbing and drainage; and
- AS/NZS 3500.1 Plumbing and drainage Part 1: Water services.
- ATS 5200: 460, Technical Specification for plumbing and drainage products – Greywater Diversion Device (GWDD).
- AS/NZS 2845.1 Water Supply – Backflow prevention devices
- AS3600 Concrete structures



Australian/New Zealand Standards (1546 series and 1547 referred to above) are taken to apply to all onsite wastewater systems and land application areas.

Any additional information or requirement provided in this Code overrides corresponding or differing AS/NZS requirements. References to AS/NZS in this Code must be considered as the corresponding clauses of the subsequent versions of the AS/NZS will apply. If revisions of the AS/NZS differ considerably, the relevant authority will determine which approach best meets the required performance outcomes.

## **4 Application Process**

Applications for product approval should be submitted in hard copy and electronic format to the Water Unit – Environmental Health Directorate - DoH. They must include:

- an application form signed and dated either by the applicant or a person authorised to act on their behalf (written confirmation of such authorisation should be provided with the application). The application form is included in appendix 1;
- where applicable, a certificate of incorporation and business name certificate; and
- supporting technical information as required by the application form.

The application form for product approval shall be lodge with the following documentation:

- Copies of certification documentation from an independent product certification agency accredited by JAS-ANZ, showing certification of the onsite wastewater treatment system to a relevant product certification program in accordance with Section 6;
- A certification evaluation report prepared by the product certification body detailing the testing methods used, inclusion of all log sheets, comparing performance against the test criteria and detailing the security arrangements adopted to ensure testing integrity;
- Documentation that the laboratories used for offsite chemical and bacteriological determinations are National Association of Testing Authorities (NATA) registered to carry out analyses for the parameters specified;
- A statement of the warranty and guaranteed service life of the prefabricated onsite wastewater treatment system and all components;
- A complete and detailed specification of the prefabricated onsite wastewater treatment system describing the basis for design, effluent quality, materials,

methods of construction, servicing intervals and manner of operation of all equipment supplied and giving capacity and efficiency of motors, pumps, and aerators;

- Drawings as detailed in section 9.1 of this Code; and
- A copy of the product literature specified in Section 9.2, 9.3 and 9.4 of this Code.

Applicants are encouraged to contact the DoH, Water Unit staff for clarification before submitting the OWS application. Under no circumstances will a preliminary approval be issued.

### **Leach drains and soak wells**

The application form for product approval for leach drains and soak wells can be found on the DOH web site web site: [www.public.health.wa.gov.au](http://www.public.health.wa.gov.au). The application shall be lodged with the following documentation:

- Two sets of scaled engineering drawings as detailed in section 9.1 of this Code. The drawings must be detailed fabrication drawings providing all necessary dimensions, sizes and locations of all elements of the leach drain/soak well included but not limited to the internal width, effective depth, wall thickness, location of reinforced mesh, entry point of effluent, location of inspection openings, sole plates, end plates, lids etc.
- Engineering certification on the structural soundness of the leach drain/soak well
- If a geotextile is to be used the specification and sample of the material must be submitted
- If ends of segments are not rebated for the leach drains the method of sealing gaps between segments (such as use of concrete grout, strips of plastic or geotextile) must be nominated.
- Specifications of concrete for concrete leach drains or soak wells

### **Confidentiality**

The information in an application may be subject to the freedom of information process. Applicants who want specific information to be treated as confidential should clearly indicate this by marking each and every relevant page 'commercial in confidence'.

## 5 Product Certification and Quality Assurance

### 5.1 *Product Certification of Systems covered by AS/NZS*

Prior to seeking product approval from the DoH, the manufacturer must obtain certification to an approved product certification program, for each onsite wastewater system model.

A range of publications provide performance requirements for onsite systems. The publications that are relevant depend on a system's technology.

Australian Standards provide the design, installation, performance and management requirements for the following onsite systems:

- AS 1546:1 On-site domestic wastewater treatment units: Septic Tanks
- AS 1546.2 On-site domestic wastewater treatment units: Waterless Composting Toilets
- AS 1546.3 On-site domestic wastewater treatment units: Aerated Wastewater Treatment systems
- ATS 5200: 460, Technical Specification for plumbing and drainage products – Greywater Diversion Device (GWDD).

Precast concrete steel-reinforced septic tanks and precast steel-fibre reinforced septic tanks shall demonstrate compliance to AS/NZS 1546.1 as indicated in Appendix 2 to obtain DoH approval.

Glass fibre-reinforced plastic septic tanks and plastic septic tanks are required to obtain product certification by an agency accredited by JAS-ANZ (Joint Accreditation System of Australia and New Zealand) to obtain DoH approval.

#### **5.1.1 Effluent Compliance Criteria**

Effluent that is to be of secondary quality, in accordance with AS/NZS 1547, shall meet the effluent compliance criteria detailed in AS/NZS 1546.3.

Composting toilet end product (composted solids) quality shall meet the requirements of AS/NZS 1546.2.

Effluent (including greywater) that is to be reused in house for toilet flushing and dedicated cold water for washing machines shall meet the effluent compliance criteria in Table 1 (other compliance criteria may be required by the DoH, as determined necessary):

**Table 1: Effluent Compliance Criteria for in-house reuse**

Parameter	Effluent Compliance Value
BOD	< 10 mg/L
SS	< 10 mg/L
pH	6.5 -8.5
Turbidity	Turbidity < 2 NTU (95%ile); < 5 NTU (maximum)
Disinfection	Cl: 0.2-2.0 mg/L residual UV: Reduction of no more than 25% of the UV light (intensity) emitted compared to the fraction emitted from new lamp as per manufacturer's specifications
E.coli	< 1 cfu/100 mL or MPN/100 mL (95%ile)
Clostridia	<1 cfu/100 mL
Coliphages	<1 pfu/100 mL

- The pathogen log removal performance of each part of the system, must also be demonstrated. Somatic coliphage testing is required for ongoing monitoring of the water quality in WA as viruses are considered more infectious and more resistant to treatment process. DoH therefore requires demonstration of the log removals that the system can achieve in the aerated biological treatment using granular activated carbon and the UV system for the indicator pathogens E coli, MS2 coliphage and *Clostridium perfringens*.
- The system shall be designed and installed to prevent cross-connection with the drinking water. Backflow prevention devices are required at locations identified as hazardous for cross-connection. The type of backflow prevention device must be selected according to the degree of risk hazard as provided in the AS/NZS 3500.1

and AS/NZS 2845.1. Isolating valves are required at the washing machine, each flushing toilet cistern and each backflow prevention device.

- The monitoring program needs to demonstrate the log reduction of the indicator pathogen for the system. Therefore samples need to be taken from both the influent and the effluent of the system.

### **5.1.2 Nutrient Compliance Criteria**

This criteria is optional. Septic tanks and aerated wastewater treatment systems do not significantly reduce nutrients. Manufacturers with OWS specifically designed to remove nitrogen and/or phosphorous shall nominate the nutrient concentration in the final effluent prior to commencement of testing compliance. Testing agency shall test the total nitrogen and total phosphorous in accordance to AS/NZS 1546.3: Appendix A – Performance Evaluation. All nutrient results in the raw wastewater and final effluent shall be submitted to the DoH. The average nutrient(s) concentration in the final effluent and the percentage of treatment removal capacity of the OWS will be published on the DoH website.

## *5.2 Product Quality Assurance for Non-standard Systems*

This section of the Code sets out the minimum requirements for system approval by the DoH of a particular OWS to be built/manufactured which is not covered by the AS/NZS Standards for OWS.

Systems that use novel treatment processes should be assessed for compliance with the generic performance criteria for OWS in Australian Standard AS 1547 On-site Domestic Wastewater Management, and in accordance with the design requirements in section 5.1 or as determined by the DoH on application. The standards can be obtained from Standards Australia ([www.standards.org.au](http://www.standards.org.au)).

The manufacturer/designer should make preliminary contact with the DoH to discuss the individual application requirements.

The manufacturing process shall be carried out in a controlled manner to produce a consistent product checked by a quality assurance process. Prior to obtaining product approval from the DoH, the manufacturer/designer must obtain certification to an approved product certification

program, for each onsite wastewater model through an independent product certification agency. The product certification program must include initial performance testing of the OWS, and ongoing surveillance of the manufacturer's/designer's quality systems, to meet the requirements of this Code and any further DoH requirements.

The initial performance testing program must be conducted under the expected operating conditions at full-scale operation of the system. Pre-validation studies from manufactures of parts of the treatment train can be accepted provided the testing operating conditions will remain within the validated range.

As minimum ongoing surveillance of non-standard OWS shall have:

- A procedure where an inspection of each OWS component is performed. OWS that fail the inspection shall not be sold for use.
- A record of quality control standards of materials or system components supplied by a third party
- A procedure and record of any onsite batching, off site batching and/or periodic testing conducted

Additional requirements for greywater treatment systems are listed separately in Appendix 3

See Section 6 for the requirements of the product certification agency and sampling / laboratory testing requirements.

### **5.2.1 Test Site and Procedure**

Where possible, the test site is to be at a specified test facility or at a location acceptable to the testing agency and the DoH.

- a) The raw wastewater/greywater must not be pre-treated by chemical addition and should have characteristics within the ranges listed in Table 2.
- b) The raw wastewater/greywater must not be pre-treated by chemical addition and should have characteristics within the ranges listed in Table 2.

**Table 2: Raw wastewater and Greywater Characteristics**

Parameter	Wastewater characteristics	Greywater characteristics
<i>E.coli</i> or Thermotolerant coliforms	10 <sup>6</sup> – 10 <sup>8</sup> MPN/100 mL	10 <sup>1</sup> – 10 <sup>7</sup> MPN/100 mL
BOD <sub>5</sub>	100-500 mg/L	6-620 mg/L
SS	100-500 mg/L	2-1500 mg/L
Total Nitrogen	20-100 mg/L	
Total Phosphorus	0.04-42 mg/L	5-30 mg/L

- c) The raw wastewater/greywater must not be pre-treated by chemical addition and should have characteristics within the ranges listed in Table 2.
- d) The raw wastewater/greywater must not be pre-treated by chemical addition and should have characteristics within the ranges listed in Table 2.
- e) The test plant shall be installed, commissioned, operated and maintained according to the system builder's instructions. The system builder is responsible for ensuring the system is free of defects and is operable.
- f) The product shall be placed under test over a period of twenty-six (26) weeks. During the test period, samples of the final effluent (or in the case of composting toilets, the composted material) from the product shall be collected and tested weekly in accordance with the procedure set out in AS/NZS 1546.1, 1546.2 or 1546.3, whichever is applicable. If none of these standards are determined applicable by the testing agency and the DoH, then the procedures will be as determined by the testing agency in consultation with the manufacturers and the DoH.
- g) The samples for BOD<sub>5</sub>, total suspended solids, E Coli and disinfectant residual shall be taken from the outlet of the disinfection chamber or other locations approved by the DoH.
- h) All compliance checking, monitoring, testing and sampling is to be performed by a testing agency as defined in section 6.
- i) The samples for BOD<sub>5</sub>, total suspended solids and E Coli and any other parameters determined by the DoH shall be directly transported and delivered to a laboratory,

registered by NATA to carry out analyses for the parameters specified. Analyses for disinfectant concentration shall be tested onsite immediately after sampling.

j) All testing shall be done at the cost to the applicant.

Note: These performance evaluation test procedures may not be appropriate for certain treatment plant configurations. The DoH may vary the performance evaluation testing procedure to ensure the plant is tested under the appropriate operational conditions.

## **5.2.2 Structural Performance Requirements**

The structural performance requirements for non-standard wastewater treatment systems are to be in accordance with:

- AS/NZS 1547 (Clause 4.3.3 and 2.4.2.3 in 2000 version); and
- AS 1546:1 On-site domestic wastewater treatment units: Septic Tanks; or
- Any other testing requirements specified by the DoH.

## **5.2.3 Effluent Compliance Criteria**

Effluent that is to be of secondary quality, in accordance with AS/NZS 1547, shall meet the effluent compliance criteria detailed in AS/NZS 1546.3.

Composting toilet end product quality shall meet the requirements of AS/NZS 1546.2.

Effluent (including greywater) that is to be reused in house for toilet flushing and dedicated cold water for washing machines shall meet the effluent compliance criteria in Table 1 Effluent Compliance Criteria for In-House Reuse (other compliance criteria may be required by the DoH, as determined necessary).

## **5.2.4 Hydraulic Flow Requirements**

The testing requirements for hydraulic flows will be in accordance with AS/NZS 1546.3.

## **5.2.5 Nutrient Compliance Criteria**

This criteria is optional. Please refer to section 5.1.2.



### **5.2.6 Design Parameters**

A product shall be designed to perform on premises under the following loads:

- a) a minimum daily flow of 150 litres per person;
- b) average daily BOD5 of 70 grams per person (raw wastewater);
- c) average daily total suspended solids of 70 grams per person (raw wastewater);
- d) average daily BOD5 of 50grams (after primary treatment);
- e) average daily suspended solids of 50 grams (after primary treatment);
- f) average daily total nitrogen of 15 grams per person (where applicable);
- g) average daily phosphorus of 2.5 grams per person (where applicable).

### **5.2.7 Design Considerations**

The product shall be designed to:

- a) provide adequate capacity for the design wastewater flow, storage of solids and frequency of discharge;
- b) avoid the likelihood of cross contamination between internal chambers;
- c) ensure even distribution of liquid over any filter bed that may form part of the treatment process;
- d) ensure that the entire structure and its associated inspection and access covers and/or extensions, are integrally sound and the likelihood of damage by penetration of roots, entry of groundwater, or entry of nuisance insects is avoided;
- e) provide access for maintenance, desludging and clearing of blockages;
- f) avoid access by unauthorized people;
- g) provide, where required, a disinfection unit designed in accordance with section 5.2.19
- h) avoid foul air and gases accumulating within the system or entering buildings;
- i) prevent damage from superimposed loads or normal ground movement;
- j) perform with normal maintenance for the specified serviceable life;
- k) provide an effluent pump chamber that permits ease of maintenance or replacement of an effluent pump where applicable;
- l) provide insulation against noise.

### **5.2.8 Liners**

Liners used to prevent the ingress of groundwater and the egress of wastewater shall be of durable material and conform to the relevant Australian Standard.

### **5.2.9 Tanks and Fittings**

A tank or tanks used to contain the treatment process and associated fittings and extensions comprising the product shall be constructed of durable materials. The tank or tanks shall be watertight, capable of withstanding loads imposed on the roof and walls and shall be constructed and installed so that they will not float in areas with a high water-table level or when the tank is emptied.

### **5.2.10 Design Loads and Tanks**

All tanks that comprise all or part of the product shall be designed to withstand loads in accordance with AS/NZS 1546.1 for Septic Tanks or as required by the DoH.

### **5.2.11 Construction of Tanks**

The manufacture, construction, materials and testing of tanks forming part of a product shall comply with AS/NZS 1546.1 for Septic Tanks. See Appendix 2 for minimum requirements for manufacturers of precast concrete septic tanks to demonstrate compliance to AS/NZS 1546.1.

### **5.2.12 Emergency Storage Capacity**

Products containing wastewater sludge / effluent in liquid form should have sufficient emergency storage capacity contained within the product, without cross contamination occurring between any chambers, to the satisfaction of the DoH.

Note: Where it can be demonstrated that the product does not need as much storage, the emergency storage capacity may be reduced.

### **5.2.13 Selection of Materials**

The materials and products used in the manufacture and/or construction of the product shall be selected to ensure satisfactory service for the serviceable life of the plant. Factors to be taken into consideration include:

- a) the type of usage likely to occur and the nature of the wastewater to be treated;

- b) the nature of the ground and the possibility of chemical attack there from;
- c) the physical and chemical characteristics of the materials and products used;
- d) the possibility of abrasion by solids in the flow or chemical attack;
- e) the range of temperatures likely to be encountered; and,
- f) UV degradation.

#### **5.2.14 Mechanical Equipment**

Mechanical equipment shall:

- be durable, require minimal maintenance and shall be adequately protected from the aggressive environment;
- be readily accessible for maintenance or replacement;
- be suitable for continuous and intermittent operation; and
- be suitable for all imposed loads.

#### **5.2.15 Electrical Equipment**

All electrical components for and incidental to the product shall be in accordance with AS/NZS 3000.

Where there is any possibility of an explosive gas mixture developing near a motor, the motor shall be intrinsically safe.

All electrical equipment shall be readily accessible for maintenance or replacement, and shall be suitable for continuous and intermittent operation.

#### **5.2.16 Effluent Pumps**

Effluent pumps shall have performance characteristics that match the hydraulic requirements of the irrigation system to be installed in the land application area.

#### **5.2.17 Alarm System**

An alarm system shall be provided to indicate an electrical or mechanical malfunction as follows:

- alarms shall be provided to indicate failure of mechanical equipment and pumps;
- the alarm system shall comprise audible and visible alarms with muting facility for the audible alarm. The muting facility shall reset to audible after 24 hours; and

- alarms shall be located in readily visible positions from within the dwelling or as required by the regulatory authority.

### **5.2.18 Noise**

The maximum permissible noise level with all equipment (except the alarm) operating shall be 40 dB(A) measured on fast response at a distance of 1 m from the nearest item of noise emitting equipment, or comply with a relevant current standard.

### **5.2.19 Disinfection**

Methods of disinfection include, but are not limited to chlorination, ozonation and ultraviolet irradiation.

The disinfection chamber and/or apparatus shall have a capacity sufficient for the disinfection process to meet the required microbiological criteria.

The disinfection apparatus shall:

- be capable of adjustment to alter the disinfection rate;
- be designed to prevent backflow from the disinfection apparatus;
- be linked to the alarm system to warn of failure, if the disinfection device is electronically controlled; and
- be designed to prevent hydraulic short-circuiting within the chlorine contact chamber.

Requirements for chlorine disinfection are set out in AS/NZS 1546.3.

### **5.2.20 Marking**

See section 7 for minimum marking requirements of OWS

## **6 Product Certification Agency**

Applicants must use an accredited product certification agency to certify their product complies with the design, installation, performance and management criteria in the relevant Australian Standard.

The product certification agency must be accredited by JAS-ANZ (Joint Accreditation System of Australia and New Zealand). Contact JAS-ANZ to find an accredited testing agency which offers product certification on the web at [www.jas-anz.com.au](http://www.jas-anz.com.au).

All laboratories used for off site effluent / end product quality determinations must be National Association of Testing Authorities (NATA) registered to carry out analyses for the parameters specified. Sampling must be undertaken by a NATA accredited laboratory or an independent body as agreed to by the DoH and the product certification agency, and directly transported and delivered to a NATA accredited laboratory, to carry out analyses for the parameters specified. Where applicable, residual disinfectant and dissolved oxygen samples must be analysed on site.

Applicants should demonstrate that their product has obtained product approval under the Standards Mark Quality Assurance program, has ISO 9000 accreditation, or has gained comparable accreditation under a quality assurance process. If manufacture of the product has not commenced, the applicant must provide evidence that the product has been submitted for accreditation under the type of process described above.

## **7 Marking, labeling and signage**

The minimum marking requirements for a prefabricated OWS shall be in accordance with AS/NZS 1546.1, 1546.2 or 1546:3, whichever is applicable. All marking shall be permanent, legible and clearly visible.

All pipes, valves and outlets must be clearly and permanently labelled with safety signs in accordance with AS1319 and AS2700. Land irrigation areas utilising surface or sub-surface irrigation must have at least two warning signposts, complying with Standards AS 1319, at the boundaries of the irrigation area. The signs must be clearly visible to property users, with wording such as, "Recycled Water – Avoid Contact – DO NOT DRINK".

The following minimum information shall be marked on the product:

- a) Manufacturer's name or trademark;
- b) Date of manufacture;
- c) Design capacity in litres;
- d) Product identification (model or design identification number);
- e) Top load or any other load limitations
- f) Contact details for service
- g) Identification of the inlet and outlet, where applicable
- h) Weight of product; and
- i) Lifting and transport instructions, where applicable.

All marking shall be permanent, legible and clearly visible at the time of installation.

Marking location and information shall be included on the design drawings

For precast concrete septic tanks, information required by a), b), c) and g) shall be on the top external face of the tank adjacent to the inlet fitting. Other information shall be marked either on the top external face or on the tank itself adjacent to the inlet fitting.

## **8 Warranty and Service Life**

By applying for and accepting an approval pursuant to the procedures in this Code, the manufacturer of a prefabricated onsite wastewater treatment system guarantees that the product is:

- manufactured and supplied as approved;
- built in accordance with an approved product specification; and
- fit for use.

The manufacturer shall nominate the guaranteed service life of the system. The service life of a system means the period for which that system is designed and rated to comply with the test criteria reliably, using the components specified.

The service life of components means that period for which they are designed and rated to perform reliably to specification and may vary from the performance life of the system. The guaranteed service life of components shall be as follows:

- All metal fittings, fasteners and components of the onsite sewage treatment plant other than the pumps and motors shall be of non-corroding material and shall have a service life of at least 15 years;
- All mechanical and electrical parts shall have a minimum service life of 5 years and minimum warranty period of 12 months.

## 9 Product Literature

The manufacturer must produce and submit to the DoH the following drawings and manuals for approval, as indicated in the following subsections.

### 9.1 Drawings

Certified engineering drawings, dimensioned and accompanied by a listing of all components must be submitted. The plans must show the intended layout of the system, including typical siting of tanks, chambers and control panels, pipes, effluent application areas and other relevant details.

The drawings must be scaled engineering drawing(s), preferably A3 size (min. A4), to include both plan-views and cross-sectional drawings of the system as a whole and for each of its components with name, model, size, description, function, material of manufacture and location in the product.

The drawings must be detailed fabrication drawings providing all necessary dimensions, sizes and locations of all elements of the OWS, including the fittings in their final locations

If the product receives approval from the DoH, a public domain 'certificate of approval', to inform stakeholders of the approval will be issued. This approval includes a schematic diagram of the approved product so that, for example, a Local Government can confirm that the product specified in a permit application is the one that has been approved. Thus, an application must include a schematic diagram of the product in an electronic format (such as pdf format), suitable for attachment to a certificate of approval.

## 9.2 *Owner's Manual*

Each onsite wastewater system (except septic tanks, soak wells and leach drains) must be accompanied by an owner's manual prepared by the manufacturer. The authorised representative must provide the manual to the owner at the time of system installation or on occupation of the premises. The manual must be written so as to be easily understood by the intended reader and must include, at a minimum:

- a) an overview of the product and intended use including a clear statement of examples of the types of wastewater/waste that can be effectively treated by the product
- b) a diagram explaining the system and the process
- c) warranty and service life
- d) servicing requirements
- e) troubleshooting guide and signs of failures including the name and telephone number of an appropriate service representative to be contacted in the event that a problem with the product occurs.
- f) desludging requirements
- g) safety information
- h) alarm information and use restriction.
- i) A statement confirming that the product meets the requirements of this Code;
- j) A list of toxic substances / loads to be avoided including a list of household substances that, if discharged to the treatment plant, may adversely affect the integrity of the product, the process, or the environment and the spreading of hydraulic loads
- k) Comprehensive operating instructions that clearly delineate proper function of the treatment plant, operating and maintenance responsibilities of the owner and authorised service agent, and service-related obligations of the manufacturer or system builder;
- l) A course of action to be taken if the product is to be used intermittently or if extended periods of non-use are anticipated;
- m) A list of terms and their definitions

## 9.3 *Installation Manual*

Manufacturers must provide comprehensive and detailed installation instructions to authorised representatives. The manual must be written so as to be easily understood by the intended reader and must include, as a minimum:



- a) A numbered list of product components and an accompanying illustration, photograph, or print in which the components are respectively identified;
- b) Design, construction, and material specifications for the components of the product;
- c) Wiring schematics for the treatment plant's electrical components, where applicable;
- d) Off-loading and unpacking instructions including safety considerations, identification of fragile components and measures to be taken to avoid damage to the product;
- e) Required soil properties for installation
- f) A process overview of the function of each component and the expected function of the product when all components are properly assembled and connected;
- g) A clear definition of product installation requirements including plumbing and electrical power requirements, ventilation, air intake protection, bedding, hydrostatic displacement protection, water tightness, slope and miscellaneous fittings and appurtenances;
- h) Repair or replacement instructions in the event that a product possesses flaws that would inhibit proper functioning and a list of sources where replacement components can be obtained; and
- i) A detailed start-up procedure.

#### 9.4 *Operation and Maintenance Manual*

Manufacturers must provide comprehensive and detailed operation and maintenance instructions to authorised service agents. The manual must be written so as to be easily understood by the intended reader and shall include, at a minimum:

- a) A maintenance schedule for all components;
- b) Requirements and recommended procedures for the periodic removal of residuals from the product;
- c) Recommended methods for collecting effluent samples or end products; and
- d) The expected effluent produced by the operational system.
- e) Service report sheet
- f) An evaluation of the irrigation system and the land application characteristics.

## 10 Renewal of Product Approval

Certified OWS by a certification body to the corresponding AS/NZS standard is endorsed by the DoH until expire date of the product licence. For OWS not covered by AS/NZS, the DoH product approval shall normally be valid for a period of five years. In some cases the DoH may choose a lesser period for the product approval.

Prior to the expiry date, the manufacturer must submit the renewed certificate from the corresponding AS/NZS standard certification body. For Non-standard OWS the manufacturer shall submit six months prior to the expire date an application to the DoH for renewal of the approval.

The DoH will determine based on the type of OWS what documentation listed in section 5 of this Code is required for product renewal.

Assessment for renewal of product approval shall take into account all application documentation requirements and the annual report undertaken by the manufacturer as described in Section 12 of this Code.

NOTE: Any modifications or variations of the approved design shall be submitted to the product certification body that issued the licence. Once the product certification body has considered the application, completed additional testing if required and re-issued the certification documentation, the manufacturer shall seek separate consideration and variation of approval of the system by the DoH.

The DoH is now requiring all products (except precast concrete septic tanks) for which an Australian Standard exists be fully certified to that standard. If a product was previously approved by the DoH without being certified, it will not have its product approval renewed unless it is certified to be in compliance with the latest relevant Australian Standard. Precast concrete septic tanks are required to demonstrate compliance to AS/NSZ1546.1 as detailed in Appendix 2 to obtain DoH approval.

## 11 Annual Report

All OWS producing effluent of secondary quality in accordance with AS/NZS 1547 or further treatment shall provide to the DoH annual reports from the previous calendar year by 1 March of each year with the following information:

- a) Manufacturer company and address,
- b) Type of OWS and model,
- c) Approval number and date of approval,
- d) List of installed systems in the previous calendar year including date of installation address and Local Government,
- e) Copy of any complaints received in the previous calendar year,
- f) Updated list of certified installers and service agents,
- g) Performance monitoring results (if requested by the DoH under the conditions of approval).

### 11.1 *Annual Performance Monitoring Requirements and Selection Criteria*

All OWS installations that provide secondary or further treatment (including aerated treatment units, greywater treatment systems and composting toilets) shall undergo annual performance monitoring, in accordance with the conditions of approval.

The following selection criteria apply:

- The OWS shall be selected at random by the DoH from a complete list of installations in yearly order in WA;
- A maximum of 10% of the first 100 OWS installed and an additional 1% thereafter for each year of the installed systems, shall be selected;
- If the manufacturer has less than 10 units installed at least one must be tested;
- The maximum number of systems tested per model will under normal circumstances be limited to 20 per year.
- Testing of composting toilets must be undertaken on the end product which has undergone the full 12 month composting period.

For each randomly selected installation, the manufacturer/ designer/ installer, or the local council (where applicable) shall arrange for sampling and testing for BOD5, SS, E Coli,

disinfectant concentration (where applicable) and any further parameters that might be specified by the manufacturer or DoH together with citing of the service history.

Sampling must be undertaken by a NATA accredited laboratory or an independent body as agreed to by the DoH in accordance with sample locations specified in the product design approval by the DoH.

Samples are to be analysed and reported on by a NATA registered laboratory and samples for disinfectant concentration, where required, are to be determined on site.

## 12 Glossary of Terms

**Authorised service person:** A person who has been suitably trained in the installation, operation and service requirements of the system and is accredited by the system manufacturer and/or the DoH.

**Aerated Treatment Unit (ATU):** A system that uses the processes of aeration following clarification to achieve secondary (biological) treatment of wastewater also known as Aerobic Treatment Unit.

**Apparatus for the treatment of sewage:** Means any apparatus for the bacteriological or aerobic treatment of sewage or any other apparatus for the treatment of sewage approved by the Chief Health Officer and includes any buildings, fittings, works, or appliances used or required in connection with the bacteriological or aerobic treatment of sewage, and the disposal of effluent or any residue of such treatment.

**AS/NZS:** Australian Standards/New Zealand Standards (latest version).

**Blackwater:** Refers to wastewater containing products of human excretion.

**BOD<sub>5</sub> (Biochemical oxygen demand):** Refers to the amount of oxygen that would be consumed over a period of five days by microbiological action in a sample of wastewater at 20 degrees C.

**Composting toilet:** A device that receives and treats human excreta, domestic organic matter and bulking agents, using natural aerobic stabilisation and disinfection processes to produce a product that is not a public health risk.

**Design capacity:** The maximum number of people for a specified use.

**Disinfection:** The method of treatment of wastewater, which reduces the concentration of pathogens via inactivation to an acceptable level satisfactory for the intended use.

**Effluent:** The liquid discharged from a wastewater treatment process / unit.

**Greywater:** The domestic wastewater from baths, showers, basins, laundries and kitchen sinks / dishwashers specifically excluding water from toilets and urinal wastes.

**Greywater diversion device (GDD):** A device that collects and directs untreated greywater to a sub-surface irrigation area or to the sewer. This system does not allow storage or treatment, apart from a coarse screen filter, which may remove lint, hair and coarse particles.

**Greywater treatment system (GTS):** A system or device that collects, treats and disinfects greywater arising from an individual single domestic premises for reuse for toilet and urinal flushing or laundry use, and / or for use in surface and sub-surface irrigation in dedicated non-trafficable areas.

**JAS-ANZ:** Joint accreditation system of Australia and New Zealand.

**Land application system:** The system used to apply effluent from a wastewater treatment system into or onto the soils for further in-soil treatment and soakage/reuse.

**Onsite wastewater system (OWS):** A system that collects treats and disposes of or reuses domestic wastewater within an individual allotment. This includes land application of treated wastewater which is to be on the same allotment. This applies to septic tanks, aerated treatment units, composting toilets, leach drains, soak wells, greywater systems and temporary site toilets.

**Performance requirements:** The functions that the onsite wastewater system has to perform in order to operate as defined.

**Performance criteria:** The quantitative or qualitative description of the performance requirements.

**NATA (National Association of Testing Authorities):** Government-endorsed provider of accreditation for laboratories and similar testing facilities. Accredited laboratories in Australia will provide reliable and accurate test results of wastewater contaminants.

**Septic tank:** A single or multiple chambered tank through which wastewater is allowed to flow slowly to allow suspended matter to settle and be retained, so that organic matter contained therein can be decomposed (digested) by anaerobic bacterial action in the liquid. The term covers the tanks that are used to treat all wastewaters, greywater and blackwater.

**Service agent:** A person contracted by the manufacturer or system owner to regularly maintain the onsite wastewater system (may be the system supplier).

**Serviceable life:** The period of time in which with only normal and routine maintenance, the onsite wastewater system including any associated fittings perform satisfactorily without failure.

**Sewage:** Wastewater generated in a domestic premise, including refuse liquids, wastewater or waste matter (including both greywater and blackwater).

**Sewerage:** the network of collection drains carrying domestic wastewater to the treatment plant.

**Sewerage service provider:** The body holding a licence from the Economic Regulation Authority of Western Australia for the provision of sewerage services, which would be affected by the application of a sewerage requirement to a proposed subdivision or development.

**Secondary treatment:** Biochemical (or other) processing and settling or filtering of effluent received from a primary treatment unit. Effluent quality following secondary treatment is expected to be equal to or better than 20 mg/L 5-day biochemical oxygen demand (BOD5) and 30 mg/L suspended solids (SS).

**Sub-surface irrigation:** Irrigation at a depth of at least 100mm below the surface level of soil or mulch.

**Surface Irrigation:** Irrigation applied to the ground from above the ground surface.

**Wastewater:** The used water arising from domestic activities consisting of all wastes, greywater and blackwater.

**WaterMark:** A graphic symbol that is issued for products that have been approved under the WaterMark Certification Scheme as defined in the Plumbing Code of Australia (PCA).

## Appendix 1: Application for Product Approval

Please attach this application form to your submission and post to:

The Manager  
**Water Unit**  
Environmental Health Directorate  
Department of Health  
PO Box 8172  
Perth Business Centre WA 6849

**NAME OF SYSTEM FOR APPROVAL:** \_\_\_\_\_

**MODEL NUMBER FOR APPROVAL:** \_\_\_\_\_

**BRIEF DESCRIPTION OF THE PRODUCT INCLUDING THE TREATMENT PROCESS:**

\_\_\_\_\_

### DISINFECTION SYSTEM

Chlorine                       Bromine                       Ozone                       UV

Other (please specify): \_\_\_\_\_

### IRRIGATION SYSTEM

Spray                       Dripper (Sub-surface)                       Dripper (Sub-Strata)                       Leach Drain

Other (please specify): \_\_\_\_\_

Company Name: \_\_\_\_\_

Applicant Name: \_\_\_\_\_

Contact person name: \_\_\_\_\_

Address: \_\_\_\_\_



Phone: \_\_\_\_\_

Mobile no.: \_\_\_\_\_

Fax: \_\_\_\_\_

Email: \_\_\_\_\_



Company Name: \_\_\_\_\_

Contact person name: \_\_\_\_\_

Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Mobile no.: \_\_\_\_\_

Fax: \_\_\_\_\_

Email: \_\_\_\_\_



Company Name: \_\_\_\_\_

Contact person name: \_\_\_\_\_

Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Mobile no.: \_\_\_\_\_

Fax: \_\_\_\_\_

Email: \_\_\_\_\_

Please refer to the Department of Health, “Code of Practice for Product Approval of Onsite Wastewater Systems in Western Australia”.

**1** Description of the system, including:

- description of the product and its application
- a schematic diagram of the treatment process
- calculations used to size system components
- effluent quality
- how the effluent from the system will be managed

**2** Drawings

- Engineering drawings, preferably A3 size (min. A4), including all dimensions and/or capacities of all components. The plans must show the intended layout of the system, including typical siting of tanks, chambers and control panels, pipes, effluent application areas and other relevant details. The drawings must include both plan-views and cross-sectional drawings of the system as a whole and for each of its components with name, model, size, description, function, material of manufacture and location in the product.
- Schematic diagram for inclusion on the public domain so that, for example, a local government, can confirm that the product specified in a permit application is the one that has been approved. The schematic diagram of the product must be in an electronic format (such as pdf format), suitable for attachment to a certificate of approval.

**3** Attach a report from an independent certification agency the systems describing the system’s compliance with the design, installation, performance and management criteria in the relevant Australian Standard.

**4** A certification evaluation report prepared by the product certification body detailing the testing methods used, inclusion of all log sheets, comparing performance against the test criteria and detailing the security arrangements adopted to ensure testing integrity;

- 5 Documentation that the laboratories used for off site chemical and bacteriological determinations are National Association of Testing Authorities (NATA) registered to carry out analyses for the parameters specified;
- 6 A statement of the warranty and guaranteed service life of the prefabricated onsite wastewater treatment system and all components;
- 7 A copy of the Owners manual
- 8 A copy of the Installation Manual
- 9 A copy of the Operation and Maintenance Manual.

**Please fill in the following declaration after reading the "Application Requirements" section above.**

I understand that the DOH may require further details if necessary, and that failure to supply all the details referred to in this application form and any additional information requested by the DOH concerning my application above may result in delays in processing the application.

NAME: \_\_\_\_\_

COMPANY: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

## Appendix 2: Precast concrete septic tanks minimum requirements to demonstrate compliance to AS/NZS 1546.1 to obtain DoH approval

Precast concrete septic tanks manufacturers consist of both large and small operators through the state. Precast concrete septic tank manufacturers can obtain full AS/NZS 1546.1 accreditation through a product certification agency accredited by JAS-ANZ (Joint Accreditation System of Australia and New Zealand). Alternatively precast concrete septic tank manufacturers of conventional designs can apply to the DoH for certification of the precast concrete septic tanks (valid only to WA).

The following limitations apply to what AS/NZS 1546.1 considers a conventional design:

- The capacity of the tank does not exceed 6000 L;
- The tank lid or wall is not below ground level;
- The internal diameter of the cylindrical tank and the internal width or internal height of a rectangular tank is not greater than 1800 mm;
- The internal length of a rectangular tank is not greater than 2400 mm and
- The tank lid plan area is not greater than 4.5 m<sup>2</sup>.

Specific structural design by a suitably qualified structural engineer using appropriate design methodologies and relevant standards would need to be carried out if any one of the above conditions does not apply.

Concrete holding tanks with a capacity of up to 6,000L capacity should be designed for a soil loading of 11 kPa/m depth acting on an empty tank with a minimum ultimate (strength) load factor of 2.0 Anchorage should be provided on tanks where the deadweight of the empty tank and applicable soil loads is less than 1.5 times the force due to hydrostatic uplift.

This section details the minimum DoH requirements to demonstrate compliance to AS/NZS 1546.1 to obtain DoH certification for precast concrete septic tanks. Sections 3, 4 and 5 of AS/NZS 1546.1:2008 specifies the design, fittings, access/inspection provisions and optional features for precast concrete septic tanks and to be read in conjunction to the following requirements:

## **1. Engineer certified fabrication drawings**

The following minimum requirements apply:

- The drawings must show the specific tank design under consideration.
- The drawings must be detailed fabrication drawings providing all necessary dimensions, sizes and locations of all elements of the tank, including the fittings in their final locations.
- A minimum drawing size is A3

The certifying engineer shall provide to the manufacturer for submission to the DoH the following:

- Approved and signed design drawings certifying that the minimum requirements set out in AS1546.1 and this Code have been met;
- Approved and signed installation manual certifying that the minimum requirement of this report have been met;
- A letter citing the drawings and installation manual and certifying that construction and installation of the tanks in accordance with the drawings and installation manual shall be safe and in accordance with AS1546.1; and
- Proof of current professional indemnity insurance coverage for the design works conducted.

## **2. Installation manual**

The following minimum information shall be included in the manual:

- Intended loading including:
  - Maximum/minimum depth for installation,
  - Maximum cover loading,
  - Maximum wall loading,
- Required soil properties for installation;

- Correct handling/lifting procedure;
- If cast in-situ elements are required, procedure for their placement;
- A list of materials not to be used in conjunction with the tank;
- Contact information for the tank manufacturer;
- Design life of the tank.

### **3. Hydrostatic leak test**

- **Internal Hydrostatic Test**

This test can be done on the manufacturer premises. It basically involves the filling of the tank and recording any leaks.

- **External Hydrostatic Test**

The tank leak is tested by submerging the tank in water. The test can also be done on the manufacturer premises. In the absence of a specific test tank, large water storage tanks or a lined pit could also be used to perform the test.

As a minimum one internal and one external hydrostatic leak test per model is required to obtain DoH approval. It is up to the manufacturer to determine the frequency of hydrostatic leak test to be performed as part of the quality assurance/quality control procedures.

### **4. Evidence of concrete material properties**

Provide evidence of concrete material properties by way of appropriate supplier documentation. Manufacturers of structural precast concrete elements are required to produce concrete in accordance with AS3600. This standard requires that concrete mixes are regularly tested and recorded for compliance of both strength and workability. This is standard industry practice. If concrete is supplied by a third party, i.e. Concrete Ready-Mix Supplier, then the evidence of concrete materials properties will be provided as part of the ready mix supplier's standard delivery notification process.

## **5. Evidence of quality control procedures**

Minimum quality control procedures and corresponding records for precast concrete septic tanks and tank components are:

### **5.1 Tank inspection**

Manufacturers shall have in place a procedure where an inspection of each tank or tank component is performed.

Prior to tanks leaving the casting yard a visual inspection of the tank shall be undertaken.

Tanks shall be deemed to fail if the inspection identifies:

- Poor concrete compaction or placement;
- Exposed reinforcement;
- Cracking (other than that typical in production); and
- Excessive distortion.

Tanks that fail this inspection shall not be sold for use as septic tanks.

### **5.2 Concrete testing**

Concrete is to be tested for the minimum compressive strength at the following intervals:

#### ***5.2.1 For on site batching:***

- At a change of mix design including;
  - Change of material ratios;
  - Change of admixtures;
  - Change of cementitious material; and
  - Change of aggregate.
- At a change of manufacture technique.

### **5.2.2 For off site batching:**

- As above and at a change of supplier.

### **5.2.3 Periodic testing**

- The interval for periodic testing shall be conducted based on results of previous testing and shall be no less than:
  - Where previous testing has indicated strengths in excess of 10% of required design strength, the lesser of every 28 days or every 100 m<sup>3</sup>; and
  - Where previous testing has indicated strengths of between 0% and 10% of required design strength, the lesser of every 14 days or every 50 m<sup>3</sup>.

### **5.2.4 Following Test Failures**

If testing shows samples have failed the minimum strength requirements then the next two batches are to be tested.

- if both batches pass, resume testing at the minimum frequency stated above;
- if either batch fails by less than 5% of the design strength, production shall stop and the manufacturer shall examine the manufacturing procedures to determine the reason for failure, and after remedial action has been taken, test the first four batches and, if necessary, repeat this until four consecutive batches pass; and
- if either batch fails by more than 5% in addition to the above, all products manufactured since the last passing test shall be identified and a product recall issued.

### **5.3 Leak testing**

Vertically installed, cylindrical tanks need only be leak tested internally (See section 3: internal hydrostatic test) as part of the quality control procedures. The external leak test (Resistance to lateral load – Hydraulic Test Method) as described in Appendix H of AS/NZS 1546.1 may not be necessary as the design limits set in the deemed to comply design for cylindrical tanks would ensure strength capacity well beyond the lateral loads to be applied in a septic tank installed in standard conditions.



## Appendix 3: Greywater Systems

Greywater systems can be separated into two types:

- a) Greywater Diversion Devices (GDD), which divert greywater without storage or treatment
- b) Greywater Treatment Systems (GTS), which collect and treat greywater to a higher quality, often with storage.

GDDs must receive a “Watermark” licence in accordance with Australian Technical Standard ATS 5200: 460, Technical Specification for plumbing and drainage products – Greywater Diversion Device (GWDD). GDDs will also be assessed in accordance with the following relevant requirements.

GTSs are not covered directly by an Australian Standard therefore, the following product approval requirements will be applicable.

### 1 Design Criteria for Greywater Systems

- a) The greywater treatment / diversion system must be designed, manufactured/constructed and installed in accordance with the relevant sections in Section 6 and Appendix 1.
- b) The greywater treatment / diversion system must be designed to treat / divert all nominated greywater streams arising from the domestic premises.
- c) Where it is intended to install a greywater treatment / diversion system in a sewered area (or other reticulated sewerage system), the greywater system shall be capable of connection to the sewer such that:
  - The greywater system (and any associated storage tanks) must be designed to provide automatic overflow to sewer (or other reticulated system) so that an overflow to the environment will not occur should there be a failure of the greywater treatment / diversion system;
  - The householder/owner 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; and
  - Installation approval is obtained from the relevant Sewerage Service Provider through the Local Government.

- d) Where it is intended to install a greywater treatment / diversion system in a non-reticulated area, the system shall be capable of connection to an effluent disposal system (as agreed in discussion with the Local Government).
- e) Cross connection prevention controls shall be installed in accordance with AS/NZS 3500.1.
- f) The greywater treatment / diversion system must be designed to perform continuously and without any interventions between specified servicing intervals, performed by the service agent.
- g) The greywater treatment / diversion system must be constructed / installed in accordance with the design specifications, Department of Health product approval requirements, relevant Local Governments conditions, and in accordance with good trade practices so as to allow ease of access for maintenance and with regard to the health and safety of users, installers and service agents.
- h) 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).
- i) Untreated greywater must not be stored for more than 24 hours.
- j) An in-line strainer/filter is required and must be designed for easy removal of lint, hair and other larger particles.
- k) The greywater treatment / diversion 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.
- l) All components shall be securely fixed to withstand all loads encountered during the transportation, installation and normal operation.
- m) All metal components shall be of stainless steel or other non-corroding material unless adequately protected against corrosion to satisfy the service life of the component.
- n) All plastics and perishable components that are subject to exposure to ultra-violet radiation, or an adverse chemical or biological environment shall be able to retain their integrity under normal operating conditions to satisfy the service life of the component.

#### 1.1 Specific Criteria for Greywater Treatment Systems (GTS):

- The DGTS must be designed to treat the greywater stream for a minimum of 6 EP based on 100L/p/d (mains water supply).

- Any tanks and/or vessels and their lids used to contain the DGTS shall be accompanied by technical information supporting the design to the satisfaction of the Department of Health.

## **1.2 Specific Criteria for Domestic Greywater Diversion Devices (GDD):**

- No kitchen waste is to be diverted into the GDD.
- The manufacturer must provide a recommended soil effluent percolation rate for the irrigation design (if the GDD comes with an irrigation component).
- Installation instructions to be provided on each unit for sale (including pipe material, diameter, orientation etc).
- Be certified to the Australian Technical Standard ATS 5200: 460, Technical Specification for plumbing and drainage products – Greywater Diversion Device (GWDD) and have a “Watermark Licence”.

## **2 Product Testing Criteria for Greywater Treatment Systems**

**2.1** The test GTS shall be installed on a premises that is representative of a domestic greywater source, including all intended greywater source components such as laundry, kitchen, bath, shower and hand basins.

**2.2** Approval for installation and operation of the GTS test site shall be obtained from the Department of Health.

**2.3** 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 attained from the owner/operator of the sewerage (or other) system.

**2.4** 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 GTS 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 GTS shall be metered and readings recorded weekly.
- Appropriate diversion plumbing is made available in the case of GTS failure, to either the sewer or other appropriate available wastewater system.

**2.5** 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.

**2.6** The test period for the GTS shall be 26 weeks from the date of commissioning. The GTS shall be commissioned in accordance with the manufacturer’s recommended procedure.

**2.7** The following data described in Table 3 shall be obtained at the described intervals from grab samples collected over the 26 week monitoring period.

**Table 3: Frequency of Sampling.**

Parameter	Influent	Effluent
Required		
E.coli (or Thermotolerant coliforms)	every 6 days	every 6 days
BOD5	every 6 days	every 6 days
SS	every 6 days	every 6 days
Free Chlorine (where used)	every 6 days	every 6 days
Turbidity (where necessary)	every 6 days	every 6 days
Optional		
TKN	every 6 days	every 6 days
TN	every 6 days	every 6 days
TP	every 6 days	every 6 days

**Note:** E.coli, Coliphages and Clostridia will need to undergo challenging testing. The frequency of sampling will be dependent on the particular product being tested.

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

- GTS 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.

**2.9** Sample locations: The final effluent grab samples shall be taken from the outlet chamber or point from the GTS prior to disposal. The influent samples shall be taken upstream of all process units associated with the GTS, including coarse filters.

**2.10** The samples for BOD5, 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.

**2.11** Nutrient removal testing criteria must be discussed with the Department of Health prior to testing.

**2.12** All alarms are to be tested (including those alarms used for online monitoring).

### **3 Compliance Criteria**

Treatment processes and onsite controls are to be designed so as to achieve sufficient pathogen reduction (assessed as log reductions) of bacteria, protozoa and virus in accordance with the National Guidelines for Water Recycling and Department of Health requirements.

The following criteria are based on a single domestic onsite greywater system. Criteria for communal systems or a series of connected onsite systems from different dwellings will be assessed by the Department of Health separately.

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.

- a) Greywater treated to a secondary standard via a GTS must meet the effluent quality requirements specified in AS 1546.3 (refer to Section 5 of the code)

- b) The compliance criteria for accreditation of a domestic GTS where the treated effluent is to be used for toilet flushing, washing machine or unrestricted garden watering shall be in accordance to Table 4 (other compliance criteria may be required by the Department of Health, as determined necessary).

**Table 4: Compliance Criteria for Accreditation of a Domestic GTS**

Parameter	Effluent Compliance Value
E.coli	< 1 cfu/100 mL or MPN/100 mL (95%ile)
BOD	< 10 mg/L
SS	< 10 mg/L
pH	6.5 -8.5
Turbidity	Turbidity < 2 NTU (95%ile); < 5 NTU (maximum)
Disinfection	Cl: 0.2-2.0 mg/L residual UV: Reduction of more than 25% of the UV intensity light emitted compared to the fraction emitted from new lamp as per manufacturer's specifications
Coliphages	<1 pfu/100 mL
Clostridia	<1 cfu/100 mL

- The pathogen log removal performance of each part of the system must also be demonstrated. Somatic coliphage testing is required for ongoing monitoring of the water quality in WA as viruses are considered more infectious and more resistant to treatment process. DoH therefore requires demonstration of the log removals that the system can achieve in each treatment train for the indicator pathogens E coli, MS2 coliphage and Clostridium perfringens.
- The system shall be designed and installed to prevent cross-connection with the drinking water. Backflow prevention devices are required at locations identified as hazardous for cross-connection. The type of backflow prevention device must be selected according to the degree of risk hazard as provided in the AS/NZS 3500.1:2003 and AS/NZS 2845.1:1998. Isolating valves are required at the washing machine, each flushing toilet cistern and each backflow prevention device.

## **4 Online Monitoring Requirements for Greywater Treatment Systems**

**4.1** All GTS are required to have an alarm system to indicate an electrical or mechanical malfunction as follows:

- alarms shall be provided to indicate failure of mechanical equipment and pumps;
- the alarm system shall comprise audible and visible alarms with muting facility for the audible alarm. The muting facility shall reset to audible after 24 hours; and
- alarms shall be located in readily visible positions from within the dwelling or as required by the regulatory authority.

**4.2** For effluent to be used for toilet flushing or unrestricted garden watering, online monitoring must incorporate:

- Continuous monitoring for turbidity at the outlet of the treatment system. The turbidity must be less than or equal to 2 NTU. If the turbidity exceeds 2NTU for over 30 consecutive minutes, supply of the product water is to be stopped and not recommenced until the turbidity is reduced to below 2 NTU.
- For UV disinfection, a minimum dose of 100mJ/cm<sup>2</sup> is required. An alarm must indicate when this is not achieved.
- Monitoring requirements for other technologies (e.g. membrane filtration, ozonation) need to be discussed with the Department of Health prior to application. Failure of the GTS to achieve these monitoring requirements shall result in alarm, automatic shut-off and diversion of the greywater being treated to sewer.

## **5 Disposal and Reuse Options**

**5.1** For greywater diversion devices:

- Land application is to be via approved subsurface disposal or subsurface irrigation (provided soil testing is undertaken for each installation), in accordance with AS/NZS 1547 and the Code of Practice for Greywater Reuse;
- A dedicated irrigation area is required for irrigation using a GDD. 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.

**5.2** For greywater treatment systems achieving secondary treatment:

- Land application can be via surface or shallow subsurface irrigation, or subsurface disposal in a dedicated area in accordance with AS/NZS 1547 and the Code of Practice for Greywater Reuse.
- A dedicated irrigation area is required for treated greywater of secondary quality. 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.

**5.3** Under certain conditions, effluent from greywater treatment systems of a quality better than secondary treatment can be used for:

- Toilet flushing; and
- Unrestricted garden watering.

Note: The required water quality is to be verified through the nominated pre-approval testing regime and online monitoring is required. These requirements are dependent on the final usage and treatment technology and should be discussed with the Department of Health prior to application.

## **6 Operation and Maintenance**

**6.1** Low phosphorous detergents should be used where greywater is recycled for land applications.

**6.2** The greywater system shall be operated and maintained in accordance with the manufacturer's recommendations, Department of Health product approval, relevant Local Governments installation approval, the requirements of this Code and any other requirements from the relevant sewerage service provider.

## **7 Marking, labeling and signage**

The marking, labelling and signage of the greywater plumbing and/or irrigation systems has to be in accordance with AS/NZS 3500 and other Australian Standards.

All pipes or pipe sleeves and identification tapes (including those on greywater irrigation systems) shall be coloured purple as per the Australian Standard AS 2700 and marked with the following in accordance with the Australian Standard AS 1345 "WARNING RECYCLED/RECLAIMED WATER – DO NOT DRINK" at intervals not exceeding 0.5 m.



All below ground pipes (including those used for sub-surface irrigation) shall have an identification tape marked in accordance with the Australian/New Zealand Standard AS/NZS 3500.1 installed on top of the greywater pipeline, running longitudinally, and fastened to the pipe at not more than 3 m intervals

Greywater outlets (connections, taps, appliances) shall have signs that are marked "WARNING DO NOT DRINK" in accordance with the Australian Standard AS 1319.

Land irrigation areas must have at least two warning signposts, complying with Standards AS 1319 or NZS/AS 1319, at the boundaries of the irrigation area. The signs must be clearly visible to property users, with wording such as, "Recycled Water – Avoid Contact – DO NOT DRINK".

## Appendix 4: Annual Report Requirements

### CONTACT DETAILS

<b>Full Name of Company</b>	
<b>Address</b>	
<b>Phone Number</b>	
<b>Email</b>	

### NAME AND MODEL OF THE SYSTEM

<b>Name of onsite wastewater treatment system</b>	
<b>Model number of onsite wastewater treatment system</b>	

### DOH APPROVAL OF THE SYSTEM

<b>Approval Number</b>	
<b>Approval Date</b>	

### LIST OF INSTALLED SYSTEM

Number of System	Address of Systems	Local Government Authority	Date of Installation

## COMPLAINTS REGISTER

Date of Complaint	Address of Complaint	Nature of Complaint	Local Government Authority

## LIST OF CERTIFIED INSTALLERS

Name of Installer	Contact Details

## LIST OF CERTIFIED SERVICE AGENTS

Name of Service Agent	Contact Details

## PERFORMANCE MONITORING RESULTS

Date Sampled	Address of Premises	Local Government	Sample Id Number	Parameter	Parameter Units	Result



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