Interpretation

The Queensland Plumbing and Wastewater Code (QPW code) has been designed to provide performance solutions to meet the statutory requirements of the Plumbing and Drainage Act 2002. This will maintain the standards set by the QPW code while allowing for innovation in materials and methods.

Objectives and Functional Statements are informative only and are included to provide an aid to interpreting the Performance Criteria. Objectives are the community expectations for the QPW code. Functional Statements describe how to meet those community expectations.

Performance Criteria have been developed to meet the Objectives and Functional Statements. The Acceptable Solutions provide a simple and direct manner of meeting the Performance Criteria.

Where legislation requires compliance with the QPW code, compliance with the Performance Criteria is mandatory.¹

¹ Section 8B of the Standard Plumbing and Drainage Regulation 2003 provides:

8B Compliance with QPW code

(1) Plumbing and drainage work and on-site sewerage work must comply with the QPW code.

(2) Plumbing and drainage work or on-site sewerage work complies with the QPW code only if the work satisfies the relevant performance criteria under the QPW code.

(3) Compliance with the relevant performance criteria can be achieved only by—

(a) complying with the relevant acceptable solution under the QPW code; or

(b) formulating an alternative solution that—

(i) satisfies the performance criteria; and

(ii) is shown to be at least equivalent to the relevant acceptable solution under the QPW code; or

(c) a combination of paragraphs (a) and (b).
Unless otherwise provided by the QPW code, the requirements of the relevant Australian and New Zealand Standards are applicable. Where there is any inconsistency, or the QPW code has additional requirements, the QPW code prevails.

The Australian / New Zealand Standards referred to in the QPW code, are taken to apply to all on-site wastewater management systems and greywater use facilities assessed under the Plumbing and Drainage Act 2002 regardless of the limitations expressed in the relevant standard.

Objective and Functional Statements

The QPW code adopts the Objective, Functional Statement and Verification Methods of Part F1 of the Plumbing Code of Australia.

Definitions

Unless noted otherwise, all terms have the same meaning as defined in the Plumbing and Drainage Act 2002, Standard Plumbing and Drainage Regulation 2003 or a relevant Australian/New Zealand Standard.

If a definition given in a relevant standard is inconsistent with the Act, Regulation or the QPW code, the legislation (i.e. the Act or Regulation) prevails, to the extent of the inconsistency.

Note: Italicised words within the body of the text, other than legislation titles, are defined below.

amenity – means an attribute which contributes to the health, physical independence, comfort and well being of people.

apparatus – for supplying water to premises, includes a water meter.

applied provisions – has the meaning provided in Schedule 1 of the Standard Plumbing and Drainage Regulation 2003.

automatic switching device – controls the water supply to plumbing outlets by automatically switching from rainwater tank water to the water service when the water level in the rainwater tank is insufficient to meet household demand.

blackwater – is defined as:
(a) the waste discharged from the human body into a toilet, and
(b) the water used for the discharge.

certified – means a plumbing or drainage product approved by a Conformity Assessment Body (CAB) in accordance with the Product code authorisation and certification.

classes 1, 2, 4, 5, 6, 7, 8 and 9 – in relation to a building, mean the definitions as specified in Part A3.2 of Volume One of the Building Code of Australia.

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2 Standard Plumbing and Drainage Regulation 2003 s9 requires compliance with Australian and New Zealand Standards 3500.0 to .2 and .4 and 1546.1 and .3 and 1547

3 Example: the definitions of design loading rate and design irrigation rate are separately defined in AS/NZ 1547 (On-site domestic-wastewater management). This standard is an “applied provision” under the Standard Plumbing and Drainage Regulation 2003 and therefore applies to the interpretation of the QPW Code.
**closed loop greywater treatment system** – means a system incorporating:
(i) a source water tank containing greywater from appliance/s,
(ii) a greywater treatment plant,
(iii) provision for make up water,
(iv) provision for bleed water to be disposed of to sewer or approved discharge point; and
(v) a treated water storage tank used to supply the treated water to appliance/s for re-use.

**Common area** – means an area of common property.

**Common bathroom** – means the most, or what is expected to be the most, frequently used bathroom of the building.

**Common property** – has the meaning provided in section 10 of the Body Corporate and Community Management Act 1997.

**Complying valve** – means a device incorporated as part of the water meter which a water service provider can use to securely restrict the flow of water, either partially or fully, to the meterable premises, installed upstream of a water meter.

**Community titles scheme** – see section 10 of the Body Corporate and Community Management Act 1997.

**Design life** – means the period during which the item is designed to meet the performance criteria. It is to be a minimum of 15 years.

**Dry-vault toilet** – means a toilet which is not a chemical, composting or incinerating toilet.

**Efficient irrigation system** – means a fixed outdoor irrigation system consisting of a network of permanent piping connected to emitters which has been designed and installed to water a specific landscape area and will reduce the maximum output capacity.

**emitter** – means a device of any kind fitted on a pipe which is operated under pressure to discharge water in a spray, mist or drip form. Common types of emitters include drippers, micro-sprayers, pop-up and gear-drive sprays and fixed sprinkler heads.

**greywater** – means wastewater from a bath, basin, kitchen, laundry or shower, whether or not the wastewater is contaminated with human waste.

**greywater application area** – means an area in which greywater is disposed of by subsurface or surface irrigation.

**greywater diversion device**:  
1. A greywater diversion device is a device that consists of:
   (a) a diversion device with the characteristics mentioned in paragraph 2; and
   (b) a filtering system that uses a coarse filter to remove solids from greywater.
2. For paragraph 1, the characteristics are that the device—
   (a) directs and diverts greywater to sanitary drainage or a greywater application area; and
   (b) automatically diverts greywater from the facility to sanitary drainage if the facility does not work properly or at all; and
   (c) allows the manual diversion of greywater from the facility to sanitary drainage.

**greywater treatment plant** – means a treatment plant installed on premises for treating, on the premises in a day, greywater generated on the premises.

**greywater use facility** – means a facility that consists of:
   (a) a greywater diversion device and a greywater application area; or
   (b) a greywater treatment plant and a greywater application area; or
   (c) a greywater treatment plant.
**land application area** – means an area in which effluent from an **on-site sewage treatment plant**, greywater treatment plant or greywater diversion device is disposed of by subsurface or surface irrigation.

**land application system** – means a greywater application area associated with a greywater use facility or a land application area associated with an on-site sewerage facility.

**meterable premises** – means:
(a) all class 1 buildings; and
(b) each lot within a community title scheme, including the common property, in a water service provider’s area; and
(c) the sole-occupancy unit of a class 2, 4, 5, 6, 7 or 8 building in a water service provider’s area; and
(d) each storey of a class 5 building in a water service provider’s area where the building consists of more than one storey and sole-occupancy units are not identified at the time of the building’s plumbing compliance assessment.

**new class 1 building** – means a class 1 building for which a request for compliance assessment is made under the *Plumbing and Drainage Act 2002* irrespective of when the relevant building development application is approved and does not includes class 1 buildings which have an existing hot water system installed.

**on-site sewage treatment plant** – is a sewage treatment plant installed or to be installed on premises as part of an on-site sewerage facility for the premises.

**on-site sewerage facility** – means:
a facility, other than an environmentally relevant on-site sewerage facility or a dry-vault toilet, installed on premises for—
(a) treating, on the premises sewage generated on the premises, and disposing of the resulting effluent—
   (i) on part of the premises (commonly called a ‘land application area’); or
   (ii) off the premises by common effluent drainage or by collection from a tank on the premises; or
(b) storing on the premises sewage generated on the premises for its subsequent disposal off the premises by collection from the premises; or
(c) chemically treating, composting or incinerating toilet waste.

**on-site sewerage work** – means building, installing or changing an on-site sewerage facility, including, for example, building, installing or changing an on-site sewerage facility for testing purposes.

**on-site wastewater management system** – means a system installed on premises that receives and treats wastewater generated on the premises and applies the resulting effluent to an approved disposal or land application area (including an on-site sewerage facility but excluding a greywater use facility).

**outdoor irrigation system** – means a network of permanent piping connected to emitters which has been designed and installed to water a specific landscape area.

**plant** – means an on-site sewage treatment plant or a greywater treatment plant.

**public area** – means an area to which the public has lawful access, for example, a footpath.

**product code authorisation and certification** – means product authorisation and certification under the document in force from time to time called ‘Plumbing Code of Australia’, produced for all State Governments by the National Plumbing Regulators Forum.
**rainwater tank** – means a covered tank or combination of covered tanks used to collect rainwater from a building roof.

**sole-occupancy unit** – in relation to a building, means:
(a) a room or other part of the building for occupation by one or a joint owner, lessee, tenant, or other occupier to the exclusion of any other owner, lessee, tenant, or other occupier, including, for example:
(i) a dwelling; or
(ii) a room or suite of associated rooms in a building classified under the Building Code of Australia as a class 2, 4, 5, 6, 7 or 8 building; or
(b) any part of the building that is a common area or common property.

**storey** – means a space within a building which is situated between one floor level and the floor level next above, or if there is no floor next above, the ceiling or roof above, but not-
(a) a space that contains only:
   (i) a lift shaft, stairway or meter room; or
   (ii) a bathroom, shower room, laundry, water closet, or sanitary compartment; or
   (iii) accommodation intended for not more than 3 vehicles; or
   (iv) a combination of the above; or
(b) a mezzanine.

**trickle top-up system** – means a system that provides an approved plumbing connection between the water service and a rainwater tank in accordance with AS/NZS 3500.1:2003.

**water meter** – means a device, including equipment related to the device, for measuring the volume of water supplied to premises.

*Example of equipment related to the device— a pulse meter associated with the device.*

**water supply** – means the plumbing supplying water to meterable premises from a water service.

**water service** – has the same meaning as provided in The Water Supply (Safety and Reliability) Act 2008.

**water service provider** – for premises, means the person registered under the Water Supply (Safety and Reliability) Act 2008, chapter 2, part 3, as the water service provider for retail water services for the premises.
## Part 1 – On-site wastewater management systems

<table>
<thead>
<tr>
<th>PERFORMANCE CRITERIA</th>
<th>ACCEPTABLE SOLUTIONS</th>
</tr>
</thead>
</table>
| **P1** On-site wastewater management systems must be designed, constructed, installed and maintained in such a manner as to:  
(a) protect public health by ensuring that risks associated with the dispersal of wastewater to the land application area are minimised; and  
(b) protect the environment by ensuring:  
(i) surface and ground water are not polluted;  
(ii) soil productivity is maintained or enhanced; and  
(c) minimise the impacts on and maintain and enhance amenity by ensuring it has no adverse impact on:  
(i) the built environment; and  
(ii) persons on and nearby the premises for the design life of the facility. | **A1** (a) Wastewater must be dispose of in a land application area which complies with Part 3 of the QPW code; and  
(b) The on-site wastewater management system otherwise complies with the applied provisions; and  
(c) The on-site wastewater management system must be operated and maintained in accordance with the designer’s or manufacturer’s instructions. |
| **P2** On-site wastewater management systems that facilitate on-site storage, treatment, disposal or re-use of wastewater must be designed, constructed and installed:  
(a) with adequate treatment and storage capacity for the volume of waste and frequency of disposal;  
(b) with adequate size, strength and rigidity for the nature, flow rates, volume of wastes and/or waste products which must be processed;  
(c) with adequate vehicle access for collection, if required;  
(d) to avoid the likelihood of contamination of any drinking water supplies;  
(e) to avoid the likelihood of contamination of soils, ground water and waterways;  
(f) from materials which are impervious both to the waste for which disposal is required and to water;  
(g) to avoid the likelihood of foul air and gases accumulating within or entering into buildings;  
(h) to avoid the likelihood of unauthorised access by people to permit cleaning, maintenance, measurement and performance sampling;  
(i) to avoid the likelihood of surface water and stormwater entering the system;  
(j) to avoid the likelihood of uncontrolled discharge;  
(k) to permit the manufacturer, model, serial number and designed capacity to be reasonably easily identifiable after installation;  
(l) to minimise nuisance eg noise to the occupants of neighbouring properties; and  
(m) so that the installation throughout its design life will continue to satisfy the requirements of items (a) to (m). | **A2** (a) The size determination, design and installation of septic tanks must be in accordance with AS/NZS 1546.1; and the size determination, design and installation of aerated wastewater treatment systems must be in accordance with AS/NZS 1546.3; and  
(b) The design, construction, installation, replacement, repair, alteration and maintenance of all sanitary plumbing and drainage systems must be in accordance with AS/NZS 3500.2; and  
(c) The management of on-site wastewater management systems must be in accordance with AS/NZS 1547. |
## Part 2 – Greywater use facilities

<table>
<thead>
<tr>
<th>PERFORMANCE CRITERIA</th>
<th>ACCEPTABLE SOLUTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P1</strong> A greywater use facility must be designed, constructed, installed and maintained in such a manner as to:</td>
<td><strong>A1</strong> (a) Either:</td>
</tr>
<tr>
<td>(a) protect public health by ensuring that risks associated with the use and/or disposal of greywater to the greywater application area are minimised; and protect the environment by ensuring—</td>
<td>(i) greywater is disposed of in a manner appropriate for its potential end use as listed in Table T1A, T1B or T1C; or</td>
</tr>
<tr>
<td>(i) surface and ground water are not polluted; and</td>
<td>(ii) where greywater is disposed of to a land application area, it complies with Part 3 of the QPW code; and</td>
</tr>
<tr>
<td>(ii) soil productivity is contained or enhanced; and</td>
<td>(b) The greywater use facility otherwise complies with the applied provisions; and</td>
</tr>
<tr>
<td>(b) minimise the impacts on and maintain and – enhance the amenity by ensuring it has no adverse impact on:</td>
<td>(c) The greywater use facility must be operated and maintained in accordance with the designer’s or manufacturer’s instructions.</td>
</tr>
<tr>
<td>(i) the built environment; and</td>
<td></td>
</tr>
<tr>
<td>(ii) persons on and nearby the premises,</td>
<td></td>
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<tr>
<td>for the design life of the facility.</td>
<td></td>
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</table>

| **P2** A greywater use facility must be designed, constructed and installed: | **A2** (a) Design, construction and installation of a greywater use facility must be in accordance with AS/NZS 1547 and AS/NZS 3500: with necessary modifications as appropriate; and |
| (a) with adequate treatment and storage capacity for the volume of waste and frequency of disposal; | (b) The design of a greywater treatment plant must ensure that the volume of treated greywater available for any indoor use be equivalent to three days supply for the indoor use; and |
| (b) with adequate size, strength and rigidity for the nature, flow rates, volume of wastes and/or waste products which must be processed; | (c) Greywater treatment plants must be designed to provide at least 36 hours retention for the expected daily flow of greywater, with 40 litres/per person/year of capacity allowed for scum and sludge accumulation. |
| (c) with adequate vehicle access for collection, if required; | (d) Where the greywater treatment plant is installed on a sewered allotment, the greywater is diverted to the sewer in the event of the greywater treatment plant malfunctioning. |
| (d) to avoid the likelihood of contamination of any drinking water supplies; | |
| (e) to avoid the likelihood of contamination of soils, ground water and waterways; | |
| (f) from materials which are impervious both to the waste for which disposal is required and to water; | |
| (g) to avoid the likelihood of foul air and gases accumulating within or entering into buildings; | |
| (h) to avoid the likelihood of unauthorised access by people; | |
| (i) to permit cleaning, maintenance, measurement and performance sampling; | |
| (j) to avoid the likelihood of surface water and stormwater entering the system; | |
| (k) to avoid the likelihood of uncontrolled discharge; | |
| (l) to permit the manufacturer, model, serial number and designed capacity to be reasonably easily identifiable after installation; | |
| (m) to minimise nuisance eg noise to the occupants of neighbouring properties; and | |
| (n) so that the installation throughout its design life will continue to satisfy the requirements of items (a) to (m). | |
### Part 3 – Land application systems

<table>
<thead>
<tr>
<th>PERFORMANCE CRITERIA</th>
<th>ACCEPTABLE SOLUTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P1</strong> A <em>land application system</em> must be designed constructed, installed and maintained in such a manner as to:</td>
<td><strong>A1</strong> 1. The <em>land application system</em> complies with each of clauses (a) and (b) in determining the size and position of the <em>land application system</em> while taking into account the written report (and any photographic material) produced as a result of an on-site inspection carried out in accordance with Clause 4.1.3.4(b) of AS/NZS 1547:</td>
</tr>
<tr>
<td>(a) complete the treatment, uptake and absorption of the final effluent within the boundaries of the approved application area;</td>
<td>(a) The setback distances specified in:</td>
</tr>
<tr>
<td>(b) avoid the likelihood of the creation of unpleasant odours or the accumulation of offensive matter;</td>
<td>(i) Table T4 for a subsurface <em>land application system</em> from a greywater treatment plant or an on-site sewage treatment plant.</td>
</tr>
<tr>
<td>(c) avoid the likelihood of the ingress of effluent, foul air or gases entering buildings;</td>
<td>(ii) Table T5 for a surface irrigated <em>land application system</em> from a greywater treatment plant or an on-site sewage treatment plant.</td>
</tr>
<tr>
<td>(d) avoid the likelihood of stormwater run-off entering the system;</td>
<td>(iii) Table T6 for a greywater diversion device.</td>
</tr>
<tr>
<td>(e) avoid the likelihood of root penetration or ingress of ground water entering the system;</td>
<td>(iv) Table T7 for an on-site sewerage facility and all greywater use facilities.</td>
</tr>
<tr>
<td>(f) protect against internal contamination;</td>
<td>(b) The following sub clauses:</td>
</tr>
<tr>
<td>(g) provide adequate access for maintenance;</td>
<td>(i) the design irrigation rate or design loading rate is to be appropriate to the characteristics of the terrain and soil in and near the <em>land application area</em>, and</td>
</tr>
<tr>
<td>(h) incorporate adequate provisions for effective cleaning;</td>
<td>(ii) the environmental constraints and the anticipated daily volume of <em>greywater</em> in <em>Table T2</em> for sewered areas and <em>Table T3</em> for unsewered areas.</td>
</tr>
<tr>
<td>(i) avoid the likelihood of unintended or uncontrolled discharge;</td>
<td>2. The <em>land application area</em> and any pump or motor are not located adjacent to bedrooms, living rooms or recreational areas of the premises or neighbouring properties.</td>
</tr>
<tr>
<td>(j) avoid the likelihood of blockage and leakage;</td>
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</tr>
<tr>
<td>(k) avoid the likelihood of damage from superimposed loads or ground movement;</td>
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</tr>
<tr>
<td>(l) provide ventilation to avoid the likelihood of foul air and gases from accumulating in the system;</td>
<td></td>
</tr>
<tr>
<td>(m) minimise nuisance eg noise to the occupants of neighbouring properties; and</td>
<td></td>
</tr>
<tr>
<td>(n) ensure that the installation throughout its <em>design life</em> will continue to satisfy the requirements of items (a) to (m).</td>
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</tbody>
</table>
## Part 4 – Water meters for new premises

<table>
<thead>
<tr>
<th>PERFORMANCE CRITERIA</th>
<th>ACCEPTABLE SOLUTIONS</th>
</tr>
</thead>
</table>
| **P1** The water supply to a meterable premise must be fitted with a device (water meter) to measure the amount of water supplied to the premises. | **A1** Each water supply to a meterable premise is to be fitted with a water meter which:  
(a) measures only the water supplied by that water supply to that meterable premises; and  
(b) is approved by the water service provider; and  
(c) complies with relevant requirements of the water service provider that may be imposed under the Water Supply (Safety and Reliability) Act 2008. |

| **P2** A water meter must be located so it is easy to read and maintain. | **A2** The water meter is:  
(a) located so that it can be easily maintained and read from a common area, common property or public area; and  
(b) installed:  
(i) in a common area; or  
(ii) in common property; or  
(iii) less than 3m from a property boundary within a public area. |

| **P3** A water meter must be properly maintained. | **A3** A water meter is to be maintained in accordance with the relevant Australian Standards. |

| **P4** The installation of a water meter includes a device which allows for the restriction of the flow of water from the water service to the water meter. | **A4** The water meter has a complying valve. |

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4 AS3565.1:2004 Meters for Water Supply – Cold water meter  
AS3565.2:2004 Meters for Water Supply – Combination Meters  
AS3565.3:2004 Meters for Water Supply – Water meters with integral dual check values  
AS3565.4:2004 Meters for Water Supply – In-service compliance testing  
AS3565.5:2004 Meters for Water Supply – Water meters with two integral single check values
Part 5 – Chief Executive Approvals

This Part establishes the requirements for a Chief Executive Approval of an on-site sewage treatment plant or a greywater treatment plant under section 91 of the Plumbing and Drainage Act 2002.

A Chief Executive Approval is required for:

a) an on-site sewage treatment plant where the sewage generated on the property is less than that of 21 equivalent persons; or
b) a greywater treatment plant

A Chief Executive Approval does not include:

a) the method of land application of the treated effluent; or
b) a chemical, composting or incinerating toilet; or
c) a dry vault toilet (e.g. waterless toilet).

Testing Agency

All compliance checking, monitoring, testing, and sampling is to be performed by an agency accredited as a third party quality management certification body certified by the Joint Accreditation System of Australia and New Zealand (JAS-ANZ) or by another accreditation body with which JAS-ANZ has a memorandum of understanding, and at the cost of the applicant.

The samples for Biochemical Oxygen Demand (BOD), suspended solids, total nitrogen, total phosphorus and thermotolerant coliforms, taken by the testing agency, must be directly transported and delivered to a laboratory, registered by the National Association of Testing Authorities (NATA) to carry out analyses for the parameters specified. Where applicable residual disinfectant and dissolved oxygen samples must be analysed on-site. The test criteria and test period procedures specified in Appendix A of AS/NZS 1546.3 apply to an on-site sewage treatment plant placed under test.

Certification is required that tank/s have been designed, manufactured, constructed and tested in accordance with AS/NZS 1546.1

Performance Evaluation Testing – Other than AS/NZS 1546.3

Where AS/NZS 1546.3 does not apply, performance evaluation testing may be carried out in accordance with Appendix 2.

For example, this will be the case where the number of equivalent persons generating waste exceeds 10. It may also occur where it is difficult or not possible to construct the on-site sewage treatment plant (e.g. a sand filter) or test the plant at a Municipal Treatment Plant (e.g. a greywater treatment plant).
### Performance criteria for Chief Executive Approvals

<table>
<thead>
<tr>
<th>PERFORMANCE CRITERIA</th>
<th>ACCEPTABLE SOLUTIONS</th>
</tr>
</thead>
</table>
| **P1** The plant is designed and capable of being tested to ensure that:  
(a) all plant discharges are safe; and  
(b) risks associated with the discharge of human waste and domestic-wastewater to the environment are minimised; and  
(c) surface and groundwater are not polluted; and  
(d) soil productivity is maintained or enhanced, and cumulative adverse environmental effects do not occur during the design life. | **A1** The plant:  
(a) which is an on-site sewage treatment plant meets the Effluent Quality requirements in Appendix 1; or  
(b) which is a greywater treatment plant that produces outputs equivalent to the Potential End Uses in Table T1A, T1B or T1C. |
| **P2** The plant is designed to maintain and enhance community amenity by:  
(a) being managed so as to achieve sustainable long-term performance; and  
(b) providing treatment capacity to meet expected hydraulic and organic loadings. | **A2** (a) An on-site sewage treatment plant shall be designed to treat waste generated by a minimum of 8 persons or up to a maximum of 20 persons and the design loading shall be stated; and  
(b) The application is accompanied by documentation meeting the requirements of Appendix 3. |
| **P3** The plant and any necessary ancillary equipment shall be designed to function and meet all other performance requirements during the design life. | **A3** (a) Each component of the plant and ancillary equipment will be manufactured to last the design life apart from mechanical and electrical components that:  
(i) have a minimum design life of 15 years; and  
(ii) have a minimum warranty period of 12 months; and  
(iii) are readily accessible for maintenance and replacement.  
(b) All components are capable of being securely fixed to withstand all loads encountered during transportation, installation and normal operation; and  
(c) The application is accompanied by documentation meeting the requirements of Appendix 3; and  
(d) The documentation in (c) will be publicly available for downloading during the design life from the website nominated in the application and on the label. |
| **P4** The plant is designed and constructed to:  
(a) provide a reliable treatment process that will achieve the effluent quality criteria when operated and maintained in accordance with the manufacturer’s instructions; and  
(b) provide easy access for authorised persons to all parts of the plant for inspection, maintenance and repairs which is secure from unauthorised access. | **A4** (a) The application is accompanied by documentation meeting the requirements of Appendix 3; and  
(b) The plant otherwise complies with the applied provisions. |
Appendix 1 - Effluent Quality

Effluent Quality – Secondary

Secondary quality effluent must meet the following effluent compliance characteristics:

(a) 90% of the samples taken over the test period must have a BOD$_5$ less than or equal to 20 g/m$^3$ with no sample greater than 30 g/m$^3$.

(b) 90% of the samples taken over the test period must have total suspended solids less than or equal to 30 g/m$^3$ with no sample greater than 45 g/m$^3$.

(c) Where disinfection is provided 90% of the samples taken over the test period must have a thermotolerant coliform count (determined by either the most probable number or membrane filter technique) not exceeding 200 organisms per 100 ml with no sample exceeding 1000 organisms per 100 ml.

(d) Where chlorination is the disinfection process, the total chlorine concentration must be greater than or equal to 0.5 g/m$^3$ and less than 2.0 g/m$^3$ in four out of five samples taken.

Effluent Quality – Advanced Secondary

Advanced secondary quality effluent must meet the following effluent compliance characteristics:

(a) 90% of the samples taken over the test period must have a BOD$_5$ less than or equal to 10 g/m$^3$ with no sample greater than 20 g/m$^3$.

(b) 90% of the samples taken over the test period must have the total suspended solids less than or equal to 10 g/m3 with no sample greater than 20 g/m3.

(c) Where disinfection is provided 90% of the samples taken over the test period must have a thermotolerant coliform count (determined by either the most probable number or membrane filter technique) not exceeding 10 organisms per 100 ml with no sample exceeding 200 organisms per 100 ml.

(d) Where chlorination is the disinfection process, the total chlorine concentration must be greater than or equal to 0.5 g/m$^3$ and less than 2.0 g/m$^3$ in four out of five samples taken.

(e) Where the manufacturer has included nitrogen and/or phosphorus reduction in the treatment process, the effluent compliance criteria must be able to meet in addition to the above the following nutrient criteria:

(i) 90% of the samples, with 95% confidence limits taken over the test period shall have a total nitrogen concentration less than or equal to 10 mg/L.

(ii) 90% of the samples, with 95% confidence limits taken over the test period shall have a total phosphorus concentration less than or equal to 5 mg/L.

Comment: If the nitrogen and phosphorus concentrations do not meet the criteria nominated in paragraph (e) above, the manufacturer can request that recognition be given to the actual nitrogen and/or phosphorus concentration determined in the above evaluation by the Department of Infrastructure and Planning.
Appendix 2 - Performance Evaluation Testing – Other than AS/NZS 1546.3

Where AS/NZS 1546.3 does not apply (see examples mentioned previously) then performance evaluation testing may be carried out in accordance with the following clauses.

(a) The test plant (including alarm system) must be installed on a premise that will produce either a flow of sewage or greywater representative of the operational loading. For a greywater treatment plant the source components must include all components e.g. bath, shower, basin, laundry and kitchen where applicable.

(b) Aspects to consider when selecting and setting up a test site include:

- Minimum flow requirements continually received over at least the 26 week monitoring program.
- The premises are occupied full time and on a continual basis over the 26 week monitoring program.
- Greywater influent to the greywater treatment plant is not to be absent for more than three consecutive days.
- Appropriate diversion plumbing to either the sewer or other appropriate system line is made available in the case of greywater treatment plant failure.
- Approval for installation and operation of the test site shall be obtained from the local government.

(c) Raw sewage to the test on-site sewage treatment plant must not be pre-treated by chemical addition and should have characteristics within the following ranges.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Characteristic</th>
</tr>
</thead>
<tbody>
<tr>
<td>BODs</td>
<td>150-300 mg/L</td>
</tr>
<tr>
<td>SS</td>
<td>150-300 mg/L</td>
</tr>
<tr>
<td>Total Nitrogen</td>
<td>20-100 mg/L</td>
</tr>
<tr>
<td>Total Phosphorus</td>
<td>6-25 mg/L</td>
</tr>
</tbody>
</table>

(d) The test plant must be installed, commissioned, operated and maintained according to the manufacturer’s instructions. The manufacturer is responsible for ensuring the plant is free of defects and is operable.

(e) The plant must be placed under test over a period of twenty-six (26) weeks. The plant must be commissioned in accordance with the manufacturer’s recommended procedure.

(f) The following data must be obtained at the described intervals from grab samples collected over the 26-week monitoring period.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>On-site Sewage Treatment</th>
<th>Greywater Treatment Plant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Influent</td>
<td>Effluent</td>
</tr>
<tr>
<td>Prescribed (must be analysed)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BOD$_5$</td>
<td>Every 12 days</td>
<td>Every 6 days</td>
</tr>
<tr>
<td>Total Suspended Solids (TSS)</td>
<td>Every 12 days</td>
<td>Every 6 days</td>
</tr>
<tr>
<td>Thermotolerant Coliforms *</td>
<td>Every 12 days</td>
<td>Every 6 days</td>
</tr>
<tr>
<td>E. Coli **</td>
<td>Every 12 days</td>
<td>Every 6 days</td>
</tr>
<tr>
<td>Free Chlorine</td>
<td>N/A</td>
<td>Every 6 days</td>
</tr>
<tr>
<td>(where used)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optional (Manufacturer to nominate)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total nitrogen</td>
<td>Every 12 days</td>
<td>Every 6 days</td>
</tr>
<tr>
<td>Total phosphorus</td>
<td>Every 12 days</td>
<td>Every 6 days</td>
</tr>
</tbody>
</table>

- * If the plant does not include disinfection then thermotolerant coliforms can be excluded from the monitoring program.
- ** E.Coli is to be tested instead of thermotolerant coliforms where a closed loop greywater treatment system is being tested.

(g) Other data to be recorded at a minimum of every 6 days includes -

- *Plant inflow reading.*
- Site notes and comments.

(h) The final effluent grab samples must be taken from the outlet chamber or a point prior to land application or reuse. The influent samples must be taken upstream of all process units associated with the built item or greywater treatment plant.

(i) The samples for BOD$_5$, total suspended solids, total nitrogen, total phosphorus and thermotolerant coliforms taken by the testing agency must be directly transported and delivered to a laboratory, registered by NATA to carry out analyses for the parameters specified. Analyses for disinfectant concentration must be tested on-site immediately after sampling.

The manufacturer must ensure that the premises are returned to their original condition, or to the satisfaction of the owner of the premises and the local government once testing has been completed.
Appendix 3 - Documentation

The following must be produced and submitted with the application.

**Drawings**

One copy of drawings must be provided in A3 hard copy format and an electronic copy must be submitted. They must be full engineering drawings to scale and dimensioned, contain a full listing of all components with name, model, size, description, function, material of manufacture and location in the plant and include any wiring diagrams.

The components to be shown must include the electric motor(s), gearbox, compressor, pump(s), valves, diffusers, media, pipework including sewer discharges or approved discharge point (where applicable), scum collection and sludge pumping equipment, brackets, electrodes, float switches, control panel and the arrangement of the alarm.

**Owner's Manual and label**

Each plant must be accompanied by an owner’s manual prepared by the manufacturer. Each plant must have securely affixed to it a label designed to last for the design life showing items (a), (b) and (c) below.

The authorised representative must provide the manual to the owner at the time of the plant and ancillary equipment installation or on occupation of the premises. The manual must be written so that it can be easily understood by the intended reader and must include at a minimum -

(a) The plant’s model designation.
(b) The name and telephone number of an appropriate service representative to be contacted in the event that a problem with the plant occurs.
(c) The website from which the documentation can be downloaded during the design life.
(d) A statement confirming that the plant meets the requirements of this Code.
(e) A clear statement of examples of the types of waste that can be effectively treated by the plant.
(f) A list of substances that, if discharged to the plant, may adversely affect the plant, the process, or the environment.
(g) Comprehensive operating instructions that clearly delineate proper function of the plant, operating and maintenance responsibilities of the owner and authorised service personnel, and service-related obligations of the manufacturer or facility builder.
(h) Requirements for the periodic removal of sludge from the plant or backwash procedures to dispose of sludge to sewer including details of any potential requirements e.g. trade waste agreements, necessary to connect the system to sewer (where applicable).
(i) A course of action to be taken if the plant is to be used intermittently or if extended periods of non-use are anticipated.
(j) Detailed methods and criteria to be used to identify plant malfunction or problems.
(k) A statement instructing the owner to reference the label in the event that a problem arises or service is required.
Installation Manual
Manufacturers must provide comprehensive and detailed installation instructions to authorised representatives. The manual must be written so that it can be easily understood by the intended reader and must include as a minimum -

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

Operation and Maintenance Manual
Manufacturers must provide comprehensive and detailed operation and maintenance instructions to authorised service personnel. The manual must be written so that it can 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 sludge from the plant or backwash procedures to dispose of sludge to sewer including details of any potential requirements e.g. trade waste agreements, necessary to connect the system to sewer (where applicable).
(c) Recommended methods for collecting effluent samples.
(d) The expected effluent produced by the operational system.
Part 6 – Non certified testable backflow prevention devices for fire service

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>PERFORMANCE</th>
<th>ACCEPTABLE SOLUTIONS</th>
</tr>
</thead>
</table>
| P1       | Fire services connected to *water service provider’s* infrastructure have an appropriate testable backflow prevention device installed. | A1 Fire services connected to *water service provider* infrastructure have a:  
   a) certified testable backflow prevention device; or  
   b) non certified testable spring loaded single check valve. |
| P2       | Installed testable backflow prevention devices have appropriate isolating valves and are fitted for easy removal. | A2 A testable backflow prevention device:  
   a) has resilient-seated isolating valves located immediately upstream and adjacent to the device; and  
   b) is fitted in an accessible position; and  
   c) is connected with either flange or barrel union fittings for easy removal and replacement; and  
   d) locked in the open position; and  
   e) otherwise complies with the *applied provisions*. |
Appendix 4 – Field testing of testable single check valves

Scope
This appendix sets out the method for field testing of testable single check valves.

Apparatus
A test kit as shown in Figure 1

Procedure
The procedure shall require all measurements to be taken at ambient air temperature;
(a) with reference to Figure 2 check/open USIV (3); and
(b) in sequence open and close test taps (1) and (2) to flush out any impurities; and
(c) close DSIV (4).

To test the non-return valve
(a) close test kit valves (A) and (B) and open test kit valve (C) and connect;
   (i) the high pressure hose of the test kit to test tap (1); and
   (ii) the low pressure hose of the test kit to test tap (2).
(b) open test taps (1) and (2); and
(c) open test kit valve (A) and bleed water through the vent valve (C); and
(d) close the test kit valve (A); and
(e) slowly open the test kit valve (B) and bleed water through the vent valve (C); and
(f) slowly close test kit valve (B) and observe and record the reading on the differential pressure gauge; and

NOTE: A reading below 7kPa indicates a faulty non-return valve.

(g) close test taps (1) and (2), open test kit valves (A) and (B), disconnect the test kit, close the test kit valve (B).

To test the upstream and downstream isolating valves
(h) connect the high pressure hose to test tap (2); and
(i) bleed the high pressure hose to test tap (2); and
(j) in sequence close –
   (i) test kit valve (C); and
   (ii) USIV (3); then
(k) slowly open the test kit valve (B); until the pressure on the gauge drops by approx 10 kPa; then
(l) close test kit valve (B); then

NOTE: Observe the reading on the differential pressure gauge.
   • a rise in pressure on the gauge indicates a leaking USIV (3)
   • a drop in pressure on the gauge indicates a leaking DSIV (4)

(m)
   (i) close test tap (2); and
   (ii) open test kit valve (B); and
   (iii) disconnect high pressure hose from test tap (2); and
   (iv) open isolating valves (3) and (4).

(This restores the device to operating condition)
(Lock USIV and DSIV in open position)

Test report
The following shall be reported:
   (a) the reading obtained in step (f).
   (b) whether the USIV and DSIV are tight.

Criteria for acceptance
The following shall be criteria for acceptance:
   (i) the reading in step (f) shall be not less than 7kPa; and
   (ii) the USIV shall be tight; and
   (iii) the DSIV shall be tight.
Figure 1 – Typical test kit apparatus
Figure 2- Typical Arrangement Testable single check valve fire service assembly
### Part 8 – Water conservation for class 1 and class 2 buildings

<table>
<thead>
<tr>
<th>PERFORMANCE CRITERIA</th>
<th>ACCEPTABLE SOLUTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P1</strong></td>
<td><strong>A1</strong></td>
</tr>
</tbody>
</table>
| For lots which have a class 1 or class 2 building, in areas serviced by a water service provider, outdoor irrigation systems installed or replaced on or after 1 March 2009 must facilitate the efficient use of water. | For lots which have a class 1 or class 2 building, in areas serviced by a water service provider, outdoor irrigation systems installed or replaced on or after 1 March 2009 comply with Queensland Water Commission guidelines for an efficient irrigation system - 'Efficient Irrigation for Water Conservation' when:  
(a) connected to a water service; or  
(b) connected to a rainwater tank where the rainwater tank has a continuity of supply from a water service through either:  
   (i) a trickle top-up system; or  
   (ii) an automatic switching device where the off take is located downstream of the automatic switching device. |
Part 9 – Chief Executive Approval for Blackwater Trials in Southeast Queensland

Definitions

This Part establishes the requirements for a Chief Executive Approval for the installation of an on-site sewage treatment plant for testing purposes only in a sewered area in the South East Queensland (SEQ) Region. The Plumbing and Drainage Act 2002 (PDA) permits the installation for testing purposes only in class 2, 5, 6 and 9b.

A Chief Executive Approval does not include:

a) the method of land application of the treated effluent; or  
b) a chemical, composting or incinerating toilet; or  
c) a dry-vault toilet (e.g. waterless toilet).

Testing Agency

All compliance checking, monitoring, testing, and sampling is to be performed by an agency accredited as a third party quality management certification body certified by the Joint Accreditation System of Australia and New Zealand (JAS-ANZ) or by another accreditation body with which JAS-ANZ has a memorandum of understanding, and at the cost of the applicant.

The samples for Biochemical Oxygen Demand (BOD₅), suspended solids, total nitrogen, total phosphorus and thermotolerant coliform, taken by the testing agency, must be directly transported and delivered to a laboratory, registered by the National Association of Testing Authorities (NATA) to carry out analyses for the parameters specified.

Applicable residual disinfectant and dissolved oxygen samples must be analysed on site. The test criteria and test period procedures specified in the Guideline for Treated Blackwater Reuse Trials (the guideline).

Water quality specifications for the treated blackwater trials can be found in Table 9.1.
### Performance Criteria for Chief Executive Approvals for *Blackwater* Trials

<table>
<thead>
<tr>
<th>PERFORMANCE</th>
<th>CRITERIA</th>
<th>ACCEPTABLE SOLUTIONS</th>
</tr>
</thead>
</table>
| **P1** | To protect public health by ensuring that:  
(a) all plant discharges are safe; and  
(b) risk associated with the discharge of human waste and domestic-wastewater to the environment are minimised. | The *plant* which is an *on-site sewage treatment plant* :  
(a) meets the Effluent Quality requirements in Table 9.1;  
(b) meets the requirements of Appendix 9B; and  
(c) otherwise complies with the *applied provisions*. |
| **P2** | To maintain and enhance the quality of the environment by ensuring that:  
(a) surface and groundwater are not polluted; and  
(b) soil productivity is maintained or enhanced, and cumulative adverse environmental effects do not occur during the *design life*; and  
(c) the relationship between input and output within a hydrological system is correct for the volumes of *blackwater* produce. | The *plant* which is an *on-site sewage treatment plant* :  
(a) complies with the Effluent Quality requirements in Table 9.1; and  
(b) otherwise complies with the *applied provisions*. |
| **P3** | To maintain and enhance community amenity by ensuring that the *plant*:  
(a) is managed so as to achieve sustainable long-term performance;  
(b) is designed to enhance the amenity; and  
(c) provides treatment capacity to meet expected hydraulic and organic loadings. | (a) *A plant* shall be designed to treat waste generated onsite and the design loading shall be stated;  
(b) The application is accompanied by documentation meeting the requirements of Appendix 9B; and  
(c) Otherwise complies with the *applied provisions*. |
| **P4** | The system shall be designed to function and meet all other performance requirements during the *design life*. | (a) Each component of the system will be manufactured to last the *design life* apart from mechanical and electrical components that:  
(i) have a minimum *design life* of 15 years;  
(ii) have a minimum warranty period of 12 months;  
(iii) are readily accessible for maintenance and replacement.  
(b) All components are capable of being securely fixed to withstand all loads encountered during transportation, installation and normal operation;  
(c) The application is accompanied by documentation meeting the requirements of Appendix 9A;  
(d) The documentation in (c) will be publicly available for downloading during the *design life* from the website nominated in the application and on the label; and  
(e) The system otherwise complies with the *applied provisions*. |
| **P5** | The *plant* is designed and constructed to:  
(a) provide a reliable treatment process that will achieve the effluent quality criteria when operated and maintained in accordance with the manufacturer’s instructions; and  
(b) provide easy access for authorised persons to all parts of the *plant* for inspection, maintenance and repairs which is secure from unauthorised access. | (a) The application is accompanied by documentation meeting the requirements of Appendix 9A; and  
(b) The *plant* otherwise complies with the *applied provisions*. |
**TABLE 9.1: WATER QUALITY SPECIFICATIONS FOR TREATED BLACKWATER TRIALS.**

All analysis must be done by a laboratory NATA accredited for the particular parameter. If water is over the maximum value at any time, it must be disposed off to sewer while the reasons are investigated. If water that is over the maximum value for any parameter has already been used on-site, then DIP and QH must be notified via the form in Attachment 7 (of the guideline).

<table>
<thead>
<tr>
<th>Parameter (Mandatory)</th>
<th>Standard (95% of samples must comply)</th>
<th>Maximum</th>
<th>Monitoring Frequency</th>
<th>Sampling point</th>
</tr>
</thead>
<tbody>
<tr>
<td>E.coli</td>
<td>&lt;1 cfu/100ml</td>
<td>&lt;10 cfu/100ml</td>
<td>Weekly (triplicate samples)</td>
<td>End of treatment process</td>
</tr>
<tr>
<td>Clostridium perfringens</td>
<td>&lt;1 cfu/100ml</td>
<td>&lt;10 cfu/100ml</td>
<td>Weekly</td>
<td>End of treatment process</td>
</tr>
<tr>
<td>F-RNA bacteriophages(^2)</td>
<td>&lt;1 pfu/100ml</td>
<td>&lt;10 pfu/100ml</td>
<td>Weekly</td>
<td>End of treatment process</td>
</tr>
<tr>
<td>Somatic coliphages(^3)</td>
<td>&lt;1 pfu/100ml</td>
<td>&lt;10 pfu/100ml</td>
<td>Weekly</td>
<td>End of treatment process</td>
</tr>
<tr>
<td>Turbidity</td>
<td>&lt;2 NTU</td>
<td>5 NTU</td>
<td>On-line or daily</td>
<td>Before disinfection point</td>
</tr>
<tr>
<td>Chlorine residual (mandatory for toilet flushing)</td>
<td>0.2 – 1.0 mg/L residual after a minimum contact time of 30 minutes</td>
<td>0.2 mg/L (minimum)</td>
<td>On-line or daily</td>
<td>Point of use or in storage tank</td>
</tr>
<tr>
<td>pH</td>
<td>6 – 8.5</td>
<td></td>
<td>On-line or daily</td>
<td>Where applicable in treatment process</td>
</tr>
<tr>
<td>Gross gamma radiation(^1)</td>
<td>&lt;5 Bq/L</td>
<td>5 Bq/L</td>
<td>On-line</td>
<td>End of treatment process</td>
</tr>
</tbody>
</table>

**Research Parameters (Mandatory sampling, however column 2 values are guideline values only)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Standard</th>
<th>Maximum</th>
<th>Monitoring Frequency</th>
<th>Sampling point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Dissolved Solids/Electrical conductivity(^4)</td>
<td>&lt;1000 mg/L/≤1600 µS/cm</td>
<td>No maximum for research parameters</td>
<td>Weekly</td>
<td>End of treatment process</td>
</tr>
<tr>
<td>Total Nitrogen</td>
<td>No guideline value</td>
<td>No guideline value</td>
<td>Monthly</td>
<td>End of treatment process</td>
</tr>
<tr>
<td>Total Phosphorus</td>
<td>No guideline value</td>
<td>No guideline value</td>
<td>Monthly</td>
<td>End of treatment process</td>
</tr>
</tbody>
</table>

\(^1\)People undergoing radiotherapy procedures have the potential to excrete material that is high in radioactivity. Due to smaller dilution levels in blackwater sewage systems and the possibility of cross connections between the treated blackwater system and the potable drinking water system, this issue needs to be managed properly to protect public health. If water is found to contain greater than 5 Bq/L gross gamma radiation, it should be disposed of to sewer immediately.

\(^2\)Phage testing may be reduced from weekly to monthly following advice from the multi-agency committee, if validation report has found them to be non-detectable.

\(^3\)For the parameters measured on-line, a quality control sample should be sent to a to a NATA registered laboratory as part of a quality control program, to ensure accuracy of on-line equipment.

\(^4\)Either total dissolved solids or electrical conductivity can be analysed.
Appendix 9A – Documentation for Blackwater Trials

Documentation

The following must be produced and submitted with the application.

Drawings

Three copies of drawings must be provided in A3 format. They must be full engineering drawings to scale and dimensioned, contain a full listing of all components with name, model, size, description, function, material of manufacture and location in the plant and include any wiring diagrams.

The components to be shown must include the electric motor(s), gearbox, compressor, pump(s), valves, diffusers, media, pipework, scum collection and sludge pumping equipment, brackets, electrodes, float switches, control panel and the arrangement of the alarm.

Installation Manual

Each plant must be accompanied by an owner’s manual prepared by the manufacturer. Each plant must have securely affixed to it a label designed to last for the design life showing items (a), (b) and (c) below.

The authorised representative must provide the manual to the trial participant at the time of system installation or on occupation of the premises. The manual must be written so that it can be easily understood by the intended reader and must include at a minimum -

(a) A numbered list of treatment plant components and an accompanying illustration, photograph, or print in which the components are respectively identified;

(b) Design, construction and material specification for the treatment plant components;

(c) Wiring schematics for the treatment plant electrical components;

(d) Off-loading and unpacking instructions including safety considerations, identification of fragile components and measures to be taken to avoid damage to the treatment plant;

(e) A process overview of the function of each component and the expected function of the entire treatment plant when all components are properly assembled and connected;

(f) A clear definition of the treatment plant installation requirements including plumbing and electrical power requirements, ventilation and air intake protection;

(g) Displacement protection, water tightness, slope and miscellaneous fittings and appurtenances;

(h) Repair or replacement instructions in the event that a treatment plant possesses flaws that would inhibit proper functioning and a list of sources for replacement components; and

(i) A detailed start-up procedure.
Operation and Maintenance Manual

Manufacturers must provide comprehensive and detailed operation and maintenance instructions to authorised service personnel. The manual must be written so that it can be easily understood by the intended reader and shall include at a minimum -

(a) Description and schematic of the treatment system that depicts the treatment process, including the flow of water, treatment components, pumps, compressors, valves, pipework;

(b) Source water characterisation and hazards identified in the source water and the expected function of the entire treatment plant for removing hazards from source water; possible hazards in the source water;

(c) Identification of critical control points and critical limits for the parameters used to assess critical control points. For example if filtration is a critical control point for effective disinfection turbidity from the source water. High turbidity of over 5 NTU is a breach of the critical limit indicating the critical control point is not functioning effectively. An alarm should therefore be generated when turbidity is over 5 NTU to warn the operator of a potential problem with the treatment process);

(d) Water quality monitoring programs;

(e) Operation instructions for the WTS (including manuals for all the components of the system). Operating instructions should be comprehensive and clearly delineate proper function of the treatment system and the operating and maintenance responsibilities of the owner and authorised service personnel, and the service-related obligations of the manufacturer or facility builder;

(f) Proposed volumes of treated blackwater to be produced;

(g) Proposed storage times;

(h) Approximate usage figures (volumes of treated blackwater used) for each use;

(i) A maintenance schedule for all components and equipment (including sludge removal);

(j) Investigation procedure for monitoring biofilm build up in pipe work and a schedule for biofilm control such as but not limited to, pipe scouring;

(k) A calibration schedule for all relevant components and any laboratory equipment on-site;

(l) Recommended methods for collecting, preserving, storing and transporting samples to a laboratory which is NATA registered for the relevant analyses;

(m) Disposal methods for any waste produced through the treatment process or out of specification water;

(n) Workplace Health and Safety procedures for storage of chemicals and other relevant activities;

(o) Waste disposal procedures for any liquid or solid waste from the WTS site;

(p) Incident procedures if plant malfunctions while operating unattended;

(q) Notification procedures if out of specification water is used on-site;

(r) The plants model designation;
(s) The name and telephone number of an appropriate service representative to be contacted in case of problems;

(t) A statement confirming that the WTS meets the requirements of the QPW code;

(u) Register to record the types of breakdowns, how the operator knows a breakdown has occurred, reaction times and actions to rectify problems that occur in the treatment system and reticulation system. This register must also record replacement of equipment. Over the life of the trial record the amount of time that the plant was not operational due to failures over the life of the trial;

(v) Register to record the amount of time the operator has to spend daily/weekly in overseeing the operation of the WTS. Include in this register which areas of operation take up most of the operators' time;

(w) Register to document the costs associated with the project;

(x) Operators' qualifications and knowledge of the WTS;

(y) Documented results of the ongoing consultation process; and

(z) Documented results of the ongoing educational process.
Appendix 9B Conditions of Approval for Blackwater Trials

Validation of treatment process
The Treated Blackwater Reuse Trials Guide contains further information on validation methods and must be used in conjunction with this section of the Code.

1. Validation of treatment process (Mandatory)
   - Results from pre-commissioning validation and commissioning validation, methodologies and results; and
   - Results from commissioning verification (minimum of 20 sampling events must be taken within 6 months. Each sampling event must be on a different day. These samples need to be analysed at a NATA accredited laboratory for the parameters in Table 9.1 and comply with the corresponding values in column 2 and 3 of Table 9.1) E. coli samples must be taken in triplicate.

2. Validation of On-line monitoring (Mandatory)
   - All on-line monitoring equipment needs to be validated as per the manufacturer’s instructions. Validation methods and any results must be included in the validation report; All on-line monitoring equipment needs to be calibrated as per the manufacturers instructions; and
   - Calibration results must be included in the validation report.

3. Validation of Storage of blackwater (Only applicable if water is stored for more than 24 hours anytime throughout the trial).
   - If treated blackwater is to be stored on-site for longer than 24 hours during the blackwater reuse trial, then during the validation period it must be demonstrated that the quality of the water is not degraded during storage;
     - The way this is done is up to the proponent but some suggestions include:
       a) Sampling water to ensure it still meets the parameters in Table 9.1 after various storage times that correspond to those that may occur during the operational phase of the trial;
       b) Monitoring any process employed to retain the water quality (e.g. chlorination of the storage tank); and
   - Methods and results from the validation of the storage of treated blackwater must be included in the validation report.

4. Cross-connection (Only applicable if water is plumbed back into building structure for toilet flushing or irrigation systems).
   - If use of effluent could result in a cross-connection with the potable water system, then the methods to control this must be included in the validation report.

5. Operational Manual (Mandatory)
   - A copy of the operational Manual will need to accompany the validation report. The operations manual must include all relevant information from Appendix 6 of the guidelines.
Table T1A – Potential end uses of greywater where a greywater treatment plant is installed on premises generating less than 3kL (<3kL) per day

<table>
<thead>
<tr>
<th>Potential End Uses</th>
<th>Parameter</th>
<th>Effluent Compliance Value</th>
</tr>
</thead>
</table>
| End uses with a high level of human contact, including:  
* Sanitary flushing  
* Laundry use (cold water source to washing machines)  
* Vehicle washing  
* Path/Wall washdown |  
Biochemical oxygen demand (BOD5)  
Total suspended solids (TSS)  
Thermo-tolerant organisms (org/100ml)  
pH  
Turbidity  
Disinfection | ≤10 mg/L  
≤10 mg/L  
<10  
6.5 – 8.5  
<2 NTU (95%ile) / <5 NTU (maximum)  
Cl: 0.2 – 1.0 mg/L residual (where used as primary disinfection) |
| End uses with a medium level of human contact, including:  
Lawn and garden spray irrigation |  
Biochemical oxygen demand (BOD5)  
Total suspended solids (TSS)  
Thermo-tolerant organisms (org/100ml)  
pH  
Turbidity  
Disinfection | ≤20 mg/L  
≤30 mg/L  
<30  
6.5 – 8.5  
<5 NTU (95%ile)  
Cl: 0.2 – 1.0 mg/L residual (where used as primary disinfection) |
| End uses with a low level of human contact, including:  
* Lawn and Garden manual bucketing, surface broadcasting, sub-surface irrigation |  
Biochemical oxygen demand (BOD5)  
Total suspended solids (TSS)  
Thermo-tolerant organisms (org/100ml)  
pH  
Disinfection | ≤240 mg/L  
≤180 mg/L  
N/A  
N/A |

Table T1B – Potential end uses of greywater where a greywater treatment plant is installed on premises generating greater than 3kL (>3kL) per day

<table>
<thead>
<tr>
<th>Potential End Uses</th>
<th>Parameter</th>
<th>Effluent Compliance Value</th>
</tr>
</thead>
</table>
| End uses with a high level of human contact, including:  
* Sanitary flushing  
* Laundry use (cold water source to washing machines)  
* Vehicle washing  
* Path/Wall washdown |  
Biochemical oxygen demand (BOD5)  
Total suspended solids (TSS)  
Escherichia coli (95% of samples taken over a 12 month period)  
Escherichia coli (maximum)  
pH  
Turbidity  
Disinfection (where chlorine is used as primary disinfection) (residual must be maintained at point of use for sanitary flushing and laundry use) | ≤10 mg/L  
≤10 mg/L  
<1 cfu/100ml  
10 cfu/100ml  
6.5 – 8.5  
<1 NTU (95%ile) / 5 NTU (maximum)  
Cl: 0.2 – 1.0 mg/L residual |
| End uses with a medium level of human contact, including:  
Lawn and garden spray irrigation |  
Biochemical oxygen demand (BOD5)  
Total suspended solids (TSS)  
Escherichia coli (95% of samples taken over a 12 month period)  
Escherichia coli (maximum)  
pH  
Turbidity | ≤10 mg/L  
≤10 mg/L  
<100 cfu/100ml  
<1000 cfu/100ml  
6.5 – 8.5  
<5 NTU (95%ile) |
| End uses with a low level of human contact, including:  
* Lawn and Garden drip or sub-surface irrigation (no pooling on surface) |  
Biochemical oxygen demand (BOD5)  
Total suspended solids (TSS)  
Escherichia coli (95% of samples taken over a 12 month period)  
Escherichia coli (maximum) | ≤20 mg/L  
≤30 mg/L  
<100 cfu/100ml  
<1000 cfu/100ml |
Table T1C – End uses of greywater where a closed loop greywater treatment system is installed on premises

<table>
<thead>
<tr>
<th>End Use</th>
<th>Parameter</th>
<th>Effluent Compliance Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>End uses in closed loop greywater treatment system with little or no human contact for use in a washing machine</td>
<td>Escherichia coli (maximum) *</td>
<td>10 cfu/100ml in any single sample. Less than 1 cfu/100ml in any follow-up sample</td>
</tr>
</tbody>
</table>

* Note - Total dissolved solids, oil and grease and total suspended solids effluent compliance values for the operational functionality of the system may be conditioned as part of the testing approval.

Table T2 - Estimate of greywater generated by an average house in a sewered area (3-bedroom home and four occupants)

<table>
<thead>
<tr>
<th>Greywater flow</th>
<th>Litres/person/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily greywater flow from bathroom</td>
<td>60</td>
</tr>
<tr>
<td>Daily greywater flow from laundry</td>
<td>35</td>
</tr>
<tr>
<td>Total for bathroom and laundry</td>
<td>95</td>
</tr>
</tbody>
</table>

Table T3 - Estimate of greywater generated by an average house in an unsewered area

<table>
<thead>
<tr>
<th>Greywater flow total for bathroom and laundry</th>
<th>Bedrooms</th>
<th>Litres /day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5</td>
<td>3</td>
<td>600</td>
</tr>
<tr>
<td>6-7</td>
<td>4</td>
<td>840</td>
</tr>
<tr>
<td>8</td>
<td>5</td>
<td>960</td>
</tr>
<tr>
<td>9-10</td>
<td>6</td>
<td>1200</td>
</tr>
</tbody>
</table>

Table T4 - Setback distances for subsurface land application area for a greywater treatment plant or an on-site sewage treatment plant

<table>
<thead>
<tr>
<th>Feature</th>
<th>Horizontal Separation Distance (metres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance from the edge of trench/bed excavation or subsurface irrigation distribution pipework to the nearest point of the feature</td>
<td>Up slope</td>
</tr>
<tr>
<td>Property boundaries, pedestrian paths, footings of buildings, walkways, recreation areas, retaining wall footings.</td>
<td>2</td>
</tr>
<tr>
<td>In ground swimming pools.</td>
<td>6</td>
</tr>
<tr>
<td>In ground potable water tank.</td>
<td>6 *</td>
</tr>
</tbody>
</table>

*Note: For Primary effluent the distance from an in-ground potable water tank must be 15 metres.
Table T5 - Setback distances for surface irrigated land application area for a greywater treatment plant or an on-site sewage treatment plant

The separation distances are based on a spray plume with a diameter not exceeding 1 m or a plume height not exceeding 0.3 m above the finished surface level. Distances are given in metres from the edge of the irrigated wetted area to any point of the feature.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Horizontal Separation Distance (metres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property boundaries, pedestrian paths and walkways.</td>
<td>2</td>
</tr>
<tr>
<td>Water edge of a swimming pool.</td>
<td>6</td>
</tr>
<tr>
<td>Dwellings, recreation areas.</td>
<td>10</td>
</tr>
</tbody>
</table>

* Note: For Primary effluent the distance from an in-ground potable water tank must be 15 metres.

Table T6 - Setback distances from a greywater diversion device

<table>
<thead>
<tr>
<th>Feature</th>
<th>Setback Distance (metres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property boundaries, pedestrian paths, and driveways.</td>
<td>1.0</td>
</tr>
<tr>
<td>Footings of buildings.</td>
<td>1.5</td>
</tr>
<tr>
<td>Retaining wall footing.</td>
<td>1.0</td>
</tr>
<tr>
<td>In ground swimming pool surrounds.</td>
<td>1.0</td>
</tr>
<tr>
<td>In ground potable water tank.</td>
<td>6.0</td>
</tr>
<tr>
<td>Bores intended for human consumption.</td>
<td>50</td>
</tr>
</tbody>
</table>

Table T7 - Setback distances for on-site sewerage facilities and greywater use facilities

(Protection of surface water and groundwater)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Separation</th>
<th>Distance (metres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>For onsite – see Appendix 1</td>
<td>Advanced</td>
<td>Secondary</td>
</tr>
<tr>
<td>Top of bank of permanent water course; or</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Top of bank of Intermittent water course; or</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>Top of bank of a lake, bay or estuary or</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>Top water level of a surface water source used for agriculture,</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>aquaculture or stock purposes or;</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>Easement boundary of unlined open stormwater drainage channel or drain.</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>Bore or a dam used or likely to used for human and or domestic consumption</td>
<td>10</td>
<td>30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Feature</th>
<th>Separation</th>
<th>Distance (metres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top of bank of permanent water course; or</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Top of bank of Intermittent water course; or</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>Top of bank of a lake, bay or estuary or</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>Top water level of a surface water source used for agriculture,</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>aquaculture or stock purposes or;</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>Easement boundary of unlined open stormwater drainage channel or drain.</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>Bore or a dam used or likely to used for human and or domestic consumption</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>Unsaturated soil depth to a permanent water table (vertically)</td>
<td>0.3</td>
<td>0.6</td>
</tr>
</tbody>
</table>

* Note: Primary effluent typically has a BOD (Biochemical Oxygen Demand) of between 120 -240 mg/L and Total Suspended Solids of between 65 -180 mg/L.