Approval

1. The **M800s Greywater System** ("the system") described in the Specifications and Drawings in the attached Schedule and manufactured by **Aqua Clarius Holdings Pty Ltd** ("the manufacturer") (ABN 810 942 428 14) has been assessed in accordance with the Queensland Plumbing and Wastewater Code (QPW Code) dated 15 January 2013.

2. Approval is granted for an advanced secondary greywater treatment system, subject to compliance by the manufacturer with the requirements of the **Plumbing and Drainage Act 2002**, part 5 and the conditions of approval detailed below.

3. This approval, the conditions of approval and the Schedule comprise the entire Chief Executive Approval document.

4. Any modification by the manufacturer to the design, drawings or specifications scheduled to this approval must be approved by the Chief Executive.

Conditions of approval

5. The manufacture, installation, operation, service and maintenance of the systems must be in conformity with the conditions of this Chief Executive Approval.

6. The advanced secondary greywater treatment system may only be used on premises that generate per day:

   (a) a maximum hydraulic loading of 720 litres/day; and
   
   (b) a maximum organic loading of 400 grams/day BOD5

7. For the system to meet the requirements of an advanced secondary greywater treatment system, the system must produce the following effluent quality —

   (a) 90% of the samples taken must have a BODs less than or equal 10g/m³ with no sample greater than 20g/m³; and
   
   (b) 90% of the samples taken must have total suspended solids less than or equal 10g/m³ with no sample greater than 20g/m³; and
   
   (c) 90% of the samples taken must have thermotolerant coliform count not exceeding 10 organisms per 100 mL with no sample exceeding 200 organisms per 100mL.

8. Each system must be serviced in accordance with the manufacturers details supplied in the owner’s service and maintenance manuals.

9. Each system must be supplied with —

   (a) a copy of this Chief Executive Approval document;
   
   (b) details of the system and ancillary equipment;
   
   (c) instructions for authorised persons for its installation;
   
   (d) a copy of the owner’s manual to be given to the owner at the time of installation; and
   
   (e) detailed instructions for authorised service personal for its operation and maintenance.
10. This approval does not extend, apply to, or include the land application system used in conjunction with an approved system installed on premises.

11. At each anniversary of the Chief Executive Approval date, the manufacturer must submit to the Chief Executive a list of all systems installed in Queensland that they have received an installation and commissioning certificate for during the previous 12 months.

12. Where the Chief Executive is notified of any system failures that they believe are a result of poor design or faulty manufacture, the Chief Executive may randomly select a number of installed systems for audit. The Chief Executive will notify the National Association of Testing Agencies (NATA) accredited laboratory nominated by the manufacturer, which systems are to be audited for Biochemical Oxygen Demand (BOD5) and Total Suspended Solids (TSS). The sampling and testing of the selected systems, if required, is to be done at the manufacturer's expense. The following results must be reported to the Chief Executive:

(a) Address of premises.
(b) Date inspected and sampled.
(c) Sample identification number.
(d) Biochemical Oxygen Demand (BOD5).
(e) Total Suspended Solids (TSS).

13. The Chief Executive may, by written notice, cancel this approval if the manufacturer fails — to comply with one or more of the conditions of approval; or within 30 days, to remedy a breach, for which a written notice been given by the Chief Executive.

14. This approval may only be assigned with the prior written consent of the Chief Executive.

15. This approval expires on 7 March 2022 unless cancelled earlier in accordance with paragraph 13 above.

Lindsay Walker
Director
Strategic Policy (Plumbing, Drainage, Committees and Special Projects)

Date approved: 7 March 2017

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SCHEDULE

Attachment 1

Specifications for the

M800s Greywater System
How the System Works

The M800s system is an on-site packaged greywater treatment system designed to treat household greywater and kitchen waste water from domestic houses at the rate of 720 litres per day with up to eight occupants.

The system comprises a below ground collection tank which is coupled to an above ground treatment tank. The recycled water is connected to the house for re-use but additionally the below ground tank is connected to the sewer in case of malfunction.

The M800s uses a state-of-the-art treatment process that produces reclaimed water of exceptional quality at a reasonable cost.

An overview of the treatment systems is illustrated below.

![Diagram of greywater treatment system]

How Waste is Processed

The greywater flows into an in ground feed tank where the liquid is strained to remove hair, lint and other items. The collected liquid is then pumped to the above ground treatment system where it enters a bioreactor, membrane filter and finally passes through an ultraviolet disinfection system before entering a small treated water tank.

When the liquid in the water tank reaches a predetermined level it is automatically pumped back to backflush the membranes. The bulk of the treated water is pumped to a larger water storage tank for reuse.

Solids removed in the process are discharged to sewer or other approved solid treatment system.
A schematic of the system is as follows:

**Electrical, mechanical and communication**

The M800s utilises four small low wattage pumps, an ultra-violet disinfector and an aerator. The system is self-contained and only needs to connect to a standard 10 amp GPO outlet.

A audio visual alarm is also incorporated in to the system with light and buzzer which alerts you to a problem.
SCHEDULE

Attachment 2

Drawings for the

M800s Greywater System
<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>DETAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Inlet Pipe</td>
<td>100DWV from inlet and to overflow</td>
</tr>
<tr>
<td>2</td>
<td>Pre-filter</td>
<td>100mm ag pipe with socket</td>
</tr>
<tr>
<td>3, 3a</td>
<td>Collection tank/upper section housing blower</td>
<td>Everhard Tank Pumpwell with extension. 500 litres</td>
</tr>
<tr>
<td>4</td>
<td>Membrane Tank/upper section housing blower</td>
<td>300mm SW pipe with end caps</td>
</tr>
<tr>
<td>5</td>
<td>Trickler Reactor</td>
<td>100mm ag pipe cut into 100mm lengths 220L</td>
</tr>
<tr>
<td>6</td>
<td>Treatment cartridge</td>
<td>50 mm ag pipe cut into 50mm lengths</td>
</tr>
<tr>
<td>7</td>
<td>Recirculation Pump</td>
<td>12v pump</td>
</tr>
<tr>
<td>8</td>
<td>Pump-well</td>
<td>10mm DWV pipe</td>
</tr>
<tr>
<td>9</td>
<td>Collection tank floats</td>
<td>2 magnetic float switches</td>
</tr>
<tr>
<td>10</td>
<td>Standpipe</td>
<td>2 magnetic float switches</td>
</tr>
<tr>
<td>11</td>
<td>Aeration tube</td>
<td>50mm ag pipe without holes</td>
</tr>
<tr>
<td>12</td>
<td>Membrane feed tank</td>
<td>100 mm DWV</td>
</tr>
<tr>
<td>13</td>
<td>Membrane cartridge</td>
<td>2x Microdyn NadirUltra flow UF Membrane BT42</td>
</tr>
<tr>
<td>14</td>
<td>Booster pump</td>
<td>Rule 12v</td>
</tr>
<tr>
<td>15</td>
<td>UV</td>
<td>Wedeco LCU2</td>
</tr>
<tr>
<td>16</td>
<td>Water tank</td>
<td>SW pipe with end caps 30 litres</td>
</tr>
<tr>
<td>17</td>
<td>Water tank Floats</td>
<td>2 magnetic float switches attached to outlet pipe</td>
</tr>
<tr>
<td>18</td>
<td>Water Tank Pump</td>
<td>Rule 12v pump</td>
</tr>
<tr>
<td>19</td>
<td>Air lift pipes</td>
<td>Lift 20mm pipe Air pipe 15mm</td>
</tr>
<tr>
<td>20</td>
<td>Solenoid valve</td>
<td>12v DC solenoid valve</td>
</tr>
<tr>
<td>21</td>
<td>Outlet pipe</td>
<td>15mm female connection</td>
</tr>
<tr>
<td>22</td>
<td>Control Panel</td>
<td>300mm SW pipe</td>
</tr>
<tr>
<td>23</td>
<td>Blower</td>
<td>Hiblow HP90 Blower</td>
</tr>
<tr>
<td>24</td>
<td>Controller</td>
<td>Aquad Claron specification</td>
</tr>
<tr>
<td>25</td>
<td>Air lift pipe</td>
<td>20mm pipe</td>
</tr>
</tbody>
</table>

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**Department of Housing and Public Works**

**Chief Executive Approval**

Approval No: 03/2017

Date of Issue: 29/3/17

Delegat Signature: [Signature]

Building Codes Queensland

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**M800s GREYWATER SYSTEM**

**Key Components**

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AU M800-04-003
Header tank → BL1 → F07

Membrane feed tank

Greywater IN → F01 → L5 → L4

Recirculation pumpwell

PU1 → PU2 → Treated Water Tank

Collection Tank

Displayed Text | Detail | Litres/day
--- | --- | ---
F01 | Max 150l/hr | 800
F02 | 20 l/min when pump running | 6760
F03 | 96 l/hr | 905
F04 | 3000 l/hr | 7200
F05a | 96 l/hr Approx 1.2 litre/min When booster PU2 on 2 l/m | 905
F05b | Backwash 5 sec 0.55l + pump out L3 to L4 11 sec 4.14l Also every 30 min for 5 sec Total 37.5 l/hr | 929
F05c | Backwash 5 sec 0.55l Total 4.4 l/hr | 60
F05d | 0.55l per backwash 4.4 l/hr plus Carried by air lift from 6a est. 4 litres/hr Total 8.4 l/hr | 160
F05e | Air lift 8 l/hr Air on 2 min/hr Total 160 l/hr | 400
F06 | Air 20 l/min 2 min/hr | 500
F06a | Air 10 l/min (air holes sized to balance flow between 6a and 6b) | 250
F06b | Air 10 l/min | 250
F07 | 20 l/min Pump on 4 sec 4.1 litres 190 pump outs One every 8 min | 800

Power kWhr

PU1 Recirc | 20 l/min 20 kPa 5kW on 2 min off 8 min 2.9 hrs/day | 0.17
PU2 Booster | 20 l/min 36 kPa 40W 2 hrs/day | 0.08
PU3 Water | 20 l/min 74 kPa 80W 0.8 hrs/day | 0.06
BL Blower | 38 W 1 hr/day | 0.04
UV | 20W On 24 hrs | 0.44
TOTAL | | 0.79 kWhr

L1 L2—L3 | 188 mm 61 litres L2 136 l L3 75 l Overflow 153 l
L4—L5 | 268 mm 4.7 litre