



# Class A Recycled Water Developer Guidelines

This guide is a requirement for all developers engaged in the design; construction and maintenance of class A recycled water dual water supply systems within the Western Water region. It contains instruction on the management of environmental risks.

Changes may be made periodically to this guide as inclusions or withdrawals. For current information, designers and contractors should contact Western Water.

This guide will be available on Western Water’s website: [www.westernwater.com.au](http://www.westernwater.com.au)

Western Water assumes no responsibility for any damages arising out of the misuse or inability to follow this guide.

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# 1. Introduction

The Eynesbury Township as well as the Toolern and Rockbank regions can benefit from a supply of class A recycled water (recycled water)<sup>1</sup> sourced from Western Water’s Melton Recycled Water Plant (Melton RWP). Western Water is required to maintain recycled water system in a safe and sustainable manner. These guidelines adhere to Western Water's Health and Environmental Management Plan (HEMP) for the region. New developments in the region that receive a Class A Recycled Water supply shall comply with the requirements outlined in the following document.

There are potential environmental impacts that may result from recycled water use. These guidelines have been developed to provide a framework for identifying, assessing and addressing these environmental impacts. As outlined in this guideline, Developers shall provide plans to Western Water which consider the environmental parameters and associated risks identified and detail the management regime to mitigate this risk, if applicable.

# 2. Surface Waters

There is potential risk for surface water to receive additional pollutant loads as a result of recycled water use in adjacent areas. A number of inappropriate uses or incidental events could result in an environmental impact through direct recycled water flow into surface waters.

Triggers	Management Action
<p>Recycled water supplied to the development for irrigation purposes.</p> <p><b>Note: All developments that have a dual pipe system must complete the following management actions.</b></p>	<p>Before the supply of recycled water is secured for a new development, developers must complete a Stormwater Management Strategy (SWMS) or equivalent document. This must then be reviewed and approved by an appropriate waterway manager (E.g. Melbourne Water)</p> <p>The SWMS or equivalent document must demonstrate how any additional nutrient load is accommodated by the development’s stormwater collection and treatment system. Details shall include:</p> <ul style="list-style-type: none"> <li>• Calculation of expected additional nutrient load</li> <li>• Proposed treatment train and performance to satisfy relevant water quality standards before discharge to waterway/s</li> </ul> <p>Guidance on calculating the additional pollutant loads in outlined in Appendix 1.</p>

<sup>1</sup> Class A recycled water supply for new developments is subject to Western Water approval

### 3. Soils

Soil characteristics are an important factor in the sustainable use of recycled water. The use of recycled water has the potential to degrade soils if not used appropriately.

Triggers	Management Action(to be implemented only if trigger level exceeded)
<p>Recycled water supplied to the development for irrigation purposes.</p> <p><b>Note: All developments that have a dual pipe system must complete the following management actions</b></p>	<p>Before the supply of recycled water is secured for a new development, the developer shall undertake baseline soil monitoring.</p> <p>Guidance on soil monitoring is outlined in Appendix 2.</p>
<p>If soil Phosphorus baseline value (Colwell extractable) is &gt;30 mg/kg</p>	<p>Reassess soil capacity to absorb high Phosphorus load in recycled water and implement additional management if required.</p>

### 4. Topography

Slopes greater than 5% pose a risk of recycled water run off directly entering surface water. The use of recycled water in steep areas may require particular management practices to be implemented.

Trigger	Management Action (to be implemented only if trigger level exceeded)
<p>&gt; 5% slope to be irrigated with recycled water.</p>	<p>Developers shall ensure recycled water run off is prevented from directly entering surface water.</p> <p>In order to control the risk of run off entering surface water the following measures are recommended:</p> <ul style="list-style-type: none"> <li>• No irrigation should be planned on non-residential areas with a slope greater than 5%</li> <li>• If irrigation does occur on slopes &gt;5% sub surface irrigation is required</li> </ul>

## 5. Native Vegetation

Some native plants are sensitive to the relatively high level of Phosphorus that may occur in recycled water. This shall be considered by developers during the protection of existing native vegetation or when establishing revegetated areas.

Trigger	Management Action (to be implemented only if trigger level exceeded)
Native vegetation irrigated with recycled water	<p>The developer shall outline management measures for the protection of native vegetation. These measures may include:</p> <ul style="list-style-type: none"> <li>• Selection of non-Phosphorus sensitive species</li> <li>• No irrigation should be planned on non-residential areas with phosphorus sensitive vegetation.</li> </ul>

## 6. Groundwater

Recycled water can negatively impact on the beneficial uses of groundwater and adversely affect surrounding land and surface waters through groundwater discharge. Risk to the environment has been assessed as low, on the basis that groundwater depths in the region are believed to be >30m and recycled water applied through irrigation is unlikely to percolate deeper than a meter.

Trigger	Management Action (to be implemented only if trigger level exceeded)
Groundwater depth <30m below ground surface level.	<p>If shallow groundwater (i.e. depth less than 30m) has been identified at the site, developers shall ensure recycled water does not have a negative impact on groundwater.</p> <p>The following practices may be considered for baseline and ongoing groundwater monitoring where shallow groundwater exists:</p> <ul style="list-style-type: none"> <li>• Install groundwater monitoring bore/s</li> <li>• Monitor baseline groundwater depth, salinity and nutrient levels</li> </ul>



## 7. Infrastructure

Inappropriate layout of recycled water infrastructure can negatively impact on environmental values, in particularly those related to water bodies.

Trigger	Management Action (to be implemented only if trigger level exceeded)
<p>Large (&gt;300mm diameter) recycled water mains or hydrants located &lt;100m from a water body.</p> <p>Recycled water hydrant/ scour valve directly entering a waterway (i.e. by-passing stormwater system).</p>	<p>Develop appropriate layouts of recycled water reticulation systems in the functional design plan. This shall include (but not limited to) the following details;</p> <ul style="list-style-type: none"> <li>• A buffer distance of greater than 100m between surface water and large (greater than 300mm diameter) recycled water mains,</li> <li>• Flushing points (hydrants/ scour valves) on the recycled water reticulation system to discharge via sewer manhole or eductor pit wherever possible.</li> </ul> <p>If management actions cannot be achieved, an environmental risk assessment will be provided to Western Water to demonstrate how risks to waterways are managed.</p>

## 8. Information Required from the Developer

The following information shall be provided by the Developer for recycled water dual pipe developments. Recycled water will not be approved for any new development until the following information is provided by the developer to Western Water for assessment and approval.

Information Required from all Developers:	Related Section	Developer Tick Box
<p>A map of the development including:</p> <ul style="list-style-type: none"> <li>• Land use including residential, public open spaces and retail</li> <li>• Topography contours (highlight slopes greater than 5%)</li> <li>• Non-residential areas to be irrigated with recycled water</li> <li>• Water bodies (including rivers, creeks, dam, lakes, wetlands and reservoirs)</li> <li>• Large (&gt;300mm diameter) recycled water mains</li> <li>• Recycled water hydrants/ scour valves</li> <li>• Stormwater system and discharge points into waterways</li> </ul>	<p>Topography Infrastructure Surface Waters</p>	<input type="checkbox"/>
Any relevant 'Designated Biodiversity Area' as per the Native Vegetation Protection Plan for the region, the developer must provide a plan indicating these area/s.	Biodiversity	<input type="checkbox"/>
Groundwater and geotechnical investigations conducted at the development site including documentation identifying the typical groundwater level of the development and identifying areas with shallow groundwater depths (<30m) (i.e. borehole logs to indicate watertable depth, water quality sampling, test pit investigations).	Groundwater	<input type="checkbox"/>
The SWMS or equivalent document for the development, including a copy of the relevant stormwater model consistent with Appendix 1 of this Guideline.	Surface Waters	<input type="checkbox"/>
Approval of SWMS or equivalent document by the relevant receiving waterway manager (eg. Melbourne Water).	Surface Waters	<input type="checkbox"/>
Soil sampling results and a plan of soil sample locations consistent with Appendix 2 of this Guideline.	Soils	<input type="checkbox"/>

## Appendix 1: Assessing the Impact of Recycled Water on Stormwater Management

This appendix details the methodology to be used in calculating and modelling the effects of any expected additional nutrient load as a result of supply recycled water to the development stormwater management system.

Stormwater modelling should be utilised to estimate the amount of pollutants the catchment produces (including likely inputs of Class A Recycled Water), the performance of treatment measures and the pollutant load generated once the stormwater is treated.

Developers shall model the additional nutrient load as a direct flow input with the following characteristics:

- Volume calculated as per Table 1
- Average Recycled Water quality of 10 mg/L Total Nitrogen (TN) and 10 mg/L Total Phosphorus (TP)
- Nutrient load reductions located approximately two thirds along the treatment train

Calculations are based on assumptions of flow rate, duration, frequency and coverage during events listed below. Developers shall estimate values (released volumes, nutrient loads) for listed events that may result in recycled water runoff into the stormwater system using calculations on the basis identified in Table 1.

**Table 1 Basis for calculating release volumes and nutrient loads from incidental events**

<b>Incidental Uses</b>	Generic Assumptions: Number events per year – 14 per 100 km mains <sup>##</sup> Duration 1.5 hours
Burst / Flushing Main; major event	10 % major event (flow rate 100 L/s)
Burst/Flushing Main; minor event	90 % average event (flow rate 3.33 L/s)
<b>Inappropriate Uses<sup>#</sup></b>	Generic Assumptions: Flow rate 20 L/min 2% of development population
Car washing on paved surface	For 10 minutes, 20 times / year
Washing down of hard surfaces	For 10 minutes, fortnightly
Garden over watering	For 10 minutes extra, weekly
<b>Firefighting<sup>#</sup></b>	Generic Assumptions: Flow rate 11 L/s 2 hydrants in use 30 minute duration

<sup>#</sup> Based on *Eynesbury Recycled Water HEMP (Western Water) 2008*

<sup>##</sup> Based on *Annual Report 2010/11 (Western Water) 2011*

## Appendix 2: Baseline Soil Sampling

The following baseline soil sampling shall be undertaken and results provided to Western Water:

Parameters	Sampling Locations	Sampling Procedure
Nitrogen (Total) Phosphorus (Total) Phosphorus (Colwell & Olsen) Exchangeable cations Exchangeable sodium percentage (ESP) pH EC Slaking and Dispersion Permeability	Each public open space area  Representative samples of residential area	Soil sampling and analysis to be undertaken in accordance with " <i>Industrial Waste Resource Guidelines, Sampling and Analysis of Waters, Wastewaters, soils and wastes, EPA 2009</i> "  Soils sampling must be carried out within a system accredited by NATA or meet the requirements laid out in Section 1.1 of the <i>Industrial Waste Resource Guidelines, Sampling and Analysis of Waters, Wastewaters, soils and wastes, EPA 2009</i>

Initial soil testing should be undertaken prior to supply of recycled water to establish baseline values for each parameter. Subsequent testing should be carried out in the same location so that temporal trends may be observed.