



5. Water Element of EnviroDevelopment

TITLE:	Water
OBJECTIVE:	Improved water use efficiency
TARGET:	Measures that would achieve 55% reduction in potable water use across the development (compared to recent historical data and/or 'traditional' development meeting basic regulatory standards).

Example table of 'traditional' development water use standards:

Development Type	Standard			EnviroDevelopment
	External	Internal	Total	Total
Class 1 dwelling	420L/household/day	400L/household/day	820L/household/day	369L/household/day
Class 2 dwelling	238L/household/day	257L/household/day	495L/household/day	222L/household/day

Reference: Queensland Government (2004), Regulatory Impact Statement: Proposed Amendments to Building and Plumbing Regulations to Improve Housing Sustainability of New Housing, drawing on MMA data.

PRINCIPLES

- Reduce potable water use. There are two fundamental strategies to achieve this, although a combination of these strategies may also be selected:
 - Reduce overall water use by 55% – e.g. through water efficiency mechanisms – more than mandated under Queensland Development Code.
 - Utilise alternative water sources (e.g. rainwater, stormwater, dual reticulation) for more than 55% of the development's water use (without increasing water use unnecessarily/unreasonably). If underground water/bore water is to be used to supplement potable supplies, there will also need to be evidence of water efficiency mechanisms and water balance calculations to show aquifer recharge.

Notes:

- Where estimations of rainfall are necessary to calculate the water usage (e.g. for landscape and gardens) or supply/harvesting (e.g. for rainwater and storm water solutions) to determine the water saving, the calculations should be based on median rainfall from at least 10 years of recent data.
- Where there are known historical water usages for the types of land uses the development will include, these may be used as the baseline against which efficiency is measured. (This could include different types of developments or land uses such as golf courses for example.) Otherwise, calculations will also need to be submitted about the predicated water use if it was developed 'traditionally', to compare with the water use for the proposed EnviroDevelopment.

POTENTIAL BENEFITS AND INCENTIVES

Benefits for Occupants

- Reduced operating costs
- Self-sufficiency of supply
- Satisfaction that occupier is reducing ecological footprint
- Rebates for rainwater tanks, appliances etc.
- More affordable more sustainable housing

- Qualification for 'green homes loans', as offered by some financial institutions
- Decreased rates
- Enhanced marketability and property value

Benefits for Local, State or Federal Government

- Reduced mains water consumption
- Reduced infrastructure costs/delay infrastructure upgrades/equivalent to enhanced capacity
- Improved stormwater quality through improved stormwater management
- Reduced local flooding through reducing peak stormwater discharges
- Can facilitate greater population growth for limited resources
- More attractive and sustainable city/shire/state
- Helps raise community awareness of government's efforts to enhance sustainability
- Helps raise community awareness of the need to protect the environment and only use resources sustainably
- Helps to reduce the ecological footprint of communities

Benefits for Developers

- Marketing advantages through quality product and EnviroDevelopment promotion
- Recognition of development as an EnviroDevelopment
- Reduced approval/assessment times
- Reduced size of water mains
- Improved corporate image
- Reduced infrastructure charges based on reduced water demand as agreed by local council.
- Rebates for rainwater tanks, appliances etc.
- May help facilitate site-based solutions for reducing demand on town supplies of potable water
- Greater lot utilisation

REQUIREMENTS

Criteria	Notes on evidence to be provided to Board of Management for approval prior to certification as an EnviroDevelopment
<p>5.1 ESSENTIAL ACTIONS</p> <p>Must meet the requirements to show at least 55% reduction in potable water demand and reduce water consumption for irrigation by 50% (where irrigation demand exceeds 25% of total water use for the development).</p>	<p>Meet evidence requirements of the relevant option/s of 5.2 and 5.3 (if applicable).</p>
<p>5.2 55% REDUCTION IN POTABLE WATER DEMAND</p> <p>In addition to the regulatory requirements for water efficiency, a development will need to meet the criteria below for at least one of the options to show reduction of potable water demand from community supplies of 55% compared to historical water use or water use for 'traditional' development types, or compared to similar commercial or industrial operations for certification as an EnviroDevelopment (or other efficiency as outlined below).</p>	

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<p>5.2.1 Stormwater Harvesting</p> <p>Stormwater harvesting (e.g. broad scale collection of stormwater runoff for use in irrigation).</p>	<p>Certification by engineer or local government engineer or development assessment officer or other qualified professional (e.g. through water balance calculations and hydrological modelling and a statement) that sufficient stormwater will be available and that the civil works will be constructed in such a way as to facilitate its harvest and use. (Such infrastructure should be constructed as part of the civil works.)</p> <p>It is also a requirement to show evidence that it is or will be connected to and utilised by toilet, garden or landscaping uses etc. as required to reduce demand on potable water supply by more than 55%. This could be evidenced through a report signed by a plumber or plumbing inspector, body corporate contract, covenant or similar in addition to worked calculations showing that this will provide greater than 55% reduction in demand on potable water supplies.</p>
<p>5.2.2 Recycled Water</p> <p>Plumbing of recycled water reticulation (such as dual reticulation facilitating the reuse of treated effluent water).</p>	<p>Certification by engineer, water provider or local government engineer or development assessment officer or other qualified professional that dual reticulation is or will be provided (e.g. as part of the civil works).</p> <p>It is also a requirement to show evidence that it is or will be connected to and utilised by toilet, garden, landscaping uses etc. as required, to reduce demand on potable water supply by more than 55%. This could be evidenced through a report signed by a plumber / plumbing inspector, body corporate contract, covenant or similar in addition to worked calculations showing that this will provide greater than 55% reduction in demand on potable water supplies.</p>
<p>5.2.3 Greywater Reuse</p> <p>Greywater reuse (e.g. plumbing to facilitate reuse of greywater on lot).</p>	<p>Certification by engineer or local government engineer or development assessment officer or other qualified professional (e.g. through water balance calculations) that sufficient appropriate greywater reuse will occur (e.g. infrastructure constructed as part of the civil works).</p> <p>It is also a requirement to show evidence that it is or will be connected to and utilised by garden or landscaping uses etc. as required to reduce demand on potable water supply by more than 55%. This could be evidenced through report signed by a plumber or plumbing inspector, plumbing approval, body corporate contract, covenant or similar in addition to worked calculations showing that this will provide greater than 55% reduction in demand on potable water supplies.</p>
<p>5.2.4 Rainwater Harvesting</p> <p>Rainwater harvesting (e.g. collection of rainwater in tanks from roof runoff).</p>	<p>Certification by engineer or local government engineer or development assessment officer or other qualified professional (e.g. through water balance calculations) that sufficient rainwater harvesting and storage is provided (e.g. infrastructure constructed as part of the civil works) to reduce demand on potable supplies by 55%, at least in years with rainfall equivalent to the median rainfall of a recent 10 year period.</p> <p>It is also a requirement to show evidence that it is or will be connected to and utilised by toilet, garden or landscaping uses etc. as required to reduce demand on potable water supply by more than 55%. This could be evidenced through a report signed by a plumber /plumbing inspector, body corporate contract or covenant etc. in addition to worked calculations showing that this will provide greater than 55% reduction in demand on potable water supplies.</p>

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<p>5.2.5 Sustainable Use of Underground Water Sources</p> <p>Use of underground water to reduce demand on other water supplies plus water efficiency measures to reduce total water use by at least 25%.</p> <p>5.2.6 Water Use Efficiency</p> <p>Where the buildings and/or landscaping are being constructed or mechanisms are in place to ensure water efficiency measures will be implemented, ensure that they achieve water efficiency of 55% or greater.</p> <p>Examples of fittings and features to achieve this may include: 3 stars WELS rated fittings, low flow dual flush toilet, rainwater tanks, flow restrictors, etc.</p> <p>(Recognition may also be given to high-rise type designs that either are designed not to need air-conditioning or choose air-conditioning systems that are extremely water efficient.)</p> <p>Water efficient landscaping (through design, choice of plants or watering system) may also be considered as part of the requirement.</p> <p>Note: As the requirement is to reduce water use by 55% across the development, if there is also communal green space or facilities etc. that will have traditional water requirements and be watered with potable water, greater than 55% efficiency will need to be achieved for the houses to achieve 55% efficiency across the development. There can be any combination of efficiencies between the individual house blocks and communal land/ green space provided that 55% efficiency is achieved across the whole development. Conversely, if the communal land and/or facilities are especially water efficient (i.e. more than 55%) it could be possible to meet the requirements without achieving 55% efficiency across all houses.</p> <p>5.2.7 Combination of the Above Options</p> <p>A combination of options above to achieve required efficiency.</p> <p>5.2.8 Other</p> <p>For industrial, commercial or retail developments or manufacturing plants utilising specific technological innovations to reduce water use. Must show 55% reduction in potable water demand compared to historical data or comparable development types.</p>	<p>Certification of bore licence and capacity, together with signed statement of use in the development and plumbing intentions. Must also show reduction in water use by 25%. Must show proof of recharge (by hydro-geologist) (e.g. through ponds and dams) and water balance calculations to show that there will be no net drain on aquifer.</p> <p>Evidence should include one of the following:</p> <ul style="list-style-type: none"> • EnviroDevelopment Guide option for Water Efficiency (primarily appropriate for small scale developments where the water use of the dwellings will be more than 90% of the development's total water use) or • Signed written statement by water modelling professional supported by water usage and water balance calculations (e.g. engineer if house and fittings solution or, landscape architect, plus water balance calculations if landscape solution). May also require evidence of performance efficiencies of specific technology to be submitted. <p>Evidence requirements for relevant options as above.</p> <p>Evidence of efficiencies compared to other industrial operations in comparable sectors – together with signed statement by engineer.</p>
<p>5.3 Irrigation</p> <p>(where irrigation demand exceeds 25% of total water use for the development)</p> <p>Reduce potable water consumption for irrigation by 50% from a calculated baseline case.</p>	<p>Evidence of efficiencies, and signed statement by landscape architect or other qualified professional.</p>

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<p>5.3 Irrigation (cont.)</p> <p>Reductions can be made from any combination of the following items:</p> <ul style="list-style-type: none"> • Plant species factor (i.e. use of native plants or xeriscaping) • Irrigation efficiency • Use of captured rainwater • Use of recycled wastewater • Use of water treated and conveyed by a public agency specifically for non-potable uses. 	

Water Efficiency Guide

This is an option primarily for small scale developments (less than 100 lots) with primarily class 1 dwellings and where the dwellings account for 90% or more of the development's total water use.

The water efficiency guide considers approximate water savings for a number of water efficiency measures. The below estimates are based on a number of assumptions and should be used as a guide only. In addition to the below guide, developers should consider water saving measures for public spaces including greywater reuse and stormwater harvesting. In the instance of alternative water saving measures, developers are required to submit their calculations as a part of the submission.

Water Pressure		Nominal Estimated Water Savings per Household per year
Water pressure is limited to 3.5 bar (350kPa) or less, through system design or water pressure limiting devices ^{oe}		8,600L [^]
Toilets, Fittings, Showers		
Toilets with dual flush (4.5L/3L) ^{oo} (4 Stars [WELS] rated)		9,700L ^{^s}
All kitchen, laundry and bathroom sink and basin taps have 4 stars [WELS] or greater ^{oe}		7,850L ^{oo}
All showers are 3 stars [WELS] rated ^{oe}		37,800L ^{oo}
All showers have thermostatic mixers ^{oo}		1,300L ^{oo}
Rainwater Tanks/Stormwater Harvesting		
Rainwater tank supplying garden with a capacity of:	1kL	19,300L ^f
	2kL	28,500L ^f
	3kL	33,300L ^f
	4kL	37,300L ^f
	5kL	39,000L ^f
	10kL	47,800L ^f

Rainwater Tanks/Stormwater Harvesting Cont.		Nominal Estimated Water Savings per Household per year
The rainwater tank supplies the toilet [∞]	1kL	2,300L ^f
	2kL	3,400L ^f
	3kL	3,900L ^f
	4kL	4,400L ^f
	5kL	4,600L ^f
	10kL	5,600L ^f
The rainwater tank supplies garden/outdoor use, a toilet and laundry	1kL	37,800L ^f
	2kL	55,900L ^f
	3kL	65,300L ^f
	4kL	73,100L ^f
	5kL	76,500L ^f
	10kL	93,700L ^f
Dual Reticulation		
Dual reticulation for all outdoor purposes (assuming that the development has significant outdoor area e.g. > 100m ² per dwelling)		152,600L
Irrigation Systems		
Water efficient drip irrigation landscape system		6,100L [°]
Water efficient automatically controlled garden irrigation system with soil moisture sensing is installed for at least 100m ² of garden area [∞]		6,100L [∞]
TARGET (55% reduction)		164,615L

[∞] McLennan Magasanik Associated Pty Ltd, 2004, *Economic, Social and Environmental Analysis of the Draft Sustainable Housing Code Version 7x*

[∞] Brisbane City Council, 2005, *Sustainable Home Checklist for Houses*

[^] Department of Local Government and Planning, Environmental Protection Agency, 2004, *Regulatory Impact Statement – Proposed Amendments to Building and Plumbing Regulations to Improve Sustainability of New Housing*.

[§] South East Water, *how much water do you use?* Available at: http://www.southeastwater.com.au/sewl/upload/document/water_you_use.pdf

^f Adapted from: McLennan Magasanik Associates Pty Ltd (2004), *Social, Economic and Environmental Analysis of the Draft Sustainable Housing Code Version 7x*, Coomes P., and Kuczera G. (2003), *Analysis of the Performance of Rainwater Tanks in Australian Capital Cities*.

[°] Melbourne Water, *The Source*, Available at: http://www.melbournwater.com.au/content/library/publications/the_source/The_Source_Issue_34.pdf