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This report captures a summary of the current water efficiency practices undertaken by Central Coast Council and implemented across the Coast.

It shows how water conservation has performed over time on the Central Coast.

It is not intended to set out a water conservation strategy – this will be done later within the delivery of the Central Coast Water Security Plan (CCWSP).

More detail about how we have conserved water on the Central Coast can be provided upon request.



Making the most of the water we have

As the Central Coast population increases, it is important that we make the most of what we have through efficient use of water. This will contribute to the sustainability of our long-term water supplies and our ability to respond to our changing climate and drought.

In 2020, Council produced approximately 82 megalitres per day (ML/d) of drinking water to deliver to homes and businesses on the Central Coast.

Over the past 30 years, the total amount of water used by residences and businesses on the Central Coast has reduced – despite a growing population.

Figure 1 presents typical water consumption, over time, on the Coast. It shows that since 2002, there has been a reduction in water demand by 6 ML/d – from 88 ML/d in 2002 to 82 ML/d in 2020. Over this same period, the Coast population has increased by nearly 50,000 people.

Most of these water savings occurred following the millennium drought, where major demand management measures and structural water conservation programs¹ were introduced, such as:

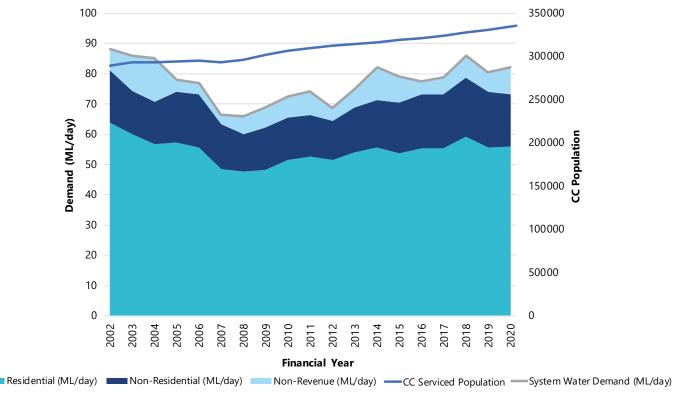
- new residential premises being required to achieve a 40 per cent water conservation target

 through the planning measure known as the Building and Sustainability Index (BASIX)
- informing consumers of an appliance's water efficiency rating when buying new appliances – this scheme is known as Water Efficiency Labelling and Standards (WELS)
- water fix assistance programs (targeting inefficient water use within the home and businesses).

Ongoing water conservation initiatives are undertaken by Council to reduce water usage and extend supply on the Central Coast. These include:

- minimising leakages from the water supply system
- community education and awareness programs
- mandatory water management plans for businesses.

Figure 1. Central Coast total system water demand (megalitres)



¹ Structural Water conservation programs have an ongoing benefit as they become embedded within the community.

The Central Coast community has shown a strong commitment to water conservation during periods of drought, which has been retained in non-drought periods.

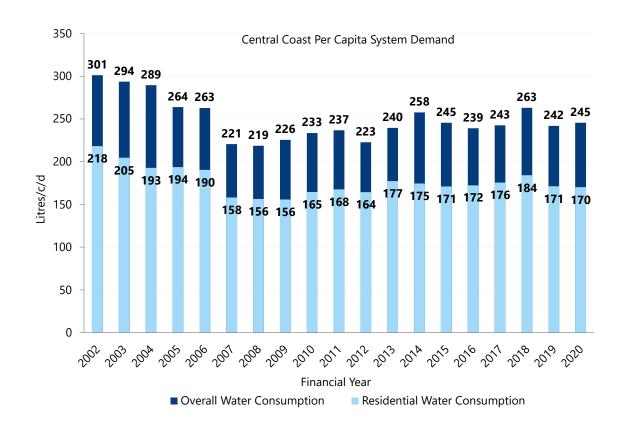
By expressing water consumption on an individual person basis, we can see more clearly the benefits achieved. While consumption varies, depending on whether we have hot, dry or wet periods, we can see (Figure 2) that since the millennium drought, individual consumption of water within homes has been fairly static since restrictions were lifted in 2012 at 170 litres per person per day (L/p/d).

The total use of water within homes and businesses has reduced from 301 L/p/d in 2002, to 245 L/p/d in

2020. Specifically within homes, we've reduced the use of water by 48 L/p/d – from 218 L/p/d in 2002 to 170 L/p/d in 2020.

By conserving water now, and into the future, means that our growing community can make the most of our existing water supply scheme – in turn, this means that Council can delay large investments into new supplies of water sources, further into the future.

Figure 2. Average consumption per person from 2002 to 2020 on the Central Coast (Litres)



We all have a part to play

The Central Coast has a widespread coastal community with a diverse mix of household types and industries, each contributing to our overall water consumption.

Figure 3 shows the average breakdown of the water usage types on the Central Coast:

- Most of the water used on the Coast (70%) is used within the home.
- 21% of water is used by non-residential customers (including some intensive water customers – mostly food manufacturing companies, power stations and business).
- 9% of water is non-revenue water (NRW) which includes water for fire-fighting, unmetered connections, water theft, water main leaks, water lost in main breaks and water mains flushing etc.

On the Coast, currently about 89% of residential water is used within stand-alone houses and about 11% is in units and flats.

There are many water conservation and efficiency measures that can be implemented across all water users in our community, so that together we can help save and manage our water. These can be through modifying our behaviours (such as shorter showers and using trigger hoses etc) or through water-efficient appliances (such as modern toilets, washing machines, showerheads and dishwashers).

Figure 3. The average breakdown of water usage on the Central Coast from 2012 – 2020 (%)

70% residential
21% non-residential
9% non-revenue

Non-revenue

Residential

Residential



Water in the home

Residential homes are the largest water users on the Central Coast, with the average person using about 170 L/p/d.

Understanding where water is most used in our homes and how to use more water efficiently, is key to realising water savings.

Most of the water used at home is in showers and outdoors, with the remainder taken up by dishwashers, basins, toilets and washing machines (**Figure 4**).



Dishwashers

Council's Live to 150 initiative is one of many webbased water education initiatives available which encourage the community to conserve water through a voluntary residential water conservation target of 150 litres of water per person per day.

Our **Love Water website** provides water saving tips, tricks and guides to assist in implementing water efficiency across homes and businesses.

However, there are still some key opportunities to improve water efficiency across homes and the community. These include technological advancements such as smart water fixtures, digital controls and data analytics for live monitoring as well as the implementation of national and state-wide water saving schemes and rebates.

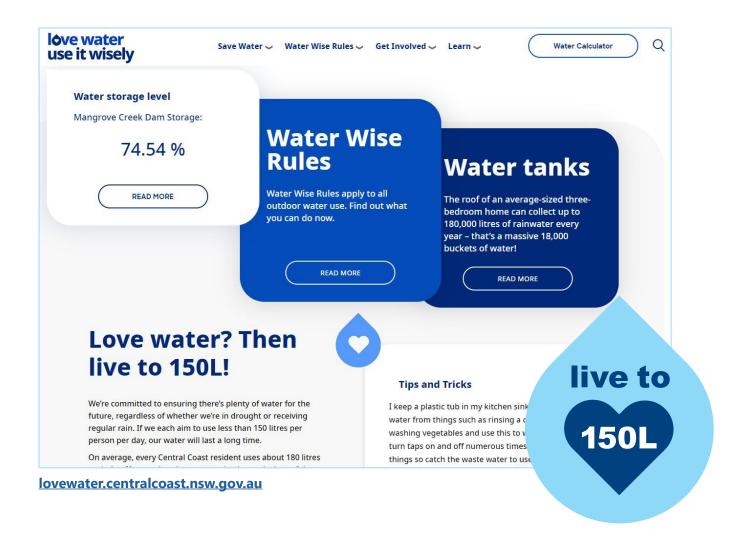
Building and Sustainability Index (BASIX)

Building and Sustainability Index (BASIX) aims to create more comfortable and cost-efficient homes.

The introduction of the BASIX policy in 2005 has played a key role in reducing water and energy use in homes across New South Wales. The policy requires new residential buildings, or alterations to existing homes worth over \$50,000, to achieve a reduction in drinking water use by 40% - through the installation of water efficient appliances, rainwater tanks and recycled water connections.

Prior to its introduction, Council required rainwater tanks to be installed under the Development Control Plan (DCP) 100 and DCP165. Approximately 1,300 internally connected rainwater tanks were installed under the DCP. A further 9,200 rainwater tanks have since been installed under the BASIX regulation, all connected internally as well as externally.

Kitchen sinks



Subsidies for rainwater tanks

During the millennium drought, Council subsidised rainwater tank installations – approximately 14,500 were installed (mostly between 2006-2010). These included a mixture of internally and externally connected tanks.

In total, approximately 25,000 rainwater tanks are assumed to be supplementing the Central Coast town water supply, which represents approximately 22% of total connected properties. Of these rainwater tanks, about 50% of are connected internally. It is estimated that these rainwater tanks should be contributing about 2 ML/day.

Water Efficiency Labelling and Standards (WELS)

The Water Efficiency Labelling and Standards (WELS) scheme is an Australian government initiative in partnership with state and territory governments.

The scheme was developed and implemented across Australia in 2005. The scheme requires mandatory star rating labels to be applied on appliances to inform and display their water efficiency rating. The purpose of the scheme is to conserve water by reducing consumption and to promote the adoption of efficient and effective water-using and water-saving technologies.

It is estimated that by 2030 the WELS program, over time, will have reduced water bills by an average of \$61 per year.

Community education

A key part of the Central Coast Water Security Plan is to encourage people to implement water saving habits as part of their daily routine and everyday activities.

Love water, use it wisely – this is the theme of our water education program, which commenced in April 2019. This program provides resources to increase water literacy on the Central Coast while developing a new digital footprint where the public can interact, explore, and have fun while learning all about water.

Some of the new resources developed have been implemented into the geography syllabus at local schools to introduce or reinforce water conservation concepts. Notable resources that were developed include:

- our Love Water website
- an online water supply game: Working with Water
- educational resources for primary and high school classes
- repair and maintenance guides
- a 360 virtual tour of two storage dams on the Central Coast
- a small business water education program
- a Central Coast water supply system animation
- an optional installation of free smart water data loggers for two months – where Council can monitor the school's water usage
- Dr. Hydro Incursion at early childhood centres
- water education packs at 130+ early childhood centres.





lovewater
use it wisely

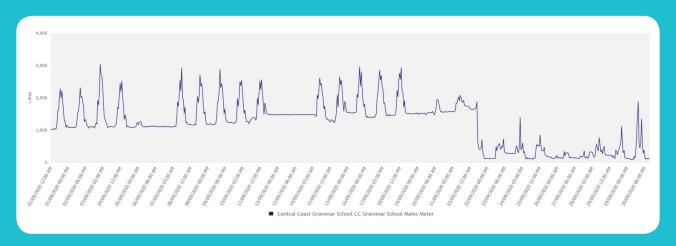
Case study one: Saving water in schools

During 2020, Council visited over 20 schools as part of our School Water Audit Program designed to support the Stage 4 Geography unit 'Water is the World.'

Our program has a strong focus on conserving water, as well as using water at school and on the Coast.

As part of the program, Council provided the option to schools to install a data logger for two months, so Council can monitor the school's water usage – Central Coast Grammar was one of the schools who opted for this.

The graph below shows the results over 30 days Central Coast Grammar, including the detection of a major leak, which was creating water losses of around 24 litres per minute.







Are water losses costing my business?

The Central Coast has about 5,000 non-residential users, which include food manufacturing companies, power stations, mining companies, hospitals, holiday parks and nurseries. From 2012 to 2020, the non-residential customers consumed 21% of the total water used across the Central Coast.

To reduce the demand of water, and conserve water, mandatory water management plans are required for customers who use over 3.5 million litres of water a year. These involve auditing and identifying water saving measures, through inspection of taps, hoses, fittings and water infrastructure to optimise water savings across all areas of the business operations.

We also provided businesses with the opportunity to undertake a voluntary water audit, which included the free installation of a water data-logging device for two months. Several businesses took part in the program, which resulted in the discovery of major leaks across their operations. Through this program, leak detection and monitoring provided opportunities for improved water management, water savings and efficiency.

Case study two: Avoca Beach Markets

During 2020, we provided businesses with the opportunity to install the free water data-logging device for two months, to monitor their water usage, identify water losses and improve their water efficiency.

Avoca Beach Markets (Fixx Events) was one of these businesses. By undertaking a review of their water assets at their primary business location we were able to identify and fix major leaks which were contributing to significant water losses and subsequently high water billing costs.



Water efficiencies within Council

Council has established water efficiency measures across its operations to conserve water and improve water management practices as part of our daily business activities.

During the millennium drought, to extend our water supply, and to offset the demand for water, we:

- retrofitted flow restrictors on showers and hoses within council owned buildings including Council chambers, oval amenities, senior citizen centres and surf life saving clubs
- installed waterless urinals at Council chambers
- performed water audits on 3,876 Council properties including leak detection, repair and efficiency works
- installed water storage tanks to supply Council depots, buildings and sports facilities including irrigation of parks, wash down pads and toilet flushing
- replaced drinking water with recycled water at several sewage pump stations and truck washdown facilities at Kincumber Treatment Plant
- temporarily disconnected taps at public fish cleaning tables to conserve water
- temporarily disconnected showers at beaches and hose facilities to conserve water.

Council will continue to identify areas for improved water efficiency measures across the business as well as provide ongoing water savings advice to encourage the behaviours and activities of the community with the aim to conserve, recycle and reduce water usage on the Coast.

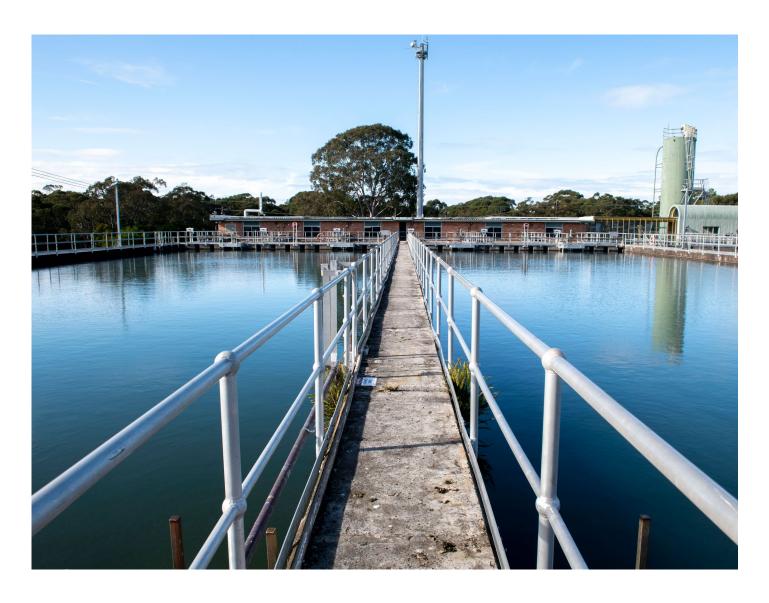


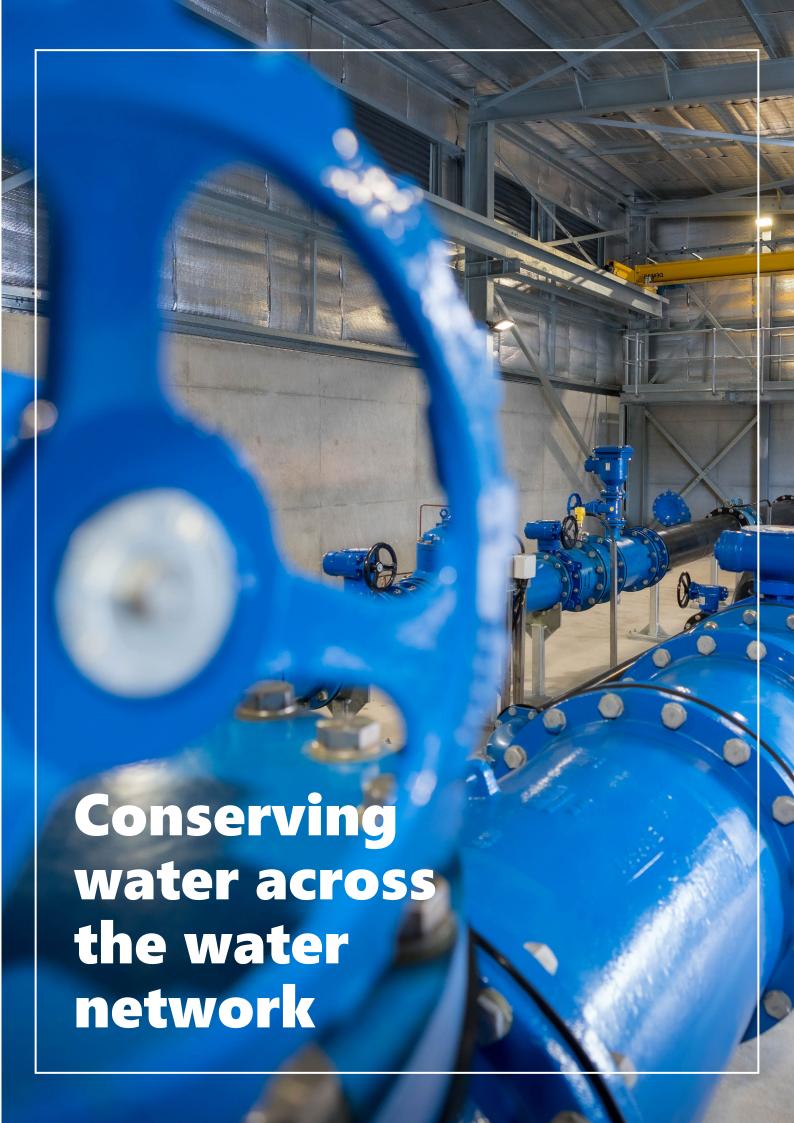
The production of recycled water on the Central Coast has been valuable in providing resilience to our water supply system during periods of drought, as well as providing a reliable alternate water resource during non-drought periods.

Council currently produces a total of around 1.81 megalitres per day (ML/day) of recycled water at the following sites for internal operations, as well as the irrigation of nearby parks and sporting fields:

- Bateau Bay Wastewater Treatment Plant (WWTP)
- Toukley WWTP (including Magenta Shores)
- Kincumber WWTP
- Mannering Park WWTP
- Central Coast Stadium Reuse Scheme (Graham Park)
- Hylton Moore Park Reuse Scheme
- Terrigal Reuse Scheme

Council's recycled water and stormwater harvesting schemes are in various states of operability following their installations in response to the millennium drought. A key focus of the Central Coast Water Security Plan is to further investigate the refurbishment and upgrade requirements at the existing plants, as well as undertake community engagement, to identify new customers.





Unaccounted for water and water leakage

Water leakages are common across all water supply systems and are generally caused by the deterioration of joints and corrosion of pipework due to ground movement or pressure changes.

Approximately 9% of water produced by Council (including fire-fighting and maintenance) is lost from the network as it is transported from the water treatment plants to our homes.

Table 1 shows categories of revenue and non-revenue water and outlines the various ways in which water can be lost, which can be categorised as either real or apparent losses. Currently around 56 litres of water is lost per service connection, per day on the Central Coast, which is approximately 3 per cent of our current average water demand.

Table 1. International Water Association (IWA) 'best practice' standard water balance (Hirner and Lambert, 2000)

System input volume (corrected for known errors)	Authorised consumption	Billed authorised consumption	Billed metred consumption (included water exported)	Revenue water	
			Billed unmetered consumption		
		Unbilled authorised consumption	Unbilled metered consumption		
			Unbilled unmetered consumption		
	Water losses	Apparent losses	Unauthorised consumption		
			Customer metering inaccuracies	Non-revenue water (NRW)	
		Real losses	Leakage on transmission and/or distribution mains		
			Leakage and overflows at utilities storage tanks		
			Leakage on service connections up to point of customer metering		

Water losses are often expressed by the number of service connections to homes and business (as this provides the greatest opportunity for leakage).

Relative to other Australian water utilities of the same size, Council performs well in terms of overall water leakages (real losses) in the network (see **Figure 5**).

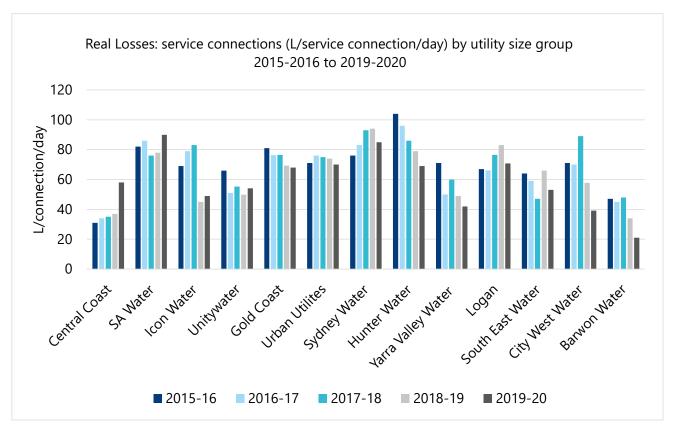


Figure 5. Central Coast system leakage performance

Since 2020, our active leak detection program has inspected over 1,200 kilometres of watermains and has identified around 900 million litres of water losses in the distribution system.

As part of the Central Coast Water Security Plan, a key focus is to improve water leakage by expanding the current leak detection program, improving the measurement of leakages, and investigating emerging technologies and innovations to better manage network leakages.

Pressure management to reduce leakage and main breaks

Parts of Council's water distribution network are subject to higher than desirable operating pressures which can result in:

- higher leakage rates in the distribution network
- higher likelihood of watermain breaks in the distribution network
- customers appliances being subject to greater wear and tear.

Council is reviewing its ability to better manage network pressure across the network through increased monitoring and control infrastructure.



Water Wise Rules supported by the community

Our Water Wise Rules are everyday actions and conditions permanently implemented during non-drought periods with the aim to conserve water. They apply to all water users, including residents, and commercial, industrial and government users of the town water supply.

Water Wise Rules were first implemented on the Central Coast during 2012, following nearly 10 years of water restrictions triggered by the millennium drought. Sydney Water and Hunter Water Corporation have implemented similar permanent water wise guidelines and conditions to help save water outside of drought.

Community support is crucial for the management and sustainability of our water supply. As part of developing the Central Coast Water Security Plan, a survey for Central Coast residents was undertaken which indicated an overall positive attitude towards water conservation. The residents acknowledged that attitudes had changed considerably as a result of the recent drought, water restrictions and bushfires, and there was strong support for some rules to be in place at all times.

We will continue to implement Water Wise Rules to influence water conservation behaviours and activities across the community. A summary of the rules is shown below.

Central Coast Water Wise Rules



Water the garden before 10am or after 4pm to avoid excessive evaporation through the heat of the day.



Avoid hosing paths or driveways and instead use a bucket.



Reduce water use by using a trigger nozzle on all hand-held hoses.



Customers with an annual demand of more than 3,500KL are required to prepare and implement a Water Management Plan.



Wash vehicles with a bucket or trigger nozzle and on the grass wherever possible.

When water is scarce, we will introduce water restrictions

The Central Coast region has experienced periods of drought, which have required compulsory water restrictions to be applied in order to reduce water usage and extend our water supply.

When Mangrove Creek Dam storage drops to 50%, we implement water restrictions as part of our Drought Management Plan **(Appendix A)**. These water restrictions and rules become more severe during drought in order to conserve water as the dam storage levels continue to decline.

Table 2 shows the five water restriction trigger levels and associated targeted water savings, which are a key part of Council's Drought Management Plan.

Restriction level	Percentage of Mangrove Creek Dam when restrictions are triggered on	Percentage of Mangrove Creek Dam when restrictions are triggered off	Anticipated water savings	
Level 1	50%	55%	5%	
Level 2	40%	42%	10%	
Level 3	35%	37%	15%	
Level 4	30%	32%	19%	
Level 5	25%	27%	23%	

Table 2 Current water restrictions



As part of the Central Coast Water Security Plan, we will develop a water conservation strategy – aligned with the New South Wales Water Efficiency Framework and Program. The key components of our Water Efficiency Plan will include:

- a focus on gaining a better understanding of the main drivers for water efficiency on the Central Coast, including future demand and supply analysis, climate change and population impacts on water usage
- community engagement and education to promote water efficient behaviours and uptake and maintenance of water efficient devices
- research and development into emerging water saving technologies, designs and identification of water efficiency options
- implementation of the Economic Level of Water Conservation (ELWC) tool for assessing water conservation options, taking into the account the need for a wholistic approach to evaluating water savings programs
- · design and assess water efficiency pilot programs
- continued improvement of active leak detection and water management programs, through water audits, smart meters and data logger installations
- collaboration, where possible, with Hunter Water Corporation and the Department of Planning Industry and Environment in developing parallel water efficiency tools and programs.



Appendix A - Current Water Restriction Rules

	Anticipated Water Wise Rules	Level 1	Level 2	Level 3	Level 4	Level 5
Target Overall Savings Compared to 2021	0 %	5%	10%	15%	19%	23%
Trigger Levels	Permanent	50%	40%	35%	30%	25%
Lawns & Garden	Watering including with sprinklers and irrigation systems is permitted any day before 10:00am and after 4:00pm to avoid heat of the day All hand-held hoses to have a trigger nozzle	No fixed hoses or sprinklers (including micro spray) Hand-held hoses (with a trigger nozzle) and drip irrigation systems can be used any day before 10:00am and after 4:00pm to avoid heat of the day Watering cans may be used to water at any time on any day.	No fixed hoses or sprinklers (including micro spray) Hand-held hoses (with a trigger nozzle) and drip irrigation systems can be used for 1 hour a day on three days of the week, between the hours of 6:00am - 9:00am and 4:00pm - 7:00pm (Odd numbered homes Mon, Wed & Sat, Even numbered homes Tues, Thur & Sun) Watering cans may be used to water at any time on any day.	on any day.		All external use of town water banned.
Vehicle / Boat Washing**	All road vehicles (including cars, trucks, caravans and cars in car yards) and boats and their trailers may be washed with a bucket or a hose provided a trigger nozzle or pressure cleaner is used Hose to flush boat engines is permitted.	All road vehicles (including cars, trucks, caravans and cars in car yards) and boats and their trailers may be washed with a bucket or a hose provided a trigger nozzle or pressure cleaner is used. Hose to flush boat engines is permitted.	All road vehicles (including cars, trucks, caravans and cars in car yards) and boats and their trailers may be washed with a bucket or a hose provided a trigger nozzle or pressure cleaner is used. Hose to flush boat engines is permitted.	boats and their trailers may be washed with a bucket or a hose provided a trigger nozzle or pressure cleaner is used. Hose to flush boat engines is permitted	All road vehicles (including cars, trucks, caravans and cars in car yards) and boats may be washed with a bucket Boats trailers may be washed with a bucket or a hose provided a trigger nozzle or pressure cleaner is used (max 5 mins). Hose to flush boat engines (max 5 mins)	All external use of town water banned. Vehicles windows can be cleaned using a bucket.
Hard Surfaces	No hosing of paths and driveways.	No hosing of paths and driveways.	No hosing of paths and driveways.	No washing or wetting of any external surface is permitted, including paths, driveways, building surface, outside furniture or structures.	No washing or wetting of any external surface is permitted, including paths, driveways, building surface, outside furniture or structures.	All external use of town water banned.
Private Pools	Topping up of existing pools using a hose from the town water supply is permitted.	Topping up of existing pools using a hose from the town water supply is permitted,		Topping or refilling of existing pools using a hose from the town water supply is not permitted. A bucket may be used or supply other than the drinking water supply system. Filling of new pools from the town water supply is permitted.	Topping or refilling of existing pools using a hose from the town water supply is not permitted. A bucket may be used or supply other than the drinking water supply system, Filling of new pools from the town water supply is not permitted.	All external use of town water banned.
Bowling Greens, Golf greens & Cricket Pitches	Watering including with sprinklers and irrigation systems is permitted any day before 10:00am and after 4:00pm to avoid heat of the day. All hand-held hoses to have a trigger nozzle	Fixed watering system up to 2 hours per day 6:00 -8:00am 6:00 -10:00pm.	Fixed watering system up to 2 hours per day 6:00 -8:00am 6:00 -10.00pm.	Watering systems for a total of 1 hour per day on Monday, Wednesday and Friday between the hours of 6.00 - 8:00am and 6:00 - 8:00pm are permitted.	Watering systems for a total of 1 hour per day on Monday, Wednesday and Friday between the hours of 6:00 - 8:00am and 6:00 - 8:00pm are permitted.	All external use of town water banned.
Nurseries & Commercial Gardens	Watering including with sprinklers and irrigation systems is permitted any day before 10:00am and after 4:00pm to avoid heat of the day. All hand-held hoses to have a trigger nozzle	Fixed watering system up to 4 hours per day –6:00 -8:00am 6:00 -8:00pm.	Fixed watering system up to 2 hours per day 6:00 -8:00am 6:00 -8:00pm.	Watering systems for a total of 1 hour per day between the hours of 6:00 - 8:00am and 6:00- 8:00pm are permitted.	Watering systems for a total of 1 hour per day between the hours of 6:00 - 8:00 am and 6:00 - 8:00 pm are permitted.	
Sporting Fields, School Ovals and Grassed Areas	Watering including with sprinklers and irrigation systems is permitted any day before 10:00am and after 4:00pm to avoid heat of the day All hand-held hoses to have a trigger nozzle	Fixed water systems three times a week between 6:00 -10:00pm.	Fixed water systems two times a week between 6:00 -10.00pm.	All external use of town water banned.	All external use of town water banned.	All external use of town water banned.
Water Cartage from Town Water Supply	Permitted	Permitted for domestic internal use only.	Permitted for domestic internal use only.	Permitted for domestic internal use only.	Permitted for domestic internal use only.	Permitted for domestic internal use only.
Auto Flush urinals	Timer controlled operation is not permitted.	Timer controlled operation is not permitted.	Timer controlled operation is not permitted.	Timer controlled operation is not permitted.	Timer controlled operation is not permitted.	Timer controlled operation is not permitted.
tables and boat ramp taps.	Permitted.	Permitted.	Permitted.	Permitted.	Not permitted.	Not permitted.
Customers with an annual demand greater than 3,500KL and hotels, motels, resorts, caravan parks and public pools	Preparation and implementation of a Water Management Plan	Preparation and implementation of an approved Water Management Plan.	Preparation and implementation of an approved Water Management Plan.	Preparation and implementation of a Water Management Plan is required to achieve a minimum of 24 % reduction on pre restriction (2001) water usage.	Preparation and implementation of a Water Management Plan is required to achieve a minimum of 24 % reduction on pre restriction (2001) water usage.	Preparation and implementation of a Water Management Plan is required to achieve a minimum of 24 % reduction on pre restriction (2001) water usage.



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