The City of Joondalup's Water Actions Summary

1. Introduction to context of water management

Western Australia

Western Australia is home to 2,163,200 people (Australian Bureau of Statistics 2008) and has positive growth trends. The majority of the population live in the south-west region of the State. In recent years demand for water has increased with an expected increase of 20% in the amount of water used in each home in the next 20 years (Water Corporation 2008). However, the State is currently experiencing drought, leading to decreased availability of water resources and placing the reliability of current water sources under pressure.

Within Western Australia there are two main bodies that look after water supply and water resources, the Department of Water and the Water Corporation. The Department of Water collects and analyses water resource information, issues licences, regulates water use, protects the quality of water and prepares policies and plans that are critical to the future of Western Australia. The Water Corporation looks after water supply, wastewater treatment and drainage.

Over the past 25 years, water use has tripled in Western Australia (Government of Western Australia 2007). Declining rainfall has reduced runoff into metropolitan dams by 50% in the past 25 years (Government of Western Australia 2003).

The City of Joondalup

The City of Joondalup (the City) has been one of the fastest growing cities within the Perth metropolitan area over the past 30 years. Its population base makes it the second largest local government authority in Western Australia. The City is located in the northern suburbs of Perth between 15 and 30km from the Perth CBD and covers an area of 96.5km^2. It is bounded by the City of Wanneroo in the north and east, the City of Stirling to the south and the Indian Ocean to the west.

The City was named after Lake Joondalup, the Aboriginal meaning of which is "place of whiteness or glistening". The original inhabitants of the Joondalup area were the Yellagonga Aboriginal tribe. European settlement of the area dates from 1838, with land used mainly for farming and market gardening. Growth was minimal until the late 1960s, with development initially in the southern areas, then moving northwards over time. Significant development occurred from the 1970s, spurred by the government's north-west corridor plan. Rapid development took place in the late 1980s and 1990s with the population more than doubling between 1981 and 2001. As of the census in 2006, population within the City was 148,389.

The City contains significant natural water resources in the form of large wetlands (Yellagonga Regional Park) and groundwater (Gnangara Mound). The urban activities that occur above and adjacent to these water bodies impacts heavily on water quality and can have significant effects on public health and the ecologies contained within the water systems.

Coastal waters

The City has over 17km of popular coast line used for many recreational activities. The City manages and controls activities, ensuring the ocean bodies are protected from negative external impacts. Bins are located at all beaches, particularly dog beaches, and are emptied regularly. Beaches are cleaned once a week using a tractor with an attached rake ensuring that rubbish is removed before being washed or blown into the ocean.

The coastline within the City is also home to a number of stormwater outfalls and an ocean outfall of secondary treated wastewater gravity fed from the Beenyup Treatment Plant. The ocean outfall discharges within the vicinity of the Marmion Marine Park and is managed by the Water Corporation. Treated wastewater is discharged into 10 metres of water via two outlets, one 1850 metres offshore and the other 1650 metres offshore. All ocean outfalls are monitored as part of the Perth Long Term Ocean Outfall Monitoring (PLOOM) Program to ensure that the treated wastewater does not adversely affect the water quality within the Indian Ocean (Water Corporation 2008).

Freshwaters

The City's major freshwater bodies are located within the Yellagonga Regional Park. The wetland system includes Lake Joondalup, Lake Goollelal and the Beenyup and Walluburnup Swamps. The land surrounding these wetlands is reserved in the Metropolitan Region Scheme for "Parks and Recreation", a mechanism used to protect the area from urban development.

Projects are undertaken within the Yellagonga Regional Park to maintain water quality within the wetlands; examples of which are stormwater outfall projects and Integrated Catchment Management Planning.

Groundwater

The City of Joondalup is situated above the Perth Metropolitan area's major drinking water resource, the Gnangara Mound. Areas of the Mound are classified into three categories from Priority 1 to Priority 3 (Priority 1 seeking to "avoid" harmful activities from polluting the groundwater resource, Priority 2 seeing to "prevent increased risk" of existing human activities and Priority 3 seeking to "manage" existing human activities).

The area of the mound on which the City of Joondalup is located is classified as priority 3, due to the extensive residential, commercial and light industrial developments that exist over the water resource. As such, all land-use activities in the area are subject to State Government regulation or risk management guidance to ensure that the quality of the subsurface water resource is not adversely affected.

The City is given an abstraction allocation for each groundwater bore that it installs, with groundwater used for irrigation of all public open space (POS). Community groundwater use currently does not have allocation restrictions and thus management is difficult. However, domestic bores are subject to sprinkler restrictions (3 times a week) to try and ensure that domestic bore owners do not exceed sustainable groundwater extraction.

Recently groundwater management has become an issue with increasing reliance on groundwater due to a reduction in rainfall. The City needs to work within the boundaries created by the Gnangara Sustainability Strategy (GSS). Drying climate and reduction in groundwater availability have meant that the City is under pressure to maintain parks amenity whilst reducing its water usage.

Drinking water

The City's drinking water is supplied from the Perth Integrated Water Supply System (IWSS) that draws from both surface and groundwater sources. Up to 60% of Perth's water supply is extracted from the Gnangara Mound with the City's drinking water supply being 100% treated groundwater. Groundwater is treated at the Wanneroo Groundwater Treatment Plant, stored in regional reservoirs and then released into the IWSS for residential use.

Sustainability

The City places a high priority on environment sustainability in all actions that it undertakes. This is governed by the Sustainability Policy, which states:

> "*in carrying out its functions as a local government the City of Joondalup will use its best endeavours to meet the needs of current and future generations through an integration of environmental protection, social advancement and economic prosperity."*

The City's strategic position is to provide ongoing environmental leadership to the community to ensure the City retains its natural environmental assets and preserves them for future generations to enjoy. The City aims to achieve this goal through integrated planning and working in partnership with the community, key stakeholders and relevant agencies. All the actions within this document relate to the following themes:

- Caring for the environment;
- Planning and managing natural resources to ensure environmental sustainability;
- Developing environmentally effective and energy efficient programs; and
- Developing coordinated environmental frameworks, including community education.

2. Baseline profile

The baseline profile for Corporate and Community water consumption was prepared following an inventory of the Community and Corporate water consumption as part of Milestone 1 of the ICLEI Water Campaign™. A water quality gap analysis was also prepared to highlight areas where the City and the community could do more to ensure water quality is maintained.

Water usage

The City of Joondalup uses both scheme water and groundwater for its everyday operations. Scheme water is used within the City's buildings. Groundwater is used for irrigation of all the City's parks. The City uses on average 60,000 kilolitres of scheme water per year (Figure 1) through 97 buildings and irrigates 226 parks (area 599.5 hectares) using approximately 4.9 million kilolitres (Table 1) of groundwater, averaging 8,239 kilolitres per hectare per year.

Corporate water usage – water used within City operations

SCHEME WATER

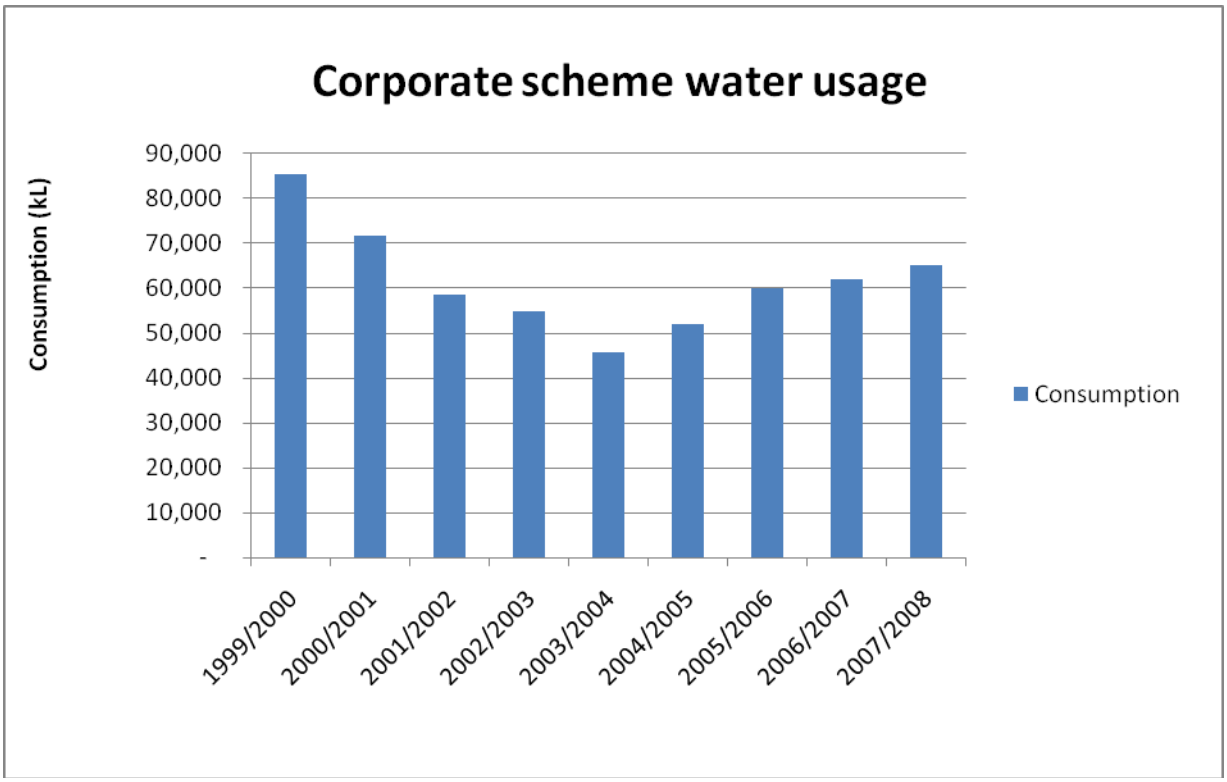

Figure 1: The City of Joondalup's Corporate scheme water usage July 1999 - June 2008

It should be noted that 2001 was one of the driest years on record in Western Australia. Due to this, low dam water levels going into the 2001/2002 summer caused water restrictions to be applied throughout the City. It is from this initial set of water restrictions that current water saving culture has become the norm. Water usage within the City reflects this change in water usage habits and thus lower consumption levels from 2000/2001 can be seen.

Since the 2003/2004 financial year the City has seen an increasing trend in consumption. Large increases were seen within the Joondalup Library between the 2004/2005 and 2005/2006 financial year and the Craigie Leisure Centre between the 2005/2006 and the 2006/2007 financial year. The increase at the Joondalup library was due to increased patronage, inefficient fittings such as automatically flushing toilets (replaced during the 2006/2007 financial year) and installation of dishwashers. The increase in consumption at Craigie Leisure Centre was due to the upgrade of facilities and increased patronage.

NON-SCHEME WATER

The only non-scheme water the City of Joondalup uses is groundwater. During the 2007/2008 financial year the City used 4,939,322 kilolitres of groundwater (Table 1). The City has three (3) groundwater licenses allowing it to abstract groundwater for irrigation. The three licences cover the area of the City (Figure 2) with allocations for each licence determined by the Department of Water. The current allocations are as follows and are set to expire on 30 September 2016:

- Licence number 155510 – 288,000 kilolitres per annum;
- Licence number 155582 – 1,924,500 kilolitres per annum; and
- Licence number 155515 – 1,905,050 kilolitres per annum.

Only one year of Corporate non-scheme water usage data was available as the City has never previously been required to record water usage of its bores. Not all bores were metered before 2007/2008, thus accurate consumption figures could not be ascertained before this time. It has been noted that the City is currently using over its allocation and is working with the Department of Water to try and rectify this situation.

Table 1: The City of Joondalup's Corporate non-scheme water usage

Year	Usage (kilolitres)	Area irrigated (hectares)	Per hectare usage
2007/2008	4,939,322	599.5	8,239

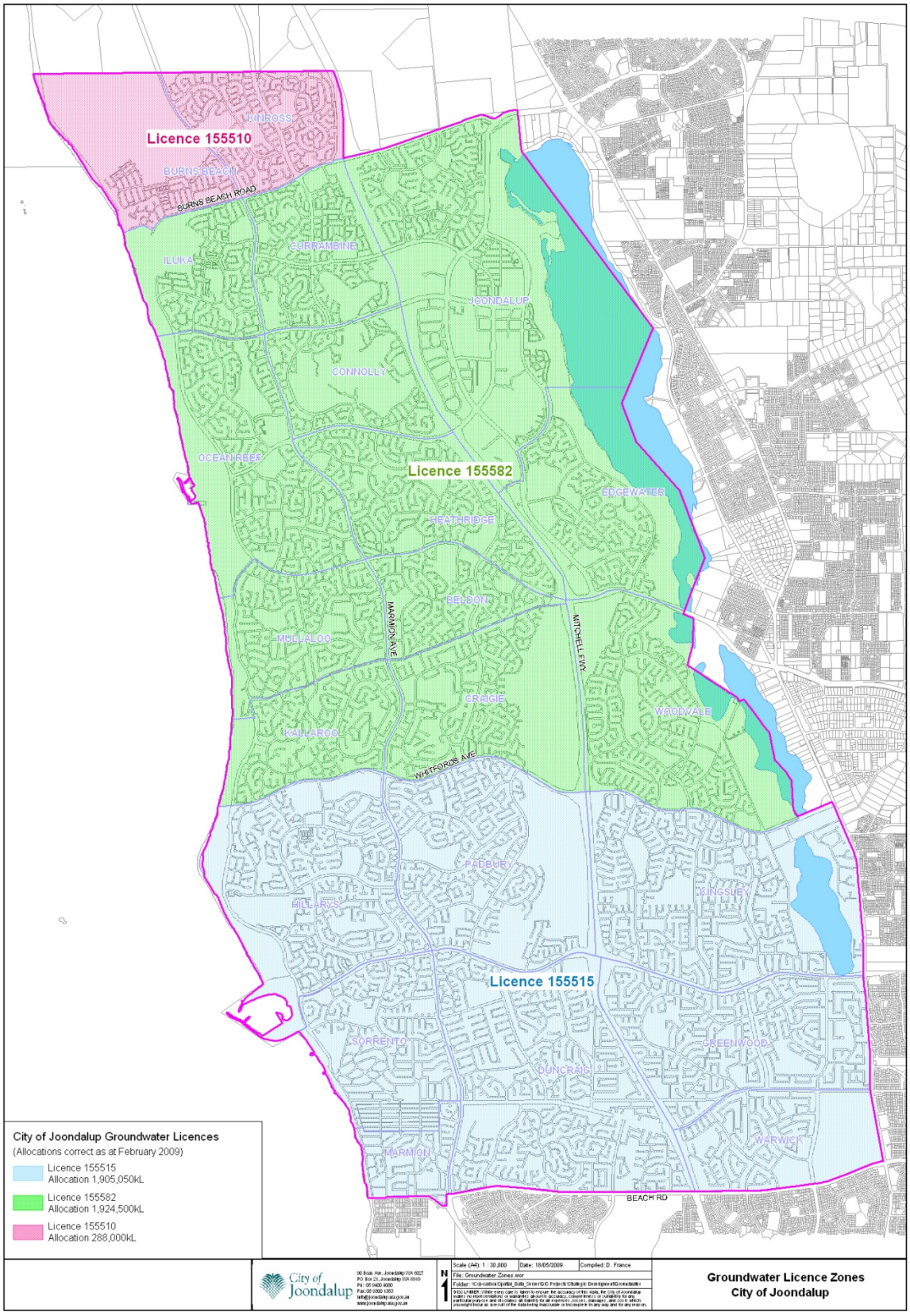

Figure 2: Groundwater licences within the City of Joondalup

Community water usage – water used by all sectors of the community, such as by businesses and residents

Community water usage was determined from the Water Corporation's scheme water data. Total community consumption includes both residential and non-residential water users.

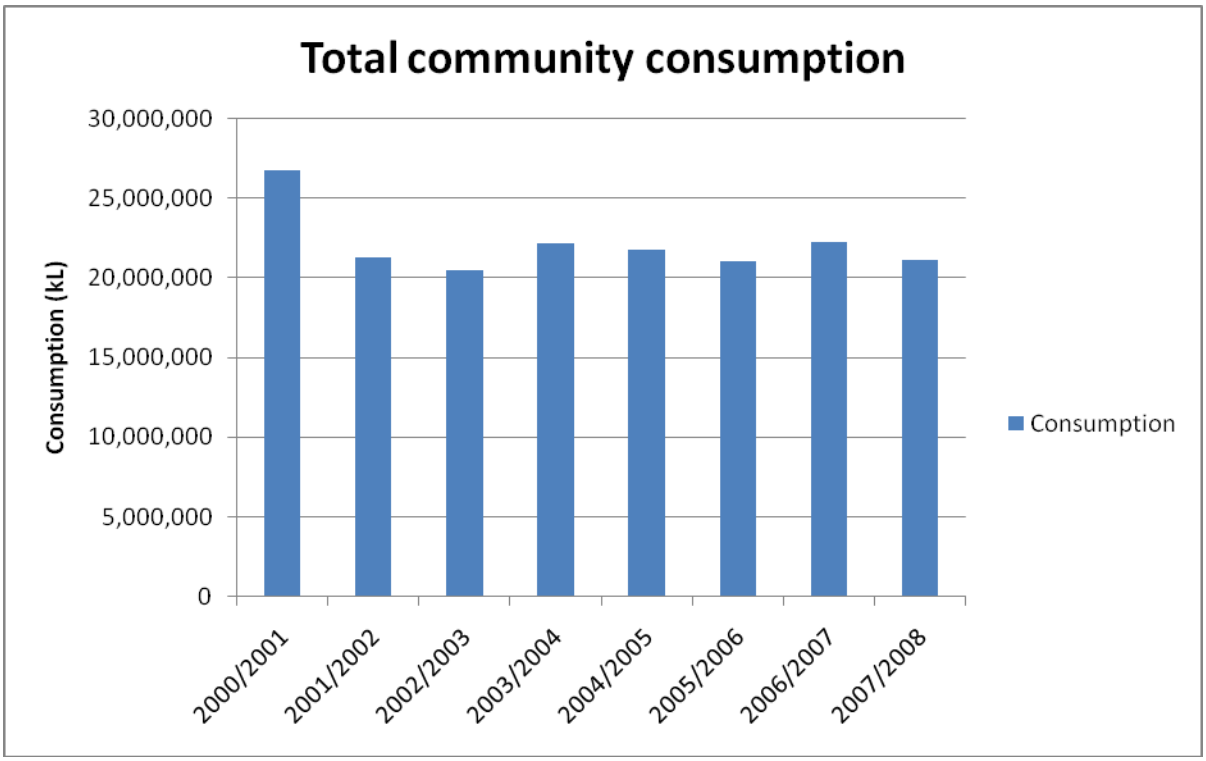

Figure 3: The City of Joondalup's Community (both non-residential and residential) scheme water consumption July 2001 – June 2008

As seen before with the Corporate water usage data (Figure 1), the low dam water levels going into the 2001/2002 summer caused water restrictions to be applied throughout Perth. The change in water consumption between 2001 and 2002 reflects the implementation of water restrictions and water usage from that point onwards has remained steady around the 20,000,000 kilolitres a year in both the residential and non-residential sectors (Figure 3).

The residential sector is the largest user of water, using just below (from 2002 onwards) 20,000,000 kilolitres every year (Figure 4). Population of the City at the 2001 census was 148,268 people in 53,612 buildings. At the 2006 census population was 148,389 in 56,529 buildings, indicating that the City has a stable population with limited growth occurring.

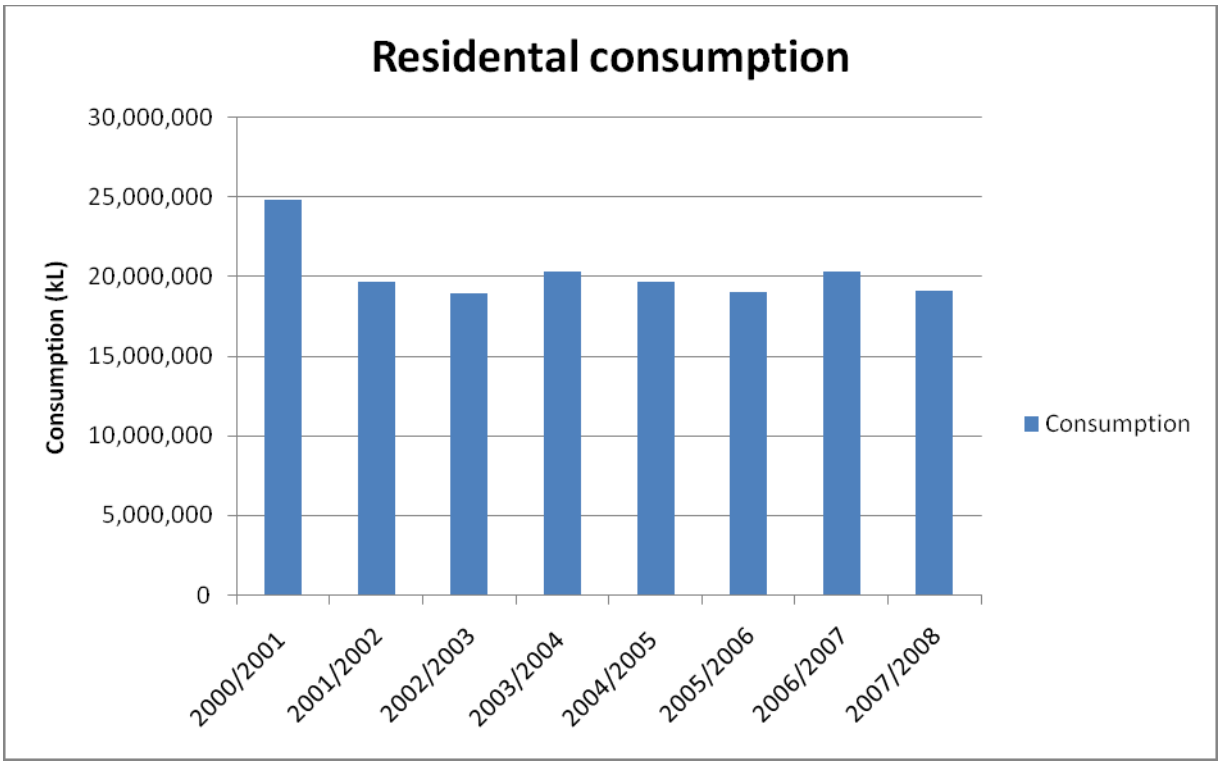

Figure 4: The City of Joondalup's residential scheme water consumption July 2001 – June 2008

Non-residential water usage varies between 1,500,000 – 2,000,000 kilolitres (Figure 5) with the lowest consumption occurring in 2003. Water users within the non-residential sector were separated into the following user types

- Commercial
  - Communication services (Communication)
  - Cultural, recreational, personal and other services (Cultural)
  - Education (Education)
  - Finance, insurance and property (Finance)
  - Health and Community services (Health)
  - Hospitality (Hospitality)
  - Other (Other)
  - Transport and storage (Transport)
  - Wholesale and retail trade (Trade)
- Industrial
  - Agricultural, forestry and fishing (Agriculture)
  - Gas, electricity and water (Gas)
  - Manufacturing and Constructions (Manufacturing)

Water consumption within the non-residential sector is mainly by commercial users (Figure 6), with wholesale and retail trade being the highest consumer (Figure 7). The greater commercial consumption occurs due to the higher number of commercial users located within the City.

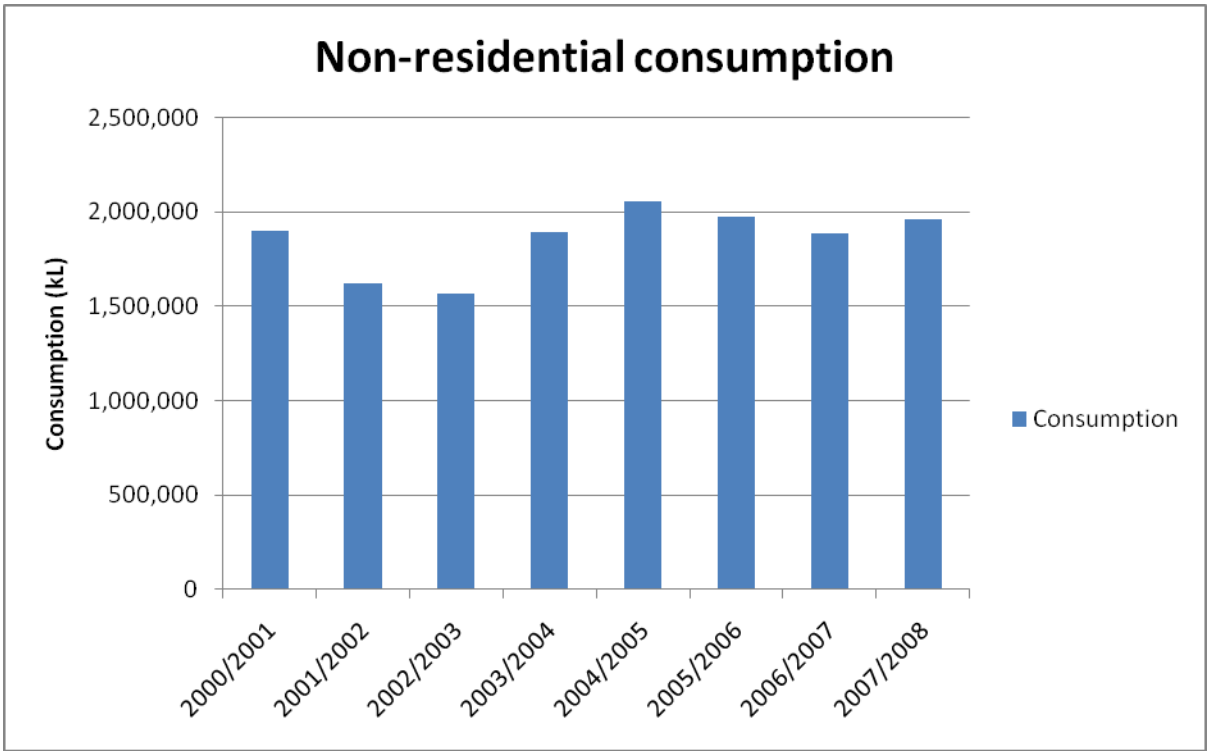

Figure 5: The City of Joondalup's non-residential scheme water consumption July 2001 – June 2006

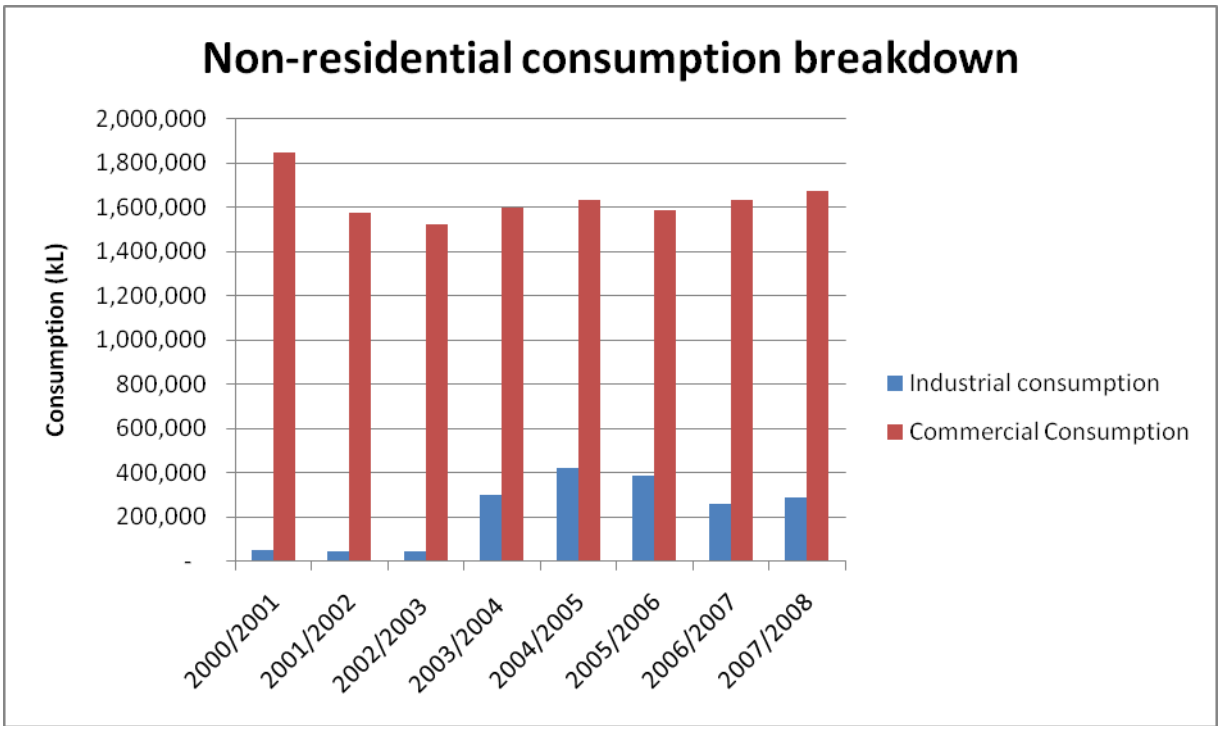

Figure 6: The City of Joondalup's non-residential water consumption broken down into commercial and industrial water use

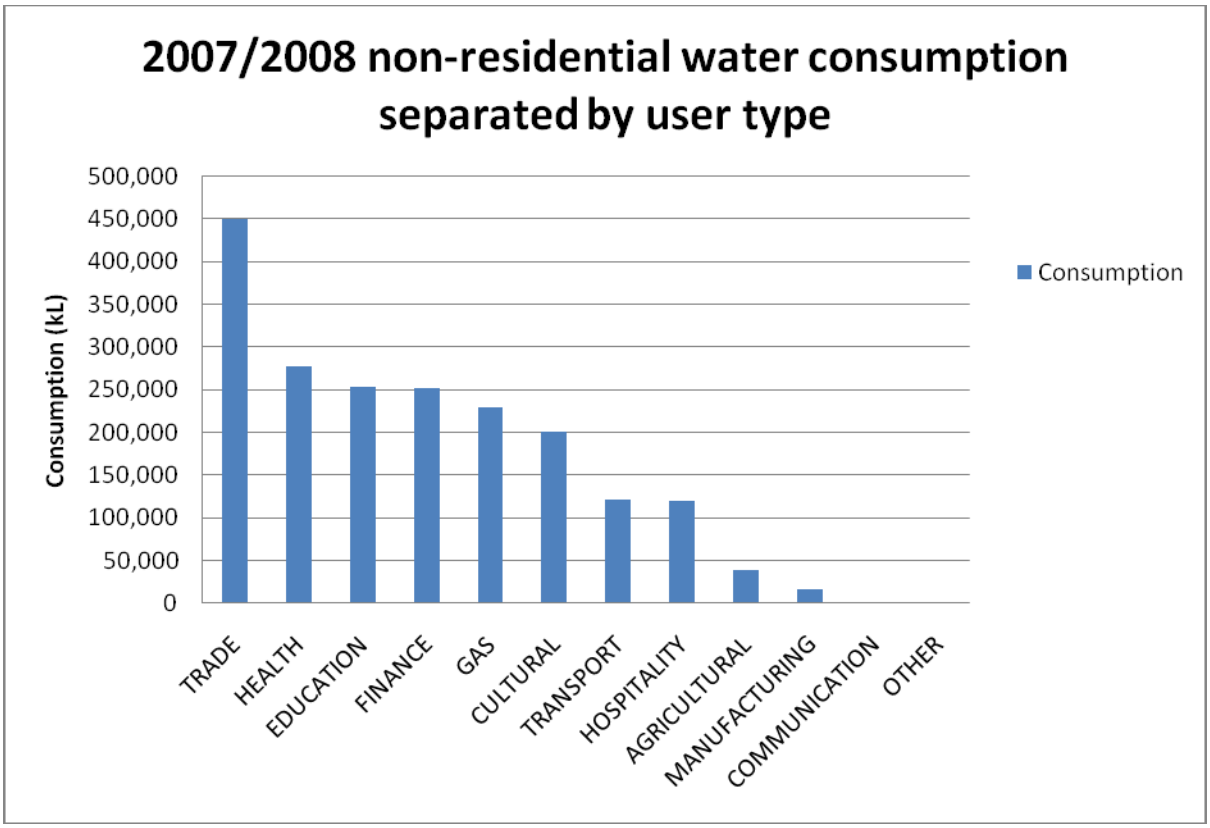

Figure 7: The City of Joondalup's 2007/2008 non-residential scheme water consumption separated by usage type

Baseline usage

As the City only has groundwater usage data for the 2007/2008 financial year, the baseline year for both the Corporate and Community water consumption has been determined as the 2007/2008 financial year (Table 2). Actions to reduce water consumption or improve water quality undertaken by the City after this time can be counted towards Milestone 4 – Implementation.

Table 2: Baseline for Milestone 1

	Consumption (kilolitres)
Corporate	5,004,366 (4,939,322 groundwater & 65,044 scheme water)
Community	21,102,034

Water Quality

Gap analysis

The water quality gap analysis, undertaken as a Milestone 1 action, highlighted that the City undertakes many of its operations in such a way that ensures ongoing water quality. In light of this, three priority areas with greatest scope for improvement in both the Corporate and Community sectors were chosen:

1. Herbicide and pesticide management
2. Groundwater management
3. Nutrient management

Baseline

The baseline year for water quality actions is the 2006/2007 financial year, based on when the City commenced the ICLEI Water Campaign™. This means that any actions related to water quality undertaken after this time can be counted towards Milestone 4 – Implementation.

3. Statement of water management goals

Corporate conservation goal	To reduce water consumption by 10% based on 2007/2008 baseline levels by 2015.

Community conservation goal	To work with the Community to try and reduce water consumption by 5% based on 2007/2008 baseline levels by 2020.

Corporate water quality goal	To implement 55 points worth of actions from the Water Campaign™ action cards by 2015.

Community water quality goal	To implement 50 points worth of actions from the Water Campaign™ action cards by 2020.

4. Outline of existing actions and policies

As part of the City's ongoing commitment to the environment and water management a number of water related policies and actions are already in place (Table 3 & Table 4).

Table 3: Water usage reduction actions and policies already in place before the water usage baseline year (* denotes a mandatory field to pass Milestone 3).

City of Joondalup Plan containing this action/policy*	No.	Action/Policy*	Responsible Directorate or Business unit	Implemented (Yes, No, Current)	Implementation Year	Other Stakeholders	Page reference*	Relevance to ICLEI Water campaign
Green Transport Plan	2.13	Upgrade end-of-trip facilities in the Administration building basement by increasing quantity of showers, improving change room and bathroom facilities and modifying floor plan	Infrastructure Services	Yes	2008	N/A	25	Involved installation of waterless urinals and low flow shower heads
Environment Plan	2.1.7	Implement State "Water Wise" programs that pertain to the City's water issues	Strategic Development	Yes	2006	Great Gardens Team	15	Two Great Gardens Workshops run every year for the community, educating on fertiliser use and use of native vegetation in gardens

Table 4: Maintaining water quality related actions and policies already in place before the water quality baseline year (*denotes a mandatory field to pass Milestone 3).

City of Joondalup Plan containing this action/policy*	Project No.	Action/Policy*	Responsible Directorate or Business unit	Implemented (Yes, No, Current)	Implementation Year	Other Stakeholders	Page reference*	Relevance to ICLEI Water campaign
Stormwater drainage 2004/2005 capital works program	SWD011	Stormwater drainage outfall upgrade – upgrade of stormwater drainage outfalls discharging into Yellagonga Regional Park	Infrastructure services	Yes	2007	N/A	56	Gross pollutant traps installed to reduce rubbish flowing into lake Goollelal

5. Implementation list

The City already has a number of Plans which contain water actions. The plans are:

- Strategic Pan;
- Environment Plan;
- Landscape Master Plan;
- Biodiversity Action Plan.
- Water Conservation Plan; and
- Greenhouse Action Plan;

The actions from these Plans have either been implemented since the baseline year or are due to be implemented. They relate to the four focus areas of the ICLEI Water Campaign™

- Corporate water consumption;
- Community water consumption;
- Corporate water quality; and
- Community water quality.

The consumption related actions relate to areas of potential consumption reduction highlighted from the Milestone 1 baseline. Water quality actions are related to the ICLEI action cards and equate to 55 points of Corporate water quality actions and 50 points of Community water quality actions.

Corporate water consumption

*Note: in all tables * denotes a mandatory field to pass Milestone 3.*

Data management

Issue: Lack of knowledge about water consumption.
Action:

City of Joondalup Plan containing this action/policy*	No.	Action/Policy*	Responsible Directorate or Business unit	Implemented (Yes, No, Current)	Implementation Year	Other Stakeholders	Page reference*
Water Conservation Plan	3.1.2.7	Upgrade infrastructure by completing the installation of flow meters on all existing bores and associated parks	Infrastructure services	Yes	2008	N/A	6
Landscape Master Plan	1.6	Measure and report on total water usage (ongoing)	Strategic and Organisational Development	Current	2008	N/A	9

Issue: Lack of knowledge and up to date information on the City's parks and irrigation within the City.
Action:

City of Joondalup Plan containing this action/policy*	No.	Action/Policy*	Responsible Directorate or Business unit	Implemented (Yes, No, Current)	Implementation Year	Other Stakeholders	Page reference*
Water Conservation Plan	3.5.2.6	Create a parks database bringing together all City knowledge of individual parks	Infrastructure Services	No	2010	N/A	10
Water Conservation Plan	3.1.2.1	Obtain data on irrigation system performance for a representative number of City Parks	Strategic and Organisational Development	Current	2009	N/A	5
Landscape Master Plan	2.2.1	Undertake an audit of all current irrigation system assets and map these on the City's GIS, including design, specification and maintenance records	Infrastructure Services Information Technology	Current	2009	N/A	12

Irrigation practices

Issue: Older inefficient irrigation systems and watering schedules
Actions:

City of Joondalup Plan containing this action/policy*	No.	Action/Policy*	Responsible Directorate or Business unit	Implemented (Yes, No, Current)	Implementation Year or time frame	Other Stakeholders	Page reference*
Water Conservation Plan	3.1.2.6	Review and alter watering programs across a selection of the City's high-water-using parks.	Infrastructure Services	Current	September 2008 onwards	N/A	5
Landscape Master Plan	4.1	Perform cost-benefit analysis to determine the most cost effective combination of ecozoning, hydrozoning and improvements to irrigation system performance to improve water use efficiency in individual parks	Strategic and Organisational Development Infrastructure Services	Current	2009	N/A	5
Water Conservation Plan	3.2.2.2	Develop individual park management plans for the 10 top-water-using park and allocate funding to implement zoning changes	Strategic and Organisational Development.	Current	2009	N/A	7
Landscape Master Plan	4.11	Develop and conduct a research project which demonstrates and evaluates ecozoning and hydrozoning techniques at a pilot park location. At the conclusion of the research project, develop guidelines for future application of ecozoning and hydrozoning in the City	Strategic Development Infrastructure Services	Yes	Short - Medium	N/A	16

Issue: Complaints from Community regarding changing watering schedules and perceived loss of amenity.
Action:

City of Joondalup Plan containing this action/policy*	No.	Action/Policy*	Responsible Directorate or Business unit	Implemented (Yes, No, Current)	Implementation Year	Other Stakeholders	Page reference*
Water Conservation Plan	3.7.4.1	Develop fact sheets and provide training to customer service staff to deal with queries and complaints as they arise	Strategic and Organisational Development	No	2010	N/A	12

Issue: Ensuring that irrigation staff have access to training and 'upskilling'.
Action:

City of Joondalup Plan containing this action/policy*	No.	Action/Policy*	Responsible Directorate or Business unit	Implemented (Yes, No, Current)	Implementation Year	Other Stakeholders	Page reference*
Landscape Master Plan	2.2.3	Devise and implement a scheme for the City's irrigation operators to become accredited under Irrigation Australia's Certification Program, or a suitable alternative	Infrastructure Services Human Resources	Ongoing	Long	Irrigation Australia and other such industry bodies	12

Buildings

Issue: Water efficiency within council buildings.
Action:

City of Joondalup Plan containing this action/policy*	No.	Action/Policy*	Responsible Directorate or Business unit	Implemented (Yes, No, Current)	Implementation Year or time frame	Other Stakeholders	Page reference*
Greenhouse Action Plan	4.2	Finalise the development of a sustainable purchasing policy. (includes water efficient devices)	Strategic and Organisational Development	No	2010	N/A	8
Environment Plan	2.1.8	In Conjunction with building codes, develop guidelines for "Water wise" products to be incorporated into public and private building development (eg: dual flush toilets and waterless urinals)	Planning, Approvals and Environmental Services	No	Short	N/A	15

Community water conservation

*Note: in all tables * denotes a mandatory field to pass Milestone 3.*

Communication / education

Issue: Community complaints about perceived reduction in park amenity.
Opportunity: To lead by example and promote the City's water conservation actions and, by example, encourage the Community to do likewise.
Action:

City of Joondalup Plan containing this action/policy*	No.	Action/Policy*	Responsible Directorate or Business unit	Implemented (Yes, No, Current)	Implementation Year of time frame	Other Stakeholders	Page reference*
Water Conservation Plan	3.7.2.1	Develop an Integrated Communication Plan (ICP) which would incorporated the following types of marketing strategies and principles • Utilise media • Give face and be consistent and authentic • Erect interactive signs in parks when they are undergoing transformations, informing the Community of the process	Governance and Marketing Infrastructure services.	No	2010	N/A	11
Landscape Master Plan	3.4	Identify and implement an innovative waterwise garden to showcase within the City of Joondalup	Strategic and Organisational Development Infrastructure Services	No	Medium	N/A	14
Landscape Master Plan	3.3	Develop a strategy that aims to educate the public on water wise concepts employed within the CBD landscape	Strategic and Organisational Development Marketing	No	Medium	N/A	14

Treated wastewater and greywater

Issue: Lack of information for residents interested in installing greywater treatment systems.
Action:

City of Joondalup Plan containing this action/policy*	No.	Action/Policy*	Responsible Directorate or Business unit	Implemented (Yes, No, Current)	Implementation Year or time frame	Other Stakeholders	Page reference*
Environment Plan	2.2.3	Develop Community information sources and awareness campaigns to assist the Community and developers installing safe, approved greywater systems and rainwater collection tanks within the City	Planning, Approvals and Environmental Services	Current	2011	Department of Health	16

Corporate water quality

*Note: in all tables * denotes a mandatory field to pass Milestone 3.*

Nutrients

ICLEI action card action		Points
N-2	Carry out an ongoing water quality monitoring program to assess the level of nutrient enrichment occurring in local water bodies (in conjunction with stakeholders)	5
N-4	Develop and implement an ongoing maintenance schedule appropriate to each action implemented	5
N-5	Conduct staff training to ensure effective implementation of the above maintenance regimes	

City of Joondalup Action

City of Joondalup Plan containing this action/policy*	No.	Action/Policy*	Responsible Directorate or Business unit	Implemented (Yes, No, Current)	Implementation Year or time frame	Other Stakeholders	Page reference*	No. of points
Environment Plan	2.1.3 and 2.1.4	Develop a standardised method of testing the City's Freshwater and ocean bodies through partnerships with key government agencies to monitor changes in the quality of freshwater and saltwater areas, and remedy any problems identified	Planning, Approvals and Environmental Services	No	Short	Water Corporation and/or Department of Water	15	5

Gross litter control

ICLEI action card action		Points
GLT-2a	Implement best management practices in street sweeping	5
GLT-3	Develop and implement an ongoing maintenance schedule appropriate to each action implemented	5
GLT-4	Conduct staff training to ensure effective implementation of the above maintenance regimes	

City of Joondalup Action

City of Joondalup Plan containing this action/policy*	No.	Action/Policy*	Responsible Directorate or Business unit	Implemented (Yes, No, Current)	Implementation Year or time frame	Other Stakeholders	Page reference*
Environment Plan	2.1.9	Continue to maintain existing stormwater infrastructure through the City's Maintenance Program and regular Road Sweeping program	Infrastructure Services	Current	Ongoing	N/A	15

ICLEI action card action		Points
GLT-2b	Install appropriate litter traps in stormwater drains	5
GLT-3	Develop and implement an ongoing maintenance schedule appropriate to each action implemented	5
GLT-4	Conduct staff training to ensure effective implementation of the above maintenance regimes	

City of Joondalup action

City of Joondalup Plan containing this action/policy*	No.	Action/Policy*	Responsible Directorate or Business unit	Implemented (Yes, No, Current)	Implementation Year or time frame	Other Stakeholders	Page reference*
Environment Plan	2.1.5	Continue to enhance stormwater outfalls and sumps across the City to protect both environmentally sensitive areas and public health	Infrastructure Services	Current	Ongoing	N/A	15
Strategic Plan	2.1.4	The City implements improved stormwater management and water quality processes	Strategic and Organisational Development Infrastructure Services	Current	Ongoing	N/A	10

Herbicide, pesticide and fertiliser

ICLEI action card action		Points
HP-2	Adopt environmental herbicide, pesticide and fertiliser application policy/guidelines for staff and contractors	10
HP-3	Carry out the ongoing enforcement of this policy/these guidelines.	
HP-4	Develop and implement a maintenance schedule to ensure the ongoing implementation	
HP-5	Conduct staff training to ensure effective implement of the above maintenance regimes	
HP-6	Assess the reduction in herbicide, pesticide and fertiliser use as a result of the above	5

City of Joondalup Action

City of Joondalup Plan containing this action/policy*	No.	Action/Policy*	Responsible Directorate or Business unit	Implemented (Yes, No, Current)	Implementation Year or time frame	Other Stakeholders	Page reference*
Landscape Master Plan	2.2.7	Investigate best practise for weed control methods and management of associated chemicals and then develop a weed management strategy and guidelines	Strategic and Organisational Development Infrastructure Services	No	Medium	N/A	12

ICLEI action card action		Points
WSUD-2	Adopt Water Sensitive Urban Design (WSUD) policy/guidelines for council operations and managed land	5
WSUD-3	Conduct staff training in WSUD modelling and engineering practises	5

City of Joondalup Action

City of Joondalup Plan containing this action/policy*	No.	Action/Policy*	Responsible Directorate or Business unit	Implemented (Yes, No, Current)	Implementation Year or time frame	Other Stakeholders	Page reference*
Biodiversity Action Plan	2.4	Develop Water Sensitive Urban Design (WSUD) guidelines that are suitable for the Community as well as the City to ensure WSUD concepts are incorporated into future urban planning and development	Planning, Approvals and Environmental Services Infrastructure Services	No	Short	N/A	19

Community water quality

*Note: in all tables * denotes a mandatory field to pass Milestone 3.*

Nutrients

ICLEI action card action		Points
N-2	Carry out an ongoing water quality monitoring program to assess the level of nutrient enrichment occurring in local water bodies (in conjunction with stakeholders)	5
N-4	Develop and implement an ongoing maintenance schedule – appropriate to each action implemented	5
N-5	Conduct staff training to ensure effective implementation of the above maintenance regimes	

City of Joondalup Action:

City of Joondalup Plan containing this action/policy*	No.	Action/Policy*	Responsible Directorate or Business unit	Implemented (Yes, No, Current)	Implementation Year or time frame	Other Stakeholders	Page reference*
Environment Plan	2.1.3 and 2.1.4	Develop a standardised method of testing the City's Freshwater and ocean bodies through partnerships with key government agencies to monitor changes in the quality of freshwater and saltwater areas, and remedy any problems identified	Planning, Approvals and Environmental Services	No	Short	Water Corporation and/or Department of Water. Friends groups	15

ICLEI action card action		Points
N-3c	Develop a community education campaign that provides education about the affects of contaminants entering water bodies	5
N-4	Develop and implement an ongoing maintenance schedule – appropriate to each action implemented	5
N-5	Conduct staff training to ensure effective implementation of the above maintenance regimes	

City of Joondalup Action:

City of Joondalup Plan containing this action/policy*	No.	Action/Policy*	Responsible Directorate or Business unit	Implemented (Yes, No, Current)	Implementation Year or time frame	Other Stakeholders	Page reference*
Environment Plan	2.2.0	Develop an awareness campaign that informs the Community about the effects of contaminants entering the City's water bodies and groundwater	Strategic and Organisational Development Community Development and Libraries	Current	2008	High schools within the City of Joondalup and Friends of Yellagonga Regional Park	15

ICLEI action card action		Points
N-3a	Engage garden groups to run sessions for the community on ways to minimise fertiliser use in private gardens	5
N-3b	Develop a community education campaign that promotes sustainable gardening practises	5
N-4	Develop and implement an ongoing maintenance schedule – appropriate to each action implemented	5
N-5	Conduct staff training to ensure effective implementation of the above maintenance regimes	
N-6	Assess the nutrient export reduction as a result of the above	5

City of Joondalup action:

City of Joondalup Plan containing this action/policy*	No.	Action/Policy*	Responsible Directorate or Business unit	Implemented (Yes, No, Current)	Implementation Year or time frame	Other Stakeholders	Page reference*
Environment plan	2.1.7	Implement state "Water Wise" programs that pertain to the City's water issues.	Strategic and Organisational Development Governance and Marketing	Continuing	Year by year basis	Great Gardens or other stake holders	15

ICLEI action card action		Points
WSUD-1	Adopt Water Sensitive Urban Design (WSUD) policy into council's planning scheme	5
WSUD-5	Enforce the WSUD planning policy as required	5

City of Joondalup action:

City of Joondalup Plan containing this action/policy**	No.	Action/Policy*	Responsible Directorate or Business unit	Implemented (Yes, No, Current)	Implementation Year or time frame	Budget	Other Stakeholders	Page reference*
Biodiversity Action Plan	2.4	Develop Water Sensitive Urban Design (WSUD) guidelines that are suitable for the Community as well as the City to ensure WSUD concepts are incorporated into future urban planning and development	Planning, Approvals and Environmental Services Infrastructure Services	No	Short		N/A	19

6. Commitment to monitoring and review

The City is committed to ensuring sustainable water usage into the future. Each of the plans summarised will be reviewed at the following times.

- Strategic Plan – 2011
- Environment Plan – 2011
- Biodiversity Action Plan – 2019
- Landscape Master Plan – 2019
- Water Conservation Plan – 2010
- Greenhouse Action Plan – 2010

The actions within this summary will be reviewed at the time of completing Milestone 5. Milestone 5 is set to be undertaken once the City has completed 10 points of Community and Corporate water quality actions; and completed enough actions to result in a 2% reduction in Corporate water consumption and a 1% reduction in Community water consumption.

Works Cited

Australian Bureau of Statistics. *Australian Demographic Statistics June 2008.* December 2, 2008. http://www.abs.gov.au/ausstats/abs@.nsf/mf/3101.0 (accessed February 2, 2009).

Government of Western Australia. *A State Water Strategy for Western Australia.* Government of Western Australia, 2003.

Government of Western Australia. "State Water Plan 2007." 2007.

Water Corporation. *Beenyup Wastewater Treatment Plant.* 2008. http://www.watercorporation.com.au/W/wwtp_beenyup.cfm?uid=4584-1343-1830-2361 (accessed February 2, 2009).