Water Wastewater and Irrigation Performance Report 2007

April 2008

Economic Regulation Authority
WESTERN AUSTRALIA

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1 Purpose of the Report

The purpose of this report is to bring transparency and accountability to the performance of the providers of water, wastewater and irrigation services in Western Australia and to benchmark, where possible, performance against similar supply schemes both within Western Australia and in other States and Territories.

The objectives of this report are to:

- Report on the performance of water, wastewater and irrigation supply schemes operated by Western Australian water delivery agencies;
- Highlight comparative performance outcomes for the different towns served within Western Australia; and
- Examine service performance variations over time.

This report focuses on the performance data provided to the Authority by water delivery agencies in accordance with the performance reporting obligations set out in their licences and comprises four parts:

- Part A provides water performance data on 32 major Western Australian towns and small potable and non-potable water suppliers for 2006/07 and earlier years if applicable;
- Part B provides wastewater performance data for 22 major Western Australian and small wastewater providers for 2006/07 and earlier years if applicable;
- Part C provides performance data for 36 major towns or schemes that apply to both water and wastewater for 2006/07 and earlier years if applicable; and
- Part D provides small supplier irrigation data for 4 small suppliers for 2006/07.

This report describes selected indicators for water, wastewater and irrigation providers and describes maximum and minimum values as well as highest and lowest percentage variations where relevant. For major towns and those with over 10,000 connections the data sets have been collected in the format of the National Performance Framework as required by the new National Water Initiative (NWI), since 2005/06.

2 Background

2.1 Legislation

The *Water Services Licensing Act 1995* (Act) includes provision for the licensing of water services. Part 3 of the Act sets out the provisions pertaining to the licensing scheme for water service providers. The Act defines 4 classes of water operating licence: water supply services (covers both potable and non-potable services), sewerage services, irrigation services and drainage services. Among other things, Part 2 of the Act includes provisions for the Authority to administer the licensing scheme provided for in Part 3 of the Act and to monitor the performance of the providers of water services.

Section 24 and Schedule 1(h) of the Act provide powers for water services licences to include conditions requiring licensees to provide to the Authority, in the manner and form approved by the Authority, specified information on any matter relevant to the operation of

the licence, the operation of the licensing scheme or the performance of the Authority's functions under the Act. Water supply, sewerage and irrigation licences include conditions requiring the licensee to provide to the Authority specified non-financial performance data on an annual basis.

2.2 Current Structure of water services industry in WA

A total of 30 water services licences have been granted to Western Australia water service providers:

- The Water Corporation: water supply, sewerage, irrigation and drainage supply;
- Aqwest – Bunbury Water Board and Busselton Water Board: water supply;
- Hamersley Iron: water supply and sewerage;
- Rottnest Island Authority: water supply, sewerage services and drainage;
- The Shire of Denmark: non-potable water; and
- 20 local government authorities[1]: sewerage and non-potable water; and
- Gascoyne Water Cooperative, Harvey Water (SWIMCO), Ord Irrigation Cooperative and Preston Valley Irrigation Cooperative: irrigation and non-potable water.

The Water Corporation is owned by the Western Australian Government and was established by the *Water Corporation Act 1995*. The Water Corporation is Western Australia's largest water service provider serving almost two million Western Australians and managing more than $10.9 billion in water supply, sewerage and drainage infrastructure. The Water Corporation supplies a range of services, including the supply of potable drinking water to urban and regional areas, the bulk supply of water to regional areas, the receipt, treatment and management of wastewater in urban and regional areas and the management of drainage systems in urban and regional areas.

Bunbury Water Board - Aqwest is a government statutory authority operating under the *Water Boards Act 1904*. It provides potable water services to the regional centre of Bunbury.

Busselton Water Board is a government statutory authority operating under the *Water Boards Act 1904*. It provides potable water services to the regional centre of Busselton.

2.3 National Water Initiative Agreement

In April 2006, Western Australia became a signatory of the National Water Initiative Agreement (NWI Agreement), joining the Commonwealth and the other States and Territories. The Commonwealth is represented by the National Water Commission (NWC) and the States and Territories are represented by the agencies that are responsible for regulating water supply services. Under the NWI Agreement, the signatories agreed to report independently, publicly, and on an annual basis, benchmarking data on the pricing and service quality of urban and rural water delivery agencies. The first report on urban water utilities, covering the 2005/06 reporting year, was published by the NWC in May 2007. The 2006/07 urban water utility and rural service delivery agency reports will by published by the NWC in April 2008.

[1] See section 7.1.1 for a list of the local government licensees.

The signatories to the NWI Agreement have developed a performance reporting framework for urban utilities (Urban Framework) and a performance reporting framework for rural water delivery agencies (Rural Framework). The Urban and Rural Frameworks comprise a handbook with performance indicators and definitions. The performance indicators are subject to independent audit at least once every 3 years. Further information on the NWI Agreement and the performance reporting framework can be found on the National Water Commission's web site[2].

The Urban Framework captures all urban utilities that service 10,000 or more connected properties. In Western Australia there are 4 licensees that are captured by the Urban Framework: Aqwest – Bunbury Water Board (water only), Busselton Water Board (water only), City of Kalgoorlie-Boulder and the Water Corporation[3].

The Rural Framework captures all rural water service delivery agencies that provide more than 4GL of water for irrigation services. In Western Australia there are 2 licensees that are captured by the Rural Framework: Harvey Water[4] and Ord Irrigation Cooperative.

The Authority has amended the licences of the licensees that are captured by the NWI Urban and Rural Frameworks to require them to provide to the Authority performance information in accordance with the relevant Framework.

2.4 Review of water licences

The Authority is currently undertaking a review of water services licences. The objectives of the review are to:

- Utilise best practice principles of utility licensing;
- reflect the current regulatory environment and promote consistent licence regulation across the utility sector (the Authority also licenses electricity and gas service providers);
- improve consistency between operating licences;
- enhance consumer protection, including scope for improved compliance; and
- reduce the regulatory burden by removing spent, redundant or inappropriate licence provisions.

An outcome of the review is to replace the current provision of information clauses in licences with a generic condition requiring licensees to provide to the Authority any information that the Authority may require in connection with its functions under the Act in the time, manner and form specified by the Authority. With regard to the provision of performance information, the Authority intends to adopt the same model as that used in gas and electricity licensing, where the information reporting requirements are placed into a separate compliance reporting manual.

The Authority has published a draft standard form licence, which includes the generic information provision condition, and the draft Water Compliance Reporting Manual (Manual) for comment.

[2] http://www.nwc.gov.au/nwi/index.cfm

[3] The Water Corporation services 6 towns that are captured by the Urban Framework: Albany, Bunbury (sewerage only), Geraldton (water only), Kalgoorlie-Boulder (water only), Mandurah and Perth.

[4] Harvey Water is also known as South West Irrigation Management Cooperative (SWIMCO)

The Manual sets out standard performance reporting obligations for each type of supply service: potable water, non-potable water, sewerage and irrigation. In the case of large service providers, who are captured by the NWI Agreement, the reporting requirements are aligned with the Urban Framework and Rural Framework. The reporting requirements for the remaining, smaller, service providers have been aligned, where possible, to a sub-set of the Urban and Rural Framework indicators. This will facilitate consistency of performance reporting for all service providers in Western Australia.

It is anticipated that the earliest that the performance reporting obligations for smaller service providers in the Manual will become operational is the 2008/09 reporting period.

3 Summary of Performance Information

This is the second report published by the Authority that examines the performance of water, wastewater and irrigation service providers in Western Australia. The previous report, covering the period up to 2004/05[5], presented performance information for urban water and wastewater supply schemes with more than 1,000 connected properties and the 4 irrigation licensees. The performance information was based on the performance reporting obligations in the licences.

Since the publication of the 2004/05 report, the State has signed the National Water Initiative Agreement (NWI Agreement)[6]. The signatories to the NWI Agreement have developed national performance reporting frameworks for urban and rural water delivery agencies, which includes a suite of financial and non-financial performance indicators. The national urban performance reporting framework captures supply schemes with 10,000 or more connected properties and the rural performance framework captures agencies who supply more than 4GL/annum of water for irrigation purposes[7].

The transition to national performance reporting frameworks for the captured urban and rural supply schemes has impacted on the ability of the Authority to report historical data. Some indicator data can only be reported for 1 to 2 years depending upon the completeness and reliability of the data. Some indicator information has been provided for up to 6 comparative years, where indicators can be mapped from the previous data format to the format of the National Performance Framework. Complete sets of water, wastewater and irrigation performance data are available in statistics tables published on the Authority's web site[8].

The Authority is currently undertaking a review of water licences. The scope of the licence review includes the development of a water compliance reporting manual, which brings together the compliance and performance reporting obligations for water licences into a single document. A key consideration in the review of the licence performance reporting obligations is, where possible, to align the performance indicators in the manual with the relevant national performance reporting framework.

3.1 Drinking Water Supply

The water supply performance information in this report covers 32 locations[9] that have more than 1,000 connected properties. This includes locations serviced by Aqwest – Bunbury Water Board, Busselton Water Board and the Water Corporation.

Between 2005/06 and 2006/07, total connected properties have increased by 2.5% to 857,000. Perth experienced an increase in connected properties of 2.3% (or 15,000) to a total of 680,000. The other towns (excluding Perth) experienced an increase in connected properties of 3.5%, or 6,000 connections, to a total of 177,000 connected properties.

[5] Water, wastewater and irrigation report 2005, which is available on the Authority's web site: http://www.era.wa.gov.au/2/257/51/publications.pm

[6] See section 2.3 for more information on the NWI Agreement.

[7] The irrigators for whom the additional recurrent expenditure on collecting and supplying performance data exceeds more 1% of total revenue are not required to report.

[8] http://www.era.wa.gov.au/2/429/51/licence_statist.pm

[9] For a full list of locations see section 4.1.

In 2006/07, total sourced water has increased by 4.4% to 345,500ML, when compared to 2005/06. Over the same period water sourced for Perth increased by 4.0%, to 253,837ML. The proportion of water sourced from groundwater sources increased by 14.5% to 196,354ML while water sourced from surface water sources decreased by 22.8% to 108,124ML. 2006/07 was the first year that the new Kwinana desalination plant was in operation and it supplied 7.1% (18,120ML) of Perth's sourced water. Recycling contributed 2.5% (8,576ML) of total water sourced in 2006/07, up from 2.0% (6,600ML) in 2005/06.

The total urban water supplied in 2006/07 was 312,977ML, an increase of 3.8% compared to 2005/06, of which 235,153 ML (75.1%) was supplied to Perth. Urban water supplied to the other towns increased by 4.9% to 71,789ML over the corresponding period[10].

In 2006/07, the average residential property in Perth consumed 281kL of water, an increase of 4.8% compared to 2005/06. However, over the same period, the average residential property in regional towns consumed 390kL, an increase of 8.3%. In 2006/07, the highest consumption was 663kL/annum in Port Hedland and the lowest consumption was 190kL/annum in Denmark. This difference in water consumption levels between Perth and regional towns is consistent with Perth's water restrictions applying for the full 2006/07 year, whereas other towns, such as Bunbury and Busselton have only brought in water restrictions from 1 October 2007.

In 2006/07, the average number of water quality complaints for all towns was 5.8 per 1,000 properties Perth recorded 6.8 complaints per 1,000 properties, a fall of 39.8% compared to 2005/06. In 2006/07, the average number of water service complaints for all towns was 24.4 per 1,000 properties. Perth recorded 21.7 water service complaints per 1,000 properties over the same period.

3.2 Wastewater Services

The performance information in this report covers 22 locations[11] that have more than 1,000 sewerage connected properties. This includes towns serviced by the City of Kalgoorlie-Boulder and the Water Corporation.

Between 2005/06 and 2006/07, total connected properties in all towns have increased by 3.9% to 723,000. Perth experienced an increase in connected properties of 3.1% to 603,000 connections. The other towns (excluding Perth) experienced an increase in connected properties of 8.1%, or 9,000 connections, to a total of 120,000 connected properties.

In 2006/07, the average volume of sewage collected per property in all towns was 191kL, a reduction of 11.2% compared to 2005/06. Over the same period, the volume of sewage collected per property in Perth was 192kL, a reduction of 3.0%.

In 2006/07, the total volume of recycled water supplied was 15,135ML with Perth accounting for 46% of the total (6,958ML). In 2006/07, Perth recycled 6.0% of the total effluent produced and the average regional town recycled 51.7% of effluent produced.

In 2006/07, the average number of properties served per km of sewer main in Perth was 57, compared to 41 in the average regional town. The difference is consistent with the higher urban density in Perth's compared to the average regional town.

[10] Does not include information for Bunbury as 2005/06 data was not available.

[11] For a full list of towns see section 6.1.

In 2006/07, the average number of sewage odour complaints for all towns was 0.9 per 1,000 properties, unchanged from 2005/06. Perth recorded 1.0 sewerage odour complaints per 1,000 properties, an increase of 11.1% compared to 2005/06. In 2006/07, the average number of sewerage service complaints was 7.9 per 1,000 properties, an increase of 5.3% compared to 2005/06. Perth recorded 7.7 complaints per 1,000 properties, an increase of 37.5% compared to 2005/06.

In 2006/07, the average town had approximately 58% of its sewage treated to a secondary level and approximately 42% of its sewerage treated to a tertiary level, unchanged from 2005/06. In Perth, 94.3% of sewage was treated to a tertiary level. This contrasts with the average regional town, where only 39% of sewage was treated to a tertiary level.

3.3 Irrigation Services

The Authority licences 4 agencies providing irrigation services: Gascoyne Water Cooperative Ltd (Gascoyne), Harvey Water (SWIMCO), Ord Irrigation Cooperative Ltd (Ord Irrigation) and Preston Valley Irrigation Cooperative (Preston Valley).

In 2006/07, the total volume of water supplied as irrigation water was 247.1GL, an increase of 16.7% compared to 2005/06. Gascoyne increased the supply volume by 42.9% to 5.3GL, Ord Irrigation increased supply volume by 19.3% to 175.8GL, Preston Valley increased supply volume by 10.7% to 0.99GL and Harvey Water increased supply volume by 8.9% to 65GL.

In 2006/07, the total volume of water supplied for other non-potable purposes was 3.99GL, a decrease of 14.8% compared to 2005/06. Gascoyne supplied 79.8ML (19ML in 2005/06), Harvey Water supplied 3.88GL (4.68GL in 2005/06) and Preston Valley supplied 28ML.

In 2006/07, the total number of irrigation connections was 2,106, an increase of 27% compared to 2005/06. Compared to 2005/06, the number of connections increased by 31.7% for Harvey Water, 28.7% for Ord Irrigation, 4.6% for Preston Valley and 1.2% for Gascoyne.

PART A: WATER PERFORMANCE INFORMATION

4 NWI Format Water Performance Information

4.1 Covered Water Supply Schemes

Water supply schemes for the following 32 towns are included in the analysis of water supply performance:

Albany Scheme	**Dunsborough / Yallingup**	**Margaret River Scheme**
Australind / Eaton	**Esperance**	**Merredin**
Bridgetown / Hester	**Geraldton**	**Narrogin**
Broome	**Harvey / Wokalup**	**Newman**
Bunbury (AQWEST)	**Jurien**	**Northam**
Busselton (BWB)	**Kalgoorlie-Boulder**	**Perth**
Carnarvon	**Karratha**	**Pinjarra**
Collie	**Katanning**	**Port Hedland**
Denmark	**Kununurra**	**South Hedland**
Derby	**Mandurah Scheme**	**York**
Dongara / Denison	**Manjimup**	

With the exception of Bunbury, which is managed by Aqwest-Bunbury Water Board, and Busselton, which is managed by the Busselton Water Board, all the town water supply schemes are managed by the Water Corporation. The performance data for all the above towns has been reported in a format consistent with the national Urban Framework.

4.2 Sources of Water

4.2.1 Total Sourced Water

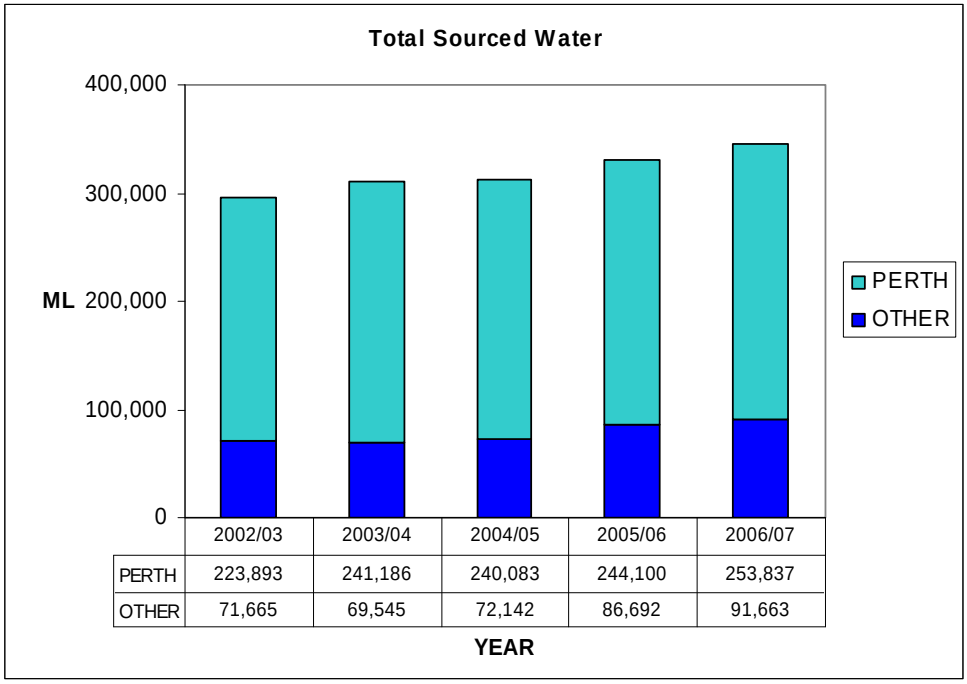
Total sourced water includes water abstracted from various water sources including surface water, groundwater, desalination, recycled water and water received from a bulk supplier.

Figure 1 shows that total water sourced by the 32 towns has increased by 4.4% (to 345,500 ML) in 2006/07 compared to 2005/06 and increased by 16.9% over the period 2002/03 to 2006/07[12]. Water sourced for Perth increased by 4.0% and other towns increased by 5.7% in 2006/07. In 2006/07, Pinjarra had the largest percentage increase of sourced water (55.8%), while South Hedland the largest percentage decrease (5.0%).

In 2006/07, 73.5% of total water sourced was supplied to Perth, compared to 73.8% in 2005/06.

[12] For years 2002/03 to 2004/05 total sourced water includes impounding reservoir and groundwater only.

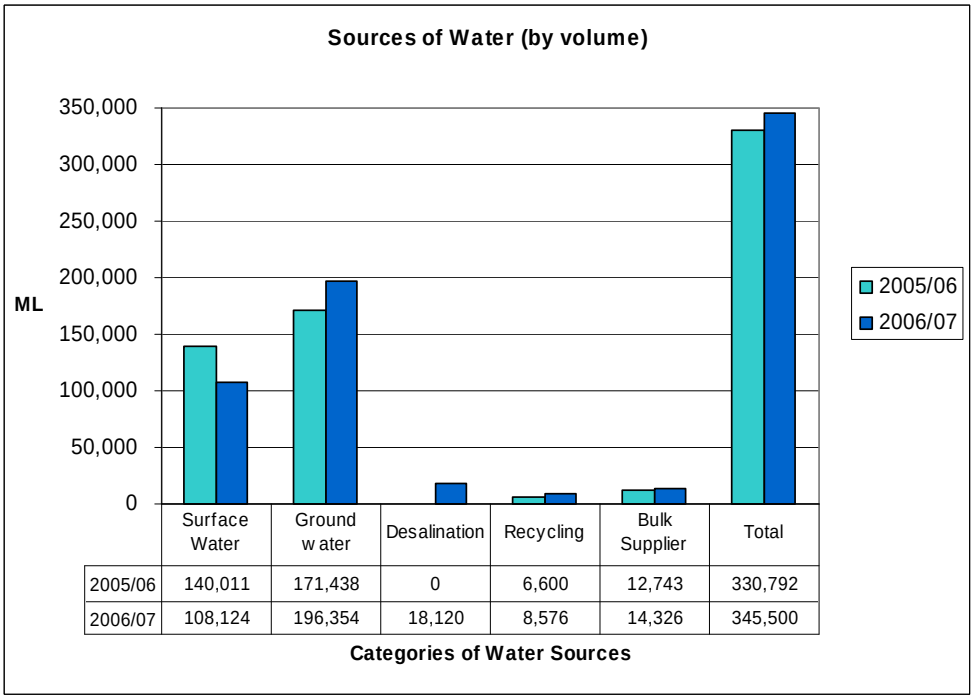
Figure 1: Total volume of water sourced from all sources



	2002/03	2003/04	2004/05	2005/06	2006/07
PERTH	223,893	241,186	240,083	244,100	253,837
OTHER	71,665	69,545	72,142	86,692	91,663

Figure 2 shows that, in 2006/07, water sourced from groundwater, desalination, recycling and bulk supplier have increased in volume by 14.5%, 100%, 29.9% and 12.4% respectively, compared to the 2005/06 year. Correspondingly water sourced from surface water has decreased by 22.8% over the same period. In 2006/07, the total volume of sourced water increased by 4.4%, compared to 2005/06[13]. The introduction of water sourced from desalination is due to the Kwinana desalination plant commencing service during the 2006/07 reporting period.

Figure 2: Sources of water by volume (All Towns)



	Surface Water	Ground water	Desalination	Recycling	Bulk Supplier	Total
2005/06	140,011	171,438	0	6,600	12,743	330,792
2006/07	108,124	196,354	18,120	8,576	14,326	345,500

[13] 2005/06 Information for Desalination, Recycling and Bulk Supplier volumes for Bunbury is unavailable.

Figure 3 shows that, in 2006/07, groundwater (56.8%) and desalination sources (5.2%) provided an increased percentage of the total water sourced compared to 2005/06. Correspondingly, the percentage of water sourced from surface water has decreased from 42.3% from 31.3%, over the same period.

Figure 3: Sources of water by percentage (All Towns)

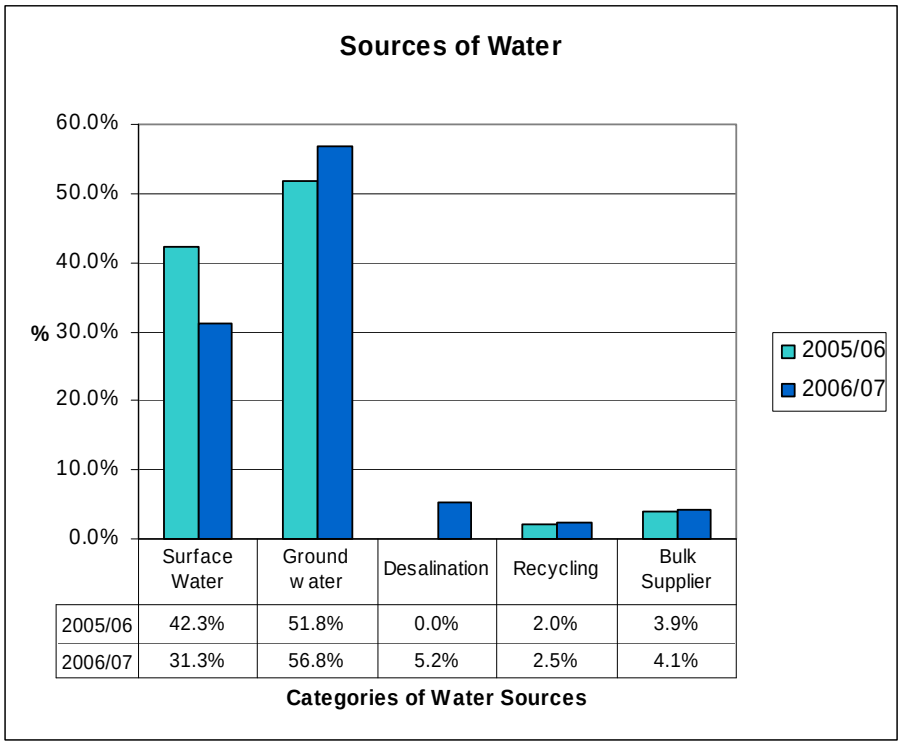


Figure 4 shows that, in 2006/07, water sourced from groundwater, desalination and recycling for Perth increased in volume by 19.7%, 100% and 21.8% respectively, compared to 2005/06. Correspondingly, water sourced from surface water has decreased by 28.0% over the same period. In 2006/07, the total volume of sourced water increased by 4.0%, compared to 2005/06. Comparing Figure 2 and Figure 4 shows that 100% of the desalinated water produced by the Kwinana desalination plant was supplied for consumption in Perth.

Figure 4: Sources of Water by Volume (Perth Only)

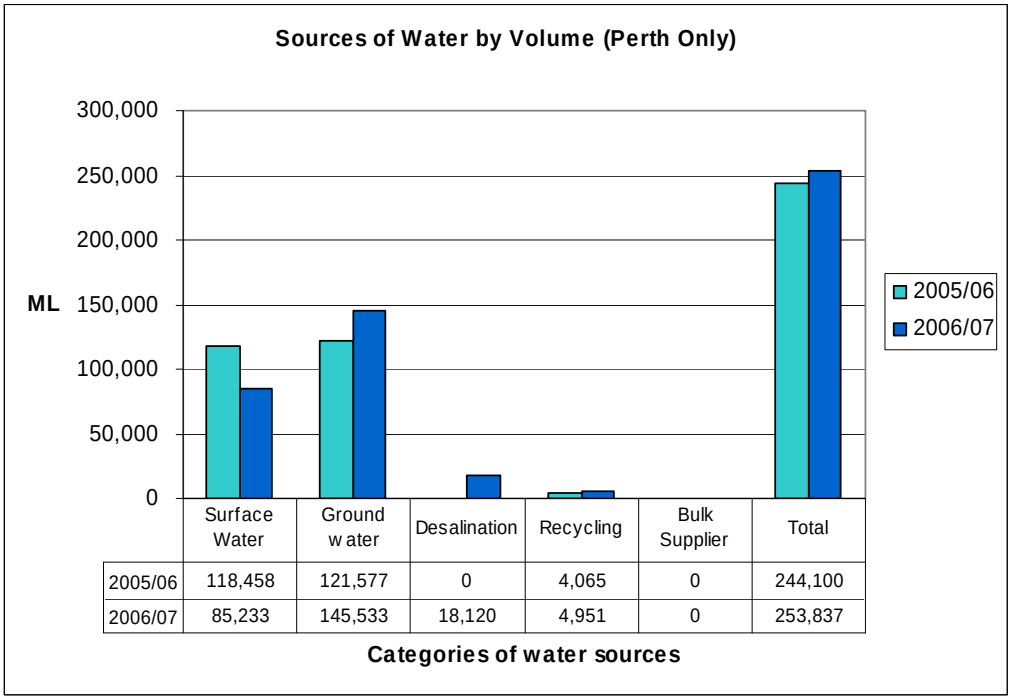
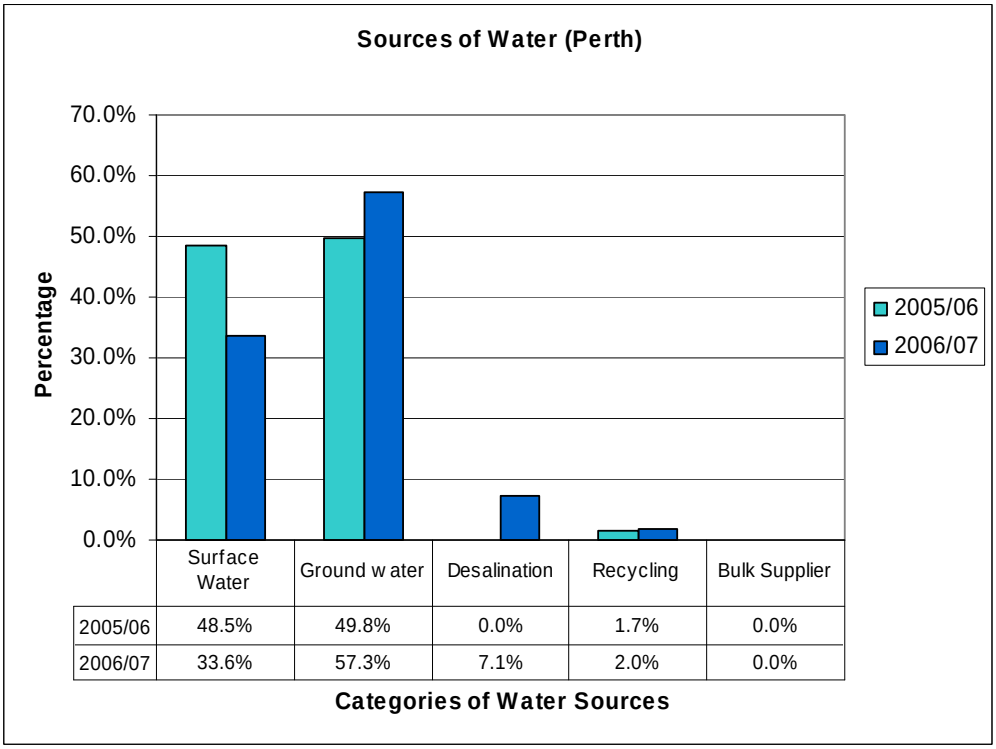


Figure 5 shows that, in 2006/07, groundwater accounted for 57.3% of Perth's total sourced water, up from 49.8% in 2005/06. In 2006/07, surface water accounted for 33.6% of the total sourced water, down from 48.5% in 2005/06. The Kwinana desalination plant supplied 7.1% of Perth's total sourced water in its first year of operation.

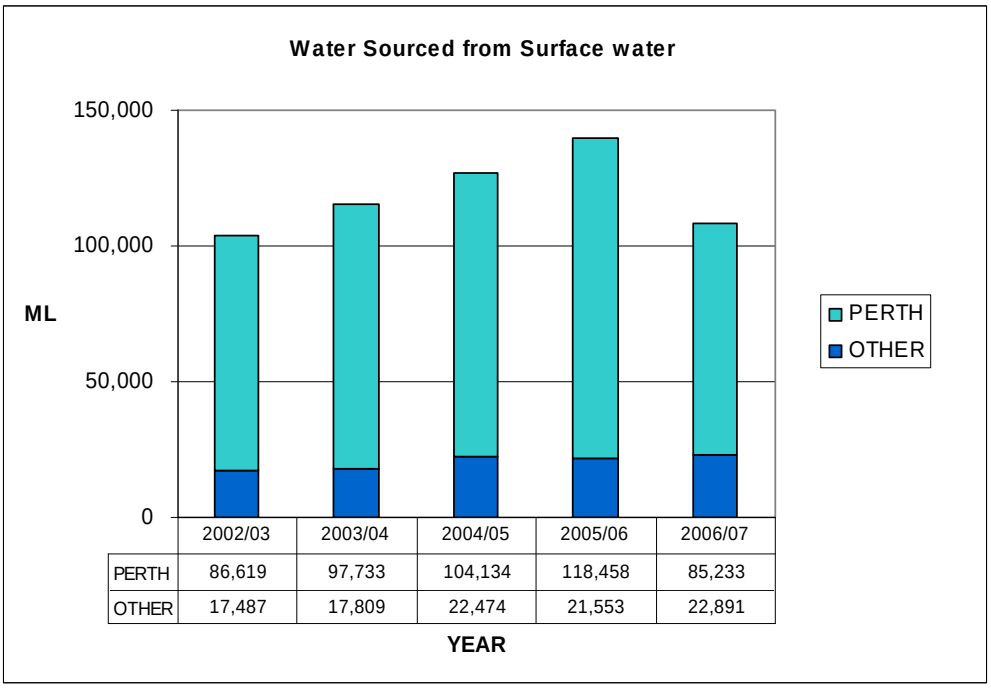
Figure 5: Sources of water by percentage (Perth Only)



4.2.2 Water Sourced from Surface Water

Surface water is water abstracted from dams, rivers or irrigation channels. Figure 6 shows that, in 2006/07, the total volume of water sourced from surface water (108,124 ML) decreased by 22.8%, compared to 2005/06 (140,011 ML). The volume of surface water sourced for consumption in Perth fell by 28% in 2006/07, compared to 2005/06, but the volume of surface water sourced for other towns increased by 6.2% over the same period. In 2006/07, 78.9% of water sourced from surface water was used to supply Perth.

Figure 6: Total volume of water sourced from surface water- All Towns

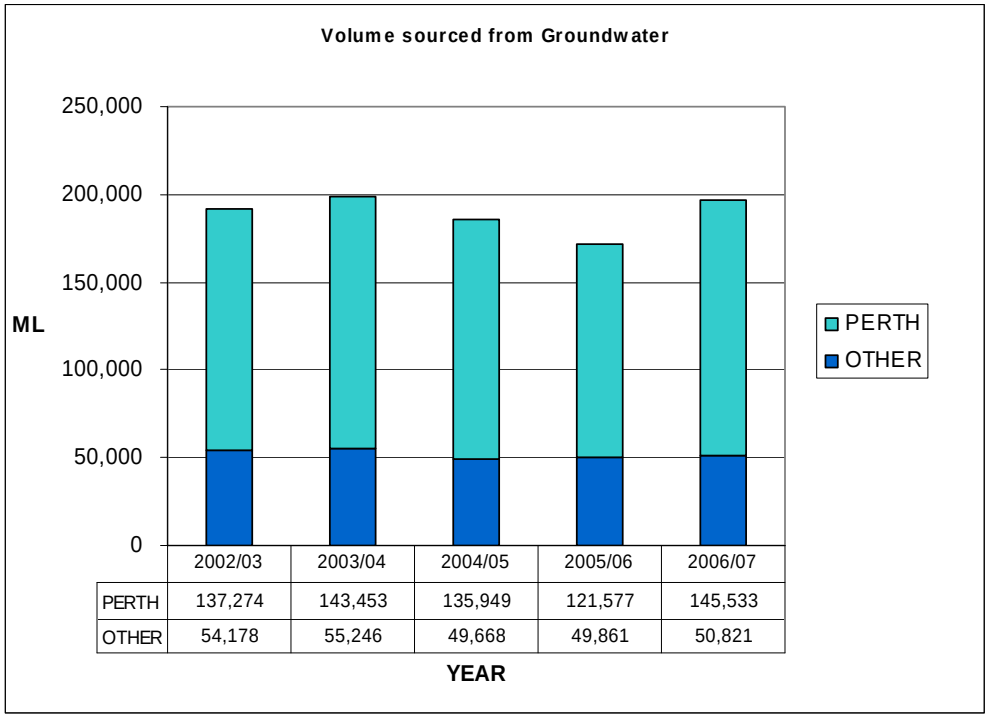


4.2.3 Water Sourced from Groundwater

Groundwater is water abstracted from groundwater sources. It excludes volumes sourced from groundwater supplies that have been artificially recharged using sources of water that have been counted elsewhere i.e. from rivers, desalination or recycling sewerage plants.

Figure 7 shows that, in 2006/07, the total volume sourced from groundwater (196,354ML) increased by 14.5% compared to 2005/06 (171,438ML). The volume of groundwater sourced for consumption in Perth (145,533ML) increased by 19.7%, compared to 2005/06. In 2006/07, Perth was supplied with 74.1% of the total water sourced from groundwater.

Figure 7: Total volume of water sourced from groundwater



	2002/03	2003/04	2004/05	2005/06	2006/07
PERTH	137,274	143,453	135,949	121,577	145,533
OTHER	54,178	55,246	49,668	49,861	50,821

4.2.4 Water sourced from desalination

Desalinated water has contributed to the total water supply for the first time in 2006/07. Figure 3 and Figure 5 show that desalination has contributed 5.2% of total water sourced for all towns and that 100% of the desalination plant output was supplied to Perth, accounting for 7.1% of Perth's total sourced water in 2006/07.

4.2.5 Water sourced from recycling

The volume of water sourced from recycled water is defined in Appendix 1. Figure 2 shows that in 2006/07, the total volume of water sourced from recycling increased by 29.9%, compared to 2005/06, and Figure 3 shows that recycling has contributed 2.5% of total sourced water. Figure 4 shows that, in 2006/07, the volume of water sourced from recycling in Perth increased by 21.8%, compared to 2005/06. Figure 5 shows that, in 2006/07, recycling contributed 2.0% to Perth's total sourced water, up from 1.7% in 2005/06.

4.2.6 Water received from bulk supplier

Bulk water is water purchased from another utility or entity outside this utility's geographic area of responsibility (See Appendix 1). Figure 2 shows that, in 2006/07, the total volume of water sourced from bulk suppliers increased by 12.4%, compared to 2005/06. Figure 3 shows that, in 2006/07, the total volume of water received from bulk suppliers contributed 4.1% of the total water sourced, compared to 3.9% in 2005/06. Figure 4 shows that none of the water sourced from bulk suppliers is used in Perth.

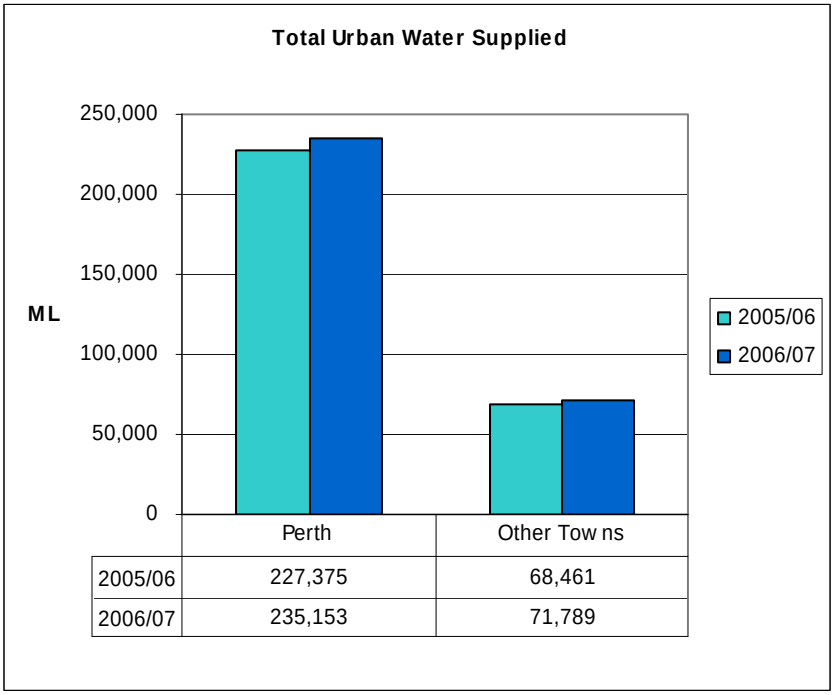
4.3 Uses of Water Supplied

4.3.1 Total Urban Water Supplied

Total urban water supplied is defined as the total metered volume of water (potable or non-potable) supplied to customers over the reporting period plus estimated non-metered water supplied. This comprises the sum of residential water supplied, commercial, municipal and industrial water supplied and other estimated water supplied.

Figure 8 shows that, in 2006/07, the total urban water supplied was 312,977 ML, of which 235,153 ML (75.1%) was supplied to Perth. The volume of water supplied to Perth increased by 3.4%, compared to 2005/06, and the volume supplied to other towns increased by 4.9% over the corresponding period[14]. In 2006/07, Jurien had the largest percentage increase in volume supplied (26.2%), while South Hedland the largest percentage decrease (17.8%).

Figure 8: Total urban water supplied (All Towns)



	Perth	Other Towns
2005/06	227,375	68,461
2006/07	235,153	71,789

4.3.2 Average annual residential water supplied

Table 1 shows that, in 2006/07, the average residential property in Perth consumed 26% less water than the average WA town (including Perth). Since 2005/06, residential water consumption per property in Perth has increased at a lower rate (4.8%) than the average town (8.2%). Consumers in Perth have been subject to water restrictions throughout the reporting period, whereas other towns, such as Bunbury and Busselton have only been subject to water restrictions from 1 October 2007.

Across the State, Port Hedland had the highest average annual residential water consumption (663 kL/property) and Denmark had the lowest consumption (190 kL/property). This is reflective of very different climatic conditions in these towns. It is interesting to note that, while Denmark had the lowest annual residential water

[14] Data for Bunbury in 2005/06 was not available.

consumption of the 32 towns, average consumption in 2006/07 grew by 21.0%, compared to 2005/06.

Table 1: Average annual residential water supplied per property

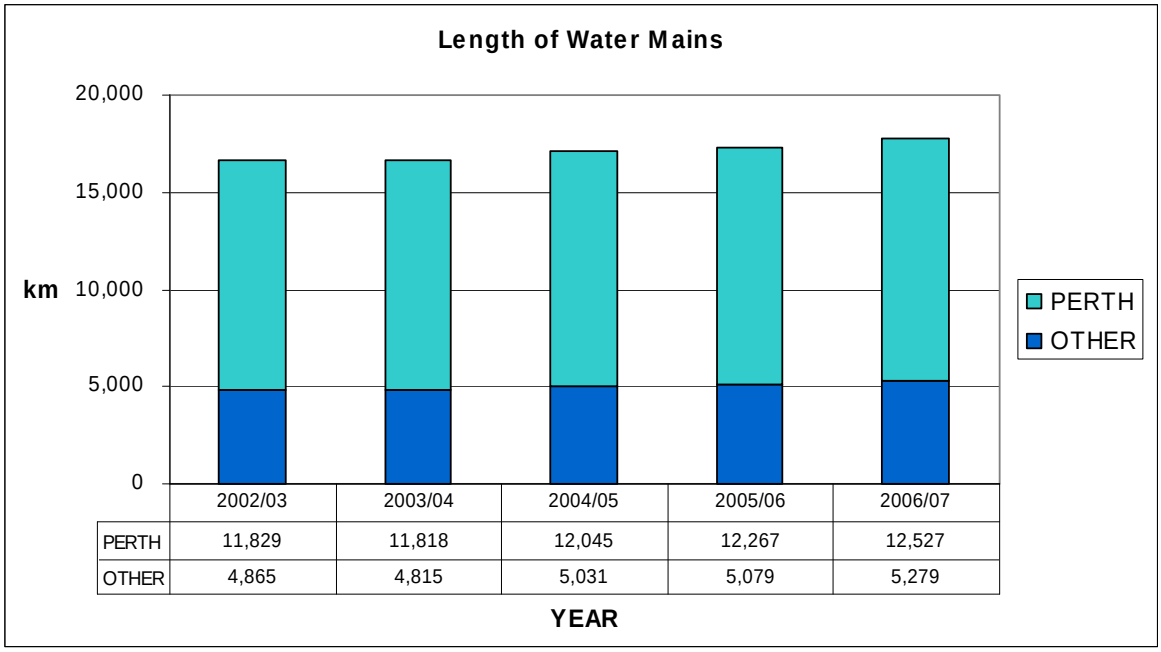
Data	Average Annual residential water supplied per property (kL/property) YEAR		Percentage Change
	2005/06	2006/07	%
Perth	268	281	4.8
Highest in 2006/07 (Port Hedland)	629	663	5.4
Lowest in 2006/07 (Denmark)	157	190	21.0
Average of all 32 Towns	353	382	8.2
Average of all Towns less Perth	360	390	8.3

4.4 Asset

4.4.1 Water Mains

Figure 9 shows that, in 2006/07, the length of water mains increased by 2.6% since 2005/06, and by 6.7% since 2002/03. Water mains increased by 2.1% in Perth and by 3.9% in all towns (excluding Perth) during 2006/07. Perth accounts for 70.4% of the total length of water mains in service. During 2006/07, Jurien experienced the largest percentage growth in mains (25.8%), while Collie, Derby, Katanning, Kununurra, Merredin and South Hedland had no change to the length of water mains.

Figure 9: Length of water mains



4.4.2 Properties Connected per kilometre of water mains

Table 2 shows that, in 2006/07, Perth had 54 properties served per km of water main and the average town (excluding Perth) had 30 properties served, both unchanged from 2005/06. The average number of properties served in Perth is 74.2% higher than the average town (excluding Perth), which reflects the greater urban density when compared to the average regional town. The highest number of properties served was in Newman (57) and the lowest was in Merredin and Carnarvon (13).

Table 2: Properties served per kilometre of water main

Data	Properties served per km of water main		Percentage Change
	YEAR		
	2005/06	2006/07	%
Perth	54	54	0
Highest in 2006/07 (Newman)	56	57	1.8
Lowest in 2006/07 (Merredin and Carnarvon)	13	13	0
Average of all 32 Towns	31	31	0
Average of all Towns less Perth	30	30	0

4.4.3 Water Main Breaks

Table 3 shows for 2006/07, Perth experienced 34% less water main breaks per 100 kilometres of mains than the average town (excluding Perth). The level of water main breaks in Perth (13.1) was 10.9% less that that in 2005/06. In 2006/07, Jurien had the lowest level of water main breaks (5.1) and Port Hedland had the greatest number of water main breaks (70.1). Among other things, the level of water main breaks is influenced by the type of mains infrastructure (above ground and below ground), the age of the mains and local geological conditions, particularly soil types.

Table 3: Water main breaks (per 100km of water main)

Data	Water main breaks per 100 km of water main - 2006/07
Perth	13.1
Highest in 2006/07 (Port Hedland)	70.1
Lowest in 2006/07 (Jurien)	5.1
Average of all 32 Towns	19.6
Average of all Towns less Perth	19.8

4.4.4 Water Treatment Plants providing full treatment

The definition of a water treatment plant providing full treatment can be found in Appendix 1.

This indicator can provide a partial explanation of a utility's relative operating cost and total cost as the operation of a full treatment plant is higher than a treatment plant that provides lower order treatment processes. Table 4 shows that, in 2006/07, Perth had 8 of

the 25 treatment plants providing full treatment across the State. The remaining 31 towns were supplied by 17 full treatment plants, which implies that some towns were supplied by treatment plants with lower order treatment processes.

Table 4: Water Treatment Plants providing full treatment

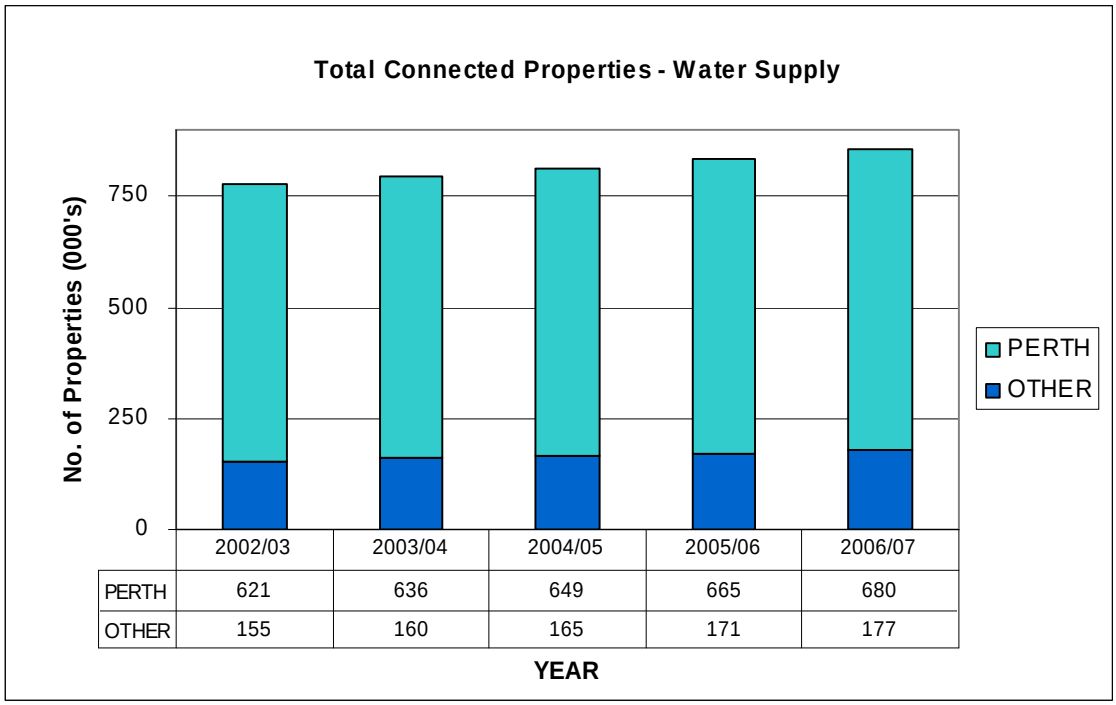
Data	No. of Water treatment plants - 2006/07
Perth	8
Total of all 32 Towns	25
Total of all Towns less Perth	17
Average no. per town	0.8
Average no. per town (Less Perth)	0.5

4.5 Customers

4.5.1 Connected Properties

The definition of a connected water property can be found in Appendix 1. Figure 10 shows that, during 2006/07, the total number of connected properties grew by 2.5% to 857,000 properties. The number of connected properties in Perth increased by 2.3% and in towns other than Perth by 3.5%. Since 2002/03, total connected properties have increased by 10.4%, with Perth experiencing growth of 9.5% and towns other than Perth experiencing growth of 14.2%. During 2006/07, Karratha had the largest percentage increase in connected properties (11.3%), while Derby the largest percentage decrease (1.6%).

Figure 10: Total connected properties – water supply (000's)



The higher rate of growth in connected properties in regional towns compared to Perth correlates with other statistics in this report, such as total sourced water, urban water supplied and length of water mains, and suggests there is a proportionately higher rate of development in the regional towns, compared to Perth.

4.5.2 Customer Service

4.5.2.1 Water Quality Complaints

Water quality complaints include any complaint regarding discolouration, taste, odour, stained washing, illness or cloudy water (See Appendix 1). Table 5 shows that, in 2006/07, the average number of complaints for all towns, including Perth, was 5.8 per 1,000 properties. In 2006/07, the number of complaints in Perth (6.8) was 39.8% lower than the number recorded in 2005/06 (11.3), and the all town average number of complaints was 16.9% lower (5.8). In 2006/07, Broome and Margaret River recorded the largest percentage increase in complaints (500%), while Derby, Jurien and South Hedland had the largest percentage decrease of 100%. In 2006/07, Collie recorded the highest number of water quality complaints (30.9).

Table 5: Water quality complaints

Data	Water Quality Complaints per 1,000 properties YEAR		Percentage Change
	2005/06	2006/07[15]	%
Perth	11.3	6.8	-39.8
Average of all Towns	6.9	5.8	-15.9
Average of all Towns less Perth	6.7	5.6	-16.4
Highest no. of Complaints in 2006/07 - Collie	14.3	30.9	116.1
Largest increase in 2006/07 - Broome	0.5	3.0	500.0
Largest increase in 2006/07 – Margaret River	0.6	3.6	500.0
Lowest no. of Complaints in 2006/07 -Derby	2.1	0.0	-100.0
Lowest no. of Complaints in 2006/07 - Jurien	0.8	0.0	-100.0
Lowest no. of Complaints in 2006/07 – South Hedland	0.5	0.0	-100.0

4.5.2.2 Water Service Complaints

Water service complaints include all complaints concerning bursts, leaks, service interruptions, adequacy of service, water pressure and water reliability (See Appendix 1). Table 6 shows that, in 2006/07, Perth recorded 11.1% less water service complaints than the average town. The highest level of recorded complaints was in Dongara/Port Denison (107.6) and Busselton recorded the lowest level of complaints (0.7).

[15] Bunbury Data is unavailable for 2005/06 and has been excluded from the average calculation

Table 6: Water service complaints

Data	Water Service Complaints per 1,000 properties - 2006/07[16]
Perth	21.7
Highest no. in 2006/07 (Dongara/Port Denison)	107.6
Lowest no. in 2006/07 (Busselton)	0.7
Average of all Towns	24.4
Average of all Towns less Perth	24.5

4.5.2.3 Average Duration of an Unplanned Interruption

An unplanned water supply interruption is when the customer has not received at least 24 hours notification of the interruption to supply. The average duration that a customer is without a drinking water supply is a partial indicator of customer service, the condition of the water network and the effectiveness of management. Table 7 shows that, in 2006/07, the average duration of an unplanned interruption for all towns (92.2 minutes) was 36% shorter than Perth (145 minutes). Bridgetown/Hester recorded the longest average unplanned interruption at 227.3 minutes, and Jurien the shortest at 16 minutes.

Table 7: Average Duration of an Unplanned Interruption

Data	Average Duration of an unplanned interruption (minutes) - 2006/07
Perth	145.0
Highest no. in 2006/07 (Bridgetown/Hester)	227.3
Lowest no. in 2006/07 (Jurien)	16.0
Average of all Towns	92.2
Average of all Towns less Perth	90.5

4.5.2.4 Customer Interruption Frequency

Customer interruption frequency is a partial indicator of service quality, reliability and customer satisfaction.

Table 8 shows that, in 2006/07, the average customer in Perth experienced 56% less interruptions than the average customer in regional towns. Dongara/Denison recorded the highest interruption frequency (793.6) and Bunbury recorded the lowest frequency (0.2).

[16] Bunbury Data is unavailable for 2006/07 and has been excluded from the average calculation

Table 8: Customer Interruption frequency (per 1,000 properties)

Data	Customer Interruption Frequency- Water (per 1,000 properties)- 2006/07
Perth	63.5
Highest no. in 2006/07 (Dongara/Port Denison)	793.6
Lowest no. in 2006/07 (Bunbury)	0.2
Average of all Towns	142.0
Average of all Towns less Perth	144.5

4.6 Health - Water Quality Compliance

The definition of a water supply zone can be found in Appendix 1. Table 9 and Table 10 show that Perth has 31.6% of the total number of zones where compliance with microbiological and chemical health standards were measured. All zones achieved 100% compliance with the microbiological and chemical health standards in 2006/07.

Table 9: Zones and Population (%) where microbiological compliance was achieved

Data	Number of Zones where microbiological compliance was achieved - 2006/07	Percentage of Population where microbiological compliance was achieved - 2006/07
All Towns	76/76	100%
Perth	24/24	100%
All Towns less Perth	52/52	100%

Table 10: Zones where chemical compliance was achieved

Data	Number of Zones where chemical compliance was achieved - 2006/07
All Towns	76/76
Perth	24/24
All Towns less Perth	52/52

5 Other Small Water Providers

5.1.1 Small Potable Water Providers

Rottnest Island Authority and Hamersley Iron are two small potable water providers licensed by the Authority.

Hamersley Iron is licensed by the Authority to supply potable water in 3 towns (Dampier, Paraburdoo and Tom Price). Pilbara Iron, a division of Rio Tinto, is the asset manager for the water supply schemes operated by Hamersley Iron.

The potable water for Paraburdoo and Tom Price is sourced from artesian bores while the potable water supply for Dampier is sourced from a bulk water supply from the Water Corporation.

Rottnest Island Authority (RIA) holds an operating licence to supply potable water on Rottnest Island. Currently, RIA supplies potable water to 420 residential and non-residential connections. Saline water bores supply two desalination trains, whose output is then pumped to storage tanks.

Table 11 shows that, in 2006/07, the total volume of potable water supplied by RIA increased by 33.1% and the volume supplied by Hamersley Iron increased by 17.1%, compared to 2005/06.

Table 11: Volume of Potable water supplied

Data	Volume of Potable water supplied (kL)	
	2005/06	2006/07
Rottnest Island Authority	108,575	144,553
Hamersley Iron	3,089,554	3,617,077
Total	3,198,129	3,761,630

During 2006/07, there was no change to the number of water service connections, for both RIA (420 connections) and Hamersley Iron (2,402 connections). Table 12 shows the total length of the water supply mains has also remained unchanged.

Table 12: Length of Water Supply Mains

Data	Length of Water supply Main (km)	
	2005/06	2006/07
Rottnest Island Authority	20	20
Hamersley Iron	106	106
Total	126	126

Table 13 shows that, in 2006/07, the total number of leaks and bursts recorded by RIA reduced by 33.3%, compared to 2005/06, whereas those recorded by Hamersley Iron increased by 21.4%. The increase recorded by Hamersley Iron is mainly attributable to the Paraburdoo and Tom Price systems, where a proactive leak detection program led to the detection of an increased number of leaks and bursts, compared to 2005/06. In

Dampier, work is progressing on a 5 year program to replace water service connections on mains, which are the major cause of leaks. This initiative has already resulted in a 61.5% reduction in the level of leaks/bursts recorded during 2006/07.

Table 13: Number of Leaks or Bursts

Data	No. of Leaks and Bursts	
	2005/06	2006/07
Rottnest Island Authority	3	2
Hamersley Iron	42	51
Total	45	53

Table 14 shows that, in 2006/07, the number of confirmed interruptions to drinking water services for RIA reduced by 33.3%, compared to 2005/06. Hamersley Iron recorded had an increase of 95.1% during the same period. The Hamersley Iron interruptions were all caused by planned maintenance related to a program of works to install additional valves to reduce the number of properties interrupted when isolations occur due to maintenance or repairs. This work will be ongoing during 2007/08.

Table 14: Number of Confirmed Interruptions to drinking water services

Data	No. of Confirmed Interruptions to drinking water services	
	2005/06	2006/07
Rottnest Island Authority	3	2
Hamersley Iron	1,233	2,406
Total	1,236	2,408

The number of written customer complaints in 2006/07 is nil for both RIA and Hamersley Iron. This is the same result as in 2005/06.

5.1.2 Small Non-Potable Water Providers

The Shire of Denmark and the Shire of Northampton are two small non-potable water providers licensed by the Authority.

The Shire of Denmark has a water services licence to provide non-potable water to 203 leasehold holiday use lots at Peaceful Bay, primarily for watering the gardens and toilet flushing. The assets consist of a production bore, storage dam, and pumping station.

The Shire of Northampton has a water services licence to provide non-potable water supplies to 52 properties at Port Gregory for ablutions, garden watering and wash down purposes only. The assets consists of 2 bores located some 6 Km north east of the town site, an elevated storage tank, a 4.5km pipeline, two storage tanks located above the town site and a reticulation system connecting to the 52 properties.

Table 15 shows that, in 2006/07, the volume of non-potable provided for the Shire of Denmark has remained unchanged from 2005/06 and the volume supplied by the Shire of Northampton decreased by 3.7% over the same period.

Table 15: Volume of Non-Potable Water Supplied

Data	Volume of Non Potable water supplied (kL)	
	2005/06	2006/07
The Shire of Denmark (Peaceful Bay)	45,000	45,000
The Shire of Northampton (Port Gregory)	49,254	47,430
Total	94,254	92,430

Table 16 and Table 17 shows that, during 2006/07, there was no change to the length of water supply mains and the number of water service connections for both the Shire of Denmark and the Shire of Northampton.

Table 16: Length of Water Supply Mains

Data	Length of Water supply Mains (kM)	
	2005/06	2006/07
The Shire of Denmark (Peaceful Bay)	1.8	1.8
The Shire of Northampton (Port Gregory)	18	18
Total	19.8	19.8

Table 17: Number of water service connections

Data	No. of water service connections	
	2005/06	2006/07
Shire of Denmark (Peaceful Bay)	203	203
Shire of Northampton (Port Gregory)	52	52
Total	255	255

Table 18 shows the total number of emergency calls requiring a response for the 2 licensees has decreased by 11.1% in 2006/07 when compared to the 2005/06 financial year. The Shire of Northampton recorded all of the emergency calls requiring a response (8) during 2006/07.

Table 18: Total No. of emergency calls requiring a response

Data	Total No. of emergency calls requiring a response	
	2005/06	2006/07
Shire of Denmark (Peaceful Bay)	1	0
Shire of Northampton (Port Gregory)	8	8
Total	9	8

Both the Shire of Denmark and Shire of Northampton recorded zero written customer complaints during 2006/07.

On 13 November 2007, The Governor of Western Australia granted the Shire of Northampton a licence exemption to operate the Port Gregory non-potable water supply service for a period of 2 years. As a consequence, and at the request of the Shire of Northampton, the Authority has revoked the Shire of Northampton's Operating Licence effective from 13 December 2007.

PART B: WASTEWATER PERFORMANCE INFORMATION

6 NWI Format Wastewater Performance Information

6.1 Covered Wastewater Schemes

Wastewater schemes for the following 22 WA Towns are included in the analysis of wastewater performance:

Albany	**Karratha**
Australind/Eaton	**Katanning**
Broome	**Kununurra**
Bunbury	**Mandurah**
Busselton	**Manjimup**
Collie	**Merredin**
Dunsborough/Yallingup	**Narrogin**
Esperance	**Newman**
Geraldton	**Northam**
Jurien	**Perth**
Kalgoorlie/Boulder	**South Hedland**

All of wastewater schemes are managed by the Water Corporation, with the exception of Kalgoorlie/Boulder, which is managed by the City of Kalgoorlie/Boulder. The performance data for all the above towns has been provided in a format consistent with the national Urban Framework.

6.2 Sewage Collected per total property

Sewage collected is defined as the total volume of sewage collected by the utility, measured as treatment plant inflow, plus sewage treated by another business on behalf of the water utility e.g. wholesaler. The purpose of this indicator is to provide an overview of the volume of sewage collected by the utility.

Table 19 shows that, in 2006/07, the all town average sewage collected per property was 191 kL per property, a decrease of 11.2% compared to 2005/06. Over the same period the sewage collected per property in Perth fell by 3.0% and in the average regional town by 11.6%. Of the 21 towns[17] that provided volume of sewage per property data, 16 reported decreases in volume, 3 reported increases in volume and 2 reported no change. In 2006/07, Kununurra recorded the largest volume of sewage collected per property (321kL) and Jurien recorded the smallest volume (95kL). South Hedland recorded the largest fall in sewage collected, a reduction of 45.2% to 240kL.

Table 19: Sewage Collected per total property

Data	Sewage collected per total property (kL per property)		Percentage Change
	YEAR		
	2005/06	2006/07	%
Perth	198	192	-3.0
Average of all Towns	215	191	-11.2
Average of all Towns less Perth	216	191	-11.6
Largest volume of sewage collected per property in 2006/07 - Kununurra	330	321	-2.7
Smallest volume of sewage collected per property in 2006/07 - Jurien	157	95	-39.5
Largest % increase in 2006/07 – Northam	133	153	15.0
Largest % decrease in 2006/07 – South Hedland	438	240	-45.2

[17] Data from Newman was unavailable

6.3 Uses of Recycled Water

6.3.1 Total recycled water supplied

Total recycled water supplied is the sum of all treated effluent that is used by either the water utility itself, a business supplied by the water utility, or supplied through a third pipe system for urban reuse. The volume of recycled water supplied is an indirect measure of the volume of potable/non-potable water that is not being consumed for non-potable purposes.

Table 20 shows that, in 2006/07, Perth accounted for approximately 46% of the total recycled water supplied. In 2006/07, the volume of recycled water supplied in Perth grew by 14.6% to 6,958ML. The average volume supplied in regional towns was 430ML per town.

Table 20: Total recycled water supplied

Data	Total Recycled water supplied (ML) - 2006/07
Perth	6,958
Highest volume in 2006/07 (Perth)	6,958
Lowest volume in 2006/07 (Collie, Jurien, Kununurra)	0
Average of all Towns[18]	757
Average of all Towns less Perth	430
All Town total	15,135

6.3.2 Recycled Water (% of Effluent Recycled)

This indicator measures the percentage of treated sewage (effluent) that is used to supply recycled water. Table 21 shows that, in 2006/07, Perth recycled 6% of the effluent treated whereas the average regional town reused 51.7%. In 2006/07, the percentage of effluent recycled in Perth grew by 15.4%, compared to 2005/06. Table 21 shows that 5 towns recycle 100% of their effluent and 3 towns do not recycle any effluent.

Table 21: Recycled water (% of effluent recycled)

Data	Recycled water (% of Effluent Recycled) - 2006/07
Perth	6.0
Highest volume in 2006/07 (Albany, Australind/Eaton, Broome, Manjimup and South Hedland)	100.0
Lowest volume in 2006/07 (Collie, Jurien and Kununurra)	0.0
Average of all Towns[19]	49.5
Average of all Towns less Perth	51.7

[18] Excluding Bunbury and Newman as no data was provided for 2006/07

[19] Excluding Bunbury and Newman as no data was provided for 2006/07

6.4 Asset

6.4.1 Length of sewerage mains and channels (km)

A sewer main is defined as a reticulation mains including all gravity sewer mains, all pressure mains (including common effluent pipelines, rising mains etc) and all vacuum system mains of any diameter. This excludes property connection sewers and pipelines carrying treated effluent.

Figure 11 shows that, in 2006/07, the total length of sewerage mains and channels has increased by 2.6%, compared to 2005/06. During this period, sewerage mains grew by 2.2% in Perth and by 4.2% in regional towns. In 2006/07, Perth accounted for 78.3% of all sewerage mains and channels. In 2006/07, the largest percentage growth in sewerage mains and channels occurred in Jurien (36.8%), Karratha (10.0%) and Busselton (8.7%). Kalgoorlie/Boulder, Katanning, Kununurra, Manjimup, Merredin, Narrogin, Newman and South Hedland showed no increase in the sewerage mains during 2006/07.

Figure 11: Length of sewerage mains and channels

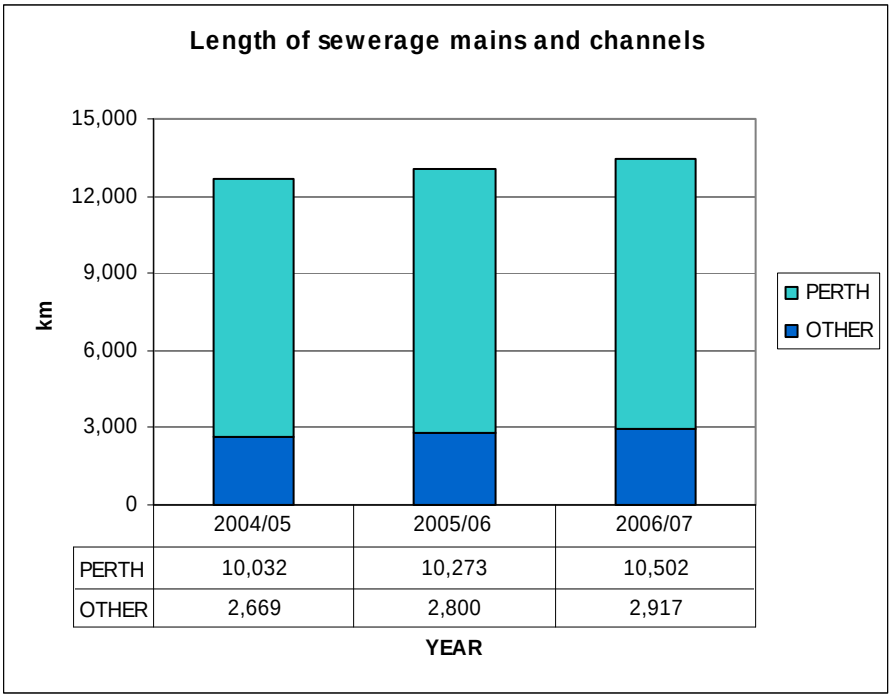
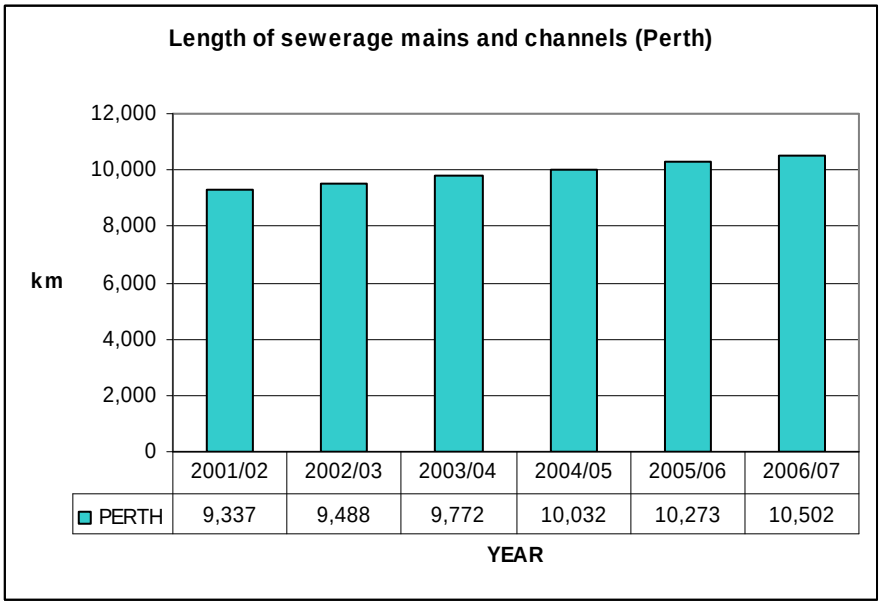


Figure 12 shows that between 2001/02 and 2006/07, the length of Perth's sewerage mains and channels has grown by 12.5%, equating to a compound growth of 0.66% per annum.

Figure 12: Length of sewerage mains and channels (Perth)



6.4.2 Properties served per km of sewer main

The purpose of this indicator is to report on the spatial density of properties served by the sewerage mains. Table 22 shows that, during 2006/07, the all town average has remained unchanged at 42 properties per km. In 2006/07, Perth had 57 properties per km of sewer main and the average regional town had 41 properties. In 2006/07, Newman had the highest density of properties served at 67 per km of mains and Jurien had the lowest density at 20 properties per km. Jurien also recorded the largest fall in properties served (-23.1%) and Kalgoorlie-Boulder recorded the largest increase (14.3%).

Table 22: Properties served per km of sewer main

Data	Properties served per km of sewer main (No. Properties per km)		Percentage Change
	YEAR		
	2005/06	2006/07	%
Perth	57	57	0.0
Average of all Towns	42	42	0.0
Average of all Towns less Perth	41	41	0.0
Highest no. of properties served per km of sewer main in 2006/07 - Newman	67	67	0.0
Lowest no. of properties served per km of sewer main in 2006/07 - Jurien	26	20	-23.1
Largest % increase in 2006/07 – Kalgoorlie/Boulder	56	64	14.3
Largest % decrease in 2006/07 – Jurien	26	20	-23.1

6.4.3 Sewer main breaks and chokes

The purpose of this indicator is to report the number of sewer main breaks and chokes in the sewerage system operated by the water utility. It is a partial indicator of customer service and the condition of the sewerage network and may also be used to compare customer service. A choke is defined as a confirmed partial or total blockage that may or may not result in a spill to the external environment from the sewer system.

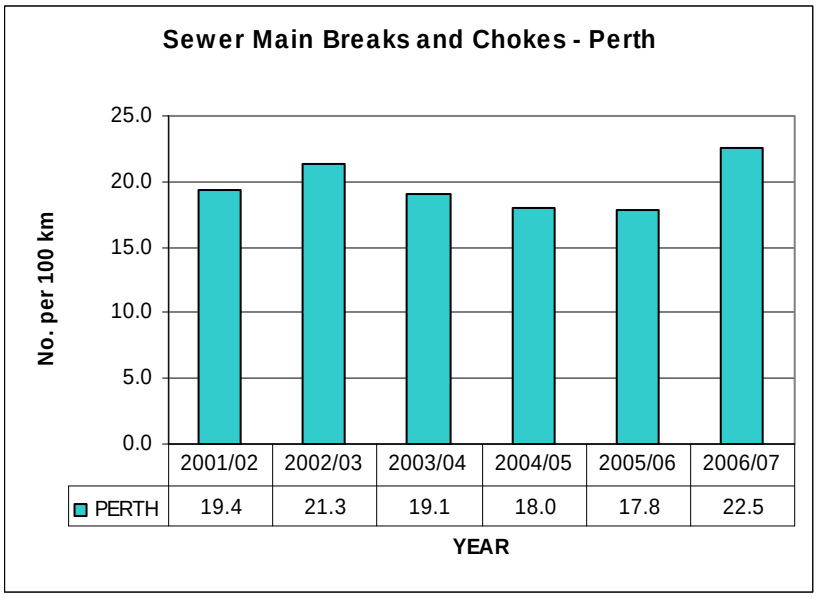
Table 23 shows that, in 2006/07, Perth recorded 9.2% more sewer main breaks and chokes (22.5) compared to the average regional town (20.5). In 2006/07, Australind/Eaton had the lowest number of sewer main breaks and chokes (4.3) and Narrogin had the highest number of sewer main breaks and chokes (67.1).

Table 23: Sewer main breaks and Chokes per 100 km

Data	Sewer Main Breaks and Chokes (No. per 100 km) - 2006/07
Perth	22.5
Average of all Towns	20.6
Average of all Towns less Perth	20.5
Highest no. of sewer main breaks and chokes per 100 km in 2006/07 - Narrogin	67.1
Lowest no. of sewer main breaks and chokes per 100 km in 2006/07 – Australind/Eaton	4.3

Figure 13 shows that, in 2006/07, Perth had 26.4% more sewer main breaks and chokes, compared to 2005/06. In 2006/07, Perth recorded 14.2% more breaks and chokes than the 6 year average of 19.7 breaks and chokes.

Figure 13: Sewer main breaks and chokes per 100 km of mains (Perth)

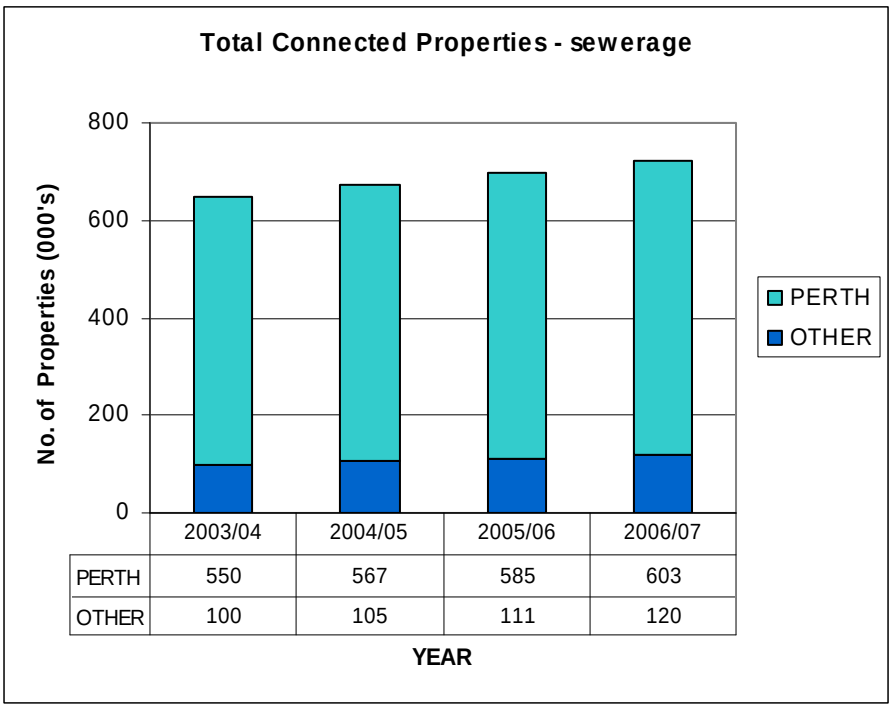


6.5 Customers

6.5.1 Total connected Properties – sewerage (000's)

The definition of a connected sewerage property can be found in Appendix 1. Figure 14 shows that, in 2006/07, the total connected properties for all towns was 723,000, an increase of 3.9% compared with 2005/06. Perth accounted for 83.4% of the total sewerage connections in 2006/07. In 2006/07, the number of connections in Perth increased by 3.1% and in the average regional town by 8.1%, compared to 2005/06.

Figure 14: Total connected properties – sewerage (000's)



6.5.2 Number of Sewerage Odour complaints (per 1,000 properties)

This is a partial indicator of customer satisfaction with the sewerage service. It may also indicate problems with the treatment plant (i.e. the type of process or the operation of the plant), possible septic sewage (odours at sewage pumping stations), sewer main breaks and chokes or sewer overflows to the environment. Complaints where the utility can prove beyond reasonable doubt that the odour was attributable to an external source are excluded.

Table 24 shows that the overall level of odour complaints recorded in 2006/07 (0.9 per 1,000 properties) was unchanged from 2005/06. In 2006/07, Perth recorded 11.1% more complaints than in 2005/06 but the average regional town remained unchanged at 0.9 complaints. In 2006/07, Busselton recorded the highest level of odour complaints (4.5) and Esperance, Jurien, Kalgoorlie/Boulder, Narrogin and Newman recorded zero odour complaints. In 2006/07, Albany recorded the largest increase in odour complaints (600%) and Broome recorded the largest fall in odour complaints (-92.3%), compared to 2005/06.

Table 24: Number of sewerage odour complaints (per 1,000 properties)

Data	Number of sewerage odour complaints (per 1,000 properties)		Percentage Change
	YEAR		
	2005/06	2006/07	%
Perth	0.9	1.0	11.1
Average of all Towns	0.9	0.9	0.0
Average of all Towns less Perth	0.9	0.9	0.0
Highest no. of sewerage odour complaints (per 1,000 properties) in 2006/07 - Busselton	1.7	4.5	164.7
Lowest no. of sewerage odour complaints (per 1,000 properties) in 2006/07- Esperance, Jurien, Kalgoorlie/Boulder, Narrogin, Newman	0.0	0.0	0.0
Largest % increase in 2006/07 – Albany	0.4	2.8	600.0
Largest % decrease in 2006/07 – Broome	2.6	0.2	-92.3

6.5.3 Sewerage service complaints (per 1,000 properties)

The purpose of this indicator is to report customer satisfaction with sewerage service and provide a partial indicator of service quality and reliability. Sewerage service complaints include all complaints concerning sewer blockages and spills, trade waste services, sewerage system reliability and all other sewerage issues. It does not include complaints relating to sewage odours, government pricing policy or tariff structures.

Table 25 shows that the overall level of service complaints recorded in 2006/07 (7.9 per 1,000 properties) increased by 5.3%. In 2006/07, Perth recorded 37.5% more service complaints and the average regional town 5.3% more service complaints, compared to 2005/06. In 2006/07, Kalgoorlie/Boulder recorded the highest level of service complaints (29.9) and Esperance recorded the lowest number of service complaints (3.0). In 2006/07, Manjimup recorded the largest increase in service complaints (168.2%) and Jurien recorded the largest fall in service complaints (-68.3%), compared to 2005/06.

Table 25: Number of sewerage service complaints (per 1,000 properties)

Data	Number of sewerage service complaints (per 1,000 properties)		Percentage Change
	YEAR		
	2005/06	2006/07	%
Perth	5.6	7.7	37.5
Average of all Towns	7.5	7.9	5.3
Average of all Towns less Perth	7.5	7.9	5.3
Highest no. of sewerage service complaints (per 1,000 properties) in 2006/07 – Kalgoorlie/Boulder	25.6	29.9	16.8
Lowest no. of sewerage service complaints (per 1,000 properties) in 2006/07- Esperance	2.4	3.0	25.0
Largest % increase in 2006/07 – Manjimup	4.1	11.0	168.2
Largest % decrease in 2006/07 – Jurien	6.3	2.0	-68.3

6.6 Environment

6.6.1 Comparative Sewage Treatment Levels

The purpose of these indicators is to report the degree to which sewage is required to be treated. This is an important cost driver for the water utility with respect to both capital costs and operating costs. Definitions of the different levels of sewage treatment can be found in Appendix 1.

Figure 15 shows that, in 2006/07, the average town (including Perth) had approximately 58% of its sewage treated to a secondary level and approximately 42% of its sewerage treated to a tertiary level, which is unchanged from 2005/06.

Figure 15: Comparative sewage treatment levels (Perth)[20]

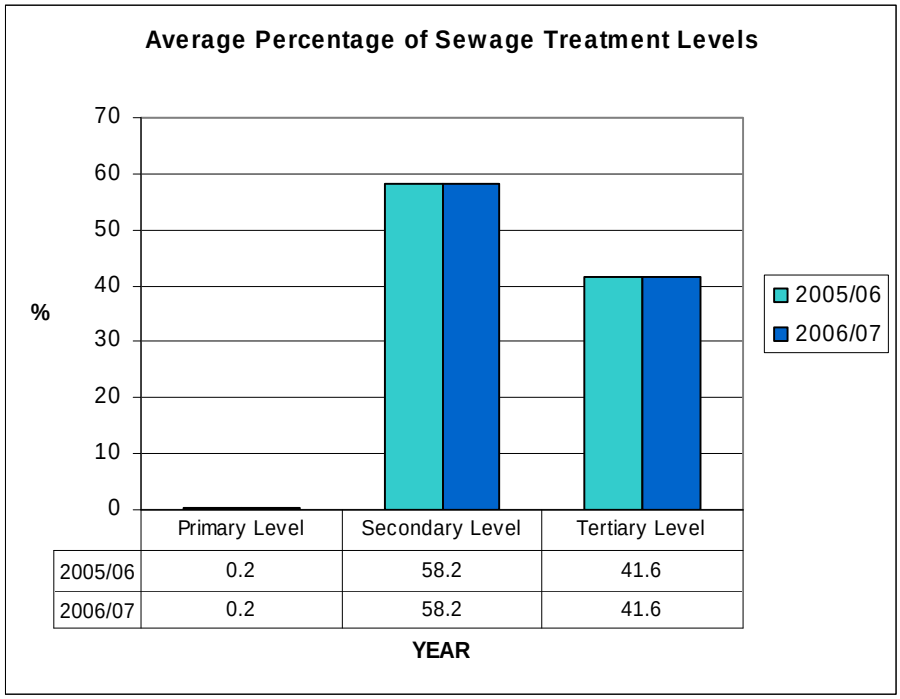
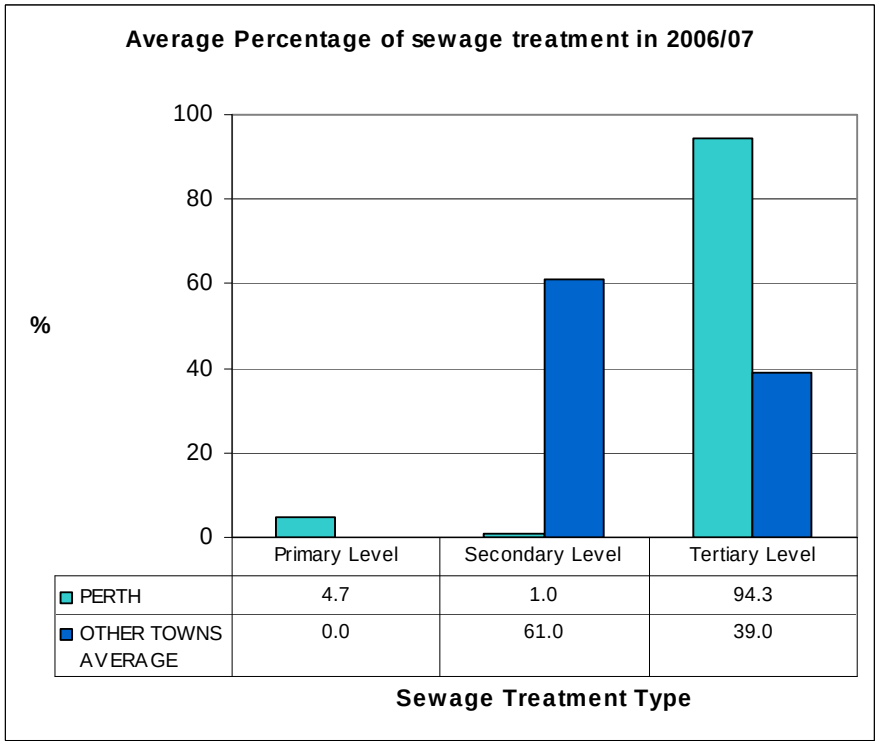


Figure 16 shows that, in 2006/07, 94.3% of Perth's sewage was treated to a tertiary level, 1% to secondary level and 4.7% to Primary level. This contrasts with the average town (excluding Perth), where 61% of sewage was treated to a secondary level and 39% to a tertiary level.

Figure 16: Comparative sewage treatment levels (All Towns ex-Perth) - 2006/07



[20] Does not include Newman

6.6.2 Percent of sewage treated volume that was compliant (%)

The purpose of this indicator is to demonstrate the water utility's ongoing commitment to protection of the environment to which the treatment plant discharges. The sewage treatment plant compliance is the number of scheduled samples that complied with the environmental standards divided by the total number of scheduled samples in the reporting period.

In 2006/07, the following 16 towns achieved 100% compliance:

Albany	**Katanning**
Broome	**Kununurra**
Collie	**Manjimup**
Dunsborough/Yallingup	**Merredin**
Esperance	**Narrogin**
Geraldton	**Northam**
Jurien	**Perth**
Karratha	**South Hedland**

Table 26 shows that, in 2006/07, 86.2% of the volume of sewage treated in the average regional town was compliant with environmental standards, relatively unchanged from 2005/06. None of the volume of sewage treated in Bunbury/Dalyellup during 2005/06 and 2006/07 was compliant[21]. In 2006/07, the largest increase in the volume of sewage treated that was compliant was in Collie (33.3%) and the largest fall was in Australind/Eaton (-86.2%).

Table 26: Percent of sewage treated volume that was compliant

Data	Percent of sewage treated volume that was compliant (%)		Percentage Change
	YEAR		
	2005/06	2006/07	%
Perth	100.00	100.00	0.0
Average of all Towns[22]	87.0	86.8	-0.2
Average of all Towns less Perth	86.3	86.2	-0.1
Highest % in 2006/07 – 16 towns listed above	100.0 (15 towns) 75.0 (Collie)	100.0	0.0 (15 Towns) 33.3 (Collie)
Lowest % in 2006/07 – Bunbury/Dalyellup	0.0	0.0	0.0
Largest % increase in 2006/07 – Collie	75.0	100.0	33.3
Largest % decrease in 2006/07 – Australind/Eaton	60.0	8.3	-86.2

[21] The Bunbury treatment plant is subject to additional ministerial direction regarding environmental standards.

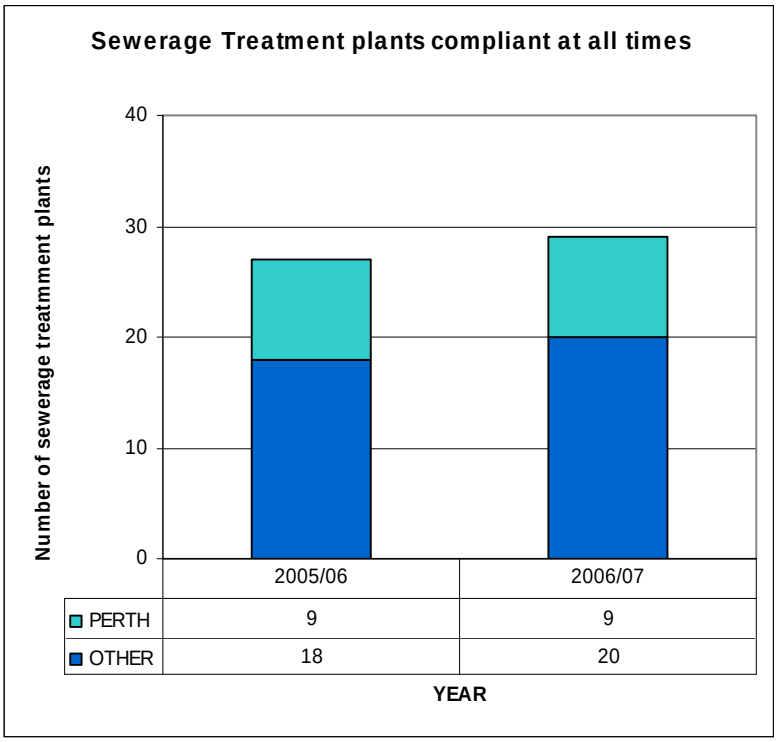
[22] Does not include Newman Data

6.6.3 Number of sewage treatment plants compliant at all times

The purpose of this indicator is to report on the number of sewage treatment plants which were compliant with the environmental licence conditions related to sewage treatment plant effluent at all times during the reporting period. This gives an indication of the overall performance of the utility's sewage treatment and, if problems exist, whether they are localised or widespread.

Figure 17 shows that, in 2006/07, the number of Perth sewerage treatment plants compliant at all times (9) has remained unchanged from 2005/06. In 2006/07, the number of sewerage treatment plants compliance in regional towns increased from 18 to 20. The increases occurred in Collie (0 to 1) and Karratha (2 to 3).

Figure 17: Number of sewerage treatment plants compliant at all times



6.6.4 Sewer Overflows to the environment (per 100 km of main)

The purpose of this indicator is to report sewer overflows which may adversely impact on water quality, human health and ecosystem stability, in the last case where they occur in sensitive areas. The number of overflows may be used as an indicator of the condition of the sewerage network, as an indication of how effectively the network is being managed and may also be used to compare customer service. The definition of sewer overflows to the environment can be found in Appendix 1.

Table 27 shows that, in 2006/07, the average number of sewerage overflows in all towns (10.4) decreased by 18.2%, compared to 2005/06. In 2006/07, the number of overflows in Perth (11.4) increased by 21.3% and the number of overflows in the average regional town (10.3) fell by 19.6%, compared to 2005/06. In 2006/07, Merredin recorded the highest number of overflows (35.5) and both Jurien and Esperance recorded zero

overflows. In 2006/07, Merredin recorded the largest percentage increase (545.5%) in overflows and Esperance recorded the largest percentage decrease (100%), compared to 2005/06.

Table 27: Sewer overflows to the environment

Data	Sewer Overflows to the environment (per 100km of main)		Percentage Change
	YEAR		
	2005/06	2006/07	%
Perth	9.4	11.4	21.3
Average of all Towns	12.7	10.4	-18.2
Average of all Towns less Perth	12.8	10.3	-19.6
Highest no. of sewer overflows in 2006/07 – Merredin	5.5	35.5	545.5%
Lowest no. of sewer overflows in 2006/07- Jurien	0.0	0.0	0%
Lowest no. of sewer overflows in 2006/07- Esperance	2.3	0.0	-100%
Largest % increase in 2006/07 – Merredin	5.5	35.5	545.5%
Largest % decrease in 2006/07 – Esperance	2.3	0.0	-100%

7 Small Sewerage Providers

7.1.1 Providers

The Authority licences 20 small suppliers of sewerage services in Western Australia including 18 local government authorities, Rottnest Island Authority and Hamersley Iron:

Hamersley Iron
Rottnest Island Authority
Shire of Brookton
Shire of Coolgardie
Shire of Dalwallinu
Shire of Dowerin
Shire of Dumbleyung
Shire of East Pilbara
Shire of Gnowangerup
Shire of Goomalling
Shire of Jerramungup
Shire of Kent
Shire of Koorda
Shire of Lake Grace
Shire of Moora
Shire of Morawa
Shire of Ravensthorpe
Shire of Victoria Plains
Shire of Wickepin
Shire of Yilgarn-Southern Cross
Shire of Yilgarn-Marvel Loch

The Shire of Yilgarn operates two sewerage schemes, located at the Southern Cross town site and Marvel Loch town site respectively. While they are owned by the single shire, the two schemes are considered separately for the purposes of this report.

Table 28 shows that, in 2006/07, the total length of sewer mains deployed by the small sewerage providers was 210,7km, which is a slight increase compared to 2005/06. Hamersley Iron operates the longest sewer mains of any of the small sewerage suppliers at 85km.

Table 28: Summary of data for small sewerage suppliers

Data	All Small Sewerage Suppliers	
	2005/06	2006/07
Total Length of Sewer Mains (km)	209.381	210.728
No. of Residential Sewerage connections	6,259	6,242
No. of Non Residential Sewerage connections	564	569
No. of Written Customer Complaints	0	0
No. of Odour Complaints	2	2
No. of Sewerage Blockages	109	93
No. of Sewerage overflows (attributable to blockage or infrastructure failure)	38	21
No. of Internal Sewerage overflows (attributable to blockage or infrastructure failure)	4	9
No. of Emergency calls	89	21
No. of Emergency calls responded to within 1 hour	89	21

In 2006/07, the number of residential (6,242) and non residential connections (569) is almost unchanged, compared to 2005/06.

No written customer complaints were received in both 2005/06 and 2006/07. The total amount of odour complaints in 2006/07 was 2, unchanged from 2005/06, both of which were made to the Shire of Brookton.

In 2006/07, the total number of recorded sewerage blockages (93) decreased by 14.6%, compared to 2005/06. The majority of these blockages were recorded by Hamersley Iron (34), who also recorded the largest reduction in blockages (-42.4%), compared to 2005/06. Conversely, Rottnest Island Authority has recorded an increase in blockages from 3 in 2005/06 to 33 in 2006/07.

In 2006/07, the total number of recorded sewerage overflows was 21, a decrease of 44.7% compared to 2005/06. Hamersley Iron recorded the most overflows in 2005/06 (12) and in 2006/07 (6).

In 2006/07, internal sewerage overflows attributable to blockage or infrastructure failure totalled 9. The Yilgarn - Southern Cross scheme accounted for 7 overflows, up from 4 in 2005/06.

The number of emergency calls (21) decreased by 76.4% in 2006/07, compared to 2005/06, which can be attributed to the reduction in the number of calls received by Hamersley Iron, who received 71 of the 89 emergency calls in 2005/06.

PART C: COMBINED WATER AND WASTEWATER PERFORMANCE INFORMATION

8 WA Towns/Schemes Included

The following WA Towns/Schemes are included in the analysis of combined water and wastewater performance information:

Albany	**Dongara / Denison**	**Mandurah**
Australind / Eaton	**Dunsborough**	**Manjimup**
Bridgetown/Hester	**Esperance**	**Margaret River Scheme**
Broome	**Geraldton (Water)**[23]	**Merredin**
Bunbury (Water)	**Geraldton**	**Narrogin**
Bunbury / Dalyellup	**Harvey/Wokalup**	**Newman**
Busselton (Water)	**Jurien**	**Northam**
Busselton	**Kalgoorlie/Boulder (W)**	**Perth**
Carnarvon	**Kalgoorlie/Boulder (S)**	**Pingarra**
Collie	**Karratha**	**Port Hedland**
Denmark	**Katanning**	**South Hedland**
Derby	**Kununurra**	**York**

This section groups the NWI performance indicators that apply to both water and wastewater supply schemes. The performance data for all the towns/schemes has been provided in a format consistent with the national Urban Framework.

The performance data in this section is derived from both water and sewerage service providers. In towns where the operators of the water and sewerage supply schemes are different then both sets of performance data are included in the report.

[23] While Geraldton water and wastewater are both managed by the Water Corporation, the information for each scheme has been supplied separately hence both schemes are listed in the table.

8.1 Total water and sewerage complaints

The purpose of this indicator is to report customer satisfaction with the water and sewerage services and provide an indicator of service quality and reliability.

For a summary of the definition of a complaint see Appendix 1. The total number of water or sewerage services complaints include those complaints concerning:

- bursts;
- leaks;
- service interruptions;
- adequacy of service;
- water pressure;
- water quality or reliability;
- sewerage service complaints;
- sewage odours;
- affordability;
- billings, and
- behaviour of staff or agents.

They do not include complaints regarding government pricing policy or tariff structures.

Table 29 shows that, in 2006/07, customers in Perth made 37.3 complaints, compared to 32.3 complaints in the average regional town. In 2006/07, Busselton Water Board received the lowest number of water and sewerage complaints (2.3) the Dongara/Dension water scheme recorded the highest number of complaints (125.3).

Table 29: Total water and sewerage complaints (per 1,000 properties)

Data	Total water and sewerage complaints (per 1,000 properties) - 2006/07
Perth	37.3
Average of all schemes[24]	32.4
Average of all schemes less Perth	32.3
Highest no. of total water and sewerage complaints per 1,000 properties in 2006/07 – Dongara /Denison Water Scheme	125.3
Lowest no. of total water and sewerage complaints per 1,000 properties in 2006/07 – Busselton (w)	2.3

8.2 Billing and Account complaints - water and sewerage

The purpose of this indicator is to report the level of billing and account complaints received for the utility's water supply and sewerage services. A billing and account complaint includes all complaints relating to account payment, financial loss or

[24] The data for Aqwest (Bunbury water scheme) was not available and has not been included in this data set.

overcharging, billing errors and affordability. Complaints regarding government pricing policy, tariff structures or when a correctly calculated bill is queried as too high are excluded.

Table 30 shows that, in 2006/07, customers in Perth made 1.1 complaints, compared to 1.0 complaints for the average regional town. In 2006/07, Derby, Kalgoorlie-Boulder (Wastewater), Narrogin and Port Hedland recorded no complaints and customers in Dunsborough/Yallingup made the highest number of complaints (2.9).

Table 30: Billing and account complaints – water and sewerage (per 1,000 properties)

Data	Billing and Account Complaints - water and sewerage (per 1,000 properties) - 2006/07
Perth	1.1
Average of all schemes[25]	1.0
Average of all schemes less Perth	1.0
Highest no. of Billing and Account complaints per 1,000 properties in 2006/07 – Dunsborough/Yallingup	2.9
Lowest no. of Billing and Account complaints per 1,000 properties in 2006/07 – Derby, Kalgoorlie/Boulder (Wastewater), Narrogin and Port Hedland	0.0

8.3 Average connect time to a telephone operator

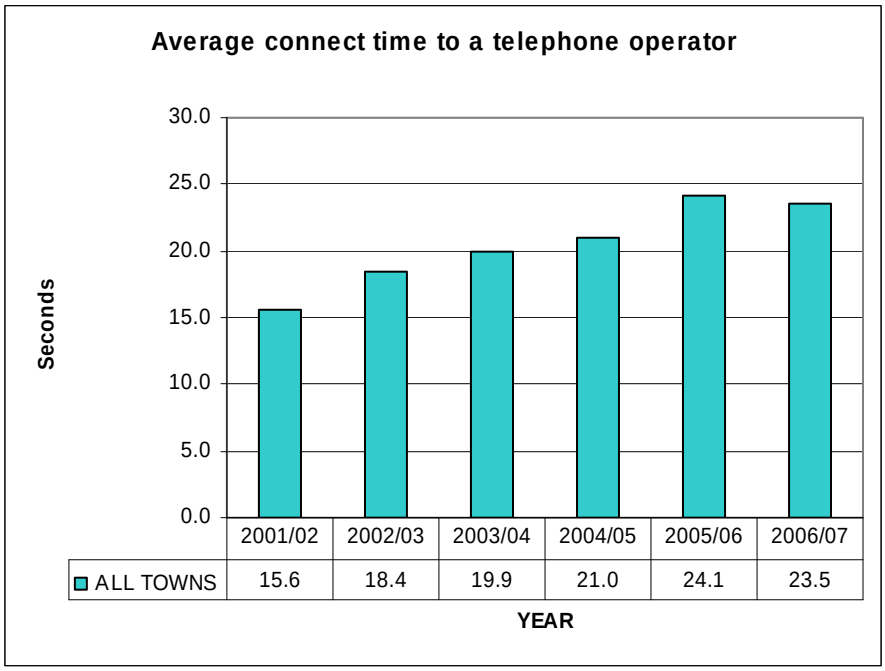
The purpose of this indicator is to report the average time a customer waits to be connected to an operator and is an element of customer service.

Water Corporation is the only water and wastewater service provider that operates a customer call centre, which handles calls for the whole of the State. The other service providers operate a simple telephone service, which is not capable of recording the average connect time.

In 2006/07, the average connect time to a telephone operator recorded by the Water Corporation was 23.5 seconds. Figure 18 shows that over the past 6 years the average connect time recorded by Water Corporation's has shown an upward trend. However, the 2006/07 average connect time is 2.5% lower than that in 2005/06.

[25] The data for Aqwest (Bunbury water scheme) was not available and has not been included in this data set.

Figure 18: Water Corporation average connect time to a telephone operator (2001-07)



PART D: IRRIGATION PERFORMANCE INFORMATION

9 Irrigation Suppliers

Part D of this report describes the performance of agencies providing irrigation services in Western Australia. This is the second time that the Authority has reported on the performance of irrigation suppliers. The data contained in this report is taken from the annual licence performance reports provided to the Authority by the irrigation licensees.

The agencies providing irrigation services to regional Western Australia are:

- Gascoyne Water Cooperative Ltd;
- Preston Valley Irrigation Cooperative;
- Ord Irrigation Cooperative Ltd; and
- South West Irrigation Management Cooperative (Harvey Water).

9.1 Characteristics

9.1.1 Volume of water supplied

Table 31 shows that, in 2006/07, the total volume of water supplied as irrigation water increased by 16.7% and the total volume of non-potable water decreased by 14.8%, compared to 2005/06. In 2006/07, the largest percentage of irrigation water was supplied by Ord Irrigation (71.1%) and the largest volume of non-potable water was supplied by Harvey Water (97.3%).

It should be noted that Preston Valley Irrigation has only begun measuring the non-potable water they are supplying during 2006/07.

Table 31: Volume of irrigation water and non-potable water supplied

Data	Volume of irrigation water supplied (kL)		Volume of non-potable water supplied (kL)	
	2005/06	2006/07	2005/06	2006/07
Gascoyne Water Cooperative	3,709,000	5,299,600	19,000	79,800
Ord Irrigation Cooperative	147,363,000	175,792,000	0	0
Preston Valley Irrigation	895,000	991,000	N/A	28,000
SWIMCO Harvey Water	59,706,000	65,010,000	4,662,000	3,880,000
Total	211,673,000	247,092,600	4,681,000	3,987,800

9.2 Customer Service Indicators

9.2.1 Irrigation and Non-Potable Water Connections

Table 32 provides details of the irrigation and non potable water supply connections. In 2006/07, Harvey Water accounted for 80.6% of the irrigation connections and 66.7% of the non-potable water connections.

It should be noted that Preston Valley Irrigation has only begun measuring the non-potable connections on their network during 2006/07.

Table 32: Number of irrigation connections and non-potable water supply connections

Data	Irrigation connections		Non-potable water supply connections	
	2005/06	2006/07	2005/06	2006/07
Gascoyne Water Cooperative	173	175	26	73
Ord Irrigation Cooperative	129	166	0	0
Preston Valley Irrigation	65	68	N/A	68
SWIMCO Harvey Water	1,289	1,697	238	282
Total	1,656	2,106	264	423

9.2.2 Complaints

Table 33 shows that the only irrigation agency to receive written customer complaints in both 2005/06 and 2006/07 was Harvey Water. The number of complaints received increased from 3 in 2005/06 to 14 in 2006/07, of which 71% were resolved within 21 days.

Table 33: Written customer complaints received by irrigation agencies

Data	Written customer complaints		Complaints resolved within 21 days	
	2005/06	2006/07	2005/06	2006/07
Gascoyne Water Cooperative	0	0	0	0
Ord Irrigation Cooperative	0	0	0	0
Preston Valley Irrigation	0	0	0	0
SWIMCO Harvey Water	3	14	3	10
Total	3	14	3	10

9.2.3 Faults

Table 34 shows the number of reported faults decreased from 13 in 2005/06 to 9 in 2006/07. In 2006/07, 89% of reported faults were repaired within 2 business days.

Table 34: Number of faults reported to irrigation agencies

Data	Number of faults		Faults repaired within 2 business days	
	2005/06	2006/07	2005/06	2006/07
Gascoyne Water Cooperative	2	1	2	1
Ord Irrigation Cooperative	0	3	0	3
Preston Valley Irrigation	1	1	1	1
SWIMCO Harvey Water	10	4	10	3
Total	13	9	13	8

9.3 Other Indicators

9.3.1 Water Quality

It can be seen in Table 35 that the quality of water varies quite markedly between the different irrigation operating areas, which reflects the local environmental conditions. The highest level of dissolved solids (>1200mg/L) was recorded by Harvey Water for the water sourced from the Wellington Dam and the lowest level (<5mg/L) was recorded by Ord Irrigation, who take their water from the M1 channel fed by the Ord River.

Table 35: Quality of water supplied by irrigation agencies

Data	Quality of water (Mg/L TDS[26])	
	2005/06	2006/07
Gascoyne Water Cooperative	<1000	<1,000
Ord Irrigation Cooperative	<500	<5
Preston Valley Irrigation	472	440
SWIMCO Harvey Water	Wellington >1,200 Harvey < 200 Waroona < 200	Wellington > 1,200 Harvey <200 Waroona <200

[26] Total Dissolved Solids

APPENDICES

Appendix 1: Summary of National Performance Framework Definitions

Please note this is a summary of some of the main definitions for reporting indicators used under the National Performance Framework. Further details can be found in the *National Performance Framework – 2006-07 urban performance reporting indicators and definitions (2007)*. This document can be sourced at the National Water Commission web site (http://www.nwc.gov.au).

Data/Indicator	Definition
Average connect time to a telephone operator	The average time taken for a caller to be connected to an operator should they elect to, or be required to do so. It does not include calls that are resolved by an automated system, or hang-ups.
Average sewerage break/choke repair time	The average time taken to repair a sewerage main, from the time of arrival on site to restoration of a sewerage service to customers. This may include bypassing of the broken main. Note: This does not include repair times relating to breaks, chokes and leaks in the property connection sewers or site restoration.
Biosolids	The stabilised organic solids derived from sewage treatment processes.
Complaint	Australian Standards define a complaint as an "expression of dissatisfaction made to an organization, related to its products, or the complaints-handling process itself, where a response or resolution is explicitly or implicitly expected." (AS ISO 10002-2006). Water Quality Complaints - The total number of complaints received by the water business that relate to water quality, including water quality complaints resulting from operational practices. With respect to water quality, this is any complaint regarding discolouration, taste, odour, stained washing, illness or cloudy water (e.g. caused by oxygenation), etc. Water Service Complaints - The total number of water service complaints received by the water utility. This includes all complaints concerning bursts, leaks, service interruptions, adequacy of service, water pressure and water reliability. Sewerage Odour Complaints - The total number of complaints received, except in the instance that the utility can prove beyond reasonable doubt that the odour was attributable to an external source. Sewerage Service Complaints - The total number of complaints received by the sewerage utility that relate to sewerage service quality and reliability. Includes all complaints concerning sewer blockages and spills, trade waste services, sewerage system reliability and all other sewerage issues. It does not include complaints relating to sewage odours, government pricing policy or tariff structures.
Overflow (Sewage)	This is when untreated sewage spills or discharges and escapes from the sewerage system (i.e. pumping stations, pipes, maintenance holes or designed overflow structures) to the external environment. Overflows are those caused by system faults originating in the system under the water utility's responsibility.
Length of water mains	The total length of potable and non-potable water mains, including all transfer, distribution and reticulation mains.

Data/Indicator	Definition
Length of sewer mains and channels	The total length of mains and channels, including all trunk, pressure and reticulation mains. It does not include lengths associated with property connection sewers or conduits carrying treated effluent.
Primary treatment	The first major treatment process in a sewage treatment facility, principally designed to remove a substantial amount of suspended matter, but little or no colloidal or dissolved matter.
Residential water supplied	Total metered and estimated non-metered, potable and non-potable water supplied to residential properties for the reporting period.
Secondary treatment	Typically, a biological treatment process that is designed to remove approximately 85 per cent of the Biological Oxygen Demand (BOD) and influent suspended solids. Some nutrients may incidentally be removed, and ammonia may be converted to nitrate.
Sewer main breaks and chokes	Breaks or Leaks - A break or leak is a failure of the sewer main which results in an interruption to the sewerage service. Choke - A confirmed partial or total blockage that may or may not result in a spill to the external environment from the sewer system.
Sewer mains	Sewer reticulation mains include all gravity sewer mains, all pressure mains (including common effluent pipelines, rising mains etc) and all vacuum system mains of any diameter. This excludes property connection sewers and pipelines carrying treated effluent.
Tertiary or advanced (sewerage) treatment	Principally designed to remove nutrients, such as phosphorus (typically <2 mg/L) and/or nitrogen (typically <15 mg/L). A high percentage of effluent suspended solids (typically >95 per cent) are also removed. Tertiary treatment may additionally target other contaminants of concern, e.g. toxicants and salt for discharges into sensitive waterways or reuse applications where high quality recycled water is required.
Total number of water main breaks	The total number of main breaks, bursts and leaks in all diameter mains for the reporting period. Breaks exclude those in the property service (i.e. mains to meter connection) and weeps or seepages associated with above ground mains that can be fixed without shutting down the main.
Total connected properties – water supply	A connected water/sewerage property is: 1. connected to the licensee's water/sewerage system 2. the subject of billing for water supply/sewerage collection—fixed and/or consumption , and 3. any property which, at the end of the reporting period, is connected to the water/sewerage system and is separately billed for water/sewerage services—fixed and/or consumption.
Total connected properties – sewerage	A connected water/sewerage property is: 1. connected to the licensee's water/sewerage system 2. the subject of billing for water supply/sewerage collection—fixed and/or consumption , and 3. any property which, at the end of the reporting period, is connected to the water/sewerage system and is separately billed for water/sewerage services—fixed and/or consumption.

Data/Indicator	Definition
Total recycled water supplied	The sum of all treated effluent that is used by either the water utility itself, a business supplied by the water utility, or supplied through a third pipe system for urban reuse. Evaporation is excluded. The parameters are the total sewage collected and the volume of effluent recycled.
Total sewage collected	Total volume of sewage collected by the utility, measured as treatment plant inflow, plus sewage treated by another business on behalf of the water utility e.g. wholesaler. Where only treatment plant outflow is measured, record this value and comment appropriately. This measure should equal the sum of volumes reported for residential, non-residential and non-trade sewage collected and trade sewage collected.
Total sourced water	This is the sum of the volumes reported above as supplied from dams, river extraction, groundwater, desalination, recycling and bulk supplier.
Total urban water supplied	The total metered volume of water (potable or non-potable) supplied to customers over the reporting period plus estimated non-metered water supplied. This comprises the sum of residential water supplied, commercial, municipal and industrial water supplied and other water supplied (includes estimated non-metered water supplied).
Volume of water sourced from surface water	The total volume of water (potable and non-potable) abstracted by the utility from surface water sources such as dams, rivers or irrigation channels during the reporting period.
Volume of water sourced from groundwater	The total volume of water abstracted from groundwater during the reporting period. To avoid double counting, this excludes volumes sourced from groundwater supplies that have been artificially recharged using sources of water that have been counted elsewhere i.e. from rivers, desalination plants or sewerage plants (recycling). Other forms of artificial recharge (i.e. storm water) not counted elsewhere are to be included.
Volume of water sourced from desalination	The total volume of water sourced from desalination plants during the reporting period.
Volume of water sourced from recycling	The total volume of water supplied by the water utility sourced from recycled water during the reporting period including recycled water from direct or indirect reuse. This should be the sum of residential, industrial/commercial, municipal irrigation. Water supplied for agribusiness by the utility should also be included where potable water (or raw supply to the potable system) would normally be used.
Volume of water received from bulk supplier	The total volume of water (potable and non-potable) purchased from another utility or entity outside this utility's geographic area of responsibility. The volume of water will include water which is subsequently exported (sold) to another utility.

Data/Indicator	Definition
Water treatment plant	An individual location receiving raw or partially treated water for treatment and ultimate delivery to customers. There may be more than one water treatment plant at an individual facility. Secondary or booster disinfection plants are not included, even where they have pH correction. Water treatment plants that provide fluoridation are classified as disinfection only. *Disinfection only* - The water treatment plant solely disinfects the water prior to supply to customers. This does not include booster disinfection plants or stations. *Further treatment* - The water treatment plant provides additional processes to serve a particular purpose. Whilst not meeting the requirements of full treatment (defined below), it may address some of the elements of full treatment. *Full treatment* - Generally, the water treatment plant is a substantial structure involving multiple treatment methods to achieve high quality water. The treatment plant would generally include processes that remove colour and/or turbidity as well as providing filtration and disinfection. In addition to the above, it may include processes for taste and/or odour reduction, softening, pH correction and the targeted removal of elements and compounds such as iron, manganese, nitrates and pesticides.
Zone	A water supply zone will generally be defined by each water business using criteria such as: ▪ A discrete area of similar water quality, e.g. served by one water treatment plant. ▪ An area able to be described by its boundaries. ▪ The nature and design of the water supply system (including the location of service reservoirs, pump stations, tanks, and trunk systems etc). ▪ The source and nature of the source of the drinking supply. ▪ The treatment components of the supply system. ▪ ADWG Framework for Management of Drinking Water Quality.