

# 2016/17 Water, Sewerage and Irrigation Performance Data Report

March 2018

**Economic Regulation Authority**

WESTERN AUSTRALIA

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## Executive summary

The ERA has been reporting data on water, sewerage and irrigation supply schemes in Western Australia since 2006. The reported data presents a snapshot as at 30 June 2017.

The ERA separately publishes data on the smaller service providers in a set of data tables.<sup>1</sup>

### *Wet summer reduces water demand*

During the summer of 2016-17, the average rainfall for Western Australia was the highest on record. The increased rainfall reduced the demand for water across the state.

The total volume of water sourced for Perth decreased, from 306,210 megalitres in 2015-16 to 290,831 megalitres in 2016-17, and in regional towns from 105,909 megalitres in 2015-16 to 100,824 megalitres in 2016-17.

The total volume of water supplied also decreased, in Perth from 261,823 in 2015-16 to 253,687 megalitres in 2016-17, and in regional towns from 100,833 megalitres in 2015-16 to 97,993 megalitres in 2016-17.

The average annual water supplied per residential property decreased across the state, by 7.1 per cent in Perth and by 6.7 per cent in regional towns. In 2016-17, the volume supplied in Perth was 223 kilolitres per property and the regional town average was 265 kilolitres per property. These were the lowest volumes reported since the ERA began reporting data in 2006.

### *Drying climate increases Perth's reliance on desalination*

The state government's strategy to source more of Perth's water from climate independent sources resulted in a further increase in water sourced from desalination in 2016-17.

The volume of water sourced from desalination increased from 138,645 megalitres in 2015-16 to 149,823 megalitres in 2016-17, a six-year high. This was the first year that both of Perth's desalination plants operated at their maximum output.<sup>2</sup> Desalination supplied 51.5 per cent of the total water sourced for Perth in 2016-17.

The wet summer of 2016-17 led to an increase in the volume of surplus water from desalination that was stored in dams. The volume of water stored exceeded the volume abstracted by 8,531 megalitres in 2016-17, compared to net abstraction of 20,100 megalitres in 2015-16. This water will be banked for use in future years.

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<sup>1</sup> This data is on water and sewerage supply schemes with less than 1,000 connected properties, and three irrigators. The data is available on the ERA website:

<https://www.erawa.com.au/water1/water-licensing/small-supplier-performance-data>.

<sup>2</sup> The Kwinana desalination plant produces approximately 45,000 megalitres of water per annum and the Binningup desalination plant produces approximately 100,000 megalitres of water per annum.

## ***Water and sewerage infrastructure growth continues***

The primary driver for water supply and sewerage infrastructure growth is land development. The data shows that demand for connections to water and sewerage infrastructure remains strong.

Between 2015-16 and 2016-17, the number of properties connected to a water supply increased, in Perth from 825,000 to 841,000 connections and in regional towns from 233,000 to 237,000 connections. The number of properties connected to a sewerage service increased, in Perth from 754,000 to 772,000 connections and in regional towns from 180,000 to 182,000 connections.

The increased demand for new connections was a driver for additional water and sewerage mains. Between 2015-16 and 2016-17, the length of water mains in Perth increased from 14,431 kilometres to 14,542 kilometres, and in regional towns from 6,187 kilometres to 6,349 kilometres. The length of sewer mains in Perth increased from 12,254 kilometres to 12,394 kilometres and in regional towns from 4,233 kilometres to 4,308 kilometres.

## ***Reduced demand for irrigation water***

There was a substantial reduction in demand for irrigation water in 2016-17, for various reasons.

The volume of water supplied by Harvey Water decreased by 18.7 per cent, from 53,456 megalitres in 2015-16 to 43,465 megalitres in 2016-17. The cause was a reduction in its water allocation following a winter of very low stream flows into the dams that supply the irrigation water.

The volume of water supplied by Ord Irrigation decreased by 13.0 per cent, from 133,699 megalitres in 2015-16 to 116,269 megalitres in 2016-17. The decrease was due to approximately 5,000 hectares of land being taken out of production, because farmers had received low returns for their produce.

## About this report

The Economic Regulation Authority (**ERA**) is the independent economic regulator in Western Australia responsible for administering the licensing schemes for water service providers (licensees).<sup>3</sup>

The ERA reports on the performance of water licensees to meet its obligation under the *Water Services Act 2012 (Act)* to monitor and report to the Minister for Water on the operation of the water licensing scheme.<sup>4</sup> The ERA has been publishing water data reports since 2006.

Publishing water performance data enhances the accountability of water licensees for the service they provide to customers. It can also provide incentives for water licensees to improve performance

Throughout the report, the terms 'town' and 'scheme' are used interchangeably, with 'scheme' usually referring to the water or sewerage supply infrastructure in the town.

This report covers water and sewerage supply schemes with more than 1,000 connected properties (see Appendix 4 for a list of the towns) and the state's two largest irrigators. Data for water and sewerage supply schemes with less than 1,000 connected properties, and two small irrigators, is on the ERA website.<sup>5</sup>

The data for Perth and the regional towns is reported separately, with the aggregated data for the latter being reported using the label 'regional town(s)'. In some places, the combined data for Perth and the regional towns is provided under the labels 'all towns' or 'all town average'.

The report is structured as follows:

- Part A – Water performance: sources of water, uses of water supplied, spatial density of properties served by water mains, the number of water main breaks, number of connected properties to water supply and the number and type of complaints received by service providers.
- Part B – Sewerage performance: annual volume of sewage collected per property, percentage of treated sewage that is used to produce recycled water, properties served per kilometre of sewer main, the number of sewer main breaks and chokes, number of sewerage connected properties, number of sewerage service complaints, percentage of sewage treated by treatment level, and sewer overflows reported to the environmental regulator.<sup>6</sup>
- Part C – Combined water and sewerage performance: total recycled water supplied, the uses of recycled water, the total number of water and sewerage complaints, billing and account complaints, and the proportion of calls that are answered by a call centre operator within 30 seconds.
- Part D – Irrigation performance: the volume of water supplied for irrigation, number of customer service points of irrigation networks, carrier length, and number of customer service delivery complaints.

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<sup>3</sup> The licensing scheme for water providers is in Part 2 of the Act.

<sup>4</sup> Section 207 of the Act.

<sup>5</sup> <https://www.erawa.com.au/water1/water-licensing/small-supplier-performance-data>

<sup>6</sup> The Department of Water and Environmental Regulation.

## Part A: Water performance

### Covered water supply schemes

There are 42 towns and cities in Western Australia with water supply schemes having more than 1,000 connected properties.

Perth is the largest scheme, with approximately 840,000 connected properties. There are also seven supply schemes with between 10,000 and 50,000 connected properties. The Water Corporation supplies all except two of the 42 water supply schemes. The exceptions are Bunbury, which is supplied by Aqwest-Bunbury Water Corporation (**Aqwest**), and Busselton, which is supplied by Busselton Water Corporation (**Busselton Water**).

The eight supply schemes with more than 10,000 connected properties are also covered by the urban reporting framework,<sup>7</sup> and included in the annual national performance reports published by the Bureau of Meteorology.<sup>8</sup> The reports provide detailed financial and non-financial performance data for each of the supply schemes.<sup>9</sup>

The remaining 34 schemes service between 1,000 and 10,000 connected properties.

Before 2015-16, this report covered 24 schemes with between 1,000 and 10,000 connected properties. From 2015-16 onwards, this increased to 34 schemes.<sup>10</sup>

Appendix 3 provides further background on water data reporting and Appendix 4 has a list of water supply schemes covered by this report.

### Sources of water

Water is supplied from multiple sources, which comprise the following:<sup>11</sup>

- Groundwater - potable and non-potable water abstracted from aquifers and other 'below ground' water sources. 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 sewage plants (recycling).
- Surface water - potable and non-potable water abstracted from surface water sources such as dams, rivers or irrigation channels.
- Desalination - potable and non-potable water sourced from desalination plants.
- Bulk water - Potable and non-potable water received from another utility or entity outside the reporting utility's geographic area of responsibility. The

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<sup>7</sup> Refer to Appendix 3 for information about the urban reporting framework, and water utilities' reporting obligations under the framework.

<sup>8</sup> National Performance Report – urban water utilities. The reports are available on the Bureau of Meteorology website: [www.bom.gov/water/npr](http://www.bom.gov/water/npr).

<sup>9</sup> The 2016-17 report is scheduled to be released in March 2018.

<sup>10</sup> There were 11 new schemes added to the total, but the Water Corporation merged the Port Hedland and South Hedland schemes to form the Hedland scheme giving a net increase of 10 schemes.

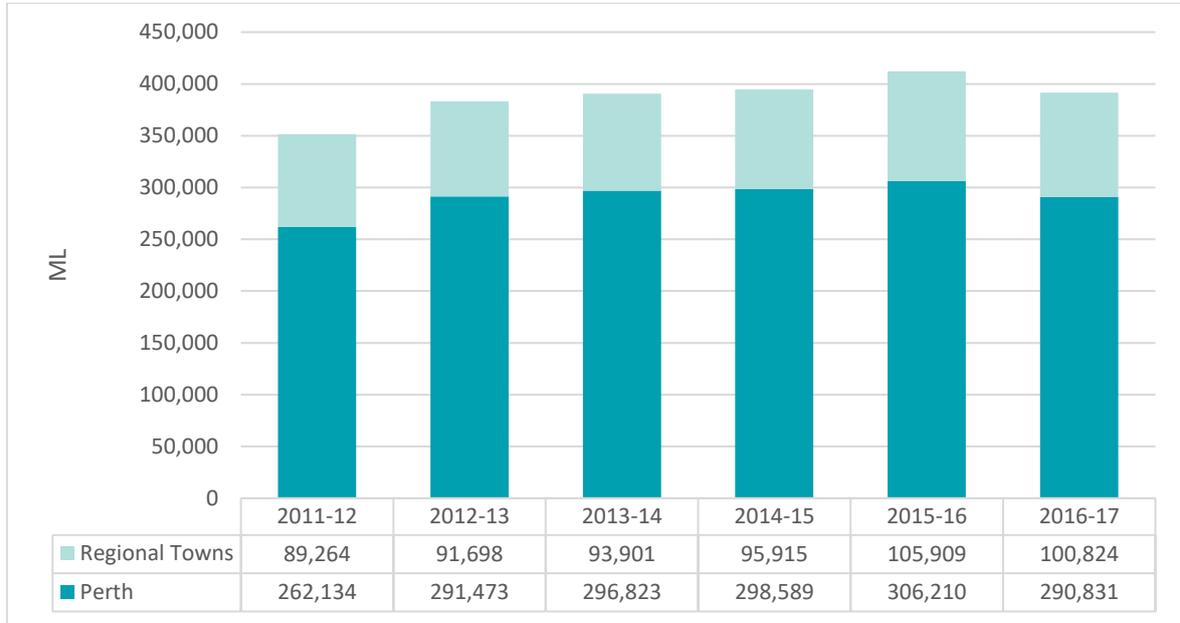
<sup>11</sup> A reference to a utility means the licensed water service provider that operates the water supply scheme.

volume of water may include water subsequently exported (sold) to another utility.

- Recycling - treated effluent used by either the water utility itself, a business supplied by the water utility, or supplied through a third party pipe system for urban reuse.

Figure 1 shows the total volume of water sourced in Perth and regional towns.

**Figure 1: Total volume of water sourced in Perth and regional towns (megalitres)**

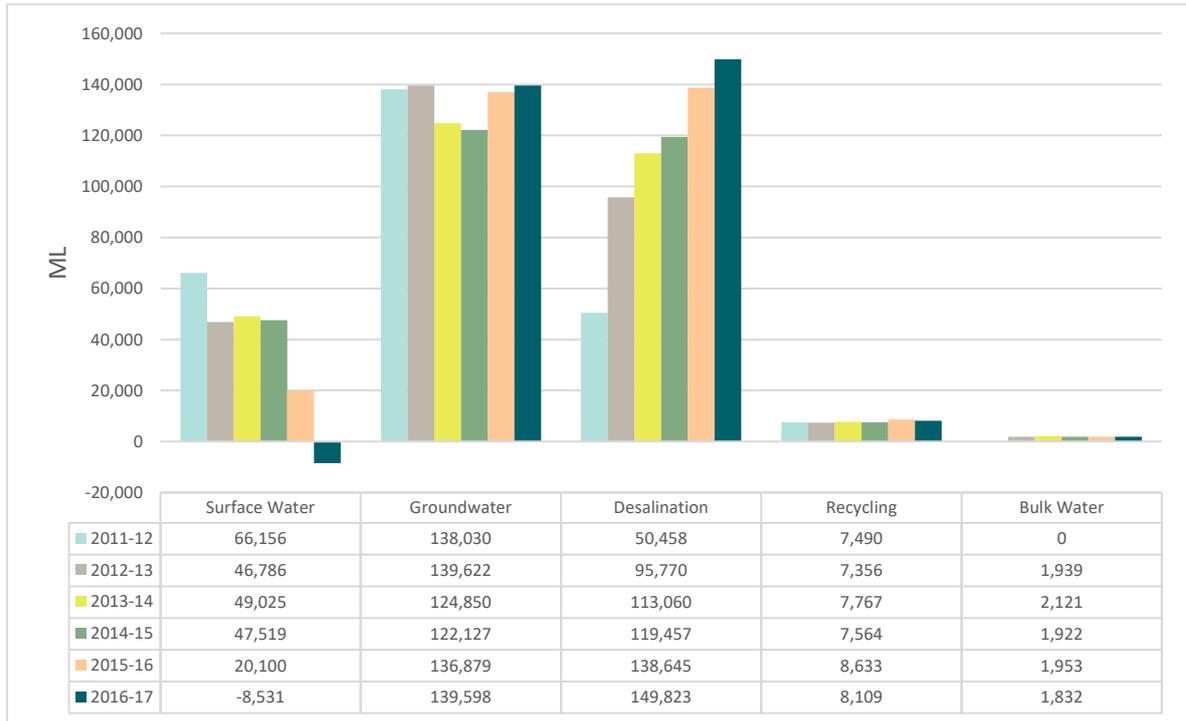


Most of the increase in water sourced in regional towns in 2015-16 was due to data for an additional 10 towns being included in the dataset.

The Water Corporation reported that water use in Perth was lower than in 2015-16, because of a cool wet spring and a record wet summer. Cooler temperatures and summer rainfall also reduced demand for water in many parts of regional Western Australia.

Figure 2 and Figure 3 provide a breakdown of Perth's water sources by volume and percentage respectively.

**Figure 2: Sources of water by volume (Perth only) (megalitres)**



**Figure 3: Sources of water by percentage (Perth only)**

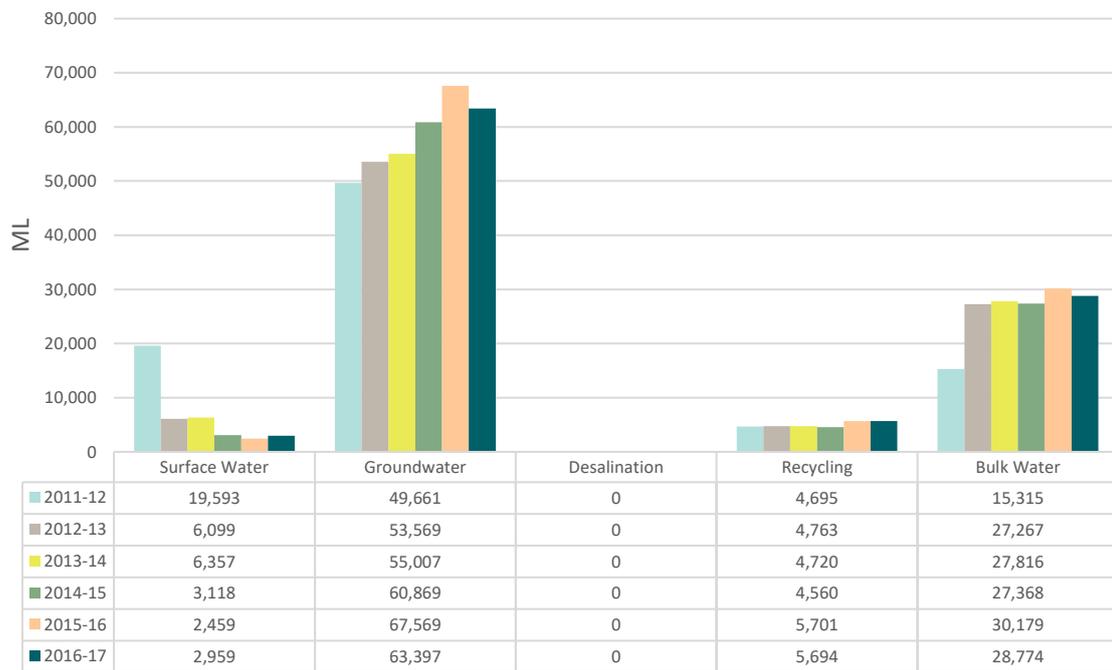


The increased use of desalinated water in Perth is the result of the Water Corporation’s water security strategy designed to counter the effects of Western Australia’s drying climate on Perth’s water supply. In 2016-17, for the first time, more than half the total water sourced for Perth came from desalination.

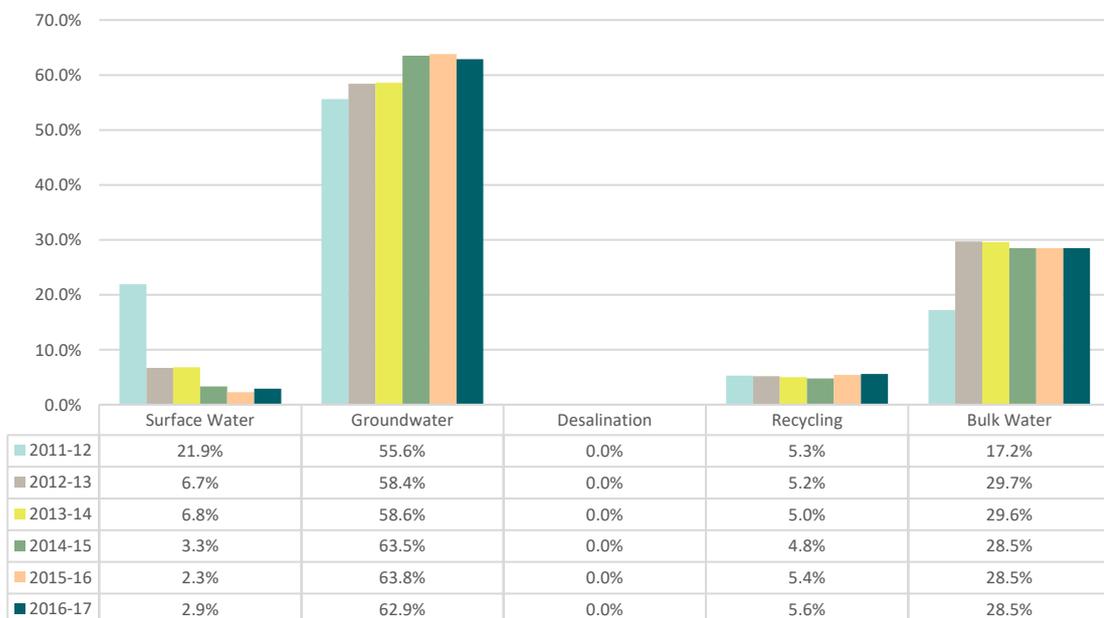
The increase in water sourced from desalination has displaced water sourced from surface water. In 2016-17, more desalinated water was transferred into surface water storages than was taken from surface water storages.

Figure 4 and Figure 5 provide a breakdown of water sources for regional towns by volume and percentage respectively.

**Figure 4: Sources of water by volume (Regional towns) (megalitres)**



**Figure 5: Sources of water by percentage (Regional Towns)**



The drying climate has also reduced the volume of surface water available to supply regional towns. If the data for the 10 towns added to the dataset in 2015-16 are excluded the volume of water sourced still fell between 2015-16 and 2016-17.

Over the past six years, the increased use of groundwater and bulk water<sup>12</sup> has offset the reduction in surface water. In 2016-17, the volume of water sourced from surface water was just over 10 per cent of the volume sourced in 2011-12.

## Uses of water supplied

### Total urban water supplied

Total urban water supplied is the total metered volume of water (potable or non-potable) supplied to customers over the reporting period, plus estimated non-metered water supplied.

The components of urban water include residential, commercial, municipal and industrial uses and estimated water supplied for other uses. The difference between sourced and supplied water is the real water losses caused by mains breaks and leaks, metering errors, and stored water.

Figure 6 shows the total volume of urban water supplied in Perth and regional towns.

**Figure 6: Total urban water supplied (megalitres)**



Most of the increase in water supplied in regional towns in 2015-16 was due to including the data for 10 additional towns.

Cooler temperatures and summer rainfall also reduced demand for water in many parts of regional Western Australia. The volume of water supplied in Perth and regional towns both fell for the first time since the ERA began reporting in 2005.

<sup>12</sup> Bulk water is water received from another utility or entity outside the reporting utility's geographic area of responsibility. The bulk water supplied to regional towns is water supplied from Water Corporation sources located outside the town boundary.

## Average annual residential water supplied

Table 1 shows the average annual water supplied per residential property.

**Table 1: Average annual water supplied per residential property (kilolitres/property)**

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b>Perth</b>	250	249	254	244	240	223
<b>Regional Town Average</b>	323	320	318	306	284 <sup>13</sup>	265

In 2016-17, average consumption was the lowest since the ERA began reporting data in 2005. This would have still been the case if the data for the 10 towns added in 2015-16 was excluded.

The long-term downward trend in per residence water consumption has continued. Water consumption was much lower in 2016-17, because of cooler temperatures and record rainfall over summer for many parts of the state.

## Asset data

### Water mains

Table 2 shows the total length of installed water mains.

**Table 2: Length of water mains (kilometres)**

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b>Perth</b>	13,292	13,673	13,859	14,161	14,431	14,542
<b>Regional Towns</b>	5,817	5,457	5,584	5,719	6,187	6,349
<b>Total</b>	<b>19,109</b>	<b>19,130</b>	<b>19,443</b>	<b>19,881</b>	<b>20,618</b>	<b>20,891</b>

The 10 towns added to the dataset in 2015-16 accounted for most of the increase in regional town water mains in that year.

The increase in water mains in 2016-17 is mostly due to land development. The largest percentage increase in the length of installed mains was in Harvey/Wokalup (up by 72.2 per cent). This was due to an expansion in the boundary of the Harvey/Wokalup water supply scheme to include Myalup and Binningup.

### Properties connected per kilometre of water main

The purpose of reporting properties connected per kilometre of water main is to provide information on the spatial density of properties served by water mains in the Perth metropolitan area and the average spatial density for the regional towns.

<sup>13</sup> The values prior to 2015-16 are different to the values in previous years, because 10 towns were added to the dataset in that year. Also, the Port Hedland and South Hedland schemes were combined to form the Hedland scheme.

Table 3 shows the number of properties served per kilometre of water main.

**Table 3: Properties served per kilometre of water main**

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b>Perth</b>	56	56	57	57	57	58
<b>Regional Town Average</b>	30	33	33	33	34	34

## Water main breaks

The number of water main breaks is influenced by a number of factors, including the type of mains infrastructure (above ground or below ground), the age of the mains, the standard of maintenance carried out by the service provider, and local conditions such as soil types and penetrating tree roots.

Table 4 shows the number of water main breaks per 100 kilometres of main.

**Table 4: Water main breaks (per 100 kilometres of main)**

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b>Perth Total</b>	12.5	13.3	13.0	15.0	12.0	13.1
<b>Regional Town Average</b>	20.2	19.6	21.6	20.9	19.5	19.5

## Connected properties – water supply

Figure 7 shows the number of properties connected to a water supply in Perth and regional towns.

**Figure 7: Total connected properties - water supply (000's)**



Most of the growth in connected properties across the state in 2016-17 was due to land development.

## Customer service

### Water quality complaints

Water quality complaints include any complaint about discolouration, taste, odour, stained washing, illness or cloudy water. The level of complaints is normalised to the number of connected properties (reported as number of complaints per 1,000 connected properties).

Table 5 shows the number of water quality complaints per 1,000 connected properties.

**Table 5: Water quality complaints (per 1,000 connected properties)**

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b>Perth</b>	6.9	0.1	0.1	0.1	0.1	0.2
<b>Regional Town Average</b>	3.9	0.9	0.1	0.1	0.2	0.3

The large reduction in complaints after 2012-13 was the result of changes in the method of recording complaints made by Aqwest, Busselton Water and the Water Corporation.<sup>14</sup>

### Water service complaints

Water service complaints include all complaints related to breaks, leaks, service interruptions, adequacy of service, water pressure and water reliability. The level of complaints is normalised to the number of connected properties (reported as number of complaints per 1,000 connected properties).

Table 6 shows the number of water service complaints per 1,000 connected properties.

**Table 6: Water service complaints (per 1,000 connected properties)**

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b>Perth</b>	0.9	0.3	0.3	0.3	0.4	0.4
<b>Regional Town Average</b>	1.3	0.8	0.1	0.2	0.3	0.3

### Average duration of an unplanned water supply interruption

An unplanned water supply interruption occurs when the customer has not received at least 24 hours' notification of the interruption to supply. The average time that a customer is without a drinking water supply is a partial indicator of service quality, the condition of the water network, and the standard of network management.

Table 7 shows the average duration of unplanned interruptions in minutes per annum.

<sup>14</sup> The Water Corporation provided the following explanation for the large reduction in water and sewerage complaints: "Historically the Corporation always reported a much higher number of complaints than other water utilities. [...] The Corporation was unique in that it automatically recorded all contacts/call on these subjects as a complaint, unless there was evidence to the contrary. [...] Previously [queries regarding malfunctions] were also automatically treated as complaints. When talking with these customers it is apparent that most people are not actually complaining but simply querying why it is happening. When given an explanation and an [estimated] completion time [...], most customers are satisfied."

**Table 7: Average duration of an unplanned supply interruption (minutes)**

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b>Perth</b>	118.0	129.7	117.0	96.0	107.9	103.0
<b>Regional Town Average</b>	102.3	91.2	93.8	124.7	153.0	96.6

Caution should be applied to interpreting the regional town average for 2015-16, which includes the data for ten additional towns for the first time.

In 2016-17, the highest regional town unplanned supply interruption durations were recorded in Northam (236 minutes) and Newman (222 minutes).

The high average supply interruption duration in Northam was caused by infrastructure failures, and in Newman by a number of faulty valves that caused temporary supply interruptions affecting the entire town in October and November 2016.

### Average frequency of unplanned interruptions

The average frequency of unplanned interruptions measures the average number of times the water supply to a customer is interrupted without at least 24 hours' notice. This is a partial indicator of service quality, reliability and customer satisfaction. The frequency of interruptions is normalised to the number of connected properties (reported as number of complaints per 1,000 connected properties).

Table 8 shows the average frequency of unplanned supply interruptions per 1,000 connected properties.

**Table 8: Average frequency of unplanned supply interruptions (per 1,000 connected properties)**

	2011-12	2012-13	2013-14 <sup>15</sup>	2014-15	2015-16	2016-17
<b>Perth</b>	104.6	121.7	286.0	314.0	322.5	289.1
<b>Regional Town Average</b>	193.3	167.5	411.0	389.5	477.1	411.9

In 2016-17, the highest frequency of interruptions was in Newman (4,557 per 1,000 connected properties). The Water Corporation explained that the high average frequency of unplanned supply interruptions in Newman was caused by the faulty valve problems, discussed above.

## Health

### Water quality compliance

The total operating area supplied by water service providers is divided into multiple zones. The definition of a zone includes a range of criteria, such as an area served by one

<sup>15</sup> The increase from 2013-14 onwards follows a change in the definition of the indicator in the 2012-13 *National Performance Framework: urban performance reporting indicators and definitions handbook*, to include mains to the meter connections in the calculation.

treatment plant, the design of the supply network, a geographical area with clear boundaries (town boundaries etc.) or other relevant environmental or health related factors.<sup>16</sup>

Table 9 shows the number of zones, and the percentage of the population resident in those zones, where the water supply complied with the chemical health standards throughout 2016-17.

All 61 zones in Western Australia covered by this report achieved 100 per cent compliance in 2016-17.

**Table 9: Zones and percentage population where microbiological compliance was achieved in 2016-17**

	Number of zones where chemical compliance was achieved	Percentage of population where chemical compliance was achieved
<b>Perth</b>	24	100
<b>Regional Towns</b>	37	100
<b>All Towns</b>	61	100

<sup>16</sup> A discussion on the criteria used to define a zone can be found on page 99 of the *National urban water utility performance reporting framework: indicators and definitions handbook, December 2017*.

## Part B: Sewerage performance data

### Covered sewerage schemes

There are 32 towns and cities in Western Australia with sewerage schemes having more than 1,000 connected properties.

Perth has the largest sewerage scheme, with approximately 772,000 connected properties. There are also six sewerage schemes with between 10,000 and 50,000 connected properties. The Water Corporation operates all of these schemes except Kalgoorlie-Boulder, which is operated by the City of Kalgoorlie-Boulder.

Perth and the six sewerage schemes with more than 10,000 connected properties are also covered by the urban reporting framework,<sup>17</sup> and included in the annual national performance report published by the Bureau of Meteorology.<sup>18</sup> The reports provide detailed financial and non-financial performance data for each of the supply schemes.<sup>19</sup>

The remaining 25 sewerage schemes supply between 1,000 and 10,000 connected properties.

Prior to 2015-16, this report covered 22 sewerage schemes with between 1,000 and 10,000 connected properties. From 2015-16 onwards, this increased to 32 schemes.<sup>20</sup>

Appendix 3 provides further background on sewerage data reporting and Appendix 4 provides a list of the sewerage schemes covered by this report.

### Sewage collected per property

'Sewage collected' is 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. a wholesaler.

Table 10 shows the annual volume of sewage collected per property.

**Table 10: Sewage collected per property (kilolitres)**

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b>Perth</b>	189	187	190	185	178	174
<b>Regional Town Average</b>	193	185	188	177	161 <sup>21</sup>	169

<sup>17</sup> Refer to Appendix 3 for information about the urban reporting framework, and water utilities' reporting obligations under the framework.

<sup>18</sup> National Performance Report – urban water utilities. The reports are available on the Bureau of Meteorology website: [www.bom.gov/water/npr](http://www.bom.gov/water/npr).

<sup>19</sup> The 2016-17 report is scheduled to be released in March 2018.

<sup>20</sup> Data for an additional 11 schemes was added to the dataset, but the Water Corporation also merged the Port Hedland and South Hedland schemes to form the Hedland scheme giving a nett increase of 10 schemes.

<sup>21</sup> The value in the 2015-16 report (130kL per property) was incorrect, because the calculation did not exclude six new schemes for which no data was provided.

It is not possible to directly compare the 2015-16 and 2016-17 data for the regional towns. In 2015-16, data was provided for only four of the ten additional sewerage schemes, increasing to all ten schemes in 2016-17. Accordingly, the data for 2016-17 should be considered as the baseline for comparing data in future years.

## Recycled water

Recycled water sourced from treated sewage effluent can be used to irrigate parks and ovals, or for agricultural, industrial or commercial uses. It can also undergo advanced treatment to produce drinking water, through a process known as groundwater replenishment.<sup>22</sup>

Table 11 shows the percentage of effluent used to produce recycled water.

**Table 11: Recycled water - percentage of effluent recycled**

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b>Perth</b>	8.0	7.9	7.0	7.0	7.6	7.1
<b>Regional town average</b>	48.4	54.1	54.5	54.0	67.2 <sup>23</sup>	62.6

The regional town average has been higher over the past two years following the addition of ten new sewerage schemes in 2015-16. This indicates the average volume of effluent recycled in the ten schemes added to the dataset in 2015-16 is higher than the average volume for the 22 schemes in the dataset before 2015-16.

## Asset data

### *Length of sewerage mains and channels (kilometre)*

Sewer mains include all trunk, pressure and reticulation mains.

Table 12 shows the length of the sewer mains and channels.

**Table 12: Length of sewer mains and channels (kilometre)**

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b>Perth</b>	11,271	11,443	11,637	12,053	12,254	12,394
<b>Regional towns</b>	3,359	3,336	3,467	3,635	4,233	4,308
<b>Total</b>	14,630	14,779	15,104	15,688	16,487	18,850

<sup>22</sup> Groundwater replenishment involves injecting treated recycled water into underground aquifers, where it is stored and taken out at a later time for further treatment before being supplied as drinking water.

<sup>23</sup> This was incorrectly stated to be 64.3 per cent in the *2015/16 Water, Sewerage and Irrigation Performance Report*.

The total length of sewer mains and channels in Perth and in regional towns increased in 2016-17, by 1.1 per cent and 1.9 per cent respectively. The increase in the total length of Perth's sewer mains mirrors the growth in water mains.<sup>24</sup>

### *Properties served per kilometre of sewer main*

The purpose of reporting on properties served per kilometre of sewer main is to provide information on the spatial density of properties served by sewer mains in the Perth metropolitan area, and on the average spatial density for regional town sewerage schemes.

Table 13 shows the properties served per kilometre of sewer main.

**Table 13: Properties served per kilometre of sewer main**

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b>Perth</b>	61	61	61	61	62	62
<b>Regional Town Average</b>	41	43	43	41	39	39

### *Sewer main breaks and chokes*

A choke is a confirmed partial or total blockage that may or may not result in a spill from the sewer system to the external environment. The number of breaks and chokes is a partial indicator of customer service and the condition of the sewerage network.

Table 14 shows the number of sewer main breaks and chokes per 100 kilometre of main.

**Table 14: Sewer main breaks and chokes (per 100 kilometre of main)**

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b>Perth</b>	18.6	16.1	17.0	17.6	19.0	17.0
<b>Regional Town Average</b>	24.9	24.6	24.2	23.6	22.0	20.7

The Water Corporation estimates nearly 40 per cent of sewer main breaks and chokes in Perth were caused by fat, oil, grease and items such as rags and wet wipes accumulating in the sewerage system. The Water Corporation has been running an education campaign to remind the community not to dispose of these items in the sewerage system.

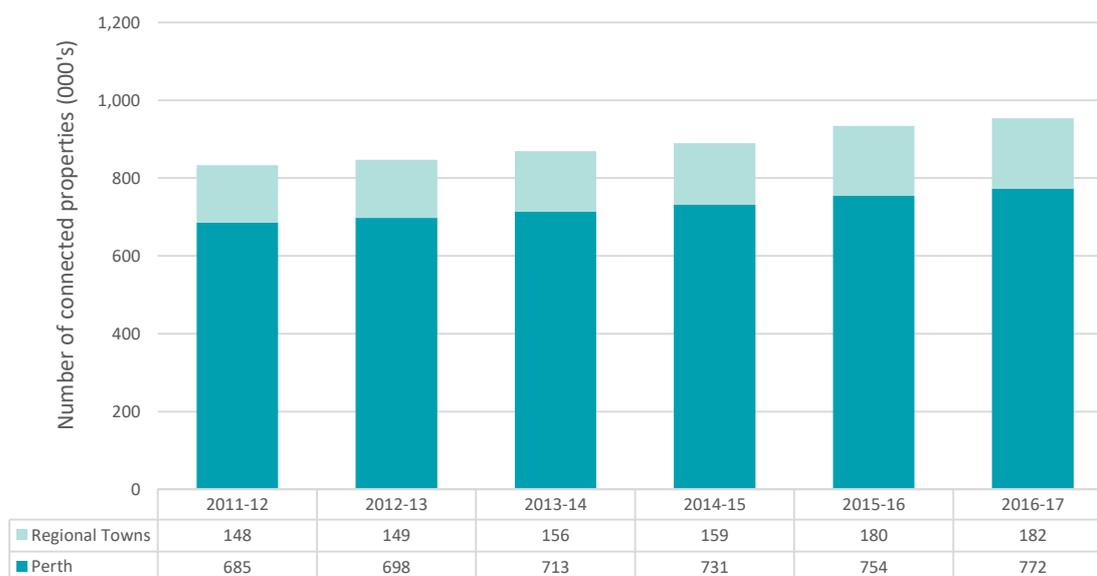
## Customers

### *Total connected properties – sewerage*

Figure 8 shows the number of properties connected to a sewerage scheme.

In 2016-17, the total number of connected properties in Perth and in regional towns increased, by 1.1 per cent and 2.4 per cent respectively. Most of the growth in connected properties across the state is due to land development.

<sup>24</sup> Refer to the discussion in relation to Table 2.

**Figure 8: Total connected properties – sewerage (000's)**

## Sewerage service complaints

Reporting on sewerage service complaints provides information on customer satisfaction with sewerage services, and provides a partial indicator of service quality and reliability. The level of complaints is normalised to the number of connected properties (reported as number of complaints per 1,000 connected properties).

Sewerage service complaints include complaints concerning sewer blockages and overflows, trade waste services, sewerage system reliability, sewage odours and all other sewerage issues.

Table 15 shows the number of sewerage service complaints per 1,000 connected properties.

**Table 15: Sewerage service complaints (per 1,000 properties)**

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b>Perth</b>	0.4	0.2	0.1	0.0	0.1	0.1
<b>Regional Town Average</b>	1.2	0.6	0.3	0.2	0.2	0.3

## Environment

### Comparative sewage treatment levels

Reporting on comparative sewage levels shows the degree to which sewage is treated. This is an important cost driver for a water utility in terms of capital and operating costs. High level treatment processes are more expensive than lower level processes.

Table 16 shows the breakdown of the all-town average percentage of sewage treated to a primary, secondary or tertiary level.<sup>25</sup>

**Table 16: Percentage of sewage treated by treatment level (all towns)**

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b>Primary Treatment</b>	4.2	4.3	4.2	4.5	4.0	4.0
<b>Secondary Treatment</b>	7.4	7.3	7.1	6.9	7.5	7.1
<b>Tertiary Treatment</b>	88.4	88.5	87.8	88.6	88.5	88.2

Perth is the only sewerage scheme that treated sewage to only a primary level.

In 2016-17, 10 of the 31 regional towns treated 100 per cent of their sewage to a tertiary level, with the other 21 towns treating 100 per cent of their sewage to a secondary level.

### ***Sewer overflows reported to the environmental regulator***

The data on sewer overflows reported to the environmental regulator provides information on the level of sewer overflows that may adversely impact on water quality, human health and ecosystem stability (if they occur in sensitive areas). The number of overflows indicates the condition and standard of operation of the sewerage scheme.

Table 17 shows the number of sewer overflows per 100 kilometre of sewer main reported to the environmental regulator.<sup>26</sup>

**Table 17: Sewer overflows reported to the environmental regulator (per 100 kilometre of sewer main)**

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b>Perth Total</b>	0.1	0.2	0.2	0.1	0.1	0.2
<b>Regional Town Average</b>	0.5	0.8	0.2	1.4	0.6	1.8

The number of reportable overflows varies each year, usually due to weather (such as storms or flooding) rather than poor sewer infrastructure maintenance.

The Water Corporation commented that the increase in sewer overflows in its schemes in 2016-17 was mostly caused by stormwater inundation as a result of extensive flooding across parts of Western Australia from the Kimberley to the Goldfields-Esperance and Great Southern regions in early February 2017.

<sup>25</sup> The definition of the sewerage treatment levels is in the Glossary at the end of this report.

<sup>26</sup> Department of Water and Environmental Regulation.

## Part C: Combined water and sewerage performance data

### Total recycled water supplied

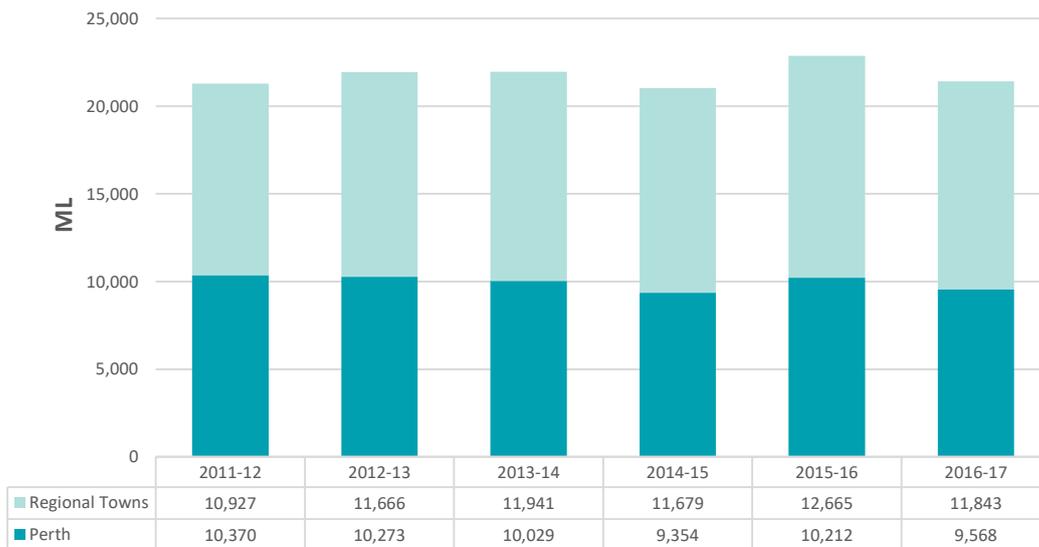
This section examines the supply of recycled water across all 45 water and sewerage supply schemes that supply more than 1,000 connected properties, covering 42 towns in total.

There are 22 towns that have water and sewerage schemes operated by the same service provider (the Water Corporation). Three towns have water and sewerage schemes operated by different service providers<sup>27</sup> and the remaining 17 towns have a water supply scheme operated by the Water Corporation.<sup>28</sup>

Total recycled water supplied is the sum of all treated effluent used by either the water utility itself, or supplied to another business, or supplied for urban reuse. The volume of recycled water supplied is an indirect measure of the volume of potable or non-potable water saved, had recycled water not been available.

Figure 9 shows the volume of recycled water supplied in Perth and in regional towns.

**Figure 9: Total recycled water supplied (megalitres)**

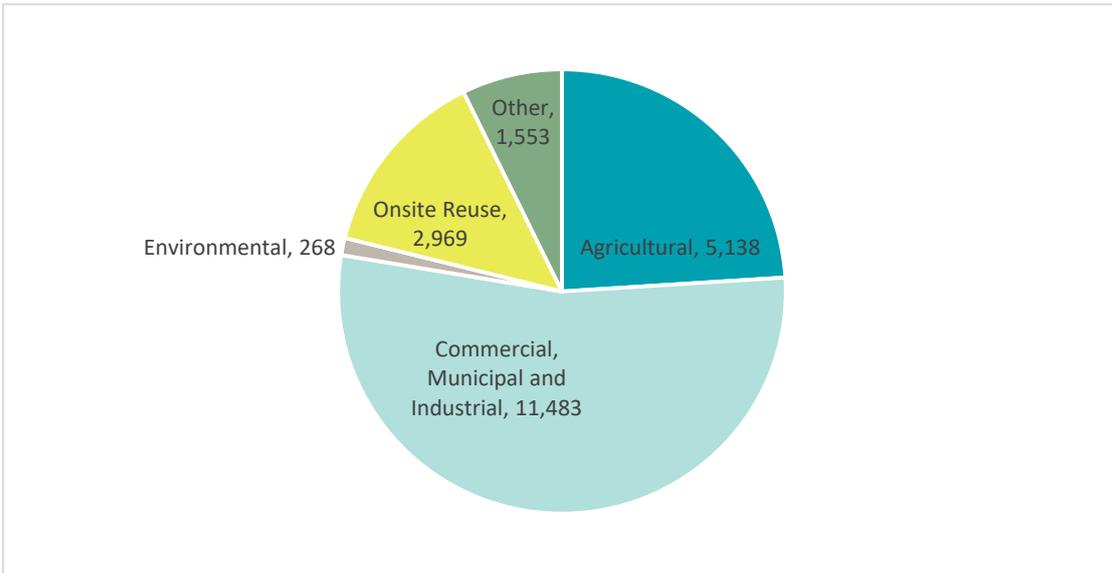


The Water Corporation commented that it began recharging recycled water at its Groundwater Replenishment Scheme in Craigie in late 2017, which is expected to increase the volume of recycled water for Perth in future years.

Figure 10 provides a breakdown of the uses of recycled water.

<sup>27</sup> The sewerage schemes in Bunbury and Busselton are operated by the Water Corporation, and the water supply schemes are provided by Aqwest and Busselton Water respectively. In Kalgoorlie-Boulder, the water supply scheme is operated by the Water Corporation and the sewerage scheme is operated by the City of Kalgoorlie-Boulder.

<sup>28</sup> In these towns the sewerage scheme has less than 1,000 connected properties.

**Figure 10: Uses of recycled water in 2016-17 (megalitres)**

## Total water and sewerage complaints

This indicator reports on customer satisfaction with water and sewerage services and service quality and reliability. The number of complaints is normalised to the number of connected properties (reported as number of complaints per 1,000 connected properties).

Table 18 shows the combined water and sewerage complaints per 1,000 connected water properties for Perth and the 21 regional towns that have their water and sewerage services provided by the Water Corporation.

**Table 18: Total water and sewerage complaints (per 1,000 connected properties)**

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b>Perth</b>	9.5	0.6	1.0	0.8	0.8	0.8
<b>Regional Town Average</b>	6.3	1.0	0.9	0.7	0.7	0.7

## Billing and account complaints – water and sewerage

The section discusses the level of billing and account complaints received for each utility's water supply and sewerage services. A billing and account complaint includes all complaints relating to account payment, financial loss or overcharging, billing errors and affordability. The number of complaints is normalised to the number of connected properties (reported as number of complaints per 1,000 connected properties).

Complaints about government pricing policy, tariff structures or when a correctly calculated bill is queried are excluded.

Table 19 shows the number of billing and account complaints per 1,000 connected properties<sup>29</sup> received from customers in Perth and 44 regional towns.

**Table 19: Billing and account complaints - water and sewerage (per 1,000 connected properties)**

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b>Perth</b>	1.4	0.2	0.5	0.3	0.2	0.1
<b>Regional Town Average</b>	1.0	0.2	0.7	0.4	0.2	0.2

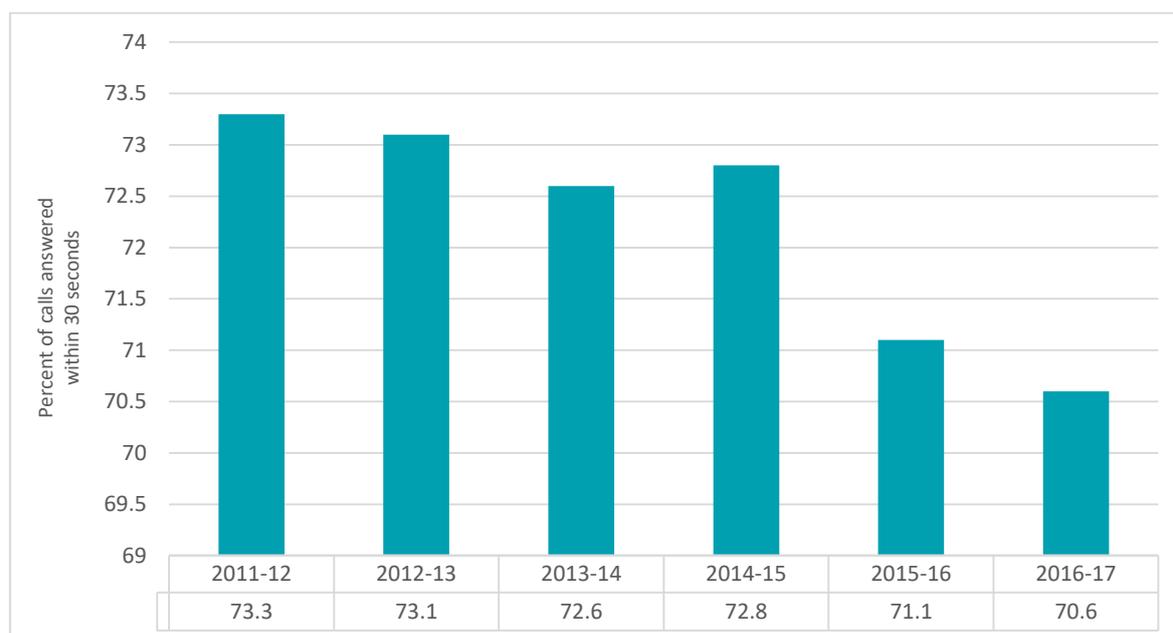
## Connect time to a call centre operator

This section discusses the proportion of calls answered by an operator within 30 seconds, where the customer has selected an option to speak with an operator.<sup>30</sup>

The Water Corporation is the only water service provider that operates a call centre that is capable of recording performance data. Its Perth call centre handles calls from across the state.

Figure 11 shows the proportion of customer calls to the Water Corporation call centre answered within 30 seconds.

**Figure 11: Percentage of Water Corporation calls answered within 30 seconds**



The Water Corporation commented that in recent years it has increased the number of ways in which its customers can contact it, including social media, webchat and email correspondence.

<sup>29</sup> The towns that have both water and sewerage supply schemes operated by the Water Corporation use the number of water connected properties to normalise the complaints.

<sup>30</sup> Utilities that operate a call centre capable of automatically recording operator responsiveness must report on this indicator. Utilities that have other telephone systems to handle customer calls may report this indicator on a voluntary basis.

## Part D: Irrigation performance data

### Irrigator performance data included in this report

This section of the report discusses the performance of two Western Australian irrigators:

- Ord Irrigation Cooperative Ltd (Ord Irrigation)
- South West Irrigation Management Cooperative (trading as Harvey Water)

There are another three irrigators licensed by the ERA (the Water Corporation, Gascoyne Water Cooperative and Preston Valley Irrigation Cooperative<sup>31</sup>). They are excluded from the report because of the relatively small scale of their operations compared to Ord Irrigation and Harvey Water.<sup>32</sup>

### Volume of water supplied

Table 20 shows the total volume of water supplied for irrigation.

**Table 20: Volume of water supplied for irrigation (megalitres)**

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b>Harvey Water</b>	46,096	41,807	56,310	52,397	53,456	43,465
<b>Ord Irrigation Cooperative</b>	118,816	100,637	95,772	146,541	133,699	116,269
<b>Total</b>	164,912	142,444	152,082	198,938	187,155	159,733

The volume of water supplied by Harvey Water decreased by 18.7 per cent in 2016-17, due to the reduction in its water allocation following a winter of very low stream flows into the dams that supply its water. Prior to 2013-14, the volume of water supplied was on a downward trend, because of reductions in Harvey Water's water allocations, caused by dry weather conditions and a contraction in the local dairy industry. A higher water allocation in 2013-14 reversed the downward trend, leading to higher annual volumes of water supplied up until 2015-16.

The volume of water supplied by Ord Irrigation decreased by 13.0 per cent in 2016-17. Ord Irrigation commented that the decrease was due to approximately 5,000 hectares of land being left fallow, and not requiring irrigation. The land was fallow because farmers had previously received low returns for their produce.

<sup>31</sup> Preston Valley Irrigation Cooperative was granted an exemption in 2017.

<sup>32</sup> Gascoyne Water provides a small set of performance data, which is available on the ERA website: <https://www.erawa.com.au/water1/water-licensing/small-supplier-performance-data>

## Customer delivery points

Table 21 shows the number of customer service (water delivery) points on the irrigation networks.

**Table 21: Number of customer service points on irrigation networks**

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Harvey Water	1,760	1,751	1,759	1,786	1,767	1,751
Ord Irrigation Cooperative	270	271	269	268	269	269
<b>Total</b>	<b>2,030</b>	<b>2,022</b>	<b>2,038</b>	<b>2,054</b>	<b>2,036</b>	<b>2,020</b>

## Carrier length (Gravity irrigation)

Table 22 shows the length of the pipes and channels in the gravity irrigation networks in 2016-17.

**Table 22: Carrier length - gravity irrigation networks in 2016-17 (kilometre)**

	Lined and unlined channel	Pipe	Total carrier length
Harvey Water	256	495	<b>751</b>
Ord Irrigation Cooperative	125	0	<b>125</b>
<b>Total</b>	<b>381</b>	<b>495</b>	<b>876</b>

## Complaints

Table 23 shows the number of customer service complaints received.

**Table 23: Number of customer service complaints**

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Harvey Water	0	0	0	0	1	1
Ord Irrigation Cooperative	0	3	2	1	2	1

## Appendix 1: Additional data

Table 24: Total urban water supplied (megalitres)

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b><u>NWC towns</u></b>						
Albany Scheme	3,702	3,609	3,953	4,445	4,460	4,049
Australind / Eaton	3,981	4,283	4,544	4,716	4,488	4,580
Bunbury (AQWEST)	5,491	5,528	5,799	5,830	6,654	6,517
Busselton Water	3,800	3,840	4,160	4,275	4,438	4,218
Geraldton	7,826	9,014	9,122	9,061	9,023	8,187
Kalgoorlie-Boulder	8,167	8,312	7,774	7,190	7,094	7,230
Mandurah Scheme	11,311	11,730	12,523	12,550	12,956	12,870
Perth	248,021	248,818	260,142	258,498	261,823	253,687
<b><u>Minor towns</u></b>						
Augusta	-	-	-	-	240	220
Bridgetown / Hester	504	437	467	487	563	514
Broome	5,737	5,836	6,021	5,788	6,405	5,986
Capel	-	-	-	-	335	342
Carnarvon	1,431	1,421	1,459	1,415	1,308	1,177
Collie	1,099	1,073	1,146	1,108	1,115	1,030
Dalyellup	-	-	-	-	1,161	1,027
Denmark	498	465	531	443	440	477
Derby	1,342	1,208	1,286	1,335	1,425	1,281
Dongara Denison	903	849	833	906	885	935
Donnybrook	-	-	-	-	411	374
Dunsborough / Yallingup	1,447	1,552	1,554	1,663	1,561	1,583
Esperance	1,794	1,708	1,806	1,744	1,652	1,549
Exmouth	-	-	-	-	1,041	1,028
Harvey / Wokalup	568	546	686	584	661	802
Jurien	376	374	396	387	372	424
Kalbarri	-	-	-	-	506	528
Kambalda	-	-	-	-	1,908	1,291
Karratha	5,162	5,530	4,934	5,661	5,692	6,002
Katanning	1,473	793	753	752	1,271	720
Kununurra	1,406	1,337	1,306	1,332	1,753	1,813
Lancelin	-	-	-	-	153	183
Manjimup	797	669	715	713	706	700
Margaret River Scheme	1,207	1,351	1,311	1,432	1,663	1,565
Merredin	625	746	567	565	559	517
Mount Barker	-	-	-	-	433	399
Narrogin	746	778	800	727	737	657
Newman	1,832	2,301	2,117	2,156	2,019	1,356
Northam	1,211	1,315	1,474	1,285	1,331	1,288
Pinjarra	2,035	1,012	1,215	1,105	1,110	1,135
Hedland Scheme <sup>33</sup>	10,343	10,357	10,498	11,333	12,395	11,644
Waroona-Hamel	-	-	-	-	401	419
Wickham	-	-	-	-	1,042	913
York	463	463	523	475	466	463
<b>Total</b>	<b>335,298</b>	<b>337,255</b>	<b>350,414</b>	<b>349,962</b>	<b>364,656</b>	<b>351,680</b>
<b>Total (excluding Perth)</b>	<b>87,277</b>	<b>88,437</b>	<b>90,272</b>	<b>91,464</b>	<b>102,833</b>	<b>97,993</b>

<sup>33</sup> Prior to 2015/16, values are reported for Port Hedland and South Hedland. The Water Corporation advised the ERA that the values should have been combined and reported under the Hedland Scheme. Refer to the ERA's past annual Water, Sewerage and Irrigation Performance reports for values for Port Hedland and South Hedland prior to 2015/16.

Table 25: Average annual residential water supplied (kL/property)

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b><u>NWC towns</u></b>						
Albany Scheme	188	179	188	188	178	175
Australind / Eaton	334	338	337	328	315	288
Bunbury (AQWEST)	255	254	267	264	238	248
Busselton Water	280	272	287	284	266	275
Geraldton	343	327	321	305	306	298
Kalgoorlie-Boulder	310	335	306	320	295	279
Mandurah Scheme	239	239	241	237	234	221
Perth	250	249	254	244	240	223
<b><u>Minor towns</u></b>						
Augusta	-	-	-	-	161	141
Bridgetown / Hester	230	183	194	194	189	177
Broome	499	504	448	446	469	420
Capel	-	-	-	-	282	273
Carnarvon	387	369	365	358	343	309
Collie	241	227	262	244	238	215
Dalyellup	-	-	-	-	358	330
Denmark	145	147	161	144	136	133
Derby	485	448	432	422	454	394
Dongara Denison	310	266	266	258	268	252
Donnybrook	-	-	-	-	263	242
Dunsborough / Yallingup	282	272	292	290	277	266
Esperance	231	228	239	236	220	205
Exmouth	-	-	-	-	408	359
Harvey / Wokalup	287	272	290	276	277	232
Jurien	180	177	180	183	177	168
Kalbarri	-	-	-	-	257	248
Kambalda	-	-	-	-	217	205
Karratha	460	473	444	462	445	395
Katanning	252	245	263	238	221	204
Kununurra	531	493	480	504	481	458
Lancelin	-	-	-	-	104	101
Manjimup	200	189	193	192	186	175
Margaret River Scheme	233	209	229	222	222	207
Merredin	280	275	271	258	237	236
Mount Barker	-	-	-	-	218	164
Narrogin	226	247	254	234	233	214
Newman	501	565	506	437	459	487
Northam	243	273	281	247	255	254
Pinjarra	285	280	298	286	281	266
Hedland Scheme <sup>34</sup>	1,012	1,047	985	890	428	398
Waroona-Hamel	-	-	-	-	266	241
Wickham	-	-	-	-	550	469
York	252	270	260	247	243	227
<b>Average</b>	<b>321</b>	<b>318</b>	<b>316</b>	<b>304</b>	<b>283</b>	<b>264</b>
<b>Average (excluding Perth)</b>	<b>323</b>	<b>320</b>	<b>318</b>	<b>306</b>	<b>284</b>	<b>265</b>

<sup>34</sup> Prior to 2015/16, values are reported for Port Hedland and South Hedland. The Water Corporation advised the ERA that the values should have been combined and reported under the Hedland Scheme. Refer to the ERA's past annual Water, Sewerage and Irrigation Performance reports for values for Port Hedland and South Hedland prior to 2015/16.

Table 26: Water main breaks (per 100 kilometre of water main)

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b><u>NWC towns</u></b>						
Albany Scheme	8.1	13.8	12.0	11.3	11.4	10.9
Australind / Eaton	7.1	5.2	5.0	4.6	7.4	9.2
Bunbury (AQWEST)	10.2	12.0	10.0	12.0	13.5	17.5
Busselton Water	3.3	6.6	8.0	8.2	7.2	7.1
Geraldton	20.0	27.7	23.0	26.8	25.5	27.4
Kalgoorlie-Boulder	16.7	13.1	17.0	20.8	20.3	15.5
Mandurah Scheme	6.8	6.3	4.0	4.2	3.6	4.0
Perth	12.5	13.3	13.0	15.0	12.0	13.1
<b><u>Minor towns</u></b>						
Augusta	-	-	-	-	16	4
Bridgetown / Hester	27.7	17.6	21	15	28	27
Broome	24.9	8.2	6	9	5	7
Capel	-	-	-	-	13	23
Carnarvon	14.8	23.2	17	32	19	19
Collie	28.7	30.8	35	20	24	18
Dalyellup	-	-	-	-	2	3
Denmark	16.1	7.5	14	28	8	10
Derby	25.9	7.4	22	23	31	21
Dongara Denison	33.9	13.8	26	38	38	19
Donnybrook	-	-	-	-	11	19
Dunsborough / Yallingup	11.9	7.9	17	9	12	16
Esperance	23.7	15.6	25	11	12	12
Exmouth	-	-	-	-	34	45
Harvey / Wokalup	15.3	11.0	5	8	9	10
Jurien	10.2	4.1	16	16	16	18
Kalbarri	-	-	-	-	9	15
Kambalda	-	-	-	-	36	47
Karratha	25.9	20.5	18	33	25	10
Katanning	17.8	27.8	24	20	28	37
Kununurra	27.0	11.1	30	16	8	13
Lancelin	-	-	-	-	0	4
Manjimup	22.5	24.2	21	16	21	20
Margaret River Scheme	6.9	9.2	8	11	13	11
Merredin	31.2	42.3	58	59	35	35
Mount Barker	-	-	-	-	45	23
Narrogin	25.4	37.5	37	40	45	37
Newman	39.6	42.6	23	21	37	39
Northam	23.1	37.8	54	28	28	46
Pinjarra	7.0	8.3	16	13	5	10
Hedland Scheme <sup>35</sup>	80.9	83.0	70	67	41	39
Waroona-Hamel	-	-	-	-	9	11
Wickham	-	-	-	-	20	7
York	14.9	30.1	26	27	29	31
<b>Average</b>	<b>20.6</b>	<b>20.0</b>	<b>22.0</b>	<b>21.4</b>	<b>19.3</b>	<b>19.3</b>
<b>Average (excluding Perth)</b>	<b>20.9</b>	<b>20.2</b>	<b>22.3</b>	<b>21.6</b>	<b>19.5</b>	<b>19.5</b>

<sup>35</sup> Prior to 2015/16, values are reported for Port Hedland and South Hedland. The Water Corporation advised the ERA that the values should have been combined and reported under the Hedland Scheme. Refer to the ERA's past annual Water, Sewerage and Irrigation Performance reports for values for Port Hedland and South Hedland prior to 2015/16.

Table 27: Total connected properties - water supply (000's)

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b><u>NWC towns</u></b>						
Albany Scheme	14.9	15.3	16.0	15.6	16.2	16.5
Australind / Eaton	10.3	10.6	11.0	11.3	11.5	12.7
Bunbury (AQWEST)	16.0	16.6	17.0	16.91	17.1	17.2
Busselton Water	11.4	11.6	12.0	12.5	12.9	13.2
Geraldton	17.2	18.1	19.0	18.8	19.0	19.3
Kalgoorlie-Boulder	14.1	14.2	14.0	14.5	14.6	14.6
Mandurah Scheme	42.2	43.0	45.0	46.1	47.3	48.2
Perth	750.0	763.5	787.0	808.0	825.3	841.0
<b><u>Minor towns</u></b>						
Augusta	-	-	-	-	1.4	1.4
Bridgetown / Hester	1.6	1.6	1.6	1.7	1.7	1.7
Broome	6.9	7.1	7.5	7.6	7.7	7.8
Capel	-	-	-	-	1.1	1.1
Carnarvon	2.6	2.6	2.6	2.6	2.6	2.7
Collie	3.7	3.7	3.7	3.7	3.8	3.8
Dalyellup	-	-	-	-	2.7	2.7
Denmark	2.1	2.1	2.3	2.4	2.4	2.4
Derby	1.7	1.8	1.9	1.9	1.9	1.9
Dongara Denison	1.7	1.7	1.7	1.8	1.8	1.8
Donnybrook	-	-	-	-	1.3	1.3
Dunsborough / Yallingup	4.4	4.7	5.0	5.1	5.3	5.5
Esperance	5.4	5.4	5.5	5.5	5.6	5.6
Exmouth	-	-	-	-	1.8	1.8
Harvey / Wokalup	1.5	1.5	1.5	1.5	1.5	2.4
Jurien	1.4	1.5	1.5	1.5	1.6	1.6
Kalbarri	-	-	-	-	1.6	1.6
Kambalda	-	-	-	-	1.4	1.4
Karratha	7.5	7.8	8.5	8.6	8.6	8.7
Katanning	1.9	1.9	1.9	1.9	1.9	1.9
Kununurra	2.0	2.1	2.1	2.1	2.2	2.2
Lancelin	-	-	-	-	1.0	1.0
Manjimup	2.4	2.4	2.4	2.4	2.4	2.4
Margaret River Scheme	4.3	4.4	4.6	4.8	5.0	5.2
Merredin	1.6	1.6	1.6	1.6	1.6	1.6
Mount Barker	-	-	-	-	1.1	1.1
Narrogin	2.2	2.2	2.3	2.3	2.3	2.3
Newman	2.4	2.5	2.9	2.9	2.9	2.8
Northam	3.4	3.5	3.5	3.6	3.6	3.6
Pinjarra	2.0	2.1	2.2	2.2	2.3	2.3
Hedland Scheme <sup>36</sup>	6.6	6.9	7.4	8.0	8.1	8.1
Waroona-Hamel	-	-	-	-	1.2	1.3
Wickham	-	-	-	-	1.1	1.1
York	1.6	1.6	1.6	1.6	1.6	1.7
<b>Average</b>	<b>947.0</b>	<b>965.6</b>	<b>996.7</b>	<b>1,021.0</b>	<b>1,058.0</b>	<b>1,078.4</b>
<b>Average (excluding Perth)</b>	<b>197.0</b>	<b>202.1</b>	<b>209.7</b>	<b>213.0</b>	<b>232.7</b>	<b>237.4</b>

<sup>36</sup> Prior to 2015/16, values are reported for Port Hedland and South Hedland. The Water Corporation advised the ERA that the values should have been combined and reported under the Hedland Scheme. Refer to the ERA's past annual Water, Sewerage and Irrigation Performance reports for values for Port Hedland and South Hedland prior to 2015/16.

Table 28: Water service complaints (per 1,000 customers)

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b><u>NWC towns</u></b>						
Albany Scheme	0.8	0.2	0.2	0.2	0.4	0.2
Australind / Eaton	1.3	0.2	0.2	0.1	0.3	0.7
Bunbury (AQWEST)	7.3	5.5	0.2	0.2	0.3	0.3
Busselton Water	0.4	0.2	0.2	0.0	0.4	0.0
Geraldton	1.6	1.3	0.6	0.5	0.6	0.7
Kalgoorlie-Boulder	0.4	0.1	0.0	0.2	0.0	0.2
Mandurah Scheme	0.5	0.0	0.0	0.0	0.1	0.2
Perth	0.9	0.3	0.3	0.0	0.4	0.4
<b><u>Minor towns</u></b>						
Augusta	-	-	-	-	0.0	0.0
Bridgetown / Hester	0.6	1.3	0.0	0.0	3.5	0.0
Broome	0.9	0.3	0.8	0.1	0.3	0.0
Capel	-	-	-	-	0.0	0.0
Carnarvon	1.9	0.0	0.0	0.0	0.0	0.8
Collie	1.9	3.0	0.3	0.3	0.5	0.0
Dalyellup	-	-	-	-	0.0	0.0
Denmark	1.4	0.0	0.0	1.3	0.0	0.0
Derby	0.0	0.0	0.0	0.0	0.0	0.0
Dongara Denison	0.6	0.0	0.0	1.1	0.0	0.6
Donnybrook	-	-	-	-	0.8	1.6
Dunsborough / Yallingup	0.5	0.2	0.0	0.0	0.2	0.2
Esperance	6.3	0.6	0.2	0.2	0.2	0.5
Exmouth	-	-	-	-	1.1	0.0
Harvey / Wokalup	0.7	1.4	0.0	0.0	0.7	0.8
Jurien	0.0	0.0	0.0	0.0	0.0	0.0
Kalbarri	-	-	-	-	0.0	0.0
Kambalda	-	-	-	-	0.0	0.0
Karratha	0.8	0.1	0.0	0.0	0.5	0.1
Katanning	0.5	0.0	0.0	0.0	0.0	0.0
Kununurra	2.5	0.0	0.0	0.0	0.0	0.0
Lancelin	-	-	-	-	0.0	0.0
Manjimup	0.4	0.0	0.0	0.0	0.0	0.8
Margaret River Scheme	0.2	0.2	0.0	0.8	0.2	0.0
Merredin	2.4	1.2	0.0	0.6	0.0	0.6
Mount Barker	-	-	-	-	0.0	0.0
Narrogin	0.4	0.0	0.0	0.0	0.9	0.4
Newman	0.8	0.4	0.7	0.0	0.3	0.4
Northam	1.5	0.0	0.3	0.3	0.0	1.7
Pinjarra	2.0	0.0	0.0	0.0	0.0	0.0
Hedland Scheme <sup>37</sup>	3.0	4.6	0.0	1.5	0.0	0.0
Waroona-Hamel	-	-	-	-	0.0	0.0
Wickham	-	-	-	-	0.0	0.0
York	0.0	3.8	0.0	0.0	0.0	0.0
<b>Average</b>	<b>1.4</b>	<b>0.8</b>	<b>0.1</b>	<b>0.2</b>	<b>0.3</b>	<b>0.3</b>
<b>Average (excluding Perth)</b>	<b>1.4</b>	<b>0.8</b>	<b>0.1</b>	<b>0.2</b>	<b>0.3</b>	<b>0.3</b>

<sup>37</sup> Prior to 2015/16, values are reported for Port Hedland and South Hedland. The Water Corporation advised the ERA that the values should have been combined and reported under the Hedland Scheme. Refer to the ERA's past annual Water, Sewerage and Irrigation Performance reports for values for Port Hedland and South Hedland prior to 2015/16.

Table 29: Average duration of unplanned water supply interruption (minutes)

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b><u>NWC towns</u></b>						
Albany Scheme	145.0	123.8	123.0	120.8	132.0	121
Australind / Eaton	86.0	75.7	78.0	72.2	56.0	85.0
Bunbury (AQWEST)	61.8	56.7	48.0	43.0	61.0	49.0
Busselton Water	79.5	2.8	3.0	197.5	85.7	63.5
Geraldton	193.0	139.7	110.0	103.4	120.0	137.0
Kalgoorlie-Boulder	36.0	33.9	56.0	39.6	62.4	44.0
Mandurah Scheme	79.0	64.3	68.0	61.2	49.9	71.0
Perth	118.0	129.7	117.0	96.0	107.9	103.0
<b><u>Minor towns</u></b>						
Augusta	-	-	-	-	197.4	188
Bridgetown / Hester	154.0	66.0	142	150	104.0	130
Broome	143.0	35.0	117	40	29.0	32
Capel	-	-	-	-	59.0	46
Carnarvon	41.0	49.0	45	38	38.0	66
Collie	177.0	148.0	95	78	96.0	190
Dalyellup	-	-	-	-	61.0	50
Denmark	159.0	95.0	90	244	2,572.0	129
Derby	42.0	31.0	34	22	29.0	27
Dongara Denison	62.0	85.0	69	187	52.0	73
Donnybrook	-	-	-	-	139.0	106
Dunsborough / Yallingup	83.0	88.0	48	64	83.0	82
Esperance	83.0	90.0	149	83	105.0	89
Exmouth	-	-	-	-	75.0	66
Harvey / Wokalup	128.0	78.0	164	132	80.0	120
Jurien	54.0	97.0	42	55	73.0	41
Kalbarri	-	-	-	-	46.0	31
Kambalda	-	-	-	-	18.0	180
Karratha	41.0	60.0	54	52	61.0	38
Katanning	219.0	160.0	114	150	191.0	123
Kununurra	34.0	36.0	62	41	30.0	44
Lancelin	-	-	-	-	19.0	20
Manjimup	60.0	75.0	59	57	72.0	67
Margaret River Scheme	71.0	101.0	125	82	92.0	133
Merredin	83.0	86.0	97	250	139.0	178
Mount Barker	-	-	-	-	149.0	171
Narrogin	170.0	125.0	98	189	166.0	191
Newman	98.0	106.0	152	115	230.0	222
Northam	81.0	143.0	136	151	182.0	236
Pinjarra	73.0	47.0	56	84	117.0	77
Hedland Scheme <sup>38</sup>	166.0	191.0	171	520	63.0	42
Waroona-Hamel	-	-	-	-	61.0	80
Wickham	-	-	-	-	91.0	41
York	168.0	162.0	137	318	187.0	81
<b>Average</b>	<b>102.8</b>	<b>92.4</b>	<b>94.5</b>	<b>123.7</b>	<b>151.9</b>	<b>96.8</b>
<b>Average (excluding Perth)</b>	<b>102.3</b>	<b>91.2</b>	<b>93.8</b>	<b>124.7</b>	<b>153.0</b>	<b>96.6</b>

<sup>38</sup> Prior to 2015/16, values are reported for Port Hedland and South Hedland. The Water Corporation advised the ERA that the values should have been combined and reported under the Hedland Scheme. Refer to the ERA's past annual Water, Sewerage and Irrigation Performance reports for values for Port Hedland and South Hedland prior to 2015/16.

Table 30: Average frequency of unplanned interruptions (per 1,000 water connections)

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b><u>NWC towns</u></b>						
Albany Scheme	161.8	136.3	292.0	253.2	326.5	276.7
Australind / Eaton	64.8	40.4	246.0	268.3	467.7	322.0
Bunbury (AQWEST)	168.4	163.9	210.0	204.0	148.3	235.6
Busselton Water	1.0	127.5	175.0	165.0	18.5	17.9
Geraldton	289.7	604.3	829.0	1,097.4	940.7	775.3
Kalgoorlie-Boulder	65.6	21.9	357.0	398.0	524.9	751.9
Mandurah Scheme	62.6	35.9	123.0	152.0	181.1	248.2
Perth	104.6	121.7	286.0	314.0	322.6	289.1
<b><u>Minor towns</u></b>						
Augusta	-	-	-	-	127.0	188.0
Bridgetown / Hester	211.0	54.8	498.1	346	451.0	212.0
Broome	457.0	123.2	616.9	452	225.0	336.0
Capel	-	-	-	-	204.0	728.0
Carnarvon	68.0	35.9	131.3	154	165.0	292.0
Collie	249.0	281.7	332.7	334	126.0	127.0
Dalyellup	-	-	-	-	295.0	170.0
Denmark	440.0	297.1	351.3	518	520.0	379.0
Derby	191.0	90.6	287.4	179	502.0	242.0
Dongara Denison	197.0	294.1	1,290.8	2,348	847.0	423.0
Donnybrook	-	-	-	-	508.0	453.0
Dunsborough / Yallingup	198.0	189.2	401.2	204	255.0	321.0
Esperance	198.0	146.2	335.2	332	451.0	414.0
Exmouth	-	-	-	-	519.0	332.0
Harvey / Wokalup	275.0	85.9	221.9	158	270.0	127.0
Jurien	83.0	58.2	286.9	158	1,438.0	274.0
Kalbarri	-	-	-	-	312.0	156.0
Kambalda	-	-	-	-	64.0	337.0
Karratha	624.0	239.9	283.0	272	376.0	388.0
Katanning	207.0	252.1	335.1	427	813.0	590.0
Kununurra	56.0	55.8	287.1	376	168.0	301.0
Lancelin	-	-	-	-	74.0	76.0
Manjimup	60.0	132.9	199.7	149	132.0	125.0
Margaret River Scheme	30.0	32.3	96.0	142	155.0	196.0
Merredin	203.0	131.9	277.9	373	154.0	292.0
Mount Barker	-	-	-	-	465.0	159.0
Narrogin	136.0	179.5	288.4	175	256.0	229.0
Newman	403.0	248.5	1,734.8	485	3,056.0	4,557.0
Northam	45.0	44.7	232.8	180	369.0	441.0
Pinjarra	94.0	69.4	150.7	279	65.0	560.0
Hedland Scheme <sup>39</sup>	454.0	710.8	1,297.9	832	336.0	290.0
Waroona-Hamel	-	-	-	-	244.0	121.0
Wickham	-	-	-	-	1,695.0	301.0
York	105.0	139.0	160.2	274	88.0	125.0
<b>Average</b>	<b>190.4</b>	<b>166.0</b>	<b>406.9</b>	<b>387.1</b>	<b>444.1</b>	<b>409.0</b>
<b>Average (excluding Perth)</b>	<b>193.3</b>	<b>167.5</b>	<b>411.0</b>	<b>389.5</b>	<b>447.1</b>	<b>411.9</b>

<sup>39</sup> Prior to 2015/16, values are reported for Port Hedland and South Hedland. The Water Corporation advised the ERA that the values should have been combined and reported under the Hedland Scheme. Refer to the ERA's past annual Water, Sewerage and Irrigation Performance reports for values for Port Hedland and South Hedland prior to 2015/16.

Table 31: Sewage collected per property (kL per property)

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b><u>NWC towns</u></b>						
Albany	188	180	182	170	178	183
Australind / Eaton	159	163	160	159	156	161
Bunbury / Dalyellup	178	173	181	185	182	179
Busselton	178	149	148	146	144	147
Geraldton	157	153	152	149	143	142
Kalgoorlie/Boulder	179	177	166	156	149	173
Mandurah	144	141	145	144	143	140
Perth	189	187	190	185	178	174
<b><u>Minor towns</u></b>						
Broome	251	244	197	186	186	192
Carnarvon	-	-	-	-	-	163
Collie	194	175	201	164	154	165
Denmark	-	-	-	-	-	135
Derby	-	-	-	-	-	180
Dongara-Denison	-	-	-	-	-	116
Dunsborough	142	140	146	121	123	123
Esperance	202	191	192	168	157	168
Exmouth	-	-	-	-	73	81
Harvey-Wokalup	-	-	-	-	-	256
Jurien	73	89	101	96	-	-
Kalbarri	-	-	-	-	102	102
Kambalda	-	-	-	-	156	154
Karratha	261	229	211	211	195	183
Katanning	148	166	169	171	164	189
Kununurra	324	286	306	256	231	313
Manjimup	237	183	211	210	213	198
Margaret River scheme	-	-	-	-	151	152
Merredin	176	152	139	149	157	126
Narrogin	205	204	204	194	185	168
Newman	-	-	N/A	N/A	N/A	N/A
Northam	130	157	191	187	163	183
Pinjarra	-	-	-	-	118	133
Hedland scheme <sup>40</sup>	338	350	352	314	185	190
Wickham	-	-	-	-	229	266
<b>Average</b>	<b>193</b>	<b>185</b>	<b>188</b>	<b>177</b>	<b>162<sup>41</sup></b>	<b>164</b>
<b>Average (excluding Perth)</b>	<b>193</b>	<b>185</b>	<b>188</b>	<b>177</b>	<b>161</b>	<b>169</b>

<sup>40</sup> Prior to 2015/16, values are reported for Port Hedland and South Hedland. Water Corporation advised the ERA that the values should have been combined and reported under the Hedland Scheme. Refer to the ERA's past annual Water, Sewerage and Irrigation Performance reports for values for Port Hedland and South Hedland prior to 2015/16.

<sup>41</sup> The average and average (excluding Perth) reporting in the 2015-16 report were both incorrect, because the calculation did not exclude six new schemes for which no data was provided.

Table 32: Recycled water (Percentage of effluent recycled)

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b><u>NWC towns</u></b>						
Albany	100.0	100.0	100.0	100.0	100.0	97.0
Australind / Eaton	100.0	100.0	100.0	100.0	101.3	77.3
Bunbury / Dalyellup	3.9	3.8	5.0	3.2	3.1	3.5
Busselton	18.0	16.6	15.0	14.0	13.3	12.4
Geraldton	13.6	13.8	13.0	12.7	12.3	12.6
Kalgoorlie/Boulder	100.0	72.4	56.0	97.0	64.8	98.0
Mandurah	2.4	2.1	2.0	2.4	2.4	3.0
Perth	8.0	7.9	7.0	7.0	7.6	7.1
<b><u>Minor towns</u></b>						
Broome	18.0	102.0	100.0	100.0	100.0	100.0
Carnarvon	-	-	-	-	89.0	51.1
Collie	0.0	0.0	0.0	0.0	0.0	0.0
Denmark	-	-	-	-	0.0	0.0
Derby	-	-	-	-	115.7	110.9
Dongara-Denison	-	-	-	-	88.1	76.2
Dunsborough	100.0	100.0	100.0	100.0	100.0	100.0
Esperance	25.0	16.0	15.0	12.1	4.2	3.6
Exmouth	-	-	-	-	90.9	91.2
Harvey-Wokalup	-	-	-	-	0.0	0.0
Jurien	0.0	0.0	0.0	0.0	-	-
Kalbarri	-	-	-	-	80.8	73.0
Kambalda	-	-	-	-	89.3	90.1
Karratha	51.0	50.0	49.1	51.4	90.8	60.8
Katanning	100.0	69.0	56.4	83.0	71.5	82.1
Kununurra	0.0	100.0	100.0	100.0	100.0	100.0
Manjimup	79.0	84.1	92.9	85.4	97.3	73.6
Margaret River scheme	-	-	-	-	179.1	169.1
Merredin	100.0	100.0	100.0	95.5	100.0	80.1
Narrogin	25.0	26.0	29.2	22.4	26.5	23.3
Newman	-	-	not applic	not applic	not applic	not applic
Northam	39.0	32.0	65.9	44.6	58.2	50.6
Pinjarra	-	-	-	-	135.3	137.4
Hedland scheme <sup>42</sup>	94.0	94.0	90.9	56.1	100.0	100.0
Wickham	-	-	-	-	0.0	40.9
<b>Average</b>	<b>46.5</b>	<b>51.9</b>	<b>52.3</b>	<b>51.8</b>	<b>65.2</b>	<b>60.8</b>
<b>Average (excluding Perth)</b>	<b>48.4</b>	<b>54.1</b>	<b>54.5</b>	<b>54.0</b>	<b>67.2<sup>43</sup></b>	<b>62.6</b>

<sup>42</sup> Prior to 2015/16, values are reported for Port Hedland and South Hedland. Water Corporation advised the ERA that the values should have been combined and reported under the Hedland Scheme. Refer to the ERA's past annual Water, Sewerage and Irrigation Performance reports for values for Port Hedland and South Hedland prior to 2015/16.

<sup>43</sup> The regional town average of recycled water – percentage of effluent recycled reported for 2015-16 was 64.3% in the 2015/16 Water, Sewerage and Irrigation Performance Report. The corrected value is 67.2% as reported in this report.

Table 33: Sewer main breaks and chokes (per 100 kilometres of sewer main)

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b><u>NWC towns</u></b>						
Albany	25.6	30.7	19.0	23.0	30.6	20.9
Australind / Eaton	6.1	6.5	6.0	10.4	7.9	7.4
Bunbury / Dalyellup	12.2	14.6	12.0	12.4	12.8	9.2
Busselton	5.4	8.4	3.0	4.0	3.7	3.8
Geraldton	8.8	14.3	7.0	10.7	8.7	7.1
Kalgoorlie/Boulder	63.7	24.4	30.0	18.0	27.0	30.0
Mandurah	8.1	9.4	8.0	7.5	9.0	10.0
Perth	18.6	16.1	17.0	17.5	18.6	17.0
<b><u>Minor towns</u></b>						
Broome	3.0	1.6	4.0	1	3	7
Carnarvon	-	-	-	-	32	9
Collie	33.7	21.3	19.0	26	23	22
Denmark	-	-	-	-	16	15
Derby	-	-	-	-	3	16
Dongara-Denison	-	-	-	-	0.0	2
Dunsborough	6.2	12.6	9.0	4	10.0	15
Esperance	2.7	8.4	12.0	17	10	12
Exmouth	-	-	-	-	13	10
Harvey-Wokalup	-	-	-	-	16	16
Jurien	-	-	3.0	6	-	-
Kalbarri	-	-	-	-	5	0
Kambalda	-	-	-	-	14	14
Karratha	20.1	29.5	16.0	16	13	19
Katanning	52.4	54.8	62.0	62	53	100
Kununurra	20.5	7.4	23.0	27	34	25
Manjimup	14.0	18.0	18.0	8	16	10
Margaret River scheme	-	-	-	-	6	13
Merredin	32.4	32.4	25.0	39	36	42
Narrogin	57.8	62.2	82.0	81	70	48
Newman	37.5	48.8	40.0	25	44	40
Northam	48.8	46.4	64.0	46	38	32
Pinjarra	-	-	-	-	8	15
Hedland scheme <sup>44</sup>	39.5	39.5	22.0	28	23	21
Wickham	-	-	-	-	97	54
<b>Average</b>	<b>24.6</b>	<b>24.2</b>	<b>23.9</b>	<b>23.3</b>	<b>21.9</b>	<b>20.7</b>
<b>Average (excluding Perth)</b>	<b>24.9</b>	<b>24.6</b>	<b>24.2</b>	<b>23.6</b>	<b>22.0</b>	<b>20.8</b>

<sup>44</sup> Prior to 2015/16, values are reported for Port Hedland and South Hedland. Water Corporation advised the ERA that the values should have been combined and reported under the Hedland Scheme. Refer to the ERA's past annual Water, Sewerage and Irrigation Performance reports for values for Port Hedland and South Hedland prior to 2015/16.

Table 34: Total connected properties – Sewerage (000's)

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b><u>NWC towns</u></b>						
Albany	11.1	11.4	12.0	11.7	12.0	12.1
Australind / Eaton	8.0	8.3	9.0	8.9	9.0	9.5
Bunbury / Dalyellup	16.2	16.6	17.0	16.8	18.0	17.9
Busselton	10.0	10.6	10.9	11.3	12.0	12.1
Geraldton	10.5	11.2	12.0	11.9	12.0	12.3
Kalgoorlie/Boulder	15.0	14.0	15.1	15.0	15.0	12.9 <sup>45</sup>
Mandurah	33.8	34.7	36.0	37.5	39.0	40.3
Perth	685.4	698.1	713.0	731.4	754.0	771.7
<b><u>Minor towns</u></b>						
Broome	6.0	6.2	6.5	6.7	6.8	6.8
Carnarvon	-	-	-	-	1.4	1.4
Collie	3.2	3.2	3.2	3.3	3.3	3.3
Denmark	-	-	-	-	1.0	1.0
Derby	-	-	-	-	1.5	1.5
Dongara-Denison	-	-	-	-	1.2	1.2
Dunsborough	3.2	3.5	3.7	3.8	4.0	4.2
Esperance	3.7	3.8	3.9	4.0	4.1	4.1
Exmouth	-	-	-	-	1.5	1.5
Harvey-Wokalup	-	-	-	-	1.2	1.2
Jurien	0.6	0.7	0.7	0.7	-	-
Kalbarri	-	-	-	-	1.5	1.5
Kambalda	-	-	-	-	1.2	1.2
Karratha	8.6	7.2	7.8	7.9	8.0	8.0
Katanning	1.6	1.6	1.6	1.6	1.6	1.6
Kununurra	1.8	1.8	1.9	1.9	1.9	1.9
Manjimup	1.7	1.7	1.7	1.7	1.8	1.8
Margaret River scheme	-	-	-	-	3.5	3.6
Merredin	1.3	1.4	1.4	1.4	1.4	1.4
Narrogin	1.9	1.9	1.9	1.9	1.9	1.9
Newman	2.3	2.4	2.5	2.7	2.7	2.7
Northam	2.8	2.8	2.9	2.9	2.9	2.9
Pinjarra	-	-	-	-	2.0	2.0
Hedland scheme <sup>46</sup>	3.8	4.0	4.2	4.8	7.0	7.1
Wickham	-	-	-	-	1.0	1.0
<b>Total</b>	<b>833</b>	<b>847</b>	<b>869</b>	<b>890</b>	<b>935</b>	<b>954</b>
<b>Total (excluding Perth)</b>	<b>148</b>	<b>149</b>	<b>156</b>	<b>159</b>	<b>181</b>	<b>182</b>

<sup>45</sup> City of Kalgoorlie-Boulder noted that the reported value does not include connections for subdivided properties.

<sup>46</sup> Prior to 2015/16, values are reported for Port Hedland and South Hedland. Water Corporation advised the ERA that the values should have been combined and reported under the Hedland Scheme. Refer to the ERA's past annual Water, Sewerage and Irrigation Performance reports for values for Port Hedland and South Hedland prior to 2015/16.

Table 35: Sewerage service complaints (per 1,000 customers)

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b><u>NWC towns</u></b>						
Albany	0.8	0.3	0.1	0.2	0.2	0.0
Australind / Eaton	2.4	0.1	0.1	0.0	0.0	0.1
Bunbury / Dalyellup	1.6	0.2	0.1	0.1	0.0	0.1
Busselton	0.4	0.3	0.1	0.2	0.2	0.7
Geraldton	0.7	0.2	0.7	0.8	0.2	0.6
Kalgoorlie/Boulder	12.3	4.1	4.2	3.0	3.8	5.1 <sup>47</sup>
Mandurah	0.3	0.1	0.0	0.0	0.1	0.0
Perth	0.4	0.2	0.1	0.0	0.1	0.1
<b><u>Minor towns</u></b>						
Broome	0.0	0.0	0.0	0.0	0.0	0.0
Carnarvon	-	-	-	-	0.0	0.0
Collie	0.0	0.0	0.0	0.0	0.3	0.9
Denmark	-	-	-	-	0.0	0.0
Derby	-	-	-	-	0.0	0.0
Dongara-Denison	-	-	-	-	0.0	0.0
Dunsborough	1.2	0.0	0.0	0.0	0.0	0.0
Esperance	0.0	0.0	0.0	0.2	0.0	0.0
Exmouth	-	-	-	-	0.0	0.0
Harvey-Wokalup	-	-	-	-	0.0	0.0
Jurien	0.0	0.0	0.0	0.0	-	-
Kalbarri	-	-	-	-	0.0	0.0
Kambalda	-	-	-	-	0.0	0.0
Karratha	0.4	0.0	0.0	0.0	0.0	0.0
Katanning	1.3	0.6	0.0	0.0	0.0	0.0
Kununurra	1.1	1.1	0.0	0.0	0.0	1.0
Manjimup	1.2	1.2	0.0	0.0	0.0	0.0
Margaret River scheme	-	-	-	-	0.0	0.6
Merredin	0.7	3.0	0.0	0.0	0.0	0.0
Narrogin	0.5	0.5	0.0	0.0	0.5	0.5
Newman	0.0	0.0	0.0	0.0	0.0	0.0
Northam	0.4	0.0	0.3	0.3	0.0	0.0
Pinjarra	-	-	-	-	0.0	0.0
Hedland scheme <sup>48</sup>	0.0	0.0	0.0	0.0	0.3	0.1
Wickham	-	-	-	-	0.0	0.0
<b>Average</b>	<b>1.2</b>	<b>0.5</b>	<b>0.3</b>	<b>0.2</b>	<b>0.2</b>	<b>0.3</b>
<b>Average (excluding Perth)</b>	<b>1.2</b>	<b>0.6</b>	<b>0.3</b>	<b>0.2</b>	<b>0.2</b>	<b>0.3</b>

<sup>47</sup> City of Kalgoorlie-Boulder noted that the reported value is calculated based on the total connected properties not including connections for subdivided properties.

<sup>48</sup> Prior to 2015/16, values are reported for Port Hedland and South Hedland. Water Corporation advised the ERA that the values should have been combined and reported under the Hedland Scheme. Refer to the ERA's past annual Water, Sewerage and Irrigation Performance reports for values for Port Hedland and South Hedland prior to 2015/16.

Table 36: Total recycled water supplied (megalitres)

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b><u>NWC towns</u></b>						
Albany (W/S)	1929	2051	2114	2009	2131	2145
Australind / Eaton (W/S)	1257	1350	1378	1433	1469	1181
Bunbury (W)	0	0	0	0	0	0
Bunbury / Dalyellup (S)	111	110	148	102	109	114
Busselton (W)	0	0	0	0	0	0
Busselton (S)	265	261	245	230	225	221
Geraldton (W/S)	223	235	237	221	216	220
Kalgoorlie/Boulder (W)	0	0	0	0	0	0
Kalgoorlie/Boulder (S)	1817	1793	1410	1607	1449	946
Mandurah (W/S)	119	104	119	131	137	168
Perth (W/S)	10370	10273	10029	9354	10212	9568
<b><u>Minor towns</u></b>						
Augusta (W)	-	-	-	-	0	0
Bridgetown/Hester (W)	35	35	43	33	37	43
Broome (W/S)	737	869	949	963	863	942
Capel (W)	-	-	-	-	85	87
Carnarvon (W)	257	231	236	229	207	114
Collie (W/S)	0	0	0	0	0	0
Dalyellup (W)	-	-	-	-	0	0
Denmark (W)	0	0	0	0	0	0
Derby (W)	273	270	248	291	340	304
Dongara / Denison (W)	125	148	143	139	125	109
Donnybrook (W)	-	-	-	-	101	65
Dunsborough (W/S)	461	495	515	462	493	512
Esperance (W/S)	132	84	72	67	23	20
Exmouth (W/S)	-	-	-	-	100	114
Harvey/Wokalup (W)	0	0	0	0	0	0
Jurien (W/S)	0	0	0	0	0	0
Kalbarri (W/S)	-	-	-	-	119	108
Kambalda (W/S)	-	-	-	-	172	172
Karratha (W/S)	789	842	599	603	818	638
Katanning (W/S)	232	178	150	205	166	178
Kununurra (W/S)	0	546	528	459	452	610
Lancelin (W)	-	-	-	-	0	0
Manjimup (W/S)	313	259	337	339	364	316
Margaret River scheme (W)	421	429	932	821	946	937
Merredin (W/S)	116	102	91	105	148	87
Mount Barker (W)	-	-	-	-	0	0
Narrogin (W/S)	96	101	114	83	85	81
Newman (W/S)	0	0	0	N/A	N/A	N/A
Northam (W/S)	126	120	226	157	207	201
Pingarra (W)	273	268	319	343	323	360
Hedland scheme (W/S) <sup>49</sup>	176	176	176	62	734	705
Waroona-Hamel (W)	-	-	-	-	0	0
Wickham (W)	-	-	-	-	0	108

<sup>49</sup> Prior to 2015/16, values are reported for Port Hedland and South Hedland. Water Corporation advised the ERA that the values should have been combined and reported under the Hedland Scheme. Refer to the ERA's past annual Water, Sewerage and Irrigation Performance reports for values for Port Hedland and South Hedland prior to 2015/16.

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
<b>York (W)</b>	28	22	30	22	21	37
<b>Total</b>	<b>21,297</b>	<b>21,939</b>	<b>21,970</b>	<b>21,034</b>	<b>22,877</b>	<b>21,411</b>
<b>Total (excluding Perth)</b>	<b>10,927</b>	<b>11,666</b>	<b>11,941</b>	<b>11,680</b>	<b>12,665</b>	<b>11,843</b>

## Appendix 2: Water services licenses

There are four classes of water service that require a licence:

- Water supply services (both potable and non-potable services)
- Sewerage services
- Irrigation services
- Drainage services

A licence may be granted for more than one class of service. For example, a sewerage and water supply licence may be granted to a sewerage service provider to enable them to supply recycled effluent.

The licence specifies the area(s) of the State in which the service is to be provided. Where a licence covers more than one service it is possible for the operating area for each service to be different.

In 2016-17, there were 20 licensed water service providers in the State as follows.

Licensee	Water supply	Sewerage	Irrigation	Drainage
Aquasol Pty Ltd (potable and non-potable)	√	√		
Bunbury Water Corporation (trading as Aqwest) (potable)	√			
Busselton Water Corporation (trading as Busselton Water) (potable)	√			
City of Kalgoorlie Boulder (non-potable)		√		
Gascoyne Water Cooperative (non-potable)			√	
Hamersley Iron (potable)	√	√		
Lancelin South (potable and non-potable)	√	√		
Moama Lifestyle Villages Pty Ltd (potable and non-potable)		√		
Ord Irrigation Cooperative (non-potable)			√	
Peel Water (potable and non-potable)	√	√		
Preston Valley Irrigation Cooperative (non-potable)	√		√	
Robe River Mining Co (potable)		√		
Rottnest Island Authority (potable and non-potable)	√	√		√
South West Irrigation Management Cooperative (non-potable)	√		√	
Water Corporation (potable and non-potable)	√	√	√	√
Water West North Dandalup Pty Ltd (non-potable)	√	√		
WA Sewage (non-potable)		√		
Three local government authorities: <sup>50</sup> (non-potable)		√		

<sup>50</sup> Since April 2016, the Minister for Water has granted exemptions to 16 local government authorities that were previously licensed by the ERA for sewerage and non-potable water services. Three local government authorities remain licensed. See *Class Exemption Order*, published 7 July 2017, Government Gazette, Western Australia.

## Appendix 3: Water performance reporting

### *National Water Initiative Agreement*

Since April 2006, Western Australia has been a signatory to the National Water Initiative Agreement (**NWI Agreement**). Under the NWI Agreement, all States and Territories report independently, publicly and on an annual basis to benchmark data on the pricing and service quality of urban and rural water delivery agencies.

The signatories to the NWI Agreement initially developed performance reporting frameworks for urban utilities (**urban framework**) and rural water delivery agencies (**rural framework**), but reporting under the latter was discontinued in 2013-14.<sup>51</sup>

The States and Territories are represented in the NWI Agreement by the agencies that are responsible for regulating water supply services in each jurisdiction. The ERA performs the roles of both the data coordinator and audit coordinator for Western Australia.

The urban framework comprises a handbook with performance indicators and definitions, which are revised and published annually. The urban framework captures all urban water services providers that service 10,000 or more connected properties.

In Western Australia, four licensees fall within the urban framework and included in the annual national performance report published by the Bureau of Meteorology.<sup>52</sup> These licensees are: Aqwest (water only); Busselton Water (water only); City of Kalgoorlie-Boulder (sewerage only); and the Water Corporation (water and sewerage).<sup>53</sup>

The licenses of the licensees that fall within the urban framework include a condition requiring the licensee to provide the ERA with annual performance data in accordance with the urban framework.

### *ERA performance reporting*

The ERA's water performance reporting handbook for the 2016-17 reporting period was published by the ERA in May 2017. The reporting handbook sets out standard performance reporting obligations for each type of supply service: potable water, non-potable water, sewerage and irrigation.<sup>54</sup>

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<sup>51</sup> The original signatory representing the Commonwealth in the NWI was the National Water Commission (NWC). In September 2014, the Australian Government made a decision to abolish the NWC and the administering responsibility of the urban framework was transferred solely to the Bureau of Meteorology. The Rural Framework was discontinued due to the limited ability to compare the performance of the rural water service providers covered by the Framework.

<sup>52</sup> The urban national performance reports benchmark the pricing and service quality of Australian water utilities. Further information on the urban national performance report can be found on the Bureau of Meteorology website, <http://www.bom.gov.au/water/npr/>

<sup>53</sup> The Water Corporation supplies eight towns that are captured by the urban framework: Albany, Australind/Eaton, Bunbury (sewerage only), Busselton (sewerage only) Geraldton, Kalgoorlie-Boulder (water only), Mandurah and Perth.

<sup>54</sup> Drainage licenses include service and performance standards in relation to drainage services, however, licensees are not required to include these in their annual license performance report.

The reporting requirements of service providers that are captured by the urban framework, are aligned with the framework. The ERA has also published reporting datasheets to collect data from the service providers.

## Appendix 4: List of water supply and sewerage schemes in Western Australia in 2016-17

Schemes with 10,000 or more connected properties	Water supply	Sewerage
Albany	√	√
Australind-Eaton	√	√
Bunbury	√	√
Busselton	√	√
City of Kalgoorlie-Boulder	√	√
Geraldton	√	√
Mandurah	√	√
Perth	√	√
Schemes with 1,000 – 9,999 connected properties	Water supply	Sewerage
Augusta	√	
Bridgetown – Hester	√	
Broome	√	√
Capel*	√	
Carnarvon	√	√
Collie	√	√
Dalyellup	√	
Denmark	√	√
Derby	√	√
Dongara Denison	√	√
Donnybrook	√	
Dunsborough - Yallingup	√	√
Esperance	√	√
Exmouth	√	√
Harvey – Wokalup	√	√
Jurien	√	
Kalbarri	√	√
Kambalda	√	√
Karratha	√	√
Katanning	√	√
Kununurra	√	√
Lancelin	√	
Manjimup	√	√
Margaret River Scheme	√	√
Merredin	√	√
Mount Barker	√	
Narrogin	√	√
Newman	√	√
Northam	√	√
Pinjarra	√	√

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<b>Hedland Scheme</b>	√	√
<b>Waroona–Hamel</b>	√	
<b>Wickham</b>	√	√
<b>York</b>	√	

## Glossary

Term	Definition
<b>Bulk water</b>	Potable and non-potable water received from another utility or entity outside the reporting utility's geographic area of responsibility. The volume of water may include water subsequently exported (sold) to another utility.
<b>Desalination</b>	Potable and non-potable water sourced from desalination plants.
<b>Groundwater</b>	Potable and non-potable water abstracted from aquifers and other 'below ground' water sources. 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 sewage plants (recycling).
<b>Non-potable water</b>	Water that is not safe to drink or to use for food preparation, but can be used for non-drinking purposes such as the irrigation of lawns or industrial processes.
<b>Onsite reuse</b>	Water used for processes within a sewage treatment plant, such as cleaning.
<b>Potable water</b>	Water that is safe to drink or to use for food preparation.
<b>Primary sewage treatment</b>	Removes suspended matter by settling it at the bottom of the tank.
<b>Secondary sewage treatment</b>	Removes up to 85 per cent of dissolved and suspended biological matter.
<b>Surface water</b>	Potable and non-potable water abstracted from surface water sources such as dams, rivers or irrigation channels.
<b>Tertiary sewage treatment</b>	Disinfects and removes, or reduces the level of, nutrients.