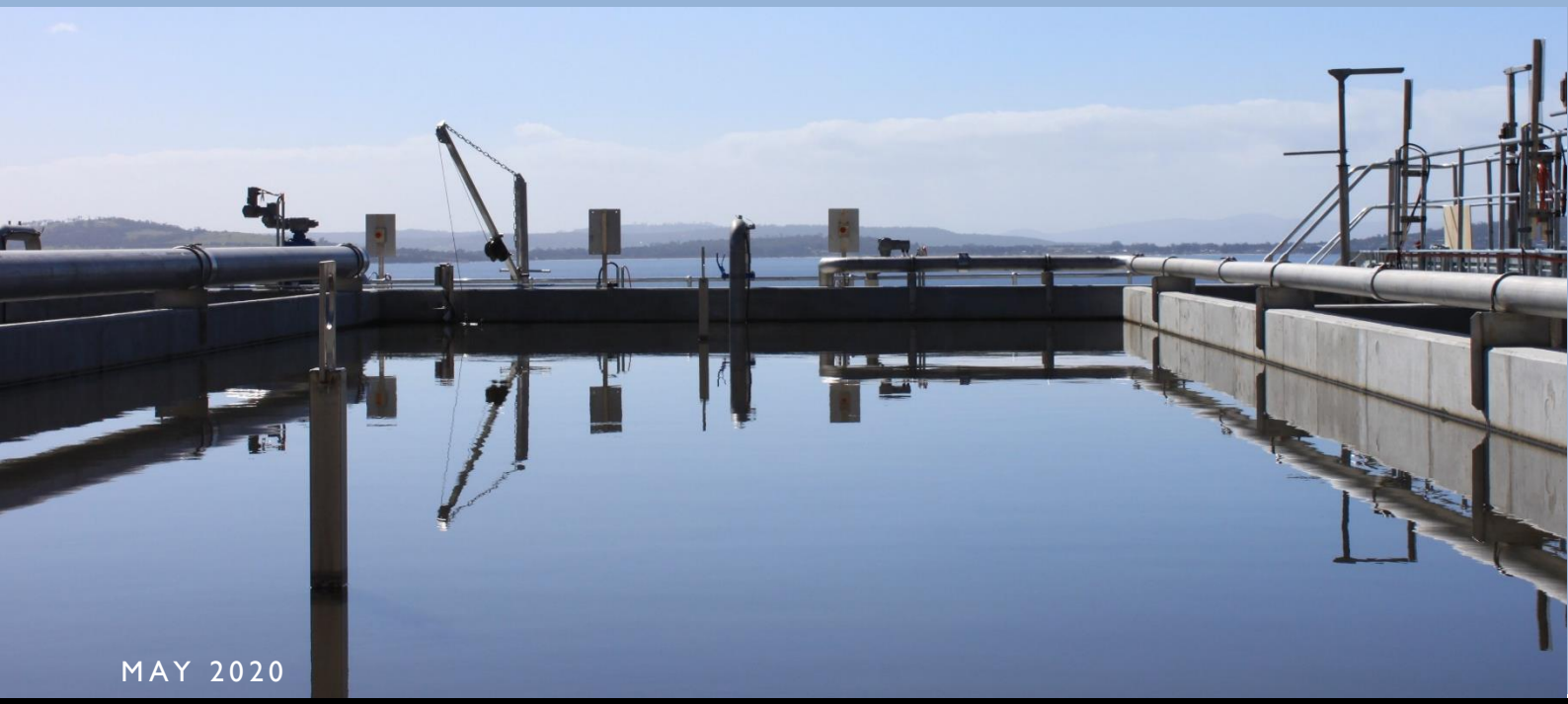
2018-19 REPORT ON THE STATE OF THE TASMANIAN WATER AND SEWERAGE INDUSTRY



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ISSUED BY THE TASMANIAN ECONOMIC REGULATOR

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Cover image: New sewage treatment tank at the Blackmans Bay Sewage Treatment Plant (TasWater)

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ACRONYMS

Term	Meaning within the context of this report
ADWG	Australian Drinking Water Guidelines 2011 (updated in 2018)
AMT	Accepted Modern Technology
ANCOLD	Australian National Committee on Large Dams
Code	Tasmanian Water and Sewerage Industry Customer Service Code
CSO	Community Service Obligation
DoH	Department of Health (Tas)
DPIPWE	Department of Primary Industries, Parks, Water and Environment (Tas)
DSMP	Dam Safety Management Plan
DWQG	Tasmanian *Drinking Water Quality Guidelines 2015*
EBIT	Earnings Before Interest and Tax
EMPCA	*Environmental Management and Pollution Control Act 1994 (Tas)*
EPA	Environment Protection Authority (Tas)
EPN	Environment Protection Notice
ERR	Economic Rate of Return
NDTE	Net Debt to Equity
NPAT	Net Profit After Tax
NPR	National Performance Report
STP	Sewage treatment plant or wastewater treatment plant
WDRC	Written down replacement cost
WTP	Water treatment plant

Basic measures:

kL kilolitre = 1 000 litres or 1 m^3 (cubic metre) and weighs 1 tonne

ML megalitre = 1 000 kL (or 1 000 m^3)

GL gigalitre = 1 000 ML

EXECUTIVE SUMMARY

This Report is the latest in a series of reports published by the Tasmanian Economic Regulator (the Economic Regulator) that provide an independent review of the performance of Tasmania's water and sewerage industry.

Tasmania (along with South Australia) differs from other states and territories in Australia in that its drinking water and wastewater services are provided by a single state-wide utility. The Tasmanian Water and Sewerage Corporation (TasWater) provides water supply services to approximately 415 000 Tasmanians.

This Report summaries TasWater's performance across the key areas of pricing, customer service, network reliability and efficiency, financial performance and its compliance with drinking water quality, dam safety and environmental obligations. It also sets out key priorities for improved performance by TasWater.

The water and sewerage industry in Tasmania has faced many major challenges in the past decade. In particular, a lack of investment in water and sewerage infrastructure in earlier decades resulted in deteriorating performance across the industry and outcomes that were not satisfactory.

In addressing these challenges, TasWater has dedicated significant resources to addressing the key priorities and actions needed to meet the expectations of the community and industry stakeholders. TasWater's investments have delivered improved public health outcomes and environmental compliance. However, its large, dispersed network, combined with ageing infrastructure and growing demands on the system, are continuing to impact the reliability and performance of the water and sewerage network.

Similar to last year, warm and dry conditions led to high levels of water use in 2018-19. In both this year and the previous year, the volume of urban water supplied was significantly above the long-term average, and average water usage by Tasmanian households continues to be well above that of households in mainland States.

It is a fundamental expectation that Tasmanians have access to safe drinking water. In 2018-19 TasWater achieved the outcome of no boil water alerts across its network of reticulated water supply. TasWater's Regional Towns Water Supply Program helped it achieve 100 per cent microbiological compliance[1] for the first time; a significant feat given that two years earlier there were 25 permanent boil water and public health alerts in place across the State.[2]

Overall, the quality of drinking water supply in Tasmania was high in 2018-19 and there has been a sizeable drop in the number of complaints made to the business. TasWater is continuing to invest in infrastructure and monitoring systems to reduce the risk of future water quality problems and the occurrence of boil water and public health alerts. However, an area where TasWater's performance has not been as strong is in the reliability of water

[1] The Gormanston water supply was removed from the serviced land layer during 2018-19 and is therefore not classified as a water supply system and its compliance is not assessed.

[2] In 2012-13 and 2016-17, there was a total of 25 permanent boil water and public health alerts applied to water supplies across Tasmania.

supply, as the rate of service interruptions and water main breaks were relatively high in 2018-19, due, in part, to the age and condition of much of the infrastructure.

There has been a sustained trend in improvement in the compliance of treated effluent discharged to waterways, with TasWater's sewage treatment plants' flow-weighted compliance passing the 90 per cent mark for the first time since 2009-10. The number of plants that achieved 50 per cent or less compliance against regulated discharge to water limits continued to shrink. 2018-19 also saw the highest uptake of effluent reuse in both percentage terms and total volume reused since 2009-10. However, a number of recent incidents involving the release of untreated sewage has highlighted unsatisfactory operating procedures at a number of sites that require urgent attention to avoid risk to public health. Trade waste also continues to be the biggest single contributor to non-compliance of sewage treatment plants.

Overall, the performance of TasWater's sewage treatment plants has improved and while there have been a number of untreated sewage releases, there is no ongoing impact on public health resulting from these incidents.

The introduction of water restrictions to the greater Hobart area in December 2019 has demonstrated that the capacity of infrastructure is not meeting the current demands of the city. Climate and rainfall have played a part in reducing the volume of water available. However, other factors such as the condition of some infrastructure and the timing of maintenance activities, coinciding with an increase in demand from irrigators, have resulted in restrictions on water use on customers. Furthermore, in the greater Launceston area, the outdated network of seven sewage treatment plants can no longer effectively cope with current demand, resulting in increased risk of odour, raw sewage discharging into waterways and breaches of permit conditions. These are priority areas for TasWater to focus its efforts.

As in previous years, water is also being lost due to high rates of leakage in the systems. TasWater's water losses were very high in 2018-19, with around 26 per cent of treated water being unaccounted for. TasWater's rate of water loss (measured in kilolitres per kilometre of water main per day), at 9.8 kL per day was almost three times the median rate reported by equivalent mainland utilities of 3.6 kL per day. While this is within the current service standard target, this reflects significant inefficiencies in the water systems that ultimately result in a poorer financial performance for TasWater and reduced capacity to upgrade its infrastructure.

TasWater's operating costs have risen sharply in 2018-19, reflecting a significant rise in expenses associated with maintenance and planning, as well as in purchasing raw materials. This increase has been more than anticipated and is greater than double the median growth in operating costs reported by major utilities nationally of around four per cent. TasWater expects operating costs to rise further with the installation of new infrastructure. Such operating costs increases are not sustainable and they highlight the importance of effective cost control measures and securing long-term efficiency gains.

Tasmanian bills for water and sewerage services are typically lower than those on the mainland and increased by 4.1 per cent in 2018-19. The relatively modest price increases in recent years have prevented price shocks for most consumers. However, a very small number of customers are still paying prices below the target tariffs and can expect some relatively large price increases until the prices they pay reach the target tariffs.

TasWater's capital expenditure in 2018-19 was around $129 million, well below the $145 million expected in TasWater's 2019-23 Corporate Plan. The establishment of TasWater's Capital Delivery Office (CDO) has initially resulted in delays to some projects though TasWater's investment expenditure has been at a higher rate in 2019-20 to date. However, it is not possible to assess to what extent TasWater's future investment program will be affected by the economic restrictions imposed as a result of the coronavirus pandemic.

The Economic Regulator will continue to closely monitor the delivery of TasWater's planned capital projects and TasWater's progress in achieving its compliance standards for the current regulatory period. The Economic Regulator considers that TasWater is well positioned to continue its proposed capital works and make further progress in achieving its compliance standards for the current regulatory period.

Networks

Sources of water

Warm and dry conditions throughout the year contributed to sustained high water usage across the network in 2018-19.

During 2018-19, TasWater sourced a total of 91 511 ML for urban use, comprising 91 234 ML from surface water (99.7 per cent) and 278 ML from groundwater (0.3 per cent). The total volume of water sourced rose by five per cent during the year (from 87 167 ML in 2017-18) and for the past two years has been substantially above the long-term average of 75 200 ML.

The total volume of urban water supplied increased by 1.5 per cent to 67 000 ML, with annual consumption levels in the past two years well above those in preceding years.

Residential water supply

The total water supply to residential customers was almost unchanged in 2018-19, at just under 35 500 ML. Average annual residential water supplied was marginally lower at 191 kL per property, which was offset by growth in the number of residential properties receiving water supply. Tasmanian residential consumption has been increasing modestly over the past five years and is well above the national median, which was 164 kL in 2018-19[3] for residential customers of major utilities across Australia.

Water supply to non-residential customers

Water supply to non-residential customers, has been increasing significantly in recent years, though the increase in 2018-19 was modest, to just over 31 500 ML. This included around 5 755 ML of recycled water.

Water supply outside the urban water supply system

The volume of water supplied to customers outside the urban water supply system (ie irrigators) was 3 017 ML in 2018-19, around three per cent of the total volume of potable water produced by TasWater.

[3] Bureau of Meteorology, *National performance report 2018-19: urban water utilities,* February 2020 (indicator W12).

Water network

The total length of water mains across Tasmania was 6 403 km. Between 2017-18 and 2018-19, the total number of properties connected to water supply increased by one per cent, to 209 571.

Over the past three years there has been a high rate of water main faults, with 41 water main breaks, bursts and leaks per 100 km of water mains reported in 2018-19 which is significantly higher (double) than the median rate for similar sized utilities on the mainland (20 per 100 km of water main).

Sewerage network

As at 30 June 2019 there were 183 115 properties connected to the sewerage network and 4 782 km of sewerage mains and channels. The network has a relatively low property density of 38 properties per kilometre of sewer main, much lower than other mainland utilities, which would usually service, on average, around 64 properties per kilometre of sewer main.

Sewage collected and recycled

The volume of sewage collected by TasWater in 2018-19 was 51 173 ML, or 280 kL per property, largely unchanged from 2017-18. Thirty-six of TasWater's 79 sewage treatment plants recycled at least some proportion of the treated sewage effluent. The number of STPs associated with full reuse schemes increased to 14 in 2018-19.

TasWater recycled over 11.5 per cent, or over 5 700 million litres, of treated effluent in 2018-19, which was sold to non-residential customers. This was the highest uptake of effluent reuse reported since the establishment of TasWater and its regional predecessors in 2009. In addition, the majority of biosolids produced at TasWater's STPs were beneficially reused in 2018-19, through composting or being applied directly to land as fertiliser.

Dam safety

There were no incidents in 2018-19 that affected the safety of TasWater's 360 water and wastewater dams, lagoons and weirs and TasWater reported no instances of non-compliance with the Dam Safety Regulator.

During 2018-19, TasWater spent $3.7 million on upgrades to the Swansea Dam to improve its safety compliance and provide water surety to the community of Swansea. Approximately $1.5 million was spent on a project to replace the Girdlestone Reservoir due to deterioration.

TasWater also completed detailed design work for Mikany Dam in Smithton, and Henderson Dam on Flinders Island. It also commenced decommissioning planning for high-risk dams at Grey Mountain in the Huon Valley, which were breached during the year to reduce the safety risk posed by the dams.

The water level was lowered at Ridgeway Dam at Hobart during the year as part of an interim risk reduction measure.

Service reliability and performance

Water supply interruptions

Interruptions to water supply affected 45 026 customers in total during 2018-19, which means on average, around 215 in 1 000 properties across Tasmania, or 21.5 per cent, experienced an unplanned interruption to their water supply during the period. Unplanned water supply interruptions lasted, on average, 171 minutes (almost three hours).

Less than one third of planned water supply interruptions met the duration standard target of up to three hours. TasWater reported that this result was primarily due to interruptions caused by the early failure of some ageing infrastructure, and noted that asset renewal had increased over the period, which impacted customers.

Over 90 per cent of 'priority 1' and 'priority 2'bursts and leaks were responded to within the required timeframes.

TasWater has found it challenging to achieve compliance against planned interruption metrics due to the nature of the works involved. The incidence of unplanned water interruptions was much higher than planned water interruptions. TasWater was able to respond to unplanned incidents within the standard of up to three hours in 86 per cent of cases.

Water loss

TasWater estimates that real losses in its reticulation networks during 2018-19 were in the order of 313 litres per service connection per day, or 9.8 kL per kilometre of water main per day. These losses were more than four times the median real losses for major Australian water utilities per service connection, which were 69.3 litres per day, and almost three times the median real losses per kilometre of water main, which were 3.6 kL per day for major Australian water utilities.

TasWater estimates that around 26 per cent of the total volume of potable water it produced was unaccounted for in 2018-19, which provides evidence of a significant volume of preventable water loss in TasWater's water supply systems.

Sewerage service interruptions

In 2018-19 there were, on average, 37 sewerage mains breaks and chokes per 100 km of sewer main. TasWater's performance for 2018-19 was consistent with its mainland counterparts, as the median rate reported nationally for similarly sized utilities was also 37 breaks and chokes per 100 kilometres of sewer main.

Eighty nine per cent of sewer spills, breaks and chokes were attended to within the 60 minute standard, with the average response time around 53 minutes.

TasWater reported 4 763 sewer service interruptions, with each lasting an average of 83 minutes. This was a significant improvement from the 493 minutes reported in 2017-18, although the accuracy of data for the duration of outages remains unreliable.

TasWater reported that preventive maintenance of its sewer mains has helped reduce the occurrence of sewer main breaks and chokes, though the rate of breaks and chokes in property connections remained high. In 2018-19, TasWater reported 231 sewer spills to the

Environment Protection Authority (EPA), with 99.7 per cent of spills contained within five hours.

Measuring performance

The accuracy and completeness of TasWater's performance data has continued to improve in 2018-19, with the implementation of data management systems (such as Maximo) resulting in more accurate data capture, with further refinements made over time. The accuracy and reliability ratings of several performance indicators has improved this year, and further progress is expected in the next reporting period with the implementation of TasWater's field management system for the real-time reporting of interruptions to supply. The new system "H2Go", scheduled for introduction in 2020, is expected to improve the accuracy of estimates of how many customers are affected by outages.

Customers

Typical residential bill

Prices for water and sewerage services rose by 4.1 per cent in 2018-19. This is marginally higher than the price increase from 2016-17 to 2017-18. The typical annual bill for residential customers with average water consumption (191 kL per annum) was $1 204 in 2018-19. The typical bill is based on $546 for water and $658 for sewerage.

Comparing annual bills nationally, residential customers in Tasmania were paying, on average, around $61, or five per cent, less per year than their interstate counterparts. This is based on consumption of 200 kL per annum, marginally higher than a typical Tasmania customer's usage.

The structure of TasWater bills reflects the relatively high fixed cost of water and sewerage services in the State, with fixed water charges representing 28 per cent of the bill compared to around 15 per cent nationally. Against this, TasWater's volumetric charge is comparatively low, at $1.06 per kL compared to a median rate of $2.60 per kL charged by mainland utilities. A small percentage of Tasmanian customers are still not paying the same as everyone else and are required to be transitioned to the target tariffs by 1 July 2020.

Approximately 28 per cent of residential customers receive a concessional rate, funded by the Tasmanian Government, which was a maximum of $192 over 2018-19 for customers receiving water services ($96) and sewerage services (also $96).

The water usage component (based on measured volume) accounted for 16 per cent of the total bill for water services. This reflects the fact that the fixed cost of providing the service to a property (such as the cost of maintaining dams, pipes, reservoirs and other essential infrastructure) is much higher than the variable cost of delivering water to a property.

Customer complaints

In 2018-19 TasWater received 2 648 complaints, down 18.2 per cent from 3 237 for the previous year. The rate of complaints, at 12.6 per 1 000 properties, was above the maximum customer service target of 11. The largest group of complaints were in relation to water quality (54 per cent) and sewerage services (13 per cent). The number of complaints regarding billing and accounts, decreased by 52 per cent compared to the previous year. Ninety-six per cent of complaints were resolved within ten days (or within an agreed timeframe).

The Ombudsman received 64 complaints against TasWater in 2018-19, an increase from the previous year (59). This was significantly lower than the nearly 200 complaints received six years ago.

Call centre performance

TasWater's call centre performance, in terms of response times, has been the best amongst similarly-sized mainland utilities for the period 2015-16 to 2017-18. In 2018-19, TasWater was second highest performing with respect to this measure by comparison to similar sized utilities nationwide.

In 2018-19, there was a significant (12 per cent) decrease in the volume of calls received by TasWater's call centre. For customers calling in, 87 per cent of calls were answered within 30 seconds, against a target of 85 per cent. TasWater's call centre average response time was much better than the national median for similarly sized water utilities in 2018-19, which was 67 per cent of calls answered within 30 seconds.

Payment management

The number of customers on the hardship program increased from 30 customers in 2017-18 to 226 customers in 2018-19. Of the 226 customers using the program, 132 were concession customers. Customers using the hardship program had significant levels of debts, with the average debt at the time of entering the hardship program around $2 922 which is close to two and a half times a typical annual bill for water and sewerage.

TasWater did not restrict water supply to customers, as a standard policy, in cases of non-payment during 2018-19 due to its internal review of debt recovery processes and a change in TasWater's resourcing. In 2018-19, only one customer had their water supply restricted for non-payment, compared to the 62 restrictions for non-payment applied in 2017-18.

TasWater has advised that, following the review, water supply restrictions for non-payment may return to higher levels in 2019-20.

Drinking water

All 62 Tasmanian drinking water supplies were adequately monitored for microbiological water quality, while 59 were adequately monitored for chemical water quality during 2018-19. All 62 drinking water supplies achieved microbiological compliance, while two water supplies had chemical contaminants detected above the ADWG health guideline values (one of which reported metal concentrations above safe health limits).

There were no water supplies on long term boil water alerts or public health alerts as at 30 June 2019. Two systems were operated under a boil water alert (both under temporary alerts) while no systems had a public health alert (do not consume) in place.

Microbiological compliance was achieved for 100 per cent of the population supplied with drinking water via the reticulated network. This is the first time that TasWater has achieved this outcome.

Environment

Sewage treatment plant compliance

In 2018-19, TasWater's Level 2 STPs achieved 90.2 per cent compliance with regulatory discharge to waters limits (flow-weighted), passing the 90 per cent mark for the first time since 2009-10. Thirteen Tasmanian STPs were classified as substantially non-compliant (less than 75 per cent compliance with regulatory discharge to water limits).

Compliance with discharge to land limits for recycled water was 88.9 per cent, an improvement on the 2017-18 result of 87.7 per cent. Fourteen STPs discharged all effluent to reuse, thereby diverting pollutant loads away from waterways towards beneficial uses. Warm and dry climatic conditions in 2018-19 contributed to the highest uptake of effluent reuse in both percentage and total volume terms since establishment of TasWater and its regional predecessor organisations in 2009.

Compliance with EPA requirements

TasWater received two Environmental Infringement Notices (EINs) for offences that occurred in 2018-19. The EINs relate to failing to notify the Director of an effluent discharge from the Sorell outfall in July 2018 and to a failure to notify as soon as reasonably practicable of a sewage spill in Glenorchy in July 2018.

Four additional EINs have been issued since July 2019. One EIN was in relation to a sewage spill at Sandy Bay in July 2019, two in relation to a power failure and subsequent discharge of untreated sewage at the Macquarie Point STP in August 2019 and one for breach of a permit condition connected to a discharge of non-disinfected effluent from Selfs Point STP in September 2019.

EPA audits of compliance with permit and EPN conditions during 2018-19 identified a number of areas where TasWater needs to implement corrective action to achieve full compliance with the regulatory requirements.

Reuse of biosolids generated out of the sewage treatment process remains at levels close to 100 per cent. Data inconsistencies in the biosolids accounting mean that there is a level of uncertainty attached to this figure.

Finance and capital projects

Revenue and profit

TasWater's revenue grew by 6.8 per cent to $359 million in 2018-19, strengthened by growth in customer connections and increased volume of water supplied. Other factors contributing to the revenue result include increased water consumption by customers due to a drier than normal summer period and economic and population growth.

As at 30 June 2019, TasWater's water and sewerage assets were worth just over $2.6 billion (written down replacement cost), a $61.3 million (2.4 per cent) increase from 30 June 2018.

Operating expenditure

TasWater's operating costs rose significantly in 2018-19, increasing by over ten per cent to $204.8 million. The increase reflects a significant rise in the costs associated with maintenance and planning, as well as raw materials. The growth in TasWater's operating costs per property was more than double the median rate reported by utilities on mainland Australia, growing by nine per cent from 2017-18 to 2018-19. TasWater's average operating cost per property was $977 in 2018-19.

Capital expenditure

During 2018-19, TasWater's water and sewerage capital expenditure was 29 per cent lower than in 2017-18, at just under $110 million, which follows a large increase in capital expenditure in 2017-18 of 50 per cent. TasWater reported that the decrease in expenditure in 2018-19 was primarily due to the transitioning of projects into its Capital Delivery Office.

TasWater's total capital expenditure in 2018-19 was $129.4 million, which includes non-network expenditure such as on the purchase of vehicles and enhancing business systems). Key drivers were compliance and renewals, with expenditure on new works (growth) much less than that spent on renewals and replacements. In 2018-19, around $70 million was spent on dedicated water assets and $40 million on dedicated sewerage assets.

Financial performance

TasWater's net profit after tax was just over $41 million, in line with the previous year ($42 million). TasWater returned $10.5 million to its council shareholders as dividends, which represented 25 per cent of its profit after tax. Councils also received $9.5 million in loan guarantee fees and income tax equivalents payments.

TasWater's net debt to equity ratio increased to just under 35 per cent in 2018-19 due to increased borrowings to fund its capital projects. This remains low relative to the net debt to equity ratio of equivalent utilities in mainland Australia, where the median ratio was 69.6 per cent in 2018-19.

TasWater's interest cover ratio, if depreciation is estimated using the written down replacement cost approach, dropped to below 1.0 for 2018-19 due to a significantly lower EBIT compared to 2017-18. This was much lower than the median interest cover ratio of 2.6 for major Australian water utilities for 2018-19, estimated using the same approach.

Major projects

During 2018-19, TasWater completed four major projects, with a further ten major projects reported as being under construction. Eighteen of TasWater's major projects were deferred or rescheduled from their original date. TasWater's 2019-20 capital works program includes projects and programs with a total of $143.5 million.

Upgrades to Bryn Estyn water treatment plant, a project costing over $220 million, will take approximately three years to complete, with early works expected to begin in mid-2020.

It is likely that some of TasWater's projects in 2019-20 and 2020-21 will be affected by the restrictions imposed by the Australian and Tasmanian Government in response to the coronavirus pandemic.

Key performance priorities

Key priorities for industry regulators in the short to medium term include working with TasWater to achieve higher levels of compliance, relating to environmental requirements, which requires a focus on upgrading or replacing assets that pose the greatest environmental and public health risk. This includes sustaining drinking water quality compliance and identifying opportunities for improvement in TasWater's practices and processes.

TasWater will face significant financial challenges as a result of its very substantial investment program, sharply rising operating costs and constrained revenue as a result of a further year of no price increases for regulated water and sewerage services in 2020-21. TasWater will, therefore, have to apply very strict financial management policies to achieve its investment program. TasWater will also need a developer charges policy that requires developers to make a fair contribution to TasWater's costs for new subdivisions and major new developments.

As discussed above, the volume of treated water for which there is no metered consumption, including water losses, continues to be substantially higher than for equivalent entities in mainland Australia. This has a high financial cost to TasWater, may also result in water restrictions being imposed earlier than otherwise, or at a higher level, and may have some adverse environmental outcomes in some parts of the State. The volume of treated water for which there is no metered consumption, including water losses, continues to be an issue for TasWater.

More generally, TasWater needs to ensure there are adequate water supplies to meet expected future demand across Tasmania, not just for the larger systems such as greater Hobart but also for some smaller systems that, as currently configured, may not meet demand in the medium term.

In the short to medium-term, TasWater's primary focus is on compliance, with planned projects including both high priority dam safety upgrades and sewerage upgrades to meet environmental standards. TasWater places a lower priority on renewing its networks to maintain service reliability and plans to maintain, rather than improve, service reliability during the third (current) regulatory period.

It is recognised that addressing these priorities may be more difficult in the short and potentially medium term due to the restrictions imposed by governments in Australia in response to the coronavirus pandemic and constraints on the international movement of goods and people.

Key performance measures

		2017-18	2018-19
C4	Water connected properties	207 051	209 571
C8	Sewerage connected properties	181 342	183 115
W11	Total urban water supplied (ML)	65 991	67 000
W12	Average residential consumption (kL per property)	193	191
A8	Water network reliability (water main breaks/100 km of main)	39	41
A10	Real water losses (L/service connection/d)	277	313
A14	Sewer network reliability (sewer breaks and chokes/100 km of main)	45	37
C15	Average customer minutes off water supply, unplanned interruptions (minutes)	159	171
C17	Number of unplanned interruptions - water (per 1 000 properties)	216	215
	Treated wastewater discharge compliant with EPA requirements (flow-weighted compliance percentage)	89.2 %	90.2%
H3	Percentage of population receiving drinking water that complied with ADWG microbiological guidelines	99.8 %	100%
	Drinking water supplies on long term boil water alerts or public health alerts[a]	10 of 64	0 of 62
IC13	Customer complaints (number)	3 237	2 648
C14	Calls answered within 30 seconds	87 %	87%
F3	Total income for whole of utility	$336.3 m	$359.0 m
IF13	Operating costs	$185.5 m	$204.8 m
F16	Capital expenditure for water and sewerage	$154.2 m	$109.8 m
F22	Net debt to equity ratio	33 %	35 %

a Reporting basis changed from 64 monitoring zones to 62 supply systems.

1 INTRODUCTION

1.1 The Economic Regulator's role

The Tasmanian Economic Regulator (Economic Regulator) is responsible for the economic regulation of the Tasmanian water and sewerage industry. One of the Economic Regulator's regulatory functions is to monitor and report publicly on the performance of the State's single water business, the Tasmanian Water and Sewerage Corporation Pty Ltd (trading as TasWater).

The Economic Regulator is also responsible for regulating service standards and conditions of supply. Although this Report covers water management, dam safety, environment and water quality, the Economic Regulator does not regulate TasWater's activities in these areas.

The Director of the Environment Protection Authority (EPA) is responsible for regulating environmental standards. The Director of Public Health is responsible for drinking water quality standards, and the Secretary of the Department of Primary Industries, Parks, Water and Environment (DPIPWE) is responsible for water management and dam safety.

Appendix 1 to this Report provides further information on the water and sewerage regulatory framework.

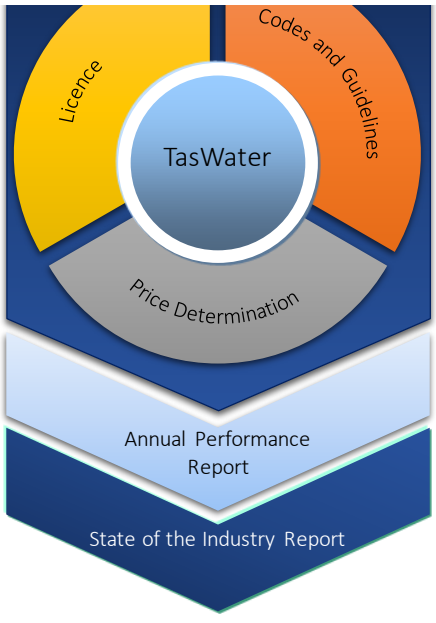
1.2 Scope of this report

Under the *Water and Sewerage Industry Act 2008* (Industry Act), the Economic Regulator has an obligation to prepare and report on the state of the water and sewerage industry, either at the request of the responsible Minister or in the lead up to a price determination investigation.

TasWater, through the performance reporting framework (Figure 1.1), has a range of reporting requirements relating to its performance against standards and limits set by its licence, codes and guidelines[4], and the Economic Regulator's price determination.

The publication of performance information assists in meeting the objective of the Industry Act to protect the long-term interests of customers and to provide for the safe, environmentally responsible, efficient and sustainable provision of reliable and secure water and sewerage services to the Tasmanian community.

Figure 1.1 Performance reporting framework



[4] Including statutory requirements and guidelines of other industry regulators.

The purpose of this Report is to make TasWater accountable for its performance by providing stakeholders with relevant information. The main objectives of this Report are to:

- provide an overview of the performance of the Tasmanian water and sewerage industry; and
- identify key priorities for improved performance by TasWater.

This Report covers the key performance indicators for TasWater for the 2018-19 financial year. Most of the performance measures covered in this Report are according to the Urban National Performance Framework, with some additional State-based measures. Appendix 1 provides an outline of performance reporting arrangements and a list of key performance measures is provided at Appendix 2.

This Report focuses on performance across a number of key areas, including:

- water and sewerage network – water sources, infrastructure assets, including its networks, and treatment;
- customers – water usage, pricing, customer complaints, call centre performance, payment management and the delivery of key customer outcomes;
- service reliability and performance – breaks, interruptions to service and water losses;
- drinking water – compliance with bacteriological, chemical and fluoridation standards;
- environment – wastewater discharge and compliance, impacts on waterways, effluent and biosolids reuse; and
- finance – revenue and expenditure, future capital expenditure and status of major projects.

This Report does not include information on the collection and use of stormwater and does not examine in detail the supply or use of water for irrigation purposes, as these are services not subject to regulation.

The Economic Regulator has prepared this Report in consultation with the Director of Public Health, the Director of the EPA and the Secretary of DPIPWE.

1.3 Information sources

This Report is based on two principal sources of information:

- performance data provided by TasWater against key performance measures, specified by the Economic Regulator in its Reporting Guideline which includes the requirement to report on measures set out under the Urban National Performance Reporting Framework[5]; and
- performance data collected as part of regulatory reporting requirements by the Department of Health (DoH), DPIPWE and the EPA.

[5] National Urban Water Utility Performance Reporting Framework: Indicators and Definitions Handbook, January 2018.

Data that have not met the audit requirements for quality and reliability[6] have been excluded from this Report or referred to in the relevant section. This is consistent with the requirements as set out in the Urban National Performance Framework Urban Auditing Requirements Handbook.

Numerous comparisons throughout this Report refer to the performance of similarly sized service providers in other Australian jurisdictions. The selection of similarly sized service providers in these comparisons is based on the number of connections. These service providers may differ from TasWater in the number of their separate schemes and assets and the density of their customers, and may face different geographical and climatic conditions. Readers should consider this when making comparisons between TasWater's performance and the performance of mainland service providers.

[6] The Economic Regulator's *Regulatory Reporting Guideline Version 3* outlines audit requirements for licensees.

2 WATER AND SEWERAGE NETWORK

2.1 Sources of water

The average annual volume of surface water runoff in Tasmania is around 33 312 000 megalitres (ML).[7] Additionally, up to 2 500 000 ML of water is potentially available each year from groundwater.[8]

ⓘ Water volumes

kL kilolitres = 1 000 litres

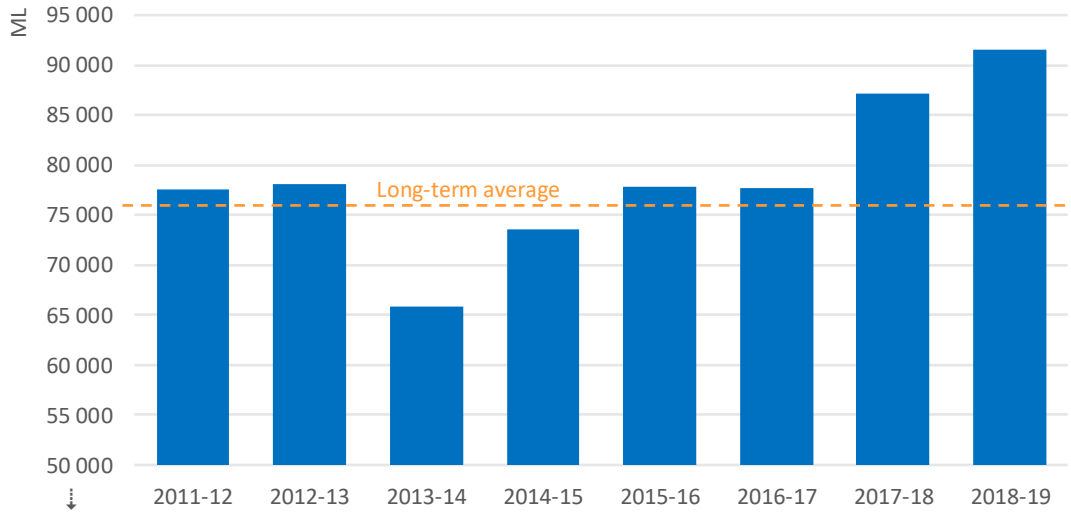
ML megalitres = 1 000 000 litres

Total sourced water includes both freshwater and recycled water and supports the requirements of urban water supply, irrigation and the majority of the State's electricity requirements.[9]

Drinking water sourced from surface water and consumed by domestic, commercial and industrial customers accounts for around 15 per cent of the estimated total use of surface water in the State (including water used for irrigation and industry). Groundwater plays a very minor role in urban supply in Tasmania, with surface water almost entirely meeting urban supply needs.

During 2018-19, TasWater sourced a total of 91 511 ML for urban use, comprising 91 234 ML from surface water (99.7 per cent) and 278 ML[10] from groundwater (0.3 per cent). The total volume of water sourced rose by five per cent during the year (from 87 167 ML in 2017-18) and for the past two years has been substantially above the long-term average of 75 200 ML (Figure 2.1).

Figure 2.1 Total sourced water in Tasmania (ML)



[7] Tasmanian Planning Commission 2009, *State of the Environment Tasmania* 2009.

[8] Department of Infrastructure, Energy and Resources, *A Review of Groundwater in Tasmania* - Background Report, 2001

[9] There is some crossover between water stored for hydro-electric purposes and water subsequently stored for use by TasWater for water services.

[10] A slight increase over the 273 ML of water sourced from groundwater during 2017-18.

Urban water in Tasmania was not sourced from desalination or recycled water in 2018-19, although TasWater did use recycled water for some non-drinking uses (see section 2.6 of this Report).

Rainwater tanks represent another important source of water for many Tasmanian households. Around one fifth of Tasmanian households have rainwater tanks as their primary source of drinking water.[11]

Chapter 3 of this Report further discusses urban water supply and water usage by customers.

2.1.1 Water supply

Due to several years of increased temperatures and reduced rainfall, there has been a reduction in the volume of water available for TasWater's water supply. Additionally, demand for water in the Hobart region and from irrigators (principally through Tasmanian Irrigation) has increased. TasWater attributes the increased demand in the Greater Hobart area to population growth and an increasing number of tourists.

In addition to these factors, TasWater's infrastructure is not operating at capacity due to maintenance, operational and safety issues. TasWater lowered the levels of Risdon Brook Dam and Ridgeway Dam during 2018-19 to carry out planned maintenance and to address safety risks, which resulted in reduced supply.

These actions have resulted in dam levels being lower during the summer period when demand typically increases. Bryn Estyn WTP has also been operating at 80 per cent capacity due to long-standing issues with poor taste and odour. TasWater has been aware of the issues with Bryn Estyn WTP since 2015, with algal blooms causing bad tasting water in the catchment. The planned upgrade of the WTP has been delayed and TasWater is not expecting the upgrade to be completed until 2023. Potable water (treated) from Bryn Estyn is also supplied to irrigators. While Tasmanian Irrigation has committed to shifting supply from treated water to raw water, the timeframe for this to occur is not clear.

In December 2019, TasWater imposed water restrictions (in consultation with the State Government) in most council areas in response to its reduced water supply, infrastructure constraints and increased demand. The restrictions for the greater Hobart area were removed on 1 April 2020.

2.2 Water assets

Tasmania's hilly terrain poses a unique challenge for the redistribution of its fresh water resources, which are unevenly distributed across the State. Water is relatively abundant in the lightly populated western part of the State, and less abundant in the more heavily populated south-east and east coast regions.

Transferring water from the source of supply to the point of use can be difficult. The distances and difficult terrain mean that, in some instances, pumping water from remote sources of supply to where it is needed incurs high costs.

The water assets that enable the treatment and transmission of water to customers include water treatment plants (WTPs), storage dams, reservoirs and the system of pipes and pumps.

[11] ABS 4602.0.55.033, Environmental Issues: Water Use and Conservation, March 2013.

2.2.1 Water supply systems and treatment plants

A water treatment plant (WTP) receives raw or partially treated water for treatment and ultimate delivery to customers.

WTPs provide three different levels of treatment to bring water quality to an acceptable level:

- full treatment – a substantial structure involving multiple treatment steps to achieve high quality water. The plant includes processes that remove turbidity and/or colour via different types of filtration and varying filter types, as well as providing filtration and disinfection. Most full treatment plants also fluoridate the water. Other treatment processes can include removal of taste and/or odour, softening, pH correction and the targeted removal of elements and compounds such as iron, manganese, nitrates and pesticides;
- further treatment – the treatment plant provides additional processes to serve a particular purpose. It does not meet the requirements of full treatment, but may address some of those requirements; and
- disinfection only – the treatment plant disinfects the water prior to supply to customers. This category also includes WTPs that provide fluoridation only.

An estimated 414 634 Tasmanians receive a reticulated drinking water supply provided by TasWater. Supply was provided by 62 drinking water supply systems[12] that were serviced by 73 water treatment plants. During 2018-19, seven of the thirteen disinfection only WTPs were decommissioned as part of the regional towns WTP program. Table 2.1 provides details of the number and type of WTPs operated by TasWater during 2018-19.

Table 2.1 Drinking water plants in Tasmania, 2018-19

Disinfection only WTPs	Further treatment	Fully treated	Total WTPs
13[a]	0	60	73

a Seven disinfection only WTPs were decommissioned during 2018-19.

2.2.2 Storage dams

TasWater is responsible for the operation and maintenance of approximately 360 water and wastewater dams, lagoons and weirs throughout Tasmania.

Owners of dams have a legal obligation to maintain and operate them so as not to present a danger to the public or cause significant environmental harm. The risks associated with each dam are assessed in accordance with the Australian National Committee on Large Dams (ANCOLD) guidelines.

The three major considerations under the guidelines are:

- the potential population placed at risk in the event of a dam failure;
- the potential impact on community and private infrastructure, such as bridges, roads, buildings, communication, energy and water and sewerage assets; and

[12] A water supply system is a unique system for the extraction and preparation of water for distribution via the water supply network. One system may be supplied with water from more than one treatment plant.

- the impact on the environment.

Once assessed, each dam is assigned one of seven a consequence categories (Table 2.2) through a structured process provided by ANCOLD. The terminology used in these Dam Safety Assessments is set out in Appendix 4.

Table 2.2 ANCOLD Guidelines - consequence categories for dams

Population at Risk	Consequences - severity of damage and loss			
	Minor	Medium	Major	Catastrophic
<1	Very Low	Low	Significant	High C
≥1 to <10	Significant (Note 2)	Significant (Note 2)	High C	High B
≥11 to <100	High C	High C	High B	High A
≥100 to <1 000	(Note 1)	High B	High A	Extreme
≥1 000	(Note 1)	(Note 1)	Extreme	Extreme

Source: Table 3 of the ANCOLD Guidelines on the Consequence Categories for Dams (2012).

Note 1: With a population at risk in excess of 100, it is unlikely that damage will be minor. Similarly, with a population at risk in excess of 1 000 it is unlikely damage will be classified as medium.

Note 2: Change to "High C" where there is potential of one or more lives being lost.

All dams with a consequence category of "Significant" or higher require comprehensive surveillance inspections. For dams where there is the potential for loss of life in the event of dam failure, dam safety emergency plans are required.

These compliance requirements become more significant as the consequence category increases. Of the dams that TasWater is responsible for, 38 have been identified as having a consequence category of "Significant" or higher, due to their potential downstream impact (ie in terms of loss of life or business or economic loss) in the unlikely event of a complete dam failure. The remaining dams and storages have consequence categories of "Low" or "Very Low".

TasWater has a five-year rolling program to mitigate the risks for its dams where the severity of damage and loss is classed as "Significant" or higher. TasWater also has a five year program in place to assess the consequence category for its smaller, un-categorised dams; 2018-19 was the fourth year of this program.

Table 2.3 sets out TasWater's water supply and wastewater dams by consequence category. Courses of action in relation to dams in the "Significant" or higher consequence categories are also set out in TasWater's Dam Safety Management Plan (DSMP) 2018-19.

Table 2.3 TasWater's water supply and wastewater dams by consequence category (no.) as at 30 June 2019

Very low	Low	Significant	High C	High B	High A	Extreme
34	38	17	9	2	8	**2**

During 2018-19, three dams previously assessed as having an 'Extreme' consequence category were reassessed as 'High A' (Knights Creek, Limekiln Gully and Tolosa Reservoir) while Ridgeway Reservoir moved into the 'Extreme' consequence category following reassessment. Risdon Brook Dam moved from 'High B' to 'High A' consequence category in 2018-19 and Coles Bay similarly moved to a higher consequence category, from 'Significant' to 'High C'. A further three dams previously assessed as 'Low' consequence category moved to the higher 'Significant' category during the year (Swansea Saddle, North Esk Intake Weir and Mt Leslie

Basin). The consequence category for all of TasWater's dams classified as 'Significant' or higher are listed in Appendix 4 (Table A4.1).

In 2018-19, TasWater completed the Swansea Dam upgrade, and completed interim risk mitigation works on Blackman River Dam No. 2 and Lower Prosser Dam. TasWater also commenced decommissioning of Girdlestone Inground Reservoir, with completion expected during 2019-20.

During the year, the water level at Ridgeway Dam was lowered as part of an interim risk reduction measure following recent assessments that indicate that the risk may be higher than previously assessed.

Sections of the dam walls at both Grey Mountain Dam No. 1 and 2 were removed down to the foundation. TasWater has indicated that dam permit applications seeking approval to remove the remaining embankments will be applied for during 2019-20. TasWater has advised that decommissioning of these dams will be finalised by 2020-21.

TasWater has completed detailed design and investigation work for the Mikany Dam upgrade. Tenders for the upgrade are currently being sought with the successful tender expected to be awarded during 2019-20.

Decommissioning or divestment of the Waratah Dam is still under consideration.

Interim risk reduction measures are also in place for 12 high-risk dams, ensuring immediate risk mitigation measures while further assessments are conducted and business needs confirmed.

2.2.3 Other water assets

Other water assets utilised by TasWater in its water supply systems include fluoridation stations/equipment, water pumping stations, water mains and water distribution storage facilities. These are summarised in Table 2.4.

The total length of water mains includes all transfer, distribution, reticulation mains and recycled water distribution and reticulation mains delivering water for urban areas.

Table 2.4 Other water assets owned by TasWater as at 30 June 2019

Number of water pumping stations	Number of water distribution storage facilities	Length of water mains (km)
206	297	6 403

Compared to other large mainland water utilities, TasWater's customer density is relatively low (33 properties per kilometre of water main), owing to the regional nature of much of the network's service area.

2.3 Sewerage assets

Sewerage assets include sewage treatment plants (STPs), pumping stations[13], sewer mains and effluent outfalls.[14] Performance indicators for these assets relate to their number, density, length and operational performance.

Most major townships in Tasmania have reticulated sewerage systems and an associated STP. STPs discharge to waterways and to effluent recycling schemes. There were 183 115 properties connected to the sewerage network across Tasmania as at 30 June 2019.

Table 2.5 summarises the sewerage assets operated by TasWater in 2018-19. With the completion of the Kingborough Sewerage Strategy in the first quarter of 2019-20, TasWater opened the new Blackmans Bay STP. As part of this upgrade, during the year TasWater began decommissioning one Level 1 STP at Howden and two Level 2 STPs at Margate and Electrona.[15]

Table 2.5 Sewerage assets operated by TasWater as at 30 June 2019

Sewage pumping stations	Length of sewerage mains (km)	Level 1 STPs	Level 2 STPs	Total number of STPs
746	4 782	33	79	112

Table 6.1 in Chapter 6 provides a list of the largest STPs by inflow volume.

In 2018-19, there were, on average, 38 properties serviced per kilometre of sewer main. As for the water supply network, the property density in TasWater's service area is much lower than for most major mainland utilities, which would usually service, on average, around 64 properties per kilometre of sewer main.[16]

2.3.1 Sewage treatment plants

There are two categories of sewage treatment plant (STP). Level 1 STPs have a design capacity of treating less than 100 kL of sewage per day and continue to be regulated by municipal councils. Level 2 STPs have a design flow capacity rate equal to or greater than 100 kL/day and are regulated by the EPA.

During 2018-19, TasWater operated 79 Level 2 STPs and 33 Level 1 STPs. DPIPWE's Parks and Wildlife Service also operated two Level 2 STPs (Ben Lomond and Lake St Clair National Parks) and the Port Arthur Historical Site Management Authority operated one Level 2 STP.

Table 2.6 provides a breakdown of TasWater's Level 2 STPs by treatment level, which remains unchanged from 2017-18. The majority of Level 2 STPs operated by TasWater perform secondary treatment.

[13] Sewage pumping stations pump sewage from low points in the reticulation system to facilitate the passage of sewage to the sewage treatment plant.

[14] An effluent outfall is the outlet of a drain or a sewer where it discharges into another body of water, usually a lake, river or the sea.

[15] Margate, Electrona and Howden STPs were decommissioned in 2019-20.

[16] Bureau of Meteorology, *National Performance Report 2018-19: urban water utilities*, February 2020 (indicator A6).

Table 2.6 Number of Level 2 STPs operated by TasWater (by treatment level)

Primary	Secondary	Tertiary
1	67	11

In 2018-19, Pardoe STP in Devonport continued to be the only level 2 STP that treated sewage to a primary level. Effluent from this STP is discharged via a long ocean outfall. Long-term ambient monitoring has not indicated any significant environmental impacts outside the mixing zone.

Sewage treatment plants discharge to inland, estuarine and marine (coastal) environments. Chapter 6 of this Report discusses outfall volumes in more detail.

2.4 Sewage collected

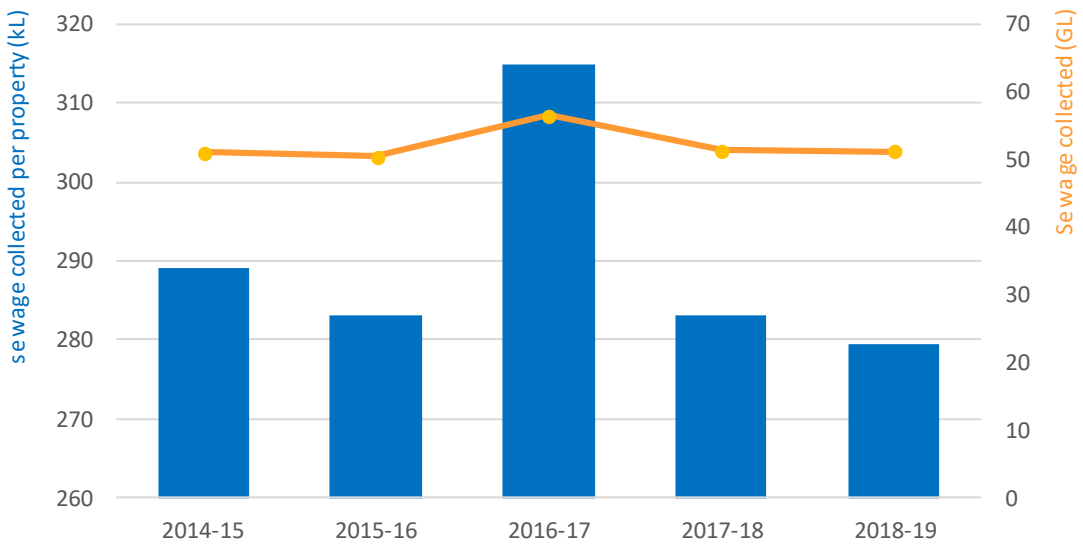
Sewage volumes discussed in this section are based on total inflows received by TasWater's STPs.

Table 2.7 Volume of sewage collected - TasWater (Level 1 and 2 STPs)

	2014-15	2015-16	2016-17	2017-18	2018-19
Sewage collected (ML)	51 009	50 356	56 582	51 318	51 173
Per property (kL)	289	283	315	283	280

Figure 2.2 shows the volume of sewage received by TasWater's STPs over the past five years.

Figure 2.2 Volume of sewage received / treated (kL per property and volume GL)



In 2018-19, the total volume of sewage collected at TasWater's STPs was 51 173 ML. TasWater's level 2 STPs collected 98.9 per cent of this total (50 588 ML). The average volume of sewage collected (residential and non-residential) was 280 kL per property.

Total annual flow volumes are affected to some degree by climatic patterns. Rainfall can increase inflow and infiltration of water into the sewer system, resulting in STPs receiving increased volumes of sewage.

2.5 Comparative sewage treatment levels

As set out in section 2.3.1., based on the degree to which sewage is treated, there are three categories of sewage treatment.

During 2018-19, of the 50 588 ML of sewage treated at TasWater's Level 2 STPs, approximately 38 337 ML or 75.8 per cent was treated to secondary standard, including the majority of effluent discharged to reuse schemes. Tertiary treatment was applied to 15.2 per cent (7 699 ML) of the total effluent volume and primary treatment accounted for the remaining nine per cent (4 552 ML).

State-wide, these proportions have remained relatively constant since 1 July 2009.

ⓘ Sewage treatment levels

Primary treatment involves screening the solids from the water and allowing a proportion of the suspended solids and organic matter to settle from the sewage.

Secondary treatment takes primary treated effluent and, with the aid of biological processes, breaks down a further proportion of the dissolved or suspended organic matter to a form that reduces its environmental impact if discharged. Disinfection by means of chlorination, ozonation or UV radiation is generally also considered to be part of the secondary treatment step.

With **tertiary treatment**, the secondary treated effluent is further processed using various techniques including flocculation, coagulation, clarification and filtration.

2.6 Recycled water

Recycled water is sewage effluent treated to an appropriate standard and then reused. Recycled water can be used on-site at an STP or for off-site applications such as land irrigation or industrial processes.[17] The effluent reuse schemes associated with TasWater's level 2 STPs all involve land irrigation. As a result, annual fluctuations in volume are generally reflective of climatic factors driving demand for irrigation water in a given year.

2.6.1 Recycled water treatment plants

Thirty-six of TasWater's 79 Level 2 STPs discharged a proportion of their outflows to effluent reuse schemes in 2018-19.

Table 2.8 categorises the Level 2 STPs operated by TasWater according to whether full, partial or no reuse of treated effluent occurred over the last five years. Partial reuse schemes are further divided into those achieving less or greater than 50 per cent recycling. Schemes are classified each year based on actual recycling percentages.

The table shows that the number of STPs that achieved full reuse increased in 2018-19 compared to previous years. The number of STPs that discharge to a reuse scheme but also discharge a percentage of the effluent to waterways also increased with the STPs at Carrick, Selfs Point and Riverside reporting reuse for 2018-19 but not for the preceding period. Reuse of effluent from the Carrick STP as part of a permanent partial reuse scheme commenced in 2018-19, and effluent reuse at Riverside recommenced at the associated golf course reuse scheme. At the Selfs Point STP, part of the effluent produced is reused for urban irrigation.[18]

[17] These uses require treated effluent to meet the 'Class B' quality standard as specified in the E*nvironmental guidelines for the use of recycled water in Tasmania (EPA Tasmania 2002)*.

[18] Urban uses include watering sports grounds.

The *State Policy on Water Quality Management*[19] requires effluent reuse to be considered in order to minimise discharge of pollutants to water, unless there are valid reasons not to do so.

Establishing and expanding effluent reuse schemes can avoid the need for costly wastewater treatment upgrades to achieve advanced treatment capability suitable for discharge to sensitive waterways. Improvements in the uptake of effluent for recycling can take the form of full effluent reuse at a higher number of STPs, higher total volumes of reused effluent or an increase in the number of STPs where effluent recycling occurs. To date, consumer demand has been the primary driver of increased uptake of effluent recycling.

Table 2.8 Classification of reuse schemes associated with Level 2 STPs[20]

	Tasmanian reuse category			
	Full	Partial (>50% recycled)	Partial (<50% recycled)	None
2014-15	10	18	7	43
2015-16	13	12	8	46
2016-17	8	13	12	46
2017-18	13	14	6	46
2018-19	14	15	7	43

2.6.2 Recycled water volume

In 2018-19, the total volume of effluent recycled from Level 2 STPs was 5 700 ML, or 11.5 per cent of the total effluent discharged from Level 2 STPs. The Clarence Recycled Water Scheme, which sources effluent from Richmond, Rokeby, Rosny and Cambridge STPs, is the largest reuse scheme in the State (2 584 ML recycled during 2018-19), followed by the Brighton/Bridgewater scheme (884 ML recycled). The Penna scheme (275 ML recycled), which is fed by Midway Point and Sorell STPs, is the third large recycled water scheme in the south of Tasmania. Together, these three southern schemes diverted approximately 80 per cent (3 743 ML) of the treated effluent generated at the associated STPs to beneficial reuse. This volume represents 66 per cent of the total volume of effluent recycled in the state.

Table 2.9 shows the volume of recycled water supplied each year in Tasmania and the percentage of total treated effluent volume recycled each year compared to preceding years.

The 2018-19 summer was the second warmest on record for Tasmania. Rainfall in the southern and western parts of the state was below average during spring 2018 and summer 2018-19. The east coast experienced below average rainfall in winter 2018 and autumn 2019. Above average mean temperatures across Tasmania during October 2018 continued through to January 2019 and like many other parts of the nation, Tasmania experienced its driest January on record. These warm and dry conditions contributed to the reuse rate of 11.5 per cent of total effluent, which is the highest uptake of effluent reuse in percentage and

[19] Policy available at http://epa.tas.gov.au/Documents/State_Policy_on_Water_Quality_Management_1997.pdf

[20] Numbers include Penna STP, which is a polishing lagoon providing further treatment for effluent from Midway Point and Sorell STPs.

total volume terms since establishment of TasWater and its regional predecessor organisations in 2009.

Table 2.9 **Volume of recycled water and percentage of total treated effluent reused**

Year	Total volume of effluent recycled (ML)	Percentage of treated effluent recycled
2014-15	4 814	9.4
2015-16	5 257	10.4
2016-17	4 691	8.4
2017-18	5 417	10.7
2018-19	5 700	11.5

The proportion of effluent reused over the longer term is set out in Figure 2.3. It demonstrates the yearly fluctuation in the reuse proportion, and the general upwards trend in the volume of recycled water produced.

Figure 2.3 Volume and percentage of total treated effluent reused state-wide over time (ML/year, %)

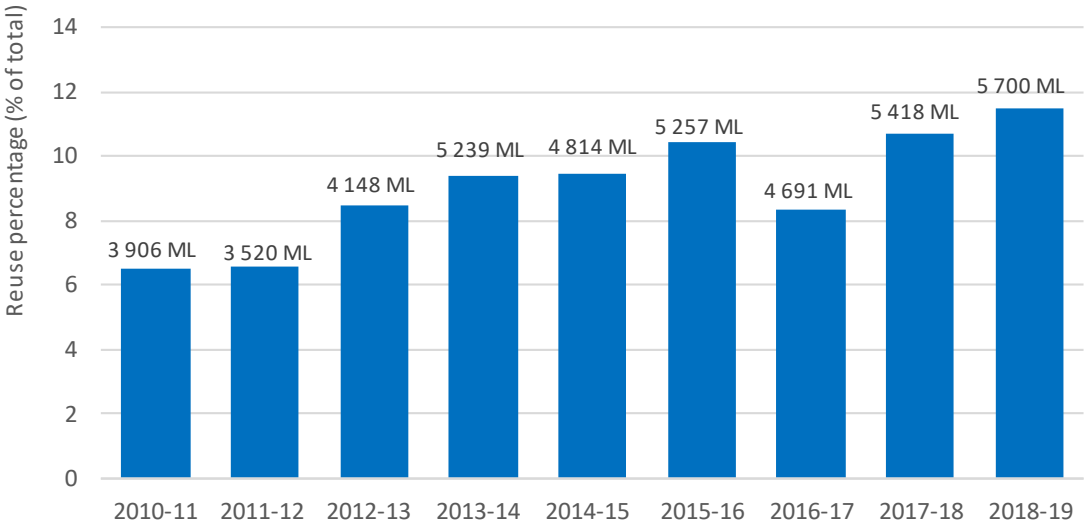


Table A-3.3 in Appendix 3 lists the proportion of effluent reused and reuse flow per year for each Level 2 STP between 2014-15 and 2018-19.

3 CUSTOMERS

This Chapter looks at how much households use and pay for water and sewerage services. It also reports on how some customers are paying their bills and the assistance programs available when customers are experiencing payment difficulties. The Chapter then explores how TasWater responds to its customers and looks at the most common areas for complaints made by its customers.

As at 30 June 2019, 209 571 properties were connected to TasWater's water supply network, with residential customers making up around 88 per cent of those connections. There were 183 115 properties connected to TasWater's sewerage network.

3.1 Water usage

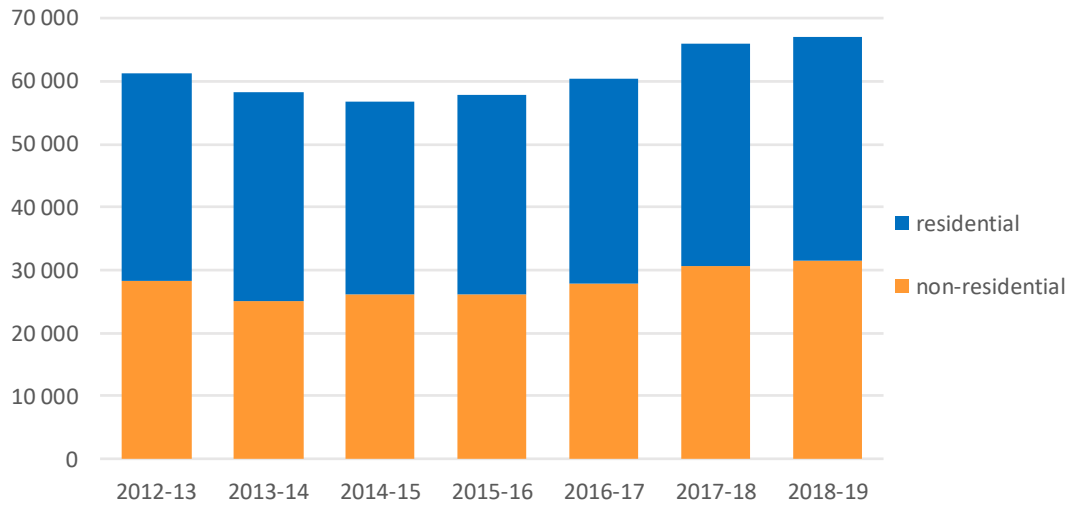
For the purposes of this Report, total urban water supplied is TasWater's metered volume of water (both drinking water quality and non-drinking water quality) supplied to customers during 2018-19 plus estimated non-metered water supplied. The total water supplied comprises the sum of residential, commercial, municipal, industrial and other water supplied.

TasWater provided the following detailed breakdown of the 67 000 ML of water supplied to its residential and non-residential customers[21] during 2018-19:

- residential customers were supplied with 35 417 ML of water (potable and non-potable); and
- commercial, municipal and industrial customers were supplied with 31 584 ML of water (which included recycled water and stormwater).

Figure 3.1 shows the total volumes of urban water supplied from 2012-13 through to 2018-19, including the supply of stormwater and recycled water.

Figure 3.1 Total urban water supplied (ML)



[21] Non-residential customers include all commercial, industrial and municipal users.

Urban water supply in 2018-19 was approximately 14 per cent above the long-term average from 2012-13 to 2017-18 (58 905 ML). Most of the growth in recent years has been in the water supply to non-residential customers.

Water supply to residential customers increased by 0.3 per cent in 2018-19, accounting for 53 per cent of total urban water supplied. Water supplied to commercial, municipal and industrial customers increased by approximately three per cent in 2018-19.

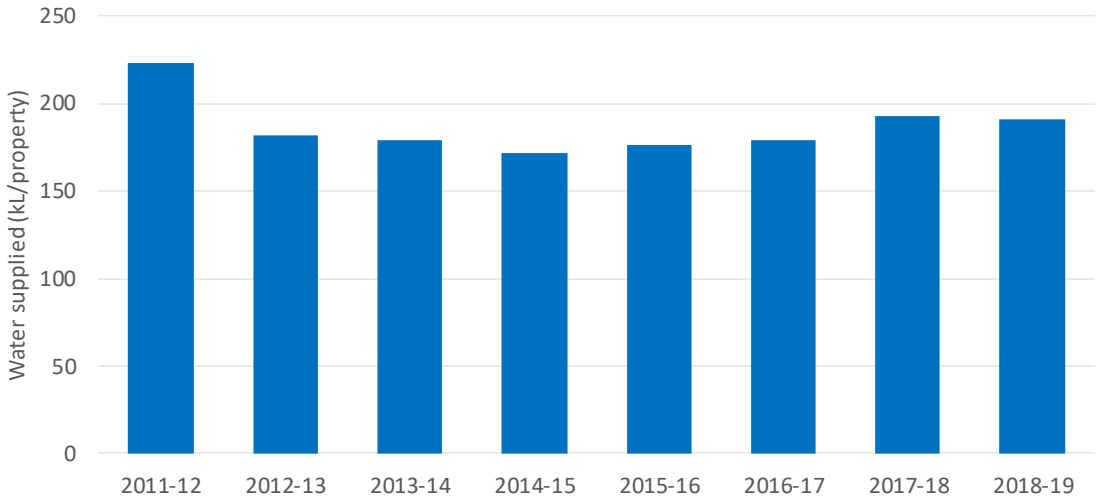
The average annual consumption per connection across the State in 2018-19 was 320 kilolitres (kL). This represents a negligible change from the average for 2017-18 of 319 kL.

Average residential consumption decreased slightly, with consumption falling from 193 kL per connection in 2017-18 to 191 kL in 2018-19 (Figure 3.2). Residential consumption has shown marginal variation over recent years with the lowest value reported in 2014-15 at 172 kL. The material drop in average residential consumption from 2011-12 to 2012-13 likely reflects the following factors:

- the state-wide roll-out of water meters raising consumers' awareness of their consumption levels and introducing volumetric charging in many areas; and
- the improvement in the quality of the data collection relating to water consumption with the state-wide introduction of water meters.

Average residential consumption has not returned to levels before the roll-out of water meters and volumetric charging in all areas of the State.

Figure 3.2 Average annual residential water supplied (kL/property)

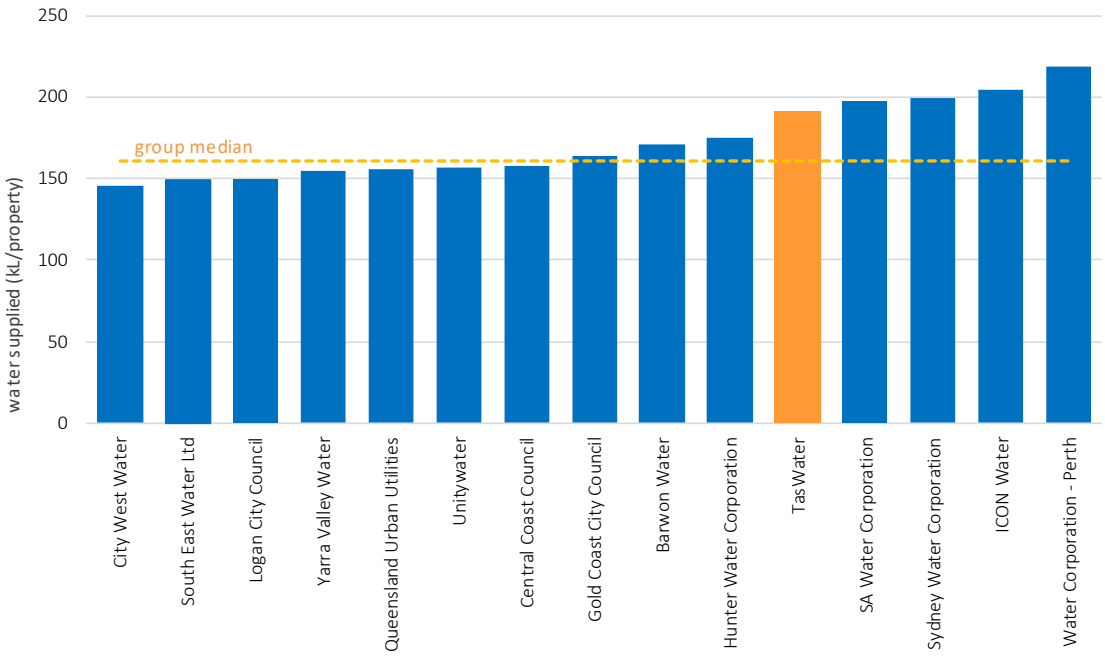


The consumption by residential customers in 2018-19 is similar to that of 2017-18 which is likely due to similar climatic conditions in these years.

Figure 3.3 shows the average annual volumes of residential water supplied by major utilities (100 000 or more connected properties) across Australia during 2018-19 together with the median volume of water supplied by these providers.

TasWater's average annual volume of residential water supplied of 191 kL per residence was 16 per cent above the median for major water utilities in 2018-19, which was 164 kL.

Figure 3.3 Average annual residential water supplied (kL/property) – major utilities (large)



Source: Bureau of Meteorology, *National performance report 2018-19: urban water utilities* (indicator W12)

The volume of water supplied to customers outside the urban water supply system (which is not included in the volume of urban water supplied) (ie irrigators) was 3 017 ML in 2018-19, representing around three per cent of the total volume of potable water produced by TasWater.

3.2 Pricing

For 2018-19, TasWater's prices were required to comply with the Economic Regulator's *Tasmanian Water and Sewerage Corporation Pty Ltd, Water and Sewerage Services Price Determination, 1 July 2018 – 30 June 2021* and the decisions in the Economic Regulator's *2018 Water and Sewerage Price Determination Investigation – Final Report,* May 2018.

State-wide pricing applies for water and sewerage services in Tasmania. Residential tariffs and tariffs for smaller businesses are generally made up of:

- a fixed water service charge based on the size of the water connection to the property;
- a variable water usage charge based on the metered water usage; and
- a sewerage service charge based on the number of equivalent tenements (ETs) assessed for each property.

ⓘ Equivalent tenements (ETs)

An ET is a classification used in the Water Services Association of Australia Sewer Code to measure the demand a property is expected to place on infrastructure.

3.2.1 Residential bills

Table 3.1 shows the components of a residential customer's annual water and sewerage bill based on average consumption and the applicable target tariffs.

Annual bills for individual customers may differ from these figures depending on the price each customer is paying relative to the target tariff and the volume of water used.

ⓘ Target tariffs

'Target tariffs' are the published prices that TasWater charges for water and sewerage services. All customers are required to transition to these target tariffs by 1 July 2020.

Table 3.1 Components of typical annual residential customer bill

Component	Charges (2018-19)
Water fixed charge	$342.96
Water usage charge	106.20c/kL
Average annual residential water use	191 kL
Typical residential bill - water	$545.79 [a]
Sewerage fixed charge	$658.16
Typical residential bill - water and sewerage	$1 203.95[a]

[a] Based on Tasmanian average annual residential consumption of 191kL.

Due to past pricing structures, not all customers are paying the same price for the same service. TasWater has reported that, as at 30 June 2019, 847 water customers (0.4 per cent) and 3 788 sewerage customers (2 per cent)[22] were paying tariffs below the target tariffs and will continue to transition to regulated target tariffs. Under the Industry Act, the transition of customers to target tariffs is required to be completed by 1 July 2020).[23]

For comparison, annual bills are calculated for residential customers across Australia based on usage of 200 kL of water per annum. Figure 3.4 compares water and sewerage bills for customers of major water utilities (ie utilities with 100 000 or more customers), including TasWater (target tariffs) during 2018-19.[24]

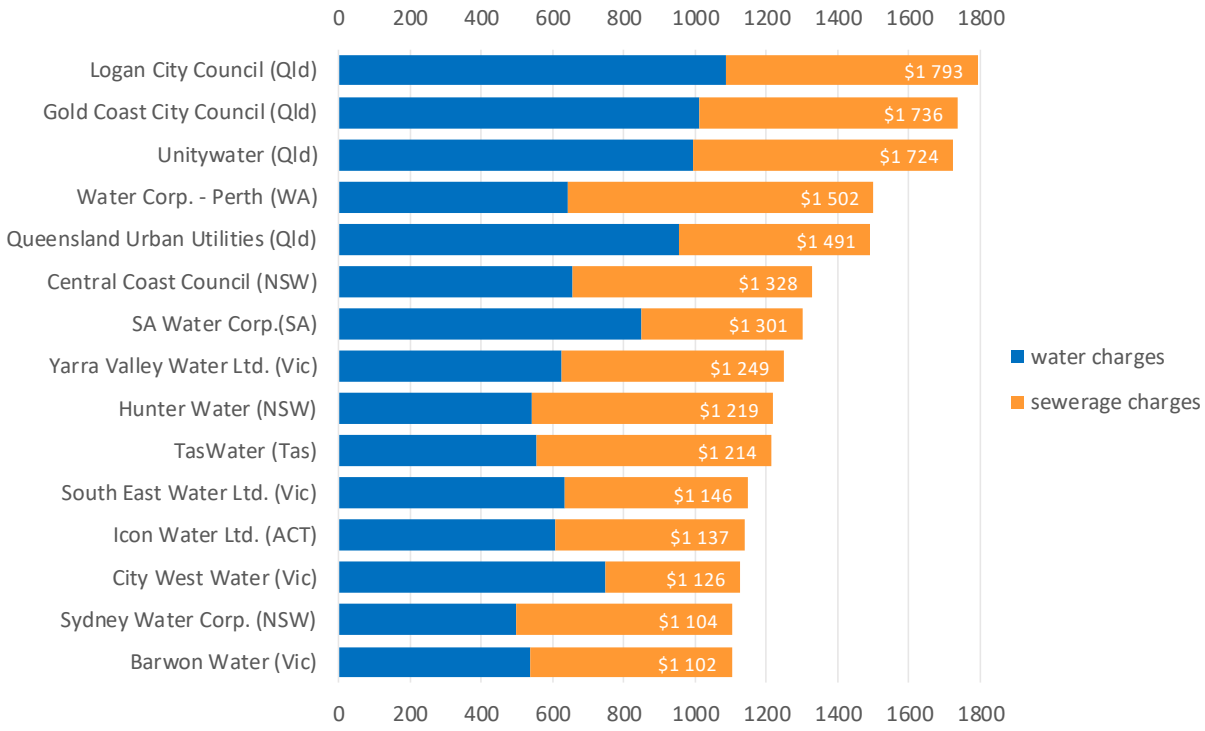
The national median residential bill for water and sewerage services was around $1 275 while a TasWater customer's bill based on the same consumption was the sixth lowest in this group at $1 214, or around five per cent below the national median.

[22] 2.6 per cent of water customers and 3.0 per cent of sewerage customers were paying below target prices as at 30 June 2018.

[23] Under Clause 27.1 of the *Shareholders' Letter of Expectation* TasWater has committed to ensuring that transitioning customers who are currently significantly below target tariffs will reach the target tariffs within the legislated timeframe without facing significant price shocks.

[24] Bureau of Meteorology, *National Performance Report - urban water utilities, 2018-19* (indicator P7).

Figure 3.4 Annual bills based on 200kL/pa (water and sewerage), $ 2018-19



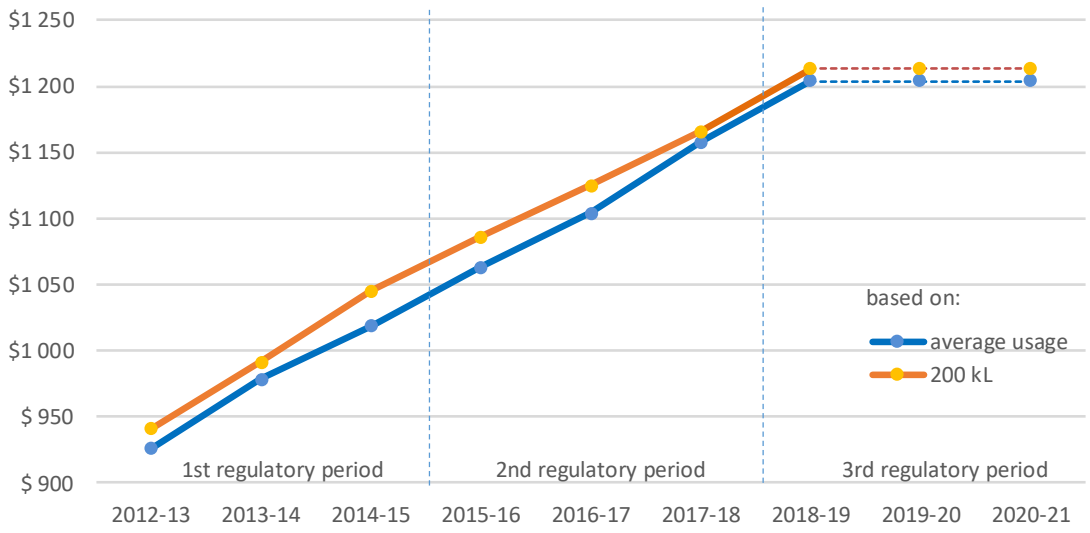
Overall, TasWater customers would be paying around $61 less per annum than their interstate counterparts, on average, for water and sewerage based on this consumption level.

Figure 3.5 shows the calculated annual residential bill for TasWater's customers based on the target tariffs, average annual usage and 200 kL per annum. Higher household water usage during 2018-19 compared to 2017-18 had little impact on the typical residential bill in 2018-19 while fixed sewerage charges (based on 1 ET) rose by 4.1 per cent.

From 2017-18 to 2018-19, for a household using 200 kL per year the bill would have risen by 4.1 per cent, to $1 214. This outcome is 0.5 of a percentage point higher than the price increase from 2016-17 to 2017-18 and is consistent with TasWater's decision to apply an increase of 4.1 per cent for 2018-19. Consistent with Clauses 21.5 and 27.1 of the *Shareholders' Letter of Expectations*,[25] TasWater has imposed no price increase in 2019-20. In late March 2020, the Tasmanian Premier, Hon Peter Gutwein MP, announced that there will also be no price increases for water and sewerage services in 2020-21.

[25] Under the *Water and Sewerage Corporation Act 2012*, a copy of which can be found at https://www.taswater.com.au/About-Us/Governance-and-Policies

Figure 3.5 Annual residential bill ($ nominal)



Compared to other major utilities in Australia, TasWater's fixed water charges are relatively high, with mainland utilities typically charging around $200 per property.[26] As a percentage of total water and sewerage bills, TasWater's fixed water charges ($342.96) represent 28 per cent of the total bill while the fixed water charges of mainland utilities are typically around 15 per cent of the total bill.

Conversely, TasWater's usage charges are significantly less than those charged by mainland utilities (around $2.60 per kL compared to TasWater's $1.06 per kL). Many mainland utilities have inclining block tariff structures for water, with usage charges rising to over $3.00 per kL. This difference in pricing reflects the fact that, until recently, Tasmania does not typically experience water shortages and has not been required to invest in very high cost water treatment plants (eg desalination plants) to meet urban water supply requirements.

3.2.2 Concession customers

Eligible customers were entitled to an annual water and sewerage concession of up to $192 ($96 each for water and sewerage) during 2018-19. The concession increases each year in line with movements in the consumer price index (CPI) for Hobart. In 2018-19, 51 916 customers received the benefit of a concession (approximately 28 per cent of residential customers).

To be eligible for a concession, the applicant must be legally responsible for the account and occupy the property as their principal place of residence as well as holding either a:

- Department of Human Services Health Care Card;
- Department of Human Services or Department of Veterans' Affairs Pensioner Concession Card; or
- Department of Veterans' Affairs Health Card - All Conditions ("Gold Card").

These concession arrangements are funded by the State Government and administered by TasWater. A community service obligation (CSO) payment is a subsidy provided by the State Government to allow TasWater to provide services at less than total cost. In 2018-19,

[26] Bureau of Meteorology, National Performance Report - urban water utilities, 2018-19 (indicator P1.2)

TasWater received a total of approximately $8.3 million in CSO payments to cover the cost of providing these concessions.

3.3 Call centre performance

TasWater's call centre provides the entity with an important link to its customers.

TasWater's call centre performance is measured in terms of the time it takes an operator to answer a customer's call. Since 2015-16, TasWater's service standard has been to ensure that 85 per cent of calls, where the customer has selected a relevant operator option, are answered within 30 seconds.[27]

Table 3.2 shows call centre performance for 2018-19 and over the previous four years. As shown in the table, the call centre has met the service standard target of 85 per cent in each of these five years.

Table 3.2 Call centre performance

Category	2014-15	2015-16	2016-17	2017-18	2018-19
Total number of calls	126 152	134 127	149 170	174 579	153 866
Number of calls answered by an operator within 30 seconds	111 748	118 691	132 876	151 017	134 040
Performance/service standard (%)	**89%** / 90%	88% / 85%	89% / 85%	87% / 85%	87% / 85%

Results in **bold** indicate that the standard was not met.

While call volumes had grown year on year from 2014-15 through to 2017-18, there was a decrease of 12 per cent in the number of calls received by TasWater in 2018-19 compared to 2017-18. TasWater reported that the reduction in calls was primarily due to proactive communication, additional questioning of staff to fully understand the context of the call and reduce call backs, and enabling staff to resolve more issues at the first point of contact.

TasWater's call centre average response time was much better than the national median for similar sized water utilities, which was 67 per cent of calls answered within 30 seconds in 2018-19.[28] TasWater has been the highest performing against this measure amongst similar sized utilities on the mainland during the period 1 July 2015 and 30 June 2018. In 2018-19, TasWater was the second highest performing utility with respect to this measure by comparison to similar sized utilities nationwide.

[27] The 2014-15 service standard was 90 per cent of calls answered within 30 seconds.

[28] Bureau of Meteorology, National Performance Report - urban water utilities, 2018-19 (indicator C14).

3.5 Complaints

The numbers of, and categories of, customer complaints received by TasWater provides a general indication of overall customer satisfaction and is also a useful way of identifying issues of concern to customers.

During 2018-19, TasWater received 2 648 complaints, which represented a reduction of approximately 18.2 per cent on the number of complaints received in 2017-18.

ⓘ TasWater defines a complaint as:

"...an expression of dissatisfaction made to an organisation, related to its products, or the complaints-process itself, where a response or resolution is explicitly or implicitly expected."

The rate of complaints per 1 000 properties reduced by 17 per cent from 15.6 in 2017-18 to 12.6 in 2018-19. While an improvement, the 2018-19 result did not meet the service standard target of 11 complaints per 1 000 properties. TasWater advised that the reduction in the number of complaints per 1 000 properties in 2018-19 was primarily due to the increased resolution focus in both its customer service team as well as proactive escalation of complex situations with the intention of preventing multiple contacts and complaints that follow. The rate of complaints per 1 000 properties (12.6) continues to be higher than the rate reported for comparable utilities on the mainland (median of 3.5 per 1 000 properties for 2018-19).[29]

TasWater advised that, overall, 96 per cent of complaints were resolved within 10 days in 2018-19 against a target of 90 per cent, which is an improvement on the result achieved the previous year (93 per cent).

Customers whose complaints are not resolved through TasWater's customer complaints process may refer their complaint to the Ombudsman. TasWater is bound by recommendations made by the Ombudsman in relation to a complaint. The service standard target that applies to TasWater for complaints to the Ombudsman is 0.5 per 1 000 customers.

During 2018-19, the Ombudsman received 64 complaints[30] regarding TasWater which was an increase compared with the previous year (59). However, as noted by the Ombudsman, they were significantly down from nearly 200 complaints in 2012-13. The complaints received for 2018-19 equates to 0.31 complaints per 1 000 properties and therefore meets the service standard target of 0.5.

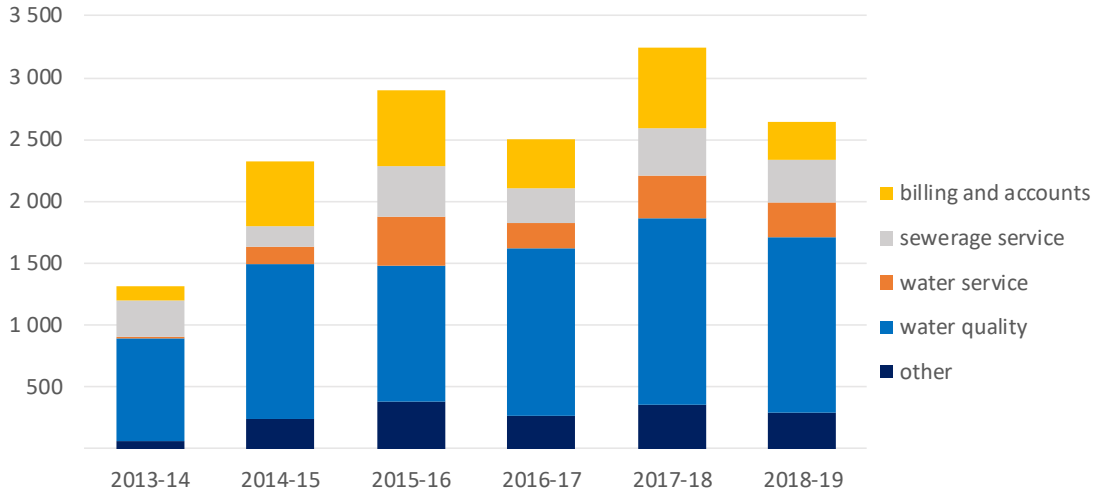
TasWater indicated that the increase in the number of Ombudsman complaints from 2017-18 to 2018-19 was primarily due to the Ombudsman receiving complaints prior to TasWater having an opportunity to review and resolve the customer's concern in the first instance in accordance with its Complaints, Enquiries and Disputes Management Policy. TasWater advised that it will be addressing this issue with the Ombudsman.

Figure 3.6 summarises the complaints received by category for 2018-19 and over the previous five years. The majority (54 per cent) of complaints received in 2018-19 related to water quality (ie taste, colour and odour), which was also the case for the previous five years. The number of complaints received across all complaint categories in 2018-19 decreased from those received in 2017-18, the most significant of which were complaints regarding billing and accounts, which decreased by 52 per cent.

[29] Bureau of Meteorology, National Performance Report - urban water utilities, 2018-19 (indicator C13).

[30] Ombudsman Tasmania, *Annual Report 2018-19,* November 2019.

Figure 3.6 Summary of complaints received by category



TasWater reported that it is continuing to undertake works to improve the water quality, including a project at Risdon Brook Dam to remove 500 tonnes of vegetation from the dam and reduce the suspended sediments in the water. In 2019-20, TasWater reported that it will be focussing on the following initiatives to reduce the number of water quality complaints.

- Improve customer awareness of supply interruptions, preventative maintenance programs and operational activities that may alter the quality or aesthetics of their water supply through the use of all media platforms.
- Implement enhanced network cleaning programs utilising standard operating procedures for network cleaning.
- Install automated flushing devices to reduce customer impacts and improve productivity.
- Review and modify network sampling points to reduce the potential for false positive results.
- Upskill employees in water quality management and disinfection techniques.

3.6 Payment management

Under the Customer Service Code, TasWater is required to provide customers with flexible payment options and to offer a hardship program to customers who are experiencing difficulties paying their bill.

In certain circumstances, TasWater may restrict or disconnect the water supply to residential customers for non-payment. Water restrictions for non-payment are only applied after other arrangements such as flexible payment plans have not resulted in the customer either paying or agreeing to pay their outstanding debt.

After all reasonable steps have been taken to allow a customer to pay an outstanding debt, TasWater may commence legal action to recover the debt.

Table 3.3 shows data for residential customers who had difficulty paying their accounts during 2017-18 and 2018-19. Data for concession customers is shown in brackets.

As at 30 June 2019, 4 060 residential customers were repaying a debt, comprising around 2.2 per cent of residential connected properties. Results for 2018-19 show an increase in the number of customers repaying a debt, which is also reflected in increases in the number of customers owing more than $500 and a significant increase in the number of customers on the hardship program.

As at 30 June 2019, 664 non-residential customers were repaying a debt, which is a small increase compared with the previous year (651).

Table 3.3 Residential customers with payment difficulties

Category	2017-18	2018-19
Customers repaying a debt	3 722	4 060
Average debt	$1 253	$1 203
Customers owing more than $500 (percentage of total)	2 184 (59%)	2 413 (59%)
Customers on hardship program (concession customers)	30 (18)	226 (132)
Average debt of customers on hardship program (upon entry)	$3 388	$2 922
Water supply restrictions applied for non-payment (concession customers)	62 (0)	1 (0)
Restrictions for non-payment removed within seven days of being applied (concession customers)	36 (0)	0 (0)
Customers to which legal action applied for non-payment of water bill	50	114

The average amount of debt decreased by around four per cent compared to 2017-18, with residential customers owing, on average, $1 203. The average debt is exactly the typical annual bill for water and sewerage in Tasmania in 2018-19.

The number of customers on the hardship program increased from 30 customers in 2017-18 to 226 customers in 2018-19. TasWater has indicated that it now has a dedicated hardship team known as Customer Support which liaises with TasWater's hardship customers on a regular basis.

Of the 226 customers using the program, 132 were concession customers. Customers using the hardship program have significant levels of debts, with the average debt at the time of entering the hardship program around $2 922 which is close to two and a half times a typical annual bill for water and sewerage.

TasWater reported that it did not, as a matter of general policy, restrict customers' water supply in cases of non-payment during 2018-19 due to its internal review of debt recovery processes and a change in TasWater's resourcing. In 2018-19, only one customer had their water supply restricted for non-payment, compared to the 62 restrictions applied in 2017-18.

TasWater advised that it will review its policy on water supply restrictions for non-payment in 2019-20. As a result, water supply restrictions for non-payment may return to higher levels in 2019-20.

3.7 Performance against key customer outcomes

TasWater is required to report to the Economic Regulator on its performance against the key customer outcomes set out in its approved 2018-21 Price and Service Plan.[31]

TasWater's Price and Service Plan sets out the prices, services, projects and outcomes to be delivered by 2021 in support of the long term outcomes articulated in its Long Term Strategic Plan (LTSP). Based on the preferences expressed by its customers, TasWater maintained it would deliver the following outcomes to its customers:

- Effluent compliance of 90 per cent by volume measured against EPA standards and mitigation of environmental risks for 90 per cent of the EPA's top 20 sites.
- Microbiological compliance of 100 per cent, removal of all boil water and public health alerts and a progressive reduction of public health risk in TasWater's water systems.
- Risk reduction of all but one dam to within tolerable levels, with the remaining dam managed through interim measures to reduce its risk appropriately.
- Maintain current service reliability standards by focusing investment on assets that, if they failed, would cause substantial service interruption or environmental impact.
- Limiting price increases to be less than full cost recovery to achieve the above outcomes while managing impacts to customer bills and maintaining prudent debt levels.

TasWater advised that, as at 30 June 2019, it was well advanced in achieving the key outcomes listed above, having already achieved its targets for microbiological compliance and boil water and public health alerts. TasWater also stated that, during 2019-20, it will continue to focus on delivering the remaining outcomes of PSP3. TasWater is also developing its proposed *Price and Service Plan 4* (PSP4) that will set out the customer outcomes and prices to be delivered in the following regulatory period.

TasWater's key priorities for improved performance are discussed further in Chapter 8.

[31] TasWater's Price and Service Plan for the third regulatory period (1 July 2018 to 30 June 2021), available for download at https://www.taswater.com.au/Your-Account/Price---Service-Plan

4 SERVICE RELIABILITY AND PERFORMANCE

This Chapter reports on the reliability and performance of TasWater's water and sewerage infrastructure.

4.1 Water service reliability and performance

Information on the frequency and duration of water interruptions is useful in assessing the reliability of the water supply network and the effectiveness of its operation and management. Water loss and leakage figures (eg the volume of water that does not reach customers due to leaking pipes or other factors) also help to gauge the condition of the system.

Data collection issues affected Taswater's performance data for supply interruptions during 2016-17. This resulted in unreliable or incomplete data that is not considered to provide a reliable representation of performance for that year. Where reported, these indicators are identified with the # suffix.

TasWater remains committed to improving data quality and reliability for its performance metrics and is reviewing its Data Quality Policy so that it reflects recent process and management system improvements.

ⓘ Customer service standards

TasWater is required to meet the minimum service standards set out in Schedule 1 of the Customer Service Code (the Code).

4.1.1 Water main breaks

Water main breaks are the primary cause of supply interruptions for the reticulated water network. Factors affecting the frequency of breaks, bursts and leaks include soil type, rainfall, pipe material and the age and condition of the network.

Table 4.1 shows the number of water main breaks, bursts and leaks per 100 kilometres of water main as reported by TasWater for 2018-19 and the previous four years.

Table 4.1 Water main breaks, bursts and leaks

	Total number of water main breaks (breaks, bursts and leaks)	Water main breaks (per 100 km of water main)
2014-15	1 753	28
2015-16	2 051	33
2016-17	3 021	48
2017-18	2 461	39
2018-19	2 609	41

As shown in the table, in 2018-19, the average rate of bursts and leaks across the State was 41 per 100 kilometres of water main. For comparative purposes, the median rate of water

main breaks for mainland major water utilities was 20 per 100 kilometres of water main.[32] TasWater's rate of water main breaks has been much higher than the national median for this indicator over the past five years.

4.1.2 Water losses

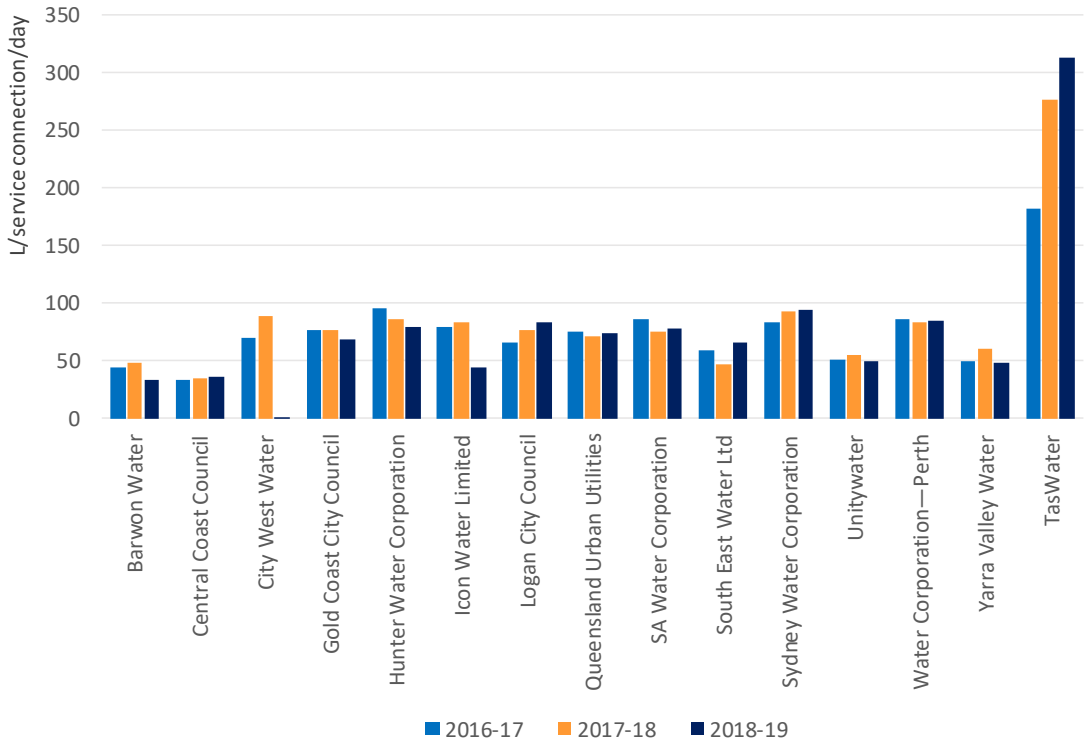
Water losses in the distribution system can be either apparent losses (unauthorised consumption, metering errors) or real losses (leakage and overflows from mains, service reservoirs and service connections prior to customer meters).

The level of real losses per service connection per day provides a measure of the effectiveness of the management of the network and of the condition of the network. Water pressure, condition and age of the infrastructure, or a combination of these factors can all influence performance against this measure. Real losses represent a wasted resource, reduce the effective capacity of a water supply system and result in unnecessary operating costs (ie the costs of treating water that customers are unable to use).

TasWater estimates that, in 2018-19, real losses in its reticulation networks were in the order of 313 litres per service connection per day. This represents 13 per cent more than the real losses per service connection per day estimated for 2017-18.

TasWater's water losses were the highest of all major Australian water utilities (Figure 4.1). Per service connection, TasWater's real losses were more than four times the median of major Australian water utilities, which was 69.3 litres per day in 2018-19. [33]

Figure 4.1 Real losses (L/service connection/day)



[32] Bureau of Meteorology, *National performance report 2018-19: urban water utilities* (indicator A8).

[33] Bureau of Meteorology, *National performance report 2018-19: urban water utilities* (indicator A10).

Expressed as real losses per kilometre of water main, TasWater's real losses (estimated to be 9.8 kL per kilometre of water main per day) were almost three times the national median, which was 3.6 kL per day.[34]

In 2018-19, TasWater's infrastructure leakage index (the ratio of actual real losses to unavoidable real losses[35]) was 2.8, which provides evidence of a significant volume of preventable water loss in TasWater's water supply systems. The increase in the reported losses continues to be due, in part, to the availability of more accurate data.

Overall, TasWater estimates that around 26 per cent of the total volume of potable water was unaccounted for in 2018-19. The current service standard target for 2018-19 is for unaccounted for potable water to represent less than 28 per cent of the total volume of potable water. The target of 28 per cent was set for application from 1 July 2018 in light of the volume of unaccounted for water being very high for TasWater in earlier years. It is expected that this service standard target will be reviewed.

4.1.3 Water supply interruptions

A water supply interruption is an event that causes a total loss of water supply to customers. Water supply interruptions may be unplanned, such as when a pipe bursts, or planned, such as a result of scheduled repairs and maintenance. TasWater is required to notify customers of planned interruptions.

Infrastructure age, construction material, the condition of water mains and the type of soil surrounding pipes potentially influence the frequency and duration of unplanned water supply interruptions.

ⓘ Unplanned interruptions

An interruption is classed as unplanned when a customer has not been given at least 24 hours' notification or when a planned interruption exceeds the original notified duration.

Figure 4.2 shows the average frequency and duration of unplanned water supply interruptions over the past five years. For 2018-19, TasWater reported 215 unplanned interruptions per 1 000 properties, a marginal decrease from 2017-18.

The median rate reported by similar utilities on the mainland was 161 unplanned interruptions per 1 000 properties.[36]

As shown in Figure 4.2, the duration of unplanned water interruptions reported by TasWater fluctuates from year to year, with a long-term average of around 157 minutes. As can be seen, the incidence of reported interruptions has generally grown from year to year, due, in part, to improved data collection and reporting practices.

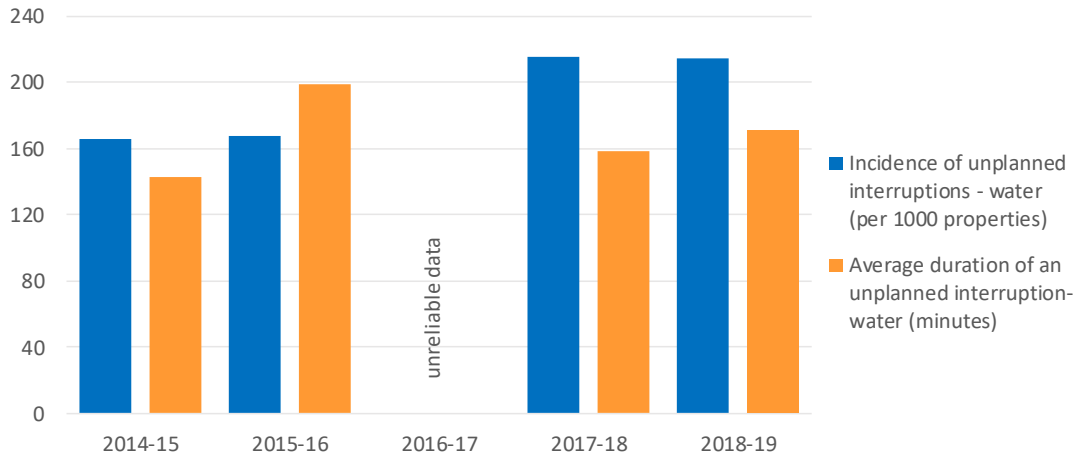
In 2018-19, TasWater reported an average of 171 customer minutes off supply (ie each water supply interruption lasted, on average, approximately 2 hours and 51 minutes). Similar utilities on the mainland reported a median of 126 customer minutes off supply during the year. In 2016-17, TasWater was unable to reliably report on either the duration of, or number of customers impacted by, water supply interruptions due to issues with data collection and reporting.

[34] Bureau of Meteorology, *National performance report 2018-19: urban water utilities* (indicator A11).

[35] Unavoidable real losses are the lowest technically achievable annual real losses in a water supply system for any combination of mains length, number of connections, customer meter location and average operating pressure.

[36] Bureau of Meteorology, *National performance report 2018-19: urban water utilities* (indicator C17).

Figure 4.2 Incidence and duration of unplanned water supply interruptions



Depending on the location of the break or fault, an unplanned interruption may affect one or many customers. Interruptions to water supply affected, in total, 45 026 customers during 2018-19.

Table 4.2 shows that the number of customers affected by unplanned interruptions increased marginally in 2018-19 compared to the preceding year (an unplanned interruption is often the result of a water main break).

Table 4.2 Unplanned water interruptions

	Number of unplanned interruptions	Number of customers affected
2014-15	6 007	33 352
2015-16	5 807	33 898
2016-17	Unreliable data	Unreliable data
2017-18	1 463	44 737
2018-19	1 511	45 026

In relation to the number of unplanned interruptions, TasWater has previously advised that the number of unplanned interruptions reported for 2016-17 represented only six months of data collected following the upgrade of its asset management information systems. Therefore, this data has been excluded from this Report. TasWater further advised that the figures reported for 2017-18 and 2018-19 are lower than previous years due to improvements in data collection that now exclude some incidents when the service to customers was not interrupted. Performance reported for earlier years may also include interruptions where no customers were affected.

Table 4.3 shows the average customer minutes off supply for both planned and unplanned water interruptions, together with the minimum customer service targets for 2018-19.

In relation to planned water interruptions, TasWater did not meet any of the Code's minimum targets in 2018-19. As an example, with respect to the duration of planned interruptions, TasWater only achieved the customer service standard of less than 3 hours only 27 per cent of the time (against a target of 80 per cent). This is also reflected in other measures, with only 59 per cent of planned interruptions lasting less than five hours (against a target of 90 per cent).

Table 4.3 Water supply interruptions

	CSC standard 2018-19[37]	2014-15	2015-16	2016-17	2017-18	2018-19
Planned interruptions						
Average customer minutes off supply*		9	2	N/R	36#	29
Incidence of planned interruptions - water (no. per 1 000 properties)	20	N/A	N/A	N/A	109	112
Percentage of planned water interruptions with a duration of less than 3 hours[a]	80%	-	94%	N/R	11%[b]	27%
Percentage of planned water interruptions with a duration of less than 5 hours[c]	90%	95	97	99#	38#[b]	59
Unplanned interruptions						
Average customer minutes off supply*		24	34	N/R	34	37
Water main breaks (no. per 100km of water main)	35	28	33	48	39	41
Incidence of unplanned interruptions - water (no. per 1 000 properties)	170	166	167	N/R	216	215
Percentage of unplanned water interruptions with a duration of less than 3 hours[a]	80%	N/R	90%	N/R	86%	86%
Percentage of unplanned water interruptions with a duration of less than 5 hours[c]	94%	97	94	86#	96	96

* This estimate is calculated with reference to all TasWater customers and not just those experiencing a supply interruption.

- Data contains errors or is unreliable N/R - Not reported due to incomplete or missing data

N/A - Standard not applicable for relevant period and result, therefore, not reported.

a - The service standard in the Code refers to the 'average duration' of interruptions being 180 minutes.
b - TasWater reported that documentation on this measure was not maintained into 2017-18. Calculation assumes worst-case scenario in absence of exact figures.
c - The service standard in the Code refers to the percentage of interruptions 'restored within 5 hours'.

TasWater reported it is developing actions targeted at improving planned water supply interruption performance results. However, the nature of works that affect performance against planned interruption metrics makes achieving compliance a challenge.

With respect to the incidence of unplanned interruptions per 1 000 properties, TasWater did not meet the Code's minimum target in 2018-19. However, TasWater met the minimum standards for the remaining two performance indicators relating to the duration of unplanned interruptions.

The incidence of unplanned interruptions (number per 1 000 properties) for 2018-19 was 215, which did not meet the service standard target of no more than 170. This result is largely unchanged from 2017-18.

For those customers who experienced an unplanned interruption to their water supply in 2018-19, for 86 per cent of the time the average duration of the interruption met the target

[37] Minimum service standards for 2018-19, as per the Customer Service Code.

of 180 minutes, which was consistent with the result of the previous year. Ninety six per cent of unplanned interruptions were restored within five hours, meaning that the minimum service standard target for 2018-19 of 94 per cent was met.

TasWater reported that the incidence of unplanned interruptions result for 2018-19 was primarily due to interruptions caused by the early failure of some ageing infrastructure. TasWater also stated that asset renewal had increased over the current period and, with improved data about the performance of its network, TasWater will continue to focus renewals in areas that have the most impact on customers. TasWater also reported that its updated mobility solution "H2Go" will allow it to improve its data capture of the frequency and duration of interruptions.

4.1.4 Bursts and leaks

Bursts and leaks are often attributable to the failure of a pipe, hydrant, valve, fitting or joint material. A burst or leak may not necessarily result in a loss of supply to customers. Bursts and leaks are prioritised according to their respective impact on, for example, customers, water quality and the environment.

Table 4.4 shows, for each interruption priority, the 'time to attend' and 'percentage of time the measure was met' performance measures, together with TasWater's performance, against each, during 2018-19 and for the previous three years.[38]

ⓘ Bursts and leaks – interruption priority categories

A burst or leak that causes, or has potential to cause:

Priority 1: substantial damage or harm to customers, water quality, flow rate, property or environment.

Priority 2: minor damage or harm to customers, water quality, flow rate, property or environment

Priority 3: no discernible impact on customers, property or the environment

In 2018-19, TasWater met the minimum service standards for Priority 1 and Priority 2 bursts and leaks. TasWater's performance was close to meeting the standard for responding to Priority 3 bursts and leaks. Priority 3 bursts and leaks represent a lower risk and the standard has a correspondingly greater attendance time than Priorities 1 and 2.

Table 4.4 Time to attend bursts and leaks (% of time standard achieved)

	CSC standard 2018-19[39]	2014-15	2015-16	2016-17	2017-18	2018-19
Priority 1	60 min/90%	-	87%	93%	94%	97%
Priority 2	180 min/90%	-	98%	94%	96%	96%
Priority 3	4 320 min/90%	-	91%	81%	90%	89%

[38] In 2014-15, TasWater was required to report only its average response time (in minutes) for attending to bursts and leaks. Data is therefore unavailable for the percentage of time the standard was achieved for that year.

[39] Customer Service Code minimum standards, 2018-19.

4.2 Sewerage service reliability and performance

In cases where the relevant information for Level 1 STPs is not available, this chapter relates only to the performance of TasWater's 79 Level 2 STPs.[40,41]

The performance of the sewerage infrastructure is assessed against a range of measures relating to sewer blockages, breaks and chokes, at both the sewer main and property connection points.

4.2.1 Sewer main breaks and chokes

The number of breaks and chokes in sewer mains indicates both the level of service received by customers and the condition of the sewerage network. A break is a failure of a sewer main that results in an interruption to the sewerage service. A choke is a partial or total blockage that may or may not result in a spill from the sewer system to the external environment.

TasWater reported 1 752 sewer main breaks and chokes during 2018-19, which is an improvement on the previous year (2 135 reported in 2017-18).

ⓘ Sewer connection points

Sewer mains and channels include:

- all trunk, pressure, and reticulation mains
- wastewater mains

Property connections include:

- the short sewer that connects the sewer main to the customer sanitary drain
- the junction on the sewer main
- property connection fitting
- vertical riser and pipes

TasWater reported that climate, and, in particular, rainfall and soil dryness has had a significant impact on the occurrence of sewer mains breaks and chokes, with approximately 60 per cent of the blockages caused by tree roots infiltrating sewer pipes. Tasmania in general experienced very wet conditions in March 2018 and July 2018 as well as record-breaking rain in the southeast in May 2018. TasWater surmised that this wet start to the financial year provided an ongoing reduction in blockages through to the end of the calendar year, when incidences returned to historical trend levels. TasWater also reported that ongoing development and implementation of preventive maintenance of its sewer mains has contributed to the reduction in breaks and chokes.

Reliability of the sewerage network is measured by the frequency of service failure, as indicated by the number of sewer mains breaks and chokes per 100 kilometres of sewer main (Table 4.5). This measure does not include breaks and chokes that occur within property connections (ie inside the customer's property boundary).

TasWater's performance of 37 breaks and chokes per 100 kilometres of sewer main in 2018 -19 is approximately 18 per cent less than the number in the previous year (45) and comfortably achieves the 2018-19 service standard target of 65 per 100 kilometres of sewer main. TasWater has indicated that it will continue to develop and improve its dedicated scheduling and dispatch team in response to sewer main breaks and chokes and expects to see an improvement in the future, with respect to response times and outages, with the rollout of its updated mobility solution.

[40] The EPA does not regulate Level 1 STPs are performance information is therefore not collected in relation to the performance of these STPs.

[41] The performance of Level 2 STPs operated by organisations other than TasWater are outside the scope of this Report.

TasWater's performance for 2018-19 was on par with its mainland counterparts, as the median rate reported nationally for similarly sized utilities was also 37 breaks and chokes per 100 kilometres of sewer main.[42]

Table 4.5 Sewerage main breaks and chokes

	Total number of breaks and chokes	Sewerage mains breaks and chokes (per 100km sewer main)
2014-15	2 710	57
2015-16	2 895	61
2016-17	2 156	45
2017-18	2 135	45
2018-19	1 752	37

4.2.2 Property connection sewer breaks and chokes

The property connection is a short sewer owned and operated by TasWater that connects the sewer main to the customer's property at the inspection opening. TasWater measures and reports on breaks and chokes in property connections on a per 1 000 connected properties basis.

The rate of property connection sewer breaks and chokes reported for 2018-19 was 11 per 1 000 property connections, slightly higher than the rate of 10 per 1 000 property connections reported in 2017-18.

The national median for similarly sized urban water utilities around Australia was around 4.5 breaks per 1 000 properties.[43]

4.2.3 Sewer spills

A spill occurs when untreated sewage spills or discharges from the sewerage system (ie pumping stations, pipes, maintenance holes or designed overflow structures) escape into the external environment.

Stormwater ingress, particularly during periods of high rainfall, is a major factor affecting the frequency and impact of sewerage system spills.

TasWater must notify the Director, EPA, of any release of sewage that causes or may cause serious or material environmental harm.[44] The threshold for reporting sewer spills varies between environmental regulators in different jurisdictions. Because of the variations in these thresholds, sewer spills are no longer included in national performance reporting.

The rate of sewer spills is calculated with reference to the length of the sewer mains and channels to give the average frequency of sewer spills for the system per 100 km of sewer main as shown in Table 4.6.

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42 Bureau of Meteorology, *National performance report 2018-19: urban water utilities* (indicator A14).

43 Bureau of Meteorology, *National performance report 2018-19: urban water utilities* (indicator A15).

44 The *Sewage Spill Notification Guidelines* issued by EPA Tasmania in October 2017 provide clarification as to what is considered a sewage spill that is notifiable to the Director, EPA. The guidelines are available on the EPA's website at https://epa.tas.gov.au/regulation/wastewater.

In 2018-19, TasWater reported 231 sewer spills to the EPA, a significant increase from previous years. This equates to 4.8 spills per 100 km of sewer main. TasWater reported that two spills occurred in sensitive environments and that there were 121 dry weather sewage spills during the year. Chapter 6 provides details of two incidents in 2018-19 that resulted in TasWater receiving environmental infringement notices from the EPA.

TasWater continues to recognise that reducing the impact and number of sewage spills resulting from blockages can affect environments of importance to TasWater customers; environments such as swimming beaches and productive inshore coastal areas like those used by the shellfish industry. This remains a key priority for the entity.

To reduce the number and impact of these spills, TasWater reported that it has continued to improve its monitoring of its sewage pumping stations and has improved its spill notification process to key regulators and stakeholders, with the objective of ensuring that relevant information is reported in a timely manner.

ⓘ Sewer spills

For the purpose of performance reporting, a sewer spill is a failure to contain sewage within the sewerage system, excluding:

- spills to emergency relief structures (a manhole is not an emergency relief structure)
- pump stations spills; and
- spills due to house connection branch blockages

Table 4.6 Sewer spills

	Number of sewer spills reported	Sewer spill rate (per 100 km of sewer main)	Number of sewer spills (per 100km of sewer main)	Spills contained within five hours (%)
2014-15	209[a]	4.4[a]	38	98.2%
2015-16	201	4.3	57	99.1%
2016-17	134	2.8	NR[b]	NR[b]
2017-18	146	3.1	78	99.7%
2018-19	231	4.8	98	99.7%

Source: TasWater Annual Performance Report 2018-19.

a. Data for 2014-15 has been amended. TasWater previously reported 164 overflows/ 3.5 per 100 km of sewer main.
b. NR - Not reported due to incomplete or missing data

Over 99 per cent of sewage spills (from reticulation and branch sewers) were contained within five hours.

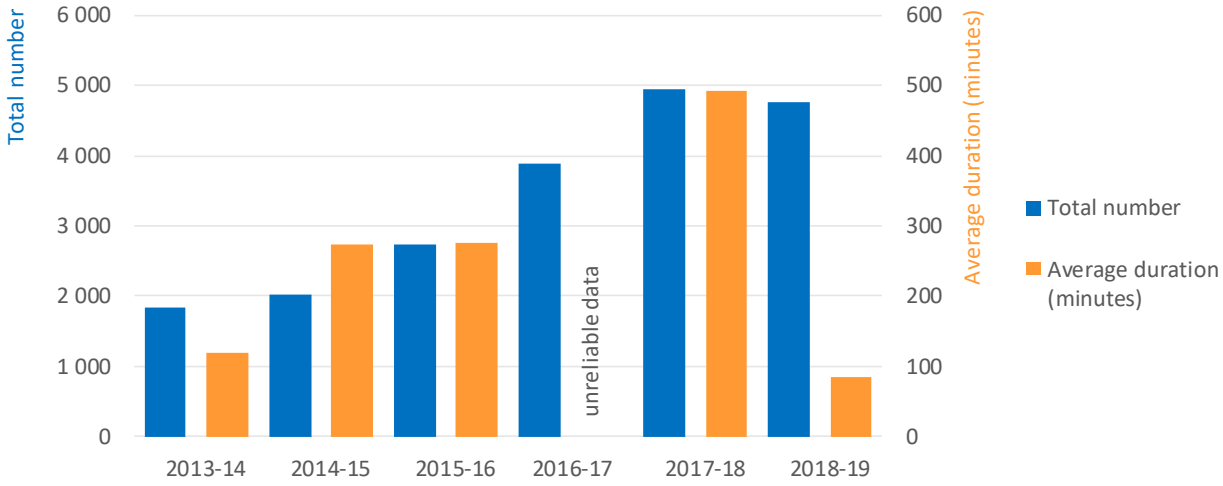
During 2018-19, the rate of spills relative to the length of the sewerage network was 98 per 100 km of sewer main. This was an increase from the 78 sewer spills per 100km of sewer main reported in 2017-18. The rate of sewer spills has fluctuated year to year and can be affected by weather events and network blockages.

4.2.4 Sewerage service interruptions

A sewerage service interruption is any event causing a loss of sewerage services. This includes events that cause sewerage services to be suspended without affecting customers. Timing of the duration of an interruption starts when TasWater is made aware that sewerage services are no longer available and ends when normal service is restored.

The total number and average duration of sewerage interruptions over the past six years is shown in Figure 4.3. During 2018-19, TasWater reported 4 763 sewer service interruptions, lasting an average of 83 minutes.

Figure 4.3 Sewerage service interruptions



The number and average duration of reported interruptions to sewerage services have increased year on year from 2014-15 to 2017-18. The results for 2018-19, however, reflect a small reduction in the number of reported sewerage service interruptions and a significant improvement in the average duration of those interruptions.

TasWater has previously reported a problem with its data collection processes which resulted in incomplete data reported about the duration of sewage service interruptions during 2016-17. However, the collection of data on the frequency and duration of interruptions has improved since the identification and correction of those data issues. TasWater has reported that the improvement in results for 2018-19 is evidence of better record keeping in TasWater's performance management system, and better reporting and analysis.

Table 4.7 shows the average duration of interruptions and average time to attend breaks and chokes, together with the minimum service targets for sewerage services as outlined in the Code.

Table 4.7 Sewerage service interruptions

	CSC standard 2018-19[45]	2014-15	2015-16	2016-17	2017-18	2018-19
Average time to attend breaks and chokes (minutes)		51	55	NR	52	53
Average duration (minutes)		274	277	NR	493	83
Sewerage mains breaks and chokes (no. per 100km of sewer main)	65	57	61	45	45	37
Percentage of response times within 60 minutes to attend sewer spills, breaks and chokes	85%	N/A	74%	NR	81%	89%
Percentage of sewage spills contained within 5 hours	99%	98.2%	99.1%	NR	99.7%	99.7%

NR - Not reported due to incomplete or missing data.

N/A - Not applicable as the standard applied from 1 July 2015.

In 2018-19, TasWater met all three service standards for sewerage services as specified in the Code. During 2018-19, TasWater attended sewer spills, breaks and chokes within 60 minutes 89 per cent of the time with an average attendance time of 53 minutes. This is an improvement on the 81 per cent reported in 2017-18. The average duration of sewerage service interruptions for customers also decreased significantly in 2018-19 to 83 minutes, although the accuracy of data for the duration of outages remains unreliable.

TasWater reported a continued focus during 2018-19 on identification of time variances and understanding the reasons for the variances. In addition, an expectation that an investment in fleet modernisation will increase dispatch efficiency and provide data on fleet usage. TasWater expects that further refinement of its scheduling and dispatch processes will improve its response times to sewer interruptions, thereby improving outcomes for customers and ensuring ongoing achievement of minimum standards.

[45] Minimum service standards for 2018-19, as per the *Customer Service Code*, Version 6, 25 November 2019.

5 DRINKING WATER

This Chapter outlines the Department of Health's assessment of TasWater's compliance with respect to drinking water quality against microbiological, chemical and fluoridation standards.

5.1 Drinking water systems and zones

TasWater undertakes compliance testing across the State. Sampling requirements are determined by both the risk and the geographical layout of a supply system.

Several systems comprise numerous monitoring zones to ensure that the water supplied to customers does not pose a threat to public health. In these systems, an aggregation of all the available data from these monitoring zones has been undertaken prior to the assessment of compliance of that system.

ⓘ Drinking water systems and zones

A public drinking water supply system consists of the entire water supply network, from the treatment to the customer's connection.

In some instances, a supply system can service multiple communities or geographic locations; largely originating from a series of pipelines to facilitate the movement and delivery of treated water around the networks.

One water supply system can be split into a number of discrete monitoring zones, also referred to as water supplies.

This approach is consistent with 2017-18, but it is different to previous years, when each monitoring zone was assessed separately. This approach has resulted in a reduction in the number of supply systems that have been assessed for compliance (ie from 87 systems in 2016-17 to 64 in 2017-18 to 62 in 2018-19).

For example, the Ringarooma supply system consists of five discrete monitoring zones relating to the towns of Ringarooma, Legerwood, Branxholm, Derby and Winnaleah. The aggregation of the data set results in one assessment of compliance for the entire population serviced by this supply system, which this year is reported as one system and not five zones (or water supplies) as in previous years. This change to reporting against overall systems has also attempted to resolve some inconsistencies in how previous assessments were made during the periods when water supplies were managed by councils or the regional water corporations.

Whilst compliance is assessed for a public drinking water supply system, it is sometimes appropriate to refer in context to a public water supply (or water supplies). Where this term is used, it generically refers to the water supplied to a customer at the point of consumption, irrespective of the supply system.

5.2 Drinking water treatment

Further to the three categories of water treatment discussed in section 2.2.1, during 2018-19 no water supply systems supplied raw water (no treatment processes) prior to delivery to customers.

Two water supply systems provided disinfection only, with a single treatment barrier such as chlorination or ultra violet light. Chlorination can become ineffective if the source water becomes turbid, which commonly affects raw water during heavy rain and/or drought conditions. If chlorination becomes ineffective a temporary boil water alert may be issued.

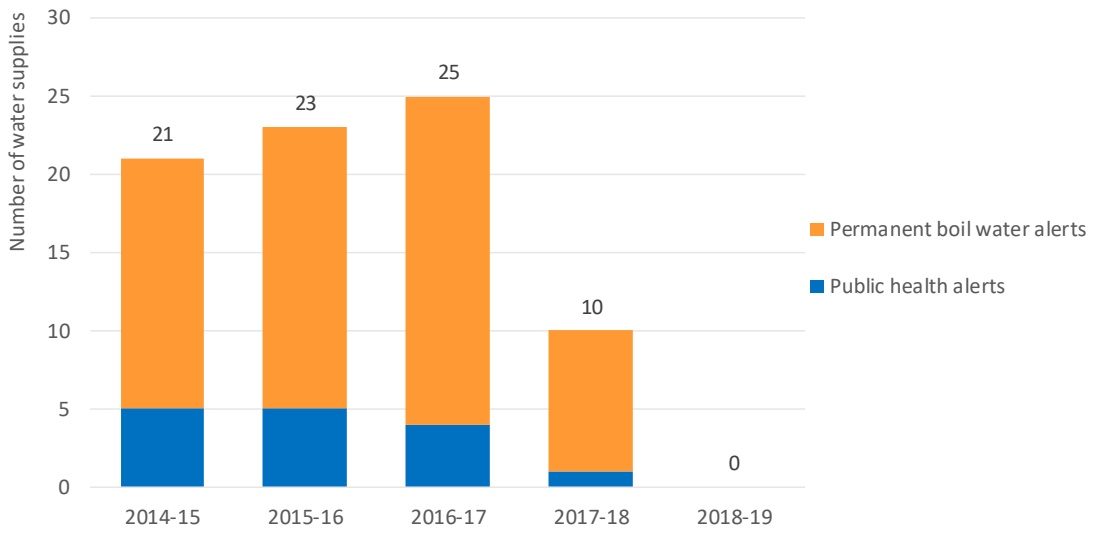
The remaining 60 water supply systems (97 per cent) had multiple water treatment processes to address public health risks posed by the source water quality. These water treatment processes require effective operation and ongoing maintenance to ensure they are adequate. These systems are effective against most microbiological hazards that may be present in the source water.

5.3 Drinking water compliance

As at 30 June 2019, none of TasWater's 62 water supply systems operated under either a long-term boil water alert (BWA) or a public health alert (PHA - do not consume) compared to ten in the previous year. Figure 5.1 shows the number of water supplies with a public health warning applied over the past five years.

During 2017-18 and 2018-19, TasWater implemented its Regional Towns Water Supply Program resulting in the removal of the remaining boil water alerts and public health alerts from water supply systems. Boil water alerts are detailed in Section 5.4 (microbiological compliance) while chemical compliance and public health alerts are discussed in Section 5.5. The Gormanston water supply was removed from serviced land during 2018-19 and is therefore not classified as a water supply system and therefore its compliance is not assessed.

Figure 5.1 Total number of water supplies with a public health warning (BWA or PHA)



5.4 Microbiological compliance of water supply systems

Microbiological compliance monitoring is one way of measuring the effectiveness of the management of drinking water supply systems. Monitoring assesses whether the microbiological risk associated with the supplied water has been adequately managed.

Water suppliers must sample and test drinking water from their drinking water supplies in accordance with the sampling requirements prescribed in the ADWG and the DWQG. Sufficient samples and appropriate frequency of sampling demonstrate that monitoring is

ⓘ Drinking water guidelines

The Australian Drinking Water Guidelines (ADWG) and the Tasmanian Drinking Water Quality Guidelines 2015 (DWQG)

representative of the water provided to consumers throughout the year.[46]

During 2018-19, the Department of Health found that TasWater had adequately monitored all 62 of its water supply systems in compliance with the required sampling frequency specified in the ADWG and DWQG.

The Department of Health therefore assessed all 62 of TasWater's public drinking water supply systems to be microbiologically compliant (100 per cent).

Table 5.1 compares the level of compliance, non-compliance and unknown compliance (due to insufficient sampling) from 2014-15 to 2018-19.

Table 5.1 Microbiological compliance of drinking water supply systems

Microbiological compliance	2014-15	2015-16	2016-17	2017-18	2018-19
Compliant (no. / percentage)	63 (72)	66 (76)	71 (82)	56 (88)	62 (100)
Non-compliant (no. / percentage)	15 (17)	20 (23)	16 (18)	8 (12)	0
Unknown compliance (no. / percentage)	10 (11)	1 (1)	0	0	0

TasWater uses microbiological compliance data to identify and manage risks of water supply systems. TasWater addresses the risks by commissioning the capital projects required to provide permanent improvements to the microbiological quality of these water supply systems.

5.4.1 Incidence of boil water alerts

In accordance with the DWQG issued under the *Public Health Act 1997*, when water samples indicate non-compliance (eg *E.coli* are detected), TasWater must undertake immediate corrective actions to minimise the public health risk. Most commonly, the source of the contamination is quickly identified, and the contamination removed or treated. At other times a more extensive investigation is required, and a temporary boil water alert is issued to protect the public from the risk of water contamination in the meantime.

ⓘ Boil water alerts (BWAs)

When a boil water alert is issued, water should be brought to a rolling boil and then cooled to room temperature or below before drinking or use in food preparation. Boiling the water kills pathogenic bacteria, viruses and protozoa.

Permanent boil water alerts are issued for water supply systems that are subject to contamination from various environmental sources and where there is inadequate or no water treatment process in place. In these instances, consumers need to act to protect themselves from the hazards of potentially contaminated water.

Temporary boil water alerts are used to manage well defined, time-limited (usually short term), events. If the source of contamination or risk cannot be addressed within three months, the status is changed to a permanent boil water alert, and additional criteria must be met before the alert can be lifted.

No Tasmanian water supply system operated under a permanent boil water alert in 2018-19.

[46] Information about the quality of each drinking water supply can be obtained from the Department of Health's Annual Drinking Water Quality Report or from water quality reports published by TasWater.

Two water supply systems operated on a temporary boil water alert during 2018-19 owing to the identification of potential risks to public health from treatment barriers not being able to operate to a sufficient standard. A summary of the two instances of temporary boil water alerts is presented in Table 5.2 below.

Table 5.2 Summary of drinking water non-compliances, 2018-19

Date	Water supply affected	Action	Status
7 July 2018	Deloraine	A temporary BWA was issued due to the inability of the water treatment plant to treat highly turbid water that occurred after a significant rainfall event.	BWA removed 12 July 2018
27 December 2018	Herrick	A temporary BWA was issued following the detection of microbiological contamination within the reservoir.	BWA removed 2 January 2019

These two water supply systems affected approximately one[47] per cent of the Tasmanian population receiving a reticulated water supply. Both were fully treated supplies. Both temporary boil water alerts were removed within one week after TasWater demonstrated that appropriate intervention had occurred, and the water was safe for consumption ie neither of these temporary boil water alerts remained in place as at 30 June 2019.

Table 5.3 compares the number of water supply systems which operated with permanent or temporary boil water alerts between 1 July 2014 and 30 June 2019. During 2018-19 and as at 30 June 2019, there were no drinking water supplies with a permanent boil water alert in place. This is a large decrease in the number reported in 2016-17 and 2018-19 and has been due to the completion of TasWater's Regional Towns Water Supply Program.

Table 5.3 Boil water alerts (number of water supply systems)

Alert type	2014-15	2015-16	2016-17	2017-18	2018-19
Temporary boil water alerts	5	7	3	3	2[(a)]
Permanent boil water alerts	16	18	21	9	0

(a) Both temporary BWAs were removed during 2018-19.

5.4.2 Population receiving microbiologically compliant reticulated water

Approximately 78 per cent of Tasmanians[48] (414 634[49]) receive their drinking water from a public drinking water supply system.

During 2018-19, none of the Tasmanian population supplied with water from a reticulated water supply received drinking water that was microbiologically non-compliant.

[47] Determined to be 0.6 per cent, rounded to the nearest whole number and reported as 1 per cent.

[48] Connection data provided by TasWater is normalised through the estimated occupancy rate for each water supply area as sourced from the ABS website through population data. Determined to be 77.7 per cent, rounded to the nearest whole number and reported as 78 per cent.

[49] These estimates exclude visitors to the State. In 2017-18, there were 1.3 million visitors to Tasmania, a very large percentage of whom would have consumed water supplied by TasWater.

5.5 Chemical compliance of water supply systems

During 2018-19, TasWater adequately monitored 59 of 62 water supply systems for chemical contaminants. The exceptions were Maydena (214 people) and Rosebery (692 people). The required number of chemical samples were not taken with respect to these two water supply systems. In the samples that were taken within the Maydena supply system, contaminants did not exceed the health related guideline values and therefore the Maydena supply system has been classified as unknown compliance. In the samples that were taken within the Rosebery supply system, contaminants did exceed some of the health related guideline values and therefore the Rosebery supply system has been assessed as non-complaint.

Health related guideline values are conservative and incorporate a range of safety factors that err on the side of caution to protect public health. Guideline values represent the maximum allowable concentration of a chemical that would not result in any significant risk to the health of the consumer over the consumer's lifetime. For most parameters, intermittent exceedances of guideline limits do not harm health.

As shown in Table 5.4, two of TasWater's water supply systems had chemical contaminants detected above the ADWG health guideline during 2018-19.

Table 5.4 Number of water supply systems exhibiting chemical non-compliances

	2014-15	2015-16	2016-17	2017-18	2018-19
Chemical non-compliances	14	13	10	7	2

During 2018-19, temporarily elevated levels of lead and manganese were identified in the Rosebery water supply system (692 people). Temporarily elevated levels of disinfection by-products were detected in the Coles Bay water supply system (144 people). In both cases, remedial action was taken by TasWater and re-sampling of the water supply showed that contaminants had returned to acceptable levels.

Overall chemical compliance saw 59 of the 62 water supply systems assessed as being compliant, two systems as non-complaint and one as unknown compliance due to inadequate sampling.

5.5.1 Incidence of Public Health Alerts

Public health alerts (do not consume notices) are put in place when non-compliant water is detected that cannot be rendered safe by boiling. No water supply systems operated under a public health alert as at the end of 2018-19.

Table 5.5 shows the number of water supply systems operating under a public health alert between 1 July 2014 and 30 June 2019. There were no new public health alerts issued during 2018-19, and the public health alert on the Rossarden supply (PHA in 2017-18) was lifted after changes in supply arrangements that provided compliant drinking water to customers.

Table 5.5 Number of water supply systems operating under a public health alert

	2014-15	2015-16	2016-17	2017-18	2018-19
Public health alerts	5	5	4	1	0

5.5.2 Population receiving chemically compliant reticulated water

In 2018-19, 100[50] per cent of the Tasmanian population serviced by a reticulated water supply system received drinking water that was chemically compliant throughout the year. This is an increase from the 98 per cent reported in 2017-18. This increase in the population receiving chemically compliant water is largely due to improvements in treatment and supply processes and more comprehensive monitoring programs.

5.6 Fluoridation of public drinking water supply systems

Natural fluoridation of water occurs when fluoride compounds dissolve in water as it passes through rocks and soil. Tasmania's natural water supplies are comparatively low in fluoride, so fluoridation of drinking water is used to adjust the level of fluoride in the water to a level considered safe and effective in reducing tooth decay.

The widespread fluoridation of water in Tasmania is conducted in accordance with the *Australian National Oral Health Plan 2015-2024* which advocates water fluoridation of public water supplies for communities across Australia with populations of 1 000 or more. In Tasmania, fluoridation of public water supplies has been achieved in all communities with populations of greater than 1 000 that currently receive a reticulated public water supply. Only Tasmania, the Australian Capital Territory and the Northern Territory have achieved this significant outcome.

Tasmania was the first jurisdiction to fluoridate a public drinking water supply (Beaconsfield in 1953). Under the *Fluoridation Act 1968*, the Minister for Health directs TasWater (based on recommendations from the Fluoridation Committee) to fluoridate specific public water supplies in a prescribed manner. TasWater must monitor the level of fluoride in drinking water daily.

5.6.1 Fluoridation compliance

Of the Tasmanian population receiving a reticulated water supply, 98 per cent receive fluoridated water.[51]

Under the *Fluoridation Regulations 2019*, the fluoride concentration range required in the drinking water supply (to achieve optimum tooth decay prevention) was 0.8 to 1.1 milligrams per litre (mg/L). The maximum level of fluoride allowed in the water (the maximum level specified in the ADWG) is 1.5 mg/L. The *Tasmanian Code of Practice for Fluoridation of Public Water Supplies (2018)* prescribes that the average of all samples taken from within a reticulation network should fall within that range. Compliance is assessed against each fluoridation system (dosing station where the fluoride is added to the drinking water) rather than as an overall water supply system configuration, as is done for the microbiological and chemical compliance assessments.

In 2018-19, there were 38 fluoridation systems in operation throughout the State servicing 38 of the 62 water supply systems. Thirty six of the 38 fluoridation systems maintained an average fluoride level within the required fluoride concentration range. This was comparable

[50] Determined to be 99.7 per cent, rounded to the nearest whole number and reported as 100 per cent.

[51] TasWater is wholly responsible for the operation and maintenance of fluoridation systems and is obliged under the Fluoridation Act to fluoridate the drinking water when directed to do so. For very small systems, TasWater is not required to provide fluoridated water.

to the compliance reported in 2017-18. The non-compliant fluoridation systems, including the average fluoride concentration, were Leven River (0.4 mg/L) and Rocky Creek (0.7 mg/L), which were providing less than the required annual average fluoride level.

Table 5.6 shows fluoridation compliance between 1 July 2014 and 30 June 2019. In 2018-19, 98.9 per cent of Tasmanians receiving a fluoridated reticulated water supply received water with an average fluoridation concentration within the prescribed range of 0.8 to 1.1 mg/L.

Table 5.6 Fluoridation compliance (per cent of serviced population)

	2014-15	2015-16	2016-17	2017-18	2018-19
Fluoridation compliance	97	100	82	100[52]	99[53]

During 2018-19, there were no instances where a fluoride concentration exceeded the ADWG health-related guideline of 1.5 mg/L.

[52] Determined to be 99.8 per cent, rounded to the nearest whole number and reported as 100 per cent.

[53] Determined to be 98.9 per cent, rounded to the nearest whole number and reported as 99 per cent.

6 ENVIRONMENT

This Chapter reports on the performance of TasWater's sewage treatment plants (STPs) including effluent and biosolids reuse, and environmental impact on waterways. For the purpose of this Chapter, only the performance of Level 2 STPs operated by TasWater is assessed. The EPA's analysis of the performance of individual STPs operated by TasWater during 2018-19 is at Appendix 3.

6.1 Sewerage schemes

> ⓘ Sewage treatment plants (STPs)
>
> The information in this section does not extend to Level 1 STPs, which have a design capacity of less than 100 kilolitres per day and continue to be regulated by municipal councils, or STPs operated by entities other than TasWater.

During 2018-19, 15 of TasWater's Level 2 STPs received annual inflows of more than 1 000 ML (Table 6.1 provides total flow volumes for 2017-18 and 2018-19). These 15 STPs accounted for approximately 72 per cent of the total inflows to TasWater's Level 2 STPs. Most of the listed plants service major urban areas and/or accept large volumes of industrial trade waste. In 2018-19, Ti-Tree Bend was again the largest STP by inflow volume in the State. This is in part due to both sewage and stormwater flows from the Launceston Combined System[54] being collected and transported to that STP.

Table 6.1 Tasmanian STPs with annual inflows exceeding 1 000 ML/year

		Total flow ML/year	
Premises name	Catchment area	2017-18	2018-19
Ti-Tree Bend	Launceston	5 540	5 503
Pardoe	Devonport	5 158	4 552
Macquarie Point	Hobart	3 952	3 881
Selfs Point	Hobart	3 586	3 205
Prince of Wales Bay	Glenorchy	2 827	2 918
Ulverstone	Ulverstone	2 689	2 624
Round Hill	Burnie	2 299	2 293
Rosny	Clarence	2 268	2 213
Cameron Bay	Glenorchy	1 803	1 763
Blackmans Bay	Kingston	1 470	1 597
Smithton	Smithton	1 271	1 486
Wynyard	Wynyard	1 519	1 331
Newnham Drive	Launceston	1 092	1 072
Hoblers Bridge	Launceston	990	1 043
Norwood	Launceston	791	1 041

[54] Both sewage and stormwater are treated before being discharged into waterways.

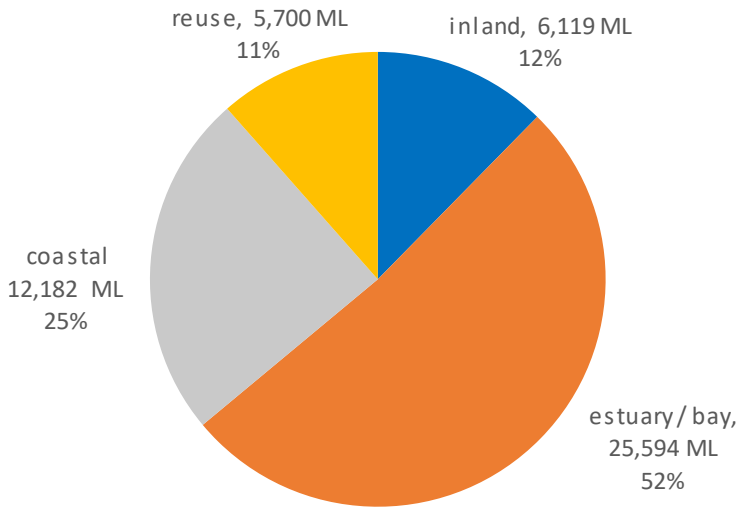
6.2 Outfalls to the environment

STPs discharge to inland, estuarine and marine (coastal) environments. The type of receiving environment provides an indication of environmental sensitivity and capacity to cope with pollutants, with inland waters considered the most sensitive.

Of the 79 Level 2 STPs operated by TasWater during 2018-19, 13 discharged to marine environments, 31 to estuaries or bays and 35 discharged to inland waters. Not all STPs actually discharged to water in 2018-19. Treated effluent produced at 14 plants was fully reused and not discharged to receiving waters.

Figure 6.1 shows the volume and percentage of treated effluent discharged by Level 2 STPs during 2018-19, categorised by receiving environment. These percentages have remained relatively unchanged over recent reporting periods.

Figure 6.1 Sewage discharge by receiving environment 2018-19 (ML/year; percentage of flow)



Of the total volume of effluent discharged, most was discharged to estuarine waters (25 594 ML or 51.6 per cent). Discharge to coastal waters accounted for 12 182 ML or 24.6 per cent, and inland waters accounted for 6 119 ML or 12.3 per cent. 5 700 ML or 11.5 per cent of effluent was reused.

There are significant regional differences in the receiving environment, reflecting differences in population settlement. Discharges in southern and northern Tasmania are predominantly to the Derwent and Tamar estuaries respectively, with smaller volumes discharged to inland watercourses. In the north-western region, discharges are predominantly to coastal environments. Most treated effluent reuse occurs in southern Tasmania. The Clarence, Brighton and Penna effluent reuse schemes together accounted for 66 per cent of the total volume of effluent reused in 2018-19.

6.3 Sewage treatment plant compliance

The level of compliance with discharge limits stipulated by the EPA is an important measure of STP environmental performance.

Regulatory discharge limits for each Level 2 STP are specified in the environmental conditions issued by the EPA. Discharge limits vary from STP to STP depending on the sensitivity of the receiving environment and the volume of discharge.

STP performance is also evaluated against Accepted Modern Technology (AMT) limits. AMT limits represent a theoretical but stable benchmark. While AMT limits are not binding, the degree to which they are met is a better indicator of performance over time.

Section 6.3.1 examines compliance against current regulatory limits, while performance against theoretical AMT limits is examined in section 6.3.2.

ⓘ Discharge limits

Environmental conditions for many STPs have been updated recently via the issue of Environment Protection Notices (EPNs) - a process that is continuing. While most EPNs contain interim discharge limits based on the 90th percentile of recent performance, the next phase of EPNs will introduce limits that reflect the assimilative capacity of the receiving environment and are commensurate with contemporary standards. This process will ultimately provide a more consistent and relevant benchmark for STP compliance.

Compliance has been calculated for TasWater as a single entity since its formation in July 2013. Previously, compliance was calculated separately for the three regional water and sewerage corporations. Back-calculations of compliance on a state-wide level for the period prior to July 2013 provide a baseline against which TasWater's compliance can be compared.

Calculations and charts in this section are based on analysis of effluent quality monitoring data held by the EPA.

Compliance is assessed for each parameter for which a limit is specified by determining the number of samples that complied with the specified limit as a percentage of the total number of samples analysed in the reporting period. Compliance percentages for all parameters are combined to provide one overall compliance figure for each STP. To account for STPs of varying hydraulic capacities, the flow-weighted average of individual STP compliance is used to calculate TasWater's overall compliance. To calculate compliance, only flows directed to the respective receiving environments (i.e. waters vs reuse) are taken into account.

If both land-based and water-based discharge limits exist for a STP, compliance is assessed and reported separately against each limit. In 2018-19, compliance is also reported for the flow-weighted combined compliance for discharge to water and land.

The discharge to waters compliance figure for STPs with full reuse has relevance as an indicator of the likely discharge quality for potential future discharge events. For this reason, discharge to waters compliance for full reuse STPs with authorised discharge points to water is presented in the compliance assessment for individual STPs in Appendix 3, despite the fact that discharge may not have occurred in the reporting period.

6.3.1 Compliance with current discharge to waters limits

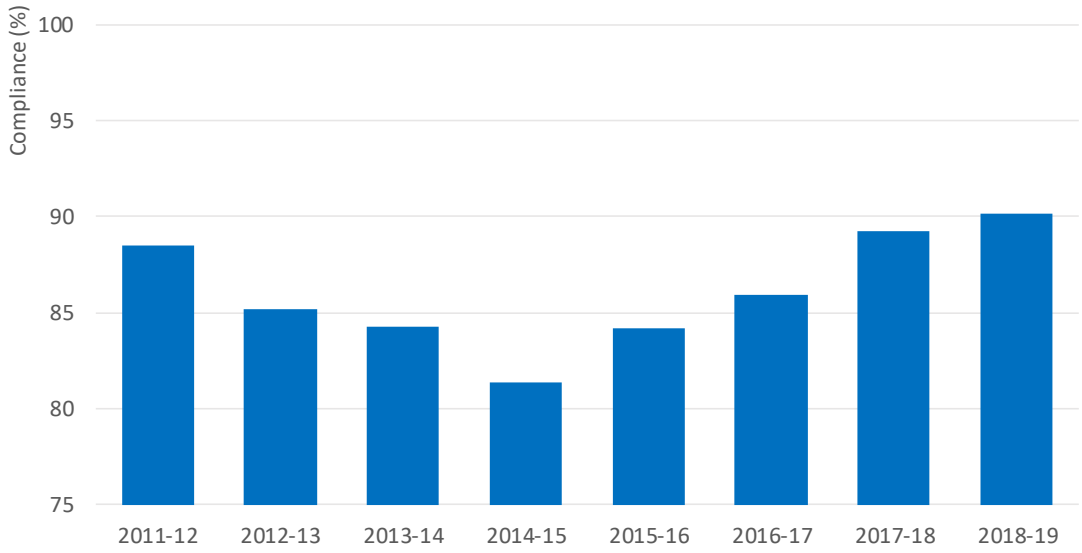
This section assesses compliance with regulatory discharge to waters limits for all STPs combined. STPs from which discharge to waters did not occur during 2018-19 are excluded from the assessment. In 2018-19, 14 full-reuse STPs were excluded. 65 out of TasWater's 79 Level 2 STPs contributed to the flow-weighted discharge to waters compliance measure for 2018-19.

Figure 6.2 shows compliance against discharge to waters limits over time. In 2018-19, TasWater achieved 90.2 per cent compliance with regulatory discharge to waters limits, further continuing the upward trend since 2014-15 when compliance was at 81.4 per cent.

ⓘ Compliance Calculations

Effluent compliance can be calculated in a number of ways. The EPA uses an independent limits calculation where each testing parameter is assessed for compliance and the results aggregated. This approach allows a more detailed analysis of non-compliant parameters within a monitoring program. Up to 2016-17, TasWater used a linked limits calculation where all parameters must be compliant before the sample is considered compliant. The linked limits approach is more stringent and leads to lower state-wide compliance results. From 2017-18 onwards, TasWater also uses the independent limits calculation, making the results of this report and TasWater's reporting directly comparable.

Figure 6.2 Compliance against discharge to waters regulatory limits (per cent)



Overall compliance levels are further illustrated in Table 6.2. In 2018-19, 13 of TasWater STPs were classified as substantially non-compliant (ie 75 per cent or less compliant), down from 14 STPs in 2017-18. Of these 13 STPs, 11 discharged treated effluent to water. The other two STPs with low compliance levels discharged all effluent to reuse, thereby diverting pollutant loads away from waterways towards beneficial uses.

Effluent discharged from Blackmans Bay STP during the commissioning phase (from cut-over of flows from Margate and Electrona STPs beginning in March 2019 to commissioning of the new treatment process in August 2019) has been excluded from compliance assessment, as it is not considered to be representative of the plant's true operational performance.

In 2018-19, flow-weighted overall compliance with regulatory discharge to water limits passed the 90 per cent mark for the first time since 2009-10 (91.4 per cent), the period immediately

following formation the of water and sewerage corporations in 2009.[55] Seven of the 13[56] largest plants achieved more than 90 per cent compliance in 2018-19 the same number as in 2017-18, albeit a slightly different composition of plants. Compliance at Prince of Wales Bay STP improved. However, reduced performance at Ulverstone STP meant compliance dropped below the 90 per cent compliance mark. The average compliance of all 65 STPs that discharged to water was 84.6 per cent, demonstrating that per cent compliance levels were higher at the STPs with larger discharge flows, therefore biasing the overall flow-weighted compliance towards those large STPs. The performance of Smithton STP continues to be below historical compliance levels following desludging, but displays an upwards trend.

Table 6.2 Number of STPs by compliance category (regulatory limits)

	2014-15	2015-16	2016-17	2017-18	2018-19
>90% compliance	22	24	30	33	25
>75 - 90% compliance	29	31	30	27	35
>50 - 75% compliance	15	12	8	11	11
≤50 % compliance	5	5	4	3	2

Table 6.3 shows two STPs (Bridport and Port Sorell) with 50 per cent or less compliance against regulatory discharge to water limits in 2018-19. Bridport and Port Sorell are lagoon systems. As in past reporting periods, Bridport STP struggles to achieve compliance with its stringent AMT discharge limits and is subject to high seasonal loading due to summer tourist visitation. Sludge surveys in past years confirmed significant sludge accumulations within treatment lagoons at Port Sorell STP, which may impact performance. Desludging may lead to improved performance outcomes in the future for this STP.

Table 6.3 STPs with 50 per cent or less compliance against discharge to waters limits

STP	Limit type	Number of limits assessed	Compliance (%)
Bridport[1]	Max/Min	9	50.0
Port Sorell[1]	Max	4	37.5

Notes: 1. Indicates consecutive years of 50 per cent or less compliance.

6.3.2 Performance against AMT discharge to waters limits

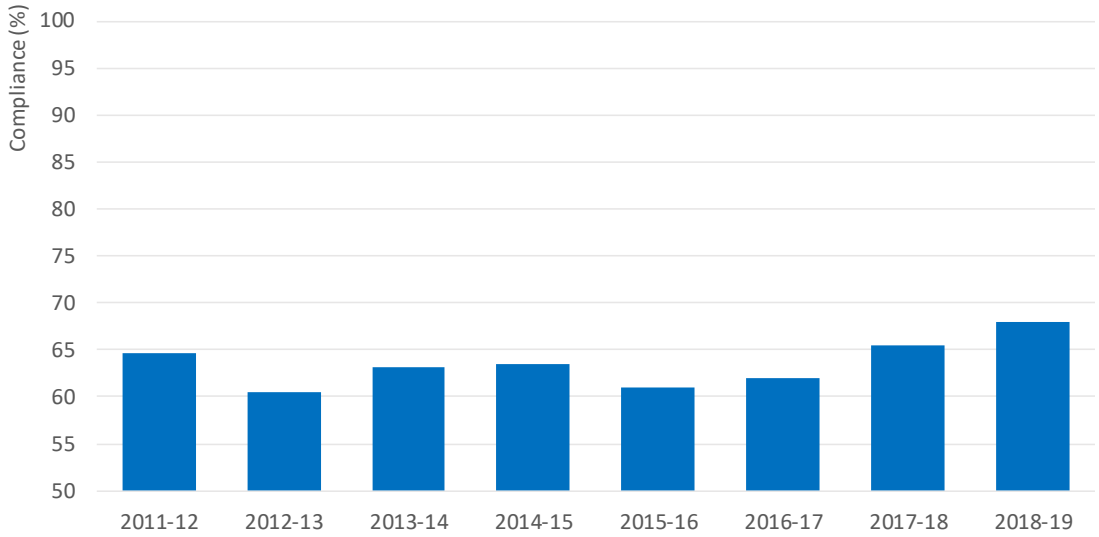
The limits adopted for the analysis in this section represent AMT standards contained in the *Emission Limit Guidelines for Sewage Treatment Plants* (DPIPWE, 2001). AMT limits, which differentiate between fresh water and marine receiving environments, incorporate stringent nutrient reduction and disinfection standards. While AMT limits generally reflect expected performance at a tertiary treatment level, most sewage in Tasmania is currently treated to a secondary level only.

[55] Compliance datasets for the 2009-10 periods are less complete than those assessed for the 2018-19 period, and as a result there is less confidence in the 2009-10 result of 91.4 per cent flow weighted compliance than there is in the current result.

[56] Refers to the 'Big 13' strategy, which is a component of the MoU, targeting performance improvements for TasWater's largest STPs by volume.

Figure 6.3 shows performance of TasWater's level 2 STPs against AMT limits as a time series.

Figure 6.3 Performance against AMT discharge to waters limits (per cent)



Performance against the AMT limits benchmark has been more stable over time than compliance with regulatory discharge to water limits. The 2018-19 performance level of 68.0 per cent of flow-weighted sample compliance is the highest to date, and an improvement on the 2017-18 result of 65.5 per cent, continuing the upwards trend observed since 2016-17. Relocation of the compliance sampling point at the Ti-Tree Bend STP in September 2018 to provide better distinction between fully treated effluent and combined system bypass flows is likely to have contributed to the improved result.

In parallel to compliance with regulatory limits, the average performance level of 65.8 per cent across all 64[57] STPs contributing to this measure is below the flow-weighted performance of 68.0, demonstrating that the larger STPs have better performance against the AMT benchmark.

Table 6.4 below shows distribution of STP numbers separated into performance categories over time. Round Hill STP in Burnie and Selfs Point STP in Hobart, achieved more than 90 per cent compliance with the AMT benchmark in 2018-19. Both plants use tertiary treatment technology.

Table 6.4 Number of STPs by performance category (AMT limits)

	2014-15	2015-16	2016-17	2017-18	2018-19
>90% compliance	9	9	10	12	11
>75 - 90% compliance	8	9	15	14	17
>50 - 75% compliance	39	33	34	30	24
≤50 % compliance	17	23	15	19	20

[57] Rosny STP was not assessed against AMT limits in 2018-19 due the change of monitoring parameters from biochemical oxygen demand (BOD) to carbonaceous biochemical oxygen demand (cBOD). cBOD is considered a more appropriate compliance parameter for this particular STP, but is not part of the AMT parameter suite.

6.3.3 Summary of discharge to waters limits compliance

TasWater's flow-weighted compliance against regulatory discharge to waters limits continued its upward trend with a lift from 89.2 per cent in 2017-18 to 90.2 per cent in 2018-19. Flow-weighted performance against AMT limits improved from 65.5 per cent in 2017-18 to 68.0 per cent. Despite some of the compliance gain being the result of regulatory changes, there continues to be an underlying upward trend in overall flow-weighted compliance for both regulatory discharge limits and the AMT benchmark measure, over the past four reporting periods.

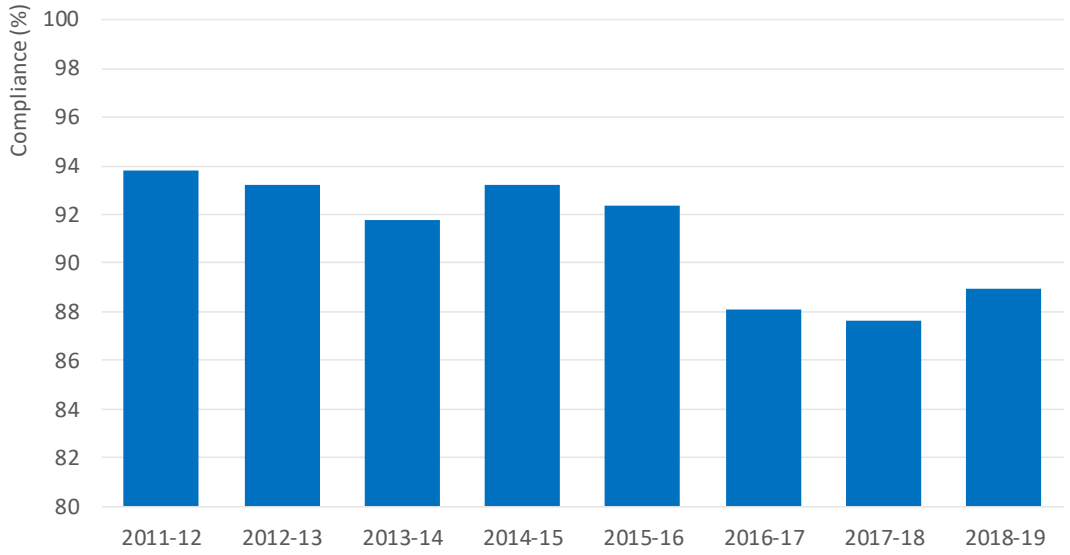
Table A3.1 and Figures A3.1 to A3.2 in Appendix 3 show compliance with regulatory limits and AMT limits for each individual STP.

6.3.4 Compliance with discharge to land limits

This section assesses the levels of compliance for discharge to effluent recycling schemes that use treated effluent generated by Level 2 STPs. Effluent recycling schemes operated in 2018-19 were generally required to comply with 'Class B'[58] quality standards (as outlined in the *Environmental Guidelines for the Use of Recycled Water in Tasmania* (DPIWE, 2002).

TasWater's flow-weighted performance against Class B reuse limits was 88.9 per cent in 2018-19, a slight recovery from the low point of 87.7 per cent recorded for 2017-18.

Figure 6.4 Compliance with Class B discharge to land limits (per cent)



Treated effluent from the Smithton STP was used to irrigate land in 2017-18 and again in 2018-19. As in 2017-18, performance against Class B reuse limits for Smithton is included in the flow-weighted compliance assessment for 2018-19. Effluent performance for Smithton against reuse limit expectations improved from 60 per cent in 2017-18 to 72.7 per cent in 2018-19. Effluent quality at Smithton continued to be impacted by desludging operations for

[58] The EPA's assessment is against 'Class B' Recycled Water quality with an adjusted pH range of 5.5 – 8.5 and an additional upper limit of 10 000 cfu/100mL *E.coli*.

part of 2018-19, but is expected to improve in the future, following completion of lagoon desludging.

No STP achieved less than 50 per cent compliance with Class B reuse limits in 2018-19, and most STPs are represented in the two highest categories of compliance. Four STPs reported up to 75 per cent compliance and 16 STPs reported up to 90 per cent compliance with Class B reuse limits. Similar to the 2017-18 result, 14 STPs achieved compliance above 90 per cent in 2018-19.

Table 6.5 provides an overview of the distribution of STP compliance against discharge to land limits for 2018-19 and for the previous four financial years.

Table 6.5 Number of STPs by performance category (Class B reuse limits)

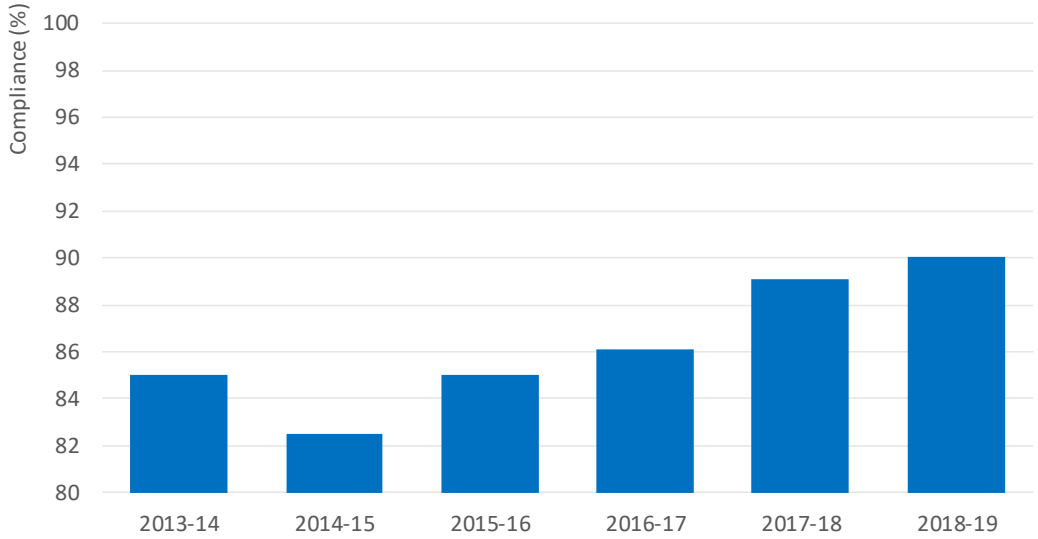
	2014-15	2015-16	2016-17	2017-18	2018-19
>90% compliance	15	10	15	14	14
>75 - 90% compliance	14	15	8	11	16
>50 - 75% compliance	3	7	7	5	4
≤50 % compliance	0	0	1	1	0

Table A3.2 and A3.3 in Appendix 3 show compliance with Class B reuse limits and reuse proportion for each STP.

6.3.5 Combined discharge compliance to water and land

This section summarises the levels of compliance achieved by TasWater's Level 2 STPs when assessed against the regulatory discharge limits for discharge to water and Class B discharge to land limits combined, on a flow-weighted basis. Results for this measure have been calculated back to the formation of TasWater as a single, state-wide entity in 2013-14.

Figure 6.5 Compliance with discharge limits – combined water and land (per cent)



Given the distribution of flow volumes is overwhelmingly weighted towards the discharge to water (in 2018-19, 11.5 percent of effluent was discharged to land, and 88.5 per cent to water), the combined compliance result follows discharge to water compliance closely.

In 2018-19, TasWater achieved a combined discharge limits compliance to water and land of 90.0 per cent, an improvement from the 2017-18 result of 89.1 per cent.

6.3.6 Public disclosure of sewage treatment plant performance

TasWater is required to submit Annual Environmental Review (AER) reports to the Director, EPA and to make these publicly available. TasWater provided a single state-wide AER report to the EPA in 2018-19. The report considers all Level 2 STPs. The EPA has determined that reliability of the data provided in the 2018-19 AER is not sufficiently high, and expects the data quality to improve in subsequent reports.

The EPA makes AERs available to the public upon request. Publication of the STP performance information in this Report is another means of public disclosure, supporting transparency and helping to make TasWater accountable to the community, government and regulators for its environmental performance.

Monitoring data for STPs discharging to estuarine and marine environments is also available from the National Outfalls Database.[59] TasWater makes discharge monitoring results for individual STPs available to the public on request.

6.3.7 Compliance with EPA requirements

Sections 6.3.1 to 6.3.5 discuss level of compliance with regulatory discharge limits to water and to reuse achieved by TasWater's Level 2 STPs. Effluent compliance is one of a number of relevant measures of TasWater's environmental performance. Other measures include the degree of compliance with conditions of permits and EPNs for individual STPs, occurrence of nuisance odours, and management of other incidents.

Incidents that originate from STPs or associated sewerage infrastructure and that have potential to cause environmental harm can trigger an enforcement response under the provisions of the *Environmental Management and Pollution Control Act 1994*, or associated regulations.

TasWater received two Environmental Infringement Notices (EINs) for offences that occurred in 2018-19 as follows:

- contravening a permit condition by failing to notify the Director of a discharge from the Sorell STP in July 2018 that was not to the Sorell reuse scheme; and
- failing to notify relevant authorities within the required timeframe of a sewage spill at Glenorchy in July 2018.

Four additional EINs have since been issued, for:

- depositing a controlled waste in a manner likely to adversely affect the use or value of receiving waters, as a result of a sewage spill at Sandy Bay in July 2019;
- failing to develop an operational procedures manual sufficient to ensure compliance with effluent quality limits, as a result of a significant discharge of untreated sewage from Macquarie Point wastewater treatment plant in August 2019;

[59] Refer to www.outfalls.info for further details.

- depositing a controlled waste as a result of a significant discharge of untreated sewage from Macquarie Point wastewater treatment plant in August 2019; and
- failing to develop an operational procedures manual sufficient to ensure compliance with effluent quality limits, as a result of a significant discharge of non-disinfected effluent from Selfs Point STP in September 2019.

The EPA maintained its focus on STP compliance audits during 2018-19. During 2018-19, the EPA undertook 16 audits of compliance with permit and EPN conditions. Areas identified for corrective action included:

- flow meter validation;
- signage at monitoring and discharge locations;
- development of operational manuals and contingency management plans;
- maintenance of controlled waste registers;
- lagoon maintenance; and
- late submission of monitoring results, reports and plans.

Section 8.1 provides further information on the EPA's priorities for improving TasWater's environmental performance.

6.4 Biosolids reuse

Biosolids are stabilised organic solids produced in sewage treatment processes. Biosolids reuse involves managing biosolids safely and sustainably to ensure nutrients, energy and other valuable components are directed to agriculture (as fertiliser), soil conditioning, mine rehabilitation or other beneficial applications.

The reuse proportion can be calculated as:

$$\frac{\text{Total dry weight (tonnes) of biosolids reused during the reporting period}}{\text{Total dry weight (tonnes) of biosolids produced during the reporting period}}$$

TasWater reported 6 562 dry solid tonnes (DST) of biosolids were produced at Level 2 STPs across Tasmania during 2018-19. Approximately 3 800 DST remained stored on STP sites at the end of the reporting period while 6 614 DST were beneficially reused during 2018-19. A minor volume of approximately 12 DST was taken to landfill.

The proportion of the biosolids material beneficially reused in 2018-19 was 100.8 per cent of the volume generated. A reuse proportion in excess of 100 per cent indicates that materials stockpiled from previous periods have been reused during the year being reported on.

Significant biosolids stockpiles at the end of 2018-19 were reported at the STPs at Ti-Tree Bend (2 135 DST), Smithton (1 036 DST), Stanley (343 DST) and Georgetown (300 DST).

Composting as an end use of biosolids increased from 18 per cent in 2017-18 to 85 per cent in 2018-19. Both direct application of biosolids to land and reprocessing by composting extract value from biosolids nutrients, and are therefore recognised as biosolids reuse. However, the increase in composting during 2018-19 largely represents reprocessing (ie requiring additional energy and potentially entailing some nutrient loss) of a product that is already suitable for its end use.

A number of lagoon systems continue to hold significant sludge accumulations at levels likely to impact treatment capacity. Desludging of such lagoons is likely to improve treatment capacity.

An overview of the STPs generating the greatest volumes of biosolids in 2018-19 and associated reuse/management practices is set out in Table 6.6, based on the best information available at the time of assessment, noting some data inconsistencies. Improvements to accounting and record-keeping practices will be required to achieve increased accuracy.

Section 8.1 provides further information on the EPA's priorities for improvements to TasWater's biosolids management.

Table 6.6 Biosolids – major volumes generated and reuse percentage in 2018-19

STP Name	Biosolids generated (dry solid tonnes / year)	Biosolids beneficially reused (dry solid tonnes / year)	End use / purpose	Biosolids reused (%)
Ti-Tree Bend	1 535	1 027	Ti-Tree Bend STP generates significant volumes of biosolids at the premises as well as receiving additional material from other STPs. 2 135 DST of sewage sludge remained stockpiled at the STP premises at the end of 2018-19. The remainder was beneficially reused on agricultural land.	67%
Selfs Point	691	691	Biosolids generated at Selfs Point STP were composted prior to beneficial reuse.	100%
Rosny	667	667	Biosolids generated at Rosny STP were beneficially reused. The majority of biosolids were composted prior to beneficial reuse, the remainder were spread on agricultural land without having been composted.	100%
Pardoe	488	488	Biosolids generated at Pardoe STP were composted prior to beneficial reuse.	100%
Prince of Wales Bay	442	442	Biosolids generated at Prince of Wales Bay STP were composted prior to beneficial reuse.	100%
State-wide (TasWater) total	6 562	6 614	Material removed from the treatment system which remains stockpiled at the premises is counted as generated but not reused. 3814 DST of biosolids remained stored at STP sites at the end of 2018-19. Composted sewage sludge is counted as beneficially reused if the end product is used in accordance with the relevant definition in the *Tasmanian Biosolids Reuse Guidelines* (1999). Stockpiles from previous reporting periods are not counted in biosolids generated.	100.8%

6.5 Net greenhouse gas emissions

This section reports on the impact of water and sewerage activities on greenhouse gas emissions. It is important not to consider a single indicator in isolation, but rather to look at the total environmental footprint arising from water and sewerage activities. For example, increased sewage treatment levels can provide water quality benefits but will also consume additional energy, resulting in greater net greenhouse gas emissions.

In 2018-19, TasWater's total net greenhouse gas emissions were estimated around 41 067 tonnes CO_2-equivalents (CO_2e) or an average of 196 tonnes produced per 1 000 properties. Greenhouse gas emissions categorised into water and sewerage related operations are set out in Table 6.7.

The quality and accuracy of the data reported to date is low. It is known that, on a per 1 000 properties basis, sewerage-related operations produce a higher volume of CO_2e compared to water treatment operations due to the nature of STPs and the production of nitrous oxide and methane through sewage processing.

Table 6.7 Volume of greenhouse gases produced by TasWater (CO_2-equivalent)

	Water-related operations (E9)		Sewerage-related operations (E10)	
	CO_2e (tonnes)	CO_2e (per 1 000 properties)	CO_2e (tonnes)	CO_2e (per 1 000 properties)
2014-15	9 786	48.8	21 697	123.0
2015-16	9 873	48.8	22 646	127.3
2016-17	9 129	44.5	21 856	121.6
2017-18	11 438	55.2	24 535	135.3
2018-19	12 131	57.9	27 277	149.0

TasWater's net greenhouse gas emissions were significantly below those reported by similar utilities on the mainland, which typically average around 240 tonnes CO_2e produced per 1 000 properties.[60]

TasWater did not trigger the 50 000 tonnes CO_2-equivalent per facility reporting threshold under the *National Greenhouse and Energy Reporting Act 2007* (Cwlth).

TasWater is not required to report greenhouse gas emissions directly to the EPA under the stipulated environmental conditions for STPs.

[60] Bureau of Meteorology, *National performance report*: urban water utilities (indicator E12).

7 FINANCE AND CAPITAL PROJECTS

This Chapter looks at factors affecting the cost of water and sewerage services for households. It also provides an overview of TasWater's financial performance, including its completed and planned capital expenditure.

7.1 Financial performance

Analysis of TasWater's financial performance indicators provides a guide as to the efficiency of its operations, its viability and its longer-term sustainability.

Financial performance measures have been calculated based on information presented in TasWater's annual reports and the financial statements attached to those reports. Some measures are reported exactly as they appear in those reports and statements. Other measures are calculated in accordance with the NPR Indicators and Definitions Handbook using data sourced from those statements and reports. For example, asset values and depreciation on a written down replacement cost basis are used to calculate three of the financial performance measures. Where relevant, TasWater's financial performance in prior years has been recalculated adopting this approach so accurate comparisons can be made.

Appendix 6 sets out the formulae used to calculate the measures reported on in this Chapter, together with details of the data sources for each of the components in those formulae.

7.1.1 Revenue

Table 7.1 shows TasWater's revenue from water and sewerage services and related activities for the period 1 July 2014 to 30 June 2019. Other income includes revenue from other sources such as revenue from third parties (ie CSOs and contributed assets) and other revenue from its operations.

Table 7.1 Revenue ($'000s, nominal)

		2014-15	2015-16	2016-17	2017-18	2018-19
F1	Water	150 070	142 665	143 471	153 147	164 506
F2	Sewerage	146 389	150 450	157 197	172 564	183 046
	Other	3 855	16 216	14 816	10 556	11 487
F3	**Total income**	**300 314**	**309 331**	**315 484**	**336 267**	**359 039**

Total income was $359 million in 2018-19, an increase of $22.8 million or 6.8 per cent from 2017-18. This increase includes an $11.4 million increase in water revenue, driven by increases in:

- regulated target tariffs and the continuation of arrangements to transition customers to these tariffs;
- customer connections; and
- the volume of urban water supplied throughout the year.

Sewerage income increased by $10.5 million from the previous year, largely due to increased revenue of $7.6 million from sewerage service charges

Revenue from residential water usage charges represented 35 per cent of water revenue in 2018-19.

The increase in water revenue from 2017-18 to 2018-19 is consistent with higher variable and fixed charges, combined with rising customer connections and a small increase in the total volume of urban water supplied during the year. Sustained relatively higher water usage across the network over the past two years has been due, in part, to dry and warm weather, increased tourist numbers and economic growth.

Trade waste revenue represented around 6.2 per cent of sewerage revenue during 2018-19, or around $11 million, which is the same as the previous year. Contributed assets and headworks charges contributed just over $29.6 million of TasWater's total income during 2018-19, a large increase from $24.5 million in 2017-18.

7.1.2 Asset values

TasWater is required to report annually on the value of its water and sewerage infrastructure assets under the NPR Framework on a written down replacement cost (WDRC) basis.

Table 7.2 summarises the value of TasWater's water and sewerage infrastructure assets (net of accumulated depreciation) over the past five years.

Table 7.2 Fixed asset values ($'000s, nominal)

		2014-15	2015-16	2016-17	2017-18	2018-19
F9	Water assets	1 378 227	1 308 099	1 269 045[a]	1 273 448	1 313 597
F10	Sewerage assets	1 316 010	1 320 226	1 286 529[a]	1 270 873	1 292 058
	Total	2 694 237	2 628 325	2 555 574	2 544 321	2 605 655

[a] 2016-17 asset values were amended in TasWater's 2017-18 Annual Report to correct an error.

As at 30 June 2019, the WRDC of TasWater's water and sewerage infrastructure assets was $2.6 billion, a $61.3 million (2.4 per cent) increase from 30 June 2018. TasWater's capital expenditure is projected to accelerate over the third regulatory period and asset values are expected to continue increasing. Care should be taken when making comparisons as the WDRC asset values in this table are not used for all of the measures reported in this Chapter.

7.1.3 Operating costs

Operating costs are the costs of operating and maintaining the water and sewerage infrastructure assets (chemicals, raw materials and energy costs) and associated administration costs such as salaries and wages. Table 7.3 summarises TasWater's operating costs over the past five years, allocated between water and sewerage operations.

Table 7.3 Operating costs ($'000s, nominal)

		2014-15	2015-16	2016-17	2017-18	2018-19
IF11	Water	80 655	88 951	84 184	93 683	103 429
IF12	Sewerage	85 796	88 812	103 414	91 826	101 379
IF13	Total	166 451	177 763	187 598	185 509	204 808

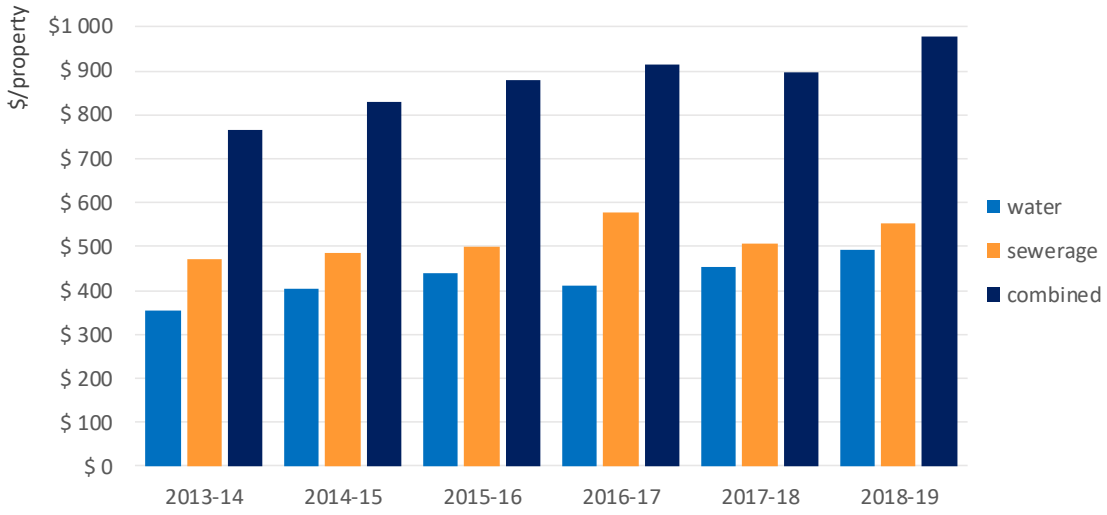
The $19.3 million increase in operating costs in 2018-19 comprises an $11.6 million increase in operating and maintenance expenditure and a $4.0 million increase in employee-related expenses. TasWater has attributed these increases to:

- additional costs associated with operating the upgraded and new water treatment plants that commenced operations during the year as part of TasWater's '24 glasses' regional towns water supply program; and
- increased volumes of water supplied to residential and non-residential customers.

TasWater has forecast a reduction in operating costs in its price and service plan for the third regulatory period. During 2018-19, TasWater reported around $4.5 million in operational cost reductions which, it states, partially offset the overall increase in operating costs in 2018-19.

TasWater's average operating cost per property, shown in Figure 7.1, was $977 in 2018-19. Operating costs during the year were significantly above forecast levels, while the increase in customer connections was relatively small, at only 1.2 per cent. TasWater's operating costs are significantly higher than those of its interstate counterparts[61] which are typically around $885 per property.[62] Across the nation, median operating costs increased by four per cent in 2018-19, after a slight reduction the previous year. TasWater's operating costs per property grew by nine per cent from 2017-18 to 2018-19, more than double the median growth in costs nationally and the highest increase in this group of utilities.

Figure 7.1 Operating costs - water, sewerage and combined ($/property, nominal)



Note: The estimates of combined operating costs per property are based on the number of connected properties for water supply.

TasWater reports that its operating costs reflect the relatively larger number of dispersed and separate water and sewerage assets that it operates. TasWater also reported that it expects operating costs to rise as it builds new infrastructure and upgrades existing non-compliant infrastructure. It is expecting to offset most of these cost increases with efficiency gains.

[61] Major utilities (large) with 100 000 or more customers.

[62] Bureau of Meteorology, *National Performance Report - urban water utilities, 2018-19* (indicator F13).

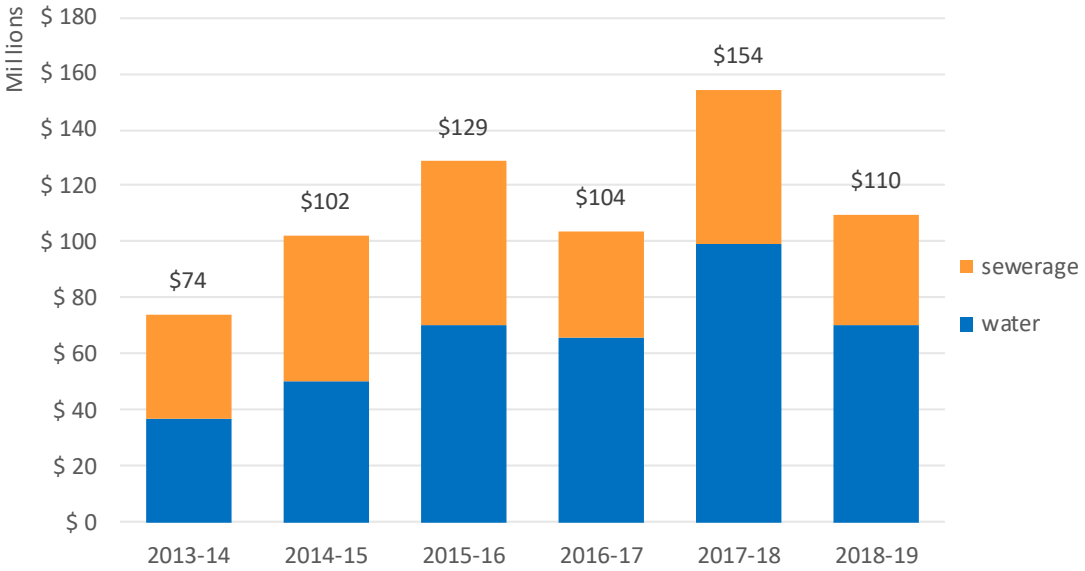
7.1.4 Capital expenditure

In 2018-19, TasWater's total capital expenditure was $129.4 million, with around $70 million spent on dedicated water assets and $40 million spent on dedicated sewerage assets as set out below. During the year, approximately $10.6 million was spent on non-network business information systems, office relocation, fencing, fleet and facilities.

Water and sewerage capital expenditure represents the investment made by TasWater in its infrastructure, and includes expenditure on new works, renewals or replacements and expenditure on plant and equipment.

Figure 7.2 shows TasWater's capital expenditure (F16) for water and sewerage over the previous six years. These totals exclude gifted assets and developer charges.

Figure 7.2 Water and sewerage capital expenditure ($millions, nominal)



During 2018-19 TasWater invested $70 million in water infrastructure and $39 million in sewerage infrastructure, an overall decrease of $44.3 million (29 per cent) from 2017-18. By contrast, between 2016-17 and 2017-18, capital expenditure in these categories increased by $50.5 million. Figure 7.2 highlights the volatility of TasWater's capital expenditure on water and sewerage infrastructure from year to year.

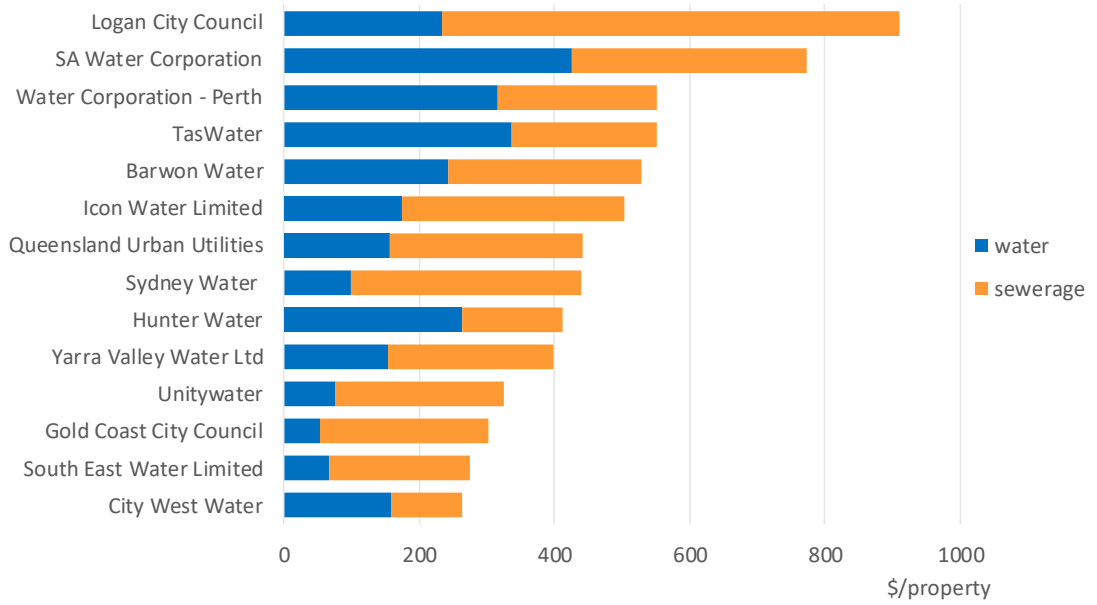
TasWater reported that the shortfall to its planned capital expenditure in 2018-19 was primarily due to the transitioning of projects into its Capital Delivery Office and changing the way it delivers its projects, which it expects to correct as its program gains momentum over the remaining years of the third regulatory period. TasWater's capital expenditure forecasts for 2019-20 and 2020-21 have been increased accordingly.

Amongst major Australian water utilities, TasWater was one of only two utilities that reported a decrease in total capital expenditure between 2017-18 and 2018-19, with other utilities reporting an increase, on average, of 15 per cent in their total capital expenditure in 2018-19.

Figure 7.3 shows capital expenditure per property for water and sewerage for major Australian water utilities. TasWater's capital expenditure per property was $336 for water and $215 for sewerage in 2018-19, a total of $551 per property. This is higher than similar utilities on the mainland, which reported a median capital expenditure per property for 2018-19 of around

$166 for water and $249 for sewerage (total of $415).[63] This is indicative of the scale of capital expenditure required to bring the Tasmanian water and sewerage network up to the required standards, including the work associated with replacing old or poor infrastructure that is currently underperforming.

Figure 7.3 Water and sewerage capital expenditure - major water utilities ($/per property), 2018-19



TasWater's average capital expenditure is expected to be similar over the next few years as it plans to deliver an extensive capital works program. TasWater's approved price and service plan allows for significantly increased spending on sewerage projects in 2019-20 and 2020-21, with capital investment targeted at improving compliance.

Table 7.4 shows capital expenditure relating to the renewal or replacement of water and sewerage infrastructure increased by $10.4 million in 2018-19, whereas capital expenditure on new works decreased by $6.8 million for the same period. This shift in capital expenditure can be attributed to the completion of TasWater's Regional Towns Water Improvement Project which involved the construction of 13 new WTPs across the State.

[63] Bureau of Meteorology, *National Performance Report - urban water utilities, 2018-19* (indicators F28 & F29)

Table 7.4 Water and Sewerage capital expenditure by category ($'000s, nominal)

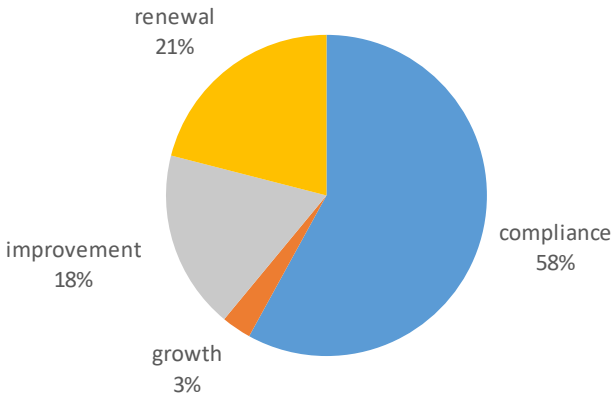
	2014-15	2015-16	2016-17	2017-18	2018-19
Water:					
New works	6 399	4 764	3 887	23 580	14 833
Renewals or replacements	17 272	19 402	15 449	19 916	24 306
Other	26 613	46 191	46 588	56 033	31 365
Subtotal for water (F14)	50 284	70 357	65 924	99 530	70 504
Sewerage:					
New works	6 284	5 559	10 351	12 945	14 850
Renewals or replacements	16 071	20 610	12 095	10 933	16 950
Other	29 842	32 121	15 308	30 760	7 527
Subtotal for sewerage (F15)	52 197	58 290	37 753	54 638	39 327
Total (F16)	**102 481**	**128 647**	**103 677**	**154 168**	**109 831**

The key drivers for capital expenditure in 2018-19 were compliance and renewals, with expenditure on new works (growth) much less than that spent on renewals and replacements. TasWater's focus on compliance activities has seen spending in this area grow by 34 per cent for water and sewerage, while expenditure on new works has decreased by around 19 per cent. Capital expenditure categorised by key driver is shown in Figure 7.4.

The amount spent on 'other' capital expenditure includes expenditure on:

- ongoing programs to renew high priority water main and sewerage networks;
- the installation of water meters; and
- an electrical program to reduce safety risk at specific sites.

Figure 7.4 Capital expenditure on water and sewerage infrastructure by driver, 2018-19



Further details about capital projects completed or commenced during 2018-19 are set out in section 7.2 below.

TasWater plans to invest $203 million on further improvements to drinking water quality in the three years from 2018-19 to 2020-21,[64] through measures such as treatment plant upgrades (Bryn Estyn WTP), system optimisation, risk assessments and increasing treatment barriers.

7.1.5 Other financial performance information

Table 7.5 provides a summary of other financial performance information the Economic Regulator has used to determine how efficiently TasWater is using its financial resources and assess its financial sustainability and viability.

Table 7.5 Financial performance measures

NPR Ref	Description	2014-15 [a]	2015-16 [a]	2016-17[a]	2017-18	2018-19
F24	Net Profit After Tax ($000s) (NPAT)	33 155	25 310	25 804[a]	40 214[b]	41 259
n/a+	Earnings Before Interest and Tax (EBIT) ($000s)*	19 185	12 626	10 932	33 278	13 404
F30	Net Profit After Tax ratio (%)	11.0	8.2	8.2[a]	12.0[b]	11.5
F19	Economic rate of return (%) (ERR)*	0.74	0.48	0.43	1.31	0.51
F20	Dividends ($000s)	22 120	20 332	19 457	18 499	10 489
F21	Dividend payout ratio (%)	66.7	80.3	68.0	43.3	25.4
F22	Net debt to equity (%) (NDTE)	22.8	27.2	29.9	33.6	34.9[c]
F23	Interest cover ratio (ICR)*	1.11	0.70	0.60	1.74	0.71

Notes:

+ EBIT is an input into the calculation of other financial performance measures.

* The written down replacement cost approach is used for asset values and depreciation when calculating these measures. As a result, they are measured on a different basis to some other financial performance measures in this table.

a TasWater's 2017-18 Annual Report included a correction of a prior period error which, among other things, reduced NPAT for 2016-17 from the previously reported $28.592 m to $25.804 m (Note 2.4, page 77).

b TasWater's 2018-19 Annual Report included a correction of a prior period error which reduced NPAT for 2017-18 from the previously reported $42.685 m to $40.214 m and reduced total asset values from $2 249m to $2 244m (Note 2.4, page 88).

c TasWater's 2018-19 Annual Report included very substantial asset revaluation decrements and increments for water and sewerage infrastructure respectively (Note 11, page 105). The impact of both of these changes has been removed from the calculation of NPAT and NDTE for 2018-19.

Key observations:

- TasWater's NPAT for 2018-19 was $41.3 million, an increase of $1.05 million from the previous year).
- The $19.8 million decrease in EBIT between 2017-18 ($33.2 million) and 2018-19 ($13.4 million) reflected a $22.8 million increase in total revenue, a $23.3 million increase in depreciation due to a higher value of water and sewerage assets held as at 30 June 2019 and a $19.3 million increase in expenses (excluding depreciation).
- The $19.3 million increase in expenses included a $11.6 million increase in operating and maintenance expenditure, a $4.1 million increase in employee-related expenses and a $2.7 million increase in expenditure on raw materials.

[64] TasWater's 2018-19 PSP is available at: https://www.taswater.com.au/Your-Account/Price---Service-Plan

- TasWater's NPAT as a percentage of revenue (NPAT ratio) of 11.5 per cent in 2018-19 was lower than the median reported by major utilities interstate, which was 15 per cent.[65]
- TasWater's lower EBIT for 2018-19 resulted in its economic rate of return being 0.79 percentage points lower in 2018-19 than in the previous year.
- TasWater's borrowings increased by one per cent during 2018-19 and its NDTE ratio was higher than in 2017-18 due to a small increase in TasWater's equity (total assets less total liabilities) and a proportionately larger increase in net debt. TasWater's NDTE ratio, at 34.9 per cent, is around half the median NDTE ratio of major interstate utilities of 69.6 per cent.[66]
- TasWater's dividend payout ratio decreased by 17.9 percentage points in 2018-19 due to an agreed reduction in distributions to owner councils.[67] Councils also received $9.5 million in loan guarantee fees and income tax equivalents payments.
- While net interest expense was similar for 2018-19 and 2017-18, TasWater's interest cover ratio (ICR) dropped to below 1.0 for 2018-19 due to a significantly lower EBIT compared to 2017-18. Basing depreciation on the fair value of assets rather than the WDRC of assets, TasWater's EBIT was higher, resulting in an ICR for 2018-19 of 3.6 as reported in its annual report for 2018-19.[68]
- TasWater's ICR (using depreciation on a written down replacement cost basis) was much lower than the median ICR for 2018-19 of 2.6 for major Australian water utilities.

7.2 Status of major projects

This section provides an overview of the major projects completed or progressed by TasWater during 2018-19. Major projects are those that are high priority and/or involve expenditure of over $2 million.

TasWater's 2018-21 Price and Service Plan[69] included its planned major capital investment projects that were to be progressed or completed during the third regulatory period.

The Economic Regulator's assessment of the capital expenditure TasWater requires for each year of the regulatory period is a key input into the calculation of TasWater's annual revenue requirement. The revenue requirement is used, in turn, to determine the maximum regulated prices TasWater can charge customers.[70] It is, therefore, appropriate and important that TasWater explain delays or changes to its capital expenditure program.

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65 Bureau of Meteorology, *National Performance Report - urban water utilities, 2018-19*, February 2020 (indicator F30).

66 Bureau of Meteorology, *National Performance Report - urban water utilities, 2018-19*, February 2020 (indicator F22).

67 TasWater agreed to reduce distributions (including dividends) to its council owners to $20 million per annum commencing in 2018-19.

68 TasWater, *2018-19 Annual Report*, page 14.

69 TasWater's 2018-19 PSP is available at: https://www.taswater.com.au/Your-Account/Price---Service-Plan

70 Tasmanian Economic Regulator, *2018 Water and Sewerage Price Determination Investigation, Final Report*, May 2018, Chapters 6 and 11.

In 2018-19, TasWater completed four major projects:

- Water network upgrades at Rocky Creek. This upgrade along with other network upgrades associated with the removal of BWA's or PHA's has improved water quality to the regional town communities.
- Swansea Dam Rectification and Improvement Project (Stage 1 & 2), with upgrades allowing the removal of the dam from the list of dams assessed as being above the ANCOLD LoT. These works also improved the surety of the water supply to Swansea.
- The Ti-Tree Bend STP upgrade (project commenced in 2016-17). These works will prevent odour issues in the local area surrounding the site and improve the handling of sludge and biosolids at the STP.
- Rosebery WTP and reticulation to relocate existing WTP and improve compliance. Initially planned for completion in 2017-18, the new plant began operations in October 2018.

ⓘ Abbreviations

ANCOLD - Australian National Committee on Large Dams
BWA - boil water alert
DAFF - dissolved air flotation-filtration
HBT - health based targets
LoT - Limit of Tolerability
NMSIP - Northern Midlands Sewerage Improvement Plan
PAC - powdered activated carbon
PHA - public health alert

A further ten major projects have been reported as being under construction during 2018-19, with some of these projects continuing from the previous year. Construction works occurring throughout the year included the following projects:

- The King Island Water Infrastructure Project including WTP upgrade, clearwater storage tanks, re-chlorination station and raw water intake projects, improving and guaranteeing the water quality to the communities of Grassy and Lady Currie. The new WTP opened in November 2019.
- The Kingborough Sewerage Strategy allows the decommissioning of three STPs with the construction of one new plant, which should reduce operating costs, along with the implementation of a single discharge point, and the improvement in compliance for environmental discharge. The project was completed in July 2019.
- Burnie-Cam pipeline, this project allows the decommissioning of the existing Cam WTP, which will improve and guarantee safe drinking to the Cam area while also reducing operational costs.
- Girdlestone Reservoir, involving the construction of a replacement reservoir for the existing reservoir following the latter's failure. Construction was completed in November 2019.
- The Margate Water Main upgrade has been completed, with minor works in December 2019. The project completion date was extended to allow for an increased scope to renew parts of the network to improve reliability.

Other notable projects included the Jason Street SPS and Esplanade SPS rising main replacements at St Helens, which will mitigate spills to shellfish and public waterways. The St Marys reuse upgrade was also completed thereby reducing the high environmental risk previously posed by this plant.

The original schedule for the $22 million project to improve safety at Ridgeway Dam has also been extended, following the completion of design work beginning in 2017-18. Once completed the project will ensure the dam meets the ANCOLD LoT.

A planned upgrade to the Forth WTP has also been deferred and will now begin in 2019-20.

TasWater's Northern Midlands sewerage improvement plan continues to progress with work to upgrade STPs at Perth, Western Junction and Evandale due to start in early 2019-20. This project, to improve environmental compliance, is expected to be completed in December 2021.

Options to improve the capacity of the greater Launceston sewerage network are being explored under TasWater's Launceston Sewer Improvement Program. TasWater currently operates and maintains a network of seven sewage treatment plants in the greater Launceston area and has stated the outdated network can no longer effectively cope with current demand, increasing the risk of odour, raw sewage discharging into waterways and breaches of operational permit conditions. The project was in planning stage during 2018-19.

TasWater has deferred or rescheduled 18 major projects from their original start dates. This has largely occurred due to the original completion dates being based on the known scope at the project commencement date and pending the completion of further detailed analysis outlining other areas for consideration and completion of a full assessment of project dependencies. In the future, to ensure greater accuracy TasWater has decided not to supply expected completion dates until a project is formally approved by TasWater's Board in alignment with its delegation policy.

In reviewing its Asset Class Plans identified a risk in the reliability of its current infrastructure. This resulted in the expansion of multiple programs thereby allowing for the completion of a number of additional smaller cost projects as reflected in the actual expenditure for these projects in 2018-19 compared to the planned projects in the PSP3. These expanded programs have delivered the following key benefits:

- improving water quality;
- mitigating the risk of non-compliant water;
- improving reliability of our water networks by reducing unplanned interruptions;
- preventing odour and noise from sewer treatment plants; and
- preventing a number of spills impacting sensitive receiving waters, inclusive of oyster leases and creating public nuisance.

The priority of the projects listed which have not progressed beyond an approved status, are only committed in principle. Once a review of the project for approval is completed, the outcomes to the customers and subsequent costs will be reviewed against other projects in TasWater's capital works program to guarantee the project delivers the maximum benefits to the community.

A range of major projects that continued or commenced during 2018-19, including expenditure for 2018-19 and the project budget, is set out in Table 7.6.

Table 7.6 Major capital projects continued or commenced in 2018-19

Project	Driver	Project value ($ '000)	Project description	2018-19 expenditure ($ '000)	Status
Water treatment					
Forth River Major Upgrade / Replacement	Improvement	101 253	Either an upgrade or replacement of current WTP. Will improve Health Based Target compliance and ensure safety of water	118	Planning
Bryn Estyn Major Upgrade / Replacement	Improvement	226 880	Either an upgrade or replacement of current WTP. Will improve HBT compliance and ensure safety of water	4 250	Approved
Rocky Creek WTP	Compliance	3 714	Part of the Regional Towns Water Improvement Project. Provide water compliant with the Australian Drinking Water Guidelines (ADWG) to the system of Rocky Creek by installing a new Water Treatment Plant.	280	Completed
Huon Valley Major Upgrade / Replacement	Improvement	26 652	Upgrade or replace the existing WTP to reduce the risk of non-compliant water in the system.	0	Planning
Fern Tree WTP Major Upgrade	Improvement	69 000	Upgrade or replace the existing WTP to reduce the risk of non-compliant water in the system.	0	Planning
Regional Towns Stage 4	Compliance	22 500	Project to upgrade the water supply to the seven next highest water quality risk systems. This will be undertaken by upgrading the following WTP's at Dover, Coles Bay, Oatlands, Bothwell, Ellendale, Bruny and St Marys.	55	Planning
King Island Treated Water Supply	Compliance	21 689	New WTP at Currie with connecting pipeline to Grassy. Improve water quality and prevent risk of non-compliant water.	11 281	Construction
Rosebery WTP and Reticulation	Compliance	11 416	Relocation of existing WTP to improve water quality and prevent risk of non-compliant water.	1 140	Completed
Gretna, Glenora and Bushy Park Water Supply Upgrade	Compliance	7 650	New WTP construction at Bushy Park to provide treated water to the communities of Gretna, Glenora and Bushy Park.	1 755	Construction

Project	Driver	Project value ($ '000)	Project description	2018-19 expenditure ($ '000)	Status
Sewage treatment					
Kingborough Sewerage Strategy - Treatment & Network	Growth	50 605	Decommissioning of the Electrona, Margate and Howden STP's. Conversion of these STP's into storage and pumping operations. Major upgrade of the Blackmans Bay STP to treat all of these flows and allow for future growth in the system.	14 366	Construction
Northern Midlands Sewerage Improvement Plan - Longford STP Upgrade	Compliance	25 100	Project will consist of upgrade of the existing STP, new discharge to Back Creek and partial effluent reuse to nearby land owners.	473	Design
St Marys Reuse Upgrade	Compliance	420	Install two new pivot irrigators and upgrade a third to conform with standards. Further civil upgrades and rectifications including fencing in the reuse zone.	105	Construction
Geeveston Optimisation	Compliance	2 433	Relocate the existing outfall to Shipwrights Point.	7	Planning
Turriff Lodge Optimisation	Compliance	2 143	Top 20 STP for sensitive receiving waters - Currently considering options, but scope will most likely involve a new outfall or reuse scheme.	0	Planning
Launceston Sewer Improvement Program	Compliance	273 000	Greater Launceston Sewer Improvements. A long term project that will look at rationalising multiple STP's into one new STP at the current Ti Tree Bend site.	0	Planning
Westbury Sewer Treatment Plant Upgrade and Reuse	Compliance	3 795	Increased storage to the existing lagoons with minor remedial works. Inlet works, including consolidating two inlets into one and a new inlet screen.	120	Design
Ti Tree Bend STP Biosolids Upgrade (Launceston Sewer Improvement Plan)	Compliance	12 255	Clean out refurbish and automate mixing for digester 2. Heating and mixing upgrades. Electrical, control and instrumentation to allow improved operation of the digester system.	2 054	Completed
Prince of Wales Bay STP Digester Roof Replacement/Repairs	Compliance	3 500	Replace the existing digester roof. Prevent catastrophic failure.	436	Construction
Wynyard STP Upgrades	Compliance	16 904	Improve effluent discharge. May include disinfection upgrade, partial reuse or outfall extension.	0	Planning
Hamilton STP Relocation	Improvement	2 500	Relocation of STP lagoons to appease neighbouring landowner. Will reduce odour complaints.	0	Planning

Project	Driver	Project value ($ '000)	Project description	2018-19 expenditure ($ '000)	Status
Distribution					
Burnie Cam Pipeline Construction	Improvement	2 029	Supply Somerset/Wynyard from the existing spare capacity of the Burnie WTP. This will be achieved by constructing a new pipeline between Cam reservoir and the existing Burnie WTP.	1 680	Construction
3 ML Concrete Reservoir at Girdlestone - Forth	Renewal	2 843	Replacement reservoir for existing reservoir which has failed.	891	Completed
Margate Water Main Upgrade Stage 2	Renewal	4 095	Duplication main to support growth in demand in the Kingborough area.	1 618	Extended Construction
Collection - Sewer					
Jason St SPS and Esplanade SPS Rising Main Replacements (St Helens)	Compliance	2 029	Environmental and shellfish lease improvements. This will be achieved by replacing the rising mains from the respective sewer pump stations to the downstream pump station.	1 496	Construction
Davis St, Smithton SPS Upgrade	Compliance	4 095	Replacement and relocation of existing sewer pump station. The replacement will allow for increased emergency storage coupled with increased pumping capacity and inlet works at the affected sewer treatment plant.	456	Tender
Catchment					
Pet Dam	Compliance	7 710	Safety Upgrades: Raising the crest level of the dam by 300mm. Reconstruction and upgrade of the spillway.	36	Design
Lake Mikany Dam	Compliance	17 597	Safety upgrades remove dam from above ANCOLD limit of tolerability.	601	Tender
Flagstaff Dam	Compliance	5 528	Safety upgrades remove dam from above ANCOLD limit of tolerability.	178	Planning
Upper Reservoir	Compliance	4 335	Works include raising of dam crest, installing a localised filter, providing new erosion protection and upgrading of instrumentation and associated telemetry.	264	Design
Swansea - Rectification & Improvement Project (Stage 1 & 2)	Compliance	6 603	Full clay liner installed including sourcing and testing. Dam has a significant leak and poses potential to fail. Works identified will prevent these outcomes from occurring.	3 695	Completed

Project	Driver	Project value ($ '000)	Project description	2018-19 expenditure ($ '000)	Status
Lake Isandula Dam	Compliance	70	Safety upgrades, remove dam from above ANCOLD limit of tolerability.	0	Planning
Henderson Dam	Compliance	4 141	Increase of capacity of Henderson Dam to provide water surety to Flinders Island during the summer months. This will be undertaken by raising the Henderson Dam weir by 2 metres and associated raising and upgrade of spillway. Also allowing for temporary measures until implemented.	331	Tender
Ridgeway Dam upgrade	Compliance	20 718	Safety upgrades, potential of post-tensioned anchor upgrade.	176	Planning
Blackman River Dam No 1	Compliance	70	Safety upgrades remove dam from above ANCOLD limit of tolerability.	0	Planning
Other					
Rocherlea Redevelopment	Improvement	3 015	Redevelopment of TasWater office/Depot. Fit for purpose	0	Deferred
Glen Dhu Stormwater Management Improvements	Improvement	2 100	Stormwater pipeline diversion to prevent overflowing to the Glen Dhu school.	901	Construction
Programs					
Facility, Fleet and Plant renewals	Improvement	10 000	Replace vehicles and plant as appropriate	6 111	Ongoing
STP Renewals Program	Renewal	10 000	Renewals to STP. Effluent will be compliant with EPA requirements	4 351	Ongoing
Sewers Main Proactive Asset Management - Renewals	Renewal	7 140	Sewer main renewals	5 311	Ongoing
Water Mains Proactive Asset Management - Renewals	Renewal	5 440	Water main renewals	10 624	Ongoing
Minor Projects Program	Various	4 100	Ensure efficient and prudent funding of projects that do not fall into any of the other programs currently provided	7 126	Ongoing
SCADA program	Improvement	3 770	Implementation of SCADA	3 562	Ongoing

Project	Driver	Project value ($ '000)	Project description	2018-19 expenditure ($ '000)	Status
System optimisation - Water	Improvement	3 400	Various improvements to systems to ensure that ADWG compliance is maintained	3 213	Ongoing
Non-network IT	Renewal	3 330	Fit for purpose non-network IT improvements	2, 06	Ongoing
Water Metering Program	Renewal	2 800	Renewal and replacement of water meters	5 441	Ongoing
Dams - Minor CAPEX	Improvement	2 480	Safety upgrades to ensure dams achieve the ANCOLD limit of tolerability.	2 121	Ongoing
Electrical Program	Renewal	2 260	Electrical switchboard and safety renewals	4 820	Ongoing
WTP Renewals program	Renewal	2 000	Public health and compliance	2 648	Ongoing
SPSs Proactive Asset Management - Renewals	Renewal	1 890	Replacement of pumps and mechanical components within SPSs	2 433	Ongoing
Dams - Compliance	Compliance	1 510	Safety upgrades to achieve the ANCOLD limit of tolerability	365	Ongoing
Combined System Program	Various	1 410	Allow for expenditure in the Launceston Combined System region	94	Ongoing
Inflow and Infiltration Program	Improvement	1 200	Program to investigate inflow and infiltration in various systems	378	Ongoing
Reservoir Renewal Program	Renewal	1 080	Upgrade and minor renewals of reservoirs, will maintain water surety.	1 081	Ongoing
System optimisation - Sewer	Improvement	710	Improve effluent discharge compliance at various sites.	1 644	Ongoing
CCTV Program	Renewal	650	Ongoing CCTV program	554	Ongoing

7.2.2 Future capital works projects

TasWater's 2019-20 capital works program includes projects and programs with a total budget of $143.5 million.[71]

TasWater's major capital works projects that will continue into, or commence in, 2019-20, including forecast expenditure in the year and the project budget, are shown in Table 7.7.

Table 7.7 Capital projects to continue or commence in 2019-20

Project	Project budget ($ millions)	Project description	Scheduled completion
Bryn Estyn WTP major upgrade	$223.4	Upgrade to improve best practice risk mitigation to ensure compliance and ensure safety of drinking water.	2022-23
Lake Mikany Dam safety upgrade	$20.1	Upgrades to remove the dam from above the ANCOLD level of tolerability.	2020-21
Longford STP upgrade	$33.7	Part of the Northern Midlands Sewerage Improvement Plan to improve environmental compliance. Phase 1 to improve effluent compliance	2021-22
Forth and Leven WTP major upgrades (includes pipeline)	$50.6	Upgrades to improve risk mitigation and ensure compliance and safety of water. Includes a pipeline from Level to Gawler, enabling decommissioning of the Gawler WTP.	2024-25
King Island Water Supply	$18.2	New WTP at Currie with connecting pipeline to Grassy. Improve water quality.	2020-21
Davis St, Smithton SPS upgrade	$4.5	Replace deteriorated asset and prevent overflows into shellfish leases.	2020-21
Prince of Wales Primary Sewer Digester Roof Replacement	$3.5	Renewal of existing digester roof due to potential failure	2019-20

To assist in delivering an increasing capital program over the next three to four years, TasWater has established a Capital Delivery Office (CDO) using a Program Management Alliance (PMA) model with a number of partners. The CDO has the following functions:

- program management – overall management of the CDO and its operations;
- planning and investigation – options analysis, strategic business case development;
- project development – concept / preliminary design, detailed business case; and
- project delivery – detailed cost estimation, design, procurement, delivery and handover.

The authority to approve capital and operational expenditure generated by TasWater's Asset Management System (whether delivered by the CDO or otherwise), rests with TasWater's Board and Executive Management Team. TasWater expects the collaboration will provide a more efficient project delivery mechanism and also improve the safety and quality of projects over this period.

[71] TasWater, *Corporate Plan FY2020-2024*, page 40. Available from https://www.taswater.com.au/About-Us/Publications.

Upgrades to Forth and Leven WTPs are expected to commence in 2019-20 after being delayed due to issues with water licensing in the region. The Longford STP upgrade was also delayed and is now expected to be completed in 2021-22.

Upgrades to Bryn Estyn WTP, which is the primary water supply for the City of Hobart and surrounding areas, will take approximately three years, with early works commencing in March 2020.

Projects considered by industry regulators to be high priority for improving performance in the future are discussed further in Chapter 8. TasWater's price and service plan for the third regulatory period sets out its planned capital expenditure over the period from 1 July 2018 to 30 June 2021.[72]

[72] TasWater's price and service plan is available at: https://www.taswater.com.au/Your-Account/Price---Service-Plan

8 KEY PERFORMANCE PRIORITIES

This Chapter outlines the incidence of non-compliance and, in accordance with section 70(2) of the Industry Act, sets out the key priorities for improved performance by TasWater as identified by each of the industry regulators and TasWater itself.

8.1 Incidents of non-compliance

For 2018-19 TasWater reported six regulatory non-compliances:

- two drinking water supply systems (Deloraine and Herrick Reservoir) detected elevated levels of microbiological contaminants, resulting in the issuing of temporary Boil Water Alerts;
- one drinking water supply system (Mathinna Reservoir) detected elevated levels of *E.coli* which did not result in any further action;
- two environmental infringement notices issued by the EPA in relation to a raw sewage spill from a failed rising main at 65 Wilmot Road, Huonville in March 2018;
- one environmental infringement notice issued by the EPA in response to a raw sewage spill from a collapsed sewer main in close proximity to a school, businesses and residences in Glenorchy in July 2018; and
- one environmental infringement notice issued by the EPA in response to effluent discharge at Sorell STP that occurred in July 2018.

TasWater reported no instances of non-compliance with the Dam Safety Regulator and no instances of non-compliance with economic regulation.

8.2 Key priorities for improved performance

8.2.1 Environment Protection Authority

In December 2016, the EPA and TasWater signed a three-year Memorandum of Understanding on Public Wastewater Management (MoU) aimed at accelerating improvements in environmental compliance and performance. Improved overall flow-weighted effluent compliance against regulatory limits occurred during the period of the MoU, which expired on 2 December 2019.

The key priorities identified by the EPA for TasWater to focus on in the short to medium term are:

- determining future sustainable treated effluent discharge limits based on sound scientific evidence and achieving EPA approval for future discharge management options for STPs, prioritised according to risk;
- completing planned major upgrades to those STPs identified to pose the greatest environmental and public health risk;
- integrating regular STP optimisation assessments into the business cycle to achieve ongoing high level of effluent compliance;

- increasing the number of effluent reuse schemes and proportion of treated effluent diverted to sustainable reuse, particularly for STPs discharging to inland waters;
- achieving significant improvements to availability and quality of critical data used for process control and infrastructure planning, including improved flow metering, process monitoring and incident detection capabilities;
- improvements to operational and contingency documentation for key assets and promoting staff knowledge and use of these; and
- attaining sustainable, low-cost and efficient state-wide biosolids management practices with a high proportion of biosolids reused. This includes addressing legacy sludge accumulations and reliably meeting an ongoing pre-emptive desludging roster for lagoon systems. Improvements in record keeping and data management practices for biosolids will support achievement of these goals.

8.2.2 Public health

The Department of Health (DoH) works closely with TasWater to maintain and improve compliance with its legislative requirements, which ultimately protects public health.

During 2018-19, TasWater continued to address the priority capital works list agreed with DoH as part of its operating licence. DoH is keen to ensure that emerging public health issues and associated risks are incorporated in TasWater's decision-making processes when prioritising capital works. In October 2019, DoH issued a priority listing for inclusion in TasWater's fourth Price and Service Plan (from 1 July 2021 to 30 June 2025).

DoH has identified the following key areas for TasWater to focus on in the medium to longer term:

- considering service introduction in some areas currently not serviced by reticulation networks, where changes in populations and community needs are changing;
- evaluating drinking water infrastructure, risk review, and asset maintenance and upgrades on an ongoing basis;
- when benchmarked, achieving comparable compliance outcomes as other similarly-sized water corporations; and
- achieving sustained and improved drinking water quality compliance.

TasWater's Regional Towns Water Supply Program was implemented during 2017-18 and completed during 2018-19. This program resulted in all boil water alerts and all but one public health alert being lifted by August 2018. The exception is the Gormanston supply system that has been removed from serviced land, but still supplies one resident who is not yet self-sufficient under the current service replacement program. TasWater is now focussing on integrating the new infrastructure from the Regional Towns Water Supply Program into its operations through its management systems to ensure that safe and reliable operations and efficiencies are standardised across its water supply systems.

TasWater's Drinking Water Quality Management Plan was externally audited in November and December 2017 and November 2019 as required under the *Public Health Act 1997*. No significant public health issues were identified, but the audit highlighted several opportunities for improvement in TasWater's practices. TasWater has been working on addressing, documenting and reporting to DoH in relation to these opportunities.

8.2.3 Water allocations/licences and dam safety

DPIPWE is responsible for the sustainable management and development of the State's freshwater resources through the *Water Management Act 1999*.

Before water can be taken directly from a stream or stored in a dam for supply to urban water systems, a water allocation licence must be obtained from DPIPWE. A water allocation specifies conditions pertaining to the taking of water, including the volume that can be taken within a specified period.

DPIPWE considers that it remains a priority for TasWater to continue to work with the agency to secure adequate water supplies to meet expected future demand, as allocated supplies in a small number of systems are considered unlikely to continue to meet demand in the medium-term.

All applications to undertake dam works must include a range of information, including engineering designs, for review by departmental staff who advise the Minister or delegate.[73] The Minister then decides whether or not to grant approval for an application and to issue the terms and conditions of this approval. This is to ensure that all dam works are undertaken in a manner that ensures they avoid environmental harm and do not present a risk to the Tasmanian population (as required under the Water Management Act and the *Water Management (Safety of Dams) Regulations 2015).*[74]

DPIPWE is responsible for ensuring that owners of existing dams meet their safety responsibilities through mandatory ongoing surveillance and maintenance of dams and, where necessary, ensuring dams meet contemporary safety standards. TasWater has been required to undertake a portfolio risk assessment (PRA) of all dams to ensure the risk that these dams may present are mitigated to within modern tolerable risk standards as outlined in the various Australian National Committee on Large Dams Incorporated (ANCOLD) guidelines and other acceptable risk standards and legislation. DPIPWE's role as Dam Safety Regulator is to ensure that:

- these risk mitigation plans are developed;
- that they are to an acceptable standard as outlined by ANCOLD; and
- that they are implemented to an agreed schedule as outlined in their respective PRAs.

The Delegate for Dam Safety Regulation monitors and reviews annual management plans for dams to ensure that the required maintenance and risk mitigation tasks are being carried out in accordance with assessed PRA priorities and the identified high-risk dams are being managed to reduce their risk to a tolerable level.

A priority for TasWater is to continue implementing its five-year rolling program on dam improvements, which largely relates to dams with a consequence category of "Significant" or higher.

[73] As of 1 January 2016, the approval Committee (Assessment Committee for Dam Construction) requirements under the *Water Management Act 1999* have been rescinded.

[74] The *Water Management (Dam Safety) Regulations 2011* were rescinded and remade with an effective date of 1 January 2016.

8.2.4 Priorities of the Economic Regulator

The Economic Regulator considers that, in addition to the priorities identified above, areas where TasWater should focus its efforts include:

- implementing strict financial management and securing long term efficiency gains to enable its capital investment program to be achieved;
- reducing the volume of treated water for which there is no metered consumption;
- ensuring adequate water supplies to meet expected future demand without water restrictions except where they are needed due to factors outside TasWater's control; and
- further improvement in its information collection and management, including data required for the Annual Performance Report and the proposed Price and Service Plan for the fourth regulatory.

TasWater will face significant financial challenges as a result of its very substantial investment program, sharply rising operating costs and constrained revenue as a result of a further year of no price increases for regulated water and sewerage services in 2020-21. Unless TasWater imposes very significant (catch up) price increases in future years, its future revenue stream over the medium term will be much lower than without the second year frozen prices (by around $15 million a year or around $150 million for the decade ahead).

TasWater will, therefore, have to apply very strict financial management policies, including securing long term operational efficiencies, to achieve its investment program and meet its environmental, public health and other obligations. TasWater will also need a developer charges policy that requires developers to make a fair contribution to TasWater's costs for new subdivisions and major new developments.

As discussed above, the volume of treated water for which there is no metered consumption, including water losses, continues to be substantially higher than for equivalent entities in mainland Australia. This has a high financial cost to TasWater, in terms of avoidable water treatment costs and potentially forgone revenue. It may also result in water restrictions being imposed earlier, or at a higher level, as there is less supply available for customers. In addition, there may also be some adverse environmental outcomes as around 10 or 15 per cent more water is being sourced than is sold to customers. Reducing the volume of treated water for which there is no metered consumption, including water losses, to around the levels of equivalent mainland entities is an issue that should be addressed by TasWater.

Some of the water restrictions imposed in late 2019, especially in the greater Hobart area, were due, in part, to factors over which TasWater has control, such as the condition of the Ridgeway Dam and the quality of treated water from the Bryn Estyn water treatment plant. These restrictions impose a cost on TasWater's customers and also on irrigators to whom water supply has also been constrained.

A priority for TasWater is to ensure adequate water supplies to meet expected future demand across Tasmania, not just for the larger systems but also for some smaller systems that, as currently configured, may not meet demand in the medium term.

The Economic Regulator also expects TasWater to continue improving the quality and accuracy of its reported performance information so that more complete assessments can be made of TasWater's performance, including against earlier years and in comparison with

mainland providers. The Economic Regulator notes after its most recent audit, some performance indicators are still not of a suitable quality to be relied on, with TasWater's data submission for the National Performance Report being 90 per cent complete in 2018-19.

It is recognised that addressing these priorities will be more difficult in the short and potentially medium term due to the restrictions imposed by governments in Australia, and in some cases by governments of other countries. This is creating a high level of uncertainty for TasWater and determining its future strategies will be a major exercise for TasWater over coming months.

8.2.5 TasWater's current priorities

In August 2017, TasWater released its *Long Term Strategic Plan 2018-2037* (LTSP).[75] The LTSP, which was developed in consultation with industry regulators, identifies the customer outcomes that TasWater plans to deliver over the next 20 years and the resulting balance that must be maintained between customer prices, service standards and the time to reach full compliance.

The outcomes outlined in the LTSP are reflected in TasWater's *Price and Service Plan 3* (PSP3), which initially covered the regulatory period 1 July 2018 to 30 June 2021. This Plan has been extended for an additional year by the Premier in response to the uncertainty created by the economic impacts of the measures imposed by the Australian and State Governments to address the coronavirus outbreak.

TasWater has prioritised projects in its PSP3 based on the potential customer benefit and the cost of the project. Benefits are determined by the project's contribution towards achieving specified customer outcomes (such as improving environmental performance - see section 3.6 in Chapter 3 for a list of identified customer outcomes). Results from customer consultation were used to determine the weighting applied to each customer outcome in TasWater's strategic framework.

Drinking water quality receives the highest priority in PSP3 with key projects planned for completion early in the period. The next highest priorities are dam safety, water security and environmental compliance.

TasWater's primary focus is on compliance, with planned projects including both high priority dam safety upgrades and sewerage upgrades to meet environmental standards. TasWater notes that it has placed a lower priority on renewing its networks to maintain service reliability and will seek to maintain, rather than improve, service reliability in PSP3, and has stated that the majority of its customers support this approach. This is also consistent with the priorities in TasWater's long-term plans.

[75] TasWater's *Long Term Strategic Plan 2018 - 2037* is available at: https://www.taswater.com.au/About-Us/Long-Term-Strategic-Plan-2018---2037

APPENDIX 1 REGULATORY FRAMEWORK

A1.1 Industry structure

Since 1 July 2013, TasWater has owned, controlled and operated water supply and sewerage systems in Tasmania. TasWater manages all aspects of the water supply chain from dams and reservoirs to customers' property connections. TasWater also manages sewerage systems from customer sewer connections to wastewater treatment and disposal.

TasWater's services include:

- harvesting, storing and treating raw water supplies;
- transporting bulk water from dams and reservoirs to water treatment plants;
- operating the sewerage service and treating sewage for discharge;
- delivering retail services; and
- receiving and processing trade waste.

TasWater's principal objectives[76] are:

- to efficiently provide water and sewerage services in Tasmania;
- to encourage water conservation, demand management of water and the re-use of water on an economic and commercial basis; and
- to be a successful business by operating its activities in accordance with good commercial practice, delivering sustainable returns to its council members and delivering services to customers in the most cost-efficient manner.

A1.2 Regulatory framework

The key piece of legislation governing the Tasmanian water and sewerage industry is the *Water and Sewerage Industry Act 2008* (Industry Act). The Industry Act requires any persons or entities owning and/or operating water and/or sewerage infrastructure, or supplying water and/or sewerage services to others, to be licensed, unless exempted.

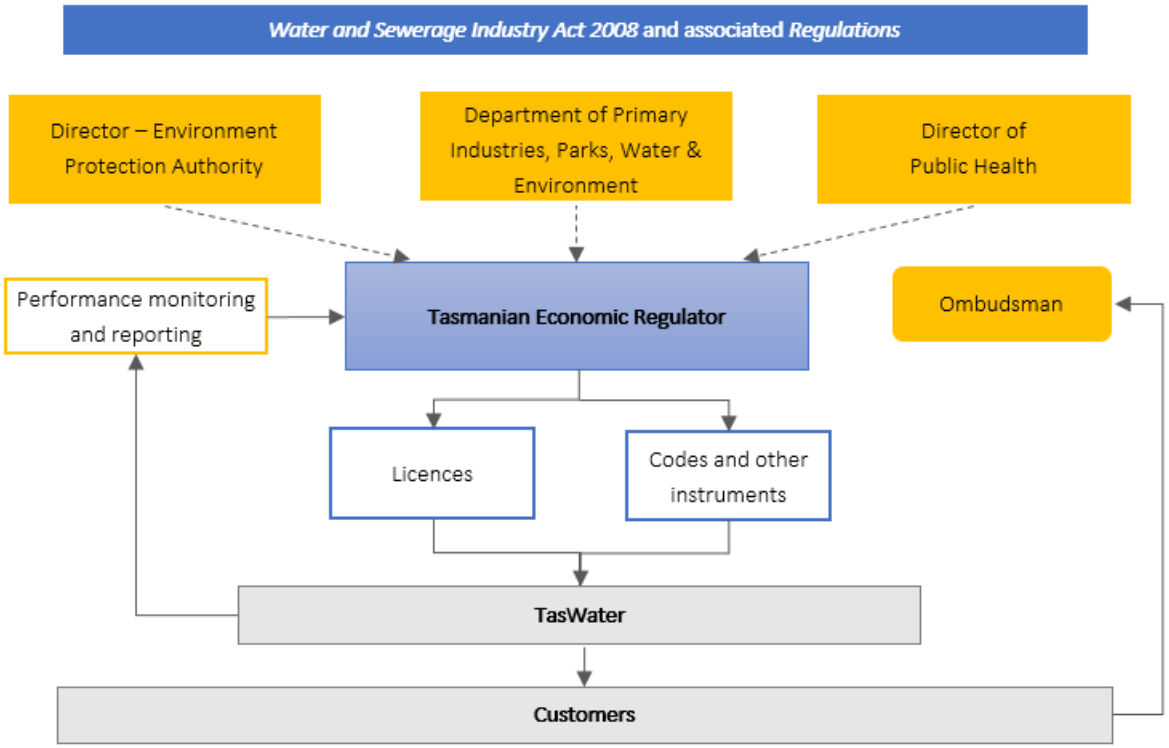
Currently, TasWater is the only licensed entity in Tasmania. The licence places a number of regulatory obligations on TasWater through reference to various regulatory instruments, such as codes and guidelines, as well as requiring the preparation of management plans in relation to matters such as asset and emergency management and compliance.

Industry regulators for the industry comprise the Tasmanian Economic Regulator, the Director, the Environment Protection Authority (EPA), the Director of Public Health and the Secretary, the Department of Primary Industries, Parks, Water and Environment (DPIPWE).

[76] From section 6 of the *Water and Sewerage Corporation Act 2012* (Tas).

Additional legislation, including the Tasmanian *Environmental Management and Pollution Control Act 1994*, *Public Health Act 1997, Fluoridation Act 1968*, *Water Management Act 1999* and the *Water Management (Safety of Dams) Regulations 2015*, imposes a range of compliance and regulatory obligations on TasWater. A diagram setting out the economic regulatory framework for the Tasmanian water and sewerage industry is shown in Figure A0.1.

Figure A0.1 Tasmanian water and sewerage industry economic regulatory framework



The regulatory framework does not cover:

- water used for electricity generation purposes;
- private water supplies, including drinking water supplies at premises that do not receive water from a reticulated system managed by a licensed provider - namely, private bores and tanks and small privately owned water systems;
- on-site sewerage treatment (septic tanks) or small private sewerage treatment plants; and
- irrigation water, stormwater and water recycling and re-use. Supply or use of water for irrigation is excluded from the definition of water service under section 3 of the Industry Act and therefore is not regulated. Services relating to stormwater, water recycling and water re-use are not regulated under clause 3 of the *Water and Sewerage Industry Declaration Order 2011* (Order).

While services in relation to recycling or re-use of water are not regulated activities, Chapter 2 of this Report provides commentary on these issues in the context of the treatment of wastewater.

A1.3 Industry Regulators

The regulatory framework for the water and sewerage industry covers economic regulation, technical regulation, water planning and customer service.

Tasmanian Economic Regulator

The Economic Regulator's role includes industry licensing, consumer protection and retail pricing:[77]

- Water and sewerage services prices – the Economic Regulator's Price Determination sets out the services, revenue requirements and pricing structure for TasWater for each regulatory period.
- Customer service standards – the Customer Service Code, issued by the Economic Regulator, sets out TasWater's obligations for the delivery of services to customers across Tasmania and sets service standards and targets for the delivery of those services.
- Performance monitoring and reporting - a periodic state of the industry report (this Report) prepared by the Economic Regulator in consultation with the other industry regulators.

In carrying out its functions under the Industry Act, the Economic Regulator is required to promote the efficient pricing of regulated services, promote efficient long-term investment in infrastructure and ensure the maintenance of appropriate service standards.

Director of Public Health

The Director of Public Health (and the Department of Health) is responsible for regulating drinking water quality and ensuring safety through monitoring and enforcing compliance with drinking water guidelines and policies established under the *Public Health Act 1997* and the *Fluoridation Act 1968.* This includes monitoring and enforcing compliance with the standards and requirements prescribed by the:

- Public Health Act (and its associated Tasmanian Drinking Water Quality Guidelines 2015);
- Fluoridation Act;
- *Fluoridation (Interim) Regulations 2009* (as in force in 2018-19 until 10 March 2019);
- *Fluoridation Regulations 2019* (as in force in 2018-19 from 11 March 2019); and
- Australian Drinking Water Guidelines 2011 (updated in 2018).

The Director of Public Health is also responsible for developing and implementing strategies to protect, promote and improve public health. In discharging its functions and duties, the Director of Public Health is supported by Public Health Services, which is part of the Department of Health.

[77] For further details, refer to the Economic Regulator's previous State of the Industry Reports and its Final Report in relation to its 2018 Water and Sewerage Price Determination Investigation, released on 4 May 2018.

Director, Environment Protection Authority

The Director of the EPA and the EPA Board[78] are responsible for administering and enforcing the *Environmental Management and Pollution Control Act 1994* (EMPCA). In discharging their functions and duties the Director and EPA Board are supported by EPA Tasmania,[79] which is part of DPIPWE.

The Director's responsibilities in regulating Level 2 sewage treatment plants (STPs)[80] and other aspects of TasWater's sewage management include:

- undertaking, as a member of the EPA Board, environmental impact assessments in relation to proposals for new STPs or significant changes to existing STPs;
- imposing legally binding environmental conditions relating to the operation of STPs;
- applying the *Tasmanian State Policy on Water Quality Management 1997* as it relates to wastewater management activities;
- ensuring compliance with environmental conditions;
- investigating incidents involving STPs or the sewerage network; and
- applying enforcement provisions as warranted.

EPA Tasmania provides TasWater with advice on wastewater issues including those relevant to wastewater and biosolids reuse, trade waste, blue green algae management and environmental aspects of the operation of the sewerage system, including sewage pumping stations.

Department of Primary Industries, Parks, Water and Environment

The Water Policy and Planning Branch in DPIPWE develops and coordinates policies relating to the regulation of the water and sewerage industry and supports the Minister for Primary Industries and Water in fulfilling the Minister's functions under the Industry Act.

The Water and Marine Resources Division within DPIPWE also plays an important water management, planning and regulatory role for the State's water resources, including the administration and enforcement of the *Water Management Act 1999*.

The Water Management Act is part of Tasmania's resource management and planning system and provides for the use and management of Tasmania's freshwater resources through licensing, water trading, water allocations and dam permits.

[78] For further information on the EPA's functions, see www.epa.tas.gov.au.

[79] The former EPA Division of DPIPWE adopted the name 'EPA Tasmania' in 2016.

[80] The EPA regulates Level 2 STPs ie STPs with a design flow capacity to treat more than 100kL per day. Local government (Councils) regulate Level 1 STPs.

Delegate for Dam Safety Regulation

The Minister for Primary Industries and Water also has regulatory oversight of dam safety. The Water Operations Branch, part of the Water and Marine Resources Division within DPIPWE, administers the Water Management Act and the *Water Management (Safety of Dams) Regulations 2015* to ensure that dam owners meet their dam safety responsibilities.[81]

The Minister's Delegate is the General Manager of the Water and Marine Resources Division. The Delegate's key functions include:

- developing prescribed standards required for the design, construction, maintenance, surveillance and decommissioning of dams, and ensuring compliance with those standards, which are largely based on the criteria and guidelines produced by the Australian National Committee on Large Dams (ANCOLD); and
- formulating measures to ensure the safety of dams and, in particular, plans to remove or minimise risks to persons, property or the natural environment arising from a dam safety incident.

Tasmania Fire Service

The Tasmania Fire Service (TFS) is responsible for fire safety in Tasmania.

TasWater's obligations under the Industry Act, with respect to fire safety, include:

- installing fire hydrants in its water infrastructure at distances and locations as are necessary for the ready supply of water to control and extinguish fires; and
- keeping its water infrastructure charged with water where that infrastructure supplies water to a fire hydrant.

The Industry Act permits TasWater reducing or restricting the quantity of water it supplies on days declared by the TFS to be days of total fire ban. Limiting non-essential water use such as garden watering or lawn sprinklers on days of total fire ban can help to ensure that the TFS and residents who may be facing a bushfire threat have water available for firefighting.

The *Water and Sewerage Industry (General) Regulations 2019* also permits TasWater to restrict the supply of water by all or any of the means including such things as specifying the days or times, or both, when water may be used or how water may be used).[82]

Ombudsman

A customer dissatisfied with the outcome of a complaint made under TasWater's customer complaints process may refer the complaint to the Tasmanian Ombudsman (the Ombudsman) under the *Ombudsman Act 1978*., It is a condition of TasWater's licence that it complies with any recommendations made by the Ombudsman relating to a complaint (under section 77 of the Industry Act).[83]

[81] For further information on dam safety, see www.dpipwe.tas.gov.au/water/dams/dam-safety.

[82] See Part 2 of the *Water and Sewerage Industry (General) Regulations 2019*.

[83] See www.ombudsman.tas.gov.au for further information.

A1.4 Performance and regulatory reporting

Performance reporting

The Industry Act requires the Economic Regulator to prepare a State of the Industry Report (this Report) within three months before a regulated entity, namely TasWater, is required to submit a proposed price and service plan, and at any other time when directed to do so by the Minister for Primary Industries and Water and the Minister for Finance. The Report must be published within a reasonable time of its preparation and tabled in Parliament within seven sitting days of its finalisation.

The Industry Act provides that the Economic Regulator is to issue guidelines to regulated entities in relation to their annual performance and information reporting requirements.

The Economic Regulator's *Tasmanian Water and Sewerage Industry Performance and Information Reporting Guideline* sets out the data and contextual information that TasWater must provide to the Economic Regulator, so that its performance can be measured.

Regulatory reporting

TasWater is required to carry out regular audits to assess:

- compliance with and the adequacy of its management and compliance plans; and
- the quality, reliability, and conformity of regulatory information, including performance information.

The audits are an important element of the regulatory framework. They ensure that all stakeholders are provided with sufficient information to properly assess TasWater's performance in meeting its regulatory obligations, and provide a reliable basis for on-going performance assessment.

The approach to regulatory reporting is set out in the Economic Regulator's *Regulatory Reporting Guideline Version 3*. The Economic Regulator's approach to managing non-compliance is outlined in its *Compliance Enforcement Policy Version 2.*

TasWater's performance indicator data is subject to independent audit at least once every three years in accordance with the Urban National Performance Framework auditing requirements. Approximately one third of indicators are assessed each year.

If errors are identified in the data submitted under the Urban National Performance Framework, revised data is included in the Tasmanian water and sewerage state of the industry reports, resulting in possible discrepancies in the data across these reports.

Some of the data provided by TasWater up to 2015-16 was assessed as being at a basic level. The reliability and accuracy of all data therefore, cannot be assured. Readers should consider this when interpreting the data and commentary presented in the Report particularly when comparing performance across years.

TasWater continues to adjust its processes and improve the quality of its data to ensure that independently audited and consistent data is available for its annual performance reporting requirements and inclusion in the state of the industry reports.

A1.5 National policies and obligations

Regulation of the water and sewerage industry is effected by national policies and obligations. These policies and regulatory obligations and responsibilities are set out below.

National Water Initiative

In June 2005, Tasmania, together with the Australian Government and the other states and territories, became a signatory to the National Water Initiative (NWI) Agreement. Under the NWI Agreement, the signatories agreed to report independently, publicly and on an annual basis, and to benchmark data on the pricing and service quality of urban water delivery agencies.

National performance reporting framework

The National Urban Water Utility Performance Reporting Framework (the NPR Framework) is one outcome of the National Water Initiative. The NPR Framework was developed by the signatories to the NWI Agreement.

The performance data and benchmarking reports produced under the Framework are an important resource, used by governments and the urban water sector.

Following the abolition of the National Water Commission in 2013, the Bureau of Meteorology (the Bureau) has supported the Framework and its collection of performance data, as well as the production and publication of the set of Urban NPRs.

ⓘ NPR framework guidelines

- The *2017-18 National Urban Water Utility Performance Reporting Framework: indicators and definitions handbook*; and
- The *2013-14 Urban National Performance Framework Urban Auditing Requirements*

TasWater provides annual performance data to the Bureau, with oversight of the data provided by the Office of the Tasmanian Economic Regulator.

The preparation of annual national performance reports that independently and publicly benchmark pricing and service quality, is an important commitment under the NWI. The reports align with a nationally consistent performance framework, built on reporting practices already in place in the urban water sector.

The performance data is subject to independent audit at least once every three years. Further information on the NWI Agreement and the NPR framework is available on the Bureau's website at www.bom.gov.au/water/npr/index.shtml.

NPR Framework Review

On 19 July 2018, the Economic Regulator signed a new three-year Framework Agreement that includes the Commonwealth (Department of Agriculture and Water Resources, DAWR), the Water Services Association of Australia and the Bureau to conduct a major review of the Framework. The Agreement covers the collection of performance data and benchmark reporting for the 2017-18, 2018-19 and 2019-20 financial years.

In 2019, the Bureau engaged a consultant to undertake a review of the NPR framework with a view to developing a set of recommendations that support the framework into the future. The consultant's final report was published 1 July 2019.

The review report outlined a number of key findings and recommended actions. This included new administrative and governance arrangements, extending to the replacement of the Round Table Group (the governing body for the NPR Framework for urban water utilities) with two new separate committees: a technical reference committee and a steering committee. There may be changes to the Economic Regulator's role as the new governance arrangements are developed and defined.

A1.6 Other government bodies

Department of Treasury and Finance

The Department of Treasury and Finance is responsible for providing advice to the Minister for Finance on water and sewerage pricing regulatory matters, as the Minister for Finance is responsible for pricing regulation under the Industry Act.

Local Government

Prior to 2009-10, local government was responsible for providing most reticulated urban water and sewerage services (excluding some water and sewerage infrastructure located within private or Crown land). TasWater is presently owned by local government (29 Councils) and the Tasmanian Government (which became a shareholder in early 2019). As at 30 June 2019, Councils held 99 per cent ownership in TasWater and the Tasmanian Government one per cent. Prior to TasWater's formation, local government owned the three regional corporations.

Local government is responsible for the regulation of smaller and on-site sewerage infrastructure (including STPs with design capacity of up to 100 kL per day and septic tanks).

Stormwater

Under the *Urban Drainage Act 2013*, local government is directly responsible for urban drainage. This includes providing public stormwater systems as are necessary to effectively drain urban areas, and maintaining those systems in good working order.

The Urban Drainage Act also requires local councils to develop Stormwater System Management Plans (SSMPs) for the urban areas within their municipalities. A SSMP must specify:

- plans for the management of any assets used for the delivery of a stormwater service;
- the level of risk from flooding for each urban stormwater catchment in the public stormwater system; and
- any other matters prescribed in the regulations or that the council considers appropriate.

Tasmanian Government

In May 2018, a Memorandum of Understanding (MoU) was signed between the State Government, the Council Owner's Chief Representative and TasWater.[84] The MoU proposed new ownership arrangements for TasWater under which the State Government became a shareholder of TasWater. In accordance with the MOU, councils remain the majority owner of TasWater and receive all returns from TasWater. The parties also agreed to work cooperatively to reform the water and sewerage sector and progress projects of special economic importance to Tasmania.

Under these new ownership arrangements, the Crown provides TasWater with $200 million of equity funding over 10 years from 2018-19.

As part of the 2019-20 State Budget, the Government announced that the $200 million in equity funding will be provided over five years from 2018-19 to support TasWater in:

- implementing its accelerated infrastructure investment program; and
- continuing to progress major capital projects, including the decommissioning and relocation of the Macquarie Point STP, the Launceston Combined System improvements and the Freycinet Peninsula wastewater system.

A further $100 million of grant funding will also be provided to TasWater by the State Government over five years from 2023-24 to further support TasWater's infrastructure investment program and the progression of major projects.

Bureau of Meteorology

In 2008, the Bureau assumed a new role in relation to water accounting, as part of the then Australian Government's Water for the Future initiative. In 2014, the Bureau also took over the administration of the Urban National Performance Framework for water performance reporting. The Bureau has produced the annual performance reports since 2013-14.[85]

The Bureau's water information functions are contained in the *Water Act 2007* (Cwlth), under Part 7 - Water Information. The *Water Regulations 2008* (Cwlth) (the Water Regulations) support the carrying out of these functions.

In Tasmania, the Water Regulations require a number of organisations, including TasWater, to submit a range of water accounting information to the Bureau.

[84] http://www.premier.tas.gov.au/__data/assets/pdf_file/0008/376622/TasWater_Media_Release_and_MOU.pdf

[85] The National Water Commission (NWC) was previously responsible for overseeing progress under the NWI Agreement including performance reporting. With its closure in 2015, the Bureau, with the agreement of all states and territories, took on the role of co-ordinating and producing annual national performance reports.

APPENDIX 2 PERFORMANCE INDICATORS

Performance indicators used in this report are defined in the *2013-14 National Performance Framework: Urban performance reporting indicators and definitions handbook*, July 2014, and the *Tasmanian Water and Sewerage Industry Performance and Information Reporting Guideline*, November 2016. Key performance indicators are shown below.

Indicator	NPR reference
WATER RESOURCES	
Sources of water	
Volume of water sourced from surface water (ML)	W1
Volume of water sourced from groundwater (ML)	W2
Volume of water sourced from desalination of marine water (ML)	W3.1
Volume of water sourced from recycling (ML)	W4
Volume of water received from bulk supplier (ML)	W5
Volume of bulk recycled water purchased (ML)	W6
Total sourced water (ML)	W7
Uses of water supplied	
Volume of water supplied - residential (ML)	W8
Volume of water supplied - commercial, municipal and industrial (ML)	W9
Volume of water supplied - other (ML)	W10
Total urban water supplied (ML)	W11
Average annual residential water supplied (kL per property)	W12
Volume of water supplied - environmental (ML)	W13
Volume of bulk water exports (ML)	W14
Volume of bulk recycled water exports (ML)	W15
Sewage collected	
Volume of waste collected - residential sewage, non-residential sewage and non-trade waste (ML)	W16
Volume of waste collected -trade waste (ML)	W17
Total sewage collected (ML)	W18
Sewage collected per property (kL per property)	W19
Uses of recycled water and stormwater	
Volume of recycled water supplied - residential (ML)	W20
Volume of recycled water supplied - commercial, municipal and industrial (ML)	W21
Volume of recycled water supplied - agricultural (ML)	W22

Volume of recycled water supplied - environmental (ML)	W23
Volume of recycled water supplied - on-site (ML)	W24
Volume of recycled water supplied - other (ML)	W25
Total recycled water supplied (ML)	W26
Recycled water (percent of effluent recycled)	W27
Volume of urban stormwater supplied to other infrastructure operators (ML)	W28.1
Volume of urban stormwater used (ML)	W28.4
Total volume of treated and untreated sewage discharges from a sewage discharge point	W29
ASSET	
Water treatment plants	
Number of water treatment plants providing disinfection only	
Number of water treatment plants providing further treatment	
Number of water treatment plants providing full treatment	A1
Other water assets	
Number of water pumping stations	
Length of water mains (km)	A2
Properties served per km of water main (no. per km)	A3
Number of water distribution storage facilities	
Sewerage assets	
Number of sewage treatment plants	A4
Number of sewage pumping stations	
Length of sewerage mains and channels (km)	A5
Properties served per km of sewer main (no. per km)	A6
Water main breaks	
Water main breaks (no. per 100 km of water main)	A8
Water losses	
Infrastructure leakage index (ILI)	A9
Real losses (L per service connection per day)	A10
Real losses (kL per km of water main per day)	A11
Sewerage breaks and chokes	
Sewerage mains breaks and chokes (no. per 100 km sewer main)	A14
Property connection sewer breaks and chokes (no. per 1 000 properties)	A15
CUSTOMERS	
Connected properties and population	
Population receiving water supply services (000s)	C1
Connected residential properties - water supply (000s)	C2
Connected non-residential properties - water supply (000s)	C3

Total connected properties - water supply (000s)	C4
Population receiving sewage services (000s)	C5
Connected residential properties - sewerage (000s)	C6
Connected non-residential properties - sewerage (000s)	C7
Total connected properties - sewerage (000s)	C8
Complaints, call wait time, service interruptions, customer restrictions and legal actions	
Water quality complaints (no. per 1 000 properties)	C9
Complaints meaningfully responded to within ten days (%)	
Water service complaints (no. per 1 000 properties)	C10
Sewerage service complaints (no. per 1 000 properties)	C11
Billing and account complaints - water and sewerage (no. per 1 000 properties)	C12
Total water and sewerage complaints (no. per 1 000 properties)	C13
Percent of calls answered by an operator within 30 seconds (%)	C14
Average duration of an unplanned interruption - water (minutes)	C15
Average sewerage interruption (minutes)	C16
Number of sewer spills	
Time to attend sewer spills, breaks and chokes (minutes)	
Incidence of unplanned interruptions - water (no. per 1 000 properties)	C17
Customers to which restrictions applied for non-payment of water bill (no. per 1 000 properties)	C18
Customers to which legal actions applied for non-payment of water bill (no. per 1 000 properties)	C19
ENVIRONMENT	
Percent of sewage treated to a primary level (%)	E1
Percent of sewage treated to a secondary level (%)	E2
Percent of sewage treated to a tertiary or advanced level (%)	E3
Percent of biosolids reused (%)	E8
Greenhouse gas emissions - water (tonnes CO_2-equivalents per 1 000 properties)	E9
Greenhouse gas emissions - sewerage (tonnes CO_2-equivalents per 1 000 properties)	E10
Net greenhouse gas emissions - other (net tonnes CO_2-equivalents per 1 000 properties)	E11
Total net greenhouse gas emissions (net tonnes CO_2-equivalents per 1 000 properties)	E12
Sewer overflows reported to the environmental regulator (no. per 100 km of main)	E13
FINANCE	
Revenue	
Total revenue - water ($000)	F1
Total revenue - sewerage ($000)	F2
Total income for whole of utility ($000)	F3
Residential revenue from usage charges - water (%)	F4
Revenue per property for water supply services ($ per property)	F5
Revenue per property for sewerage services ($ per property)	F6
Income per property for whole of utility ($ per property)	F7

Revenue from community service obligations (%)	F8
Written down replacement costs of fixed assets	
Nominal written down replacement cost of fixed water supply assets ($000)	F9
Nominal written down replacement cost of fixed sewerage assets (000$)	F10
Costs	
Operating cost - water ($ per property)	F11
Operating cost - sewerage ($ per property)	F12
Combined operating cost - water and sewerage ($ per property)	F13
Capital expenditure	
Total water supply capital expenditure ($000)	F14
Total sewerage capital expenditure ($000)	F15
Total capital expenditure for water and sewerage ($000)	F16
Water supply capital expenditure ($ per property)	F28
Sewerage capital expenditure ($ per property)	F29
Economic real rate of return	
Economic real rate of return - water	F17
Economic real rate of return - sewerage	F18
Economic real rate of return - water and sewerage	F19
Dividends	
Dividend ($000)	F20
Dividend payout ratio (%)	F21
Net debt to equity, interest cover, net profit after tax and community service obligations	
Net debt to equity (%)	F22
Interest cover	F23
Net profit after tax (NPAT) ($000)	F24
NPAT ratio (%)	F30
Community service obligations ($000)	F25
Capital works grants	
Capital works grants - water ($000)	F26
Capital works grants - sewerage ($000)	F27
HEALTH	
Water quality guidelines	H1
% of population where microbiological compliance was achieved	H3
Number of zones where chemical compliance was achieved (eg 23 / 24)	H4
Risk-based drinking water management plan externally assessed? (yes/no)	H5
PRICING	
Water	
Tariff structure - water (text)	P1
Free water allowance (kL per property) - water	P1.1
Fixed charge ($ per property) - water	P1.2

Usage charge 1st step ($ per kL)	P1.3
Special levies ($ per property) - water	P1.12
Income from special levies retained by utility? (yes/no) - water	P1.13
Annual bill based on 200kL per annum - water	P2
Average annual residential water supplied (kL per property)	P2.1
Typical residential bill - water	P3
Sewerage	
Tariff structure - sewerage (text)	P4
Fixed charge ($ per property) - sewerage	P4.1
Usage charge - sewerage ($ per kL)	P4.2
Special levies ($ per property) - sewerage	P4.3
Income from special levies retained by utility? (yes/no) - sewerage	P4.4
Annual bill based on 200kL per annum - sewerage	P5
Typical residential bill - sewerage	P6
Water and sewerage	
Annual bill based on 200kL per annum (water and sewerage)	P7
Typical residential bill (water and sewerage)	P8

APPENDIX 3 SEWAGE TREATMENT PLANT (STP) PERFORMANCE SUMMARY

Chapter 6 reports on TasWater's state-wide environmental compliance results. This Appendix provides detailed information on each individual STP's contribution to the overall state-wide performance of TasWater's STPs.

Table A3.1 and Figures A3.1 to A3.2 shows, for all Level 2 STPs assessed, TasWater's compliance with regulatory discharge limits and Accepted Modern Technology (AMT) limits, for effluent discharges to water. Where STPs report compliance with AMT limits that exceeds compliance with regulatory limits, this generally means that the regulatory limits, which are site-specific, are more stringent than AMT limits.

Table A3.2 lists the reported compliance for each recycled water scheme that uses treated effluent generated by Level 2 STPs. Compliance is measured against 'Class B' quality expectations (as outlined in the *Environmental Guidelines for the Use of Recycled Water in Tasmania, DPIWE 2002*) for each of the 2013-14 to 2018-19 financial years.

Table A3.3 lists the proportion of effluent re-used and total re-use flow per year, for each Level 2 STP that discharges to re-use, for each of the 2014-15 to 2018-19 financial years.

Table A3.4 provides the permitted average dry weather flow limit and the actual average annual inflow in 2018-19 for each Level 2 STP.

Table A3.1 Compliance results - Summary of STP discharge to waters against regulatory Limits and AMT Limits, 2014-15 to 2018-19

Premises name	2018-19		2017-18		2016-17		2015-16		2014-15	
	Regulatory limits (%)	AMT limits (%)	Regulatory limits (%)	AMT limits (%)	Regulatory limits (%)	AMT limits (%)	Regulatory limits (%)	AMT limits (%)	Regulatory limits (%)	AMT limits (%)
Beaconsfield	90.7	54.6	84.3	49.1	80.6	57.4	83.6	60.7	93.4	55.7
Beauty Point	86.5	52.8	(94.8)	(66.7)	94.7	66.0	88.5	48.2	93.1	64.4
Bicheno	68.8	61.1	77.1	60.2	87.5	76.9	89.6	68.5	89.6	68.9
Blackmans Bay	76.1	45.3	75.8	54.3	70.4	55.8	73.3	53.7	90.0	58.3
Boat Harbour	79.6	77.8	76.9	75.9	85.9	83.8	74.1	71.3	55.6	51.5
Bothwell	(78.7)	(64.8)	88.0	72.2	(91.7)	(76.9)	(75.9)	(69.4)	(85.9)	(74.5)
Bridgewater	83.3	63.9	87.0	58.3	90.7	61.1	87.6	62.3	86.0	61.7
Bridport	50.0	50.0	43.5	43.5	49.1	49.1	45.4	45.4	50.8	50.8
Brighton	(-)1	(-)1	(-)[1]	(-)[1]	(-)[1]	(-)[1]	(-)[1]	(-)[1]	(-)[1]	(-)[1]
Cambridge	90.7	94.4	96.3	98.1	88.9	92.6	83.3	88.0	83.3	90.4
Cameron Bay	97.9	80.6	98.7	81.2	93.3	80.2	92.5	74.1	89.1	74.8
Campania	(76.0)	(39.8)	(70.3)	(54.6)	58.3	51.9	37.5	38.0	(39.6)	(41.5)
Campbell Town	(68.5)	(45.4)	83.3	53.7	(72.0)	(44.4)	(80.2)	(50.0)	(80.2)	(56.9)
Carrick	76.1	53.2	78.7	50.9	82.5	63.1	75.2	54.3	82.8	60.6
Cradle Mountain	100.0	100.0	99.6	100.0	99.6	99.8	98.8	99.2	98.7	99.0
Cressy	82.3	48.1	(87.5)	(44.4)	93.8	55.6	(83.3)	(40.7)	(91.6)	(51.4)
Currie	79.2	55.6	91.7	52.8	96.7	57.1	90.1	66.0	90.3	72.4
Cygnet	85.8	80.6	80.8	76.9	89.6	83.3	100	85.9	97.9	77.6
Deloraine	70.4	70.4	70.4	70.4	71.7	71.7	57.4	54.6	66.0	66.0
Dover	89.8	79.6	100.0	93.5	97.2	89.8	96.3	88.9	96.3	88.0
East Strahan	89.8	75.9	91.5	70.8	83.0	65.0	91.4	70.2	90.5	69.1

Premises name	2018-19		2017-18		2016-17		2015-16		2014-15	
	Regulatory limits (%)	AMT limits (%)	Regulatory limits (%)	AMT limits (%)	Regulatory limits (%)	AMT limits (%)	Regulatory limits (%)	AMT limits (%)	Regulatory limits (%)	AMT limits (%)
Electrona	93.9	82.6	89.2	67.6	89.2	55.6	90.0	36.1	85.6	27.4
Evandale	(76.0)	(42.6)	(70.5)	(36.4)	76.8	33.3	(71.9)	(33.3)	72.9	34.3
Exeter	85.4	40.7	93.8	44.4	90.6	42.6	80.2	32.4	87.1	36.6
Fingal	75.9	47.2	74.1	45.4	93.5	63.0	83.3	53.1	73.9	46.4
Geeveston	89.2	83.3	86.7	78.7	82.5	75.0	73.3	67.6	74.2	73.2
George Town	88.3	62.9	92.5	63.0	89.5	68.5	83.3	63.0	83.3	62.5
Hoblers Bridge	97.5	87.0	92.5	82.4	93.7	80.5	90.2	68.8	86.2	64.6
Kempton	(65.6)	(40.7)	54.7	41.7	(27.1)	(39.8)	(39.6)	(41.5)	(33.3)	(32.1)
Latrobe	77.1	42.6	61.9	37.3	64.6	47.2	81.3	48.2	80.4	54.7
Legana	82.4	35.2	84.3	43.5	83.0	40.9	75.9	34.3	84.0	34.9
Lilydale	(91.7)	(85.2)	88.9	81.5	91.7	84.3	89.4	85.2	92.0	67.0
Longford	83.3	75.0	63.8	50.0	70.2	56.6	64.6	46.3	54.4	35.0
Macquarie Point	93.1	52.6	94.6	56.2	94.0	54.2	88.3	54.6	78.9	50.9
Margate	72.9	41.6	85.8	50.0	81.7	53.7	79.5	48.2	73.3	52.8
Midway Point	75.5	73.2	(80.4)	(69.4)	91.7	75.0	95.8	72.2	97.9	69.8
New Norfolk	81.7	54.6	86.7	54.6	87.5	54.6	91.7	56.5	85.8	57.4
Newnham	77.6	53.6	82.3	54.7	82.8	52.6	71.7	50.0	85.9	58.5
Norwood	98.3	88.0	97.5	83.3	91.7	73.1	94.5	72.6	96.4	82.0
Oatlands	70.8	39.8	(71.9)	(54.6)	(37.5)	(45.4)	(53.2)	(50.5)	50.0	44.3
Orford	84.3	63.0	89.8	66.7	84.9	62.3	88.0	63.9	86.8	59.4
Pardoe	87.2	18.5	86.9	19.0	89.7	23.7	84.4	19.6	58.7	14.3
Perth	69.8	32.4	(65.6)	(31.5)	64.6	29.6	(73.5)	(35.5)	76.0	35.2
Port Sorell	37.5	36.8	37.5	29.0	39.6	32.4	27.1	25.9	35.4	28.9

Premises name	2018-19		2017-18		2016-17		2015-16		2014-15	
	Regulatory limits (%)	AMT limits (%)	Regulatory limits (%)	AMT limits (%)	Regulatory limits (%)	AMT limits (%)	Regulatory limits (%)	AMT limits (%)	Regulatory limits (%)	AMT limits (%)
Prince of Wales	97.7	62.4	89.5	59.7	87.9	59.7	79.2	52.8	83.0	55.1
Prospect Vale	92.6	79.6	90.4	77.2	82.0	71.2	85.9	67.7	89.9	71.7
Queenstown	96.9	79.6	98.9	78.3	96.4	75.0	91.5	68.2	70.2	72. 6[2]
Railton	68.8	61.1	93.8	66.7	-[2]	-[2]	(-)	(-)	(-)	(-)
Ranelagh	94.2	98.1	95.8	98.1	97.5	100	93.3	95.4	95.0	100
Richmond	(-)1	(-)1	(-)[1]	(40.7)	(-)[1]	(47.5)	-[1]	44.4	-[1]	44.3
Ridgley	93.5	94.4	88.0	88.9	86.9	89.9	80.2	80.0	90.9	90.7
Risdon Vale	100.0	96.3	93.9	93.5	100	94.4	97.9	90.7	96.1	93.0
Riverside	88.0	48.1	91.7	56.5	93.5	52.8	93.5	52.8	97.0	58.4
Rokeby	(92.6)	(92.6)	(92.6)	(92.6)	93.6	93.6	(95.3)	(95.3)	82.2	81.4
Rosebery	94.3	94.3	99.1	99.1	94.2	94.2	79.3	79.3	-	-
Rosny	87.8	-2	81.1	59.0	85.0	58.3	89.6	58.3	85.9	65.
Round Hill	90.4	90.4	91.4	91.4	81.1	81.3	95.4	95.4	90.6	90.6
Scamander	(-)1	(-)1	(-)[1]	(77.8)	-[1]	82.4	-[1]	64.3	(-)[1]	(64.7)
Scottsdale	100.0	63.0	96.9	61.1	97.9	60.2	96.8	57.0	94.3	64.3
Selfs Point	96.4	99.6	96.7	98.7	93.3	96.4	90.3	96.2	87.4	93.8
Sheffield	98.1	98.1	96.0	96.0	99.1	99.1	95.4	95.4	98.0	98.0
Sisters Beach	88.9	88.9	90.7	90.7	97.0	97.0	96.3	97.2	88.0	88.0
Smithton	71.2	41.6	59.0	35.7	85.0	42.7	89.7	46.0	88.2	56.8
Somerset	82.4	68.5	93.8	78.7	93.2	75.8	88.8	66.7	100.0	58.5
Sorell	82.3	59.4	47.3	50.9	89.6	61.1	91.7	68.5	89.6	78.7
St Helens	100.0	100.0	99.1	100.0	100	100	96.3	100	96.0	100
St Marys	(-)1	(-)1	86.1	40.5	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]

Premises name	2018-19		2017-18		2016-17		2015-16		2014-15	
	Regulatory limits (%)	AMT limits (%)	Regulatory limits (%)	AMT limits (%)	Regulatory limits (%)	AMT limits (%)	Regulatory limits (%)	AMT limits (%)	Regulatory limits (%)	AMT limits (%)
Stanley	85.4	55.6	92.7	48.1	94.4	54.0[1]	86.1	37.2	75.0	43.1
Stieglitz	(-)1	(-)1	(-)[1]	(-)[1]	(-)[1]	(-)[1]	(-)[1]	(-)[1]	(-)[1]	(-)[1]
Swansea	75.0	40.7	77.8	47.2	75.9	45.4[1]	83.3	48.2	81.1	44.3
Ti-Tree Bend	98.8	89.6	96.3	87.3	95.1	84.7	94.3	81.8	96.5	89.6
Triabunna	(79.6)	(56.5)	79.6	53.7	87.0	63.0	75.0	51.9	73.6	52.8
Tullah	93.6	76.4	92.7	72.2	95.6	69.6	87.5	65.2	93.9	68.82
Turners Beach	76.9	45.4	76.9	51.9	80.9	60.0	68.5	42.6	74.0	43.3
Ulverstone	84.8	77.1	90.8	59.0	56.0	28.5	41.7	18.2	33.3	11.1[2]
Westbury	64.3	64.3	69.9	69.9	75.1	75.1	51.9	51.9	72.8	72.8
Wynyard	90.4	74.8	90.4	69.9	88.0	69.0	92.4	75.9	79.7	63.6
Zeehan	89.6	76.4	91.3	80.6	80.9	78.2	81.6	82.6	68.2	75.3[2]

AMT dataset completeness:

() Values in brackets: full re-use, no discharge to water

[1] cannot be assessed (no relevant limits or no discharge to this location)

[2] dataset incomplete

Figure A3.1 STP compliance with regulatory discharge to waters limits and re-use proportion, 2018-19 (per cent)

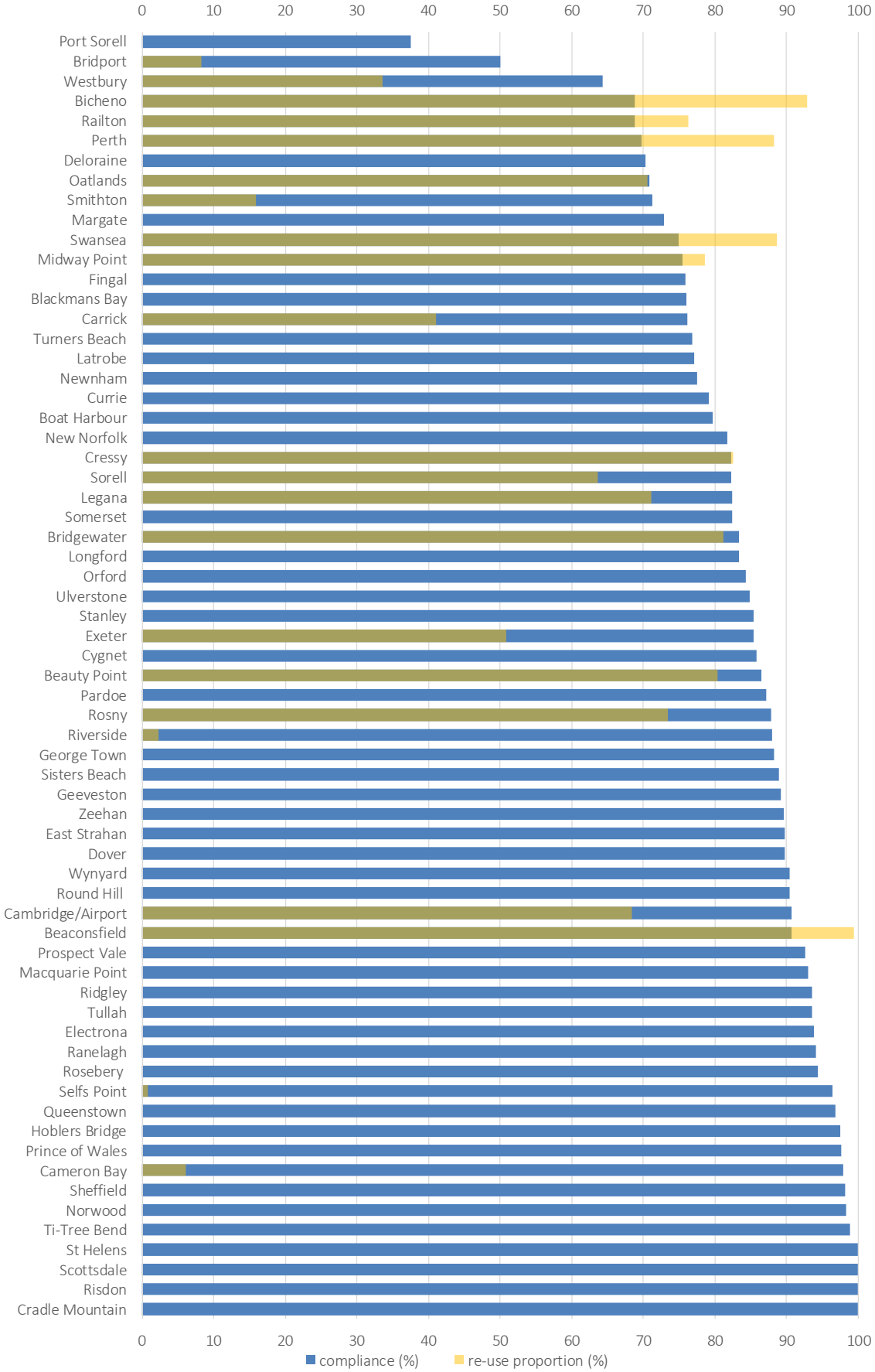


Figure A3.2 STP compliance with AMT discharge to waters limits and re-use proportion, 2018-19 (per cent)

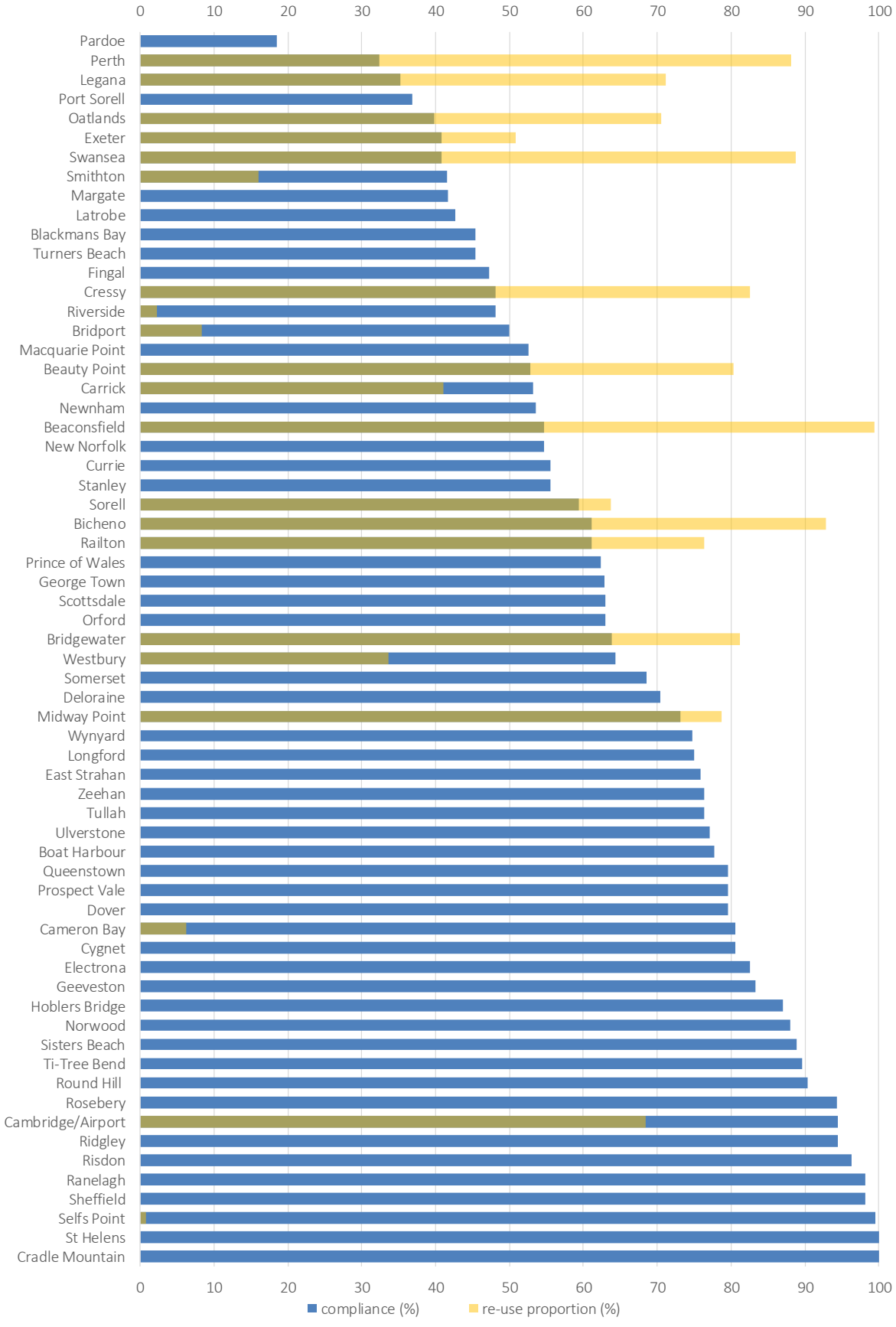


Table A3.2 STP compliance with modified 'Class B' re-use limits[86]

STP	2018-19	2017-18	2016-17	2015-16	2014-15	2013-14
Beaconsfield	95.0	96.0	-*	93.3	*	*
Beauty Point	85.0	95.0	94.8	86.7	92.1	93.3
Bicheno	86.7	90.0	93.3	96.7	94.8	83.3
Bothwell	85.0	88.3	93.3	85.0	93.1	90.0
Bridgewater	100.0	98.3	98.3	98.3	96.6	75.0
Bridport	83.3	78.3	83.3	80.0	87.9	100
Brighton	86.7	86.7	83.9	79.3	86.4	83.1
Cambridge/Airport	100.0	100.0	100	98.3	100	95.0
Cameron Bay	100.0	100.0	98.5	98.3	98.3	98.3
Campania	91.7	91.7	83.3	90.0	77.6	80.0
Campbell Town	75.0	91.7	70.0	80.0	87.1	90.0
Carrick	91.7	-	96.6	-	87.3	80.0
Cressy	93.3	86.7	91.7	85.0	91.5	90.0
Evandale	78.3	70.9	66.7	68.3	61.7	59.0
Exeter	81.7	93.3	71.7	78.3	87.3	94.1
Kempton	73.3	65.0	45.0	53.5	51.7	71.7
Latrobe	-	-	53.3	-	87.9	75.9
Legana	88.3	85.0	86.3	80.0	88.8	89.7
Lilydale	93.3	91.7	91.7	93.6	92.9	94.3
Oatlands	78.3	93.3	80.0	77.6	79.3	81.7
Orford	-	-	89.7	-	89.7	100
Penna	87.9	87.3	86.7	90.0	95.0	91.4
Perth	78.3	68.3	68.3	83.9	86.4	87.9
Railton	94.0	88.0	93.3	73.4	81.5	78.8
Richmond	81.7	80.0	74.5	80.0	87.9	76.7
Riverside	93.3	-	90.0	90.0	100	100
Rokeby	100.0	98.3	100	100	98.4	100
Rosny	81.9	82.4	82.7	100	98.4	100
Scamander	88.3	85.0	93.3	91.9	95.0	96.7
Selfs Point	100.0	-	99.6	-	99.7	100
Smithton	72.7	60.0				
St Marys	70.0	48.3	68.3	72.4	71.4	83.3
Stieglitz	91.7	100.0	95.0	95.0	88.7	98.2
Swansea	81.7	75.0	75.0	85.0	82.8	88.3
Triabunna	86.7	91.7	91.7	75.0	77.6	85.0
Westbury	100.0	92.4	93.4	70.2	-	-

* Insufficient number of samples provided

[86] EPA assessment is against 'Class B' Recycled Water quality with an adjusted pH range of 5.5 – 8.5 and an additional upper limit of 10 000 cfu/100mL thermotolerant coliforms.

Table A3.3 Re-use proportion per STP (per cent proportion and ML/year) 2014-15 to 2018-19

	2018-19		2017-18		2016-17		2015-16		2014-15	
Premises name	Re-use proportion (%)	Re-use flow ML/year	Re-use proportion (%)	Re-use flow ML/year	Re-use proportion (%)	Re-use flow ML/year	Re-use proportion (%)	Re-use flow ML/year	Re-use proportion (%)	Re-use flow ML/year
Beaconsfield	99	101	99	104	60	84	89	101	87	62
Beauty Point	80	147	100	146	39	81	75	120	68	108
Bicheno	93	91	80	80	58	66	37	46	88	89
Bothwell	100	28	73	25	100	48	100	39	100	42
Bridgewater	81	647	92	785	67	550	81	644	56	499
Bridport	8	10	6	7	10	10	13	9	16	13
Brighton	100	237	100	214	100	221	100	203	100	208
Cambridge	68	137	20	34	15	24	4	6	7	10
Cameron Bay	6	108	7	119	3	50	3	45	2	43
Campania	100	20	100	35	97	33	91	29	100	17
Campbell Town	100	62	64	42	100	119	100	72	100	69
Carrick	41	88	-	-	-	-	-	-	23	40
Cressy	83	58	100	69	32	23	100	57	100	61
Evandale	100	45	100	81	83	65	100	76	100	93
Exeter	51	29	49	25	36	24	41	26	53	29
Kempton	100	28	99	29	100	21	100	23	100	26
Legana	71	263	57	209	41	172	63	232	63	222
Lilydale	100	60	66	22	58	42	86	31	86	34
Midway Point	79	150	100	165	73	105	83	133	70	119
Oatlands	71	22	100	68	100	103	100	73	100	50
Penna	100	275	-	-	100	266	100	270	100	246
Perth	88	136	100	209	83	154	100	199	85	175

	2018-19		2017-18		2016-17		2015-16		2014-15	
Premises name	Re-use proportion (%)	Re-use flow ML/year	Re-use proportion (%)	Re-use flow ML/year	Re-use proportion (%)	Re-use flow ML/year	Re-use proportion (%)	Re-use flow ML/year	Re-use proportion (%)	Re-use flow ML/year
Railton	76	125	66	105	42	180	100	152	100	149
Richmond	100	55	100	71	100	60	100	63	91	60
Riverside	2	13	-	-	3	18	2	9	11	59
Rokeby	100	802	100	749	99	723	100	682	99	700
Rosny	73	1589	57	1300	55	1265	76	1673	56	1252
Scamander	100	42	-	-	92	45	85	46	100	44
Selfs Point	1	24	-	-	-	-	-	-	3	116
Smithton	16	230	16	207	-	-	-	-	-	-
Sorell	64	128	100	226	72	165	82	166	77	158
St Marys	100	30	86	40	40	19	80	36	85	34
Stieglitz	100	38	100	54	100	102	100	66	100	65
Swansea	89	48	66	48	19	17	48	45	87	66
Triabunna	100	53	97	55	91	69	94	60	100	60
Westbury	34	56	22	47	10	33	42	97	19	43

Table A3.4 2018-19 Licensed flow limit and actual average annual inflow per STP (kL/day and per cent proportion)

Premises name	Catchment area	Licensed flow limit (kL/day)	2018-19 average annual inflow (kL/day)	Actual inflow (per cent of licensed limit)
Beaconsfield	West Tamar	400	275	69
Beauty Point	West Tamar	540	423	78
Bicheno	Glamorgan/Spring Bay	450	295	66
Blackmans Bay	Kingborough	8530	4375	51
Boat Harbour	Waratah/Wynyard	170	32	19
Bothwell	Central Highlands	155	76	49
Bridgewater	Brighton	3500	2365	68
Bridport	Dorset	1400	316	23
Brighton	Brighton	650	649	100
Cambridge/Airport	Clarence	800	419	52
Cameron Bay	Glenorchy	6000	4831	81
Campania	Southern Midlands	136	115	85
Campbell Town	Northern Midlands	325	169	52
Carrick	Meander Valley	624	589	94
Cradle Mountain	Kentish	500	232	46
Cressy	Northern Midlands	240	193	80
Currie	King Island	290	311	107
Cygnet	Huon Valley	400	337	84
Deloraine	Meander Valley	850	899	106
Dover	Huon Valley	360	194	54
East Strahan	West Coast	1056	608	58
Electrona	Kingborough	450	328	73
Evandale	Northern Midlands	375	211	56
Exeter	West Tamar	150	151	101
Fingal	Break O' Day	125	35	28
Geeveston	Huon Valley	300	388	129
George Town	George Town	3600	1965	55
Hoblers Bridge	Launceston	4500	2858	64
Kempton	Southern Midlands	135	84	62
Latrobe	Latrobe	1000	1204	120
Legana	West Tamar	540	1001	185
Lilydale	Launceston	135	110	81
Longford	Northern Midlands	2700	1980	73
Macquarie Point	Hobart	18000	10632	59
Margate	Kingborough	681	379	56
Midway Point	Sorell	810	522	64
Turiff Lodge	Derwent Valley	4100	1734	42
Newnham Drive	Launceston	3920	2936	75
Norwood	Launceston	4050	2853	70
Oatlands	Southern Midlands	136	181	133
Orford	Glamorgan/ Spring Bay	473	185	39
Pardoe	Devonport	14000	12472	89

Premises name	Catchment area	Licensed flow limit (kL/day)	2018-19 average annual inflow (kL/day)	Actual inflow (per cent of licensed limit)
Penna#	Sorell	1400	755	54
Perth	Northern Midlands	450	636	141
Port Sorell	Latrobe	961	910	95
Prince of Wales	Glenorchy	9900	7995	81
Prospect Vale	Meander Valley	1720	1617	94
Queenstown	West Coast	1100	2299	209
Railton	Kentish	600	449	75
Ranelagh	Huon Valley	1200	1130	94
Richmond	Clarence	236	199	84
Ridgley	Burnie	110	165	150
Risdon	Clarence	1000	881	88
Riverside	West Tamar	2800	1545	55
Rokeby	Clarence	4000	2018	50
Rosebery	West Coast	242	1102	455
Rosny	Clarence	7500	6064	81
Round Hill	Burnie	9000	6282	70
Scamander	Break O' Day	240	129	54
Scottsdale	Dorset	3200	458	14
Selfs Point	Hobart	13000	8780	68
Sheffield	Kentish	350	545	156
Sisters Beach	Waratah/Wynyard	585	78	13
Smithton	Circular Head	5200	4071	78
Somerset	Waratah/Wynyard	1200	1030	86
Sorell	Sorell	810	551	68
St Helens	Break O' Day	1500	475	32
St Marys	Break O' Day	190	119	63
Stanley	Circular Head	276	195	70
Stieglitz	Break O' Day	110	150	136
Swansea	Glamorgan/ Spring Bay	430	200	47
Ti-Tree Bend	Launceston	25000	15077	60
Triabunna	Glamorgan/ Spring Bay	253	146	58
Tullah	West Coast	243	134	55
Turners Beach	Central Coast	600	914	152
Ulverstone	Central Coast	7500	7189	96
Westbury	Meander Valley	600	603	101
Wynyard	Waratah/Wynyard	2900	3645	126
Zeehan	West Coast	214	908	424

Source: EPA Tasmania database

The Penna STP acts as a "polishing plant" for treated effluent from the Midway Point and Sorell STPs, with effluent receiving further treatment prior to being made available for recycled water use

APPENDIX 4 DAM SAFETY

Dam safety assessment terminology

Consequence category

This refers to the classification scale that details the consequences resulting from a catastrophic dam failure. There are seven consequence categories in a graded scale ranging from "Very Low" (the consequences of a dam failure are negligible) through to "Extreme" (the consequences of a dam failure are severe in terms of loss of life and infrastructure impacts). Table A4.1 below lists TasWater's 'significant' or higher consequence category dams.

Consequence of Dam Failure

The result of a dam failure in terms of loss of life and damage to infrastructure, services and the environment.

Dam

An artificial barrier together with any associated works, that is constructed for the storage, control or diversion of water and other liquids, silt, debris or liquid borne debris.

Dam Safety Management Plans

TasWater is required to develop five-year dam safety works programs. These works programs are required to be submitted to, and agreed to by, the Dam Safety Regulator. The overall objective of each five-year program is that risks associated with all dams which have a "Significant" or higher consequence category are reduced As Low As Reasonably Practicable (ALARP) and brought within the Limit of Tolerability (LoT) in terms of societal risk as defined in the Australian National Committee on Large Dams (ANCOLD) guidelines. Dams not currently meeting these criteria require a program of works to be carried out to bring them within the LoT.

Dam Safety Emergency Plans (DSEP)

A DSEP is prepared for use in a situation where there is a dam safety emergency; it is the Department of Primary Industries, Parks, Water and Environment's (DPIPWE's) policy that all dams where there is the potential for loss of life in the event of dam failure, require a DSEP. As a minimum, a DSEP is required to include general information about the dam, emergency contact details, flood inundation maps, dam specifications, a plan of the dam and emergency procedure information.

Comprehensive Surveillance Inspections and Reports

TasWater is required to undertake a comprehensive surveillance inspection every five years for each of its dams that have a "Significant" or higher consequence category, and report, to the Dam Safety Regulator (DPIPWE) in its annual Dam Safety Management Plan, on the condition that each dam is inspected and any planned remedial works required to maintain or upgrade the inspected dam are set out.

Table A4.1 TasWater's dams in the Significant or higher consequence categories as at 30 June 2019

Dam name	Consequence category
Flagstaff Gully	Extreme
Ridgeway Reservoir	Extreme
Knights Creek	High A
Limekiln Gully	High A
Tolosa Reservoir	High A
Curries Dam	High A
Risdon Brook	High A
Lower Reservoir	High A
Swansea (Meredith) Reservoir	High A
Upper Reservoir	High A
Lake Isandula	High B
Lake Mikany	High B
Conglomerate Dam	High C
Coles Bay	High C
Duckhole Rivulet	High C
Girdlestone Reservoir	High C
Illabrook Dam	High C
Lower Prosser	High C
Margaret Street Detention Basin	High C
Pet Dam	High C
Westbury Dam	High C
Williams Reservoir	Significant
Barwick Effluent Lagoons	Significant
Bicheno Dam	Significant
Blackmans #1	Significant
Blackmans #2	Significant
Swansea Saddle Dam	Significant
Lake Fenton	Significant
Grey Mountain No.1	Significant
Grey Mountain No.2	Significant
Guide Dam	Significant
Midway Point Sludge Lagoon	Significant
North Esk Intake Weir	Significant
Sorell Sludge Lagoons	Significant
Mt Leslie Basin	Significant
Stiglitz Wastewater & Reuse Dams	Significant
Waratah Dam	Significant
Georges River Weir	Significant

APPENDIX 5 CUSTOMER SERVICE STANDARDS

Table A5.1 2018-19 Customer Service Code service standards and performance for 2017-18 and 2018-19

Service standard	CSC minimum standard 2018-19	2017-18	2018-19
Water:			
Water main breaks (no. per 100 km of water main)	35	**39**	**41**
Percentage of response times taken to attend bursts and leaks:			
– priority 1 (within 60 minutes)	90%	94%	97%
– priority 2 (within 180 minutes)	90%	96%	96%
– priority 3 (within 4 320 minutes)	90%	90%	**89%**
Incidence of unplanned interruptions - water (no. per 1 000 properties)	170	**216**	**215**
Incidence of planned interruptions - water (no. per 1 000 properties)	20	**109**	**112**
Average duration of an unplanned interruption - water (180 minutes) - achieved % of the time	80%	86%	86%
Average duration of a planned interruption - water (180 minutes) - achieved % of the time	80%	**11%**	**27%**
Percentage of unplanned water supply interruptions restored within 5 hours	94%	**96%#**	96%
Percentage of planned water supply interruptions restored within 5 hours	90%	**38%**	**59%**
Percentage of non-revenue water (of total sourced potable water) (unaccounted for water)	28%	23%*	26%
Sewerage:			
Sewerage mains breaks and chokes (no. per 100 km of sewer main)	65	45	37
Percentage of response times within 60 minutes to attend sewer spills, breaks and chokes	85%	**81%^**	89%
Percentage of sewage spills contained within 5 hours	99%	99.7%	99.7%
Customers:			
Total water and sewerage complaints (no. per 1 000 properties)	11	**16**	**13**
Water and sewerage complaints to the Ombudsman (no. per 1 000 properties)	0.5	0.3	0.3
Percentage of calls answered by an operator within 30 seconds	85%	87%	87%

Results in **bold** and underlined indicate that the standard was not met:

\# Standard not met in 2017-18 as minimum service standard applicable in 2017-18 was for unplanned water supply interruptions to be restored within 5 hours 98% of the time.

^ Standard not met in 2017-18 as the minimum service standard applicable in 2017-18 was for attendance to sewer spills, breaks and chokes within 60 minutes 90% of the time.

* Unaccounted water for 2017-18 has been recalculated to include irrigation water in the total for potable water.

The most recent version of the Customer Service Code (25 November 2019) can be found at: https://www.economicregulator.tas.gov.au/water/regulatory-framework/customer-service-code

APPENDIX 6 FINANCIAL PERFORMANCE MEASURES

The following table sets out the formulae used to calculate the financial performance measures reported in Chapter 7 of this Report, together with details of the data sources for each of the components in those formulae.

Table A6.1 Financial performance measures

Item	National Performance Report		NPR formula / NPR requirement	Formulae		Notes
	Reference	Performance measure		Component/s	Sources	
1	F1	Revenue from providing water services and related activities	The total revenue generated from the utility's water businesses and related activities.	Revenue	TasWater's annual financial statements (Statement of Comprehensive Income) Note 4.	
2	F2	Revenue from providing sewerage services and related activities	The total revenue generated from the utility's wastewater businesses and related activities.	Revenue	TasWater's annual financial statements (Statement of Comprehensive Income) Note 4.	
3	F3	Total income	The total income from water and wastewater businesses and related activities received by the utility during the reporting year	Income	TasWater's annual financial statements (Statement of Comprehensive Income) Note 5.	
4	F9 and F10	Fixed asset values	Value of water and sewerage infrastructure assets on a written down replacement cost (WDRC) basis.	• Water infrastructure assets • Sewerage infrastructure assets	TasWater's 2018-19 Financial Statements - see 'Cost disclosure' table in Note 11 on page 107 of TasWater's 2018-19 Financial Statements.	The WDRC represents the replacement costs of the fixed water and sewerage assets that TasWater uses to deliver water and sewerage services and derive income.
5	IF11 and IF12	Operating costs	Expenses with the exception of depreciation and finance expenses.	• Operating and Maintenance Expenses (including Raw Materials) • Employee-related Expenses • Administration Expenses	TasWater's annual financial statements (Statement of Comprehensive Income) Note 6.	

Item	National Performance Report		NPR formula / NPR requirement	Formulae		Notes
	Reference	Performance measure		Component/s	Sources	
6	N/a (see Notes)	EBIT	Revenue from the utility's operations less operating costs and current cost (WDRC) depreciation).	• Total Income/Revenue (F3) • Operating costs (IF11 and IF12) • WDRC depreciation	• Income/Revenue: TasWater's annual financial statements (Statement of Comprehensive Income) Note 5. • Operating costs: TasWater's annual financial statements (Statement of Comprehensive Income) Note 6. • Depreciation: TasWater's 2018-19 Financial Statements - see 'Cost disclosure' table in Note 11 on page 107 of TasWater's 2018-19 Financial Statements.	EBIT is not reported separately and is a component of, and input to, the calculation of other performance measures. Both revenue and expenses are for the whole water and sewerage business.
7	F19	Economic Rate of Return (ERR)	EBIT / Value of fixed assets (WDRC)	• EBIT • Water and sewerage infrastructure assets (WDRC)	• EBIT: see Item 6 above. • Asset values: TasWater's 2018-19 Financial Statements - see 'Cost disclosure' table in Note 11 on page 107 of TasWater's 2018-19 Financial Statements.	
8	F20	Dividends	The dividends paid, payable or proposed to be paid by the utility in relation to profits from its water supply and wastewater business for the reporting year.	Dividends paid	TasWater's annual financial statements: • Statement of Cash Flows and Note 9.	
9	F21	Dividend payout ratio	The ratio of the dividends paid, payable or proposed to be paid by the utility in relation to profits from its water supply and wastewater business to the utility's NPAT for the reporting year.	• Dividends paid (F20) • NPAT (F24)	TasWater's annual financial statements: • Dividends paid: Statement of Cash Flows and Note 9. • NPAT: Statement of Comprehensive Income (see also Item 12 below).	
10	F22	Net Debt To Equity (NDTE)	Net debt = (Long term plus short term borrowings) less (Cash plus investments) Equity = Total assets less total liabilities for the whole water utility Net debt to equity = Net debt / Equity	• Long term borrowings • Short term borrowings • Cash and investments • Total assets • Total liabilities	TasWater's annual financial statements (Statement of Financial Position).	Assets at fair value.

Item	National Performance Report		NPR formula / NPR requirement	Formulae		Notes
	Reference	Performance measure		Component/s	Sources	
11	F23	Interest Cover Ratio (ICR)	The ratio of the utility's earnings before interest and tax (EBIT) to its net interest expense: EBIT / Net Interest Expense (Interest expense less Interest income)	• EBIT • Interest income • Interest expense	• EBIT: see Item 6 above. • Interest income: TasWater's annual financial statements (Statement of Comprehensive Income) Note 4. • Interest expense: TasWater's annual financial statements (Statement of Comprehensive Income) Note 6.	
12	F24	Net Profit After Tax (NPAT)	The net profit after tax, disclosed in the utility's annual financial statements for the reporting year.	NPAT	TasWater's annual financial statements (Statement of Comprehensive Income).	NPAT does not account for abnormal items such as the impact of actuarial losses, gains relating to superannuation schemes, interest costs and write-off of deferred tax assets and the revaluation of assets.
13	F30	NPAT Ratio	The ratio of the net profit after tax, disclosed in the utility's annual financial statements, to its total income for the reporting year.	• NPAT (F24) • Total income (F3)	TasWater's annual financial statements (Statement of Comprehensive Income): • NPAT: see Item 12 above. • Total income: see Item 3 above.	