REPORT ON THE STATE OF THE TASMANIAN WATER AND SEWERAGE INDUSTRY 2020-21

JUNE 2022

ISSUED BY THE TASMANIAN ECONOMIC REGULATOR

CONTACT DETAILS

Office of the Tasmanian Economic Regulator

Office hours:	**8.45am to 5.00pm, Monday to Friday (except public holidays)**
Street address:	Level 3, 21 Murray Street, Hobart, Tasmania 7000
Postal address:	GPO Box 770, Hobart, Tasmania 7001
Telephone:	(03) 6145 5899 or international +61 3 6145 5899
Email:	office@economicregulator.tas.gov.au
Website:	www.economicregulator.tas.gov.au

Printed June 2022

ISSN 2653-4320

Cover image: Grassy Water Treatment Plant, King Island (supplied by TasWater - credit Joe Hutchins)

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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)
DWQG	Tasmanian *Drinking Water Quality Guidelines 2015*
EBIT	Earnings before interest and tax
EPA	Environment Protection Authority (Tas)
NDTE	Net debt to equity
NPAT	Net profit after tax
NPR	National performance report
NRET	Department of Natural Resources and Environment Tasmania
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)

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

GL gigalitre = 1 000 ML

EXECUTIVE SUMMARY

In accordance with the requirements set out in the *Water and Sewerage Industry Act 2008* (Industry Act), the Tasmanian Economic Regulator (the Economic Regulator) has prepared a state of the industry report for the Tasmanian water and sewerage industry for the period 1 July 2020 to 30 June 2021. This Report has been prepared after consultation with other industry regulators. It summarises the performance of the Tasmanian Water and Sewerage Corporation Pty Ltd (TasWater) across the key areas of:

- pricing;
- customer service;
- network reliability and efficiency;
- compliance with drinking water quality, dam safety and environmental obligations; and
- financial performance.

The Report also sets out key priorities for improved performance by TasWater.

TasWater, the single state-wide utility, provided water supply services to approximately 438 000 Tasmanians at 215 419 connected properties in 2020-21. TasWater provided sewerage services to 187 610 connected properties.

TasWater continued to meet safe drinking water standards. It achieved 100 per cent microbiological compliance across its network of reticulated water supply in 2020-21 for the third consecutive year. In addition, no long-term boil water alerts or public health alerts (do not consume) were issued during 2020-21. This remains a significant achievement given that four years earlier there were 25 long-term boil water and public health alerts in place across the State.[1]

TasWater also maintained its improved performance in complying with its requirements for treating effluent from its sewerage systems but continues to face challenges. Overall, it achieved 90.1 per cent compliance with regulatory discharge to waters limits, marginally lower than in 2019-20. The proportion of biosolids that were reused remained high at 94.3 per cent.[2]

However, unaccounted for water continues to be a concern, with TasWater estimating that around 25 per cent of treated water is being lost from the system. TasWater's estimated rate of real water loss, at 8.9 kL per kilometre of water main per day, was almost three times the median rate[3] of 3.0 kL per day reported by equivalent mainland utilities.

Based on these estimates, the level of unaccounted for water continues to reflect inefficiencies in the water systems that ultimately result in a poorer financial performance for

[1] From 2012-13 to 2016-17, there were between 21 and 25 long-term boil water and public health alerts each year applied to water supplies across Tasmania.

[2] As calculated by the Environment Protection Authority Tasmania.

[3] Comparisons to national medians for major utilities are based on information presented in the Bureau of Meteorology, *National performance report 2020-21: urban water utilities,* February 2022 - Part B (complete dataset).

TasWater which constrains TasWater's capacity to upgrade its infrastructure. It also results in higher risks of water restrictions being imposed.

The prices to customers of water and sewerage services in 2020-21 were unchanged from 2019-20. The TasWater Board determined that the 2019-20 price freeze required by a *Shareholders Letter of Expectations*[4] would also apply for 2020-21 to provide financial relief for customers to assist in dealing with the impacts of the COVID-19 pandemic.

The bill for a Tasmanian household using 200 kL of water per year therefore remained unchanged from 2019-20 at $1 214 per year. This is similar to the national median for major utilities of $1 212 per year for households using 200kL of water.

From a financial perspective, TasWater's underlying profitability improved substantially in 2020-21, compared with 2019-20. TasWater reported an underlying profit of $16.3 million[5] in 2020-21, compared to a loss of $15.8 million the previous year. Income increased by 4.5 per cent in 2020-21, while operating costs fell by 1.7 per cent.

TasWater's total capital expenditure was $177.6 million[6], an increase of 37.9 per cent from 2019-20 but below the target of $193.3 million in its 2021-25 Corporate Plan. TasWater reported that this was largely due to issues experienced in the first half of the financial year, including delays in commencing the Bryn Estyn water treatment plant upgrade, design challenges on two major dam projects and COVID-19 related travel restrictions. Capital expenditure on dedicated water and sewerage systems was $164.6 million, an increase of $36.4 million on 2019-20.

TasWater's 2022-26 Corporate Plan includes capital expenditure of $229.9 million in 2021-22, which includes $29.4 million in external funding, with the majority of this expenditure targeted towards projects to improve the safety of drinking water.

TasWater's key performance measures, and results for 2019-20 and 2020-21, are summarised in the following table, and are discussed in more detail below.

[4] 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

[5] Excludes contributed asset revenue and the impact of the revaluation of freehold land and non-infrastructure buildings.

[6] Includes gifted assets and developer charges.

Key performance measures

Indicator Number	Performance Measure	2019-20	2020-21
C4	Water connected properties	212 064	215 419
C8	Sewerage connected properties	185 181	187 610
W11	Total urban water supplied (ML)	65 537	64 964
W12	Average residential consumption (kL per property)	193	179
A8	Water network reliability (water main breaks/100 km of main)	33	52
A10	Real water losses (L/service connection/day)	361	272
A14	Sewer network reliability (sewer breaks and chokes/100 km of main)	41	57
C15	Average customer minutes off water supply, unplanned interruptions (minutes)	152	154
C17	Number of unplanned interruptions - water (per 1 000 properties)	220	208
	Treated wastewater discharge compliant with EPA requirements (flow-weighted compliance percentage)	90.8%	90.1%
H3	Percentage of population receiving drinking water that complied with ADWG microbiological guidelines	100%	100%
	Drinking water supplies on long-term boil water alerts or public health alerts	0 of 61	0 of 60
IC13	Customer complaints (number)	1 856	2 274
C14	Percentage of calls answered within 30 seconds	83%	92%
F3	Total income for whole of utility	$351 m	$367 m
IF13	Operating costs	$212.7 m	$209.2 m
F16	Capital expenditure for water and sewerage	$128.2 m	$164.6 m
F22	Net debt to equity ratio	40%	39%

Networks

Sources of water

During 2020-21, TasWater sourced a total of 88 349 ML for urban use, comprising 88 216 ML from surface water (99.8 per cent) and 133 ML from groundwater (0.2 per cent). TasWater also sourced 10 ML (0.5 per cent) from the temporary desalination of salt water on Flinders Island, due to upgrade works on Henderson Dam that restricted TasWater's ability to hold normal levels of water for treatment and supply. The total volume of water sourced decreased by 3.2 per cent compared to 2019-20.

The total volume of urban water supplied was 64 964 ML, a reduction of 0.9 per cent compared to 2019-20 but above the 63 671 ML average of the four years prior to 2020-21.

Residential water supply

The total potable water supplied to residential customers was 34 003 ML, a reduction of 6.2 per cent compared to 2019-20. Average annual residential water supplied, at 179kL per

property, was lower than that reported in 2019-20. Tasmanian residential consumption remains well above the median of average annual water supply per property for similar sized mainland utilities of 158 kL in 2020-21.

Water supply to non-residential customers

Water supplied to non-residential customers increased by 5.7 per cent to 30 912 ML in 2020-21. This included around 5 224 ML of recycled water, of which 5 126 ML (or approximately 98 per cent) was from Level 2 STPs. The volume of recycled water was 14.3 per cent less than in 2019-20.

Water supply outside the urban water supply system

The volume of water supplied to customers outside the urban water supply system (ie to irrigators) was 2 763 ML in 2020-21, a decrease of 24.4 per cent from 2019-20. This accounted for around 3.3 per cent of the total volume of potable water produced by TasWater in 2020-21.

Water network

As at 30 June 2021, the total length of water mains across Tasmania was 6 501 km, marginally more than the 6 459 km a year earlier. The total number of properties connected to water supply increased by 1.6 per cent compared to the number as at 30 June 2020.

The number of water main breaks, bursts and leaks per 100 km of water main increased significantly from 33 in 2019-20 to 52 in 2020-21. TasWater's 2020-21 result remains significantly higher than the median rate for similar sized mainland utilities of 17 per 100 km of water main.

Sewerage network

As at 30 June 2021, there were 187 610 properties connected to the sewerage network, 2 429 more than the previous year, and 4 847 km of sewerage mains and channels, 34 km more than the previous year. The sewerage network has a relatively low property density of 39 properties per kilometre of sewer main, much lower than similar sized mainland utilities which service, on average, around 66 properties per kilometre of sewer main.

Sewage collected and recycled

The volume of sewage collected by TasWater was 53 979 ML, or 288 kL per property, slightly higher than in 2019-20. Thirty-six of TasWater's 77 Level 2 STPs recycled at least some proportion of their treated sewage effluent. The number of STPs achieving full reuse of all treated effluent produced decreased to seven in 2020-21, compared to 10 in 2019-20.

TasWater recycled 9.7 per cent of treated effluent in 2020-21, which was provided to non-residential customers. This was down from 11.7 per cent in 2019-20.

Dam safety

TasWater reported one instance of non-compliance to the Dam Safety Regulator during 2020-21. This related to a small embankment that presented a potential failure risk.

During 2020-21, TasWater commenced major upgrade works at Mikany Dam (Smithton) and Henderson Dam (Flinders Island) and continued upgrade works at Upper Reservoir Dam (Hobart). TasWater also commenced major compliance investigations at Blackmans Dam No.1 and No.2 (Oatlands/Interlaken) and the Lower Reservoir Dam (Hobart).

Service reliability and performance

Water supply interruptions

Unplanned interruptions to water supply affected 44 723 customers during 2020-21. On average, there were approximately 208 unplanned interruptions per 1 000 properties across Tasmania in 2020-21. Unplanned water supply interruptions lasted, on average, 154 minutes (approximately 2.5 hours), two minutes longer than the previous year.

There were around 314 planned interruptions per 1 000 properties and only 14.3 per cent of planned interruptions met the duration standard of up to three hours. In addition, only 54 per cent of planned interruptions met the duration standard of up to 5 hours, a significant decline on the performance reported for 2019-20 (84 per cent). TasWater reported that it is continuing to develop actions targeted at improving these metrics but that the size and complexity of works are expected to continue to present challenges to achieving compliance.

TasWater responded to 'Priority 1', 'Priority 2' and 'Priority 3' bursts and leaks within the required timeframes. Whilst the service standard for response times were met, performance declined in 2020-21 compared to 2019-20. Response times and outage durations continue to be operational priorities for TasWater.

TasWater responded to unplanned incidents within the standard of up to three hours in 84 per cent of cases.

Unaccounted for water

TasWater estimates that around 25 per cent of the total volume of potable water it produced was unaccounted for in 2020-21. While this is a reduction from an estimate of 28 per cent in 2019-20, the Economic Regulator continues to be concerned that it remains very high.

TasWater estimates that real losses in its reticulation networks during 2020-21 were 272 litres per service connection per day, or 8.9 kL per kilometre of water main per day. These losses represented over four times the median real losses per service connection for similar sized mainland utilities, at 62.5 litres per day, and approximately three times the median real losses per kilometre of water main, at 3.0 kL per day for major mainland water utilities.

However, TasWater is not able to obtain reliable estimates of the volume of unaccounted for water. This is because TasWater does not have accurate information from its water meters on the volumes of water supplied to the urban water supply system from its water treatment plants. As a result, TasWater is also not able to accurately report on its water losses within its water supply systems. For some treatment plants, TasWater also does not have accurate information on the volume of sourced water that enters these plants.

As discussed elsewhere in this Report, TasWater is implementing a range of measures to address the issue of its reported very high volumes of unaccounted for water. This includes conducting an audit of its meters at all its water treatment plants to assess how accurately they measure volumes of water supplied to the urban water supply system from its

plants. This audit will then inform a program to improve the accuracy and reliability of this data and subsequent reporting of unaccounted for water.

Sewerage service interruptions

In 2020-21 there were, on average, 57 sewerage main breaks and chokes per 100 km of sewer main, an increase from 41 in 2019-20. The median rate for similarly-sized mainland utilities was 27 breaks and chokes per 100 kilometres of sewer main. TasWater reported that this higher rate was largely due to lower than expected completion rates for planned maintenance for sewer mains cleaning and a delay in delivery of the sewer main CCTV program at the start of 2020-21.

In 2020-21, TasWater met all three standards for sewerage service interruptions as specified in the *Tasmanian Water and Sewerage Industry Customer Service Code*. Notwithstanding, the rate of breaks and chokes in property connections remained high at 6.9 sewerage main breaks and chokes per 1 000 properties, compared with TasWater's mainland counterparts, at an average of 3.1 sewerage main breaks and chokes per 1 000 properties.

Measuring performance

TasWater remains committed to continuing to improve data quality and reliability for its performance metrics.

With improved data on its network, TasWater advises that it will continue to focus asset renewals in areas which have the most impact on customers. TasWater reported that its field management system for real-time reporting of interruptions to supply (H2Go) is also expected to result in further improvement in the accuracy of data capture regarding the frequency and duration of interruptions. Accurate fault and failure data reporting will further improve TasWater's ability to identify assets with a high likelihood of failure and renew these assets before a service interruption occurs.

Customers

Typical residential bill

There were no price increases for water and sewerage services in 2020-21. The annual bill for residential customers with average water consumption (179 kL per annum) was $1 191. This bill is based on $533 for water services and $658 for sewerage services.

Residential customers in Tasmania paid similar annual bills to their interstate counterparts. The bill for a Tasmanian household using 200 kL of water per year was $1 214 per year, compared to the national median for major utilities of $1 212 per year.

The structure of TasWater bills reflects the relatively high fixed cost of water services in the State, with fixed water charges representing approximately 28.3 per cent of the bill compared to around 12.4 per cent nationally. The annual fixed cost of providing water services 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.

The water usage component accounted for approximately 15.6 per cent of the typical annual bill for residential customers. TasWater's water usage charge in 2020-21 was low, at $1.06 per kL compared to a median rate of $2.55 per kL charged by mainland utilities.

In 2020-21, a very small percentage of Tasmanian customers were still not paying standard tariffs that most customers pay. As at 30 June 2021, 685 water customers (0.31 per cent) and 3 333 sewerage customers (1.69 per cent) were paying tariffs below the standard tariffs.

Approximately 26.6 per cent of residential customers receive a concession, funded by the Tasmanian Government. In 2020-21, the maximum concession was $201.62, comprising $100.81 for water services and $100.81 for sewerage services.

Customer complaints

TasWater received 2 274 complaints in 2020-21, an increase of 22.5 per cent compared to the previous year. The rate of complaints, at 10.6 per 1 000 properties, was above the maximum customer service standard for 2020-21 of 9 complaints per 1 000 properties. As was the case in 2019-20, the largest group of complaints were in relation to water quality (59 per cent), including taste, colour and odour, and sewerage services (17 per cent).

The number of complaints received in the 'water service', 'sewerage service' and 'billing and accounts' complaint categories all increased compared with 2019-20. Most significantly, complaints related to 'sewerage services' increased by 55 per cent. 96.3 per cent of complaints were resolved within ten days or within an agreed timeframe.

The Ombudsman received 34 complaints against TasWater in 2020-21, compared to 29 complaints in 2019-20. Eleven complaints against TasWater were found to be partly or fully substantiated by the Ombudsman in 2020-21.[7]

Call centre performance

The volume of calls received by TasWater's call centre decreased by approximately 18 per cent compared to 2019-20. For customers calling in, 92 per cent of calls were answered within 30 seconds, compared with a standard of 85 per cent. TasWater's call centre average response time continues to be much better than the median of 65 per cent of called answered within 30 seconds for similarly-sized mainland water utilities.

Payment management

The number of residential and business customers on TasWater's hardship program decreased from 603 customers in 2019-20 to 459 customers in 2020-21. Of the 459 customers using the program, 171 were concession customers. Customers using the hardship program had significant levels of debt, with the average debt at the time of entering the hardship program around $2 209 which is almost double the amount of a typical annual bill for water and sewerage and an increase on the $1 806 reported for 2019-20.

[7] Ombudsman Tasmania, *Annual Report 2020-21*, page 53.

As at 30 June 2021, 852 non-residential customers were repaying a debt, an increase compared with 728 the previous year.

No customers had their water supply restricted for non-payment in 2020-21.

Drinking water

All 60 Tasmanian drinking water supplies were adequately monitored for both microbiological water quality and chemical water quality during 2020-21. All 60 drinking water supplies achieved microbiological compliance. Two water supply systems had chemical contaminants detected above the ADWG health guideline values during 2020-21.

There were no water supplies on long-term boil water alerts or public health alerts as at 30 June 2021, and none during 2021-22 to the date of publication of this Report. The Adventure Bay water supply operated on a temporary boil water alert at three times during the year, resulting in upgrades to that system that enabled the plant to be reclassified as full treatment from the previous classification of disinfection only.

In December 2020, TasWater imposed Stage 1 water restrictions in Bridport (located in the north-east coast of Tasmania), due to an increased demand on the town's water supply during the annual influx of summer holiday visitors and the longer-term weather patterns in the region. These restrictions were removed in February 2021, which was earlier than planned and was due to strong river flows and lower than historic demand.

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

This level of performance has continued in 2021-22 with no long-term boil water alerts during that period. However, TasWater implemented Stage 1 water restrictions for greater Hobart between 14 December 2021 and 28 February 2022 as a result of ongoing works at the Bryn Estyn WTP and sediment and debris resulting from heavy spring rainfall affecting the amount of water that could be treated. Stage 2 water restrictions were also applied to Whitemark on Flinders Island from 15 January 2022 to 30 April 2022 due to the Henderson Dam upgrade.

Environment

Sewage treatment plant compliance

TasWater's Level 2 STPs achieved 90.1 per cent compliance with regulatory discharge to waters limits in 2020-21, passing the 90 per cent mark for the third time since 2009-10. Eight of the 13 largest STPs achieved more than 90 per cent compliance in 2020-21. Twelve Tasmanian STPs were classified as substantially non-compliant (less than 75 per cent compliance with regulatory discharge to water limits), an improvement on the 13 Tasmanian STPs that were classified as substantially non-compliant in 2019-20. This includes several of the smaller STPs.

Compliance with discharge to land limits for recycled water was 95.7 per cent, a slight decrease compared to the 2019-20 result of 96.8 per cent. Seven STPs discharged all effluent to reuse, thereby diverting treated effluent away from waterways towards beneficial uses.

Compliance with Environment Protection Authority Tasmania requirements

In 2020-21, TasWater received one Environmental Infringement Notice for failing to notify the Director, Environment Protection Authority Tasmania (EPA), within 24 hours after becoming aware of the release of a pollutant. This notice related to an incident resulting from a significant process failure at the Prince of Wales STP.

Finance and capital projects

Revenue and profit

TasWater's revenue was approximately $367 million in 2020-21, an increase of 4.6 per cent compared to 2019-20.

TasWater's underlying result for 2020-21 was a profit of $16.3 million, excluding contributed asset revenue and the impact of the revaluation of freehold land and non-infrastructure buildings. This compared to a loss of $15.8 million in 2019-20, which was heavily impacted by the COVID-19 pandemic.

As at 30 June 2021, TasWater's water and sewerage assets were valued at $2.6 billion (written down replacement cost), a $101.8 million (3.8 per cent) decrease from 30 June 2020.

Operating expenditure

TasWater's total operating costs of $209.2 million fell by $3.5 million (1.7 per cent) compared to 2019-20. The decrease reflected a $4.7 million decrease in administration expenses, a $2.7 million decrease in expenses for raw materials, partially offset by a $2.9 million increase in employee-related expenses and $1 million increase in operations expenses. Operating costs for sewerage-related activities decreased more than those for water-related activities.

TasWater's actual regulated operating expenditure for 2020-21 was $11.3 million higher than the allowance provided by the Economic Regulator in its *2018 Water and Sewerage Price Determination Investigation – Final Report, May 2018* with respect to 2020-21.

TasWater's average operating cost per property in 2020-21 was $971, higher than many of its interstate counterparts for which the median operating cost was $862 per property.

Capital expenditure

TasWater's total capital expenditure was $177.6 million in 2020-21, an increase of 37.9 per cent from the $128.8 million expended in 2019-20.

Amongst major Australian water utilities, TasWater was one of only six utilities that reported an increase in total capital expenditure in 2020-21.

TasWater's average capital expenditure per property was $805 per property ($488 for water and $317 for sewerage) in 2020-21. TasWater's expenditure was higher than for similar mainland utilities, which reported a median capital expenditure per property of $421 per property ($165 for water and $256 for sewerage). 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 underperforming infrastructure.

Although TasWater's capital expenditure in 2020-21 was $15.7 million below the $193.3 million provided for its 2021-25 Corporate Plan, TasWater expects it to increase to $229.9 million in 2021-22. Planned capital expenditure for 2021-22 includes $29.4 million in external funding provided by other parties for the Macquarie Point STP relocation project ($3.6 million) and Tamar Estuary River Health Action Plan ($25.8 million).

Financial performance

TasWater's underlying profit in 2020-21 was $16.3 million, compared to a loss of $15.8 million in 2019-20. Inclusive of contributed asset revenue, TasWater's adjusted net profit after tax was $45.7 million, an increase of around $30.7 million from 2019-20. TasWater returned $10 million to its local council shareholders as dividends.

TasWater's net debt to equity ratio decreased marginally to 39 per cent in 2020-21, down from 40 per cent in 2019-20. This remains low compared to the net debt to equity ratio of equivalent mainland utilities, where the median ratio was 85 per cent in 2020-21. TasWater's adjusted net profit after tax as a percentage of revenue (NPAT ratio) of 12.5 per cent in 2020-21 was comparable to the 12 per cent median NPAT ratio for major utilities nationwide.

TasWater's interest cover ratio was reported as zero for 2020-21 based on a written down replacement cost approach for depreciation. This is because EBIT, as reported on that basis, was negative in that year. The median interest cover ratio was 2.4 for major Australian water utilities for 2020-21, using the same approach.

Major projects

TasWater completed four major projects in 2020-21: Latrobe Sewerage System network upgrade and augmentation; Blackstone Road sewage pump station upgrade; Wellington Street sewage pump station upgrade; and the replacement of/repair to the Prince of Wales Bay digester roof.

Key performance priorities

TasWater continues to face a number of challenges in relation to regulatory compliance, particularly in respect of wastewater management. This is due to the legacy issues inherited by TasWater that it is continuing to address.

However, TasWater has demonstrated improved performance outcomes in recent years, with some major achievements that have improved services for customers and reduced TasWater's environmental impact. This has been despite the unexpected and numerous challenges presented by the COVID-19 pandemic from early 2020 that resulted in a major disruption to the way TasWater worked and delivered its services.

For example, the reliability and quality of drinking water supply for Tasmanians has remained high. TasWater achieved 100 per cent microbiological compliance across its reticulated water supply networks in 2020-21 and no system operated under long-term boil water alerts or had a public health alert (do not consume) in place during that period.

TasWater's performance in sewage treatment has remained at higher levels than in earlier years, with compliance of treated effluent with discharge to water limits in 2020-21 passing the 90 per cent mark for the third time since 2009-10.

However, there have been some delays in TasWater completing some key compliance projects during the third regulatory period (Bryn Estyn, Pardoe and Forth), with a number of projects continuing into the fourth regulatory period.

Effective long-term planning by TasWater is essential to ensure that it has the appropriate infrastructure, systems and operational arrangements to meet its compliance obligations. This includes carefully developed and managed capital investment programs and effective management of its plants and day to day operations.

The Economic Regulator's key priorities for improved performance over the short to medium-term include TasWater improving the quality of data on unaccounted for water and reducing the volume of unaccounted for water; improving the efficiency of its operations and achieving its capital investment program; ensuring adequate water supplies to meet expected future demand without water restrictions; and continuing to improve its information collection and management.

Industry regulators' priorities for improved performance over the short to medium-term include working with TasWater to ensure that it achieves, or continues to achieve, compliance with its statutory obligations relating to water quality, environmental protection and dam safety. These priorities are discussed in detail in chapter 8 of this Report.

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 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 Natural Resources and Environment Tasmania (NRET) is responsible for water management and dam safety.

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

1.2 Scope of this report

Under the Industry Act, the Economic Regulator must 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[8], and the Economic Regulator's price determination.

The publication of performance information supports the objectives of the Industry Act, namely 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

[8] These include statutory requirements and guidelines issued by 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 2020-21 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. A list of key performance measures is provided at Appendix 2.

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

- the water and sewerage network – water sources, TasWater's 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 services are not subject to regulation.

In preparing this Report, the Economic Regulator has consulted with the Director of Public Health, the Director of the EPA and the Secretary of NRET.

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 *Tasmanian Water and Sewerage Industry, Performance and Information Reporting Guideline, Version 1.5, 1 July 2018* which includes the requirement to report on measures set out under the Urban National Performance Reporting Framework[9]; and

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

- performance data collected as part of regulatory reporting requirements by the Department of Health, the EPA and NRET.

Data that have not met the audit requirements for quality and reliability[10] have generally been excluded from this Report or, where included, have been done so with commentary. 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, based on the number of connections. Many of these service providers differ from TasWater in the number of their separate schemes and assets and the geographic density of their customers. They may also face different geographical and climatic conditions. Readers should consider this when making comparisons between TasWater's performance and the performance of major utilities operating in mainland Australia.

[10] The Economic Regulator's *Regulatory Reporting Guideline, Version 5, 1 February 2022* outlines audit requirements for TasWater.

2 WATER AND SEWERAGE NETWORK

2.1 Sources of water

The average annual volume of surface water runoff in Tasmania is around 43 710 000 megalitres (ML).[11] Additionally, up to 2 500 000 ML of water is potentially available each year from groundwater.[12]

ⓘ Water volumes

kL kilolitres = 1 000 litres

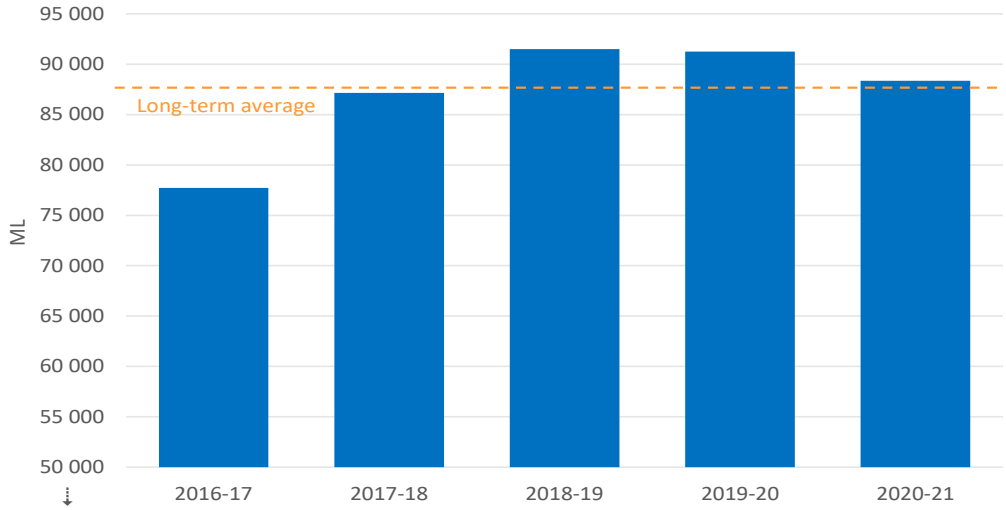
ML megalitres = 1 000 000 litres

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.[13]

Drinking water sourced from surface water and consumed by domestic, commercial and industrial customers accounts for around 13 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 urban supply needs being met almost entirely from surface water sources.

During 2020-21, TasWater sourced a total of 88 349 ML for urban use, comprising 88 216 ML from surface water, 133 ML from groundwater and 10 ML from the temporary desalination of salt water on Flinders Island whilst works were being undertaken on the Henderson Dam. The total volume of water sourced decreased compared with the previous two years, including a decrease of 3.2 per cent from 91 247 ML in 2019-20. (Figure 2.1).

Figure 2.1 Total sourced water in Tasmania (ML)



[11] CSIRO, *Climate change projections and impacts on runoff for Tasmania,* 2009.

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

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

As in past years, no urban water in Tasmania was sourced from recycled water in 2020-21, 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 in five Tasmanian households has a rainwater tank installed at their property.[14]

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

2.1.1 Water supply

Long-term reduction in rainfall and increasing temperatures across southern Australia has led to reduced streamflow, resulting in reduced availability of water.[15] Additionally, the population receiving water supply services from TasWater has increased significantly each year, including an increase from 431 513 people in 2019-20 to 438 097 people in the 2020-21. Both of these factors have influenced the supply of, and demand for, TasWater's water.

During 2020-21, TasWater established a dedicated Service Interruption Team with the aim of enabling TasWater to more effectively respond to water service faults and emergencies and deliver better outcomes for its customers. TasWater has reported that, more broadly, learnings continue to be applied in the business to update and refine processes to better manage risks and deliver improved performance. TasWater identified that a pilot of a new location system is planned to occur in 2021-22 with a view to TasWater improving response times and optimising the scheduling of work crews.

TasWater expects that its updated mobility solution (H2Go) will result in further improvement in the accuracy of data capture regarding the frequency and duration of interruptions. TasWater also expects that accurate fault and failure data reporting will further improve its ability to identify assets with a high likelihood of failure and renew these assets before a service interruption occurs.

In December 2020, TasWater imposed Stage 1 water restrictions in Bridport (located in the north-east coast of Tasmania), due to an increased demand on the town's water supply during the annual influx of summer holiday visitors and the longer-term weather patterns in the region. These restrictions were removed in February 2021. This removal was earlier than planned and was due to strong river flows and lower than historic demand.

2.2 Water assets

As stated in previous state of the industry reports, Tasmania's hilly terrain poses a unique challenge for water supply to customers as its fresh water resources are unevenly distributed across the State. Water is relatively abundant in the lightly populated western part of the State, and less abundant in some of the more heavily populated south-east and east coast areas.

[14] Australian Bureau of Statistics, *Environmental issues: Water use and conservation,* 2013.

[15] CSIRO and Bureau of Meteorology, *State of the Climate 2020*.

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, high costs are incurred in pumping water from remote sources of supply to customers.

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.

2.2.1 Water supply systems and treatment plants

A 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:

- disinfection only – the treatment plant disinfects the water prior to supply to customers. This category also includes WTPs that provide fluoridation only;
- 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
- 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.

In 2020-21, an estimated 438 097 Tasmanians received a reticulated drinking water supply provided by TasWater. Supply was provided by 60 drinking water supply systems[16] that were serviced by 65 WTPs. Table 2.1 provides details of the number and type of WTPs operated by TasWater during 2020-21.

Table 2.1 Water treatment plants in Tasmania, 2020-21

Disinfection only WTPs	Further treatment	Fully treated	Total WTPs
4	0	61	65

2.2.2 Storage dams

TasWater is responsible for the operation and maintenance of over 300 water and wastewater dams, lagoons and weirs throughout Tasmania that fall under the definition of a dam in the *Water Management Act 1999*.

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

[16] A water supply system is a system for the extraction and preparation of water for distribution via the water supply network. A system may be supplied with water from more than one treatment plant and in some cases water is transferred between systems.

dam are assessed in accordance with the Australian National Committee on Large Dams (ANCOLD) guidelines.

The two major factors under the guidelines that determine the consequence category are:

- Population at Risk (PAR) or Potential for Loss of Life (PLL) from a potential failure of a dam; and
- severity of damage and loss which includes the following categories:
  - total infrastructure costs, dwellings, bridges, roads, communications energy and water and sewerage assets; and
  - impact on dam owner's business:
    - health and social impacts
    - environmental impacts

Once assessed, each dam is assigned one of seven 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 to this Report.

Table 2.2 ANCOLD Guidelines - consequence categories for dams

Population at Risk	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: Where there is potential of one or more lives being lost, the dam is classed as 'High C'.

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 rigorous as the consequence category increases. Of the dams that TasWater is responsible for, 39 have been identified as having a consequence category of 'Significant' or higher due to their potential downstream impact (ie the two main factors discussed above that determine the consequence category) in the unlikely event of a complete dam failure. The remaining dams and storages have consequence categories of 'Low' or 'Very Low'.

During 2020-2021, the number of dams plotting above the ANCOLD Level of Tolerability (LoT) for societal risk was four, the same as the previous year, namely Waratah, Lake Mikany, Pet and Ridgeway Dams.

Major dam safety management initiatives undertaken by TasWater in 2020-21 are listed below and are also set out in TasWater's Dam Safety Management Plan for 2020-21:

- commencement of major upgrade works at Mikany Dam (Smithton) and Henderson Dam (Flinders Island);
- continuation of upgrade works at Upper Reservoir Dam (Hobart);
- submission and approval of a decommissioning permit for Waratah Dam (Waratah) due to safety concerns relating to the dam.;
- commencement of major compliance investigations at Blackmans Dam No.1 and No.2 (Oatlands/Interlaken) and Lower Reservoir Dam (Hobart);
- an independent review of the previous structural analysis undertaken on the Ridgeway Dam (Hobart); and
- in partnership with Entura, the successful completion of the sixth (and final) year of the dam safety surveillance contract. A new contract (up to five years) was tendered in March 2021. The SCADA upgrade for 15 of TasWater's southern dams has continued throughout the year. Based on the current rate of progress, this project is expected to be completed in the 2022-23 financial year.

Table 2.3 sets out TasWater's water supply and wastewater dams by consequence category.

Table 2.3 TasWater's water supply and wastewater dams by consequence category (no.) as at 30 June 2021

Very low	Low	Significant	High C	High B	High A	Extreme
34	38	18	8	4	6	3

For 2020-21, the following dams had their consequence categories changed:

- Upper Reservoir Dam increased from High A to Extreme.
- Limekiln Dam, Tolosa Dam and Knights Creek Dam reduced from Extreme to High A.
- Swansea (Meredith) Dam reduced from High A to High B.
- Illabrook Dam increased from High C to High B.
- Swansea Saddle Dam assessed as Significant - was not previously reported.
- Nunamara Weir increased from Very Low to Significant.
- Grey Mountain Dam No. 1 and Grey Mountain Dam No. 1 reduced from Significant to Very Low.

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

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 2021

Number of water pumping stations	Number of water distribution storage facilities	Length of water mains (km)
219	292	6 501

Compared to other large mainland water utilities (with, on average, 64 properties per kilometre of water main), TasWater's customer density is relatively low at 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[17], sewer mains and effluent outfalls.[18] Performance indicators for these assets relate to their number, density, length and operational performance.

All urban areas and most major townships in Tasmania have reticulated sewerage systems and an associated STP. STPs discharge to waterways and to effluent recycling schemes. There were 187 610 properties connected to the sewerage network across Tasmania as at 30 June 2021.

Table 2.5 summarises the sewerage assets operated by TasWater in 2020-21.

Table 2.5 Sewerage assets operated by TasWater as at 30 June 2021

Sewage pumping stations	Length of sewerage mains (km)	Level 1 STPs	Level 2 STPs	Total number of STPs
738	4 847	33	77	110

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

In 2020-21, there were, on average, 39 properties serviced per kilometre of sewer main. As for the water supply network, the property density in TasWater's service area is lower than other similar sized mainland utilities which would usually service, on average, around 66 properties per kilometre of sewer main.[19]

[17] Sewage pumping stations pump sewage from low points in the reticulation system to facilitate the passage of sewage to the STP.

[18] 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.

[19] Bureau of Meteorology, *National performance report 2020-21: urban water utilities,* February 2022 (indicator A6).

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 are regulated by local councils under the *Environmental Management and Pollution Control Act 1994*. Level 2 STPs have a design flow capacity rate equal to or greater than 100 kL/day and are regulated by the EPA.

During 2020-21, TasWater operated 77 Level 2 STPs and 33 Level 1 STPs. NRET's Parks and Wildlife Service also operated two Level 2 STPs (at the Ben Lomond and Lake St Clair National Parks). The Port Arthur Historic Site Management Authority operated one Level 2 STP.

Table 2.6 provides a breakdown of TasWater's Level 2 STPs by treatment level. The majority of Level 2 STPs operated by TasWater provide secondary treatment.

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

Primary	Secondary	Tertiary
1	65	11

In 2020-21, 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.

STPs discharge to inland, estuarine and marine (coastal) environments.

Chapter 6 of this Report discusses outfall volumes in more detail.

2.4 Sewage collected

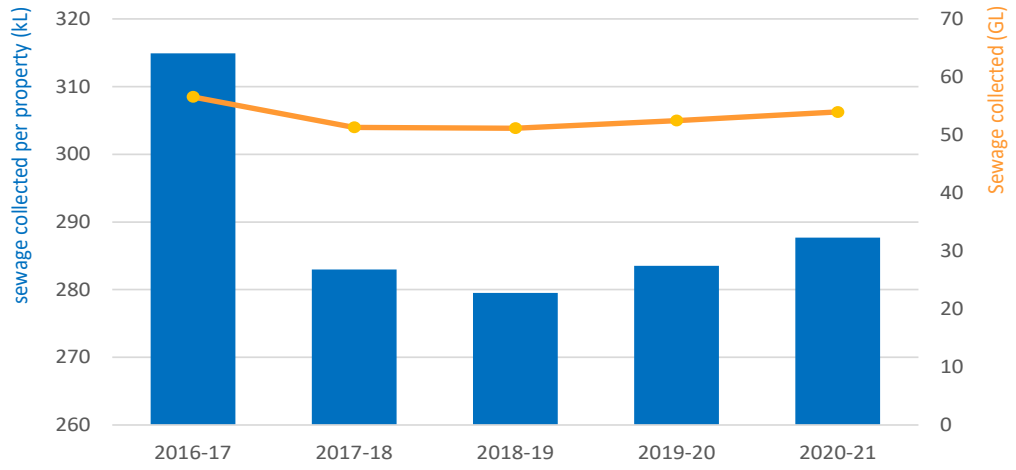
Sewage volumes discussed in this section are based on total inflows received by TasWater's STPs.

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

	2016-17	2017-18	2018-19	2019-20	2020-21
Sewage collected (ML)	56 582	51 318	51 173	52 493	53 979
Per property (kL)	315	283	280	284	288

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 2020-21, the total volume of sewage collected at TasWater's STPs was 53 979 ML. TasWater's Level 2 STPs collected 98.8 per cent of this total (53 322 ML). The average volume of sewage collected (residential and non-residential) was 288 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 2020-21, of the total 53 086 ML of treated effluent discharged from TasWater's Level 2 STPs, approximately 38 446 ML or 72.4 per cent was treated to secondary standard, including the majority of effluent discharged to reuse schemes. Tertiary treatment was applied to 18.8 per cent (9 965 ML) of the total volume and primary treatment accounted for the remaining 8.8 per cent (4 675 ML).

ⓘ 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. [20] The effluent reuse schemes associated with TasWater's Level 2 STPs all involve land irrigation.

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

As a result, annual volume fluctuations are influenced by climatic factors driving demand for irrigation water in a given year.

2.6.1 Recycled water treatment plants

Thirty-six of TasWater's 77 Level 2 STPs discharged a proportion of their outflows to effluent reuse or land irrigation schemes in 2020-21. This number remains unchanged from 2019-20.

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.

Seven STPs achieved full reuse in 2020-21, and an additional three STPs discharged 95 per cent or more of their total discharge flow to reuse.

The *State Policy on Water Quality Management*[21] 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 needed to achieve the 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[22]

	Tasmanian reuse category			
	Full	Partial (>50% recycled)	Partial (<50% recycled)	None
2016-17	8	13	12	46
2017-18	13	14	6	46
2018-19	14	15	7	43
2019-20	10	18	8	41
2020-21	7	15	14	41

2.6.2 Recycled water volume

In 2020-21, the total volume of effluent recycled was 5 126 ML, or 9.7 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, continues to be the largest reuse scheme in the state with 2 209 ML recycled during 2020-21, followed by the Brighton/Bridgewater scheme which recycled 844 ML of treated effluent. The Penna scheme (219 ML recycled), which is fed by Midway Point and Sorell STPs, is the third largest recycled

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

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

water scheme in the south of Tasmania. Together, these three southern schemes accounted for around two thirds (64 per cent) of the total volume of effluent recycled in the State in 2020-21.

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

Discharge to recycled water schemes in 2020-21 was lower both in percentage and total volumes terms when compared with the preceding three reporting periods, with seasonal weather conditions being less favourable to irrigation uses in part of the State. The central north and north-eastern part of the State, in particular, experienced wetter than average summer conditions, reducing irrigation uptake.

The Beauty Point STP experienced a significant reduction in the volume of effluent reused in 2020-21 (3.0 ML) when compared to previous years (79.0 ML in 2019-20, 147 ML in 2018-19). This was due to saline water intrusion into the sewerage network making the water unsuitable for irrigation. Investigations to eliminate the source of saltwater intrusion are ongoing.

Management of effluent salinity due to saline water intrusion into the network is also required for effluent discharged to recycling from Rosny STP. This resulted in a reduced volume discharged to reuse (1 109 ML) in 2020-21 when compared to 2019-20 (1 507ML).

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
2016-17	4 691	**8.4**
2017-18	5 417	**10.7**
2018-19	5 700	**11.5**
2019-20	6 023	**11.7**
2020-21	5 126	**9.7**

The percentage of effluent reused is set out in Figure 2.3. It demonstrates the yearly fluctuation in the reuse percentage and volumes.

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

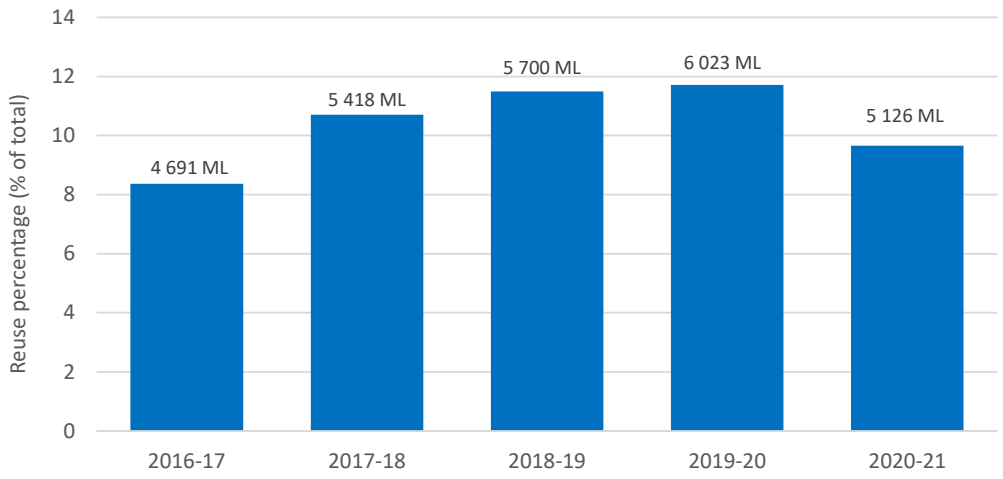


Table A3.4 in Appendix 3 lists the percentage of effluent reused and reuse flow per year for each Level 2 STP from 2016-17 and 2020-21.

3 CUSTOMERS

This chapter reports on how much households use and pay for water and sewerage services. It also reports on the number of customers experiencing payment difficulties and the assistance programs available to them. The chapter then reports on how TasWater responds to its customers and looks at the most common areas for complaints made by its customers.

As at 30 June 2021, 215 419 properties were connected to TasWater's water supply network, with residential customers making up around 88.4 per cent of those connections. There were 187 610 properties connected to TasWater's sewerage network.

3.1 Water usage

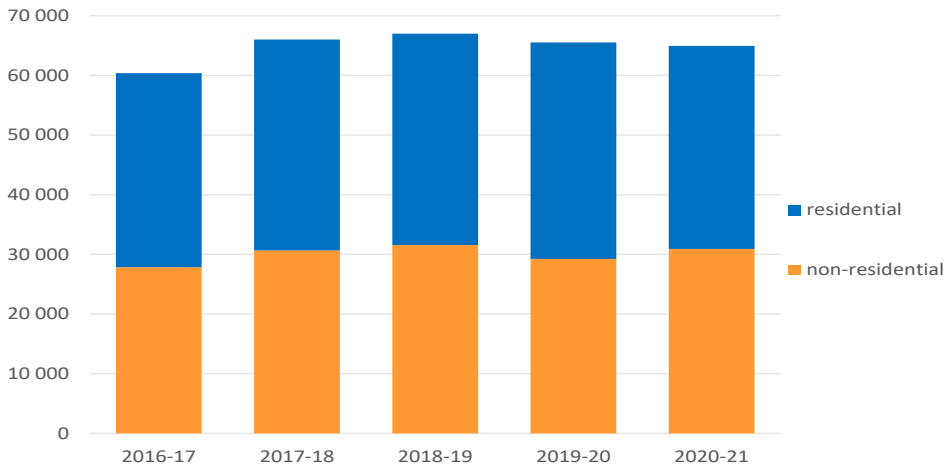
For the purposes of this Report, total urban water supplied is TasWater's metered volume of water (both drinking water quality and non-drinking water quality) supplied to customers during 2020-21 plus estimated non-metered water supplied. The total water supplied comprises the sum of residential, commercial, municipal, industrial and other water supplied.

TasWater provided the following detailed breakdown of the 64 964 ML of water supplied to its residential and non-residential customers[23] during 2020-21:

- residential customers were supplied with 34 052 ML of water (potable and non-potable); and
- commercial, municipal and industrial customers were supplied with 30 912 ML of water (which included recycled water and stormwater).

Figure 3.1 shows the total volumes of urban water supplied from 2016-17 to 2020-21.

Figure 3.1 Total urban water supplied (ML)



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

Urban water supply in 2020-21 was approximately 2.0 per cent above the 63 671 ML average for the previous four years.

Potable water supply to residential customers decreased by 6.2 per cent in 2020-21, accounting for 52.3 per cent of total urban water supplied (potable and non-potable) to residential and non-residential customers. By contrast, water supplied to commercial, municipal and industrial customers increased by approximately 5.7 per cent in 2020-21.

The average annual consumption per connection across the State in 2020-21 was 302 kilolitres (kL). This represents a 2.4 per cent decrease from the 2019-20 average of 309 kL. Average volume of residential water supplied (kL per property) reduced significantly, decreasing from 193 kL per connection in 2019-20 to 179 kL in 2020-21 (Figure 3.2).

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

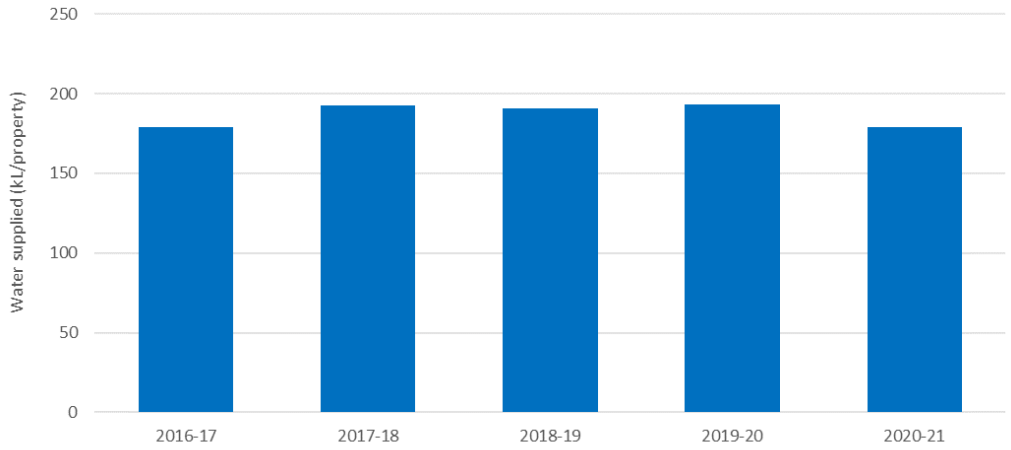
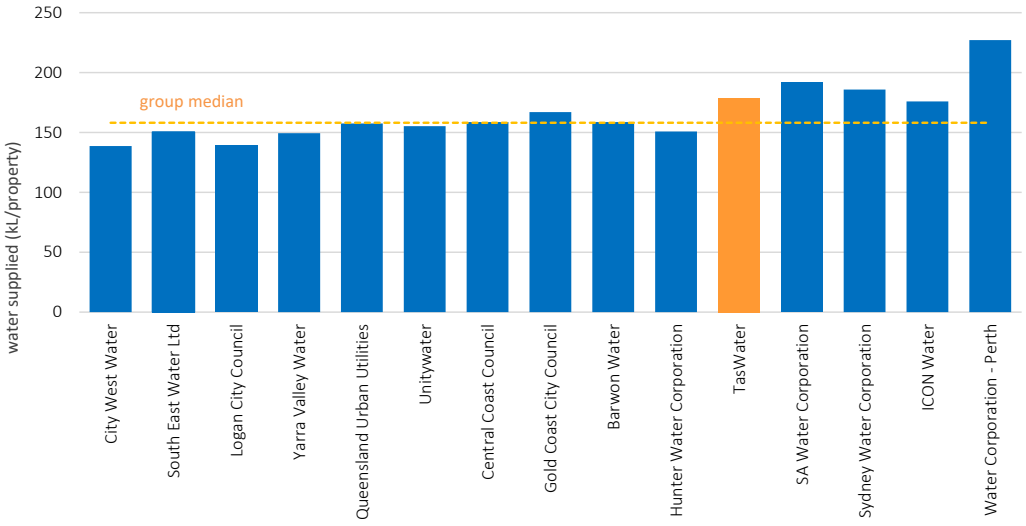


Figure 3.3 shows the average annual volumes of residential water supplied by major utilities (those which service 100 000 or more connected properties) across Australia during 2020-21, together with the median volume of water supplied by these providers. TasWater's average volume of residential water supplied of 179 kL per residence was 13 per cent above the 158 kL median for major water utilities in 2020-21.

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



Source: Bureau of Meteorology, *National performance report 2020-21: urban water utilities,* February 2022 (indicator W12)

The volume of water supplied to customers outside the urban water supply system (ie irrigators) was 2 763 ML in 2020-21, representing around 3.3 per cent of the total volume of potable water produced by TasWater. This was a 24.4 per cent decrease compared to 2019-20.

3.2 Pricing

For 2020-21, 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 uniform pricing applies to 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 tariffs.

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

Table 3.1 Components of typical annual residential customer bill

Component	Charges (2020-21)
Water fixed charge	$342.96
Water usage charge	106.20c/kL
Average annual residential water use	179 kL
Typical residential bill - water	$532.84 [a]
Sewerage fixed charge	$658.16
Typical residential bill - water and sewerage	$1 191.00[a]

[a] Based on Tasmanian average annual residential consumption of 179 kL.

Due to past pricing structures, not all customers have been paying the same price for the same service. TasWater reported that, as at 30 June 2021, 685 water customers (0.31 per cent) and 3 333 sewerage customers (1.69 per cent) were paying tariffs below the standard tariffs.

TasWater's *Shareholders Letter of Expectations* required that prices be frozen, including any transition pricing, for water and sewerage customers from 1 July 2019 to 30 June 2020. The TasWater Board also agreed to apply a price freeze for 2020-21 in order to provide financial relief for customers to assist in dealing with the impacts COVID-19.

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).[24]

The national median residential bill for water and sewerage services for major utilities was around $1 212, although there was significant variation across utilities. TasWater customer's bill based on the same consumption was almost identical at $1 214.

Figure 3.4 Annual bills based on 200kL/pa (water and sewerage), $ 2020-21

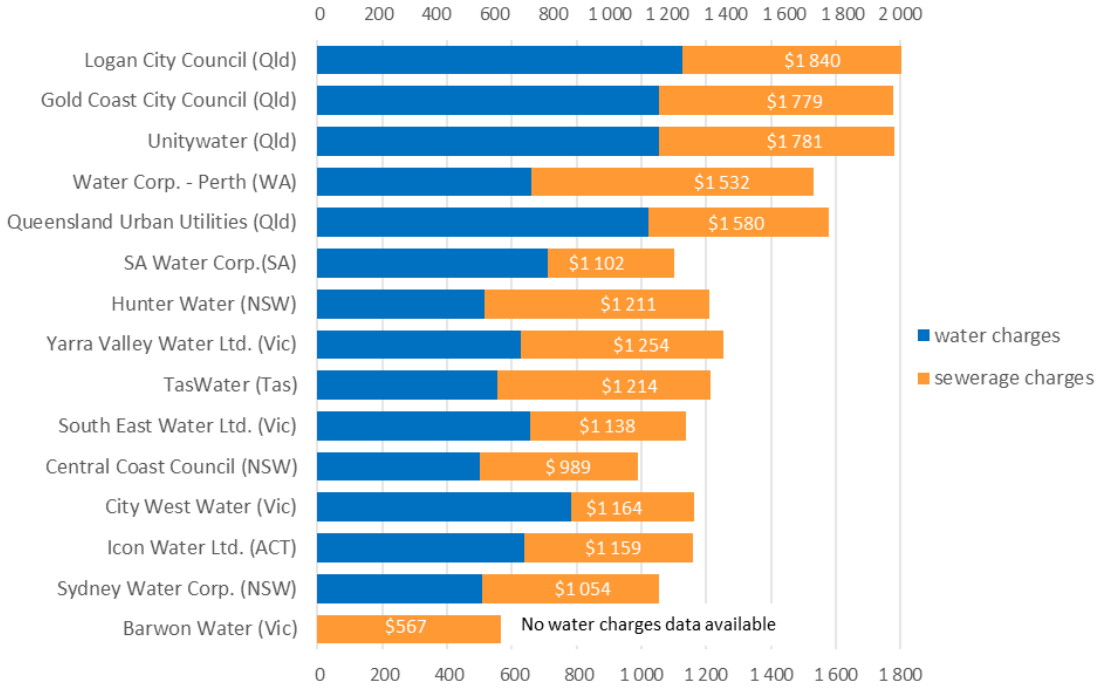
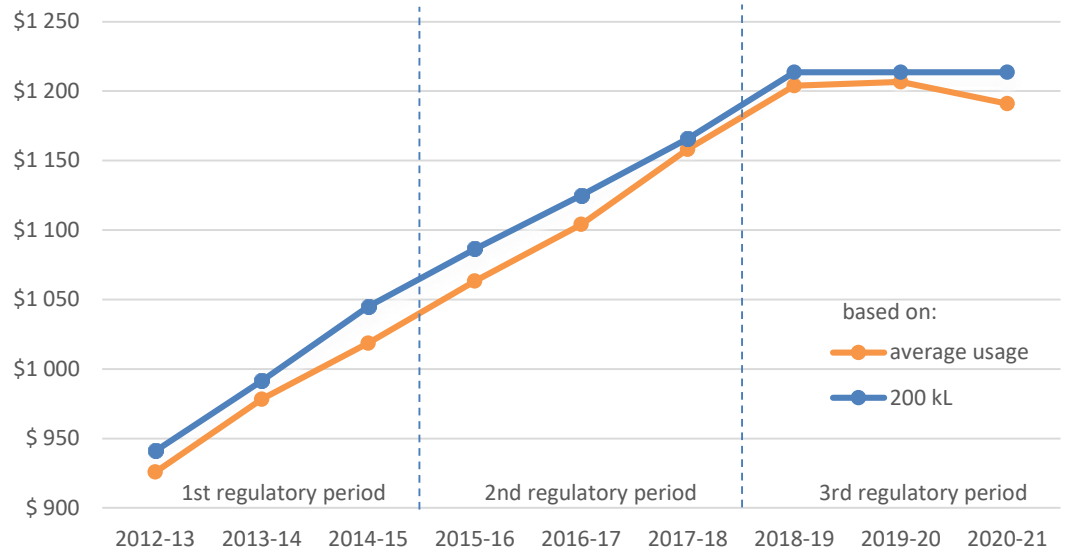


Figure 3.5 shows the calculated annual residential bill for TasWater's customers based on the current tariffs, average annual usage and an assumed 200 kL usage per annum. For a household using 200 kL per year, the bill has remained unchanged at $1 214 in 2020-21.

[24] Bureau of Meteorology, *National performance report 2020-21: urban water utilities,* February 2022 (indicator P7).

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 $171.50 per property.[25] As a percentage of total water and sewerage bills, TasWater's fixed water charges ($342.96) represent 28.3 per cent of the total bill, while the fixed water charges of mainland utilities are typically around 12.4 per cent of the total bill.

Conversely, TasWater's usage charges are significantly less than those charged by mainland utilities (around $2.55 per kL on average 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 TasWater has not been required to invest in very high cost WTPs (eg desalination plants) to meet urban water supply requirements and water transport costs, including pumping costs, are relatively low for much of Tasmania.

3.2.2 Concession customers

Eligible customers were entitled to an annual water and sewerage concession of $201.62 ($100.81 each for water and sewerage) during 2020-21. The concession increases each year in line with movements in the consumer price index (CPI) for Hobart. In 2020-21, 50 707 customers received the benefit of a concession (approximately 26.6 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:

- Services Australia Health Care Card;
- Services Australia or Department of Veterans' Affairs Pensioner Concession Card; or

[25] Bureau of Meteorology, *National performance report 2020-21: urban water utilities,* February 2022 (indicator P1.2).

- Department of Veterans' Affairs Health Card (also known as 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 much less than total cost. In 2020-21, TasWater received a total of approximately $9 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.

Table 3.2 shows call centre performance for 2020-21 and over the previous four financial years.

Table 3.2 Call centre performance

Category	2016-17	2017-18	2018-19	2019-20	2020-21
Total number of calls	149 170	174 579	153 866	168 291	138 121
Number of calls answered by an operator within 30 seconds	132 876	151 017	134 040	139 737	127 242
Performance/service standard (%)	89% / 85%	87% / 85%	87% / 85%	**83%** / 85%	92% / 85%

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

During 2020-21, TasWater's call centre responded to 138 121 customer calls, a decrease of 30 170 calls from the prior year (which had included a period of unusually high call volumes early in that financial year, prior to the COVID-19 pandemic). The results, as presented in Table 3.2, demonstrate the variability in call volumes from year to year.

For 2020-21, 92 per cent of TasWater's customer calls were answered within 30 seconds, significantly above the service standard of 85 per cent and the 2019-20 result of 83 per cent. TasWater advised that this improvement is reflective of measures implemented in the second half of 2019-20 and its ongoing focus on delivering strong customer service outcomes.

TasWater's call centre performance was significantly better than the median for similar sized water utilities on mainland Australia for 2020-21, which was 65 per cent of calls answered within 30 seconds.[26] TasWater was the highest performing utility with respect to this measure compared to similar sized utilities nationwide in 2020-21.

[26] Bureau of Meteorology, *National performance report 2020-21: urban water utilities,* February 2022 (indicator C14).

3.4 Complaints

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

During 2020-21, TasWater received 2 274 complaints, which represented an increase of approximately 22.5 per cent on the number of complaints received in 2019-20.

ⓘ 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 increased from 8.8 in 2019-20 to 10.6 in 2020-21. The 2020-21 result did not meet the 2020-21 service standard of 9 complaints per 1 000 properties. TasWater's rate of complaints per 1 000 properties was more than double the rate reported for comparable mainland utilities (median of 4.2 per 1 000 properties for 2020-21).[27]

TasWater was able to resolve 96.3 per cent of complaints within 10 days.

TasWater reported that it implemented a new complaints management system from 1 July 2020. This system is designed to deliver further improvements in recording, managing and reporting of complaints leading to a better experience for customers.

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 that applies to TasWater for complaints to the Ombudsman is 0.5 per 1 000 customers.

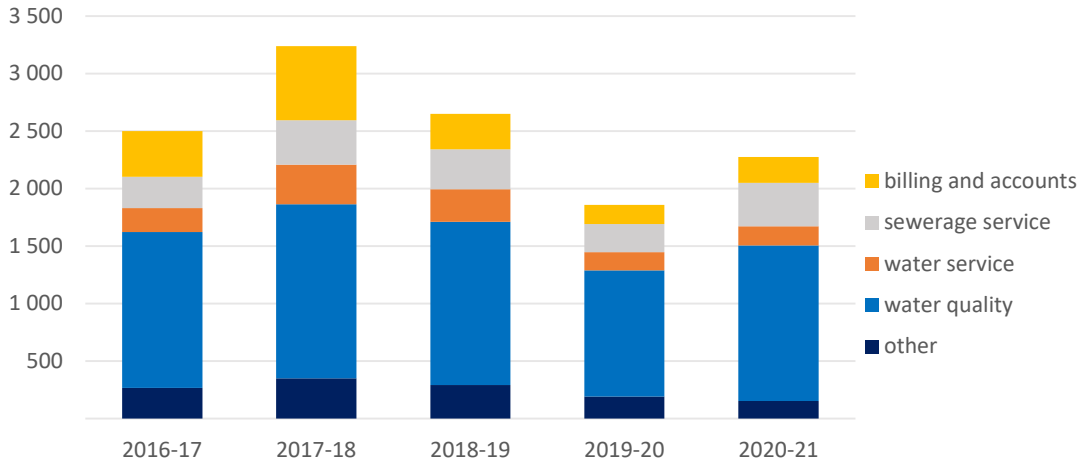
During 2020-21, the Ombudsman received 34 complaints regarding TasWater which was an increase compared with the previous year (29 complaints). The complaints received for 2020-21 equates to 0.16 complaints per 1 000 properties and therefore easily meets the 2020-21 service standard of 0.5. Eleven complaints against TasWater were found to be partly or fully substantiated by the Ombudsman in 2020-21[28].

Figure 3.6 summarises the complaints received by category for 2020-21 and over the previous four financial years. The majority of complaints received in 2020-21 related to water quality (ie taste, colour and odour), which was also the case for the previous four financial years. The number of complaints received across 'water service', 'sewerage service' and 'billing and accounts' complaint categories in 2020-21 increased from those received in 2019-20. The most significant increase was with complaints regarding 'sewerage services', which increased by 55 per cent.

[27] Bureau of Meteorology, *National performance report 2020-21: urban water utilities,* February 2022 (indicator C13).

[28] Ombudsman Tasmania, *Annual Report 2020-21*, page 53.

Figure 3.6 Summary of complaints received by category



As part of ongoing efforts to improve drinking water quality and water service provision across the State, TasWater undertook the following key projects during 2020-21:

- Bryn Estyn WTP upgrade
- Water mains renewal program
- Upgrade to the Henderson Dam

3.5 Payment management

Under the *Tasmanian Water and Sewerage Industry Customer Service Code* (the 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 2019-20 and 2020-21. Data for concession customers are shown in brackets.

As at 30 June 2021, 5 132 residential customers were repaying a debt, making up around 2.7 per cent of residential customers. Results for 2020-21 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. Notwithstanding, there was a decrease in the number of customers on the hardship program in 2020-21.

As at 30 June 2021, 852 non-residential customers were repaying a debt, an increase compared to the previous year (728).

Table 3.3 Residential customers with payment difficulties

Category	2019-20	2020-21
Customers repaying a debt	4 448	5 132
Average debt	$1 194	$1 220
Customers owing more than $500 (percentage of total)	2 434 (55%)	2 893 (56%)
Customers on hardship program (concession customers)	603 (173)	459 (171)
Average debt of customers on hardship program (upon entry)	$1 806	$2 209
Water supply restrictions applied for non-payment (concession customers)	0 (0)	0 (0)
Restrictions for non-payment removed within seven days of being applied (concession customers)	0 (0)	0 (0)
Customers to which legal action applied for non-payment of water bill	74	0

The average amount of debt increased slightly compared to 2019-20, with residential customers owing $1 220 on average.

The number of customers on the hardship program decreased from 603 customers in 2019-20 to 459 customers in 2020-21. As stated in previous state of the industry reports, TasWater has a dedicated hardship team known as Customer Support which liaises with TasWater's hardship customers on a regular basis.

Of the 459 customers using the hardship program, 171 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 $2 209 which is almost double the amount of a typical residential bill for water and sewerage ($1 191).

TasWater reported that no customers had their water supply restricted for non-payment during 2020-21.

3.6 Performance against priorities in the 2018-22 Price and Service Plan

TasWater is required to report to the Economic Regulator on its performance against the key outcomes sought in its 2018-22 Price and Service Plan.[29]

TasWater's Price and Service Plan sets out the prices, services, projects and outcomes to be delivered by 2021 consistent with its Long Term Strategic Plan. Some of these impact directly on its customers. These include:

- 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.

[29] TasWater's Price and Service Plan for the third regulatory period available for download at https://www.taswater.com.au/Your-Account/Price---Service-Plan. Amendments introduced into the Industry Act in 2020 extended the Economic Regulator's *Tasmanian Water and Sewerage Corporation Pty Ltd, Water and Sewerage Services Price Determination, 1 July 2018 – 30 June 2021* and application of TasWater's Price and Service Plan for an additional 12 months, to 30 June 2022.

- 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.
- The maintenance of 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 necessary to achieve the above outcomes while managing impacts to customer bills and maintaining prudent debt levels.

TasWater had already achieved its standards for microbiological compliance and boil water and public health alerts in 2018-19. For the third consecutive year, TasWater achieved 100 per cent microbiological compliance across its network of reticulated water supply. In addition, no system operated under long-term boil water alerts or had a public health alert (do not consume) in place during the reporting period.

During 2020-21, TasWater continued to focus on reducing environmental risk through development of an Environmental Risk Assessment for effluent discharge to water. TasWater has included this framework in its prioritisation of projects for the next (fourth) regulatory period. TasWater's effluent compliance has remained steady, with the future focus being on projects that mitigate high environmental risk.

In relation to dam safety, TasWater continued to deliver the priority-improvement program approved by the Dam Safety Regulator to ensure that dams meet modern engineering standards and that legacy issues are being progressively addressed. As at 30 June 2021, the number of dams plotting above the ANCOLD Level of Tolerability remained at four. These are being managed by TasWater under mitigation plans agreed with the Tasmanian Dam Safety Regulator.

TasWater's focus in 2021-22 will be to build on its improved performance in 2020-21 and to deliver a number of initiatives to realise further performance improvements. TasWater is currently developing its Final Price and Service Plan 4, for submission to the Economic Regulator by 30 June 2022, which will set out the customer outcomes and prices to be delivered in the next regulatory period.

TasWater's key priorities for improved performance are discussed further in chapter 8. Chapter 8 also provides an overview of TasWater's progress in addressing those key priorities for improved performance that were outlined in last year's Report (*Report on the State of the Tasmanian Water and Sewerage Industry 2019-20*).

4 SERVICE RELIABILITY AND PERFORMANCE

The reliability and performance of TasWater's water and sewerage infrastructure is measured in terms of the frequency and duration of interruptions to service, bursts, leaks or spills, and compliance with regulatory standards.

4.1 Water service reliability and performance

Information on the frequency and duration of water interruptions provides a guide to the reliability of TasWater's 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.

Reporting of performance relies on accurate and reliable data collection. For some indicators, the data remained below the expected audit quality.

Improving data quality and the reliability rating of performance indicators remains a key area of TasWater's focus.

ⓘ Customer service standards

TasWater is required to meet the minimum service standards set out in Schedule 1 of the *Tasmanian Water and Sewerage Industry Customer Service Code* (the Code).

Examples of actions that TasWater has taken during 2020-21 designed to improve data quality and reliability include:

- further development of the KPI Capture Tool that enables TasWater to record and interrogate results more quickly and easily as well as providing an audit trail when inconsistencies or questions arise;
- initial scoping of a new KPI Framework that will outline key definitions, responsibilities, accountabilities and processes in relation to the provision, reporting and analysis of performance indicators;
- the establishment of a new system for complaints management;
- consideration of opportunities to leverage SharePoint to provide further enhancements in capturing and distribution of performance data;
- continuing to embed and refine H2Go with operational field crews; and
- the development of additional automated reports for TasWater staff to use internally.

4.1.1 Water main breaks

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

Table 4.1 shows the number of water main breaks per 100 kilometres of water main as reported by TasWater for 2020-21 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)
2016-17	3 021	48
2017-18	2 461	39
2018-19	2 609	41
2019-20	2 104	33
2020-21	3 374	52

The average rate of bursts and leaks across the State in 2020-21 was 52 per 100 kilometres of water main, a significant increase from rates in recent years. For comparative purposes, the median rate of water main breaks for mainland major water utilities was 17 per 100 kilometres of water main.[30] TasWater's rate of water main breaks has been much higher than the national median for this indicator over the past five years.

TasWater has indicated that the increase in the rate of water main breaks per 100 km during 2020-21 was due to delays in replacing some water mains at the start of 2020-21 as well as a large number of assets nearing the end of their useful lives, resulting in one-off dispersed failures. TasWater advised that its asset renewal increased in 2020-21 and, with improved data on its network, the entity will continue to focus renewals in areas which have the most impact on customers.

4.1.2 Water losses

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

Water 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) and forgone revenue.

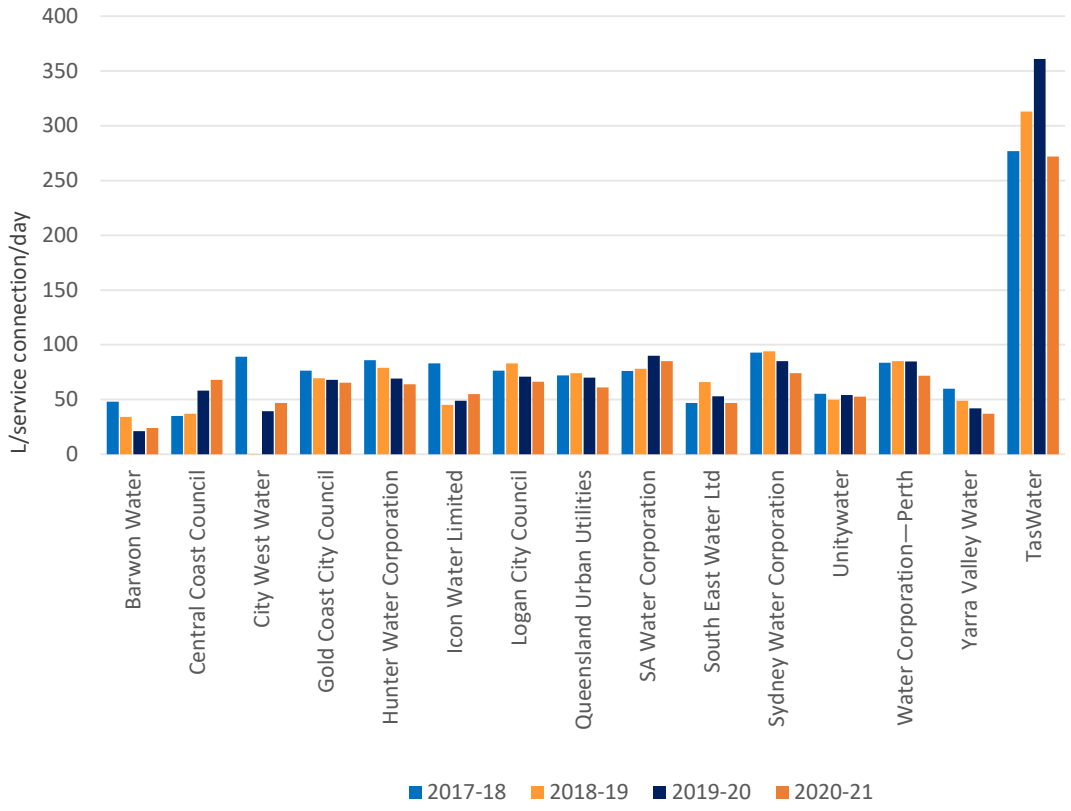
TasWater is not able to obtain reliable estimates of the volume of unaccounted for water. This is because TasWater does not have accurate information on the volumes of water supplied to the urban water supply system from its water treatment plants. As a result, TasWater is also not able to accurately report on its water losses within its water supply system. For some treatment plants, TasWater also does not have accurate information on the volume of sourced water that enters these plants.

[30] Bureau of Meteorology, *National performance report 2020-21: urban water utilities,* February 2022 (indicator A8).

As discussed elsewhere in this Report, TasWater is implementing a range of measures to address the issue of its reported very high volumes of unaccounted for water. This includes conducting an audit of its meters at all its water treatment plants to assess how accurately they measure volumes of water supplied to the urban water supply system from its plants. This audit will then inform a program to improve the accuracy and reliability of this data and subsequent reporting of unaccounted for water.

TasWater estimates that real losses in its reticulation networks were in the order of 272 litres per service connection per day in 2020-21. This is 24.6 per cent less than the losses estimated for 2019-20 (361 litres). TasWater's water losses continue to be the highest of all major Australian water utilities by a substantial margin (Figure 4.1). Per service connection, TasWater's real losses were over four times the median for similar sized mainland utilities, which was 62.5 litres per day in 2020-21. [31]

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



Expressed as real losses per kilometre of water main, TasWater's real losses, estimated at 8.9 kL per kilometre of water main per day, were approximately three times the median for major mainland water utilities, which was 3.0 kL per day.[32]

[31] Bureau of Meteorology, *National performance report 2020-21: urban water utilities,* February 2022 (indicator A10).

[32] Bureau of Meteorology, *National performance report 2020-21: urban water utilities,* February 2022 (indicator A11).

In 2020-21, TasWater's infrastructure leakage index (the ratio of estimated actual real losses to unavoidable real losses[33]) was 2.5, which provides evidence of a significant volume of preventable water loss in TasWater's water supply systems.

Overall, TasWater estimates that around 25 per cent of the total volume of potable water was unaccounted for in 2020-21. The service standard for 2020-21 is for unaccounted for potable water to represent no more than 28 per cent of the total volume of potable water. TasWater achieved this standard. The standard 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 its earlier years of operation.

TasWater advised that the reduction in the percentage of unaccounted for water in 2020-21 was primarily due to natural variation in the calculation and improvements in sourcing data for this complex indicator. TasWater further advised that as part of its Non-Revenue Water Reduction Strategy a number of initiatives are progressing that are expected to drive a tangible reduction in actual losses over coming years. They include commencement of a District Meter Area program which is aimed at identifying the areas of greatest leakage in TasWater's water supply network.

Matters relating to TasWater's rate of unaccounted for potable water, including the service standard, were considered as part of the Economic Regulator's 2022 Water and Sewerage Price Determination Investigation and are further discussed in the Economic Regulator's 2022 Price Determination Investigation Final Report.[34]

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 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 can 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.

For 2020-21, TasWater reported 208 unplanned interruptions per 1 000 properties, a small decrease from 2019-20 (220) and above the service standard for 2020-21 of 170. The median rate of water supply interruptions reported by mainland major water utilities in 2020-21 was 100 unplanned interruptions per 1 000 properties.[35]

In 2020-21, TasWater reported that the average duration of an unplanned water supply interruption was 154 customer minutes off supply (ie each unplanned water supply

[33] 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.

[34] 2022 Water and Sewerage Price Determination Investigation | Office of the Tasmanian Economic Regulator

[35] Bureau of Meteorology, *National performance report 2020-21: urban water utilities,* February 2022 (indicator C17).

interruption lasted, on average, just over 2½ hours). Similar utilities on the mainland reported a median of 144 customer minutes off supply.

Depending on the location of the break or fault, an unplanned interruption may affect one or many customers. Unplanned interruptions to water supply affected, in total, 44 723 customers during 2020-21. On average, 33 customers lost supply for each unplanned interruption.

Table 4.2 shows that the number of unplanned interruptions and the number of customers affected by unplanned interruptions each decreased in 2020-21 compared to the preceding year.

Table 4.2 Unplanned water interruptions

	Number of unplanned interruptions	Number of customers affected
2016-17	Unreliable data	Unreliable data
2017-18	1 463	44 737
2018-19	1 511	45 026
2019-20	1 477	46 710
2020-21	1 352	44 723

Table 4.3 shows the average customer minutes off supply for both planned and unplanned water interruptions, together with the minimum service standards for 2020-21.

In relation to planned water interruptions, TasWater did not meet any of the Code's minimum service standards in 2020-21. As an example, with respect to the duration of planned interruptions, TasWater only achieved the customer service standard of less than 3 hours 14 per cent of the time (against the standard of 80 per cent). This is also reflected in other measures, with 54 per cent of planned interruptions lasting less than five hours (against a standard of 90 per cent). On average, 32 customers lost supply for each planned interruption.

TasWater advised that it is continuing to develop actions targeted at improving such metrics, but that the size and complexity of works are expected to continue to present challenges to achieving compliance. TasWater also advised that capturing data at the source of the interruption (rather than through a separate manual process) is an area where further improvement can be made through ongoing refinement to H2Go and supporting changes in internal processes.

Table 4.3 Water supply interruptions

	CSC standard 2020-21[36]	2016-17	2017-18	2018-19	2019-20	2020-21
Planned interruptions						
Average customer minutes off supply*		N/R	36#	29	21	24
Incidence of planned interruptions - water (no. per 1 000 properties)	20	N/A	109	112	61	**47**
Percentage of planned water interruptions with a duration of less than 3 hours[a]	80%	N/R	11[b]	27	14	**14**
Percentage of planned water interruptions with a duration of less than 5 hours[c]	90%	99#	38#[b]	59	84	**54**
Unplanned interruptions						
Average customer minutes off supply*		N/R	34	37	34	32
Incidence of unplanned interruptions - water (no. per 1 000 properties)	170	N/R	216	215	220	**208**
Percentage of unplanned water interruptions with a duration of less than 3 hours[a]	80%	N/R	86	86	87	84
Percentage of unplanned water interruptions with a duration of less than 5 hours[c]	94%	86#	96	96	95	94

Results for 2020-21 in **bold** indicate that the standard for 2020-21 was not met.

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

- Data contain 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'.

With respect to the incidence of unplanned interruptions per 1 000 properties, TasWater did not meet the Code's minimum service standard of 170 in 2020-21. However, TasWater met the minimum standards for the remaining two performance indicators relating to the duration of unplanned interruptions.

For those customers who experienced an unplanned interruption to their water supply in 2020-21, for 84 per cent of the time the average duration of the interruption met the standard of three hours. Ninety-four per cent of unplanned interruptions were restored within five hours, meaning that the minimum service standard for 2020-21 of 94 per cent was met.

[36] Minimum service standards for 2020-21, as per the *Tasmanian Water and Sewerage Industry Customer Service Code*, Version 7, 27 November 2020.

TasWater reported that in 2020-21 it established a dedicated service interruption team with the aim of enabling TasWater to more effectively respond to faults and emergencies and deliver better outcomes for its customers. TasWater also advised that learnings continue to be applied to update and refine processes and inform training and customer service coaching with a view to better managing risks and delivering a more consistent customer experience. TasWater stated that a pilot of a new location system is planned to occur in 2021-22 with a view to improving response times and optimising the scheduling of its work crews.

4.1.4 Attendance to bursts and leaks

Water breaks, in the form of 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 2020-21 and for the previous four years.

ⓘ 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 2020-21, TasWater met the minimum service standards for Priority 1, Priority 2 and Priority 3 bursts and leaks.

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

	CSC standard 2019-20[37]	2015-16	2016-17	2017-18	2018-19	2020-21
Priority 1	60 min/90%	93%	94%	97%	92%	90%
Priority 2	180 min/90%	94%	96%	96%	97%	93%
Priority 3	4 320 min/90%	81%	90%	89%	95%	93%

4.2 Sewerage service reliability and performance

In cases where the relevant information for Level 1 STPs is not available, this chapter reports on the performance of TasWater's 77 Level 2 STPs.[38,39]

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.

[37] Minimum service standards for 2020-21, as per the *Tasmanian Water and Sewerage Industry Customer Service Code*, Version 7, 27 November 2020.

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

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

4.2.1 Sewer main breaks and chokes

The number of breaks and chokes in sewer mains indicates the condition of the sewerage network and, in some cases, the level of service received by customers. A break is a failure of a sewer main that results in an interruption to sewerage transport and treatment operations. 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.

ⓘ 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 2 745 sewer main breaks and chokes during 2020-21, which is a significant increase on the previous year (1 981 reported in 2019-20).

Reliability of the sewerage network is measured by the frequency of the number of sewer main 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 57 breaks and chokes per 100 kilometres of sewer main in 2020-21 is approximately 39 per cent more than the number in the previous year (41) but achieves the 2020-21 service standard of 65 per 100 kilometres of sewer main.

The performance of TasWater's sewerage network for 2020-21 was worse than the average of its mainland counterparts, as the median rate reported for mainland major water utilities was 27 breaks and chokes per 100 kilometres of sewer main.[40]

Table 4.5 Sewerage main breaks and chokes

	Total number of breaks and chokes	Sewerage mains breaks and chokes (per 100km sewer main)
2016-17	2 156	45
2017-18	2 135	45
2018-19	1 752	37
2019-20	1 981	41
2020-21	2 745	57

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. 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 2020-21 was 7 per 1 000 property connections, much lower than the rate of 13 per 1 000 property

[40] Bureau of Meteorology, *National performance report 2020-21: urban water utilities,* February 2022 (indicator A14).

connections reported in 2019-20. The national median for similarly sized urban water utilities on mainland Australia, however, is around three breaks per 1 000 properties.[41]

4.2.3 Sewer spills

A spill occurs when untreated sewage from the sewerage system (ie pumping stations, pipes, maintenance holes or designed overflow structures) escapes 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.

ⓘ 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

TasWater must notify the Director, EPA, of any release of sewage that causes or may cause serious or material environmental harm.[42] The threshold for reporting sewer spills varies between environmental regulators in different jurisdictions. Because of the variations in these thresholds, the data on sewerage spills are not comparable and sewer spills are no longer included in national performance reporting.

Table 4.6 shows the number of sewer spills per 100km of sewer main and the percentage of spills contained within five hours (against a customer service standard of 99 per cent). Chapter 6 in this Report provides details of an incident in 2020-21 that resulted in TasWater receiving an Environmental Infringement Notice from the EPA.

Table 4.6 Sewer spills

	Number of sewer spills (per 100km of sewer main)	Spills contained within five hours (%)
2016-17	NR [a]	NR [a]
2017-18	78	99.7%
2018-19	98	99.7%
2019-20	88	99.7%
2020-21	68	99.4%

Source: TasWater Annual Performance Report 2020-21.

a. NR - Not reported due to incomplete or missing data.

As 99.4 per cent of sewage spills (from reticulation and branch sewers) in 2020-21 were contained within five hours, the service standard was met.

During 2020-21, the rate of spills relative to the length of the sewerage network was 68 per 100 km of sewer main. This was a decrease from the 88 sewer spills per 100km of sewer main reported in 2019-20.

41 Bureau of Meteorology, *National performance report 2020-21: urban water utilities,* February 2022 (indicator A15).

42 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 EPA Policy Register | EPA Tasmania.

4.2.4 Sewerage interruptions

A sewerage interruption is any event affecting sewerage-related activities. This includes events that cause sewerage-related activities to be reduced or suspended without affecting customers. Timing of the duration of an interruption starts when TasWater is made aware of the interruption and ends when normal activities resume. Table 4.7 shows the minimum service standards for sewerage activities as outlined in the Code.

Table 4.7 Sewerage interruptions

	CSC standard 2020-21[43]	2016-17	2017-18	2018-19	2019-20	2020-21
Sewerage mains breaks and chokes (no. per 100km of sewer main)	65	45	45	37	41	57
Percentage of response times within 60 minutes to attend sewer spills, breaks and chokes	90%	NR	81%	89%	91%	91%
Percentage of sewage spills contained within 5 hours	99%	NR	99.7%	99.7%	99.7%	99.4%

NR - Not reported due to incomplete or missing data.

In 2020-21, TasWater met all three standards for sewerage service interruptions as specified in the Code. TasWater reported that the increase in the rate of sewerage mains breaks and chokes per 100km of sewer mains was largely due to lower than expected completion rates of planned maintenance for sewer mains cleaning and a delay in delivery of the sewer main CCTV program at the start of 2020-21.

Whilst the time to attend sewer spills, breaks and chokes met the minimum standard, TasWater advised that there had been continued focus during the 2020-21 year on identifying time variances and understanding the reasons for those variances.

4.3 Incidents of non-compliance

For 2020-21, TasWater reported the following regulatory non-compliances:

- Two public health non-compliances: two drinking water systems where chemically non-compliant during 2020-21 (Cornwell system and the Coles Bay system).
- One Environmental Infringement Notice issued by the EPA relating to a failure to notify of a process malfunction that occurred at the Prince of Wales Bay STP.
- One dam safety non-compliance was recorded, relating to a small embankment that presented a potential failure risk.

There were no instances of non-compliance regarding the requirements of the Economic Regulator.

[43] Minimum service standards for 2020-21, as per the *Tasmanian Water and Sewerage Industry Customer Service Code*, Version 7, 27 November 2020.

4.4 Review of customer service standards

The Economic Regulator sets customer service standards for TasWater. Each service standard has a minimum or level of service for TasWater to achieve.

As noted in its 2022 Price Determination Investigation Final Report, the Economic Regulator approved customer service standards for the fourth regulatory period, with the newly approved minimum service standards to be implemented by way of the Code change process (for a 1 July 2022 commencement).

The new version of the Code remains unchanged from the previous version in all parts except for Schedule 1. From 1 July 2022, Schedule 1 (minimum service standards) will reflect the Economic Regulator's decisions contained in its 2022 Price Determination Investigation Final Report, summarised as follows:

- improved service levels for water main breaks;
- improved service levels for unplanned water supply interruptions;
- new minimum standard for planned water supply interruptions based on the completion time nominated by TasWater to affected customers;
- improved service levels for unaccounted for water;
- new service standard for real (water) losses;
- improved service levels for sewerage mains breaks and chokes;
- improved service levels for the containment of sewage spills;
- new service standard for critically notifiable sewage spills;
- new service standards for customer complaints, separated into water and sewerage categories;
- new service standard for calls resolved upon first contact; and
- new service standard for customer satisfaction score.

The following service standards have been removed from Schedule 1:

- average standards for water supply interruptions;
- combined water and sewerage complaints; and
- complaints to the Ombudsman.

Most of the service standards removed from Schedule 1 of the Code are NPR indicators and will continue to be reported by TasWater in its annual performance reports.

5 DRINKING WATER

This chapter outlines the Department of Health's (DoH'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.

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 of this Report, during 2020-21 no water supply systems supplied raw water (no treatment processes) prior to delivery to customers.

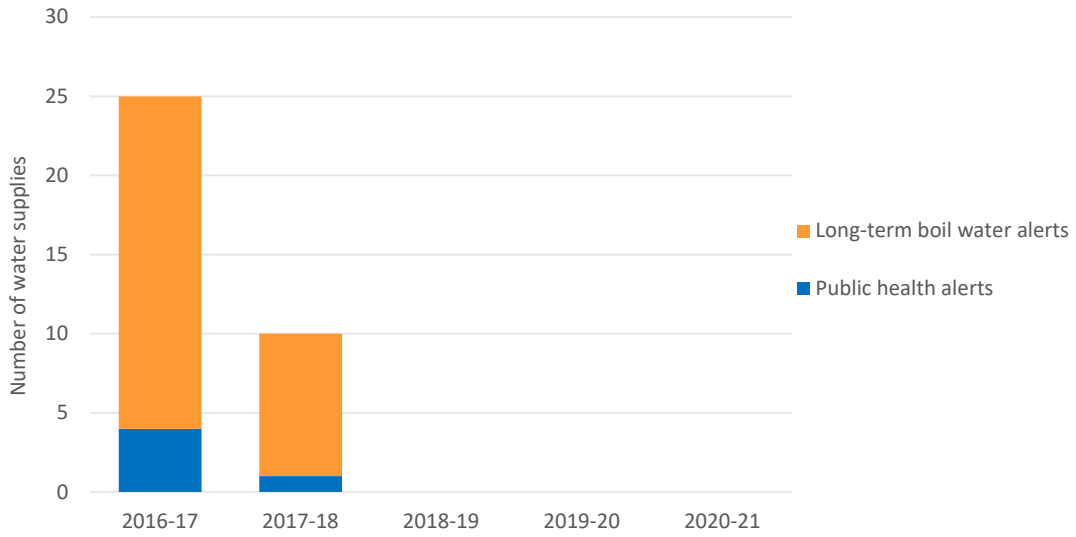
One water supply system provided disinfection only, with a single treatment barrier such as chlorination or ultraviolet light. Chlorination can become ineffective if the source water becomes turbid, which commonly affects raw water during heavy rain and/or drought conditions. If chlorination becomes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

The remaining 59 water supply systems (98 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 at30 June 2021, none of TasWater's 60 water supply systems operated under either a long-term BWA or a public health alert (PHA - do not consume) which was the same number as the previous year. Figure 5.1 shows the number of water supplies with a public health warning applied over the past five years.

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 representative of the water provided to consumers throughout the year.[44]

ⓘ Drinking water guidelines

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

During 2020-21, DoH found that TasWater had adequately monitored all 60 of its water supply systems in compliance with the required sampling frequency specified in the ADWG and DWQG.

DoH assessed all 60 of TasWater's public drinking water supply systems to be microbiologically compliant (100 per cent). This is based on each water supply system exhibiting greater than 98 per cent of all microbiological samples to be free of microbiological contamination (ie *E.coli*).

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

Table 5.1 compares the level of compliance, non-compliance and unknown compliance (due to insufficient sampling) from 2016-17 to 2020-21.

Table 5.1 Microbiological compliance of drinking water supply systems

Microbiological compliance	2016-17	2017-18	2018-19	2019-20	2020-21
Compliant (no. / percentage)	71 (82)	56 (88)	62 (100)	61 (100)	60 (100)
Non-compliant (no. / percentage)	16 (18)	8 (12)	0	0	0
Unknown compliance (no. / percentage)	0	0	0	0	0

TasWater uses microbiological compliance data to identify and manage risks of water supply systems. TasWater identifies microbiological risks in their water supply systems by using a quantitative risk management framework underpinned by health-based targets, which ensures that systems without adequate treatment barriers are prioritised for upgrades. 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 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 BWA is issued to protect the public from the risk of water contamination in the meantime.

ⓘ Boil water alerts (BWAs)

When a BWA 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.

Long-term BWAs are issued for water supply systems that are subject to contamination from various environmental sources and where there is an 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 BWAs 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 long-term BWA, and additional criteria must be met before the alert can be lifted.

No Tasmanian water supply system operated under a long-term BWA in 2020-21.

One water supply system operated on a temporary BWA during 2020-21 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 that instance of the temporary BWA is presented in Table 5.2.

Table 5.2 Summary of drinking water non-compliances, 2020-21

Dates	Water supply affected	Action
5 March to 6 March 2021 27 March to 29 March 2021 22 June to 9 July 2021	Adventure Bay (Bruny Island)	A temporary BWA was issued to address risks association with the disinfection barriers.

The Adventure Bay water supply system required replacement of components of the disinfection treatment. This required shutting down the disinfection barriers whilst work was undertaken, meaning that the water supplied potentially contained microbiological contaminants. As a precaution, the work was undertaken under a BWA to protect public from any potential health risks from the consumption of this untreated water. The works were undertaken in three stages.

The Adventure Bay water supply system is the only infrastructure owned and operated by TasWater on Bruny Island. It has one direct connection to the Adventure Bay Shop and provides a fill-point for water carriers to access treated water for delivery around the Island. It is not possible to estimate the number of people that rely on the delivery of treated water, as many Island residents are self-sufficient with their own rainwater collection and storage arrangements. During the BWA periods, the fill-point for water carriers was closed so that no untreated water could be accessed and delivered to residents.

Table 5.3 compares the number of water supply systems which operated with long-term or temporary BWAs between 1 July 2016 and 30 June 2021. During and at the end of 2020-21, there were no drinking water supplies with a long-term BWA in place. This large decrease in the number reported in 2016-17 to 2018-19 was largely 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	2016-17	2017-18	2018-19	2019-20	2020-21
Temporary BWAs	3	3	2	1	1[(a)]
Long-term BWAs	21	9	0	0	0

(a) The temporary BWA was still in place on 30 June 2021 and was subsequently lifted on 9 July 2021.

5.4.2 Population receiving microbiologically compliant reticulated water

Eighty one per cent of the estimated Tasmanian population of 542 000[45] receive their drinking water from a public drinking water supply system. This equates to an estimated population serviced by TasWater of 438 097.[46]

During 2020-21, none of the Tasmanian population supplied with water from a reticulated water supply received drinking water that was assessed as microbiologically non-compliant.

[45] Obtained from ABS website publication 3101.0: Australian Demographic Statistics, March 2021. Released on 16 September 2021. This is known as the Estimated Resident Population.

[46] These estimates exclude visitors to the State. In 2020-21, there were 574 600 visitors to Tasmania, a very large percentage of whom would have consumed water supplied by TasWater (Visitor Statistics - Tourism Tasmania Corporate).

5.5 Chemical compliance of water supply systems

During 2020-21, TasWater adequately monitored all 60 water supply systems for chemical contaminants.

Compliance is assessed against health-based guideline values, which 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 2020-21.

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

	2016-17	2017-18	2018-19	2019-20	2020-21
Chemical non-compliances	10	7	2	2	2

During 2020-21, temporarily elevated levels of lead were identified in the Cornwall water supply system (81 people). Temporarily elevated levels of disinfection by-products were detected in the Coles Bay water supply system (153 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 58 of the 60 water supply systems assessed as being compliant and two systems as non-compliant.

5.5.1 Public Health Alerts

PHAs (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 PHA as at the end of 2020-21.

Table 5.5 shows the number of water supply systems operating under a PHA between 1 July 2016 and 30 June 2021. There were no new PHAs issued during 2020-21.

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

	2016-17	2017-18	2018-19	2019-20	2020-21
Public health alerts	4	1	0	0	0

5.5.2 Population receiving chemically compliant reticulated water

In 2020-21, almost 100[47] per cent of the Tasmanian population serviced by a reticulated water supply system received drinking water that was chemically compliant throughout the year. It remains difficult for TasWater to achieve exactly 100 per cent compliance in this assessment, as any sampling result that is non-compliant for the year results in the entire system being

[47] Determined to be 99.95 per cent.

assessed as non-compliant. The order of magnitude of the percentage is inversely proportional to the population size of the non-compliant systems. That is, the bigger the population, the smaller the percentage of compliance. Matters relating to sample contamination and erroneous results, which are beyond the control of TasWater, are recorded in some sampling events.

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 that is both 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 has expanded the fluoridation of public water supplies to have all serviced communities of greater than 500 population receiving a fluoridated supply.

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, 99[48] per cent receive fluoridated water.[49]

Under the *Fluoridation Regulations 2019*, the fluoride concentration range required in the drinking water supply (to achieve optimum tooth decay prevention) is 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 2020-21, there were 38 fluoridation systems in operation throughout the State servicing 38 of the 60 water supply systems. Thirty two of the 38 fluoridation systems maintained an

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

[49] 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.

average fluoride level within the required fluoride concentration range. This is similar to the compliance reported in 2019-20. The non-compliant fluoridation systems, including the average fluoride concentration, were Bicheno (0.7 mg/L), Forth (0.7 mg/L), Leven River (0.5 mg/L), Longford (0.7 mg/L), Pet River Burnie (0.7 mg/L) and Scamander (0.7 mg/L); all providing less than the required annual average fluoride level.

All these fluoridation systems had operational issues during 2020-21, with many having their fluoride storage tanks repaired or replaced. This results in periods of fluoridation suspension with no fluoride supplied to that water supply. During periods of no or low fluoridation, the requirement still exists to take compliance samples, and this contributes to a lower average fluoride concentration throughout the year.

Table 5.6 shows fluoridation compliance between 1 July 2016 and 30 June 2021. In 2020-21, 81 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)

	2016-17	2017-18	2018-19	2019-20	2020-21
Fluoridation compliance	82	100[50]	99[51]	75[52]	81[53]

In addition to being non-compliant with the Tasmanian requirement of having an average fluoride concentration between 0.8 and 1.1 mg/L, Leven River was also outside the National Health and Medical Research Council's recommended fluoridation range of 0.6 to 1.1mg/L.

However, during 2020-21, there were no instances where a fluoride concentration exceeded the ADWG health related guideline of 1.5 mg/L.

[50] Determined to be 99.8 per cent.

[51] Determined to be 98.9 per cent.

[52] Determined to be 75.1 per cent.

[53] Determined to be 81.3 per cent.

6 ENVIRONMENT

This chapter reports on the performance of TasWater's 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 2020-21 is presented in 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 local councils, or STPs operated by entities other than TasWater.

During 2020-21, 14 of TasWater's Level 2 STPs received annual inflows of more than 1 000 ML. Table 6.1 provides the total flow volumes for 2019-20 and 2020-21 for these STPs, which together accounted for approximately 70 per cent of the total inflows to TasWater's Level 2 STPs during this period. Most of the listed plants service major urban areas and/or accept large volumes of industrial trade waste. Ti-Tree Bend is 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	2019-20	2020-21
Ti-Tree Bend	Launceston	5 644	5 602
Pardoe	Devonport	4 865	4 675
Macquarie Point	Hobart	3 816	3 935
Prince of Wales Bay	Glenorchy	2 970	3 179
Ulverstone	Ulverstone	2 800	3 165
Selfs Point	Hobart	2 929	3 049
Rosny	Clarence	2 301	2 581
Round Hill	Burnie	2 200	2 313
Blackmans Bay	Kingston	1 889	2 047
Cameron Bay	Glenorchy	1 856	2 008
Smithton	Smithton	1 516	1 518
Wynyard	Wynyard	1 389	1 403
Norwood	Launceston	1 049	1 081
Newnham Drive	Launceston	1 071	1 020

[54] In this system, both sewage and stormwater are treated before being discharged into waterways.

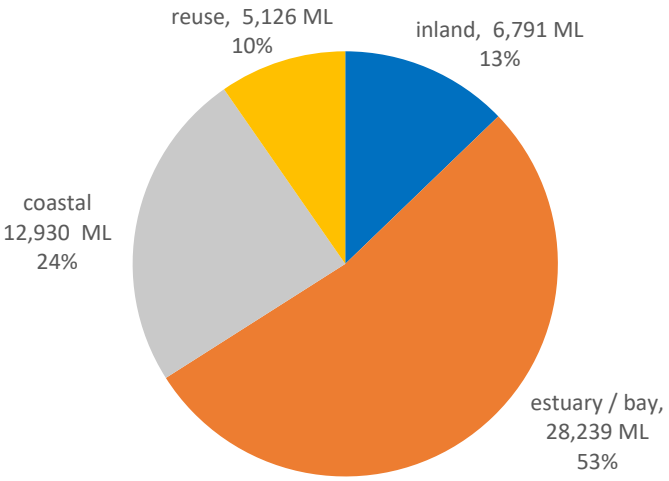
6.2 Outfalls to the environment

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.

TasWater operated 77 Level 2 STPs during 2020-21. Of the associated discharge locations, 13 locations were classified as to discharge to marine environments, 28 to estuaries or bays and 36[55] to inland waters. However, not all STPs discharged to water in 2020-21. Treated effluent produced at 7 plants was fully reused and there was no discharge to receiving waters from these plants.

Figure 6.1 shows the volume and percentage of treated effluent discharged by Level 2 STPs during 2020-21, categorised by receiving environment. These percentages have remained relatively unchanged over recent reporting periods.

Figure 6.1 Sewage discharge by receiving environment 2020-21 (ML/year; percentage of flow)



With 28 239 ML or 53.2 per cent of the total, discharge to estuarine waters represents the largest part of the total volume of effluent discharged. Discharge to coastal waters accounted for 12 930 ML or 24.4 per cent, and inland waters accounted for 6 791 ML or 12.8 per cent. 5 126 ML or 9.7 per cent of the discharged effluent was reused.

Regional differences in population settlement are reflected in the predominant type of receiving environment for different parts of the State. 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 almost two thirds (64 per cent) of the total volume of effluent reused in 2020-21.

[55] One STP, Cambridge/Airport STP, was re-classified in 2020-21 from previously estuary/bay to discharge to inland water.

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. Discharge limits may change over time as these aspects are re-evaluated.

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 reported to provide an indicator of changes in STP performance over time.

Section 6.3.1 examines compliance against current regulatory limits, while performance against the theoretical AMT benchmark 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.

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 discharge limits for both discharge to land (effluent reuse) and discharge to water exist for a STP, compliance is assessed and reported separately against each set of limits. The flow-weighted combined compliance for discharge to water and land is also reported.

The discharge to waters compliance figure for STPs with full reuse (no discharge of treated effluent to waters) has relevance as an indicator of the likely discharge quality for potential future discharge events. For this reason, where feasible, the 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

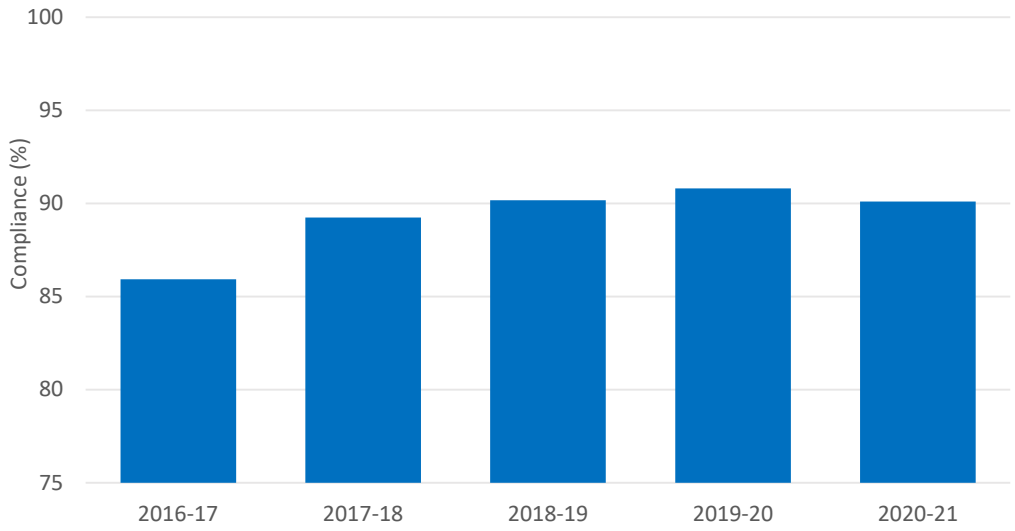
This section assesses compliance with regulatory discharge to waters limits for all STPs combined. Seven STPs from which discharge to waters did not occur during 2020-21 are excluded from the assessment. Seventy out of TasWater's 77 Level 2 STPs contributed to the flow-weighted discharge to waters compliance measure for 2020-21.

Figure 6.2 shows compliance against discharge to waters limits over time. In 2020-21, TasWater achieved 90.1 per cent compliance with regulatory discharge to waters limits.

ⓘ 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 are 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, 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) (flow-weighted)



Overall compliance levels are further illustrated in Table 6.2. In 2020-21, 12 TasWater STPs were classified as substantially non-compliant (ie 75 per cent or less compliant) with their regulated discharge limits, one plant less than in 2019-20. All 12 substantially non-compliant STPs discharged part or all of their treated effluent to water.

In 2020-21, flow-weighted overall compliance with regulatory discharge to water limits reduced slightly from the 2019-20 level (90.8 per cent) but still remained within the desirable range of above 90 per cent. Eight of the 13[56] largest plants achieved more than 90 per cent compliance in 2020-21.

Treatment process optimisation efforts over the past years have resulted in improvements in compliance levels, particularly at the larger STPs. This is illustrated by the difference in average compliance (86.0 per cent), and flow weighted compliance (90.1 per cent) of all 70 assessed

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

STPs that discharged to water in 2020-21. As a result, the overall flow-weighted compliance figure is biased towards the compliance outcome of the large STPs.

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

	2016-17	2017-18	2018-19	2019-20	2020-21
>90% compliance	30	33	25	31	32
>75 - 90% compliance	30	27	35	26	28
>50 - 75% compliance	8	11	11	10	11
≤50 % compliance	4	3	2	3	1

Table 6.3 lists STPs with 50 per cent or less compliance against regulatory discharge to water limits in 2020-21. Only Westbury STP falls into this category in 2020-21. A number of minor works have been noted as having the potential to improve compliance for this treatment plant, including desludging, reduction of inflow and infiltration, and lagoon repairs but these works have not progressed in the 2020-21 period.

Compliance against discharge limits for Bridport STP rose above the 50 per cent mark for the first time since 2014-15, as a result of a combination of minor upgrades to the treatment infrastructure, and variation of regulatory discharge limits to better reflect both the capability of the infrastructure and assimilative capacity of the receiving environment. Further improvements may be required to achieve more substantial lifts in effluent compliance at Bridport 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 (%)
Westbury[1]	Max/Min	10	50.0

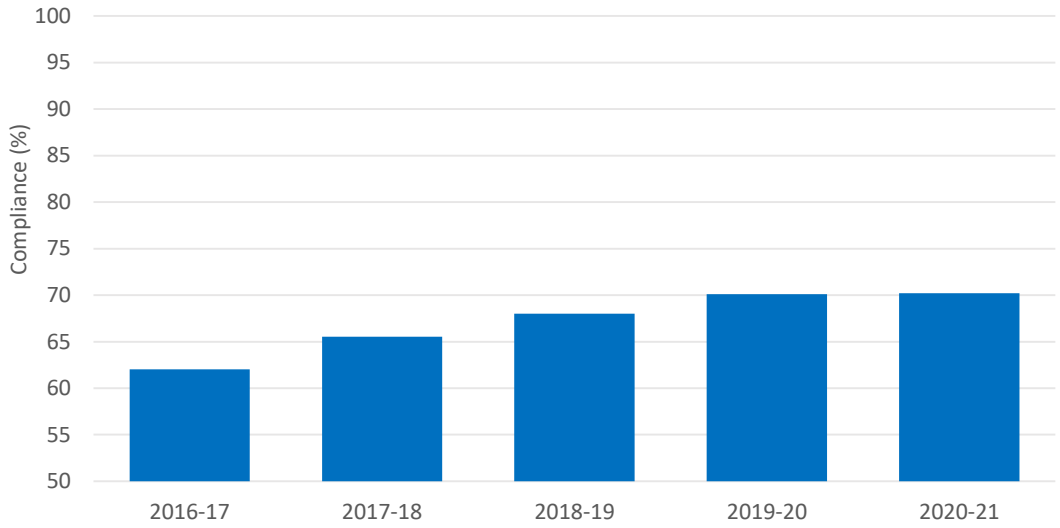
Notes: 1. Indicates consecutive years of 50 per cent or less compliance.

6.3.2 Performance against AMT discharge to waters limits

The limits adopted for the analysis in this section represent AMT standards specified by the *Emission Limit Guidelines for Sewage Treatment Plants* (Department of Primary Industries, Parks, Water and Environment, 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.

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. It continues to display a moderate upwards trend, which commenced in 2016-17. The 2020-21 performance level of 70.2 per cent of flow-weighted sample compliance is comparable to the 2019-20 result of 70.1 per cent.

Table 6.4 below shows distribution of STP numbers separated into performance categories over time. Of the 13 largest STPs, Blackmans Bay STP in Kingborough, Round Hill STP in Burnie and Selfs Point STP in Hobart achieved more than 90 per cent compliance with the AMT benchmark in 2020-21, similarly to 2019-20. Five STPs classified as having secondary treatment processes (Dover, Geeveston, Ridgley, Risdon Vale and Zeehan) also achieved more than 90 per cent compliance with the AMT benchmark.

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

	2016-17	2017-18	2018-19	2019-20	2020-21
>90% compliance	10	12	11	12	16
>75 - 90% compliance	15	14	17	15	10
>50 - 75% compliance	34	30	24	25	32
≤50 % compliance	15	19	20	19	15

6.3.3 Summary of discharge to waters limits compliance

TasWater's flow-weighted compliance against regulatory discharge to waters limits decreased from 90.8 per cent in 2019-20 to 90.1 per cent in 2020-21. Flow-weighted performance against AMT limits showed a slight improvement from 70.1 per cent in 2019-20 to 70.2 per cent in 2020-21.

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

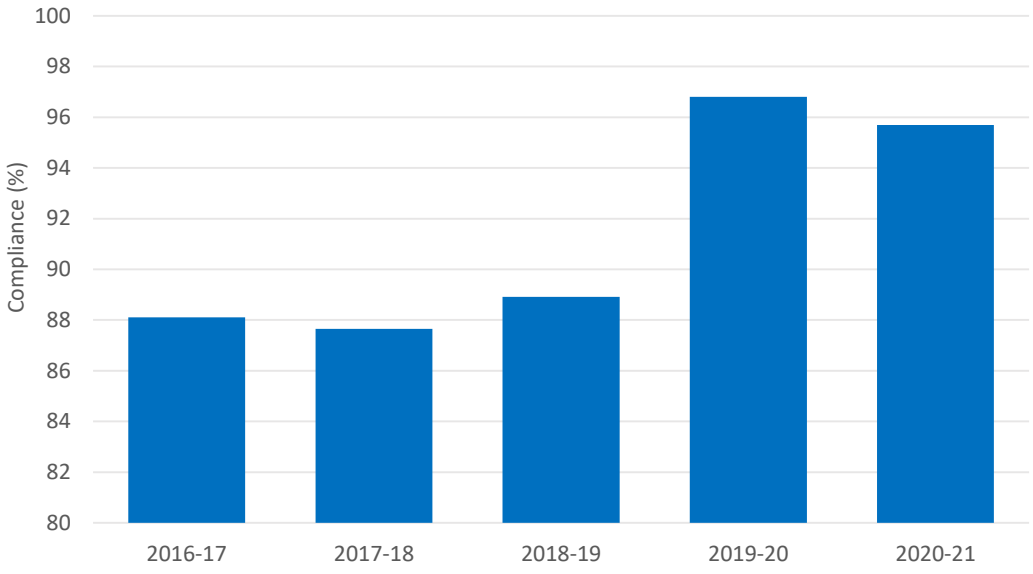
6.3.4 Compliance with discharge to land limits

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 2020-21 were assessed against regulatory discharge to land limits, following a review of those limits by the EPA in 2019. While regulatory discharge to land limits generally align with 'Class B'[57] quality standards as outlined in the *Environmental Guidelines for the Use of Recycled Water in Tasmania* (DPIWE, 2002), individual variations to parameter limits were introduced to reflect the findings of long-term monitoring programs and the use of the recycled water at individual reuse schemes.

The total parameter compliance requirement for treated effluent that is discharged to an approved recycled water scheme is 90 per cent. This requirement reflects the reduced environmental risk of discharge to effluent reuse and is part of a set of measures that support the discharge of treated effluent to sustainable reuse in Tasmania.[58] Where total parameter compliance of treated effluent discharged to reuse is 90 per cent or more for an individual STP, compliance is reported as 100 per cent (i.e. fully compliant with requirements).

TasWater's flow-weighted performance against regulatory discharge to land limits in 2020-21 was 95.7 per cent, below the 96.8 per cent reported for 2019-20 but well within the desirable range of more than 90 per cent compliance.

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



Land irrigation with treated effluent from the Smithton STP first commenced in 2017-18, and continued in 2020-21. Performance assessment outcomes against Class B reuse limits for Smithton (87.4 per cent) are included in the flow-weighted compliance assessment for 2020-21, as was the case for previous reporting periods.

[57] The EPA's assessment prior to 1 July 2019 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/100 mL *E.coli*.

[58] For further information please refer to the 'Regulatory Framework for the Sustainable Discharge of Treated Wastewater from Level 2 WWTPs', EPA Tasmania November 2020, www.epa.tas.gov.au.

No STP achieved less than 50 per cent compliance with its reuse limits in 2020-21, and most STPs are represented in the two highest categories of compliance. Two STPs reported up to 75 per cent compliance and 14 STPs reported up to 90 per cent compliance with regulatory discharge to land limits. 18 STPs achieved compliance above 90 per cent in 2020-21.

Table 6.5 provides an overview of the distribution of STP compliance against discharge to land limits for 2020-21 and for the previous four financial years. It demonstrates a gradual movement of numbers to STPs into the higher compliance categories over those years.

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

	2016-17[1]	2017-18[1]	2018-19[1]	2019-20	2020-21
≥ 90% compliance*	15	15	14	19	18
>75 - < 90% compliance*	8	10	16	12	14
>50 - 75% compliance	7	5	4	3	2
≤50 % compliance	1	1	0	0	0

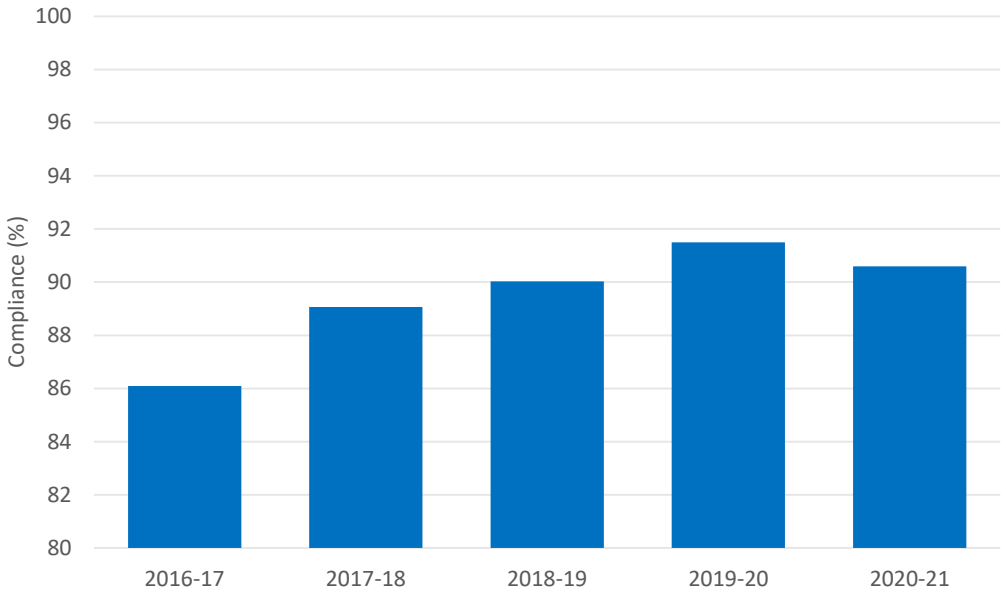
* Compliance categories changed in 2019-20 to include 90.0% in the highest category. Past period results were updated.
[1] Up to and including 2018-19, reporting is against 'Class B' reuse limits.

Tables A3.2 and A3.4 in Appendix 3 show compliance with discharge to reuse limits and reuse flow volumes 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 discharge to land limits combined, on a flow-weighted basis.

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



As the largest part of the flow volume is discharged to water (in 2020-21, 9.7 per cent of effluent from Level 2 STPs was discharged to land, and 90.3 per cent to water), the combined compliance result is weighted towards the discharge to water compliance result.

In 2020-21, TasWater achieved a combined compliance with regulated limits for discharge to water and land of 90.6 per cent. While the 2020-21 result is a reduction from the 2019-20 result of 91.5 per cent, it is still within the desirable range above 90 per cent compliance.

Table A3.3 and Figure A3.3 in Appendix 3 show the flow weighted combined compliance with regulatory discharge to waters and regulatory discharge to reuse limits and the reuse proportion for each individual STP.

6.3.6 Public disclosure of sewage treatment plant performance

TasWater is required to submit Annual Environmental Review (AER) reports for its Level 2 STPs to the Director, EPA and to make these publicly available. In 2020-21, TasWater provided AER reports on all its Level 2 STPs to the EPA. The 2020-21 AER reporting was assessed as compliant with regulatory requirements by EPA.

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 report on 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 measures relevant to 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 result in an enforcement response under the provisions of the *Environmental Management and Pollution Control Act 1994*, or associated regulations.

TasWater received one Environmental Infringement Notice for an offence that occurred in 2020-21. This was for failing to notify the Director, EPA within 24 hours after becoming aware of the release of a pollutant occurring as a result of an incident in relation to a significant process failure at the Prince of Wales STP that commenced in July 2020. Failure to properly manage associated biosolids contamination and report nuisance odour complaints to EPA were considered aggravating factors in the issue of the Environmental Infringement Notice.

The Environmental Infringement Notice specified a fine of $6 880 payable by TasWater.

Section 8.2.1 provides further information on the EPA's priorities for improving TasWater's environmental performance.

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

6.4 Mass loads of nutrients discharged from STPs

Emissions of nutrients, specifically nitrogen and phosphorus, have the potential to impact on the health of waters which receive discharges from sewage treatment. Excess nutrients in waterways can lead to increased algae growth and negatively impact on habitat and species composition in discharge situations where insufficient dilution or assimilative capacity exist. Inland waterways are more susceptible to nutrient impacts due to the generally more sensitive environment, lower level of available dilution (when compared to estuarine and coastal discharges) and the potential for cumulative impacts within a river catchment. Estuarine and Coastal environments provide a greater capacity to assimilate nutrients due to generally higher productivity and tidal flows creating a water, and therefore nutrient, exchange.

The 77 Level 2 STPs operated by TasWater in 2020-21 discharged a total of 1 212 tonnes of total nitrogen to the environment, of which 1 067 tonnes were discharged to water, and 145 tonnes irrigated onto land as part of effluent reuse. Of the 233 tonnes of total phosphorus discharged to the environment, 202 tonnes were discharged to water and 31 tonnes to land.

Figure 6.6 Annual load of major nutrient discharges by receiving environment (per cent)

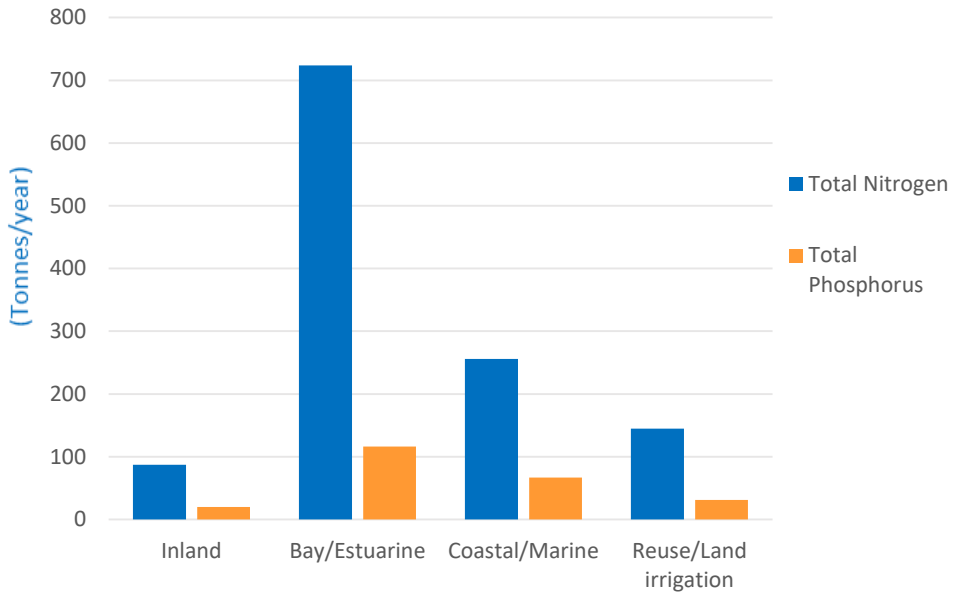


Table A3.3 in Appendix 3 provides mass loads of total nitrogen and total phosphorus discharged to the environment from each Level 2 STP.

6.5 Biosolids reuse

Biosolids are stabilised organic solids produced in sewage treatment processes. Biosolids are a valuable source of nutrients, energy and other components that, when managed appropriately, can be safely and sustainably used in agriculture (as fertilisers or soil conditioners), mine rehabilitation, and other beneficial applications.

The following calculation is used to estimate the proportion of biosolids reused in a reporting period:

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

TasWater reported that 10 503 dry solid tonnes (dst) of biosolids were produced at Level 2 STPs across Tasmania during 2020-21. 9 905 dst were beneficially reused during 2020-21. A minor volume of approximately 15 dst was taken to landfill. The proportion of the biosolids material beneficially reused in 2020-21 was 94.3 per cent of the volume generated (as calculated by the EPA). Adjustments to the method applied to stockpile accounting resulted in a moderate decrease in the reported percentage of biosolids reused when compared to the 99.2 percent reported as reused in 2019-20.

Approximately 2 867 dst remained stored on STP sites at the end of the reporting period, including some volumes produced during previous reporting periods. Significant biosolids stockpiles at the end of 2020-21 were reported at the STPs at Ti-Tree Bend (1 200 dst), Prospect Vale (1 156 dst) and Norwood (511 dst).

End use of biosolids in 2020-21 was evenly distributed between direct agricultural reuse (51.1 per cent) and composting (48.7 per cent) of biosolids end use, while 0.2 per cent was disposed of to landfill. Both direct application of biosolids to land and reuse following reprocessing by composting extract value from biosolids nutrients, and both are therefore recognised as biosolids reuse. Direct application to land is preferable where appropriate as composting represents reprocessing of a product that may already be suitable for its end use, requiring additional energy and potentially entailing some nutrient loss.

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

An overview of the STPs generating the greatest volumes of biosolids in 2020-21 and associated reuse/management practices is set out in Table 6.6, based on the best information available at the time of assessment.

Section 8.2.1 of this Report 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 2020-21

STP Name	Biosolids generated (dry solid tonnes / year)	Biosolids beneficially reused (dry solid tonnes / year)	End use / purpose	Biosolids reused (%)
Ti-Tree Bend	3040	1884	Ti-Tree Bend STP generates significant volumes of biosolids at the premises and receives additional material from other STPs. Of the biosolids produced in 2020-21, 1 884 dst were composted prior to beneficial reuse. A further 1 156 DST were transferred to Prospect Vale STP for intermediate storage. An estimated 1 200 DST of sewage sludge remained stockpiled at the STP premises at the end of 2020-21.	62%
Norwood	1150	750	Biosolids accounted for as produced at Norwood STP include 750 DST produced in earlier reporting periods that were applied to agricultural land in 2020-21. A further 511 dst of new material originating from Norwood and Longford STPs are stockpiled at Norwood for future application.	65 %
Smithton	-	1084	1 084 dst of biosolids from lagoon desludging operations from existing stockpiles on site were reused on agricultural land.	100 %
Selfs Point	914	914	Biosolids generated at Selfs Point STP were applied to agricultural land.	100%
Pardoe	848	848	Biosolids generated at Pardoe STP were composted prior to beneficial reuse.	100%
Prince of Wales Bay	790	790	790 dst of biosolids generated at Prince of Wales Bay STP were composted prior to beneficial reuse.	100%
Rosny	573	573	Biosolids generated at Rosny STP were applied to agricultural land.	100%
Round Hill (Burnie)	526	526	Biosolids generated at Round Hill STP were composted prior to beneficial reuse.	100%
State-wide (TasWater) total	10 503	9 905	Material removed from the treatment system which remains stockpiled at the premises is counted as generated but not reused. 2 867 dst biosolids remained stored at STP sites at the end of 2020-21. 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* (2020). Stockpiles from previous reporting periods are not counted in biosolids generated.	94.3%

6.6 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 2020-21, TasWater's total net greenhouse gas emissions were estimated around 54 312 tonnes CO_2-equivalents (CO_2e) or an average of 252 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 are 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)
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
2019-20	12 348	58.2	33 156	179.0
2020-21	9 701	45.0	43 479	231.8

TasWater's net greenhouse gas emissions, on a per 1 000 properties basis, were slightly higher than those reported by similar utilities on the mainland, which typically averaged, for 2020-21, around 252 tonnes CO_2e produced per 1 000 properties.[60]

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 2020-21: urban water utilities,* February 2022 (indicator E12).

7 FINANCE AND CAPITAL PROJECTS

A range of factors determine TasWater's costs of providing water and sewerage services including the value of the assets held by TasWater, its operating costs and its level of capital expenditure. This chapter provides an overview of TasWater's financial performance and its planned 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 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 2016 to 30 June 2021. Other income includes revenue from other sources such as revenue from third parties (ie CSOs and contributed assets) and other revenue from TasWater's operations.

Table 7.1 Revenue ($'000s, nominal)

		2016-17	2017-18	2018-19	2019-20	2020-21
F1	Water	143 471	153 147	164 506	161 193	169 332
F2	Sewerage	157 197	172 564	183 046	179 127	186 520
	Other	14 816	10 556	11 487	10 673	11 224
F3	**Total income**	**315 484**	**336 267**	**359 039**	**350 993**	**367 076**

TasWater's total income was $367 million in 2020-21, an increase of just over $16 million or 4.6 per cent from 2019-20. The total value of CSOs for 2019-20 was just under $9 million, or 2.5 per cent of TasWater's total income.

Contributed asset revenue of $29.4 million (including headworks charges) made a significant contribution to TasWater's financial position in 2020-21 as did revenue from trade waste, contributing $11 million to TasWater's income for the year.

Revenue from residential water usage charges decreased by 2.3 per cent, from $38.8 million in 2019-20 to $37.9 million in 2020-21, and represented 22 per cent of water revenue.

7.1.2 Infrastructure 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)

		2016-17	2017-18	2018-19	2019-20	2020-21
F9	Water assets	1 269 045[a]	1 273 448	1 313 597	1 329 607	1 323 919
F10	Sewerage assets	1 286 529[a]	1 270 873	1 292 058	1 376 031	1 279 885
	Total	2 555 574	2 544 321	2 605 655	2 705 638	2 603 804

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

As at 30 June 2021, the value of TasWater's water and sewerage infrastructure assets was $2.6 billion (WDRC), a $101.8 million (3.8 per cent) decrease from 30 June 2020. Depreciation on water and sewerage infrastructure assets in 2020-21 on a WDRC basis, was around $160.5 million.

Care should be taken in interpreting some of the measures in this chapter as some of the measures are calculated based on asset values other than the WDRC asset values set out in Table 7.2 of this Report.

7.1.3 Operating costs

For the purpose of this Report, operating costs are the direct costs TasWater incurs providing water and sewerage services (eg chemicals, raw materials, energy costs and salaries and wages). Table 7.3 summarises TasWater's operating costs (including non-regulated activities) over the past five years, allocated between water and sewerage operations.

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

		2016-17	2017-18	2018-19	2019-20	2020-21
IF11	Water	84 184	93 683	103 429	106 886	105 946
IF12	Sewerage	103 414	91 826	101 379	105 781	103 222
IF13	Total	187 598	185 509	204 808	212 667	209 168

The $3.5 million decrease in TasWater's total operating costs in 2020-21 reflected a $4.7 million decrease in administration expenses, a decrease of $1.5 million in finance expenses and a $2.9 million increase in employee-related expenses. Operating costs for sewerage-related activities decreased more from 2019-20 to 2020-21 than those for water-related activities.

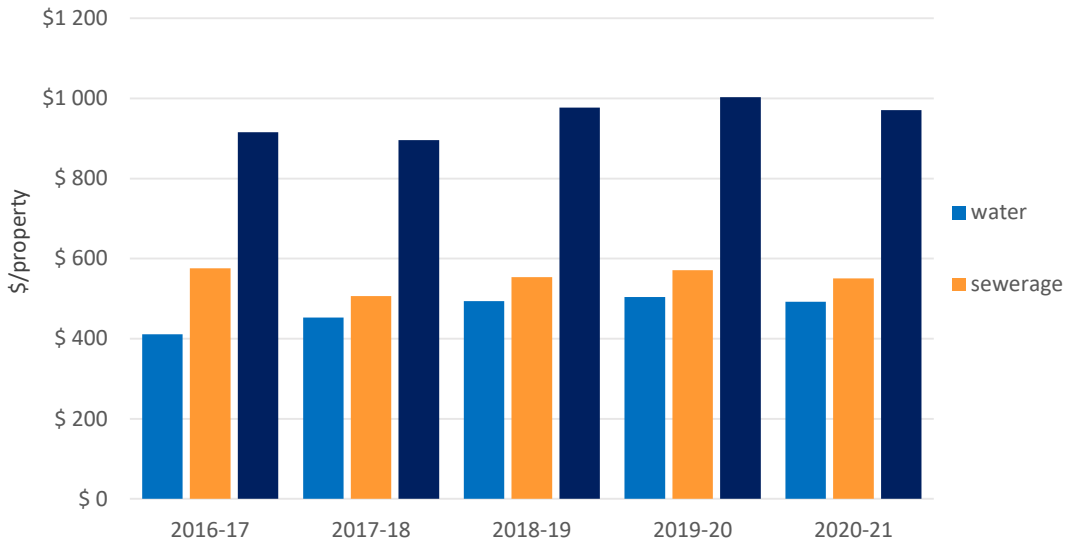
Expenditure on operations and maintenance (including raw materials) fell between 2019-20 and 2020-21.

Per property, TasWater's average operating cost (Figure 7.1) was $971 in 2020-21; approximately $492 for water-related activities and $550[61] for sewerage-related activities.

[61] Based on NPR indicator definitions, operating costs per property for water supply (F11) and operating costs per property for wastewater (F12) will not sum to equal combined operating costs per property (F13).

Operating costs per property decreased by 3.2 per cent from the previous year, compared to a five-year average increase of around two per cent per year.

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's operating costs per property in 2020-21 were higher than many of its interstate counterparts[62], where the median cost was $862 per property.[63] Across the nation, the median operating cost for similarly sized water utilities showed a two per cent decrease from the previous year, with most utilities reporting only small movements in their operating costs per property.

TasWater has previously reported that the level of its operating costs reflects the relatively larger number of dispersed and separate water and sewerage assets that it operates.

7.1.4 Capital expenditure

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.

In 2020-21, TasWater's total capital expenditure for water and sewerage was $164.6 million, which was marginally higher than the average for the past 5 years of $132.1 million. Figure 7.2 shows TasWater's capital expenditure (F16) for water and sewerage over the previous five years. These totals exclude gifted assets and developer charges.

Major expenditure during 2020-21 was attributed to the Bryn Estyn WTP upgrade ($34.3 million), the water mains renewal program ($11.9 million) and the upgrade to the Henderson Dam ($7.5 million).

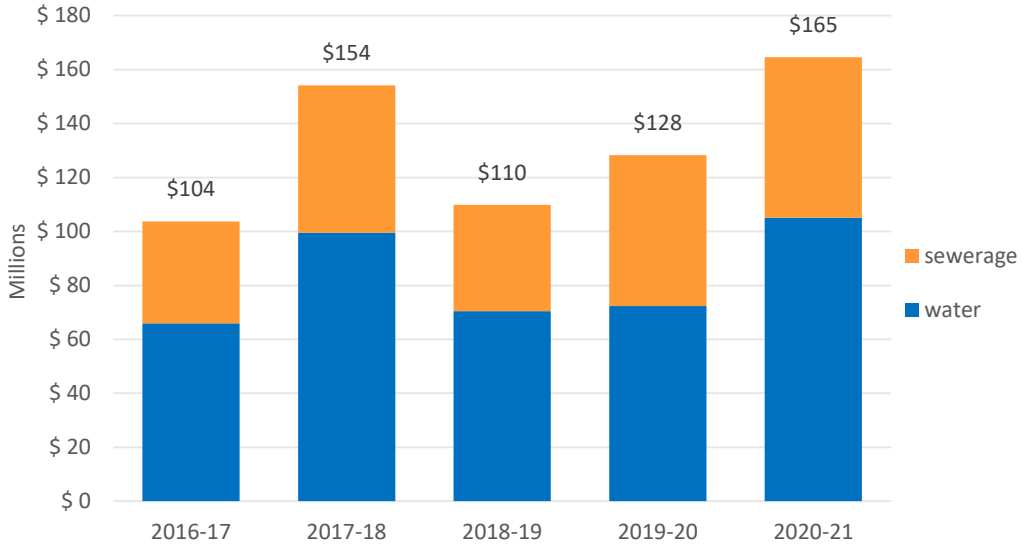
[62] Major utilities (large) with 100 000 or more customers.

[63] Bureau of Meteorology, *National performance report 2020-21: urban water utilities,* February 2022 (indicator F13).

Significant sewerage infrastructure expenditure was attributable to the Longford STP upgrade ($16.4 million), Latrobe Sewerage System – Network upgrade and augmentation ($5.0 million) and the Booth Avenue Sewer Main Upgrade – Stage 2 ($2.8 million).

Approximately $13.0 million was invested in non-network categories including business systems, supervisory control and data acquisition (SCADA), fleet and facilities.

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



During 2020-21 TasWater invested $105.1 million in water infrastructure and $59.4 million in sewerage infrastructure, an overall increase of $36.4 million (28.3 per cent) from 2019-20. Between 2018-19 and 2019-20, capital expenditure in these categories increased by only $18.4 million. Figure 7.2 highlights the variability of TasWater's capital expenditure on water and sewerage infrastructure from year to year.

Amongst major Australian water utilities, TasWater was one of only six utilities that reported an increase in total capital expenditure between 2019-20 and 2020-21. The median percentage change in total capital expenditure from 2019-20 to 2020-21 for comparable utilities was a decrease of one per cent.

Figure 7.3 shows capital expenditure per property for water and sewerage for major Australian water utilities. In 2020-21, TasWater's capital expenditure per property was $488.15 for water and $316.85 for sewerage, a total of $805 per property. TasWater's result was higher than reported outcomes for all similar utilities on the mainland, which reported a median capital expenditure per property for 2020-21 of around $165 for water and $256 for sewerage (total of $421).[64] This outcome indicates the scale of TasWater's capital expenditure to bring the Tasmanian water and sewerage network up to the required standards, including the work associated with replacing infrastructure that is currently underperforming.

[64] Bureau of Meteorology, *National performance report 2020-21: urban water utilities,* February 2022 (indicators F28 & F29).

Figure 7.3 Water and sewerage capital expenditure - major water utilities ($/per property), 2020-21

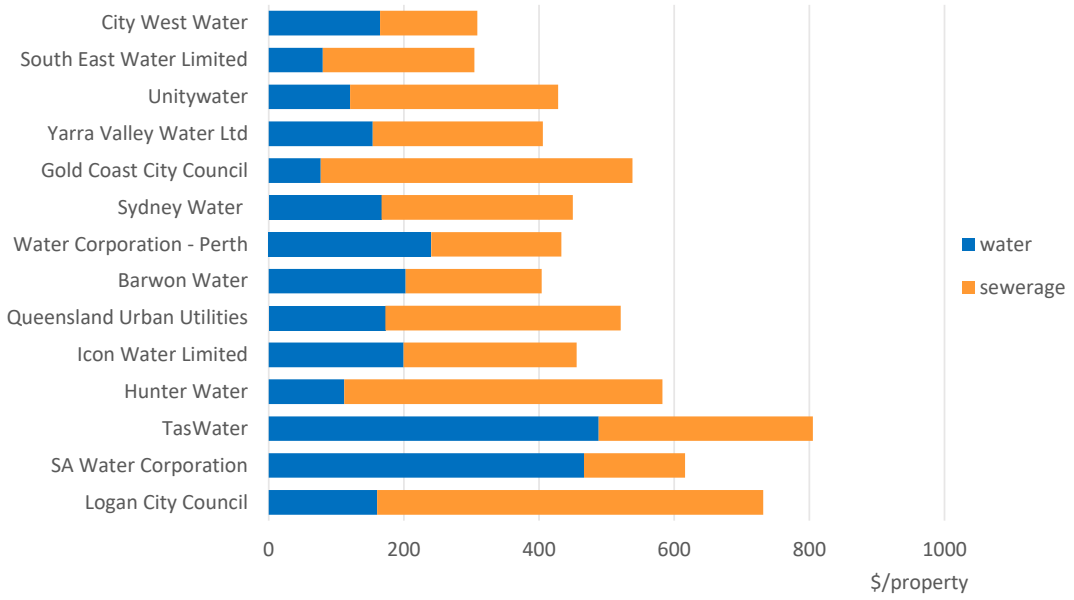


Table 7.4 shows capital expenditure categorised by new works, and renewals or replacements. In 2020-21, compared to the previous year, expenditure on new works for water more than doubled, increasing by $43.8 million. Renewals and replacements for water cost just under $33 million during 2020-21, while just over $24 million was spent on renewals or replacements for sewerage (and increase of 76.7 per cent compared to expenditure in 2019-20).

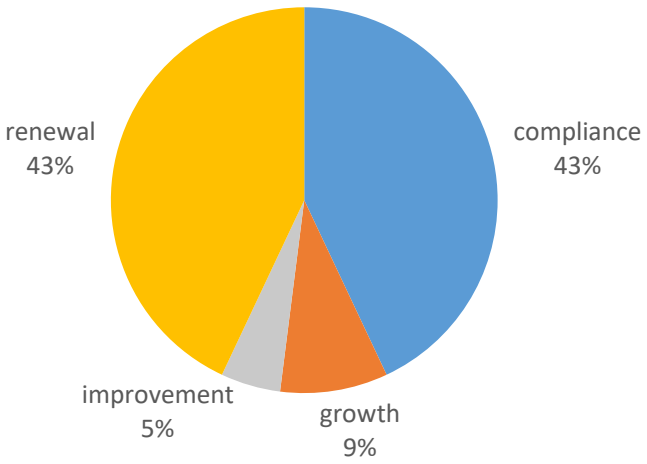
Table 7.4 Water and Sewerage capital expenditure by category ($'000s, nominal)

	2016-17	2017-18	2018-19	2019-20	2020-21
Water:					
New works	3 887	23 580	14 833	28 133	71 921
Renewals or replacements	15 449	19 916	24 306	33 769	32 770
Other	46 588	56 033	31 365	10 422	465
Subtotal for water (F14)	65 924	99 530	70 504	72 324	105 156
Sewerage:					
New works	10 351	12 945	14 850	31 810	26 941
Renewals or replacements	12 095	10 933	16 950	13 693	24 193
Other	15 308	30 760	7 527	10 422	8 310
Subtotal for sewerage (F15)	37 753	54 638	39 327	55 925	59 444
Total (F16)	**103 677**	**154 168**	**109 831**	**128 249**	**164 600**

TasWater reported that the increase in total capital expenditure in 2020-21 reflects both the significant volume of planning and investigation activities completed by the Capital Delivery Office since its formation and the decision in December 2020 for TasWater to resume responsibility for simpler, lower cost infrastructure projects.

The key driver for capital expenditure in 2020-21 (which differs from the categories used above) is shown in Figure 7.4. It shows that both compliance and asset renewal were the primary drivers for TasWater's capital program during 2020-21 (both accounting for 43 per cent of expenditure). This is a shift in comparison to the previous year when expenditure on asset renewal was the primary driver for capital works (49 per cent of expenditure) and compliance only accounted for 26 per cent of expenditure.

Figure 7.4 Capital expenditure on water and sewerage infrastructure by driver, 2020-21



Further details about capital projects completed or commenced during 2020-21 are set out in section 7.2.

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	2016-17 [a]	2017-18	2018-19	2019-20	2020-21
F24	Net profit after tax ($000s) (NPAT)	25 804[a]	40 214[b]	41 259[c]	14 968[d]	45 720 [e]
n/a+	Earnings before interest and tax (EBIT) ($000s)*	10 932	33 278	13 404	(39 472)	(2 633)
F30	Net profit after tax ratio (%)	8.2[a]	12.0[b]	11.5	4.3	12.5
F19	Economic rate of return (%)*	0.43	1.31	0.51	(1.46)	(0.10)
F20	Dividends ($000s)	19 457	18 499	10 489	8 380	10 000
F21	Dividend payout ratio (%)	68.0	43.3	25.4	55	23
F22	Net debt to equity (%) (NDTE)	29.9	33.6	34.9[c]	40[d]	39
F23	Interest cover ratio (ICR)*	0.60	1.74	0.71	0	0

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. The estimates of depreciation are significantly higher than depreciation on TasWater's infrastructure assets at fair value.

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 million to $25.804 million (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 million to $40.214 million 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.

d TasWater's 2019-20 Annual Report included very substantial asset revaluation decrements for water and sewerage infrastructure (Note 11, page 82). The impact of the revaluation has been removed from the calculation of NPAT and NDTE for 2019-20.

e. This excludes the impact of asset revaluation but includes contributed assets.

Key observations:

- TasWater's underlying result for 2020-21 was a profit of $16.3 million before tax, excluding contributed asset revenue and the impact of the revaluation of freehold land and non-infrastructure buildings. This was a significant improvement on the 2019-20 underlying loss before tax of $15.8 million (a result which had been heavily impacted by the COVID-19 pandemic).
- Including contributed assets, TasWater's NPAT was $45.7 million, an increase of around $30.7 million from the previous year.
- The depreciation of TasWater's infrastructure assets totalled $160.5 million in 2020-21 ($89.1 million for water assets and $71.4 million for sewerage assets) under the WDRC approach. This resulted in a negative EBIT of $2.6 million in 2020-21.
- TasWater's NPAT as a percentage of revenue (NPAT ratio) of 12.5 per cent in 2020-21 was on par with the median NPAT ratio for major utilities nationwide of 12 per cent.[65]
- The $36.8 million improvement in EBIT between 2019-20 (-$39.5 million) and 2020-21 (-$2.6 million) reflected a $16.1 million increase in total revenue, a $17.3 million decrease in depreciation and a $3.5 million decrease in expenses (excluding depreciation).
- TasWater's negative EBIT resulted in its economic rate of return being negative, under the WDRC approach.
- NDTE ratio remained largely unchanged from 2019-20, with only a small reduction to 39 per cent in 2020-21. TasWater's NDTE ratio is below that of the majority of similar sized mainland utilities, where reported NDTE ratios for 2020-21 are between 21 and 204 per cent, with the 2020-21 median around 85 per cent.[66]
- Due to its negative EBIT, TasWater's interest cover ratio was 0. The median interest cover ratio (ICR) for major Australian water utilities, calculated on the same basis, was 2.4 in 2020-21.
- TasWater's dividend payout ratio decreased by 32 percentage points in 2020-21. Local councils received $10 million in dividends during the year.

7.2 Status of major projects

This section provides an overview of the major projects completed or progressed by TasWater during 2020-21.

Major achievements from the Capital Works Program in 2020-21 include:

- commencement of on-site works at the Bryn Estyn Upgrade Project, TasWater's largest capital project;

[65] Bureau of Meteorology, *National performance report 2020-21: urban water utilities,* February 2022 (indicator F30).

[66] Ibid, (indicator F22).

- completion of the Wellington St SPS Upgrade Project in George Town;
- completion of the Latrobe sewerage network upgrade and augmentation;
- completion of the Prince of Wales STP primary digester roof replacement;
- replacement of approximately 4 500 water meters; and
- renewal of approximately 15kms of water mains.

TasWater also continued to progress external funding arrangements with the Tasmanian Government for the Tamar Estuary River Health Action Plan and Macquarie Point STP relocation project.

In addition to the Bryn Estyn Upgrade Project, TasWater reported the following four major projects as being progressed during 2020-21:

- Longford STP upgrade - to improve effluent discharge and odour reduction to customers in close vicinity;
- Henderson Dam Rising (Whitemark) - Provide surety of water to Flinders Island during warmer months;
- UV Program, Stage 2a, Phase 1 (Burnie, Distillery, North Esk) - Major UV installation at five of TasWater's largest sites; and
- Upper Reservoir Dam Upgrade (Hobart) - improve safety and water surety.

7.2.1 Future capital works projects

TasWater's 2021-22 capital works program includes projects and programs with a total budget of $229.9 million.

TasWater's top 10 major capital works projects that are to be progressed in 2021-22, including the project budgets, are shown in Table 7.6.

Table 7.6 Top 10 capital projects to be progressed in 2021-2022

Project	Project budget ($ millions)	Project description
Bryn Estyn WTP Major Upgrade (New Norfolk)	93.7	Upgrade of Bryn Estyn WTP to improve best practice risk mitigation to ensure compliance and ensure safety of water.
Launceston Combined System upgrade (part of the Tamar Estuary River Health Action Plan funded jointly by the Federal government, State government, City of Launceston and TasWater)	32.2	Joint project to be delivered by TW in collaboration with the Federal government, State government and City of Launceston. Project will consist of various system upgrades to improve the health of the Tamar River.
Northern Midlands Sewerage Improvement Plan – Longford STP upgrade	8.1	Phase 1 of Northern Midlands Sewer Improvement Plan resulting in improved effluent compliance and reduction in odour.
UV Program, Stage 1, Phase 1	7.4	UV installations at five (Burnie, Chimney Saddle, Distillery Creek, Mt Leslie and Reatta Rd) of TW's major sites, increasing the percentage of TW population supplied by Best Practise Risk Mitigation.
Lake Mikany Dam Upgrade (Smithton)	6.9	Removal of dam from above the ANCOLD level of tolerability improving water surety and reduction in risk of dam failure.
Macquarie Point STP relocation (funded jointly by the State government and TasWater)	4.1	Relocation of Macquarie Point STP to Selfs Point.
Rosebery Reservoir	3.2	New clear water reservoir at Rosebery to provide satisfactory water storage during warmer months.
Upper Reservoir (Major risk reduction works at Upper Reservoir Dam at Waterworks Reserve, Ridgeway)	3.0	Removal of dam from above the ANCOLD level of tolerability, improving water surety and reduction in risk of dam failure.
UV Program, Stage 2	2.6	UV installations at five (Campbell Town/Ross, Fingal, Queenstown, South Esk, Swansea, Triabunna, Tullah, West Tamar and Zeehan) of TasWater's sites, increasing the percentage of population supplied by Best Practise Risk Mitigation.
Davis St SPS Upgrade (Smithton)	2.3	Capacity increase to the Davis Street, SPS along with augmentations to two other SPS and associated rising mains to improve safety and reduce sensitive waterways spills.

TasWater's capital works projects list is set out in Appendix 6.

8 KEY PERFORMANCE PRIORITIES

In accordance with section 70(2) of the Industry Act, this chapter sets out the key priorities for improved performance by TasWater as identified by the industry regulators, the Economic Regulator and TasWater itself.

8.1 Progress on previously identified key priorities for improved performance

8.1.1 Environment Protection Authority

During 2020-21, TasWater continued to focus on reducing environmental risk through development of an Environmental Risk Assessment for effluent discharge to water. This framework has been included in the prioritisation of projects in TasWater's Price and Service Plan 4 (PSP4).

TasWater has incorporated the requirements of the Sustainable Discharge Framework and the development of regional strategies into its discharge management planning. In doing so, the focus is on making step changes in environmental improvement on the pathway to sustainability through both optimisation of existing infrastructure and commitment to capital upgrades. During the reporting period, improvements have been made in notification, reporting and data accuracy.

TasWater's effluent compliance has remained steady, with the future focus being on projects that mitigate high environmental risk.

8.1.2 Public health

During 2020-21, TasWater continued to deliver a wide range of drinking water projects addressing compliance, growth and renewal of water assets. The key improvements progressed during the reporting period included:

- continuation of upgrade works at Bryn Estyn, TasWater's largest WTP;
- continuation of the water mains renewal program; and
- installation of UV treatment at 20 sites to further mitigate drinking water quality risk.

During 2021-22, TasWater continued to reduce drinking water risks for its customers as a result of:

- improvement in operational compliance and staff awareness relating to water safety through an ongoing focus on critical control points and operational control points;
- improvement in compliance with industry practice in TasWater's water supply networks through an ongoing focus on network residual disinfection;
- the realisation of operational improvements arising from ongoing technical and network assessments; and
- improved visibility of operational performance data to the organisation.

TasWater has also finalised catchment-to-tap risk assessments to better understand catchment risks and enable targeted planning to occur.

For the third year in succession, the percentage of systems compliant with the Tasmanian Drinking Water Quality Guidelines (TDWQG) microbiological requirements was 100 per cent, meaning that all Tasmanian customers had access to safe drinking water as at 30 June 2021.

8.1.3 Water allocations/licences and dam safety

Recognising the importance of urban water security as a strategic issue, TasWater has continued to engage with the Tasmanian Government and other stakeholders to ensure that water allocations are sustainable and that Tasmania's water catchments are managed appropriately for the benefit of all Tasmanians. During 2021-22, TasWater provided feedback to the Tasmanian Government on its draft Rural Water Use Strategy and commenced a review of its water licences and evaluation of existing water rights.

In relation to dam safety, TasWater continued to deliver the priority-improvement program approved by the Dam Safety Regulator to ensure that dams meet modern engineering standards and that legacy issues are being progressively addressed. The major initiatives undertaken during 2020-21 are set out below:

- commencement of the dam safety upgrade work at Mikany Dam to address dam safety compliance requirements and ensure the dam meets modern engineering requirements;
- commencement and completion of second phase works at Upper Reservoir Dam to further lower the dam safety risk and improve the stormwater system;
- commencement of upgrade works at Henderson Dam on Flinders Island to provide Whitemark residents with improved drinking water security by doubling the storage capacity of the dam;
- continued the investigation and structural analysis at Ridgeway Dam; and
- submission and approval of a decommissioning permit for Waratah Dam due to safety concerns relating to the dam.

As at 30 June 2021, the number of dams plotting above the ANCOLD Level of Tolerability remained at four. These are being managed under mitigation plans agreed with the Tasmanian Dam Safety Regulator.

8.1.4 Priorities of the Economic Regulator

8.1.4.1 Implementing strict financial management and securing long-term efficiency gains to enable its capital investment program to be achieved

During 2020-21, TasWater reported that its Productivity Improvement Program (PIP) delivered $3.7 million in operational cost reductions and $10.3 million in revenue enhancements. TasWater has estimated that since the program's inception in 2013, it has delivered overall business savings to $32.5 million.

Recognising the ongoing strategic importance of identifying and realising productivity savings, TasWater engaged an independent consultant to assist in developing a roadmap of productivity initiatives to deliver additional cumulative savings of $11 million over five years. The five-year roadmap commenced in 2020-21 and will conclude at the end of 2025-26.

TasWater has also continued to implement the framework outlined in its Financial Sustainability Strategy and achieved internal targets for key financial indicators (EBITDA and the interest cover ratio) during the reporting period.

8.1.4.2 *Reducing the volume of treated water for which there is no metered consumption*

In 2020-21, the volume of water for which there is no metered consumption reduced to 25 per cent from 28 per cent in 2019-20. TasWater has advised that this reduction is a result of natural variation in the calculation and improvements in sourcing data for this indicator. TasWater reported that whilst some initial leaks have been identified and addressed, this has not had a material impact on the improvement in this indicator in 2020-21.

During the reporting period TasWater progressed the development of its Non-Revenue Water Reduction Strategy. The strategy outlines a number of initiatives that are expected to result in a tangible reduction of actual losses over coming years.

8.1.4.3 *Ensuring adequate water supplies to meet expected future demand without water restrictions except where they are needed due to factors outside TasWater's control*

During 2020-21, TasWater delivered a range of initiatives aimed at improving water security and ensuring that it can continue to appropriately manage its water supplies both now and into the future. Major activities included:

- completing the development of a Demand Management Strategy which identifies a number of actions to support water surety for all regions of Tasmania, including preparation of an annual seasonal outlook and delivery of an annual state-wide water conservation campaign;
- continued the program of technical assessments focused on improving surety of supply on the East Coast of Tasmania and other stressed communities;
- development of yield and reliability assessments for a number of water supplies with elevated water security risks.

A new Water Surety Strategy is also under development. The strategy that will provide an overarching framework to consider demand management, strategic master planning and water licence arrangements.

In 2020-21, water restrictions were implemented in Bridport due to the expected seasonal influx of tourists and inadequate river flows, with the restrictions lifted ahead of the original planned date due to good river flow and lower than expected demand. Water restrictions were implemented in Whitemark, Flinders Island, to support alternative water supply arrangements whilst Henderson Dam upgrade works were underway. Restrictions were eased during autumn 2021 as demand fell.

TasWater also continued to progress upgrade works at its largest WTP, Bryn Estyn, with an expected completion date of 2023-24. This project will increase water security and service the expected population growth in southern Tasmania. Work on the upgrade to Ridgeway Dam has also continued to improve both public safety and the security of supply due for completion July 2025. TasWater stated that these upgrades will improve water surety and reduce the risk of dam failure.

8.1.4.4 *Further improvement in TasWater's information collection and management, including data required for the Annual Performance Report and the proposed Price and Service Plan for the fourth regulatory period*

Throughout 2020-21, TasWater continued to deliver incremental improvements in the quality and reliability of data for performance metrics.

A key area of focus during this time has been to address the findings of the 2019-20 Annual Performance Report audit conducted by BDO. This included the development of additional data integrity reports, reviewing metadata documents for currency and accuracy and further embedding the new Excel-based tool to capture results for TasWater's 2020-21 Annual Performance Report.

As a result of this work, the 2020-21 Annual Performance Report audit conducted by BDO identified that further improvements had been made in TasWater's audit performance, with improved systems and processes relating to data capture and an overall increase in data reliability and accuracy.

8.2 Key priorities for improved performance

8.2.1 Environment Protection Authority

In December 2016, the EPA and TasWater signed a three-year MoU on Public Wastewater Management aimed at accelerating improvements in environmental compliance and performance. Overall flow-weighted effluent compliance against regulatory limits improved during the period of the MoU, which concluded on 2 December 2019.

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

- determining sustainable treated effluent discharge limits based on sound scientific evidence and reaching agreement with the EPA on future discharge management options for STPs, prioritised according to risk;
- completing planned upgrades to those STPs that pose the greatest environmental and public health risk;
- integrating regular STP optimisation assessments into the business cycle to achieve an ongoing high level of effluent compliance and operational reliability;
- increasing both the number of sustainable effluent reuse schemes and the proportion of treated effluent diverted to sustainable reuse, particularly for STPs discharging to inland waters;
- achieving significant improvements to the 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;
- attaining sustainable, low-cost and efficient state-wide biosolids management practices with a high proportion of biosolids reused. This includes addressing legacy sludge accumulations, reliably meeting an ongoing pre-emptive desludging roster for lagoon systems and appropriate management of sludge contamination. Improvements in record keeping and data management practices for biosolids will support achievement of these goals;
- establishment of pro-active management practices to prevent nuisance odour impacts from sewerage assets on nearby residents, businesses and other sensitive receptors; and
- improving the quality and reliability of Annual Environmental Reports provided to the EPA.

8.2.2 Public health

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

During 2020-21, 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. As the fourth PSP Determination was delayed owing to the global pandemic, the DoH confirmed these priorities to TasWater during the 2020-21 period.

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

- integrate the Drinking Water Quality Risk Management Strategy (Risk Management Plan) with daily operations;
- improve and upgrade water treatment assets to meet best practice risk mitigation strategies;
- improve the disinfection management in distribution networks;
- improve the aesthetic quality of treated water, particularly where this may represent an incident of public health significance;
- continue to improve fluoridation management, performance and asset renewal;
- plan and prepare, where appropriate, for the impacts of climate change on water quality incidents and raw water security;
- identify opportunities for service introduction where practical and cost-effective; and
- improve communications and responses to water quality incidents through integration of CCPs to the operations control centre.

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

NRET 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 NRET. A water allocation specifies conditions pertaining to the taking of water, including the volume that can be taken within a specified period.

NRET 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.[67] 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).*[68]

NRET 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. NRET'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 progressing work on a number of dams to lower their level of tolerability.

8.2.4 Priorities of the Economic Regulator

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

- ensuring its planned capital investment program is achieved;
- securing long-term efficiency gains;
- improving the quality of data on unaccounted for water and 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
- continued improvement in its information collection and management, including data required for TasWater's future Annual Performance Reports.

For 2020-21, TasWater reported total operating expenditure of $209.2 million. TasWater spent $190.4 million in operating expenditure on regulated water and sewerage services,

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

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

which was $11.3 million above TasWater's regulated operating expenditure of $179.2 million for that year approved by the Economic Regulator in 2018 in TasWater's Price and Service Plan 3 (PSP3).

TasWater's total capital expenditure (including gifted assets and developer charges) for 2020-21 of $177.6 million was 8.1 per cent lower than the target of $193.3 million as documented in TasWater's 2021-25 Corporate Plan.

The Economic Regulator's 2022 Water and Sewerage Price Determination Investigation included a thorough review of TasWater's actual and planned operating expenditure and capital expenditure for the third regulatory period, including the reasons why 2020-21 operating expenditure was above the level approved by the Economic Regulator in TasWater's PSP3, and why capital expenditure was below the level approved. This, in turn, informed the Economic Regulator's assessment of TasWater's planned operating expenditure and capital expenditure for the fourth regulatory period. The Economic Regulator subsequently determined maximum prices for TasWater's services for the fourth regulatory period that will provide TasWater with sufficient revenue to:

- maintain financial sustainability; and
- fund its capital expenditure program, including its initiatives to improve its compliance with required health, environmental and dam safety standards without imposing unacceptable price increases on customers.

As discussed in the Economic Regulator's 2022 Price Determination Investigation Final Report, the Economic Regulator continues to be concerned at the very high share of treated water that is not accounted for. Around 25 per cent of the total volume of potable water produced by TasWater was unaccounted for, which is significantly above the share for mainland utilities.

TasWater is not able to obtain reliable estimates of the volume of unaccounted for water. This is because TasWater does not have accurate information on the volumes of water supplied to the urban water supply system from its water treatment plants. As a result, TasWater is also not able to accurately report on its water losses within its water supply system. For some treatment plants, TasWater also does not have accurate information on the volume of sourced water that enters these plants.

TasWater is implementing a range of measures to address the issue of its reported very high volumes of unaccounted for water. This includes conducting an audit of its meters at all its water treatment plants to assess how accurately they measure volumes of water supplied to the urban water supply system from its plants. This audit will then inform a program to improve the accuracy and reliability of this data and subsequent reporting of unaccounted for water.

Matters relating to TasWater's rate of unaccounted for water, including the service standard, were considered as part of the Economic Regulator's 2022 Water and Sewerage Price Determination Investigation. It was resolved, as part of that process, that the service standard for the percentage of unaccounted for water will be retained for application during the fourth regulatory period with performance levels set at 20 per cent in 2022-23, declining by one percentage point each year to 17 per cent by 2025-26. This compares with the current service standard of 28 per cent.

As stated in the Economic Regulator's 2022 Price Determination Investigation Final Report, in reducing the percentage of unaccounted for water, whether by identifying new customers or connections or by reducing water losses, TasWater will increase its revenue from customers, or reduce its water treatment costs, or both.

The Economic Regulator places a high priority on TasWater operating efficiently and securing long term productivity gains. In the 2022 Price Determination Investigation Final Report, the Economic Regulator set maximum water and sewerage prices based on productivity improvements of 1.5 per cent per year. TasWater has reported that it has achieved much higher productivity targets in recent years. In setting a 1.5 per cent productivity target annually for the fourth regulatory period, the Economic Regulator is therefore requiring TasWater to maintain a rate of productivity improvement around recent levels. Reducing the share of unaccounted for water is one important strategy to improve TasWater's overall productivity.

8.2.5 TasWater's current priorities

In August 2017, TasWater released its *Long Term Strategic Plan 2018-2037* (LTSP 2018-2037). The outcomes outlined in the LTSP 2018-2037 are reflected in TasWater's Price and Service Plan 3 (PSP3). Whilst PSP3 initially covered the regulatory period 1 July 2018 to 30 June 2021, it was extended for an additional year in response to the uncertainty created by the COVID-19 outbreak.

For the PSP3 period, projects are prioritised based on the potential customer benefit and cost of the project. Benefits are determined by the project's contribution towards achieving specified 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 received 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.

During the reporting period, TasWater's primary focus remained on improving compliance outcomes, with planned projects including both high priority dam safety upgrades and sewerage upgrades to meet environmental standards. TasWater was able to deliver further improvements in several key areas in 2020-21 whilst largely sustaining the overall improvement it has made in recent years.

8.2.5.1 Supporting customers through COVID-19

In April 2020, as part of the COVID-19 response, TasWater expanded its assistance to customers facing financial difficulties. These enhancements expanded the existing owner-occupier residential support program to include all residential and vacant landowner customers as well as business, not-for profits, and some sporting clubs.

As at 30 June 2021, TasWater had 425 customers enrolled in a residential customer support program and 34 customers enrolled in a business support program. A total of 2 700 of TasWater's customers also had a debt related payment arrangement in place.

In 2021-22, TasWater will continue to work with customers experiencing financial difficulty, offering assistance which includes payment extensions, payment deferrals and payment arrangements for up to 36 months.

8.2.5.2 Improving health and safety outcomes

In 2020-21, TasWater's Total Recordable Injury Frequency Rate (TRIFR) was 9.4, a 50 per cent decrease compared to the previous reporting period. TasWater attributes this improvement to increased effort and investment in the health and safety program and an ongoing focus on ensuring that there is a consistent leadership presence across business operations.

To drive further improvement in headline health and safety results, TasWater will continue to focus on those activities which have potential to cause a serious injury or fatality. An updated

Health and Safety Risk Framework and Health and Wellbeing Framework are currently under development to drive further improvements in risk visibility and ensure that risk controls are targeted in a prioritised manner.

8.2.5.3 Climate change and the environment

Recognising the strategic risks associated with a changing climate, TasWater has continued to develop a new Climate Change Adaptation Strategy that will provide direction on how the business will mitigate climate change risk and reduce its carbon footprint. The key objectives of the new strategy will be to reduce TasWater's vulnerability to the impacts of climate change, build its resilience to extreme weather events, grow the capability for adaptation and allow the business to take advantage of new and emerging opportunities.

Recognising its reliance on the natural environment, a new Environment Strategy is also being developed to guide TasWater's transition from environmental compliance to environmental restoration. This new strategy will consider the full of TasWater's activities, including how it can reduce the environmental impact of effluent discharges on waterways, reduce the volume of water extracted from the environment and reduce waste to landfill.

8.2.5.4 Long-Term Strategic Plan Refresh

In June 2021, TasWater revised its Long Term Strategic Plan to reflect the progress it has made since the release of the inaugural LTSP 2018-2037. The revised *Long-Term Strategic Plan 2021-2030* (LTSP 2021-2030) also reflects the broadening in TasWater's strategic focus and priorities since the inaugural LTSP was prepared. The LTSP 2021-2030 informed development of TasWater's PSP4 proposal.

Recognising how quickly the pace of change can make such a long-term plan obsolete, the revised Long-Term Strategic Plan 2021-2030 outlines the progress TasWater expects to make by 2030 against its key customer promises. TasWater's strategic vision was also streamlined to better resonate with its customers, stakeholders and staff.

8.2.5.5 Cybersecurity

Cybersecurity has been identified as one of TasWater's key strategic risks and a new cybersecurity strategy has been developed to uplift the cybersecurity maturity of the business over a three-year period and reduce the risk of cyber-related threats.

The new cybersecurity strategy has been designed to support TasWater's business strategy, allow the business to adapt rapidly to change, and provide the agility needed to operate effectively and efficiently. Amongst other things, it establishes a security operating model for TasWater, identifies a target maturity state and provides a roadmap to address identified gaps.

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 WTPs;
- operating the sewerage service and treating sewage for discharge;
- delivering retail services; and
- receiving and processing trade waste.

TasWater's principal objectives[69] are to:

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

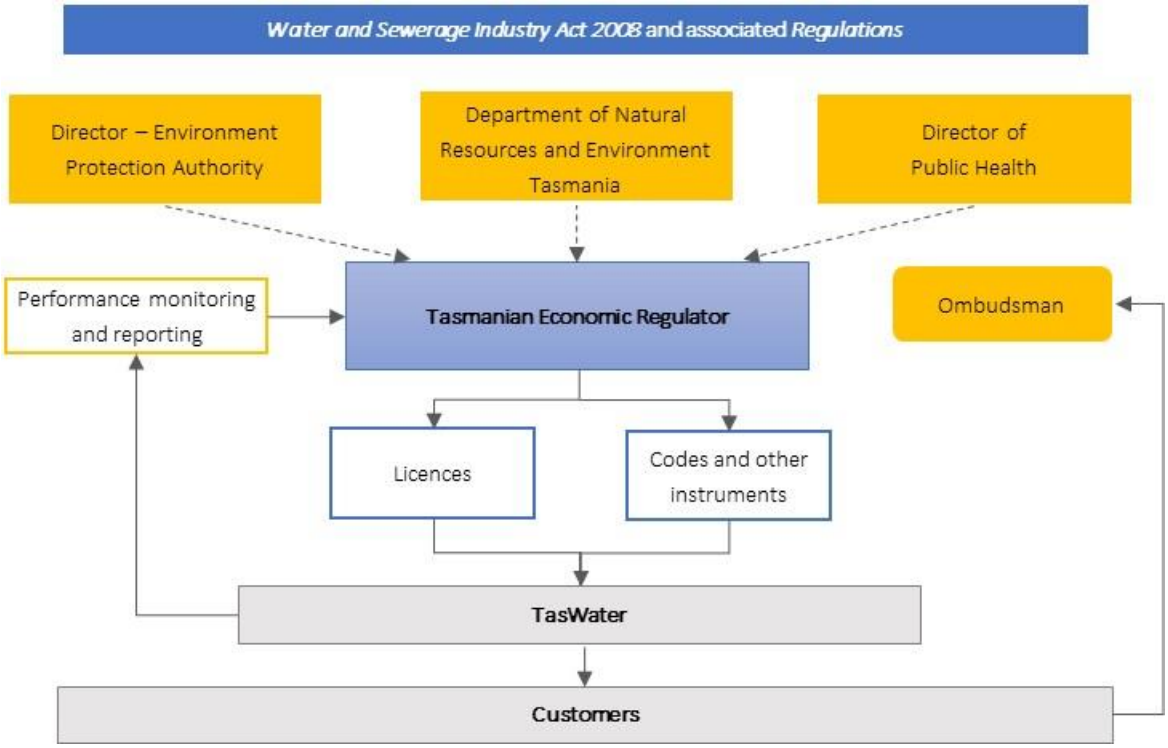
Industry regulators comprise the Tasmanian Economic Regulator, the Director, the Environment Protection Authority (EPA), the Director of Public Health and the Secretary, the Department of Natural Resources and Environment Tasmania (NRET).

Additional legislation, including the Tasmanian *Environmental Management and Pollution Control Act 1994*, *Public Health Act 1997, Fluoridation Act 1968*, *Water Management Act 1999*

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

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 8.1.

Figure 8.1 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, performance monitoring and retail pricing:[70]

- 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 Tasmanian Water and Sewerage Industry 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 1997* (and its associated Tasmanian Drinking Water Quality Guidelines 2015);
- *Fluoridation Act 1968*;
- *Fluoridation Regulations 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.

[70] For further details, refer to the Economic Regulator's previous State of the Industry Reports and its Final Report in relation to its 2022 Water and Sewerage Price Determination Investigation, released May 2022.

Director, Environment Protection Authority Tasmania

The Director of the EPA and the EPA Board[71] are responsible for administering and enforcing the *Environmental Management and Pollution Control Act 1994*. In discharging their functions and duties the Director and EPA Board are supported by EPA Tasmania[72].

The Director's responsibilities in regulating Level 2 STPs[73] 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.

The EPA 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 Natural Resources and Environment Tasmania

The Water Policy and Planning Branch in NRET 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 Agriculture and Water Strategic Business Unit within NRET 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.

[71] For further information on the functions of the Environment Protection Authority, see www.epa.tas.gov.au.

[72] On 1 December 2021, the EPA separated from the Department of Primary Industries, Parks, Water and Environment (now the Department of Natural Resources and Environment Tasmania) to become an independent State Authority.

[73] The EPA regulates Level 2 STPs, i.e. STPs with a design flow capacity to treat more than 100kL per day. Local 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 Operations Branch, part of the Agriculture and Water Division within NRET, administers *the Water Management Act 1999* and the *Water Management (Safety of Dams) Regulations 2015* to ensure that dam owners meet their dam safety responsibilities.[74]

The Minister's Delegate is the General Manager of the Agriculture and Water 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; 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 permit 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).[75]

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).[76]

[74] For further information on dam safety, see https://nre.tas.gov.au/water/dams/dam-safety.

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

[76] 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 report on the state of the water and sewerage industry (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, Version 1.5, July 2018* 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 5, February 2022*. The Economic Regulator's approach to managing non-compliance is outlined in its *Compliance Enforcement Policy, Version 3, February 2021.*

TasWater's performance indicator data are 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 is assessed each year.

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

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 NWI. 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 *National Urban Water Utility Performance Reporting Framework: Indicators and Definitions Handbook,* January 2018; 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.

A1.6 Other government bodies

Department of Treasury and Finance

The Department of Treasury and Finance is responsible for providing advice to the Treasurer on water and sewerage pricing regulatory matters, as the Treasurer 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 local councils) and the Tasmanian Government (which became a shareholder in early 2019). 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 local 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. The MoU proposed new ownership arrangements for TasWater under which the State Government became a shareholder of TasWater. In accordance with the MoU, local 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; accelerate TasWater's infrastructure investment program and progress projects of special economic importance to Tasmania.

Under these new ownership arrangements, the Crown provides TasWater with $200 million of equity funding in exchange for ten per cent ownership in TasWater.

To date, the Crown has purchased five million shares for $100 million, which represents five per cent ownership in TasWater.

The State Government has also committed $100 million in grant funding for the relocation of the Macquarie Point wastewater treatment plant and $42.5 million in grant funding for improvements to the Launceston combined sewerage and stormwater system as part of the Launceston City Deal.

Bureau of Meteorology

Since 2008, the Bureau has been responsible for 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.[77]

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

[77] 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 *National Urban Water Utility Performance Reporting Framework: Indicators and Definitions Handbook*, January 2018, and the *Tasmanian Water and Sewerage Industry Performance and Information Reporting Guideline*, July 2018. 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 waters (ML)	W3.1
Total volume of water received from other service providers or operational areas within the urban water system (ML)	W5
Volume of recycled water received from other service providers or operational areas within the urban water supply system (ML)	W6
Total volume of water sourced (ML)	W7
Uses of water supplied	
Total volume of water supplied to residential customers (ML)	W8
Total volume of water supplied to non-residential customers (ML)	W9
Total volume of urban water supplied (ML)	W11
Average volume of residential water supplied per property (kL)	W12
Volume of water returned as environmental flows from outside of the urban water supply system (ML)	W13
Total volume of water exported to other service providers or operational areas within the urban water supply system (ML)	W14
Volume of recycled water exported to other service providers or operational areas within the urban water supply system (ML)	W15
Wastewater collected	
Volume of wastewater, excluding trade waste, collected (ML)	W16
Volume of trade waste collected (ML)	W17
Total volume of wastewater collected (ML)	W18
Average volume of wastewater collected per property (kL per property)	W19
Uses of recycled water and stormwater	
Volume of recycled water supplied to residential customers (ML)	W20
Volume of recycled water supplied to non-residential customers (ML)	W21
Volume of recycled water supplied and environmental flows (ML)	W23

Total volume of recycled water supplied (ML)	W26
Recycled water as a percentage of total wastewater collected	W27
Volume of urban stormwater supplied to residential customers (ML)	W28.4
Volume of urban stormwater supplied to non-residential customers (ML)	W28.5
Volume of treated wastewater disposals (ML)	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
Number of properties served per km of water main (no. per km)	A3
Number of water distribution storage facilities	

Wastewater assets

Number of wastewater treatment plants	A4
Number of sewage pumping stations	
Length of sewer mains and channels (km)	A5
Number of properties served per km of sewer main (no. per km)	A6

Water main breaks

Number of water main breaks, bursts and leaks per 100 km of water mains	A8

Water losses

Infrastructure leakage index (ILI)	A9
Real losses: service connections (L per service connection per day)	A10
Real losses: water mains (kL per km of water main per day)	A11

Sewer breaks and chokes

Number of sewer mains breaks and chokes per 100 km (of sewer main)	A14
Number of property connection sewer breaks and chokes per 1 000 properties	A15

CUSTOMERS

Connected properties and population

Population receiving services: water supply (000s)	C1
Number of connected residential properties: water supply (000s)	C2
Number of connected non-residential properties: water supply (000s)	C3
Total number of connected properties: water supply (000s)	C4
Number of connected residential properties: wastewater (000s)	C6
Number of connected non-residential properties: wastewater (000s)	C7
Total number of connected properties: wastewater (000s)	C8

Complaints, call wait time, service interruptions, customer restrictions and legal actions	
Number of water quality complaints per 1 000 properties: water supply	C9
Complaints meaningfully responded to within ten days (%)	
Number of water service complaints per 1 000 properties	C10
Number of sewerage service complaints per 1 000 properties	C11
Number of billing and account complaints per 1 000 properties: water supply and sewerage	C12
Number of water and sewerage complaints per 1 000 properties	C13
Percentage of calls answered by an operator within 30 seconds (%)	C14
Average duration of an unplanned interruption: water supply (minutes)	C15
Number of sewer spills	
Time to attend sewer spills, breaks and chokes (minutes)	
Number of unplanned interruptions per 1 000 properties: water supply	C17
Number of restrictions for non-payment of water bills per 1 000 properties	C18
Number of legal actions taken for non-payment of water bills per 1 000 properties	C19
ENVIRONMENT	
Percentage of wastewater treated to a primary level (%)	E1
Percentage of wastewater treated to a secondary level (%)	E2
Percentage of wastewater treated to a tertiary level (%)	E3
Compliance against discharge to waters regulatory limits (%)	
Compliance against discharge to waters AMT limits (%)	
Compliance with 'Class B' discharge to land limits (%)	
Percentage of biosolids reused (%)	E8
Net greenhouse gas emissions - water (tonnes CO_2-equivalents per 1 000 properties)	E9
Net greenhouse gas emissions - wastewater (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
FINANCE	
Revenue	
Total revenue: water supply ($000)	F1
Total revenue: wastewater ($000)	F2
Total income for the utility ($000)	F3
Percentage of residential revenue from usage charges: water supply (%)	F4
Revenue per property: water supply ($ per property)	F5
Revenue per property: wastewater ($ per property)	F6
Total income per property ($ per property)	F7
Community service obligations ratio (%)	F8
Written down replacement costs of fixed assets	
Written down replacement cost of fixed water supply assets: nominal ($000)	F9
Written down replacement cost of fixed wastewater assets: nominal (000$)	F10

Costs	
Operating cost per property: water supply ($ per property)	F11
Operating cost per property: wastewater ($ per property)	F12
Combined operating cost per property: water supply and wastewater ($ per property)	F13
Capital expenditure	
Capital expenditure: water supply ($000)	F14
Capital expenditure: wastewater ($000)	F15
Total capital expenditure: water supply and wastewater ($000)	F16
Capital expenditure per property: water supply ($ per property)	F28
Capital expenditure per property: wastewater ($ per property)	F29
Economic real rate of return	
Economic real rate of return: water supply	F17
Economic real rate of return: wastewater	F18
Economic real rate of return: water supply and wastewater	F19
Dividends	
Dividend ($000)	F20
Dividend payout ratio (%)	F21
Net debt to equity (NDTE), interest cover, net profit after tax and community service obligations	
NDTE ratio (%)	F22
Interest cover ratio	F23
Net profit after tax (NPAT) ($000)	F24
NPAT ratio (%)	F30
Community service obligations ($000)	F25
Capital works grants	
Capital works grants: water supply ($000)	F26
Capital works grants: wastewater ($000)	F27
HEALTH	
Water quality guidelines	H1
Percentage of population where microbiological compliance was achieved	H3
Number of zones where chemical compliance was achieved (eg 23 / 24)	H4
Risk-based drinking water management plan externally assessed? (yes/no)	H5
PRICING	
Water supply	
Tariff structure: water supply (text)	P1
Fixed charge: water supply ($ per property)	P1.2
Usage charge: step 1 ($ per kL)	P1.3
Special levies: water supply ($ per property)	P1.12
Income from special levies retained by the utility: water supply (yes/no)	P1.13
Annual residential bill based on 200kL per annum: water supply	P2
Typical residential bill: water supply	P3

Wastewater	
Tariff structure: wastewater (text)	P4
Fixed charge: wastewater ($ per property)	P4.1
Usage charge: wastewater ($ per kL)	P4.2
Special levies: wastewater ($ per property)	P4.3
Income from special levies retained by utility: wastewater (yes/no)	P4.4
Annual residential bill based on 200kL per annum: wastewater	P5
Typical residential bill: wastewater	P6
Water supply and wastewater	
Total annual residential bill based on 200kL per annum (water supply and wastewater)	P7
Total typical residential bill (water supply and wastewater)	P8

APPENDIX 3 SEWAGE TREATMENT PLANT PERFORMANCE SUMMARY

This Appendix provides detailed information on the compliance performance of TasWater's Level 2 STPs for effluent discharged to waters and to land (effluent re-use). A flow-weighted combined compliance assessment is also included.

Table A3.1 and Figures A3.1 and A3.2 show, 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 compliance with AMT limits 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 discharge to a recycled water scheme that uses treated effluent generated by Level 2 STPs. Compliance is measured against the regulatory discharge limits for discharge to the respective reuse scheme for 2020-21 and 2019-20. For financial years 2016-17 to 2018-19, compliance is measured against 'Class B' quality expectations (as outlined in the *Environmental Guidelines for the Use of Recycled Water in Tasmania, Department of Primary Industries, Parks, Water and Environment 2002*). Regulatory discharge limits are generally similar to 'Class B' limits, but some individual parameter limits have been varied to take into account the results of long-term monitoring programs undertaken by TasWater.

Table A3.3 and Figure A3.3 show the total compliance for each STP when compliance with regulatory limits for discharge to waters and discharge to land are combined on a flow-weighted basis. Table A3.3 also provides the mass load of key nutrients nitrogen and phosphorus discharged to the environment by each STP.

Table A3.4 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 2016-17 to 2020-21 financial years.

Table A3.5 provides the permitted average dry weather flow limit and the actual average annual inflow in 2020-21 for each Level 2 STP. Actual average inflow generally includes a wet weather component and may exceed the dry weather flow limit for a number of reasons, including as a result of catchment growth or due to inflow and infiltration into the sewerage system.

The data as presented in this Appendix is derived from EPA Tasmania records, which are based on data submitted by TasWater.

Table A3.1 Compliance results - Summary of STP discharge to waters against regulatory limits and AMT limits, 2016-17 to 2020-21

Premises name	2020-21		2019-20		2018-19		2017-18		2016-17	
	Regulatory limits (%)	AMT limits (%)	Regulatory limits (%)	AMT limits (%)	Regulatory limits (%)	AMT limits (%)	Regulatory limits (%)	AMT limits (%)	Regulatory limits (%)	AMT limits (%)
Beaconsfield	75.9	48.1	76.9	41.7	90.7	54.6	84.3	49.1	80.6	57.4
Beauty Point	87.5	62.7	92.7	54.6	86.5	52.8	(94.8)	(66.7)	94.7	66.0
Bicheno	77.1	59.3	89.6	63.0	68.8	61.1	77.1	60.2	87.5	76.9
Blackmans Bay	98.9	95.9	98.1	94.9	76.1	45.3	75.8	54.3	70.4	55.8
Boat Harbour	74.0	70.0	75.0	72.2	79.6	77.8	76.9	75.9	85.9	83.8
Bothwell	89.7	76.7	(85.2)	(69.4)	(78.7)	(64.8)	88.0	72.2	(91.7)	(76.9)
Bridgewater	75.0	57.5	94.4	64.8	83.3	63.9	87.0	58.3	90.7	61.1
Bridport	51.9	49.5	48.5	48.5	50.0	50.0	43.5	43.5	49.1	49.1
Brighton	(-)[1]	(-)[1]	(-)[1]	(-)[1]	(-)[1]	(-)[1]	(-)[1]	(-)[1]	(-)[1]	(-)[1]
Cambridge	97.5	99.1	99.1	100.0	90.7	94.4	96.3	98.1	88.9	92.6
Cameron Bay	97.9	79.0	98.3	80.7	97.9	80.6	98.7	81.2	93.3	80.2
Campania	66.4	38.1	72.9	40.7	(76.0)	(39.8)	(70.3)	(54.6)	58.3	51.9
Campbell Town	(85.2)	(57.4)	(72.2)	(54.6)	(68.5)	(45.4)	83.3	53.7	(72.0)	(44.4)
Carrick	77.6	54.2	70.4	50.0	76.1	53.2	78.7	50.9	82.5	63.1
Cradle Mountain	99.1	99.3	98.1	98.5	100.0	100.0	99.6	100.0	99.6	99.8
Cressy	(90.6)	(53.7)	(80.2)	(59.3)	82.3	48.1	(87.5)	(44.4)	93.8	55.6
Currie	84.4	45.4	87.4	64.5	79.2	55.6	91.7	52.8	96.7	57.1
Cygnet	72.5	73.1	89.2	76.9	85.8	80.6	80.8	76.9	89.6	83.3
Deloraine	73.1	73.1	68.5	68.5	70.4	70.4	70.4	70.4	71.7	71.7
Dover	99.2	94.4	92.6	85.2	89.8	79.6	100.0	93.5	97.2	89.8
East Strahan	89.8	76.9	93.2	79.7	89.8	75.9	91.5	70.8	83.0	65.0

Evandale	78.1	38.0	(76.0)	(41.7)	(76.0)	(42.6)	(70.5)	(36.4)	76.8	33.3
Exeter	87.3	35.7	82.9	32.4	85.4	40.7	93.8	44.4	90.6	42.6
Fingal	79.2	59.3	81.5	51.9	75.9	47.2	74.1	45.4	93.5	63.0
Geeveston	93.3	91.7	88.3	82.4	89.2	83.3	86.7	78.7	82.5	75.0
George Town	95.4	75.0	94.5	71.3	88.3	62.9	92.5	63.0	89.5	68.5
Hoblers Bridge	98.4	88.2	98.3	88.9	97.5	87.0	92.5	82.4	93.7	80.5
Kempton	83.3	60.2	62.5	40.7	(65.6)	(40.7)	54.7	41.7	(27.1)	(39.8)
Latrobe	89.6	51.9	68.8	39.8	77.1	42.6	61.9	37.3	64.6	47.2
Legana	76.9	35.2	88.2	36.1	82.4	35.2	84.3	43.5	83.0	40.9
Lilydale	95.4	87.0	(88.9)	(82.4)	(91.7)	(85.2)	88.9	81.5	91.7	84.3
Longford	79.2	68.5	78.1	75.0	83.3	75.0	63.8	50.0	70.2	56.6
Macquarie Point	86.9	55.8	86.1	52.4	93.1	52.6	94.6	56.2	94.0	54.2
Midway Point	90.0[2]	72.2[2]	-[2]	-[2]	75.5	73.2	(80.4)	(69.4)	91.7	75.0
New Norfolk	85.0	53.7	81.7	53.7	81.7	54.6	86.7	54.6	87.5	54.6
Newnham	73.7	53.7	76.2	55.4	77.6	53.6	82.3	54.7	82.8	52.6
Norwood	99.2	88.0	94.7	89.2	98.3	88.0	97.5	83.3	91.7	73.1
Oatlands	82.3	50.0	75.8	47.7	70.8	39.8	(71.9)	(54.6)	(37.5)	(45.4)
Orford	90.7	67.6	91.7	68.5	84.3	63.0	89.8	66.7	84.9	62.3
Pardoe	93.1	22.6	88.9	20.1	87.2	18.5	86.9	19.0	89.7	23.7
Perth	66.7	32.4	57.3	35.2	69.8	32.4	(65.6)	(31.5)	64.6	29.6
Port Sorell	60.5	43.5	41.8	33.3	37.5	36.8	37.5	29.0	39.6	32.4
Prince of Wales	93.5	70.9	97.9	70.1	97.7	62.4	89.5	59.7	87.9	59.7
Prospect Vale	84.5	67.2	92.2	79.1	92.6	79.6	90.4	77.2	82.0	71.2

Queenstown	95.8	70.4	95.8	73.1	96.9	79.6	98.9	78.3	96.4	75.0
Railton	93.8	83.3	100.0	55.6	68.8	61.1	93.8	66.7	-[2]	-[2]
Ranelagh	90.8	94.4	96.7	99.1	94.2	98.1	95.8	98.1	97.5	100
Richmond	(-)[1]	(48.1)	(-)[1]	(-)[1]	(-)[1]	(-)[1]	(-)[1]	(40.7)	(-)[1]	(47.5)
Ridgley	98.1	97.2	95.4	95.4	93.5	94.4	88.0	88.9	86.9	89.9
Risdon Vale	100.0	98.1	99.2	97.2	100.0	96.3	93.9	93.5	100	94.4
Riverside	84.3	44.4	81.5	46.3	88.0	48.1	91.7	56.5	93.5	52.8
Rokeby	98.1	98.1	100.0	100.0	(92.6)	(92.6)	(92.6)	(92.6)	93.6	93.6
Rosebery	93.5	93.5	91.7	91.7	94.3	94.3	99.1	99.1	94.2	94.2
Rosny	76.7	-[2]	80.9	-[2]	87.8	-[2]	81.1	59.0	85.0	58.3
Round Hill	95.2	95.2	96.5	96.5	90.4	90.4	91.4	91.4	81.1	81.3
Scamander	(-)[1]	(87.0)	(-)[1]	(83.3)	(-)[1]	(-)[1]	(-)[1]	(77.8)	-[1]	82.4
Scottsdale	92.2	65.6	97.9	72.9	100.0	63.0	96.9	61.1	97.9	60.2
Selfs Point	95.4	98.5	95.2	97.3	96.4	99.6	96.7	98.7	93.3	96.4
Sheffield	98.1	98.1	99.1	99.1	98.1	98.1	96.0	96.0	99.1	99.1
Sisters Beach	94.4	94.4	88.0	88.0	88.9	88.9	90.7	90.7	97.0	97.0
Smithton	95.0[2]	48.5[2]	90.2[2]	52.7	71.2	41.6	59.0	35.7	85.0	42.7
Somerset	82.4	75.9	77.9	65.5	82.4	68.5	93.8	78.7	93.2	75.8
Sorell	83.3[2]	61.1[2]	66.7	16.7	82.3	59.4	47.3	50.9	89.6	61.1
St Helens	100.0	100.0	99.1	100.0	100.0	100.0	99.1	100.0	100	100
St Marys	66.7	53.3	-[2]	-[2]	(-)[1]	(-)[1]	86.1	40.5	-[2]	-[2]
Stanley	86.1	57.4	87.8	53.2	85.4	55.6	92.7	48.1	94.4	54.0[1]
Stieglitz	(-)[1]	(-)[1]	(-)[1]	(-)[1]	(-)[1]	(-)[1]	(-)[1]	(-)[1]	(-)[1]	(-)[1]
Swansea	94.4	65.7	73.1	45.4	75.0	40.7	77.8	47.2	75.9	45.4[1]
Ti-Tree Bend	98.9	87.6	97.5	87.0	98.8	89.6	96.3	87.3	95.1	84.7
Triabunna	80.6	53.7	79.6	61.1	(79.6)	(56.5)	79.6	53.7	87.0	63.0

Tullah	92.7	74.1	90.8	73.6	93.6	76.4	92.7	72.2	95.6	69.6
Turners Beach	85.2	57.9	83.2	47.8	76.9	45.4	76.9	51.9	80.9	60.0
Ulverstone	72.7	65.2	86.2	77.0	84.8	77.1	90.8	59.0	56.0	28.5
Westbury	50.0	50.0	49.5	49.5	64.3	64.3	69.9	69.9	75.1	75.1
Wynyard	81.6	73.2	91.9	76.7	90.4	74.8	90.4	69.9	88.0	69.0
Zeehan	95.4	90.7	94.4	86.1	89.6	76.4	91.3	80.6	80.9	78.2

() 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

Table A3.2 STP compliance with regulatory limits for discharge to effluent re-use schemes (2019-20 to 2020-21) and modified 'Class B' re-use limits (2016-17 to 2018-19)[1]

STP	2020-21	2019-20	2018-19[1]	2017-18[1]	2016-17[1]
Beaconsfield	87.5*	83.3*	95.0	96.0	-*
Beauty Point	77.4	77.8	85.0	95.0	94.8
Bicheno	88.3	100.0	86.7	90.0	93.3
Bothwell	100.0	100.0	85.0	88.3	93.3
Bridgewater	100.0	100.0	100.0	98.3	98.3
Bridport	83.3	100.0	83.3	78.3	83.3
Brighton	80.0	84.3	86.7	86.7	83.9
Cambridge/Airport	100.0	100.0	100.0	100.0	100
Cameron Bay	100.0	100.0	100.0	100.0	98.5
Campania	86.7	100.0	91.7	91.7	83.3
Campbell Town	100.0	88.3	75.0	91.7	70.0
Carrick	100.0	88.3	91.7	-	96.6
Cressy	100.0	100.0	93.3	86.7	91.7
Evandale	68.3	68.3	78.3	70.9	66.7
Exeter	87.7	86.3	81.7	93.3	71.7
Kempton	100.0	66.7	73.3	65.0	45.0
Latrobe	-	-	-	-	53.3
Legana	81.7	100.0	88.3	85.0	86.3
Lilydale	100.0	100.0	93.3	91.7	91.7
Oatlands	100.0	89.8	78.3	93.3	80.0
Orford	-	-	-	-	89.7
Penna	100.0	100.0	87.9	87.3	86.7

STP	2020-21	2019-20	2018-19[1]	2017-18[1]	2016-17[1]
Perth	81.7	80.0	78.3	68.3	68.3
Railton	100.0	100.0	94.0	88.0	93.3
Richmond	86.7	81.8	81.7	80.0	74.5
Riverside	65.0	71.7	93.3	-	90.0
Rokeby	100.0	100.0	100.0	98.3	100
Rosny	100.0	100.0	81.9	82.4	82.7
Scamander	100.0	100.0	88.3	85.0	93.3
Selfs Point	75.5	77.3	100.0	-	99.6
Smithton	87.4[2]	100.0*[2]	72.7[2]	60.0[2]	-
St Marys	85.0	80.0	70.0	48.3	68.3
Stieglitz	100.0	100.0	91.7	100.0	95.0
Swansea	100.0	88.3	81.7	75.0	75.0
Triabunna	100.0	100.0	86.7	91.7	91.7
Westbury	88.3	100.0	100.0	92.4	93.4

* Insufficient number of samples provided.

- No discharge to this receiving environment reported for this period.

[1] EPA changed its assessment to regulatory limits in 2019-20, with a total parameter compliance requirement of 90 per cent. Compliance assessment up to 2018-19 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/100 mL thermotolerant coliforms.

[2] Not authorised as effluent re-use, assessment against Class B Recycled Water quality expectations.

Table A3.3 STP discharge to waters and to land - compliance results against regulatory limits (flow-weighted combined) and major nutrient mass loads, 2020-21

Premises name	Discharge to water (ML/year)	Compliance to water (%)	Discharge to land (ML/year)	Compliance to land (%)	Re-use proportion of total discharge (%)	Combined compliance water and land (%)	TN to water (kg/year)	TP to water (kg/year)	TN to reuse (kg/year)	TP to reuse (kg/year)	Receiving water type
Beaconsfield	0.7	75.9	110.3	87.5[2]	99	87.4	17	4	1105	354	I
Beauty Point	160.1	87.5	3.0	77.4	2	87.3	2856	624	5	19	B/E
Bicheno	46.5	77.1	96.8	88.3	68	84.7	901	279	2194	497	B/E
Blackmans Bay	2046.5	98.9	0.0		0	98.9	12631	8665	0	0	B/E
Boat Harbour	11.4	74.0	0.0		0	74.0	287	99	0	0	C
Bothwell	2.0	89.7	37.8	100.0	95	99.5	19	10	307	199	I
Bridgewater	408.0	75.0	584.6	100.0	59	89.7	16114	2164	27797	3973	B/E
Bridport	98.3	51.9	17.3	83.3	15	56.6	4903	812	863	170	C
Brighton	0.0		259.5	80.0	100	80.0	0	0	16339	2989	I
Cambridge	54.9	97.5	191.4	100.0	78	99.4	355	10	1380	68	I
Cameron Bay	1909.3	97.9	81.4	100.0	4	98.0	51421	10438	2322	459	B/E
Campania	1.2	66.4	53.2	86.7	98	86.2	40	7	1102	364	I
Campbell Town	0.0	(85.2)	76.3	100.0	100	100.0	0	0	1647	414	I
Carrick	132.5	77.6	69.4	100.0	34	85.3	1675	762	851	515	I
Cradle Mountain	53.0	99.1	0.0		0	99.1	109	2	0	0	I
Cressy	0.0	(90.6)	70.4	100.0	100	100.0	0	0	654	221	I
Currie	113.4	84.4	0.0		0	84.4	2565	1003	0	0	C
Cygnet	119.4	72.5	0.0		0	72.5	2029	388	0	0	B/E
Deloraine	298.6	73.1	0.0		0	73.1	3369	159	0	0	I
Dover	69.9	99.2	0.0		0	99.2	596	299	0	0	C

East Strahan	276.0	89.8	0.0		0	89.8	3188	723	0	0	B/E
Evandale	33.1	78.1	47.9	68.3	59	72.3	1300	211	1370	399	I
Exeter	33.2	87.3	31.6	87.7	49	87.5	892	133	869	231	I
Fingal	12.8	79.2	0.0		0	79.2	224	44	0	0	I
Geeveston	143.9	93.3	0.0		0	93.3	1883	199	0	0	I
George Town	773.1	95.4	0.0		0	95.4	7559	2847	0	0	B/E
Hoblers Bridge	992.3	98.4	0.0		0	98.4	12237	4556	0	0	B/E
Kempton	5.8	83.3	35.7	100.0	86	97.7	43	28	315	221	I
Latrobe	494.4	89.6	0.0		0	89.6	34200	2752	0	0	C
Legana	211.2	76.9	207.6	81.7	50	79.2	7883	1007	7181	1352	I
Lilydale	24.2	95.4	16.8	100.0	41	97.3	162	31	52	21	I
Longford	679.4	79.2	0.0		0	79.2	16358	3369	0	0	I
Macquarie Point	3935.3	86.9	0.0		0	86.9	144188	23000	0	0	B/E
Midway Point	109.4	90.0[2]	115.1		51	90.0	2228	240	0	0	B/E
New Norfolk	668.7	85.0	0.0		0	85.0	8468	1293	0	0	I
Newnham	1019.6	73.7	0.0		0	73.7	42521	6372	0	0	B/E
Norwood	1080.7	99.2	0.0		0	99.2	8879	4686	0	0	I
Oatlands	134.6	82.3	19.0	100.0	12	84.5	2924	833	335	108	I
Orford	97.4	90.7	0.0		0	90.7	2098	498	0	0	C
Pardoe	4675.0	93.1	0.0		0	93.1	144714	28234	0	0	C
Penna	0.0		219.7	100.0	100	100.0	0	0	1995	1409	B/E
Perth	103.2	66.7	146.0	81.7	59	75.5	4377	601	6074	1181	I
Port Sorell	372.9	60.5	0.0		0	60.5	17066	2847	0	0	B/E
Prince of Wales	3179.5	93.5	0.0		0	93.5	86666	13493	0	0	B/E
Prospect Vale	587.4	84.5	0.0		0	84.5	4142	3412	0	0	I

Queenstown	729.1	95.8	0.0		0	95.8	6383	658	0	0	I
Railton	38.5	93.8	96.2	100.0	71	98.2	210	79	370	73	I
Ranelagh	466.1	90.8	0.0		0	90.8	2441	307	0	0	I
Richmond	0.0		53.0	86.7	100	86.7	0	0	700	457	I
Ridgley	64.0	98.1	0.0		0	98.1	305	9	0	0	I
Risdon Vale	396.7	100.0	0.0		0	100.0	2131	1560	0	0	B/E
Riverside	592.7	84.3	2.0	65.0	0	84.2	26174	3762	97	14	B/E
Rokeby	146.4	98.1	855.9	100.0	85	99.7	560	264	3611	2296	B/E
Rosebery	346.0	93.5	0.0		0	93.5	1811	244	0	0	I
Rosny	1288.1	76.7	1108.8	100.0	46	87.5	41191	5463	35966	4679	B/E
Round Hill	2329.2	95.2	0.0		0	95.2	12900	2554	0	0	C
Scamander	0.0		47.0	100.0	100	100.0	0	0	280	322	I
Scottsdale	153.4	92.2	0.0		0	92.2	5601	1180	0	0	I
Selfs Point	3028.9	95.4	24.0	75.5	1	95.2	14425	1966	113	16	B/E
Sheffield	152.8	98.1	0.0		0	98.1	871	22	0	0	I
Sisters Beach	28.7	94.4	0.0		0	94.4	121	127	0	0	C
Smithton	1238.3	95.0[2]	219.2	87.4[3]	15	93.9	62473	11838	18400	5323	B/E
Somerset	391.3	82.4	0.0		0	82.4	4769	1605	0	0	C
Sorell	112.6	83.3[2]	104.3		48	83.3	2460	290	0	0	B/E
St Helens	241.5	100.0	0.0		0	100.0	751	92	0	0	B/E
St Marys	9.5	66.7	31.8	85.0	77	80.8	119	46	490	143	I
Stanley	70.1	86.1	0.0		0	86.1	1291	439	0	0	C
Stieglitz	0.0		107.7	100.0	100	100.0	0	0	1683	741	B/E
Swansea	4.6	94.4	99.7	100.0	96	99.8	139	25	6346	1146	I
Ti-Tree Bend	5593.8	98.9	0.0		0	98.9	154274	10132	0	0	B/E
Triabunna	20.6	80.6	64.7	100.0	76	95.3	658	160	1825	419	B/E

Tullah	41.9	92.7	0.0		0	92.7	384	91	0	0	I
Turners Beach	231.3	85.2	0.0		0	85.2	17547	3395	0	0	B/E
Ulverstone	3164.8	72.7	0.0		0	72.7	35095	6426	0	0	C
Westbury	163.8	50.0	40.8	88.3	20	57.6	3206	273	673	143	I
Wynyard	1386.6	81.6	0.0		0	81.6	12634	21814	0	0	C
Zeehan	360.3	95.4	0.0		0	95.4	2031	283	0	0	I

Compliance:

() Values in brackets: full re-use, no discharge to water

Blank space represents no relevant limits or no discharge to this location)

[2] dataset incomplete

[3] assessed against modified Class B limits

Mass load:

TN – total nitrogen

TP – total phosphorus

Receiving water types: I – inland; E – estuarine; C – coastal; R – reuse only

Figure A3.1 STP compliance with regulatory discharge to waters limits and re-use proportion, 2020-21 (per cent)

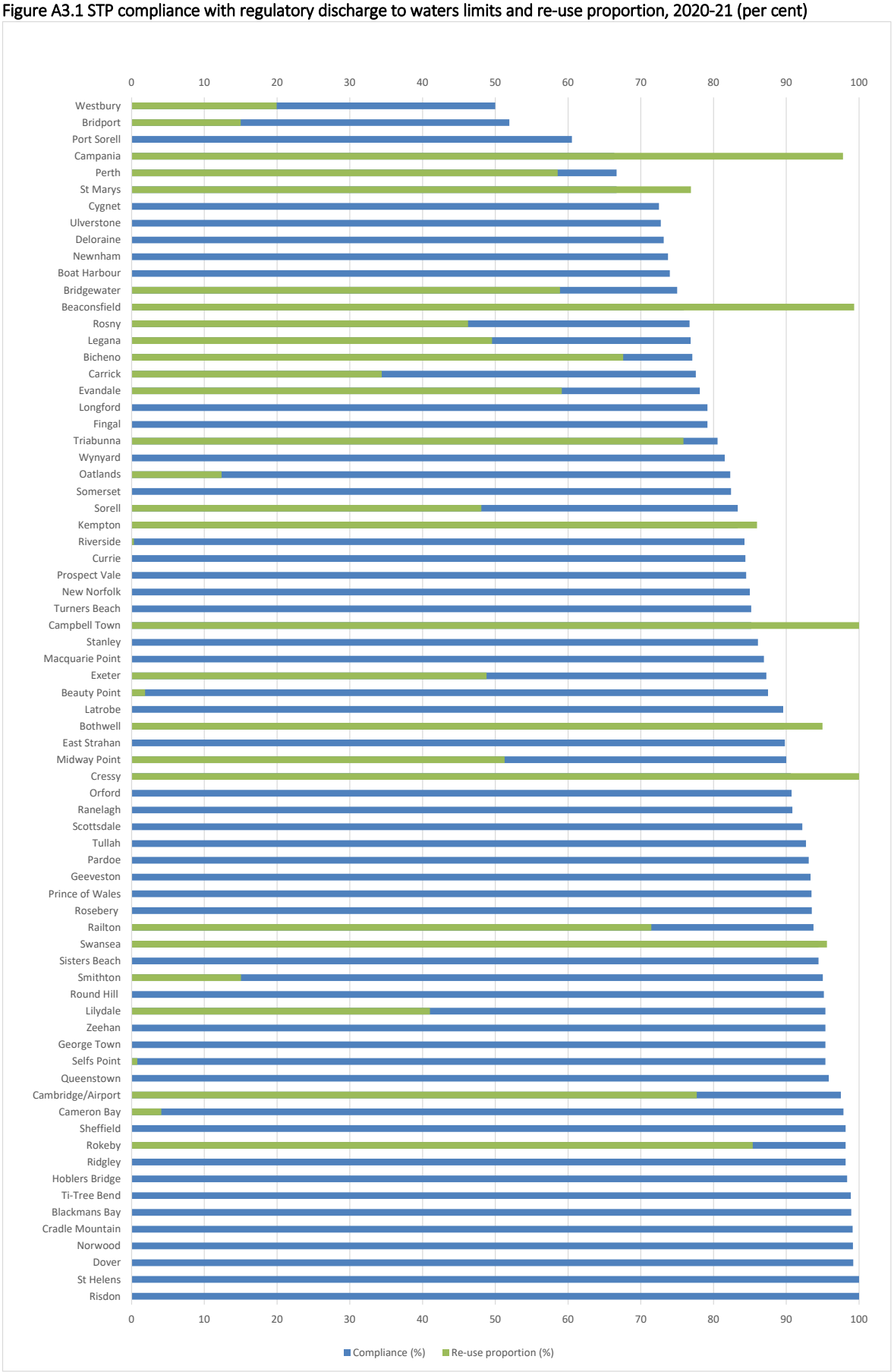


Figure A3.2 STP compliance with AMT discharge to waters limits and re-use proportion, 2020-21 (per cent)

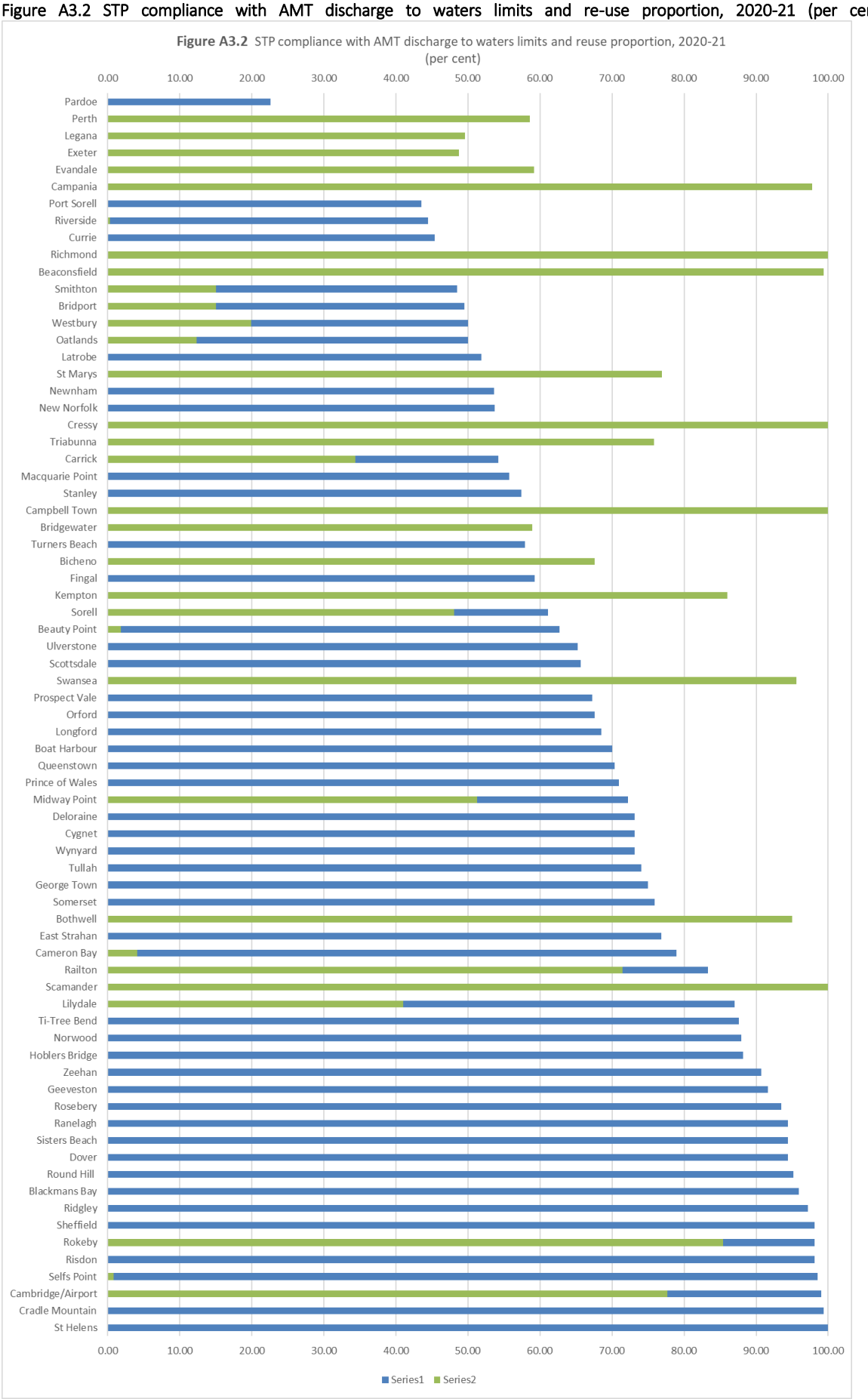


Figure A3.3 STP compliance combined regulatory discharge to waters and reuse limits; re-use proportion, 2020-21 (per cent)

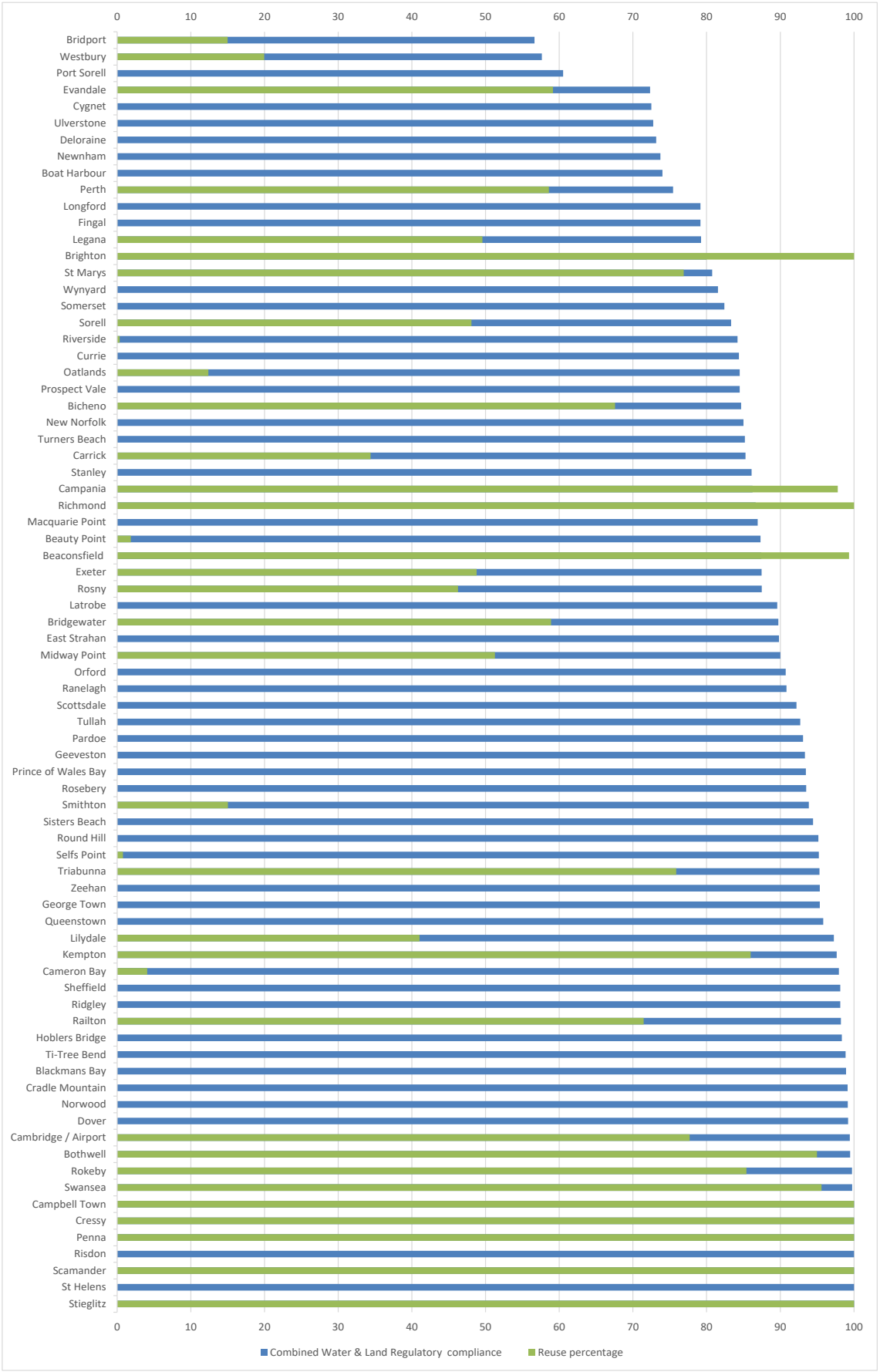


Table A3.4 Re-use proportion per STP (per cent proportion and ML/year) 2016-17 to 2020-21

	2020-21		2019-20		2018-19		2017-18		2016-17	
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	111	99	105	99	101	99	104	60	84
Beauty Point	2	3	69	79	80	147	100	146	39	81
Bicheno	68	97	91	86	93	91	80	80	58	66
Bothwell	95	38	100	33	100	28	73	25	100	48
Bridgewater	59	585	94	850	81	647	92	785	67	550
Bridport	15	17	8	9	8	10	6	7	10	10
Brighton	100	259	100	224	100	237	100	214	100	221
Cambridge	78	191	92	188	68	137	20	34	15	24
Cameron Bay	4	81	4	78	6	108	7	119	3	50
Campania	98	53	100	30	100	20	100	35	97	33
Campbell Town	100	76	100	66	100	62	64	42	100	119
Carrick	34	69	43	99	41	88	-	-	-	-
Cressy	100	70	100	70	83	58	100	69	32	23
Evandale	59	48	100	59	100	45	100	81	83	65
Exeter	49	32	68	41	51	29	49	25	36	24
Kempton	86	36	96	29	100	28	99	29	100	21
Legana	50	208	49	246	71	263	57	209	41	172
Lilydale	41	17	100	44	100	60	66	22	58	42
Midway Point	51	115	100	217	79	150	100	165	73	105
Oatlands	12	19	95	57	71	22	100	68	100	103
Penna	100	220	100	408	100	275	100[1]	389[1]	100	266
Perth	59	146	87	156	88	136	100	209	83	154

	2020-21		2019-20		2018-19		2017-18		2016-17	
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	71	96	92	146	76	125	66	105	42	180
Richmond	100	53	100	53	100	55	100	71	100	60
Riverside	0	2	2	12	2	13	-	-	3	18
Rokeby	85	856	95	828	100	802	100	749	99	723
Rosny	46	1109	68	1507	73	1589	57	1300	55	1265
Scamander	100	47	100	47	100	42	-	-	92	45
Selfs Point	1	24	1	24	1	24	-	-	-	-
Smithton	15	219	12	181	16	230	16	207	-	-
Sorell	48	104	95	191	64	128	100	226	72	165
St Marys	77	32	92	38	100	30	86	40	40	19
Stieglitz	100	108	100	75	100	38	100	54	100	102
Swansea	96	100	97	49	89	48	66	48	19	17
Triabunna	76	65	74	59	100	53	97	55	91	69
Westbury	20	41	25	45	34	56	22	47	10	33

- No discharge to this receiving environment reported for this period

[1] data correction

Table A3.5 2020-21 Licensed average dry weather flow limit and actual average annual inflow per STP (kL/day and per cent proportion)

Premises name	Catchment area	Licensed ADWF limit (kL/day)	2020-21 average annual inflow (kL/day)	Actual inflow (per cent of licensed limit)
Beaconsfield	West Tamar	400	294	74
Beauty Point	West Tamar	540	441	82
Bicheno	Glamorgan/Spring Bay	450	394	88
Blackmans Bay	Kingborough	8530	5607	66
Boat Harbour	Waratah/Wynyard	170	31	18
Bothwell	Central Highlands	155	109	70
Bridgewater	Brighton	3500	2618	75
Bridport	Dorset	1400	317	23
Brighton	Brighton	650	711	109
Cambridge/Airport	Clarence	800	621	78
Cameron Bay	Glenorchy	6000	5500	92
Campania	Southern Midlands	136	149	110
Campbell Town	Northern Midlands	325	209	64
Carrick	Meander Valley	624	544	87
Cradle Mountain	Kentish	500	207	41
Cressy	Northern Midlands	240	193	80
Currie	King Island	290	311	107
Cygnet	Huon Valley	400	327	82
Deloraine	Meander Valley	850	818	96
Dover	Huon Valley	360	192	53
East Strahan	West Coast	1056	756	72
Evandale	Northern Midlands	375	272	73
Exeter	West Tamar	150	177	118
Fingal	Break O' Day	125	35	28
Geeveston	Huon Valley	300	407	136
George Town	George Town	3600	2021	56
Hoblers Bridge	Launceston	4500	2719	60
Kempton	Southern Midlands	135	114	84
Latrobe	Latrobe	1000	1355	135
Legana	West Tamar	540	1101	204
Lilydale	Launceston	135	112	83
Longford	Northern Midlands	2700	2012	75
Macquarie Point	Hobart	18000	10782	60
Midway Point	Sorell	810	615	76
Turiff Lodge	Derwent Valley	4100	1794	44
Newnham Drive	Launceston	3920	2793	71
Norwood	Launceston	4050	2961	73
Oatlands	Southern Midlands	136	421	309
Orford	Glamorgan/ Spring Bay	473	267	56
Pardoe	Devonport	14000	12808	91
Penna#	Sorell	1400	602	43

Premises name	Catchment area	Licensed ADWF limit (kL/day)	2020-21 average annual inflow (kL/day)	Actual inflow (per cent of licensed limit)
Perth	Northern Midlands	450	695	155
Port Sorell	Latrobe	961	1022	106
Prince of Wales	Glenorchy	9900	8711	88
Prospect Vale	Meander Valley	1720	1609	94
Queenstown	West Coast	1100	2090	190
Railton	Kentish	600	369	62
Ranelagh	Huon Valley	1200	1277	106
Richmond	Clarence	236	206	87
Ridgley	Burnie	110	175	159
Risdon	Clarence	1000	1153	115
Riverside	West Tamar	2800	1629	58
Rokeby	Clarence	4000	2466	62
Rosebery	West Coast	242	785	324
Rosny	Clarence	7500	7070	94
Round Hill	Burnie	9000	6337	70
Scamander	Break O' Day	240	129	54
Scottsdale	Dorset	3200	422	13
Selfs Point	Hobart	13000	8353	64
Sheffield	Kentish	350	542	155
Sisters Beach	Waratah/Wynyard	585	74	13
Smithton	Circular Head	5200	4159	80
Somerset	Waratah/Wynyard	1200	1072	89
Sorell	Sorell	810	594	73
St Helens	Break O' Day	1500	637	42
St Marys	Break O' Day	190	116	61
Stanley	Circular Head	276	192	70
Stieglitz	Break O' Day	110	287	261
Swansea	Glamorgan/ Spring Bay	430	281	65
Ti-Tree Bend	Launceston	25000	15349	61
Triabunna	Glamorgan/ Spring Bay	253	233	92
Tullah	West Coast	243	115	47
Turners Beach	Central Coast	600	634	106
Ulverstone	Central Coast	7500	8671	116
Westbury	Meander Valley	600	686	114
Wynyard	Waratah/Wynyard	2900	3845	133
Zeehan	West Coast	214	987	461

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 NRET'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 (NRET) 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 2021

	Dam name	Consequence category
1	Flagstaff Gully	Extreme
2	Ridgeway Reservoir	Extreme
3	Upper Reservoir	Extreme
4	Limekiln Gully	High A
5	Tolosa Reservoir	High a
6	Knights Creek	High A
7	Curries River	High A
8	Lower Reservoir	High A
9	Risdon Brook	High A
10	Swansea (Meredith) Reservoir	High B
11	Illabrook	High B
12	Lake Mikany	High B
13	Lake Isandula	High B
14	Lower Prosser	High C
15	Upper Prosser	High C
16	Conglomerate Dam	High C
17	Pet Dam	High C
18	Westbury	High C
19	Duckhole Rivulet	High C
20	Margaret Street Detention Basin	High C
21	Coles Bay	High C
22	Swansea Saddle Dam	Significant
23	Williams Reservoir	Significant
24	Bicheno	Significant
25	Blackmans #1	Significant
26	Blackmans #2	Significant
27	Guide Dam	Significant
28	Waratah Dam	Significant
29	Lake Fenton	Significant
30	Stiglitz Wastewater & Reuse Dams	Significant
31	Mt Leslie Basin	Significant
32	Colebrook Dam	Significant
33	Dunalley STP Primary Sewage Lagoon	Significant
34	Dunalley STP Secondary Sewage Lagoon 1& 2	Significant
35	Evandale Sewage Lagoon	Significant
36	Stieglitz STP Lagoons	Significant
37	Colebrook (Yarlington Dam)	Significant
38	Nunamara Weir	Significant
39	Penna Reuse Lagoons	Significant

APPENDIX 5 CUSTOMER SERVICE STANDARDS

Table A5.1 Tasmanian Water and Sewerage Industry Customer Service Code service standards for 2020-21 and TasWater's performance results for 2019-20 and 2020-21

Service standard	CSC minimum standard 2020-21	2019-20	2020-21
Water:			
Water main breaks (no. per 100 km of water main)	35	33	**52**
Percentage of response times taken to attend bursts and leaks:			
– priority 1 (within 60 minutes)	90%	92%	90%
– priority 2 (within 180 minutes)	90%	97%	93%
– priority 3 (within 4 320 minutes)	90%	94%	93%
Incidence of unplanned interruptions - water (no. per 1 000 properties)	170	**220**	**208**
Incidence of planned interruptions - water (no. per 1 000 properties)	20	**61**	**47**
Average duration of an unplanned interruption - water (180 minutes) - achieved % of the time	80%	87%	84%
Average duration of a planned interruption - water (180 minutes) - achieved % of the time	80%	**14%**	**14%**
Percentage of unplanned water supply interruptions restored within 5 hours	94%	95%	94%
Percentage of planned water supply interruptions restored within 5 hours	90%	**84%**	**54%**
Percentage of non-revenue water (of total sourced potable water) (unaccounted for water)	28%	28%	25%
Sewerage:			
Sewerage mains breaks and chokes (no. per 100 km of sewer main)	65	41	57
Percentage of response times within 60 minutes to attend sewer spills, breaks and chokes	90%	91%	91%
Percentage of sewage spills contained within 5 hours	99%	99.7%	99.4%
Customers:			
Total water and sewerage complaints (no. per 1 000 properties)	9	9	**11**
Water and sewerage complaints to the Ombudsman (no. per 1 000 properties)	0.5	0.1	0.2
Percentage of calls answered by an operator within 30 seconds	85%	**83%**	92%

NOTE: Results in **bold** and underlined indicate that the standard was not met.

The most recent version of the *Tasmanian Water and Sewerage Industry Customer Service Code* (27 November 2020) can be found at: https://www.economicregulator.tas.gov.au/water/regulatory-framework/customer-service-code

APPENDIX 6 FINANCIAL PERFORMANCE MEASURES AND CAPITAL WORKS LIST

A6.1 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

	National performance report		NPR formula / NPR requirement	Formulae		Notes
Item	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	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.	

A6.2 Major capital works projects

Table A6.2 TasWater's major capital works projects (PSP3 current projects)

Project Name	Driver	Total Budget $'000	Project description	Actual/ Expected completion	Status
Water Treatment					
North West Water Supply: Revise SBC (old Forth Leven)	Compliance	50 569	Ultimate treatment capacity to service NWWS scheme from Forth. Will improve Best Practice Risk Mitigations (BPRMs) compliance and ensure safety of water.	June-26	Project Development
Bryn Estyn WTP Major Upgrade/Replacement	Compliance	243 944	New WTP at Bryn Estyn to meet BPRMs to supply water to greater Hobart.	May-23	Project Delivery
Rocky Creek WTP	Compliance	3 453	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 WTP.	Aug-18	Completed
Huon Valley Major Upgrade / Replacement	Compliance	26 652	Upgrade or replace the existing WTP to reduce the risk of non-compliant water in the system.	TBC	Unapproved
Fern Tree WTP Major Upgrade	Compliance	69 000	Upgrade or replace the existing WTP to reduce the risk of non-compliant water in the system.	Aug-27	Unapproved
Regional Towns Stage 4	Compliance	22 500	Project to upgrade the water supply to the five next highest water quality risk systems. This will be undertaken by upgrading the following WTP's: Dover, Tullah, Oatlands, Bothwell, and St Marys.	Jun-25	Project Development
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.	Dec-19	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.	Nov-18	Completed

Project Name	Driver	Total Budget $'000	Project description	Actual/ Expected completion	Status
Gretna, Glenora and Bushy Park Water Supply Upgrade - Stage 2	Compliance	800	The new WTP and associated pipeline has been commissioned and delivering water to the community. Optimisation of the plant continues, including a long term resolution to the waste stream from the plant. A short term solution is currently in place.	May-21	Completed
UV Program Stage 2a	Compliance	TBD	Install UV disinfection at five of the larger sites around the state providing an increase to BPRMs Systems.	Jun-21	Project Development
UV Program - Stage 1	Compliance	10 620	Sites are currently deemed not to be compliant with BPRMs Systems. Sites associated include Bracknell Bridport Deloraine Glen Huon Longford Scottsdale St Helens Westbury.		Project Delivery
Chimney Saddle Clarifier and Flocculation Tank	Renewal	1 698	Upgrade of WTP infrastructure / equipment.	Oct-21	Completed
Water Networks					
Burnie Cam Pipeline Construction	Improvement	3 782	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.	Aug-19	Completed
Margate Water Main Upgrade Stage 2	Growth	13 770	Duplication main to support growth demand.	Dec-19	Completed
Rosebery, Triabunna, Tunbridge and Coles Bay Reservoirs	Growth	12 800	Project will construct four new reservoirs at various sites.		Project Delivery
Lake Fenton Pipeline, Claremont - Water Main Renewal	Renewal	3 113	Renewal to assist in continuation of water supply by preventing burst per 100km. Asset is considered critical and due for replacement.	Jan-22	Project Delivery

Project Name	Driver	Total Budget $'000	Project description	Actual/ Expected completion	Status
Claremont Trunk, Berriedale - Water Main Renewal	Renewal	2 404	Renewal to assist in continuation of water supply by preventing burst per 100km. Asset is considered critical and due for replacement.	Jan-22	Project Delivery
Lake Fenton Pipeline (Gateway), New Norfolk	Renewal	TBD	Renewal to assist in continuation of water supply by preventing burst per 100km. Asset is considered critical and due for replacement.	Jun-22	Project Delivery
Sewer Networks					
Jason St SPS and Esplanade SPS Rising Main Replacements (St Helens) - Stage 1	Improvement	2 029	Environmental and shellfish Lease improvements. This will be achieved by replacing the rising mains from the respective SPS to the downstream pump station.	Oct-19	Completed
Jason St SPS and Esplanade SPS Rising Main Replacements (St Helens) - Stage 2	Improvement	1 195	Majority of Customer Outcomes achieved in Stage 1. Further improvements currently being investigated around the STP intake.	TBC	Project Development
Davis St, Smithton SPS Upgrade	Renewal	4 095	Replacement and relocation of existing SPS. The replacement will allow for increased emergency storage coupled with increased pumping capacity and inlet works at the affected STP.	Sep-23	Project Development
Latrobe Sewerage System - Network Upgrade and Augmentation	Improvement	6 184	Replace and upgrade a significant amount of the Latrobe sewerage network as it is not providing an adequate level of service, as indicated by uncontrolled sewage surcharges occurring from manholes to private property.	Jun-21	Completed
Blackstone Rd SPS	Renewal	3 230	Upgrade of SPS and associated rising main in land slip area to increase capacity and prevent sewage spills.	Aug-21	Completed
Wellington St SPS upgrade	Improvement	2 123	Various alterations to the existing process for the SPS including conversion of existing overflow well into wet well and installation of new pumps and pedestal.	Apr-21	Completed
Booth Avenue Sewage Rising Main Renewal Stage 2	Renewal	3 800	Renewal of the existing sewer rising main with significant challenges due to depth, heavy traffic, significant flow rates and no isolation.	Oct-21	Completed

Project Name	Driver	Total Budget $'000	Project description	Actual/ Expected completion	Status
Sewage Treatment					
Kingborough Sewerage Strategy - Treatment & Network	Growth	59 770	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.	Aug-19	Completed
Northern Midlands Sewerage Improvement Plan - Longford STP Upgrade	Compliance	33 672	Project will consist of 1) Upgrade of the existing STP 2) new discharge to Back Creek 3) partial reuse to nearby landowners.	Apr-22	Project Delivery
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.	Jan-20	Completed
Geeveston Optimisation	Compliance	3 238	Relocate the existing outfall to Shipwrights Point.	Nov-23	TOC/PBE
System optimisation - Sewer	Compliance	0	Minor activities which will improve the compliance of effluent discharge at various sites.	Jul-21	Project Delivery
Turriff Lodge Optimisation	Compliance	2 225	Top 20 STP for sensitive receiving waters - Optioneering still being undertaken but scope will most likely involve a new outfall or reuse scheme.	Aug-22	TOC/PBE
Launceston Sewerage Improvement Program (LSIP)	Compliance	273 000	Greater Launceston Sewerage Improvements. Long term Project. Will look at rationalising multiple STP's into one new STP at the current Ti Tree Bend site.	Feb-31	Planning & Investigation
Westbury STP Upgrade and Reuse	Compliance	4 675	Increased storage to the existing lagoons with minor remedial works. Inlet works, including consolidating two inlets into one and a new inlet screen.	Feb-31	TOC/PBE
Ti Tree Bend STP Biosolids Upgrade	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.	Dec-18	Completed

Project Name	Driver	Total Budget $'000	Project description	Actual/ Expected completion	Status
Prince of Wales Bay STP Digester Roof Replacement/Repairs	Compliance	5 006	Replace the existing digester roof. Prevent catastrophic failure.	Aug-20	Completed
Wynyard STP Upgrades	Compliance	16 904	Improve effluent discharge. May include disinfection upgrade, partial reuse or outfall extension.	Jun-27	Planning & Investigation
Hamilton STP Relocation	Improvement	2 500	Relocation of STP lagoons to appease neighbouring landowner. Will reduce odour complaints.	TBC	Project prudency under assessment by TasWater
Queenstown STP Remediation	Compliance	1 801	Upgrade of Aeration Tank, Electrical Switchboard, aeration and inlet screen.	Jun-22	Project Delivery
Other					
Rocherlea Redevelopment	Improvement	0	Redevelopment of TasWater office/Depot. Fit for purpose.		Unapproved
Glen Dhu Stormwater Management Improvements	Improvement	2 529	Stormwater pipeline diversion to prevent overflowing to the Glen Dhu school.	Dec-19	Completed
Dam					
Pet Dam	Compliance	12 094	Safety Upgrades: Raising the crest level of the dam by 300mm Reconstruction; and Upgrade of the spillway	May-24 Mar-24	TOC/PBE
Lake Mikany	Design	23 174	Safety Upgrades, remove dam from above ANCOLD LoT.	Jul-22	Project Delivery

Project Name	Driver	Total Budget $'000	Project description	Actual/ Expected completion	Status
Flagstaff Gully Dam Upgrade	Compliance	5 528	Safety Upgrades, remove dam from above ANCOLD LoT.	May-22	Unapproved
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.	Nov-21	Completed
Swansea - Stage 1 and 2	Compliance	6 603	Full clay liner installed including sourcing and testing.	Nov-18	Completed
Lake Isandula	Compliance	285	Safety Upgrades, remove dam from above ANCOLD LoT.	Mar-24	Unapproved
Henderson Dam Raising	Compliance	12 496	Increase of Henderson's Dam to provide water surety to Flinders Island during the summer months. This will be undertaken by Raising of Henderson's Dam weir by 2m and associated raising and upgrade of spillway. Also allowing for temporary measures until implemented.	Apr-22	Project Delivery
Ridgeway upgrade	Compliance	20 718	Safety Upgrades, potential of post-tensioned anchor upgrade.	Jun-26	Unapproved
Blackman River Dam No 2	Compliance	70	Safety Upgrades, remove dam from above ANCOLD LoT.	Nov-25	Unapproved

Source: TasWater Half Yearly Capital Report, Progress Update to 30 December 2021

Key: Orange - has been included Green - has been competed

- *Unapproved* – Project has had no formal approval and is still in the concept phase. These projects remain within TasWater's business as usual operations and are not yet part of the capital works program (CWP).
- *Planning and Investigation* – A formal approval to be included in the CWP has been received. The project is currently progressing through an optioneering and Strategic Business Case phase. This will determine the best option to be progressed.
- *Project Development* – Preliminary design is being undertaken in parallel to a Detailed Business Case. This will determine the preferred option and sufficient design to determine that the preferred option is feasible.
- *Target Out-turn Cost (TOC)/ Project Budget Estimate (PBE)* – This will involve the completion of a detailed design, creation of tender documents, release and subsequent award of contract. This phase provides TasWater with an accurate project cost estimate.
- *Project Delivery* – Is the overall construction phase of the project through to finalisation of the contract.