

# TASMANIAN WATER AND SEWERAGE STATE OF THE INDUSTRY REPORT 2012-13



## CONTACT DETAILS

### Office of the Tasmanian Economic Regulator

Office hours:	8.45am to 5.00pm, Monday to Friday (except public holidays)
Street address:	5 <sup>th</sup> Floor, 111 Macquarie Street, Hobart, Tasmania 7000
Postal address:	GPO Box 770, Hobart, Tasmania 7001
Telephone:	(03) 6166 4422 or international +61 3 6166 4422
Facsimile:	(03) 6233 5666 or international +61 3 6233 5666
Email:	<a href="mailto:office@economicregulator.tas.gov.au">office@economicregulator.tas.gov.au</a>
Website:	<a href="http://www.economicregulator.tas.gov.au">www.economicregulator.tas.gov.au</a>

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Cover image: Construction of a new drinking water storage reservoir at Lenah Valley (TasWater)

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# ACRONYMS

Term	Meaning within the context of this report
AAV	Assessed annual value
ADWF	Average dry weather flow
ADWG	Australian Drinking Water Guidelines 2011
AER	Annual Environmental Review
AMT	Accepted Modern Technology
AWA	Australian Water Association
BWA	Bulk water authority
COAG	Council of Australian Governments
Code	Customer Service Code
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CSO	Community Service Obligation
DEPHA	Department of Environment, Parks, Heritage and the Arts
DHHS	Department of Health and Human Services
DPIPWE	Department of Primary Industries, Parks, Water and Environment
DWQG	Tasmanian <i>Drinking Water Quality Guidelines 2005</i>
EBIT	Earnings Before Interest and Tax
EMPCA	<i>Environmental Management and Pollution Control Act 1994</i>
EPA	Environment Protection Authority
EPN	Environment Protection Notice
ERR	Economic Rate of Return
FWA	'Free' water allowance
Gentrack	Billing system
GFC	Global Financial Crisis
Industry Act	<i>Water and Sewerage Industry Act 2008</i>
IPO	Interim Price Order
NDTE	Net Debt to Equity
NPAT	Net Profit After Tax
NPF	National Performance Framework
NPR	National Performance Report
NWC	National Water Commission
NWI	National Water Initiative

Term	Meaning within the context of this report
OTTER	Office of the Tasmanian Economic Regulator
Pricing Regulations	<i>Water and Sewerage Industry (Pricing and Related Matters) Regulations 2011</i>
SOIR	State of the Industry Report
STP	Sewage treatment plant – same as WWTP
Water and Sewerage Corporations Act	<i>Water and Sewerage Corporations Act 2008</i>
WDRC	Written down replacement cost
WSAA	Water Services Association of Australia
WTP	Water treatment plant
WWMP	Wastewater Management Plan
WWTP	Wastewater treatment plant

Basic measures:

kL kilolitre = 1 000 litres or 1 m<sup>3</sup> (cubic metre) and weighs 1 tonne

ML megalitre = 1 000 kL (or 1 000 m<sup>3</sup>)

GL gigalitre = 1 000 ML

TL teralitre = 1 000 GL or 1 km<sup>3</sup> (cubic kilometre)



# EXECUTIVE SUMMARY

## Background

Under the *Water and Sewerage Industry Act 2008* (the Industry Act), the Regulator has an obligation to prepare, in consultation with other industry regulators, an annual 'State of the Industry' report on the Tasmanian water and sewerage industry which includes an overview of the industry's performance and identifies key priorities for improved performance.

This Report, the *Tasmanian Water and Sewerage Industry State of the Industry Report 2012-13*, fulfils this obligation for the period 1 July 2012 to 30 June 2013.

The water and sewerage industry makes a significant contribution to the Tasmanian economy both directly through employment and investment and indirectly through other sectors such as tourism and agriculture. Many of the State's growing industries rely heavily on water resources, particularly dairy, stone fruit and aquaculture. The availability of sustainable and reliable water and wastewater services is a key element of the State's economic development potential.

In 2012-13 the water and sewerage industry continued to face significant change and challenges, with the first year of price regulation marking the start of transition to more equitable charges based on metered consumption and also the introduction of customer service standards. The three water corporations also prepared for further structural reforms pending amalgamation into a new single entity (TasWater) from 1 July 2013.

Legislation introduced in 2012-13 provided for a range of changes to the regulatory framework to improve the interpretation of the Industry Act and allow the Price Determinations made by the Regulator in May 2012 to apply to the single amalgamated corporation (TasWater). Other industry regulators continued to monitor the corporations' progress against key management and compliance plans and guided decisions made by the corporations regarding priorities for major projects and funding.

In 2012-13 the environmental regulator, the Environment Protection Authority (EPA), continued its process of introducing contemporary environmental conditions for the State's wastewater treatment plants and also finalised its risk-based framework for ambient monitoring around treatment plant outfalls.

Drinking water quality continued to be a priority for the water corporations and regulators, with work in 2012-13 progressed against the priority capital works list agreed with the Department of Health and Human Services (DHHS).

Tasmania's water supply remains well above demand, with the expansion of the State's recycled water schemes increasing the proportion of water sourced from recycling (treated effluent) in 2012-13. Average household consumption of drinking water has reduced to around 178 kL per year, possibly due to the introduction of volumetric pricing and improved quality of usage data.

The water corporations' activities during 2012-13 were primarily focused on addressing compliance issues and improving customer service. Better control and monitoring systems on the water and sewerage networks has allowed the water corporations to identify areas of poor performance and prioritise infrastructure upgrades and renewals.

## **Customer service**

The performance of the corporations' call centres has improved markedly in 2012-13, with an average of 82 per cent of calls answered within 30 seconds. Increased resourcing and investment in new systems and processes appears to have made a positive impact, lifting performance in this area to comply with the transitional service standards.

The level of customer complaints has reduced significantly and the corporations were more efficient in responding to, and dealing with, complaints received. However, billing and customer service issues were again a major source of complaint, indicating that customers, particularly in the southern region, were confused about the new pricing structure and had concerns about the charges on their water bill. Water service complaints were also common, with a number of water main bursts occurring in the southern region largely due to environmental conditions and the age and condition of the network. Compliance improvements made to sewerage treatment facilities, particularly in the northern region, have resulted in a significant reduction in the number of sewerage service complaints.

Some Tasmanian households are struggling to pay their quarterly water and sewerage bills with 8 378 residential customers on payment plans as at 1 July 2013. Average debt is around \$430, representing two typical quarterly bills for a customer receiving water and sewerage services. Debt levels are much higher for customers on hardship programs, with customers averaging two years' worth of debt on these programs. This high level of debt may indicate that these customers are not being identified (either by the water corporation or through self-identification) early enough before debt levels become unmanageable. A small percentage of customers had their water supply restricted for non-payment of their water bill in 2012-13, the majority located in the State's north.

Service and reliability was impacted by the age and condition of the water and sewerage network, with a high number of water main breaks and interruptions, particularly in the southern region. There was also a high number of sewer main breaks and chokes and a high rate of sewer overflows, indicating that significant investment is still required in the sewerage network.

The water corporations responded quickly to high priority bursts and leaks, with attendance times within or close to the approved service standards. Typically, customers experienced less than 30 minutes of unplanned water outages throughout the year, with all three water corporations meeting the service standard for customer minutes off water supply (unplanned).

## Water

The water corporations have continued to strive to better understand the level of bacteriological compliance within their water supply systems and to manage the risks associated with non-compliant systems. There has been a significant improvement in the bacteriological compliance of the State's drinking water systems, with adequate monitoring carried out across the State.

Increased operational management and investment in infrastructure has reduced the percentage of the Tasmanian population serviced with reticulated water receiving non-compliant drinking water to just 1.1 per cent in 2012-13. This outcome represents a halving of the percentage reported for 2011-12 (2.2 per cent).

Twenty two drinking water supply systems operated with a permanent boil water alert in 2012-13 and six temporary boil water alerts were issued. Public Health Warnings were also issued in relation to a number of systems due to chemical non-compliance because of elevated levels of metals detected.

The percentage of the population receiving optimally dosed fluoridated water has increased by 24 per cent when compared to 2011-12 owing to greater operational control and management by the water corporations.

The proportion of water sourced from recycling (treated effluent) has increased in 2012-13 from 3 520 ML to 4 148 ML. However, the proportion of recycling in a given year generally reflects the climatic conditions of that year. However, Ben Lomond Water did commission one new effluent recycling scheme, at Beaconsfield, during the reporting period.

## Sewerage

The environmental impact of wastewater on the State's rivers and coastal waters continues to be of concern, with effluent containing significant organic loads, elevated nutrients and faecal bacteria concentrations discharged to the environment. The Tasmanian corporations are still lagging behind their mainland counterparts in relation to compliance of treated effluent against regulated discharge limits.

Environmental compliance has not improved to the extent expected, considering minor upgrades undertaken, with only Ben Lomond Water achieving a slight improvement in relation to regulatory discharge limits over the course of the past five years. Southern Water's compliance has remained stable, whilst Cradle Mountain Water's performance has declined over the same period. Poor performance at two large WWTPs in the State's north-west has contributed to this result.

It is generally acknowledged that significant compliance improvements will in most cases be linked to major infrastructure upgrades or maintenance works. A review undertaken by the EPA in relation to the progress achieved by the corporations against the projects outlined in their regional Wastewater Management Plans (WWMP) highlighted the delay of some projects against original timeframes. Capital expenditure also did not reach the amounts originally planned with regards to Southern Water and Cradle Mountain Water. Ben Lomond Water, on the other hand, was able to demonstrate that significant progress had been made against the

commitments in the WWMP. Overall the pace of progress regarding projects is disappointing, given the context of underperformance against compliance targets.

In addition to concerns about the quality of treated effluent discharged by the State's wastewater treatment plants (WWTPs), instances of raw sewage being released through sewer breaks and overflows are having a negative impact on the receiving environment. It is also noteworthy that in 2012-13, several WWTPs were the subject of widespread and ongoing odour complaints.

## Pricing and finance

In 2012-13 price reforms started to transition customers to target tariffs for water and sewerage charges, with regulated caps limiting annual increases in prices to minimise price shocks to customers. However, significant further reform is required to achieve the objective of all customers paying the same price for the same service.

The typical household bill in 2012-13 was around \$940 per year, with fixed (network) charges making up around 80 per cent of the bill. At 90 cents per kilolitre (target tariff), water usage charges in Tasmania are relatively low compared to mainland providers, which typically charge around \$1.60 per kilolitre. This results from the relativities between fixed and variable costs and also reflects the fact that in most areas of Tasmania there are not water supply shortages.

The water and sewerage corporations received revenue from water and sewerage services totalling \$263.5 million during 2012-13, representing a seven per cent increase from 2011-12. A further \$10.4 million of the corporations' revenue was sourced from Community Service Obligations and the corporations returned \$12.6 million in dividends to owner councils. Dividends represented around 56 per cent of the corporations' net profit after tax (NPAT) of \$22.4 million combined, with Southern Water returning dividends that significantly exceeded its NPAT.

Operating costs increased significantly in 2012-13, largely attributable to increased salary costs and general operating costs. Overall, employee related expenses increased by around 15 per cent whilst the cost of raw materials and consumables increased by around four per cent. Cradle Mountain Water and Southern Water reduced administrative expenses by seven and 11 per cent respectively compared to 2011-12.

Capital expenditure decreased across all three corporations in 2012-13 compared to 2011-12, due to the fact that some of the high cost capital projects of 2011-12 were completed or nearing completion. Some projects have been also deferred to future years, further reducing capital expenditure in 2012-13.

All three water corporations are generating rates of return significantly below full cost recovery. However, comparable water businesses on mainland Australia recorded similar rates of return, ranging from 0.04 to 2.5 per cent, indicating that the performance of the Tasmanian water corporations is comparable to their interstate counterparts.

In terms of the corporations' long term financial stability, the fact that all three water and sewerage corporations have been required to adopt 'impaired' asset values means that current levels of revenue are insufficient to fund the repair and replacement of existing assets. Without increases in revenue the corporations are

not financially sustainable in the long-run based on their existing assets, let alone being able to fund the significant capital expenditure required to meet environmental and public health regulatory requirements.

## Conclusion

Industry regulators have provided an overview of their priorities for the current regulatory period and a review of the corporations' activities against agreed management plans. During 2012-13, regulators were concerned with the lack of progress against some important capital works projects which were delayed or deferred by the corporations. Several key industry guidelines are currently under review, although progress has also been slow in this area.

In the short term, industry regulators will continue to focus on ensuring improvements in regulatory compliance, whilst updating and streamlining compliance standards to ensure that they reflect contemporary practices.

Overall, the Tasmanian water and sewerage corporations have continued to face a number of significant challenges in what was their fourth and final year of operation and have made some compliance improvements with respect to their infrastructure and customer service. It is expected that the single corporation, TasWater, will re-assess priorities and focus on addressing areas of known non-compliance. The future sustainability of the industry will largely depend on TasWater's ability to successfully operate and manage the water and sewerage infrastructure within the confines of available funds and resources.

### **Drinking water performance in 2012-13**

In 2012-13, 1.1 per cent of the Tasmanian population serviced with reticulated water received microbiologically non-compliant drinking water, compared to 2.2 per cent in 2011-12.

A total of 22 permanent boil water alerts were in place during 2012-13, affecting 1.2 per cent of the State's population. This result is comparable to the population affected by permanent boil water alerts in 2011-12.

Six temporary boil water alerts (seven less than the previous year) were used to manage public health during system failures. These outcomes have the potential to be riskier to public health than permanent boil water alerts because of their temporary nature in terms of communication of their occurrence. Nevertheless, temporary boil water alerts are required to allow sufficient time for corrective actions to address the contamination issues to be effective.

The microbiological sampling compliance of drinking water systems was determined to be one hundred per cent of the drinking water systems in Tasmania due to adequate sampling by the water corporations. This is a vast improvement on the 24 per cent which were inadequately sampled back in 2009-10.

The water corporations' implementation of expanded monitoring programs including more frequent chemical sampling has led to more instances of non-compliance now being identified. As a result, the number of systems not complying with the drinking water system standards has actually increased from eleven in 2010-11 to fourteen in 2012-13.

### **Environmental performance in 2012-13**

Compliance achieved by Tasmanian water corporations in relation to emission limits specified for Level 2 WWTPs was poor compared to similar sized utilities on the mainland. Flow-weighted compliance levels ranged from 74 to 93 per cent for the three regional corporations, compared to the narrower range of 85 to 92 per cent achieved in the previous year.

Although 33 of the assessed Level 2 WWTPs achieved compliance greater than 90 per cent (an improvement from 2011-12), compliance levels of the remaining WWTPs had deteriorated compared to the previous year. The key concern is that a high number of WWTPs continue to operate outside acceptable performance levels. The observed trend is disappointing as it was expected that minor WWTP upgrading works and better operational practices introduced by the water corporations would be reflected in some improved compliance at this point in time. In addition, the application of modern, more stringent discharge limits further highlights the lagging performance of Tasmanian WWTPs, with just seven WWTPs achieving more than 90 per cent compliance with modern emission limits.

A positive development was the reduction in the number of WWTPs operating above their regulated hydraulic capacity, with 13 in this category in 2012-13 compared to 24 in the previous year. This reduction is attributed to relatively dry climatic conditions reducing infiltration into the reticulation network, reduced water consumption following the roll-out of water meters and introduction of volumetric pricing, and improved flow measurement practices. However, four WWTPs exceeded their flow limit by more than 100 per cent. In addition, 17 WWTPs were operating at more than 75 per cent capacity.

Stormwater ingress, particularly in old or poorly maintained reticulation systems, remains an issue affecting system performance. Accumulation of sludge in sewage lagoons has also been identified as a limiting factor in relation to system compliance. The prevalence of potentially toxic blue-green algae blooms continues to be another concern in relation to sewage lagoons.

### **Pricing and financial performance in 2012-13**

The Regulator's price determinations took effect on 1 July 2012. The determinations included the requirement for two-part pricing to apply to all customers and the consequential removal of free water allowances.

Water service charges comprise two parts - a fixed charge, which is based on the size of the water connection to the property and a variable water usage charge based on the actual metered water usage at the property. Sewerage service charges are calculated on a single fixed charge based on the number of equivalent tenements (ET) assessed for each property.<sup>1</sup>

In 2012-13 price reforms started to move customers towards the real cost of providing water and sewerage services, with Government mandated caps on annual increases in prices to avoid significant price movements. The typical household bill in 2012-13 ranged from \$936 to \$946 per year, with quarterly bills issued over the course of the year.

All three corporations reported an increase in revenue in 2012-13, although a reduction in demand was greater than anticipated and translated to lower than expected income in the southern region. Operating costs have increased by around 8.3 per cent between 2011-12 and 2012-13, largely attributable to increased salary costs and increased general operating costs. Conversely, Cradle Mountain Water and Southern Water reported significant decreases in their administrative expenses, of seven and 11 per cent respectively for 2012-13 compared to 2011-12.

Capital expenditure decreased across all three corporations in 2012-13 compared to 2011-12, with some of the high cost capital projects completed or nearing completion. Total combined capital expenditure in 2012-13 was around \$101 million, with several major projects delayed or deferred to future years.

At current revenue levels the corporations are not financially sustainable in the long-run based on their existing assets, let alone being able to fund the significant capital expenditure required to meet environmental and public health regulatory requirements. The water corporations have reported significant increases in debt to fund capital projects while returns to council owners have increased, returning over \$12.6 million in dividends (not including guarantee fees and income tax equivalents) in 2012-13.

None of the corporations are achieving rates of return approaching full cost recovery.

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<sup>1</sup> An ET is a classification used in the Water Services Association of Australia Sewer Code to measure the demand a property will place on infrastructure; for example, a single residential property is rated as one standard ET whilst a hotel may be rated as 50 ETs.



### **Customer service and complaint handling in 2012-13**

The corporations deliver service standards in line with the Customer Service Code and transitional service standards agreed to in the Price Determination. These outline the minimum standards and conditions of service and supply with which the three water and sewerage corporations must comply in providing services to customers.

Compliance with the Code and customer complaints is monitored by the Regulator as the corporations develop systems and procedures to capture performance information against the set of standards and targets.

There has been a marked improvement in customer service levels in 2012-13, indicating that the water corporations have addressed the issues previously experienced with their customer service centres and successfully lifted performance in this area.

Call centre services were provided via three regional call centres with around 165 400 calls received during 2012-13. An average of 82 per cent of calls were connected within 30 seconds, which is a vast improvement over the performance reported for 2011-12 when only 58 per cent of calls were answered within 30 seconds.

The number of complaints received by the water corporations reduced significantly in 2012-13, although water service issues were common in the southern region. Billing and customer service related issues also made up a large portion of registered complaints, indicating that customers were confused about the new pricing structure and had concerns about the charges on their water bills.

Compliance improvements made to sewerage treatment facilities, particularly in the northern region, have resulted in a significant reduction in the number of sewerage service complaints. Water quality complaints (concerning colour, taste and odour) represented a small proportion of complaints, reflecting customer satisfaction with these qualities.

The water corporations were efficient in responding to, and dealing with, complaints received, with 95 per cent of complaints resolved within a ten day target period. The improved performance can be attributed to the ongoing training of customer service agents and increased resourcing in this area.

Service and reliability was impacted by the age and condition of the water and sewerage network, with a high number of water main breaks and interruptions, particularly in the southern region. There was also a high number of sewer main breaks and chokes and a high rate of sewer overflows, indicating that significant investment is still required in the sewerage network

The water corporations responded quickly to high priority bursts and leaks, with attendance times within or close to the approved service standards. Typically, customers experienced less than 30 minutes of unplanned water outages throughout the year, with all three water corporations meeting the service standard for customer minutes off water supply (unplanned).



# 1 INTRODUCTION

The Tasmanian Economic Regulator (the Regulator) is responsible for the economic regulation of the Tasmanian water and sewerage industry. The water and sewerage industry provides drinking water and wastewater services (including sewage treatment) to residential, commercial and industrial customers across the State.

The key piece of legislation governing the water and sewerage industry is the *Water and Sewerage Industry Act 2008* (the Industry Act). The Industry Act establishes the regulatory framework for the water and sewerage industry, including the Regulator's role and responsibilities.

One of the Regulator's main functions with respect to the water and sewerage industry is monitoring and reporting performance. The performance framework is designed to provide reliable and consistent information that brings transparency and accountability in the provision of water and wastewater services in Tasmania. It also helps regulated businesses, regulatory agencies and Government identify key priorities for improving performance of the industry and informing their respective decision making processes.

Under the Industry Act, the Regulator has an obligation to prepare an annual 'State of the Industry' report on the water and sewerage industry which includes an overview of the performance of the industry and identifies key priorities for improved performance. The Report is prepared in consultation with other industry regulators; the Director of Public Health, the Director, Environment Protection Authority (EPA) and the Secretary, Department of Primary Industries, Parks, Water and Environment (DPIPWE).

In carrying out its functions the Regulator is required to have regard to the promotion of efficient pricing of regulated services, the maintenance of appropriate service standards and the promotion of efficient long term investment in infrastructure. Health, public safety and monitoring with respect to the supply of drinking water are regulated by the Director of Public Health whilst relevant environmental obligations are regulated by the Director, EPA. More information on the regulatory framework and roles and responsibilities can be found in Chapter 3.

The State of the Industry Report is a comprehensive, independent review of the industry's performance. This is the sixth annual report on the performance of the Tasmanian water and sewerage industry. It addresses the key areas of affordability, customer service, network reliability and efficiency, financial performance, drinking water quality, environmental performance and an identification of priorities for improving performance.

Combined with a licensing system that ensures that only competent participants deliver appropriate services, the Report provides insights to consumers on the ongoing capability of the industry and monitors the costs of delivering appropriate services to customers.

It assesses the performance of:

- Tasmanian Water and Sewerage Corporation (Northern Region) Pty Ltd trading as Ben Lomond Water – the service provider in the northern region;
- Tasmanian Water and Sewerage Corporation (North-Western Region) Pty Ltd trading as Cradle Mountain Water – the service provider in the north-western region; and
- Tasmanian Water and Sewerage Corporation (Southern Region) Pty Ltd trading as Southern Water – the service provider in the southern region.

This Report covers the entities' performance during 2012-13 across a number of key performance measures. This will be the last Report that assesses the performance of the three regional corporations, following their amalgamation into one corporation (TasWater) in July 2013.

Much of the data provided by the corporations for 2012-13 has not been independently audited and, as such, the reliability and accuracy of the data cannot be assured. Where possible, the corporations have provided some indication of data confidence and have been given the opportunity to comment on the Regulator's assessment of their performance.

As the availability of performance data for the industry improves over time, the Regulator aims to benchmark performance against similar service providers in other states and territories.

## 1.1 Scope of this report

The structure and content of this report is based on the National Performance Reporting Framework<sup>1</sup> and some additional State-based measures, although reporting against a number of indicators is limited due to the absence of some performance data.

This report focuses on indicators in a number of key performance areas including:

- water resources – water sources, consumption and treatment;
- industry infrastructure – water and sewerage assets, reliability and efficiency of the network including frequency, duration and rectification of water supply interruptions, sewer blockages and spills as well as levels of leakage and losses from water supply systems;
- customers – connected properties and population, responsiveness and customer service including customer complaints, call centre performance and timeliness of response to supply interruptions;
- public health – water quality compliance with bacteriological and fluoridation standards;

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<sup>1</sup> National Water Commission, *2012–13 urban water performance report indicators and definitions handbook, and auditing requirements*, July 2013.

- environment – wastewater collection and treatment, effluent discharge, impacts on waterways, effluent and biosolids reuse;
- pricing and finance – tariff structures, revenue from water and sewerage operations and expenditure;
- priorities for improving performance – strategic planning and initiatives; and
- historical performance – including comparisons with last year's data where possible.

This report does not include information on private water and sewerage systems, irrigation or drainage as these areas are outside the scope of regulation under the Industry Act.

## **1.2 The Regulator's role in regulating service standards**

This Report measures performance in several key areas including environmental management and pollution and water quality. However, it is important to note that the Regulator is not responsible for regulating performance in these areas.

In addition to pricing, the Regulator is responsible for regulating service standards and conditions of supply. In this regard, the Regulator has issued a Customer Service Code (the Code) as required under the Industry Act. The Code provides:

- a consistent overarching framework for the delivery of services to customers across all three regions;
- obligations for key matters including connection and service provision, charges, handling of complaints and disputes, billing, payment of bills, collection of outstanding bills, actions for non-payment, quality of supply, reliability of supply, disconnection, meters, works and maintenance;
- service targets and standards; and
- a requirement that each business maintain a customer charter that informs customers about the services that it offers, the respective rights and responsibilities of the business and its customers and the service standards that the business proposes to deliver over the regulatory period.

The Regulator is responsible for monitoring and enforcing compliance with the obligations set out in the Code. It does this by:

- auditing compliance with the regulatory obligations on a regular basis;
- responding to and following up on issues or concerns raised by customers or other stakeholders about compliance matters; and
- publishing data on performance against Code requirements.

### 1.3 Performance data

Performance data used in this report has been provided by the water corporations in line with the *Water and Sewerage Performance and Information Reporting Guideline* issued by the Regulator in September 2010.

The Regulator, in developing the Reporting Guideline, considered the requirements and obligations under the Industry Act, standards and targets prescribed by the Code and the performance reporting obligations agreed by the Tasmanian Government under the National Water Initiative Agreement.

It is in the interests of both the Regulator and industry stakeholders that data and information supplied under the Reporting Guideline will allow an entity's performance to be monitored over time against standards and targets and against the performance of other relevant entities.

### 1.4 Information sources

This report is based on two principal sources of information:

- performance data reported by the water corporations against key performance measures specified by the Regulator in its Reporting Guideline and comments provided by the corporations explaining their performance; and
- performance data collected as part of regulatory reporting requirements by the Department of Health and Human Services, and the EPA Division of DPIPWE.

As in previous years, there are significant gaps in the performance information available to present in this report. However, there has been an improvement in the quality of the performance data provided by the water corporations in 2012-13 compared to previous years. The Regulator expects further improvement over time as compliance with the new regulatory framework is phased in and the water and sewerage corporations develop the necessary systems to collect and report on performance across the industry.

In most cases, the Regulator has been unable to verify the accuracy of the data contained in this report and has relied on the information provided to it. This should be considered when interpreting the data and commentary presented in the report.

### 1.5 Water and sewerage services

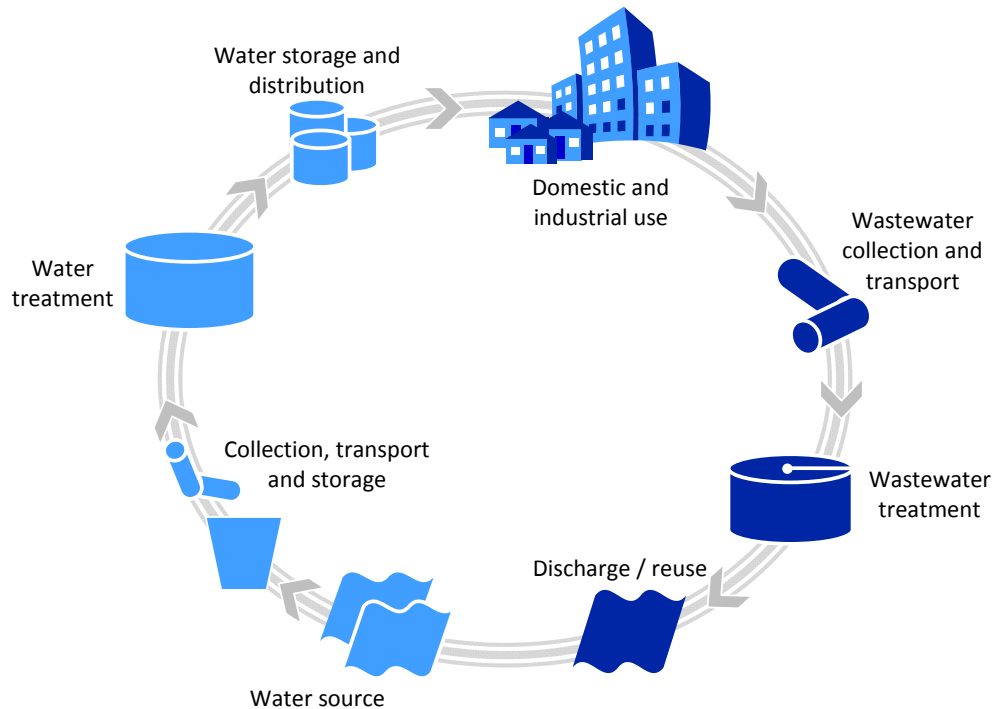
Tasmania's potable water (ie water suitable for drinking) infrastructure comprises elements to extract, treat and distribute drinking water, while sewerage infrastructure involves the collection, treatment and discharge of wastewater. The urban water cycle begins when water is collected or extracted for use in an urban community and ends when it is returned to the environment.

Figure 1.1 illustrates the urban water cycle.

Water is collected from the environment in a catchment then transported via rivers and pipes to water storage dams. Water is then cleansed and purified before being transported through water supply mains to suburban reservoirs. Water mains then deliver treated water to domestic and commercial customers.

Sewerage pipes carry the wastewater to the sewer and on to processing at a sewage treatment plant. Treated wastewater is then returned to the environment or further distributed for reuse. The cyclical nature of this process means that increases in demand for water not only result in increased costs in the provision of that water, but also increase the costs associated with the removal and treatment of wastewater before its return to the environment.

**Figure 1.1 The urban water cycle**



### 1.5.1 Water and sewerage service providers

The Industry Act requires any person or entity owning or operating water and sewerage infrastructure, or supplying water and sewerage services to others, to be licensed, unless otherwise exempted.

As at 30 June 2013 there were three licensed water and sewerage service providers in Tasmania.<sup>2</sup> Ben Lomond Water, Cradle Mountain Water and Southern Water are responsible for the control, ownership and operation of water supply and sewerage systems in Tasmania. These businesses are vertically integrated, providing wholesale, distribution and retail services for both water and sewerage. Services provided include:

- harvesting, storage and treatment of raw water supplies;
- transmission of bulk water supplies;

<sup>2</sup> The water and sewerage licences held by the three water corporations were surrendered as at 30 June 2013. The Regulator granted a water and sewerage licence to the Tasmanian Water and Sewerage Corporation Pty Ltd (trading as TasWater) on 22 April 2013. This licence took effect on 1 July 2013.

- the operation of the bulk sewerage service and treatment of the majority of sewage;
- retail services;
- trade waste; and
- managing rivers and creeks and major drainage systems.

Each water and sewerage corporation is licensed to operate in the State of Tasmania, but during 2012-13 each corporation operated in a specific geographic area and did not compete with one another for customers.

The water and sewerage corporations manage all aspects of the water supply chain from the dams to customer properties and from sewers to wastewater treatment plants and disposal, with the overarching objective of complying with public health, environmental and customer service regulatory requirements. Around 197 000 properties are supplied with water and sewerage services from the water and sewerage corporations. This represents around 83 per cent of the state's population. The principal objectives of the water and sewerage corporations are to:

- promote the efficient delivery of water supply and provision of sewerage services; and
- to encourage water conservation, demand management of water and the re-use of water on an economic and commercial basis.

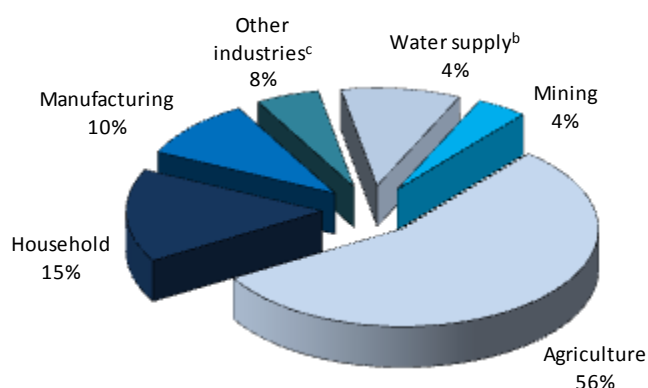


## 2 CONTRIBUTION OF THE WATER AND SEWERAGE SECTOR TO THE TASMANIAN ECONOMY

The water and sewerage industry makes a significant contribution to the Tasmanian economy through employment, investment and returns to local government owners.<sup>1</sup> In addition, the price, availability, reliability and quality of water and sewerage services impacts significantly on the economic performance of other sectors of the Tasmanian economy such as tourism and vegetable processing.

This report is primarily concerned with urban water and sewerage services. However, as Figure 2.1 shows, urban water use is only a small component of the State's total water consumption. Figure 2.1 does not show water usage for electricity generation, but the amount of water available for power generation is important to the State's economy. In addition, the need for water storage for electricity generation can affect the availability of water for other purposes.

**Figure 2.1 Water consumption in Tasmania (2011-12)<sup>a</sup>**



Source: *Water Account Australia*, 2011-12 (ABS Cat No 4610.0)

Notes:

- a Water consumption by the electricity and gas industries is not included as the majority of water used by this industry is 'in-stream' and is often re-used downstream by other water users.
- b Includes water losses as well as water used by the water supply, sewerage and drainage services industry.
- c Other industries includes forestry and fishing; construction; wholesale and retail trade; accommodation, cafes and restaurants; transport and storage; finance, property and business services; government administration; education; health and community services; and cultural, recreational and personal service industries.

Irrigation schemes have provided opportunity to expand the State's agricultural, horticultural and viticulture enterprises. The availability and quality of the State's freshwater resources are tightly linked to these growth areas.

Tasmania has the highest proportion nationally of agricultural land area under irrigation, which places increased pressure on water resources during periods of low

<sup>1</sup> From 1 July 2009, councils received dividends, guarantee fees and income tax equivalent payments from the regional corporations.

rainfall. Lower than average rainfall in 2012-13 across the State led to an increase in the share of water resources used by the agricultural industry as farmers experienced dry weather conditions. The amount of water resources used by the agricultural industry increased by ten per cent from 2011-12 to 2012-13.

The availability of sustainable and reliable water and wastewater services, including investment in water storage, treatment and delivery infrastructure, has a direct impact on land use planning and the capacity of the State to attract and appropriately manage economic development. Effective water management also influences Tasmanian businesses and the community as a whole by ensuring there is sufficient supply to meet demand.

The water and sewerage industry is a very large business activity for local government and provides vital input to the State's economy. Regulatory arrangements have the objective of assisting the sector to achieve sustainable operations over time and ensuring that the services provided meet current and future community and business needs. A significant program of infrastructure renewal and expansion will continue over the next decade to ensure system capability and environmental compliance.

Over the past four years, the water corporations invested significantly in upgrading their existing or constructing new assets, including the roll-out of water meters throughout the State. The total value of combined water and wastewater infrastructure in Tasmania is approximately \$2.8 billion.<sup>2</sup>

In 2012-13 the corporations reported a collective net profit after tax of \$22.44 million of which Southern Water contributed 38 per cent, Ben Lomond Water 39 per cent and Cradle Mountain Water 23 per cent.

Table 2.1 summarises the number of employees, net profit after tax and returns to council owners for each of the Tasmanian water and sewerage corporations in 2012-13.

**Table 2.1 Summary indicators - Tasmanian water and sewerage corporations as at 30 June 2013<sup>3</sup>**

	Number of employees FTEs	Net profit after tax \$'000	Returns to council owners \$'000 <sup>a</sup>	Returns as % of total
Ben Lomond Water	193	8 777	5 225	22
Cradle Mountain Water	178	5 215	3 962	17
Southern Water	386	8 447	14 495	61
<b>TOTAL</b>	<b>757</b>	<b>22 439</b>	<b>23 682</b>	<b>100</b>

<sup>a</sup> Includes dividends, guarantee fees and income tax equivalents. Dividends based on total dividends paid during 2012-13 ie dividends comprise 2012-13 interim dividends plus 2011-12 final dividends paid during 2012-13 and any other dividends paid after 30 June 2013 that related to the 2012-13 financial year.

<sup>2</sup> Based on the nominal written down replacement cost methodology.

<sup>3</sup> Tasmanian Audit Office, *Report of the Auditor-General No. 3 of 2013-14: Auditor-General's Report on the Financial Statements of State entities Volume 2 Government Businesses, Other Public Non-Financial Corporations and Water Corporations 2012-13*, November 2013.

Collectively, the corporations returned \$23.7 million to their council owners in 2012-13, which is around 1.4 per cent less than in 2011-12. This was the second year that Cradle Mountain Water declared dividends returning over \$3.9 million to its council owners.

Across the three corporations there were 757 employees (FTEs) as at 1 July 2013, an increase of six per cent (or 44 FTEs) from the previous year. Increased staffing levels in customer service and debt collection areas has contributed to this increase. A reduction of around 30 FTEs is expected in 2013-14 due to restructuring to a single corporation, with annual savings in the order of \$5 million in employee costs.

Council owners have received over \$84 million in the form of dividends, guarantee fees and income tax equivalents since the establishment of the three water corporations on 1 July 2009.



## 3 WATER AND SEWERAGE INDUSTRY STRUCTURE AND REGULATION

This chapter provides an overview of the Tasmanian water and sewerage industry, including the structure of the sector, the regulatory framework and the roles of the various entities and bodies involved in the industry.

### 3.1 Industry structure

As at 30 June 2013 Ben Lomond Water, Cradle Mountain Water and Southern Water owned, controlled and operated water supply and sewerage systems in Tasmania.<sup>1</sup> The corporations managed all aspects of the water supply chain from dams and reservoirs to customer property connections and from customer sewer connections to wastewater treatment and disposal. The corporations were subject to various public health, environmental and customer service regulatory requirements.

Figure 3.1 depicts the geographical boundaries of the areas serviced by each of the three regional water and sewerage corporations.

In summary:

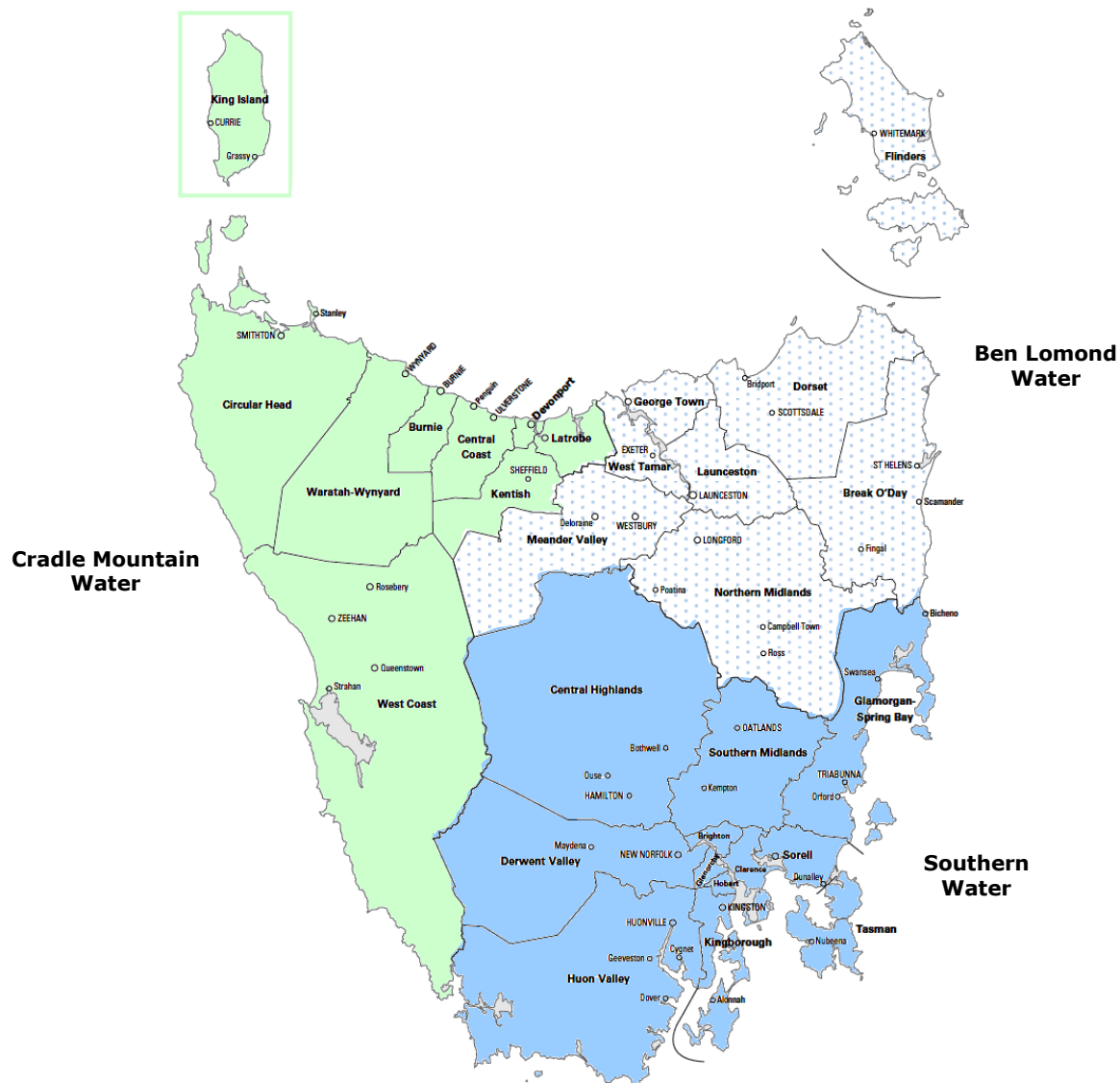
- Ben Lomond Water serviced the city of Launceston and the municipal areas of Break O'Day, Dorset, Flinders, George Town, Meander Valley, Northern Midlands and West Tamar.
- Cradle Mountain Water serviced the cities of Burnie and Devonport and the municipal areas of Central Coast, Circular Head, Kentish, King Island, Latrobe, Waratah-Wynyard and West Coast.
- Southern Water serviced the cities of Hobart, Clarence and Glenorchy and the municipal areas of Brighton, Central Highlands, Derwent Valley, Glamorgan-Spring Bay, Huon Valley, Kingborough, Sorell, Southern Midlands and Tasman.

In 2012-13 the total value of combined water and wastewater infrastructure in Tasmania was approximately \$2.8 billion and the sector directly employed around 757 people. Across Tasmania, in total, the three corporations serviced 196 965 water connections and 173 970 sewerage connections.

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<sup>1</sup> See section 3.3 on future structure post July 2013.

Figure 3.1 Map of regional service areas



### 3.2 Economic regulatory framework

The *Water and Sewerage Industry Act 2008* (the Industry Act) provides for the establishment of an economic regulatory framework for the provision of water and sewerage services and is similar to utility regulatory frameworks used in other jurisdictions.

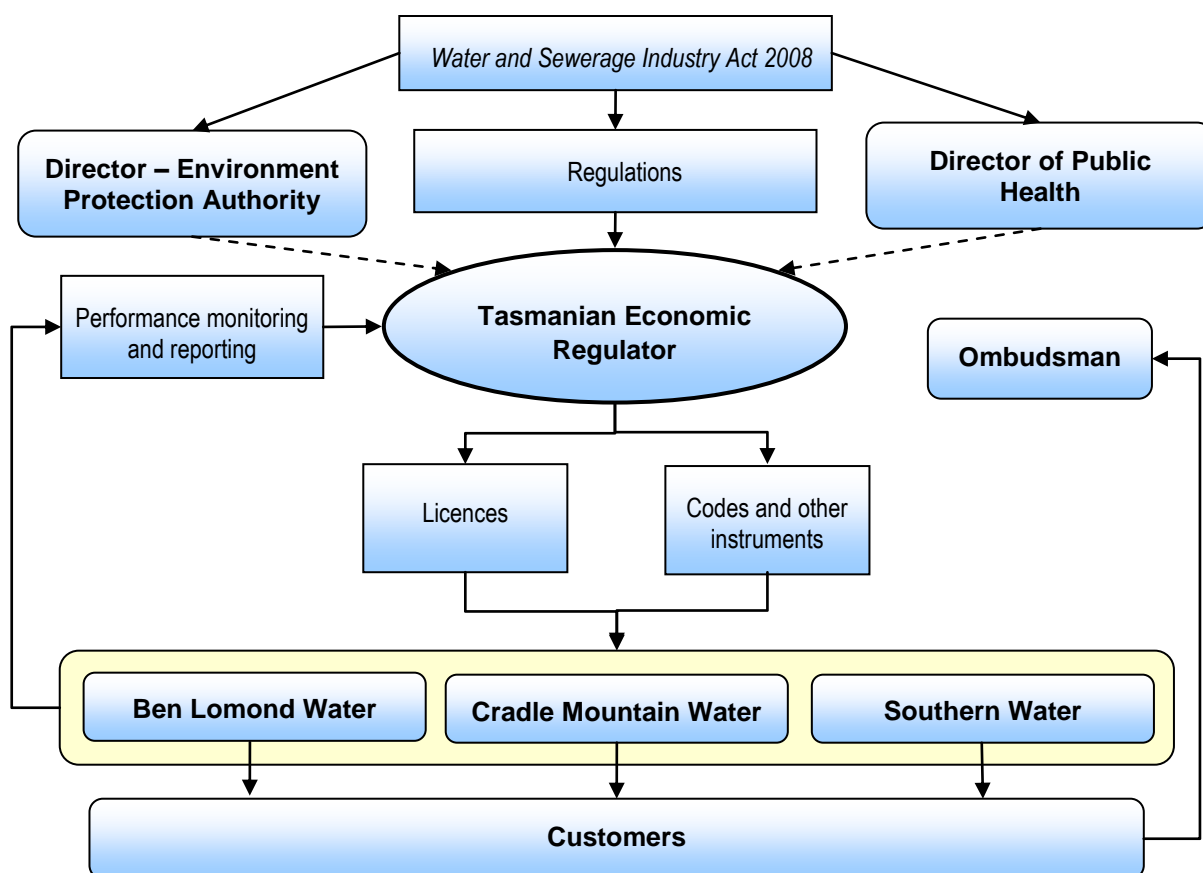
The Industry Act also provides for the following:

- a licensing regime, requiring any person or entity owning or operating water and sewerage infrastructure, or supplying water or sewerage services to others to be licensed, unless otherwise exempted;
- an independent Regulator for the sector with clear accountabilities and responsibilities to ensure effective and efficient outcomes for the sector and the protection of customers;

- a customer service standards framework for the sector, including a Customer Service Code, to ensure that service providers meet a minimum level of service;
- independent pricing regulation of the sector with service providers required to submit a price and service plan to the Regulator to outline the services, revenue requirements and operational requirements of the service provider (the plan to be the basis upon which the Regulator makes a price determination);
- the Regulator to be guided by legislated pricing principles when making a price determination, including the principle of two-part pricing for water services;
- an annual state of the industry report (this Report) prepared by the Regulator in consultation with the other industry regulators (on matters including customer service, water quality, financial performance, environmental and water management) and service providers;
- a formal complaints and disputes process, including the Tasmanian Ombudsman being assigned the role of Ombudsman for the sector who will, as a last resort, arbitrate any unresolved disputes between customers and service providers; and
- the regulatory framework to require mandatory asset management planning in the sector (this requirement is formalised as a condition of the operating licences issued by the Regulator).

The regulatory framework does not cover:

- water used for irrigation or 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; or
- on-site sewerage treatment (septic tanks) or small private sewerage treatment plants.

Figure 3.2 Tasmanian water and sewerage economic regulatory framework<sup>2</sup>

### 3.2.1 Licensing

The water and sewerage licences of the three water corporations were surrendered as at 30 June 2013. A licence was granted by the Regulator to the Tasmanian Water and Sewerage Corporation on 22 April 2013, which took effect on 1 July 2013.

## 3.3 Changes to the regulatory framework during 2012-13

Significant changes were made to the water and sewerage sector's regulatory framework during 2012-13 after Parliament passed the *Water and Sewerage Industry Amendment Act 2012* and the *Water and Sewerage Corporation Act 2012*.

The *Water and Sewerage Industry Amendment Act 2012* which received Royal Assent on 11 September 2012 introduced the following changes:

- aligned the definition of 'trade waste' with the national industry standards to clarify the type of sectors and/or activities that are considered to generate liquid trade waste for the purposes of the Act;

<sup>2</sup> Prior to 1 July 2013.



- clarified the water restriction requirements in the Act, so that a water and sewerage corporation could impose a ban on the use of outdoor water on days declared by the State Fire Commission to be days of total fire ban;
- provided the water and sewerage corporations with the flexibility to engage contractors or employees to enter properties to read water meters; and
- provided a mechanism that enables trade waste customers and the corporations to renegotiate the terms and conditions of Special Plumbing Permits (and Trade Waste Agreements) that were transferred to the corporations from local councils without a termination date.

Agreement to move to a single statewide water and sewerage corporation was made after discussions between owner councils and Board Chairman of the regional water corporations prompted a review of the potential benefits of such a move.

The *Water and Sewerage Corporation Act 2012* was subsequently prepared to implement the amalgamation of the three water and sewerage corporations from 1 July 2013. The Act received Royal Assent on 11 December 2012 and provided for:

- the establishment of a single water and sewerage corporation that will have the provision of water and wastewater services on a state-wide basis as its primary focus;
- the transfer of the assets, liabilities and employees of the existing water and sewerage businesses - Ben Lomond Water, Cradle Mountain Water, Southern Water and Onstream – to the new corporation from 1 July 2013;
- the corporation to be owned by the State's Local Government councils and any dividends, tax equivalents payments and guarantee fees will be payable to the owner councils;
- the implementation of new governance arrangements which are suitable for the new single entity structure; and
- transitional provisions which, amongst other things, allowed the three Price Determinations that applied to the previous corporations to continue to apply to the single amalgamated corporation until the end of the first pricing period on 30 June 2015.

The new corporation, the Tasmanian Water and Sewerage Corporation Pty Ltd, was registered as a proprietary limited company under *Corporations Act 2001* (Cth) on 5 February 2013 and trades as TasWater.

## **3.4 Industry Regulators**

### **3.4.1 Tasmanian Economic Regulator**

Under the Industry Act, the Regulator has a wide range of functions including:

- administering the licensing system established under Division 2 of the Industry Act;
- advising the Minister that a licence has been granted under Division 2 of the Industry Act and making the Minister aware of any conditions that apply to that licence;
- advising the Minister of any variation or amendments to the conditions of a licence;
- monitoring and reporting to the Minister on the compliance of a water and sewerage corporation with its licence conditions and obligations, including compliance with the Customer Service Code;
- establishing and administering the Customer Service Code;
- regulating prices, terms and conditions for regulated services;
- making price determinations and determinations generally;
- monitoring the performance of the water and sewerage industry and reporting on the performance of a water and sewerage corporation;
- providing advice to the Minister in connection with the regulation of the water and sewerage industry;
- undertaking inquiries, including such inquiries as may be required by the Minister, in relation to the regulation of the water and sewerage industry;
- developing and publishing guidelines on the Regulator's website; and
- performing such other functions as may be imposed on the Regulator under the Act.

### **3.4.2 Director of Public Health**

With respect to drinking water, the Director of Public Health's and the Department of Health and Human Services key functions relate to:

- protecting public health with respect to the supply of drinking water;
- establishing drinking water quality performance standards;
- monitoring water suppliers' performance against the standards and requirements prescribed by the *Public Health Act 1997* (and its associated Tasmanian Drinking Water Quality Guidelines 2005), the *Fluoridation Act 1968*, the *Fluoridation Regulations 2009* and the Australian Drinking Water Guidelines 2011;

- enforcing compliance with the requirements prescribed by the Acts and Guidelines;
- reporting on the water suppliers' compliance with the prescribed standards;
- providing oversight of the fluoridation program in Tasmania through the Fluoridation Committee; and
- developing and implementing strategies to promote and improve public health.

### **3.4.3 Director, Environment Protection Authority**

The Director, Environment Protection Authority (EPA) is one member of the EPA Board.

The EPA administers and enforces the provisions of the *Environmental Management and Pollution Control Act 1994* (EMPCA).

The EPA is concerned principally with maintaining and improving environmental quality. Officers employed within DPIPWE's EPA Division support the EPA to enable it to perform its functions and implement key programs.

The EPA's functions, with respect to the water and sewerage sector, include the assessment and regulation of significant wastewater treatment plants (WWTPs). These are defined as 'Level 2' WWTPs under Schedule 2 of the EMPCA where such plants have a design capacity of at least 100 kL of an average dry-weather flow per day of sewage or wastewater. Local Government is responsible for regulating smaller 'Level 1' WWTPs as well as on-site treatment systems including septic tanks and the sewerage reticulation network.

The EPA's responsibilities in regulating Level 2 WWTPs include:

- undertaking environmental impact assessments, under EMPCA, in relation to proposals for new WWTPs or significant changes to existing WWTPs;
- developing legally binding environmental conditions for approved WWTPs, which are included as part of the planning permit or as a stand-alone environment protection notice;
- applying the Tasmanian policy framework in relation to water quality management as is relevant for wastewater activities and updating environmental conditions where necessary; and
- ensuring compliance with environmental conditions, largely through collection and evaluation of data on specified discharge limits and the impacts on the receiving environment.

The EPA also performs an assessment and review function in relation to wastewater recycling schemes associated with Level 2 WWTPs, but does not directly regulate these activities.

In addition to assessment, regulation and enforcement activities, the EPA also offers advice and guidance in relation to a broad range of wastewater issues including pumping stations, effluent reuse, trade waste and biosolids reuse through the provision of policies and guidelines.

The EPA has released environmental guidelines governing the recycling of wastewater and biosolids and the use of recycled water and biosolids in Tasmania.<sup>3</sup> These guidelines provide a framework for the sustainable reuse and recycling of water, wastewater and biosolids in a manner, which is not only practical and safe for agriculture, the environment and the public, but consistent with industry standards and best practice environmental management.

The guidelines were produced to provide an appropriate benchmark for wastewater producers, consultants and regulators when designing and assessing the environmental impacts of wastewater recycling projects. The guidelines also assist in managing recycling schemes in an environmentally sustainable manner and provide a framework for ongoing monitoring and wastewater quality control.

#### **3.4.4 Department of Primary Industries, Parks, Water and the Environment**

The Urban Water Policy Unit in DPIPWE was established to develop and coordinate policies relating to the regulation of the water and sewerage industry and to support the Minister for Primary Industries and Water in fulfilling the Minister's functions under the Industry Act. The Minister's responsibilities under that Act include:

- issuing and administering interim licences for the new corporations;
- granting interim exemptions from the requirement to be licensed;
- setting penalties and annual licence fees;
- issuing emergency directions in order to deal with serious risks to public health or safety or to deal with the likelihood of environmental harm arising from the provision of a regulated activity;
- declaring a regulated entity to be the "reserve supplier" for a particular area of operation; and
- directing the Regulator to conduct inquiries, review codes and report on matters for which the Minister requires a report.

The Unit is also responsible for coordinating policy input across the State Government as well as undertaking strategic water supply and demand planning. The Unit also monitors the performance outcomes reported by the Regulator to ensure consistency with overall Government policy.

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

The principal aims of the *Water Management Act 1999* are to further the objectives of the resource management and planning system of Tasmania as specified in Schedule 1 of that Act and, in particular, to provide for the use and management of the freshwater resources of Tasmania having regard to the issues specified in

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<sup>3</sup> *Tasmanian Biosolids Reuse Guidelines*, August 1999.

section 6 of the Act. The Act determines, therefore, the manner in which access to, and use of, Tasmania's freshwater resources is regulated.

The Water Management Act provides for the Minister for Primary Industries and Water to oversee the sustainable use and development of all freshwater resources in the State<sup>4</sup>, including dispersed surface water and water in watercourses, lakes, wetlands and groundwater resources. In particular, the Act:

- establishes institutional arrangements for water management in Tasmania;
- provides for consistent water licensing arrangements for all types of users, including the establishment of special licences for large generators of electricity, such as Hydro Tasmania, and other major water users;
- facilitates trading in water entitlements;
- provides for the formal allocation of water to the environment (ie environmental flows);
- provides for the development of water management plans; and
- sets out the procedures for dealing with applications for dam permits.

The Water Resources Division's functions, with regard to the water and sewerage sector, include the assessment, regulation and enforcement of water allocation licensing and dam permits to ensure the sustainable and equitable use of Tasmania's water resources.

#### 3.4.5 Dam Safety Regulation

The Minister for Primary Industries and Water has regulatory oversight of dam safety through administration of the *Water Management Act 1999* and the *Water Management (Safety of Dams) Regulations 2003*. The Minister's key functions in this regard relate to:

- developing prescribed standards required for the design, construction, maintenance, surveillance and decommissioning of dams, and ensuring compliance with those standards. (These standards 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.

The Water Management Branch of the Water and Marine Resources Division of DPIWE administers the dam safety legislation. In relation to dam safety this is primarily implemented through:

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<sup>4</sup> To aid in managing its water resources the State has commissioned two reports, the Tasmania Sustainable Yields Project and the Climate Futures Project to provide detailed and useful climate projections for Tasmania. The Sustainable Yields Project provides water managers with robust projections on future water yields until 2030.

- reviewing new dam applications to ensure dams are constructed to contemporary safety standards and in accordance with the statutory requirements; and
- a program ensuring owners of existing dams meet their statutory dam safety responsibilities by monitoring, reviewing and managing dam safety as required by the above mentioned Act and Regulations which incorporate the national dam safety guidelines.

#### 3.4.6 Ombudsman

A customer dissatisfied with the outcome of a complaint made under the regulated entity's customer complaints process may raise their complaint with the Ombudsman under the *Ombudsman Act 1978*. Under section 77 of the Industry Act it is a condition of a regulated entity's licence, under which a regulated entity provides regulated services to customers, that the regulated entity comply with any recommendations made by the Ombudsman relating to a complaint involving the regulated entity and a customer.

### 3.5 Other regulatory obligations and responsibilities

Regulation of the water and sewerage industry is also affected by national policies and obligations. These policies and regulatory obligations and responsibilities are outlined below.

#### 3.5.1 National water initiative

In June 2005, along with the Australian Government and the other states and territories, Tasmania became a signatory to the National Water Initiative (NWI) Agreement. The Australian Government is represented by the National Water Commission (NWC) and the states and territories are represented by the agencies responsible for regulating water supply services. 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 and rural water delivery agencies.

The signatories of the NWI Agreement have developed a performance reporting framework for urban utilities (Urban Framework) and a performance reporting framework for rural water delivery agencies (Rural Framework). The Urban and Rural Frameworks are reflected in a handbook of performance indicators and definitions.

The performance data is subject to independent audit at least once every three years. Further information on the NWI Agreement and the performance reporting framework can be found on the NWC web site.<sup>5</sup>

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<sup>5</sup> <http://www.nwc.gov.au>

### 3.5.2 National performance reporting framework

The preparation of annual national performance reports that independently and publicly benchmark pricing and service quality is an important commitment under the NWI. The national performance reports cover urban water utilities and rural water service providers. The reports are based on a nationally consistent performance framework that builds on reporting already in place in the urban and rural water sectors.

The National Performance Reporting Framework for urban utilities was finalised in June 2006. The first urban utilities performance report was released in 2007, reporting on the 2005-06 period. Updated versions of the framework are published in April each year.

The Tasmanian water and sewerage State of the Industry Report is intended to complement the national performance reporting framework. 2009-10 was the first period in which the performance of the three water and sewerage corporations was included in the National Performance Report.

### 3.5.3 Other government bodies

#### 3.5.3.1 *Department of Treasury and Finance*

The Department of Treasury and Finance has responsibilities in relation to water and sewerage pricing policy, which remain a responsibility of the Treasurer under the Industry Act.<sup>6</sup>

#### 3.5.3.2 *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). From 1 July 2009 the responsibility for providing these services transferred to the three regional water and sewerage corporations. Local government retained ownership of the corporations and from 1 July 2013, the single water and sewerage business will continue to be owned by local government.

Local government continues to be responsible for the regulation of small and on-site sewerage infrastructure (such as septic tanks) and private water supplies (such as private bores and tanks).

#### 3.5.3.3 *National Water Commission*

The NWC, which was created to drive the national water reform agenda, is an independent statutory authority within the Australian Government's Environment, Water, Heritage and the Arts portfolio. Established under the *National Water Commission Act 2004* the NWC provides advice to the Council of Australian Governments (COAG) and the Australian Government on national water issues.

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<sup>6</sup> The administration of Subdivision 3 of Division 1, and Division 5 of Part 4 and sections 88 and 111 of the Act are assigned to the Treasurer and the Department of Treasury and Finance.

The NWC is responsible for overseeing progress towards the sustainable management and use of Australia's water resources as required under the NWI.

The NWC assesses progress on water reform against the NWI commitments through its biennial assessments and national performance reports on urban and rural water utilities. The NWC also publishes position statements on major water reform issues.

#### 3.5.3.4 *Bureau of Meteorology*

In 2008 the Bureau of Meteorology (the Bureau) assumed a new role in relation to water accounting, as part of the Australian Government's Water for the Future initiative. Water for the Future contains urban and rural policies and programs, including significant funding for water purchasing, irrigation modernisation, desalination, recycling, and stormwater capture. Water for the Future is designed to secure long-term water supply for all Australians and includes the Improving Water Information Program administered by the Bureau.

A part of this program is to coordinate the way in which water data is gathered, analysed and reported across Australia. The information collected will be used by the Bureau to better measure and understand Australia's water resources, through new reporting, forecasting and other services.

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

The Water Regulations came into effect on 30 June 2008. The Water Regulations define who must give specified water information to the Bureau and the time and format in which it must be supplied. Over 200 persons or organisations are required to provide specified water information to the Bureau that is in their possession, custody or control.

In Tasmania, the Water Regulations require 18 organisations including the three water corporations to submit a range of water accounting information to the Bureau.

### 3.6 Customer service standards

The economic regulatory framework established under the Industry Act incorporates a customer service standards framework for the sector including the requirement that the Regulator issue and administer a Customer Service Code specifying minimum service standards and conditions for regulated services a regulated entity must comply with.

The *Water and Sewerage Industry (Customer Service Standards) Regulations 2009* specify matters that must, or may, be included in the Customer Service Code. The Code is also able to address other matters in addition to those required under the Regulations.

The Customer Service Code stipulates obligations in relation to:

- minimum customer service standards;
- complaint handling and dispute resolution;



- billing, payment and collection arrangements;
- actions for non-payment; and
- quality and reliability of services.

The Regulator's approach to regulating the standards and conditions of supply for water and sewerage services has been to:

- develop the Code;
- establish minimum service standard targets in the Code;
- require the water and sewerage corporations to develop customer charters;
- require the water and sewerage corporations to propose transitional customer service standards as part of their proposed Price and Service Plans<sup>7</sup> which establish a transition path to achieving the minimum service standard targets specified in the Code; and
- establish a performance reporting framework that, amongst other things, monitors performance against approved transitional service standards and minimum service standard targets.

Transitional service standards were approved for each water and sewerage corporation as part of the Regulator's 2012 Price Determination investigation.

For the first regulatory period each water and sewerage corporation's performance will be monitored against approved transitional service standards with performance against these standards detailed in the Regulator's annual State of the Industry Report.

### **3.7 Performance and regulatory reporting**

#### **3.7.1 Performance reporting**

The Industry Act provides that the Regulator is to prepare an annual report on the state of the water and sewerage industry (the State of the Industry Report) and is to issue guidelines to regulated entities in relation to their annual performance and information reporting requirements.

The Regulator's *Performance and Information Reporting Guideline*<sup>8</sup>, issued in April 2013, sets out the data and contextual information that regulated entities must provide to the Regulator so that their performance can be measured.

The Guideline provides for a transitional compliance regime where the corporations will be required to achieve compliance in the provision of the full range of performance measures over time. Their performance in meeting those requirements will be monitored by the Regulator.

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<sup>7</sup> As part of the 2012 Price Determination Investigation for regulated water and sewerage services in Tasmania.

<sup>8</sup> Available from the Regulator's website [www.economicregulator.tas.gov.au](http://www.economicregulator.tas.gov.au).

### **3.7.2 Regulatory reporting**

In exercising its powers and functions the Regulator seeks assurances from the water and sewerage corporations that they are appropriately managing their assets and operations to deliver a level of service that is acceptable to stakeholders.

That assurance will be provided through the independent review of management plans and compliance plans and confirmation by an independent 'reporter' that the reported performance information can be relied upon. These independent reviews are conducted in accordance with the Regulators Regulatory Reporting Guideline, November 2012. It is expected that regulatory reporting will begin during 2013-14 for Tasmania's water corporations.<sup>9</sup>

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<sup>9</sup> Regulatory reporting will commence after the three regional water and sewerage corporations commence operations as a single entity on 1 July 2013.

## 4 WATER RESOURCES

The *Water Management Act 1999* provides for the use and management of Tasmania's freshwater resources and determines the manner in which access to, and use of, those resources is regulated.

The Minister for Primary Industries and Water oversees the sustainable use and development of all freshwater resources in the state<sup>1</sup>, including dispersed surface water and water in watercourses, lakes, wetlands and groundwater resources.

### 4.1 Sources of water

Access to reliable water sources is critical in ensuring that Tasmania is able to build sustainable communities and to maximise its economic development opportunities.

Whilst Tasmania has only 0.9 per cent of Australia's land area and supports 2.2 per cent of the population, the State has 12 per cent of the Nation's total freshwater resources. This represents a significant comparative advantage for the State.

The annual volume of surface runoff in Tasmania is 33 312 000 mega litres (ML)<sup>2</sup> and up to 2 500 000 ML is potentially available each year from groundwater.<sup>3</sup>

Drinking water (potable) is predominately sourced from surface water and accounts for around 16 per cent of the estimated total use of surface water in the State (including water used for irrigation, industry, etc). Surface water accounts for virtually all reticulated urban water supplied in the state.

**Figure 4.1 Water source breakdown 2012-13**

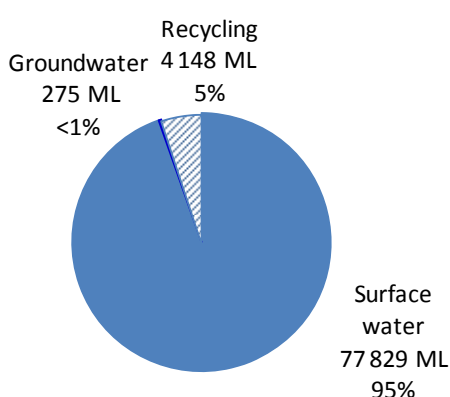


Figure 4.1 shows the breakdown of sourced water in Tasmania in 2012-13. Total sourced water (potable and non-potable) includes both freshwater and recycled water resources and supports the requirements of town water supply, irrigation and the majority of the state's electricity requirements. The majority of water supplied for use in urban areas in Tasmania is sourced from surface water, with minor amounts supplied from recycled water and groundwater sources. No water is sourced from desalination in Tasmania.

<sup>1</sup> To aid in managing its water resources the State has commissioned two reports, the Tasmania Sustainable Yields Project and the Climate Futures Project to provide detailed and useful climate projections for Tasmania. The Sustainable Yields Project provides water managers with robust projections on future water yields until 2030.

<sup>2</sup> Tasmanian Planning Commission 2009, *State of the Environment Tasmania 2009*.

<sup>3</sup> Department of Infrastructure, Energy and Resources 2001, *Report on Groundwater in Tasmania - Background Report*.

<sup>3</sup> ABS 4602.0.55.003, *Environmental Issues: Water Use and Conservation*, March 2010.

Urban use of recycled water accounts for approximately five per cent of the total water supplied for urban use. Recycled water is predominately used for agricultural supply and on-site use at wastewater treatment plants, with no recycled water being supplied for reticulated drinking water supplies. The proportion of water sourced from recycled water increased in 2012-13 to 5.0 per cent, from 4.3 per cent in 2011-12.

Urban use of groundwater accounts for less than one per cent of the estimated total groundwater usage and only 0.4 per cent of reticulated drinking water.

#### **Box 4.1 Water resource allocation and usage**

Water licensing and allocation in Tasmania provides for water to be allocated to specific uses, with irrigation, commercial (including industrial and mining), aquaculture and urban water being the major allocation classes. The total water allocations across the state for each of these classes in 2012-13 were:

- Irrigation - 687 402 ML;
- Aquaculture<sup>4</sup> - 425 239 ML;
- Urban Water - 215 533 ML; and
- Commercial - 106 955 ML.

Water allocation figures provide an indication of potential demand for water from the various sectors but as water usage is not reported for Tasmanian allocations it is not possible to view actual demand from the water license information. The Australian Bureau of Statistics (ABS) has published a National Water Account for 2011-12<sup>5</sup> which details the water extraction and consumption for each sector in each state and territory. These figures show that water use for the major sectors for Tasmania in 2011-12 was as follows:

- Agriculture - 285 761 ML;
- Aquaculture - 352 109 ML;
- Urban Water - 56 448 ML; and
- Commercial<sup>6</sup> - 66 338 ML.

Whilst the ABS consumption figures are not directly comparable with DPIPWE's allocation figures, they do provide a useful comparison point. The ABS's water consumption figures for 2011-12 show that the level of statewide demand for water is adequately covered by the volumes of water allocated with only the aquaculture sector (around 83 per cent) using more than 60 per cent of its allocation. Although the water allocated exceeds water consumption at the statewide level there are many catchments around the state that are resource constrained during different periods of the year or on an ongoing basis.

<sup>4</sup> The majority of water extracted for Aquaculture use is non-consumptive, with nearly all water being returned to the water source.

<sup>5</sup> ABS 4610.0 *Water Account, Australia 2011-12*, November 2013.

<sup>6</sup> Commercial is made up of self-extracted water usage figures for the mining, manufacturing and other industry classifications from the *Water Account, Australia 2011-12*.

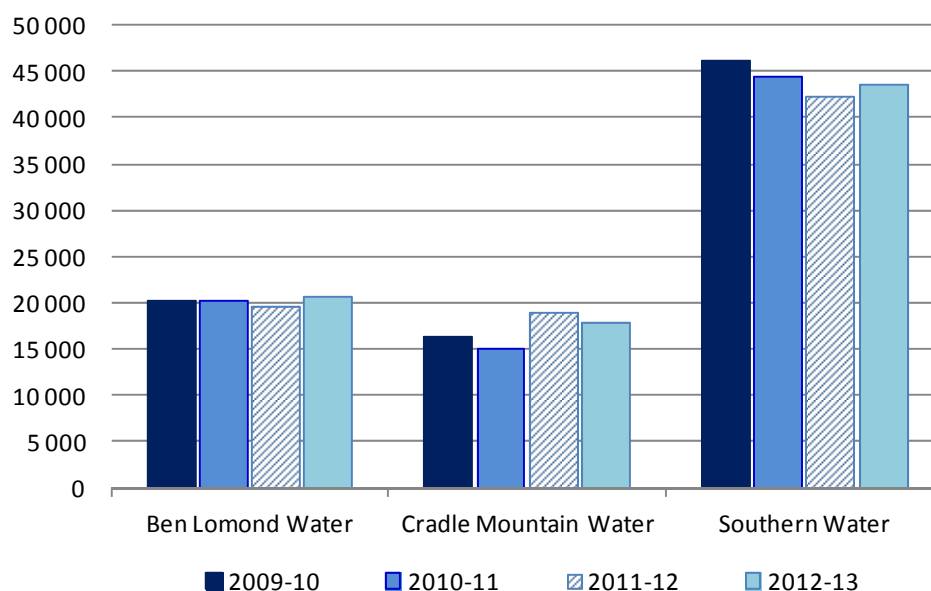
During 2012-13 a small volume of groundwater was extracted in the northern region (162 ML) and north-western region (113 ML), whilst groundwater was not utilised in the southern region, resulting in a State-wide total of 275 ML. The 2012-13 total represents a decrease of 19 ML from 2011-12 (294 ML) in the use of groundwater for reticulated supplies.

Rain water tanks represent another important source of water for many Tasmanian households. Approximately 26 per cent of Tasmanian households have rain water tanks as their primary source of water<sup>7</sup> (some in addition to a reticulated water service).

Approximately 85 per cent of Tasmanian households receive reticulated water services compared to a national average of 93 per cent. The jurisdiction with the next lowest proportion of households that receive reticulated water service is Queensland with 89 per cent. This trend reflects, among other things, that Tasmania has the most dispersed population of all jurisdictions.

In 2012-13 the majority of urban water in Tasmania was supplied by the three regionally based water corporations. Ben Lomond Water sourced 20 759 ML of urban water, Cradle Mountain Water sourced 17 910 ML and Southern Water sourced 43 583 ML. No urban water in Tasmania was sourced from desalination plants, although the water corporations do use recycled water for some non-drinkable uses (see Section 5.5 of this Report). Figure 4.2 shows the volume of water sourced over the last four financial years.

**Figure 4.2 Total volume of water sourced by water corporations (ML)**



In the north-western region the largest catchments from which Cradle Mountain Water sourced water were the Forth, West Gawler, Cam River and Deep Creek catchments. The Cam River catchment accounted for approximately

<sup>7</sup> ABS 201303, Environmental Issues: Water Use and Conservation, March 2013.

47 per cent (12 484 ML) of the total water allocated to Cradle Mountain Water for supply of urban water.

In the northern region the St Patricks, North Esk, Trevallyn and Curries River dam catchments were the largest catchments by allocation volume. The North Esk River catchment accounted for approximately 57 per cent (17 000 ML) of the total water allocated to Ben Lomond Water for supply of urban water.

In the southern region Southern Water sourced water from a number of catchments with the Lake Fenton, Mount Wellington and the Derwent River catchments being the largest by allocated volume.

The Derwent River catchment accounted for approximately 72 per cent (or 45 000 ML) of the total water allocated to Southern Water.

## 4.2 Uses of water supplied

For the purpose of this Report, the use of water supplied does not include irrigation water or private supply systems. Total urban water supplied is the total metered volume of water (potable and non-potable) supplied to customers during the reporting period plus estimated non-metered water supplied. This comprises the sum of residential, commercial, municipal, industrial and other water supplied.

All three regional water corporations were able to provide a detailed breakdown of water supply into residential, commercial, municipal and industrial uses for 2012-13:

- in the north-west, Cradle Mountain Water supplied 6 210 ML of water to residential customers, with commercial, municipal and industrial customers receiving 6 733 ML of water;
- in the north, Ben Lomond Water supplied 9 483 ML of water to residential customers, with commercial, municipal and industrial customers receiving 7 652 ML of water; and
- in the south Southern Water supplied 17 165 ML of water to residential customers, with commercial, municipal and industrial customers receiving 9 881 ML of water.

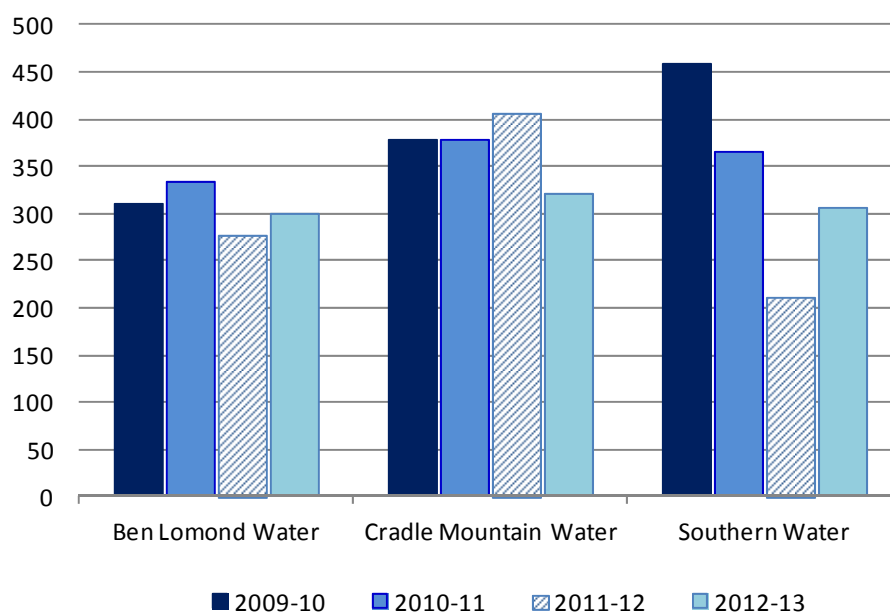
The total amount of urban water supplied in the state in 2012-13 was 60 429 ML of which 56 772 ML was potable water.<sup>8</sup> This volume was delivered to around 197 000 property connections across the residential, commercial, municipal and industrial sectors.

Figure 4.3 shows the average annual water supplied per property (residential, commercial, municipal and industrial).

The average annual consumption per connection across the state in 2012-13 was 308 kilolitres (kL). There was a relatively minor variation in consumption per connection between the three regions, ranging from 299 kL for the northern region, 306 kL for the southern region up to 321 kL for the north-western region.

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<sup>8</sup> Potable water is water suitable for drinking.

**Figure 4.3 Average annual water supplied (kL/property)**

Note: 2011-12 Southern Water figure is an estimate only and does not include Commercial, municipal and industrial water supplied.

The average annual consumption per residential connection across the state decreased significantly from 222 kL in 2011-12 to 178 kL in 2012-13. There was significant variation in consumption per residential connection between the three regions, ranging from 185 kL for the northern region, 160 kL for the north-western region and 190 kL for the southern region. Between 2011-12 and 2012-13 consumption per residential connection decreased in all three regions of the state, from 225 kL to 185 kL in the northern region, from 215 kL to 160 kL in the north-western region and 225 kL to 190 kL in the southern region.

The variation in average consumption per connection is likely to be due to a number of factors, including:

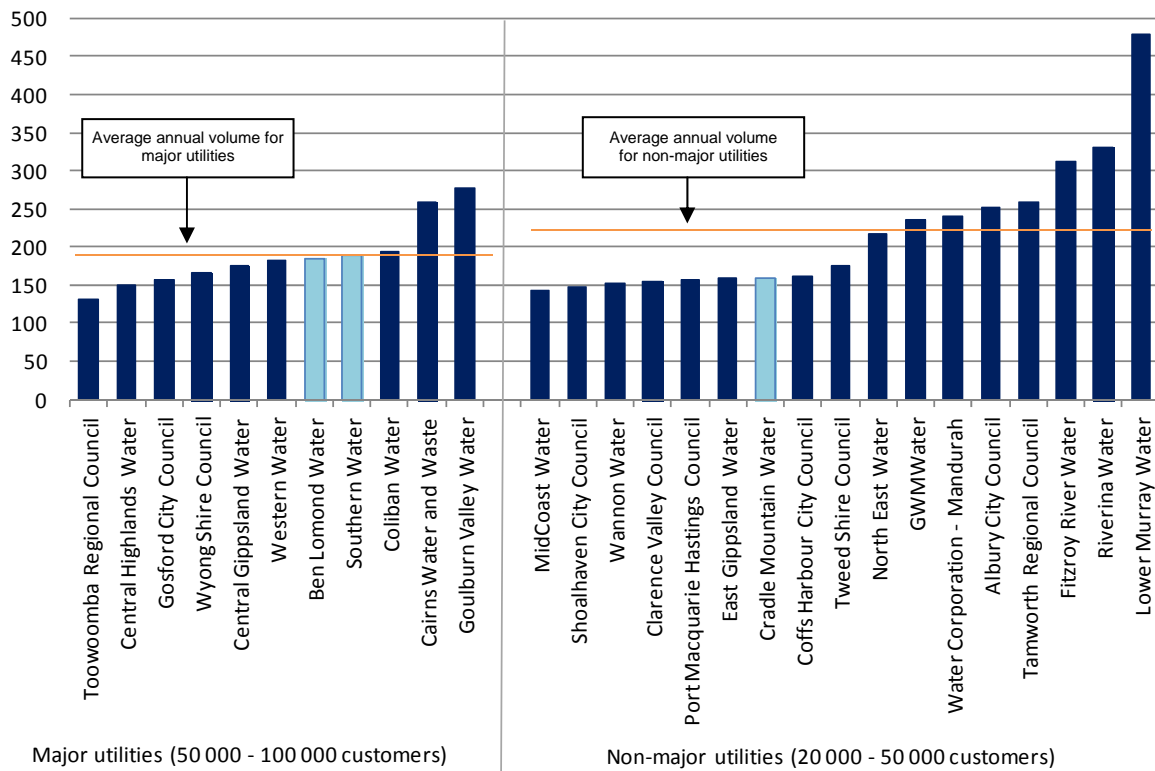
- variations in rainfall across the state which influences household demand for outside water usage;
- variations in leakage from reticulated water systems; and
- variations in user profiles (eg commercial, industrial and domestic).

Figure 4.4 shows the average annual volumes of residential water supplied by major (50 000 to 100 000 connected properties) and non-major (large, 20 000 to 50 000 connected properties) utilities across Australia in 2012-13 together with average volumes for each category of provider.

Ben Lomond Water's and Southern Water's average residential consumption of 185 kL and 190 kL per residence respectively were very similar to the average residential consumption in 2012-13 of 187 kL per property for the group of major utilities, to which Southern Water and Ben Lomond Water belong.

Cradle Mountain Water reported an average residential consumption of around 160 kL per property in 2012-13, which is well under the average for similar sized 'non-major' water businesses across Australia. The average residential consumption in 2012-13 for this group of water businesses was 219 kL per property.

**Figure 4.4 Average annual residential water supplied (kL/property) – major and non-major utilities (large), 2012-13**



Source: National Water Commission, 2012-13 National Performance Report database – Urban water utilities

### 4.3 Supply and demand balance of water

This section provides an assessment of the current supply and demand balance for drinking water in Tasmania, within the constraints of the available data. A conceptual framework for identifying supply and demand balance is provided in Appendix 2 of the 2011-12 State of the Industry Report.

For urban water, the data constraints mean that a comparison between the annual water allocation and annual water consumption for each of the three regional areas in Tasmania is the best estimate that can be achieved.

The licensed annual water allocations are used as a measure of 'water supply', for water across the state, categorised according to surety levels. The surety levels indicate the level of certainty with which a water allocation can be expected to be available for extracting. Surety level 1 is the most secure and reliable allocation and surety level 8 the least secure. During 2012-13 the corporations, collectively, had approximately two thirds of their allocations at surety level 1 with the remainder at surety level 5. The water allocations provide a reasonably accurate picture of Tasmania's current potential raw water supply for urban use.



In terms of demand, consumption data is a reasonable proxy measure. However, it does not capture the number of people/properties that demand water but do not receive it. Nor does it account for the impact that water restrictions have on usage or the difference between the quality of water demanded and received.

Since 2011-12 water meters have been rolled out to virtually all properties in the state meaning that statewide consumption data is now available. This data is then compared with water allocation data to provide an indicative picture of the current water supply and demand balance, which is shown in Table 4.1.

Whilst this analysis suggests that water supply generally exceeds demand this ignores any seasonal impact from variations in raw water availability and the availability at a more disaggregated level. The production and delivery capacity of the supply systems which could restrict the volume supplied to be less than the volume demanded is not addressed in this analysis nor is the quality of water supplied across the regions.

**Table 4.1 Regional comparison of water allocations and urban water consumption, 2012-13**

Region	Total allocation (ML)	Total consumption (ML)	Consumption (% of allocation)
Northern region	42 028	17 325	41
North-west region	26 788	13 740	51
Southern region	124 175	29 364	24

## 4.4 Wastewater production

Treated wastewater can be considered as an alternative water supply. In Tasmania, treated wastewater is primarily discharged to the environment (waterways) and only a small proportion (seven per cent) is recycled for agricultural and municipal uses. Section 4.5 contains further information about recycled water.

Tasmania has 82 level 2 waste water treatment plants (WWTPs) with 79 operated by the corporations and three<sup>9</sup> operated privately or by State Government authorities. Each WWTP has a permitted maximum licence limit specified in kL per day and based on average dry weather flow (ADWF).

The following information is based on data reported by the three water corporations for 2012-13. Since the water corporations took

### Box 4.2 Level 1 WWTPs

In addition to 82 Level 2 WWTPs in Tasmania, there are 32 Level 1 (flow rate <100 kL/day) WWTPs which service small urban centres throughout regional and rural areas of the State.

These assets are further discussed in Chapter 5. Level 1 WWTPs are currently regulated by local government and there are no reporting requirements to State Government agencies. The number of connections and customers serviced by Level 1 WWTPs is currently not recorded.

<sup>9</sup> The three non-corporation WWTPs were operated by the Parks & Wildlife Service (Ben Lomond and Lake St Clair national parks) and the Port Arthur Historical Site Management Authority.

over management of water and sewerage services the collection and provision of flow data has improved markedly. Due to the continuing roll-out of flow meters, the vast majority of WWTPs (71 of 79) now have meters. For a small number of WWTPs flows can only be estimated rather than measured. Such estimates are based on surrogate indicators such as the number of connected residences, drinking water consumption or sewage pumping station hours of operation.

Overall this compares favourably to the situation that existed in 2008-09 when 26 WWTPs failed to provide inflow data. However, flow meters are likely to generate erroneous data if not regularly maintained and tested. In this regard, some issues were identified with flow meter data in 2012-13 such that part of the data set is considered to be inaccurate. In these cases data was cross-referenced against previous periods and modified if considered justified.

Table 4.2 shows, on a regional basis, the combined maximum flow limits for WWTPs together with the combined actual flows reported.

**Table 4.2 Sewerage service supply, 2012-13 - comparison of actual flows to permitted maximum licence limits by region**

Water Corporation	Total permitted maximum licensed limits (kL/day) (ADWF) <sup>1</sup>	Actual flow as a percentage of licensed flow limit <sup>2</sup>	Total number of WWTPs	No. of WWTPs assessed against flow limit	Proportion of WWTPs exceeding their licence flow limit
Ben Lomond	60 284	64 %	27	27	3 / 27
Cradle Mountain	47 855	85 %	21	21	7 / 21
Southern Water	80 724	69 %	31	29 <sup>3,4</sup>	3 / 29

Source: EPA WWTP database.

- Notes:
1. Combined maximum licensed limits, by region for all WWTPs in each region.
  2. Percentage of combined regional actual flow to combined regional maximum licensed flow limits for those WWTPs for which measured flow data was available.
  3. Flow limit yet to be specified for the Richmond WWTP
  4. Penna WWTP is excluded as it is classified as a holding lagoon not a treatment plant.

For Ben Lomond Water and Southern Water the number of WWTPs exceeding the specified maximum flow limit was significantly lower than in the previous year (reduced from eight to three and from ten to three respectively). For both regions flows as a percentage of licensed flows decreased by ten per cent compared to 2011-12.

For Cradle Mountain Water the reverse trend was observed, with actual flow contributing a larger percentage of the combined licensed flow and one more WWTP operating above licence capacity compared to 2011-12.

These effects are likely due to the following:

- Changes in flow measurement / estimation methods, resulting in reported flows that may have changed significantly for several WWTPs. It is likely that more recent flow figures provided are a more accurate reflection of actual flows than in the past, due to the water corporations installing additional flow meters, as well as improving calibration and maintenance practices.

In the Ben Lomond Water region, several flow meters suspected of generating inaccurate results were corrected during 2012-13, resulting in significant downward adjustments to the reported flows for these plants.

For example, following replacement of the Newnham WWTP flow meter, annual flow was reported to be in excess of 1 000 ML lower than reported in 2011-12. This accounts for approximately half of the flow reduction recorded for Ben Lomond Water over this time period.

On the other hand, in 2012-13 Cradle Mountain Water provided a flow estimate for Queenstown WWTP for the first time. The licensed flow limit had previously been adopted as a best approximation of inflows. The resulting flow estimate for Queenstown amounts to a four-fold increase and is sufficient to explain the overall regional trend.

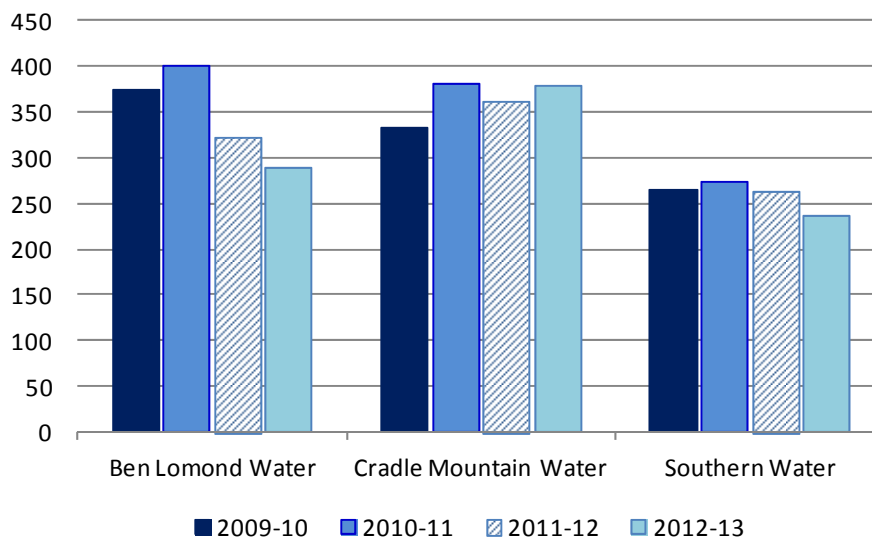
- Climatic effects are likely to impact on sewage flows, either directly in the case of combined stormwater/sewage catchments (eg Queenstown, parts of Launceston), or indirectly as a result of rainwater infiltration into the reticulation system (commonly described as Inflow and Infiltration). Rainfall experienced in 2012-13 was classified as “below average” or “very much below average” for the vast majority of Tasmania, according to the Bureau of Meteorology.
- The roll-out of water meters to residential and non-residential properties is designed to reduce water consumption which may in turn affect sewage generation volumes. Particularly in the southern region the roll-out of water meters was significantly progressed in 2012-13 (refer to Chapter 10 for details).

In 2012-13 the total volume of sewage collected across the State was 44 891 ML. The average volume of sewage collected (residential and non-residential) was 283 kL per property (Figure 4.5), which is lower than the volume reported in 2011-12 (301 kL).

Whilst the average volume of sewage collected per connection across the state generally decreased compared with 2011-12, within each region there is significant variation in the average volume of sewage collected per property. Some of this variation may be due to data quality issues, ingress of stormwater to the sewer networks or the treatment of trade waste.

In the southern region the average volume of sewage collected was 236 kL per property in 2012-13, a reduction from the 263 kL per property reported in 2011-12. The average volume collected in the north-west region was 378 kL per property which was an increase from 361 kL in 2011-12. The volume of sewage collected per property in the northern region was 289 kL which was a decrease from 322 kL in 2011-12.

A more detailed discussion of the sewerage infrastructure in the State can be found in Chapter 5 of this Report.

**Figure 4.5 Sewage collected per property (kL/property)**

## 4.5 Recycled water uses

As mentioned earlier in this Chapter, treated wastewater can be considered as an alternative water supply. Recycled water is water that has been extracted through the process of treating wastewater. Recycled water can be utilised for on-site reuse, or for off-site applications including irrigation of agricultural or recreational land or providing water for industrial processes.

In Tasmania treated wastewater is primarily discharged to waterways and only a small proportion is recycled. In other jurisdictions, particularly those experiencing significant water shortages in recent years, wastewater is increasingly being regarded as a valuable resource and recycling uptake rates are therefore higher than in Tasmania.

Rainfall was either below average or very much below average for the majority of the State during the reporting period. Areas in the southern region where effluent reuse schemes are located were particularly characterised by dry conditions. Approximately half of the reuse schemes operated by Ben Lomond Water were also in areas experiencing “very much below average” rainfall conditions.

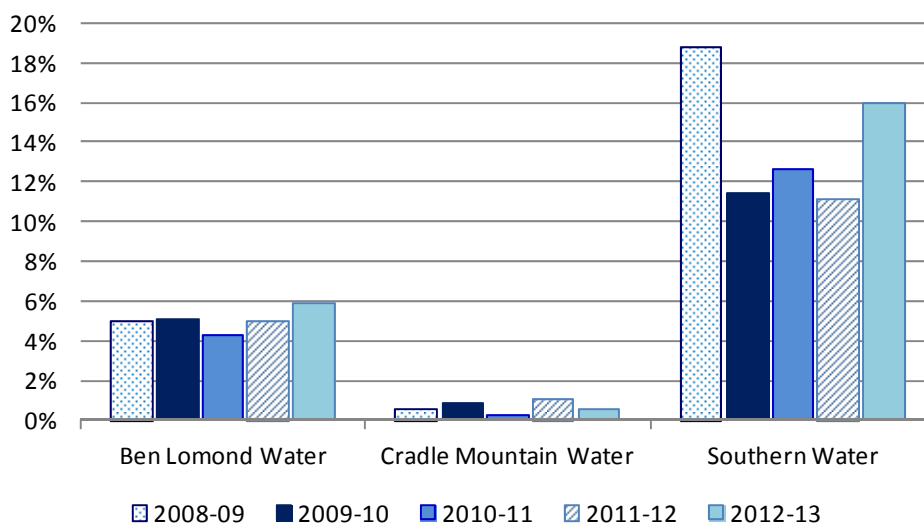
Based on available data in relation to Level 2 WWTPs, the total volume of recycled water supplied in 2012-13 was 4 148 ML with Southern Water supplying 3 229 ML, Ben Lomond Water supplying 845 ML and Cradle Mountain Water supplying 74 ML through its single existing effluent recycling scheme (Railton agricultural reuse).

Recycled water usage as a percentage of total treated effluent volume by water corporation is shown in Figure 4.6. State-wide the proportion of effluent recycled was 8.4 per cent, similar to the levels reported in 2008-09 which was also characterised by dry climatic conditions. The intervening years were characterised by higher rainfall which resulted in circumstances being less favourable for effluent recycling.

Southern Water recycled approximately 16 per cent of effluent generated in its Level 2 WWTPs during 2012-13. This return to levels achieved in past years with comparable climatic conditions is mainly driven by increased demand from the

Clarence Recycled Water Scheme coupled with a reduction in sewage volume generated in the region.

**Figure 4.6 Recycled water, percentage of treated effluent reused**



The Clarence Recycled Water Scheme continued to be the largest in the state based on the volume of effluent recycled. The scheme provides recycled water to the Coal Valley for a variety of uses including irrigation of agricultural and horticultural crops as well as golf courses. The volume of treated effluent utilised in the scheme increased significantly from 1 076 ML in 2011-12 to 1 568 ML in 2012-13. The second largest was the Brighton/Bridgewater scheme, which provided a slightly higher volume of recycled water in 2012-13, 669 ML up from 660 ML in 2011-12.

The largest effluent recycling scheme operated by Ben Lomond Water is associated with the Legana WWTP where 172 ML or 61 per cent of the volume generated was used to irrigate agricultural land.

The only effluent recycling scheme operated by Cradle Mountain Water is associated with the Railton WWTP where 74 ML or 43 per cent of the the effluent volume generated was reused.

## 4.6 Supply and demand balance of waste water

This section provides an assessment of the current supply and demand balance for wastewater in Tasmania, within the constraints of the available data. A conceptual framework for determining supply and demand balance is provided in Appendix 2 of the 2011-12 State of the Industry Report. A balance can be determined by assessing the regulated supply capacity of the WWTPs and demand for sewerage services as measured by the sewage flow data.

Demand for sewerage services by those connected to the system can be determined by measuring the sewage flow. However, there are limitations to this approach including reservations regarding the quality of flow information provided, as discussed above.

The limits specified in the environmental conditions for the WWTP relate to Average Dry Weather Flow (ADWF) conditions. ADWF excludes water ingress during peak flow conditions, which are experienced during or after periods of precipitation and result in groundwater infiltration or stormwater ingress into the reticulation system. Reporting of treatment plant flow generally does not differentiate between flow conditions (average flow versus peak flow) and a true comparison against the specified limit is therefore not possible. However, it is the best indicator available at this time and has been utilised to highlight key supply and demand conflicts.

Appendix 3 provides a list of all WWTPs operated by the three water corporations, their licensed flow limit (kL per day), and their measured actual flow for 2012-13 (also measured on a kL per day basis) and the actual flow as a percentage of the licensed limit for each WWTP.

The data indicates that flows for thirteen WWTPs exceeded their regulated capacity in 2012-13. This means that demand exceeds supply for the systems in which those plants operate. Of those plants, four exceeded their allowed effluent outflows by more than 100 per cent. Three of these plants are located in the north-western region and one is located in the southern region. The remaining ten WWTPs which exceeded their discharge limits were distributed across all regions, exceeding their regulated capacity by between three per cent and sixty two per cent.

Seventeen of the remaining WWTPs are operating at more than 75 per cent of their regulated capacity with four of those plants reporting daily flows at or above 90 per cent of their regulated daily flow limit. Twenty seven WWTPs were operating at between 50 per cent and 75 per cent of their regulated capacities whilst the remaining twenty WWTPs that provided figures<sup>10</sup> reported daily flow rates of less than half their regulated capacity.

Whilst data availability has restricted the nature of the analysis that can be undertaken, this assessment of the supply-demand balance for sewerage services in Tasmania indicates that each regional area has locations in which demand for sewerage services exceeds supply. This is in addition to shortcomings in compliance, as outlined in Chapter 8, which also indicates that existing infrastructure is not adequately coping with current demand.

During 2012-13 the EPA issued five new Environmental Protection Notices (EPNs) for the Fingal, Hoblers Bridge, Newnham Drive, Norwood and Riverside WWTPs, with an additional two WWTP's operating under draft EPNs (George Town and Ulverstone). As part of the water and sewerage reform process the EPA intends to review and, if necessary, update environmental conditions for all Level 2 WWTPs. Flow capacity limits will also be reviewed as part of this process. At the same time, flow monitoring conditions are to be strengthened and streamlined.

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<sup>10</sup> Flow limit yet to be specified for the Richmond WWTP.

## 5 INDUSTRY INFRASTRUCTURE

This Chapter provides information on the water and sewerage networks, the condition of assets and the reliability and efficiency of systems. The type and condition of water and sewerage assets impacts on the level and quality of services to customers.

Figure 1.1 in Chapter 1 depicts the urban water cycle and the type of infrastructure used to deliver water and remove waste water in urban areas.

### 5.1 Water assets

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

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

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

#### 5.1.1 Water supply systems and treatment plants

A WTP is an individual facility receiving raw or partially treated water for treatment and ultimate delivery to customers and does not include secondary or booster disinfection plants. There may be more than one WTP at a specific location. Water corporations are required to report the level and complexity of treatment provided to bring water quality to an acceptable level for the customer. These reports can, therefore, also partially explain a water corporation's relative operating costs and total costs as it relates to the complexity and capacity of the water treatment assets.

There are three broad categories of WTP:

- disinfection only – the treatment plant solely 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 the elements; 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.

Table 5.1 summarises the number of WTPs operated by Tasmania's water and sewerage service providers in 2012-13.

**Table 5.1 Number of water treatment plants in Tasmania**

	<b>Disinfection only WTPs</b>	<b>Further treatment WTPs</b>	<b>Full treatment WTPs</b>	<b>Total WTPs</b>
Ben Lomond Water	6	0	13	19
Cradle Mountain Water	2	0	15	17
Southern Water	10	0	13	23
<b>Total</b>	<b>18</b>	<b>0</b>	<b>41</b>	<b>59</b>

Whilst the number of WTPs in each region indicates the types of treatment plants operated, it does not indicate the scale of the water treatment facilities in each area. Measures such as the volume of water treated at each plant give a better indication of the scale and load on the systems operating in the different regions.

In the Greater Hobart area Southern Water operated the Bryn Estyn WTP, which consists of two plants with a total capacity of 160 ML per day. There are 12 other full treatment WTPs in the southern region, plus ten WTPs that provide disinfection only.

In the northern region, the largest WTPs are located at North Esk, Distillery Creek and West Tamar. These schemes produced 6 409 ML, 4 445 ML and 2 449 ML respectively of fully treated water in the 2012-13 period.

Cradle Mountain Water manages 17 water supply systems that service 37 localities across north-western Tasmania, including the West Coast and King Island. The largest WTPs in the north-western region are located in Burnie (Pet Dam), Forth and Smithton, which have water allocations of 11 240 ML, 2 854 ML and 3 630 ML respectively.

For further analysis of the quality of water supplied, see Chapter 7 (Public Health) of this Report. A summary of each water corporation's water treatment activities is provided in the following sections.

#### **5.1.1.1 Ben Lomond Water**

During 2012-13 Ben Lomond Water operated 35 water supply schemes, supplying a total of 58 028 customers.

Ben Lomond Water spent around \$15.9 million in capital works on its water infrastructure during the period, with major projects focusing on improving the quality of drinking water in towns previously subject to temporary boil water alerts.

The commissioning and opening of the Campbell Town Water Treatment Plant allowed temporary boil water alerts to be lifted in Campbell Town and Ross, whilst



further works at the Scamander WTP were carried out to improve pre-treatment and system capacity.

Other major capital projects included:

- the Lilydale pipeline project which was nearing completion as at 30 June 2013;
- the commencement of construction of water treatment plants in Fingal and Bracknell;
- the commissioning of the Westbury Water Treatment Plant which will supply Westbury, Hagley and Exton; and
- the preparation of tender documents for the construction of a water treatment plant to supply Mole Creek.

The latter is to be the first plant utilising UV disinfection, in combination with chlorination, to be constructed in Tasmania.

#### *5.1.1.2 Cradle Mountain Water*

Cradle Mountain Water operated 17 water supply schemes<sup>1</sup> in the north-west of the State, supplying a population of approximately 93 000 over a service area of some 22 500 square kilometres.

During 2012-13 Cradle Mountain Water focused on asset renewals and meter replacements to upgrade the ageing infrastructure in its service area and to improve meter reading, billing, accuracy and efficiency.

Dam safety improvement works were completed at the Pet Dam and Parting Creek. At Pet Dam (near Burnie), the upgrade of the outlet and scour pipe work and valving was completed whilst at Parting Creek Dam the installation of a new outlet pipe, scour, outlet valves and access platform was completed. The dam wall was further improved through the construction of a seepage control filter and weighting berm.

A primary filter was installed on the water supply at Rosebery to improve the quality of the supplied water. This project included the construction of a shed, installation of two Amiad water filters with auto backwashing systems and links to SCADA system for alarming and monitoring.

Works at the Helen Street pump station in Ulverstone were nearing completion as at 30 June 2013. Once completed this is expected to deliver a substantial improvement in the reliability of the pump station.

A project to upgrade all fluoride installations commenced during 2012-13 following the completion of a condition and safety assessment.

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<sup>1</sup> In addition to the Cradle Mountain Water operated schemes, a number of private water schemes supply the Cradle Mountain tourist area in the Kentish municipality.

### 5.1.1.3 Southern Water

Southern Water manages a total of 48 different water catchments, which feed into 25 drinking WTPs or dosing stations, which in turn feed 39 drinking water systems. The key catchments are the River Derwent, Lake Fenton and Mt Wellington which supply the majority of Greater Hobart. In total, Southern Water provides water services to over 96 000 properties.

In 2012-13 Southern Water completed the Huon Valley Water Scheme and in doing so upgraded the quality of water supplied to over 12 000 customers in the townships of Huonville, Franklin, Geeveston and Cygnet. The installation of 58 000 meters was also finalised and a meter replacement program was initiated for the remaining old meters.

During 2012-13 approximately four kilometres of water pipeline was renewed on the East Coast, Hobart and Glenorchy. Additionally, a program of pump station electrical renewals (switchboards) was commenced with works continuing into 2013-14.

In July 2013 the Risdon Valley Water Main was completed, supporting increased growth in demand in the area.

### 5.1.2 Storage dams

Cradle Mountain Water, Ben Lomond Water and Southern Water are responsible for the operation and maintenance of a number of water supply and wastewater dams throughout Tasmania. All dams in Tasmania must be maintained and operated in accordance with the *Water Management Act 1999* and the *Water Management (Safety of Dams) Regulations 2011*.

Under this legislation and regulations, owners of dams must maintain and operate them so as not to cause significant environmental harm or present a danger to the public. The procedures required and standards to be met to achieve these objectives are largely based on the guidelines produced by the Australian National Committee on Large Dams (ANCOLD) and other policy and guidelines produced by the DPIWE.

The guidelines are fundamentally based on the relative risk posed by a particular dam if there was to be a catastrophic failure of the dam, known as the Hazard Category of the dam. The risk posed by a dam is assessed against three major considerations:

- the potential population placed at risk by the dam failure;
- the potential impact on community and private infrastructure, such as bridges, roads, buildings, communication, energy and water and sewerage assets; and
- the impact on the environment.

The Hazard Category of each dam can be assigned to one of seven levels (Table 5.2) through a structured process provided by ANCOLD. These requirements increase as the Hazard Category increases. A large proportion of the dam assets the three water corporations inherited as part of the water and sewerage reforms have a "Significant" or higher Hazard Category, due to their size and / or location near the population they service.

All dams for which there is a potential loss of life resulting from failure, (a rating of “Significant” or higher), require regular comprehensive monitoring, engineering assessment and reporting.

These requirements increase as the Hazard Category increases. A large proportion of the dam assets the three water corporations inherited as part of the water and sewerage reforms have a “Significant” or higher Hazard Category, due to their size and / or location near the population they service.

**Table 5.2 ANCOLD Guidelines hazard rating for storage dams**

Population at Risk	Severity of damage and loss			
	Negligible	Minor	Medium	Major
<b>0</b>	Very Low	Very Low	Low	Significant
<b>1 to 10</b>	Low	Low	Significant	High C
<b>11 to 100</b>		Significant	High C	High B
<b>101 to 1 000</b>			High A	High A
<b>greater than 1 000</b>				Extreme

Adapted from Table 3 of the ANCOLD Guidelines on Assessment of the Consequences of Dam Failure

In addition to the higher Hazard Category dams that the water corporations inherited from local government, a number of other low risk dams also required significant levels of modification or maintenance to substantially reduce their risk of failure or to meet other operational requirements. As part of their dam assessment program the water corporations have undertaken a review of the required maintenance for each dam and included this in their dam works programs.

The corporations are in the process of determining the dam safety risks across all their dams through a Portfolio Risk Assessment process.

#### **Box 5.1 Dam Safety Assessment Terminology**

**Portfolio Risk Assessment** – A portfolio risk assessment enables a comparative estimation of risks over all dams and enables the identification and the quantification of the required capital works or development of systems and their relative priorities. This process is used to prioritize structural and non-structural measures for reducing dam safety risks across a number of dams.

**Five Year Dam Safety Surveillance Reports** – The corporations are required to undertake a dam safety surveillance review every five years for each of their dams which have a “Significant” hazard rating or higher, and provide a report to the Dam Safety Regulator (DPIPWE). The report must set out the condition of the dam and outline any planned remedial works required to maintain or upgrade the dam.

**Dam Safety Management Plans** - The corporations are required to develop five year dam safety works programs, with these to be submitted to and agreed to by the Dam Safety Regulator. The overall objective of each five year program is that all dams which have a “Significant” hazard rating or higher are within the Limit of Tolerability in terms of societal risk and reduced to As Low As Reasonably Practicable, as defined in the ANCOLD guidelines. Dams that do not currently meet these criteria would require a program of works to bring them within acceptable criteria. This five year works program will be reported on and reviewed and revised on an annual basis through agreement between a regulated entity and the Dam Safety Regulator.

**Dam Safety Emergency Management Plans (DSEMP)** – A DSEMP is prepared for use in a situation where there is a dam safety emergency; it is DPIPWE’s policy that all dams which have a “Significant” hazard rating or higher require a DSEMP. As a minimum a DSEMP 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. These documents are to comply substantially with the Guidelines on Dam Safety Management published by ANCOLD.

### 5.1.2.1 *Storage dams – Ben Lomond Water*

There are 62 dam sites in the northern region, two of which are identified as having a “Significant” hazard rating or higher (Table 5.3), with the remaining dams assessed as a low or very low risk. The total number of dams managed by Ben Lomond Water has reduced from 2011-12 (64 to 62) due to changes in site boundaries for some locations.

In 2011-12 Ben Lomond Water developed five year dam safety management plans for the two dams rated as a “Significant” hazard or higher. In addition the corporation completed five year dam safety works schedules for these two high risk dams. Following these actions in 2011-12 no further significant actions have been taken during 2012-13.

**Table 5.3 Significant and High hazard rating storage dams in northern Tasmania**

Dam name	Hazard rating
Curries Dam	High C
Westbury Storage	High C

### 5.1.2.2 *Storage dams – Cradle Mountain Water*

There are 15 dam sites<sup>2</sup> in the north-western region, of which eight are identified as having a “Significant” hazard rating or higher, with the remaining dams assessed as low risk (Table 5.4).

**Table 5.4 Significant and High hazard rating storage dams in north western Tasmania**

Dam name	Hazard rating
Conglomerate Cr Dam	High B
Lake Isandula Dam	High B
Lake Mikany Dam	High B
Pet Dam	High B
Cutten St Dam No.3	High C
Roaring Meg Dam	High C
Guide Dam	Significant
Waratah Dam	Significant

During 2011-12 Cradle Mountain Water prepared dam safety management plans covering all eight dams that are rated as having a “Significant” hazard rating or higher. Building on the work undertaken in 2011-12, in 2012-13 a portfolio risk assessment of Cradle Mountain Water’s dams was prepared and the Dam Safety Emergency Management Plan was updated.

<sup>2</sup> Cradle Mountain Water has not included sewerage treatment ponds, which are classified as storage dams, in their dam sites total.

### 5.1.2.3 *Storage dams – Southern Water*

Southern Water operates 148 dam sites in the southern region, of which 24 are identified as having a “Significant” hazard rating or higher (Table 5.5), with the remaining dams assessed as low risk. The number of dams with a significant or higher hazard category has increased from 15 to 24 as revised dam assessments were completed.

**Table 5.5 Significant and High hazard rating storage dams in southern Tasmania**

<b>Dam name</b>	<b>Hazard rating</b>
Flagstaff Gully	Extreme
Knights Creek	Extreme
Limekiln Gully	Extreme
Tolosa Reservoir	Extreme
Lower Reservoir	High A
Meredith Reservoir	High A
Ridgeway Reservoir	High A
Upper Reservoir	High A
Risdon Brook	High B
Duckhole Rivulet	High C
Illabrook Dam	High C
Lower Prosser	High C
Bicheno	Significant
Blackmans #1	Significant
Blackmans #2	Significant
Coles Bay	Significant
Grey mountain No.1	Significant
Grey mountain No.2	Significant
Upper Prosser	Significant
Midway Point Wastewater	Significant
Sorell Wastewater	Significant
Penna Wastewater	Significant

In 2011-12 Southern Water undertook a Portfolio Risk Assessment of all of its dams with a significant or higher safety rating and this assessment has been utilised in the development of a dam safety management plan covering all of these dams. The dam safety management plan incorporates a portfolio risk assessment of all of Southern Water's dams. In addition Southern Water has also completed an emergency management plan for 15 of its dams with a hazard rating of significant or higher.

### 5.1.3 Other water assets

Other water assets utilised by the water corporations in their water supply systems include fluoridation stations/equipment, water pumping stations, water mains and water distribution storage facilities.

Table 5.6 summarises the other water infrastructure assets in Tasmania by region. It shows that Southern Water has by far the most extensive reticulation network in the State, with approximately 3 082 kilometres of water mains.

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 5.6 Other water assets in Tasmania**

	Number of water pumping stations	Number of water distribution storage facilities	Length of water mains (km)
Ben Lomond Water	57	134	1 954
Cradle Mountain Water	62	85	1 406
Southern Water	88	161	3 082
<b>TOTAL</b>	<b>207</b>	<b>380</b>	<b>6 442</b>

Each water corporation reported that the length of its water and sewer mains has increased slightly from last year. This may be due to a number of factors, including better identification of pipes from the original council provided data with the introduction of GIS (geographical information systems) mapping technologies to track water assets and expansion of the supply infrastructure.

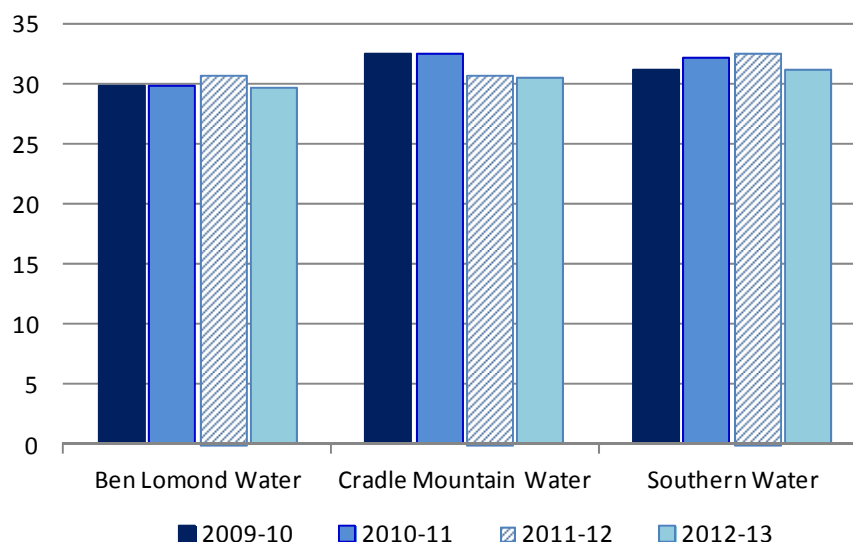
Specifically, during 2012-13, 62 km of water mains was added to the network on a statewide basis.

Growth in the southern areas of Brighton, Tranmere and Kingston resulted in Southern Water's water network being extended during 2012-13 to total 3 082 km of water mains.

The number of pumping stations indicates the ease or difficulty of delivering water to customers. Cradle Mountain Water has a particularly high number of pumping stations relative to the length of water mains, indicative of both the difficult terrain and large area covered by the water reticulation network in the north-west of the State. Ben Lomond Water and Southern Water both have around 35 km of water main between pumping stations on average.

The length of water mains and properties served per kilometre of water main indicates the scale of each water corporation's water mains network and the spatial density of properties served.

Figure 5.1 shows the number of properties served per kilometre of water main by each water corporation in 2012-13 compared to the previous three years. On average, around 30 properties were served per kilometre of water main across the State in 2012-13 which is the same as the previous two years.

**Figure 5.1 Properties served per kilometre of water main**

In 2012-13 Ben Lomond Water, Cradle Mountain Water and Southern Water served 29.7, 30.5 and 31.2 properties per kilometre of water main respectively. There was little change compared to 2011-12, with customer density in the southern region still slightly higher than elsewhere in the State, indicating a more concentrated customer base in that region.

Customer density in Tasmania is slightly lower than for the mainland water networks, which serve around 34 properties per kilometre of water main.<sup>3</sup> On average there were 30.6 properties per kilometre of water main in Tasmania, which is a similar proportion to the regional or smaller water networks on the mainland that typically serve around 31 properties per kilometre of water main.<sup>4</sup>

As discussed above, GIS mapping of water networks has resulted in improved data accuracy, and highlighted errors in previous year's data. Therefore, comparisons with previous years should not be used to gauge network growth or reduction.

## 5.2 Sewerage assets

Sewerage assets include wastewater treatment plants (WWTPs), pumping stations, sewer mains and effluent outfalls<sup>5</sup>. Performance indicators for these infrastructure elements relate to their number, density, length and operational performance.

### 5.2.1 Wastewater treatment plants

Nearly every major township in Tasmania has reticulated sewerage and an associated WWTP. WWTPs discharge to waterways and to effluent recycling

<sup>3</sup> National Water Commission, *National Performance Report* database for 2011-12.

<sup>4</sup> Utilities classified as non-major water utilities for national water performance reporting.

<sup>5</sup> 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.

schemes. Treatment levels and receiving environments are discussed in more detail in Chapter 8 of this report.

Table 5.7 summarises the sewerage assets that were operated by Tasmanian water corporations in 2012-13.

**Table 5.7 Sewerage assets in Tasmania, 2012-13**

	<b>Sewage pumping stations</b>	<b>Length of sewerage mains and channels (km)</b>	<b>Level 1 WWTPs</b>	<b>Level 2 WWTPs</b>	<b>Total number of WWTPs</b>
Ben Lomond Water	203	1 488	8	27	35
Cradle Mountain Water	246	1 205	6	21	27
Southern Water	275	2 109	19	31	50
<b>TOTAL</b>	<b>724</b>	<b>4 802</b>	<b>33</b>	<b>79</b>	<b>112</b>

In 2012-13 79 Level 2 WWTPs were operated by the regional water corporations, which is the same as in the previous year. In addition, three Level 2 WWTPs are owned by private operators or government agencies, including the Tasmanian Parks and Wildlife Service.

The water corporations also operate smaller wastewater treatment facilities including 33 Level 1 WWTPs.

Where reticulated sewerage services are not available, wastewater is often treated on site by means of septic tanks or package treatment plants, with effluent disposal to soil absorption systems rather than to surface waters. On-site systems

need to be designed and constructed in accordance with the provisions of the Tasmanian Plumbing Code and require council approval.

#### **Box 5.2 Sewerage Pumping Stations**

Sewage pumping stations are intrinsic parts of a sewerage system. They pump sewage from low points in the reticulation system to facilitate the passage of sewage to the wastewater treatment plant.

In 2012-13 Southern Water operated the largest number of sewage treatment plants (50), 19 of which were Level 1 plants. Ben Lomond Water operated 35 sewage treatment plants in total, whilst Cradle Mountain Water operated 27.

Comparing the complexity of sewerage networks Southern Water has the most extensive system, with 2 109 kilometres of sewer mains and channels and an average of 7.6 kilometres of sewer main length for each of its 275 sewage pumping stations. Ben Lomond Water has 1 488 kilometres of sewer mains and channels, and operates 203 sewage pumping stations. Cradle Mountain Water operates 246 sewage pumping stations and has 1 205 kilometres of sewerage mains and channels. The total length of sewerage reticulation in Tasmania is approximately 4 802 kilometres.

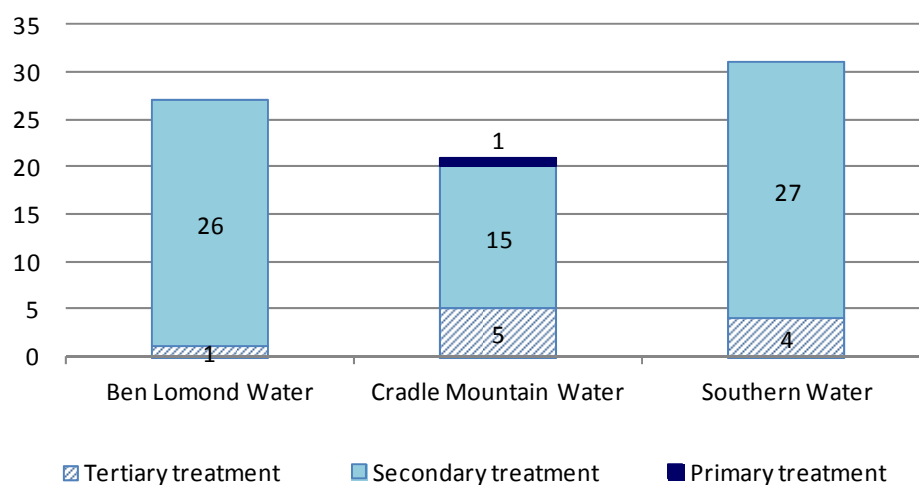
The complexity of the sewerage networks operated by the corporations varies significantly, as indicated by the fact that although they have similar numbers of sewerage pumping stations, the number of pumping stations per 100 kilometres of sewer main varies greatly. This is due to the location and topography of the areas covered by the sewerage networks. In particular, Cradle Mountain Water's network



has the highest number of pump stations per 100 kilometres of sewer main due to the requirement to service the more mountainous areas of Tasmania.

Figure 5.2 provides a breakdown of Level 2 WWTPs that were operated in Tasmania in 2012-13 by treatment level and operator. As shown, the majority of Level 2 WWTPs provided secondary treatment of wastewater. Cradle Mountain Water was the only utility to operate a primary treatment WWTP, located at Pardoe Downs in East Devonport. Across the State ten WWTPs provided treatment to a tertiary level. There were no changes from 2011-12 in this regard.

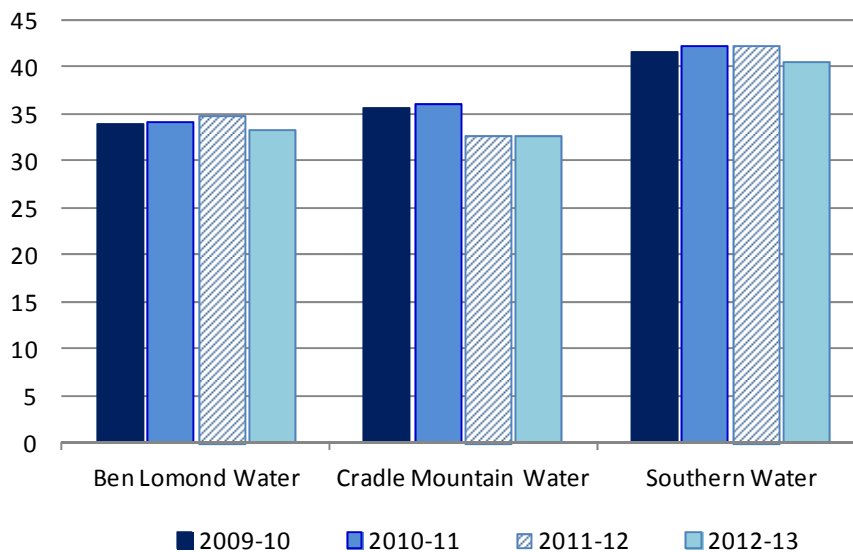
**Figure 5.2 Number of Level 2 WWTPs in Tasmania by treatment level**



Notes: Southern Water operates 30 licensed WWTPs plus the Penna WWTP which is classified as a holding lagoon.

Further discussion on comparative sewage treatment levels can be found in Chapter 8 of this report.

The number of properties served per kilometre of sewer main gives an indication of the scale of the water corporations' sewerage network and the spatial density of properties served. Figure 5.3 shows for each water corporation the number of properties served per kilometre of sewer mains and channels.

**Figure 5.3 Properties served per kilometre of sewer main**

In 2012-13 the number of properties served per kilometre of sewer main was 32.5 for Cradle Mountain Water, 33.1 for Ben Lomond Water and 40.5 for Southern Water. The result for Cradle Mountain Water did not differ from the previous year however the result for Ben Lomond Water and Southern Water decreased slightly due to an increase in the reported length of sewerage mains and channels and a decrease in the reported number of properties connected to the sewerage network. This is likely to be due to better identification of sewerage infrastructure and/or property identification.

There is considerable variation in the density of population served by the sewerage networks, attributed to the fact that each region is made up of areas ranging from predominantly rural to high density urban.

### 5.2.2 Recycled water treatment plants

The definition of a 'recycled Water Treatment Plant' (WTP) under the National Performance Report (NPR) Framework takes into account two factors. Firstly, if additional treatment processes are not required to bring effluent quality to a level appropriate for recycling, this is not included as a recycled WTP. Secondly, in the event the treatment plant has a dual purpose (used both as a sewage treatment plant and as a recycled WTP) then predominant use (ie more than 50 per cent) is used to classify the plant. Predominant usage may change over time due to upgrades or variations in demand.

Effluent recycling schemes in Tasmania typically involve the irrigation of golf courses, agricultural land (pasture, seed crops) or municipal recreational areas, requiring the waste water to be 'Class B' quality standard as specified in the *Tasmanian environmental guidelines for the use of recycled water in Tasmania*.<sup>6</sup>

'Class A' recycling quality is required for recycled water used to irrigate crops intended for raw consumption, non-potable domestic uses (eg toilet flushing) or groundwater recharge. Currently there is no operating Class A effluent recycling scheme associated with any Level 2 WWTPs in Tasmania. However, there is potential for a 'Class A' effluent recycling scheme to be implemented in relation to the Cradle Mountain WWTP which serves the Cradle Mountain National Park tourism precinct.

In Tasmania, the level of treatment required for discharge to waters is usually of an equal or higher standard than for recycling. As a consequence WWTP upgrading is generally not necessary in order to achieve effluent quality suitable for recycling. However, there are currently two exceptions, where WWTPs are retrofitted with special helminth<sup>7</sup> filters to complement existing treatment processes before discharge to reuse. As such, strictly speaking, only these WWTPs could be classified as recycled WTPs according to the NPR definition.

Table 5.8 categorises the level 2 WWTPs in each region according to whether they provided full reuse, partial reuse or no reuse of treated wastewater in 2012-13. To provide greater consistency with the relevant NPR measures, the partial reuse schemes were categorised into those achieving less than 50 per cent and greater than 50 per cent effluent recycling. Schemes are classified each year based on the actual recycling proportions achieved.

**Table 5.8 Classification of reuse schemes associated with Level 2 WWTPs**

	Tasmanian reuse category				'Recycled WTPs' (More than 50% reuse)
	Full	Partial (>50% recycled)	Partial (<50% recycled)	None	
Ben Lomond Water	4	7	5	11	11
Cradle Mountain Water	0	0	1	20	0
Southern Water	4	10	6	11	14
<b>TOTAL</b>	<b>8</b>	<b>17</b>	<b>12</b>	<b>42</b>	<b>25</b>

As shown in Table 5.8, in 2012-13 eight WWTPs in Tasmania were categorised as full reuse systems, with all effluent recycled and no discharge to waters. A further 29 WWTPs were classed as partial reuse systems where only a portion of the effluent was recycled. Systems designed for full reuse may discharge to waters during particularly wet years when the irrigation of land would not be sustainable or when storage capacity becomes limited due to other reasons.

<sup>6</sup> The guidelines stipulate that 'Class A' recycled water requires advanced treatment with disinfection, while 'Class B' recycled water requires secondary treatment with disinfection. For specific effluent quality limits, refer to the guidelines.

<sup>7</sup> Helminths are parasitic worms.

The table shows that in both the southern and northern regions the majority of WWTPs directed at least a portion of treated effluent to reuse schemes whilst in the north-west, only one WWTP had an associated reuse scheme.

In total, eight Level 2 WWTPs in Tasmania achieved full reuse in 2012-13, which is the highest proportion since 2009-10. Four were located in the northern region (one in 2011-12) and four in the southern region (unchanged from 2011-12).

Twenty-nine WWTPs were associated with partial reuse, however the proportion of recycling ranged widely, from less than one per cent for the Selfs Point WWTP up to 98 per cent for the Swansea WWTP.

One new reuse scheme commenced operations at Beaconsfield. Emergency irrigation undertaken at Westbury to manage a blue-green algae bloom meant this scheme was also included in the partial category in 2012-13.

Figure 5.4 shows the distribution of reuse categories for each water corporation over time. The number of WWTPs without associated reuse scheme has declined slightly over the years as additional schemes have been commissioned. However, considerable fluctuation exists from year to year between the full, > 50% and < 50% categories. This is primarily a reflection of regional climatic conditions (2008-09 and 2012-13 were relatively dry years whilst 2010-11 was wetter than average), coupled with other factors driving recycled water demand (eg storage dam management, utilising full irrigation potential).

**Figure 5.4 Number of WWTPs by reuse category**

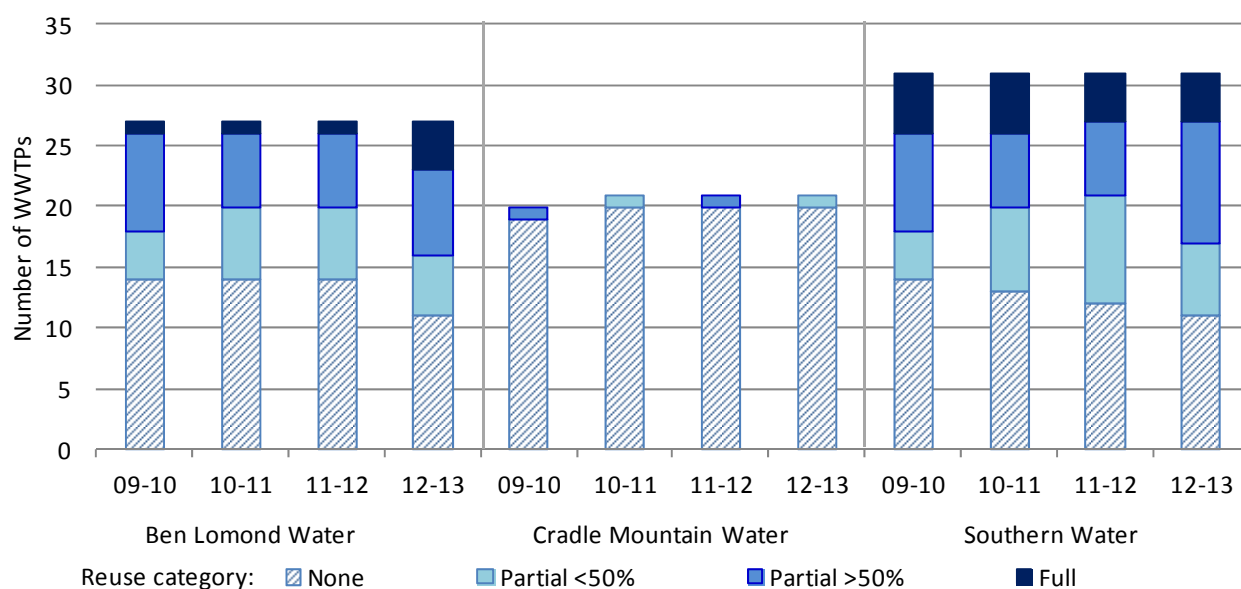


Table A 5.3 in Appendix 5 lists the proportion of effluent reused and reuse flow per year for each Level 2 WWTP for the 2008-09 to 2012-13 financial years.

### 5.3 Performance of water and sewerage infrastructure

Water supply network reliability is measured by the frequency of interruptions, as indicated by the number of water main breaks per 100 kilometres of water main. Water loss and leakage, ie the volume of water that does not reach customers due to leaking pipes or under-recording water meters, are also used to gauge system reliability.

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

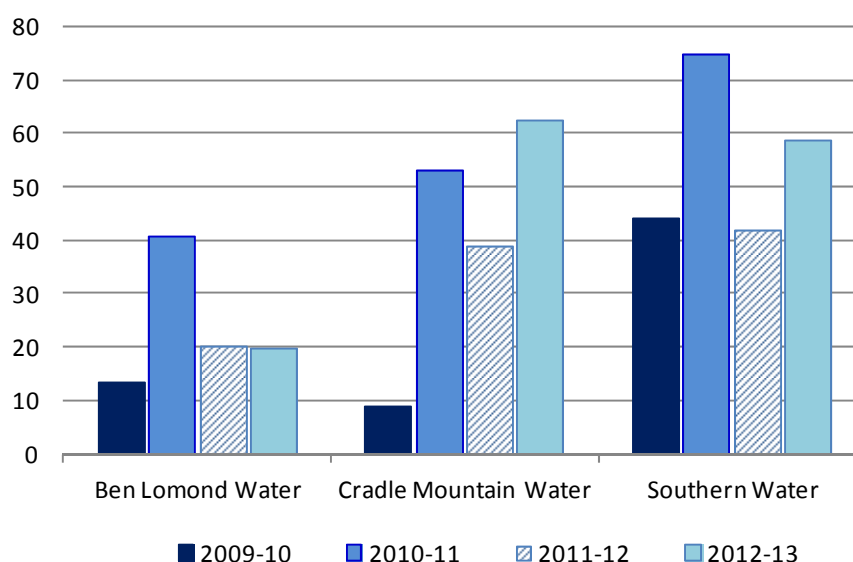
Reliability standards are listed in the Regulator's Customer Service Code, which is discussed in Chapter 2.

#### 5.3.1 Water main breaks

A water supply interruption is an event that causes a total loss of water supply to customers. The factors affecting the frequency of interruptions include soil type, rainfall, pipe material and the age and condition of the network. Water main breaks are the primary cause of supply interruptions for the reticulated water network.

Figure 5.5 shows the number of water main breaks reported per 100 kilometres of water main by the three Tasmanian water corporations. In 2012-13 the average rate of bursts and leaks across the State was 48 per 100 kilometres of water main.

**Figure 5.5 Water main breaks (per 100 km of water main)**



For comparative purposes the average water main breaks for mainland major water utilities was 18 per 100 kilometres of water main. Ben Lomond Water compared favourably with 20 breaks per 100 kilometres of water main. However Southern Water was much higher than the national average, reporting 58 breaks per 100 kilometres of water main.

Cradle Mountain Water is classified as a non-major water utility (large) for the purposes of national performance reporting, and reported 62 breaks per

100 kilometres, much higher than the national average of around 14 breaks per 100 kilometres of water main. Cradle Mountain Water noted that the high rate of water interruptions can be partly attributable to the installation of water meters in the region. Its ongoing water meter replacement program will likely continue to impact this measure however the numbers of meters to be replaced annually are not anticipated to be as large as in 2012-13.

Southern Water reported that its performance reflects in part the age of some of its networks and the effect of the expansion and contraction of reactive clay soils which leads to a peaking of bursts particularly as the soil dryness index peaks. Southern Water has acknowledged its poor performance compared to other water service providers in this area and has identified it as a priority area for improvement over the remainder of the current regulatory period.

Performance in this area is therefore expected to improve as infrastructure renewals and replacements are prioritised in the water corporation's management plan.

As has been seen with other indicators based on network size and distribution, the rate of water main breaks varied greatly between regions. However, due to inconsistencies in reporting of this data, the level of water supply reliability cannot be directly related to factors such as population size or density.

In 2012-13 the water corporations were able to report the number of customers affected by unplanned interruptions to water supply. This is shown in Table 5.9.

**Table 5.9 Unplanned water interruptions – 2012-13**

	Number of unplanned interruptions	Number of customers affected
Ben Lomond Water	311	7 005
Cradle Mountain Water	1 169	3 137
Southern Water	2 033	13 240

Depending on the location of the break or fault, one unplanned interruption may affect one or many customers. Interruptions to water supply affected a total of 23 382 customers in 2012-13, with the majority located in the southern region where there is a greater population density.

Ben Lomond Water recorded a high number of customers affected by interruptions in relation to the occurrence of interruptions, indicating that each interruption event affected a proportionally higher number of customers. In the Ben Lomond Water service area each interruption event on average affected 22 customers, whilst in the Cradle Mountain Water area each event affected less than three customers. Therefore, whilst Cradle Mountain Water reported a greater number of interruptions, fewer customers were affected by each event. In Southern Water's service area six customers were affected on average by each unplanned interruption.

### 5.3.1.1 *Bursts and leaks*

The water corporations also monitor bursts and leaks that occur on the water network. These events are often attributable to failure of a pipe, hydrant, valve, fitting or joint material. A burst or leak may not necessarily result in loss of supply to the customer. The average response time (minutes) to attend bursts and leaks, categorised by interruption priority against the transitional service standards, are shown in Table 5.10.

Bursts and leaks that had the potential to cause substantial damage or harm (classified as 'priority 1') were generally attended to in under 50 minutes, which was within or close to the approved service standard. For priority 2 bursts and leaks the average response time varied between regions, with Ben Lomond Water and Cradle Mountain Water reported attendance in under an hour. Southern Water exceeded its service target, reporting 154 minutes on average to attend to priority 2 bursts and leaks. Priority 3 bursts and leaks have less stringent attendance targets, and all three water corporations met their transitional service standards in 2012-13. Southern Water's service target reflects the current absence of sufficient data from water meters to identify low priority leaks.

**Table 5.10 Bursts and leaks – 2012-13**

	Average time taken to attend bursts and leaks (minutes)			2012-13 transitional service standard (minutes)		
	Priority 1	Priority 2	Priority 3	Priority 1	Priority 2	Priority 3
Ben Lomond Water	27	58	457	45	103	1 440
Cradle Mountain Water	35	53	552	49	120	1 440
Southern Water	48	154	2 783	45	120	4 320

Priority 1: is a burst or leak that causes, or has potential to cause, substantial damage or harm to customers, water quality, flow rate, property or environment.

Priority 2: is a burst or a leak that causes, or has the potential to cause, minor damage or harm to customers, water quality, flow rate, property or environment

Priority 3: is a burst or leak that causes no discernible impact on customers, property or the environment

Further discussion regarding network reliability in relation to customer supply can be found in Chapter 6.

### 5.3.2 *Water loss*

With water being a valuable resource, an effective measure for saving water is to eliminate leaks and other unaccounted for water losses. With regular maintenance, replacement and waste detection systems, the amount of water lost through leakage can be significantly reduced.

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

Real losses per service connection per day indicate how effectively the network is being managed. This measure is influenced by water pressure, condition or age of the infrastructure, or a combination of all these factors. Real losses represent a

wasted resource, reduce the effective capacity of a water supply system and may result in unnecessary operating costs.

Based on the limited data available it appears that there are significant losses in the reticulation networks, with Cradle Mountain Water estimating losses of around 250 litres per service connection per day and 7.6 kilolitres per kilometre of water main per day. This level of water loss equates to around 20 per cent of the total water sourced in the region.

Given the condition of the respective mains and other infrastructure and high level of water consumption, it is likely that there are similar levels of water loss in the northern and southern regions in 2012-13. Improved water metering and leakage detection systems should improve the availability of data in the future.

### 5.3.3 Sewer main breaks and chokes

The number of breaks and chokes in the sewer main is a partial indicator of customer service and the condition of the sewerage network. A break or leak is a failure of the sewer main which results in an interruption to the sewerage service.

A choke is a partial or total blockage that may or may not result in a spill to the external environment from the sewer system. A sewage spill may occur as a result of a blockage or the incapacity of the sewer to handle the volume of sewage, particularly at times of high rainfall, or if the wastewater treatment plant is at capacity.

A range of external factors can influence sewer performance, particularly fats and tree roots in the sewers, as well as the asset management practices of service providers. Soil type may also affect performance, such as in areas with reactive clay soils as these soils are subject to expansion and contraction depending on seasonal weather and site conditions. Also, dry weather conditions can cause tree roots to enter the sewer in search of water, compromising sewer performance. Age of the infrastructure, type of materials, seasonal conditions and asset maintenance programs also influence sewer performance and need to be considered when comparing performance across regional areas.

Across its sewerage system in 2012-13 Southern Water reported 1 461 sewer main breaks and chokes. As with water main breaks, Southern Water has reported that the majority of sewer blockages result from tree root growth, which is closely related to soil conditions and ground movement.

Ben Lomond Water reported 945 sewer main breaks and chokes in 2012-13, which is a similar number to the previous year. Cradle Mountain Water reported a reduction in sewer breaks and blockages with a total of 263 sewer main breaks and chokes in 2012-13, compared to 348 in 2011-12.

Reliability of the sewerage network is measured by the frequency of service failure, as indicated by the rate of sewerage breaks and chokes per 100 kilometres of sewer

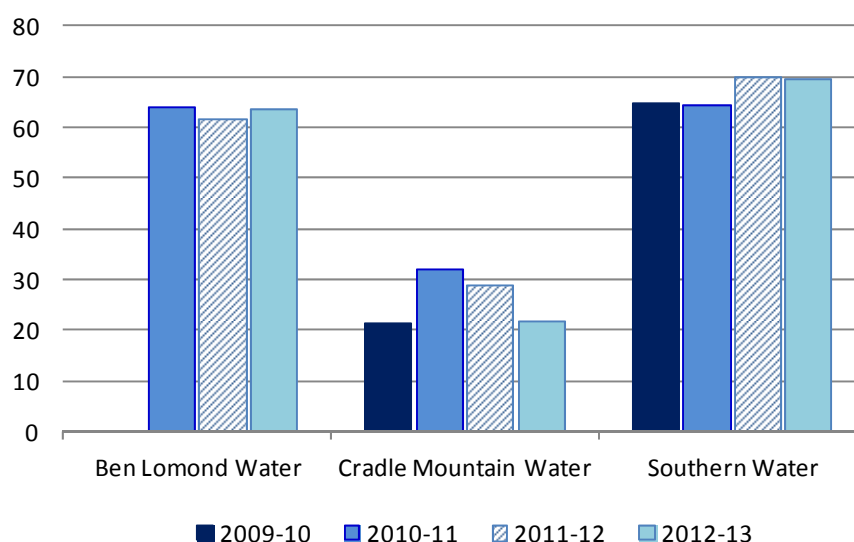


main (Figure 5.6). This measure does not include sewer breaks and chokes in property connections.<sup>8</sup>

In 2012-13 the rate of breaks and chokes on the sewer main remained high in the north and south of the State, with Ben Lomond Water reporting a rate of 64 breaks and chokes per 100 kilometres of sewer main and Southern Water reporting a rate of 69 breaks and chokes per 100 kilometres of sewer main. The performance of both Southern Water and Ben Lomond Water was poor compared to the national average of 25 breaks and chokes per 100 kilometres of sewer main for similarly sized utilities interstate.

Cradle Mountain Water reported a reduction in the number of sewerage breaks and chokes per 100 kilometres of sewer main compared to 2011-12, improving from 29 to 22 breaks and chokes per 100 kilometres of sewer main in 2012-13. The rate of breaks and chokes was around 34 per kilometre of sewer main for other non-major utilities on the mainland.

**Figure 5.6 Sewerage breaks and chokes (per 100km sewer main)**



Note: 2009-10 data for Ben Lomond Water was unavailable

The continued poor result for Southern Water is not surprising given the age of the sewer infrastructure in the southern region, particularly in the Greater Hobart area. In addition to breaks and chokes in sewer mains arising from ageing sewer infrastructure, Southern Water has noted that sewer overflows have been caused by problems such as design faults, poor construction, rainfall infiltration, lack of standby pumps, inadequate pump station storage, poor electrical equipment and the lack of standby power at the major pumping stations.

Stormwater ingress, particularly during periods of high rainfall, is a major factor affecting the frequency and impact of sewerage system blockages and overflows. Illegal connections of stormwater to the sewer network have resulted in capacity issues in a number of systems, leading to increased treatment costs and an

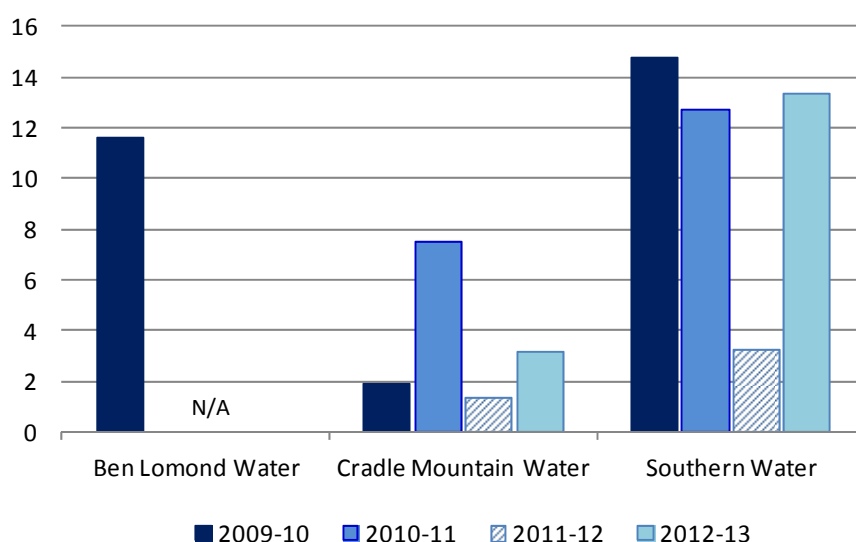
<sup>8</sup> The property connection is a short sewer that is owned by the corporation, which connects the sewer main and the customer sanitary drain.

increased number of sewer overflows. It is expected that these issues will be addressed as part of TasWater's capital works program over the next few years.

#### 5.3.4 Property connection sewer breaks and chokes

Utilities also measure breaks and chokes in property connections and report it as a measure per 1 000 connected properties. The property connection is a short sewer owned and operated by a water corporation, which connects the sewer main and the customer's property at the inspection opening. This gives an indication of the rate of breaks and chokes in relation to the customer base.

**Figure 5.7 property connection sewer breaks and chokes (per 1000 properties)**



Note: Ben Lomond Water data not available in 2010-11, 2011-12 or 2012-13

Only Southern Water and Cradle Mountain Water were able to report against this measure in 2012-13. The rate of property connection sewer breaks and chokes reported was 3.2 per 1 000 property connections for Cradle Mountain Water, and 13.4 per 1 000 property connections for Southern Water. Performance against this measure over the last four financial years is shown in Figure 5.7.

Interstate, the average range of property connection sewer breaks varies from year to year. In 2012-13 the average for all urban water utilities was around six breaks per 1 000 properties. Compared to this average Southern Water's rate of property connection breaks was very high.

As with breaks in water mains, the water corporation's reporting of this data is expected to improve in the future as better reporting systems are put in place. For example, the Field Service Management System introduced in 2011-12 will more accurately log information on faults and service metrics compared to current practices.

Details of capital projects planned and in progress across the State to improve infrastructure performance can be found in Chapter 10.

## 5.4 Sewer overflows

Sewer overflows may adversely impact on water quality, human health and ecosystem stability, particularly in the latter case where overflows occur in sensitive areas. It is therefore important to be aware of the frequency of the occurrence of these overflows. The number of overflows may indicate the condition of the sewerage network and how effectively the network is being managed.

An overflow occurs when untreated sewage spills or discharges from the sewerage system (ie pumping stations, pipes, maintenance holes or designed overflow structures) escape to the external environment. It includes sewer overflows in wet and dry weather of which the utility is aware and can attribute to its infrastructure. It should include both contained and uncontained spills.

The sewerage reticulation network, including sewer mains and feeder lines, pumping stations, manholes, access holes and overflow structures does not form part of the Level 2 WWTP activity and is, therefore, not directly regulated by the Director, EPA. However, under section 32 of the EMPCA, the corporations must notify the Director within 24 hours of becoming aware of a pollutant being released as a result of any incident including an emergency, accident or malfunction if this release causes or may cause an environmental nuisance.<sup>9</sup>

The information in this section is based on information provided by the water corporations rather than information held by the EPA Division and the accuracy of the data has therefore not been independently verified. Caution must be exercised when comparing the rate of sewer overflows between water corporations as the criteria for reporting sewer overflows may differ.

The number of sewer overflows is calculated with reference to the length of the sewer mains and channels in a region to give the average frequency of sewer overflows for the system per 100 km of sewer main (Figure 5.8).

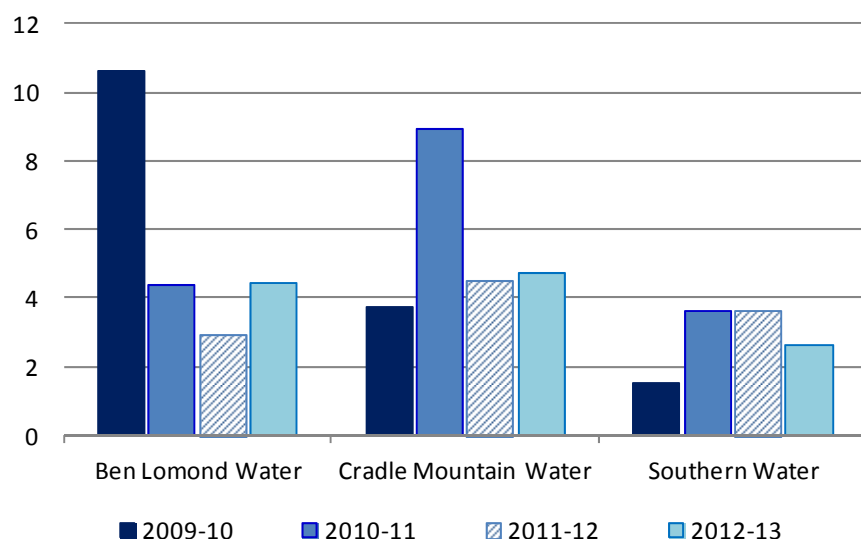
In 2012-13 Ben Lomond Water reported an increase in both the number and frequency of overflows on its sewer network, with 66 overflows reported to the environmental regulator, a rate of 4.4 per 100 km of sewer main.

Stormwater infiltration has in the past been identified as one of the main factors in the high frequency of sewer overflows in the Launceston City area. That is, the design and capacity of Launceston's combined sewerage/stormwater system, may lead to more overflows in times of high rainfall.

Cradle Mountain Water also reported a relatively high frequency of sewer overflows, with a total of 57 reported to the EPA, equating to a rate of 4.5 overflows per 100 km of sewer main.

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<sup>9</sup> Section 32(2) of the EMPCA relates to Level 2 activities.

**Figure 5.8 Sewer overflows (per 100 km of sewer main)**

Southern Water reported the lowest number of sewer overflows in 2012-13 with 55 overflows reported, a decrease from the 76 in 2011-12. The rate per 100 kilometre of sewer main also decreased to 2.6.

Southern Water has identified a range of problems in the sewerage network that contribute to the occurrence of sewer overflows. Ongoing issues with a number of sewerage treatment plants are being addressed and Southern Water's Wastewater Management Plan details its strategy to achieve compliance across all sewerage treatment plants and includes recycled water, biosolids and environmental management.

The Regulator also understands that Southern Water plans to reduce its environmental impact by undertaking measures to reduce the number of sewerage spills in dry weather and overflows during rainfall events. An incident at the Macquarie Point WWTP during the year highlighted weaknesses in the incident response protocols and has prompted Southern Water to review and implement monitoring and alarming systems across the southern region WWTPs.

Overall, the rate of sewer overflows to the environment across Tasmania was around 3.9 per 100 kilometres of sewer main in 2012-13, which is relatively high compared to the national average for similarly sized water businesses of around 1.5 per 100 kilometre of sewer main in 2012-13.<sup>10</sup>

Environmental compliance is further discussed in Chapter 8.

<sup>10</sup> National Performance Report System.

## 6 CUSTOMER SERVICE

This chapter outlines the water corporations' customer service performance and, in particular, their responsiveness to complaints during 2012-13. It covers call centre performance, customer complaints, and the timeliness of responses to service complaints and interruptions.

The Regulator's Customer Service Code specifies the minimum standards and conditions of service and supply that the water and sewerage corporations must comply with including the adoption of certain policies and procedures.

The Regulator approved transitional service standards for each corporation as part of the 2012 Price Determination Investigation.

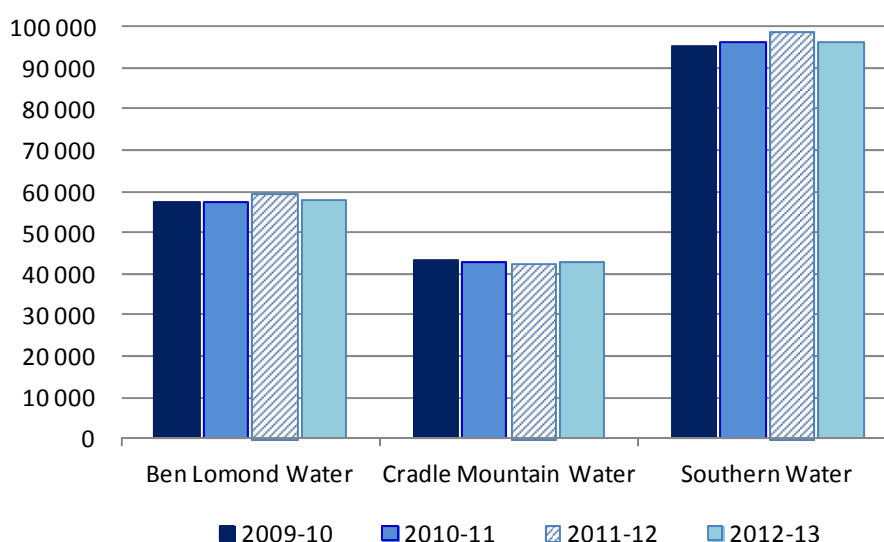
### 6.1 Connected properties and population

Due to the State's geography and the dispersed nature of Tasmania's population, Tasmania's water and sewerage networks are generally small, isolated systems (with some interconnected bulk water supply infrastructure) servicing less than 10 000 customers.

Figure 6.1 and Table 6.1 show the number of properties connected to water and sewerage services in each region. The number of connected properties gives an indication of the relative size of each of the water businesses.

Residential customers make up around 90 per cent of the total water and sewerage connections serviced by the three water corporations.

**Figure 6.1 Total connected properties – water**



As shown in Figure 6.1 the number of water connections serviced by each water corporation has not changed significantly from 2009-10 and appears to have remained fairly stable in each region over the past four years.

**Table 6.1 Number of connected properties - water and sewerage – 2012-13**

	Connected properties Water	Connected properties Sewerage
Ben Lomond Water	58 028	49 299
Cradle Mountain Water	42 844	39 201
Southern Water	96 093	85 466

In total, there were 196 965 water connected properties in Tasmania in 2012-13. A review of the basis for counting the number of connected properties has resulted in a slight reduction in connection numbers compared to 2011-12 due to the exclusion of unconnected (but rated) properties such as vacant lots.

With under 50 000 connected properties, Cradle Mountain Water is considered to be a 'non-major' urban water utility when compared to water utilities on mainland Australia. Both Ben Lomond Water and Southern Water are considered 'major' urban water utilities', which typically have between 50 000 and 100 000 connected properties.

## 6.2 Call centre performance

Call centres provide an important interface between water businesses and their customers. Call centre performance is measured in terms of the time it takes operators to answer customer calls. The water corporations are required to report their performance for the average time taken for calls to be connected to an operator and the percentage of calls connected to an operator within 30 seconds. Long waiting periods may indicate an ineffective answering system or a need for further resources in this area.

During 2012-13 call centre services were provided via three regional call centres, operated by each of the regional water corporations. In total, approximately 165 400 calls were received during 2012-13; 43 553 by Ben Lomond Water, 27 943 by Cradle Mountain Water and 93 904 by Southern Water. Call volumes increased by 13 per cent compared to 2011-12.

Table 6.2 presents the percentage of calls answered by an operator within 30 seconds for each water corporation during 2012-13, together with the transitional service standards for 2012-13 and the minimum service standard target outlined in the Code for this measure.

**Table 6.2 Percentage of calls answered by an operator within 30 seconds - 2012-13**

	% calls answered within 30 seconds	2012-13 transitional service standard (%)	Minimum service standard target (%)
Ben Lomond Water	93	70 <sup>1</sup>	90
Cradle Mountain Water	78	60	90
Southern Water	76	75	90

Note:

1. Ben Lomond Water did not have an approved transitional service standard for this indicator for 2012-13 due to data issues. As a result its transitional service standard target for 2013-14 is shown in the above table.

The Code stipulates a minimum service standard target of 90 per cent of calls received should be connected to an operator within 30 seconds. However it is the applicable 2012-13 transitional service standard that the corporations undertook to meet in that year.

In 2012-13 an average of 82 per cent of calls were connected within 30 seconds, which is a vast improvement over the performance reported for 2011-12 when only 58 per cent of calls were answered within 30 seconds. This level of service is comparable with other mainland water businesses, which typically report 80 to 90 per cent of calls connected to an operator within 30 seconds.<sup>1</sup>

All three water corporations met their respective 2012-13 transitional service standards, with Ben Lomond Water achieving 93 per cent of calls answered within 30 seconds.

Southern Water attributed its improved performance in 2012-13 to increased staffing levels as well as additional training and the implementation of workflow and process improvements.

Overall, the responsiveness of the call centres in 2012-13 indicates that the water corporations have addressed the issues previously experienced with their customer service centres and successfully lifted performance in this area to comply with the transitional service standards and, in Ben Lomond Water's case, comply with the minimum service standard target.

### 6.3 Complaints

Customer complaints provide an indication of overall customer satisfaction with the services provided by an entity. Customers who are not satisfied with the outcome of a complaint made to the water corporations through their customer complaints process may refer their complaint to the Ombudsman.

The water and sewerage corporations may receive customer complaints on a range of issues including water quality, water supply reliability, sewerage service quality and reliability, affordability, billing, water pressure and sewage odour. The basis of the customer complaints can provide important information about aspects of performance that need to be improved and is also a useful tool for identifying issues of concern to customers within each region.

The relative levels of different categories of complaints should be considered in relation to the overall levels of complaints received by each corporation.

The Australian Complaint Handling Standard (AS ISO 10002-2006) defines a complaint as an:

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

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<sup>1</sup> National Water Commission, National Performance Reporting database.

Table 6.3 lists:

- the number of complaints received by each corporation in 2012-13;
- number of complaints received per 1 000 properties in 2012-13; and
- the transitional service standards for 2012-13.

**Table 6.3 Water and sewerage complaint data - 2012-13**

	<b>Number of complaints received</b>	<b>Number of complaints (per 1 000 properties)</b>	<b>2012-13 transitional service standard (per 1 000 properties)</b>
Ben Lomond Water	32	0.6	9 <sup>1</sup>
Cradle Mountain Water	91	2.1	2
Southern Water	1 056	11.0	9

Note:

1. Ben Lomond Water did not have an approved transitional service standard for this indicator for 2012-13 due to data issues. As a result its transitional service standard target for 2013-14 is shown in the above table.

During 2012-13 the three water corporations received a total of 1 179 complaints, representing a substantial 63 per cent reduction from the total number of complaints received during 2011-12. This equates to a frequency of six complaints per 1 000 customers across the State.

Whilst Southern Water recorded a lower number of complaints received during 2012-13 compared to 2011-12 (1 698 in 2011-12), the frequency of complaints was still above the transitional service standard. Southern Water noted the majority of complaints related to water meter installations, undetected leaks and disputed water usage charges and followed the roll out of water meters across southern Tasmania. Other areas of complaint related to billing and the new two-part pricing system.

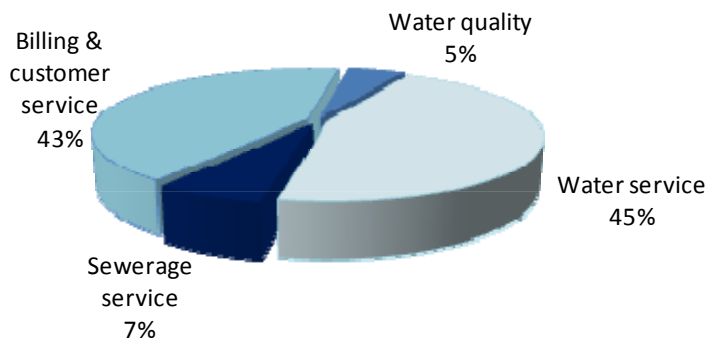
Cradle Mountain Water noted that improved billing processes significantly reduced the number of complaints received to 91 complaints in 2012-13 compared to 683 in 2011-12.

Ben Lomond Water also recorded a large decrease in the number of complaints received, with just 32 complaints received in 2012-13 compared to 829 in 2011-12. The majority of complaints were regarding billing and tariff issues, with two complaints relating to sewerage and odour issues.

In summary, the number of complaints received by the State's water corporations during 2012-13 has reduced significantly compared to the number of complaints received during 2011-12. As shown in Figure 6.2, a breakdown on complaints into categories reveals that the majority of complaints received in 2012-13 related to water service ie bursts and leaks, service interruptions, adequacy of service, water pressure and water reliability.

The vast majority of water service complaints originated in the southern region, where Southern Water have experienced a number of water main bursts, largely due to environmental conditions during the period. Water service interruptions are discussed further in section 6.4.



**Figure 6.2 Breakdown of water and sewerage complaints - 2012-13**

Billing and customer service related complaints also made up a large portion of registered complaints in 2012-13, with most complainants located in the southern region. Billing and account complaints include complaints about account payments, financial loss or overcharging, billing errors and affordability. The high number of complaints in relation to these issues indicates that customers, particularly in the southern region, were confused about the new pricing structure and had concerns about the charges on their water bills.

Southern Water has transitioned customers to one billing system which should improve the accuracy of accounts while the online self help bill calculator should help customers understand the new pricing arrangements.

A high number of billing and account complaints may also indicate issues with affordability, which is discussed further below.

Compliance improvements made to sewerage treatment facilities, particularly in the northern region, have resulted in a significant reduction in the number of sewerage service complaints. Sewerage service complaints include those concerning sewage odours, sewage blockages and spills and network reliability. As with the previous year, water quality complaints (concerning colour, taste and odour) represented a small proportion of complaints, reflecting customer satisfaction with these qualities.

### 6.3.1 Complaint handling

An important aspect of customer service is the efficiency in responding to, and dealing with, complaints received. This includes the manner and knowledge demonstrated by staff and their effectiveness in handling enquiries and complaints. The average time a customer waits to be connected to an operator is also an important element of customer service.

The customer service performance of the water service providers is measured by the percentage of complaints meaningfully responded to within ten days. If a timeframe for resolution is negotiated with the complainant, it is also counted as resolved if resolved within the agreed timeframe.

In 2012-13 Southern Water resolved an average of 88 per cent of complaints within ten days whilst Cradle Mountain Water resolved 96 per cent within ten days. Ben Lomond Water successfully resolved all complaints within the required timeframe. The improved performance in this area can be attributed to the ongoing training of customer service agents and increased resourcing in this area.

If a customer is dissatisfied with the way a complaint has been handled, the complaint may be lodged with the Ombudsman. Table 6.4 shows the number of complaints escalated to the Ombudsman in 2012-13 against the transitional service standard stipulated by the Code. The service standard is expressed on a per 1 000 properties basis.

As can be seen from Table 6.4, in 2012-13, all three water corporations exceeded the minimum service standard target for complaints referred to the Ombudsman, with around one in 1 000 customers lodging a complaint against the water corporations. Ben Lomond Water and Cradle Mountain Water were much closer to the transitional service standard than Southern Water.

The Ombudsman's Annual Report<sup>2</sup> details the number of complaints received in relation to the water and sewerage corporations.

The Ombudsman noted that, in 2012-13, there was a significant decrease of over 30 per cent in the number of complaints made against the water and sewerage corporations, from 249 in 2011-12 to 182<sup>3</sup> in 2012-13.

**Table 6.4 Complaints referred to Ombudsman - 2012-13**

	<b>Number of complaints escalated to Ombudsman</b>	<b>Number of complaints referred to the Ombudsman (per 1 000 properties)</b>	<b>2012-13 transitional service standard (per 1 000 properties)</b>
Ben Lomond Water	34	0.6	0.5 <sup>1</sup>
Cradle Mountain Water	28	0.7	0.5
Southern Water	120	1.2	0.5

Note:

1. Ben Lomond Water did not have an approved transitional service standard for this indicator for 2012-13 due to data issues. As a result its transitional service standard target for 2013-14 is shown in the above table.

Of the 182 complaints received, 66 per cent related to Southern Water, 19 per cent to Ben Lomond Water and 15 per cent to Cradle Mountain Water. More notably, complaints against the water corporations accounted for almost 23 per cent of all complaints received by the Ombudsman during 2012-13.

The Ombudsman noted that the majority of complaints in regards to the water corporations were billing related, resulting from late and inaccurate accounts. The Ombudsman also noted that a considerable number of complaints arose from confusion with development and head works charges, change of ownership issues and pensioner concessions. A number of complaints were also received from landlords who had received accounts but were unable to pass them onto their tenants due to the absence of specific provisions in the lease.

Of concern to the Regulator is the high number of complaints received by the Ombudsman from pensioners who had not received a concession. Pensioner

<sup>2</sup> Ombudsman Tasmania, *Annual Report 2012-13*, November 2013.

<sup>3</sup> This figure reflects the number of complaints referred to the Ombudsman from the corporations as well as complaints received directly by the Ombudsman.

concessions are only applied from the date a customer advises the water corporation of their eligibility. Customers who had already been receiving a concession prior to the formation of the three water corporations in July 2009 automatically had their concession applied.

The Ombudsman noted that there has been some improvement in the corporations' internal complaint handling process, which has reduced the number of complaints referred. The Ombudsman has indicated that it will continue to liaise with the corporations with a view to ensuring that complaints are resolved swiftly and appropriately.

## 6.4 Service interruptions

### 6.4.1 Water supply interruptions

A water supply interruption is any event causing a total loss of water supply. Water supply interruptions may be unplanned, such as when a pipe bursts, or planned, such as when a section of water main is replaced or a minor leak repaired. The impact of planned interruptions on customers is lessened as the water corporation is able to notify customers in advance. However, long duration planned interruptions can also inconvenience customers.

When a customer has not been given sufficient notice of an interruption the interruption is classed as unplanned. This is also the case where the duration of a planned interruption exceeds the originally notified duration.

The duration of an unplanned interruption is normally measured from the time the service provider is aware of the interruption, either through internal systems alarms or notification by a customer, and ceases when 'normal service' has been restored. The average duration of unplanned interruptions to the water supply is an indication of the condition of the water supply network and how effectively the operation of the network is being managed. It also, in part, indicates the level of customer service.

The frequency of unplanned water supply interruptions may be influenced by a number of factors including age, construction material and the condition of water mains and the nature and reactivity of soil types in which pipes are laid. It may also be influenced by matters outside the control of the water corporation. However, it is possible for service providers to establish practices and procedures to ensure the timely restoration of supply when an interruption does occur.

Table 6.5 shows the number of planned and unplanned water supply interruptions for the three water corporations in 2012-13, including the frequency of interruptions per customer against the transitional service standard.

**Table 6.5 Water supply interruptions – 2012-13**

	<b>Ben Lomond Water</b>	<b>Cradle Mountain Water</b>	<b>Southern Water</b>
Planned interruptions (No.)	66	132	95
Planned interruption frequency (per customer)	0.40	0.16	0.33
2012-13 transitional service standard (per customer)	0.25	0.25	0.25
Unplanned interruptions (No.)	311	1 169	2 033
Unplanned interruption frequency (per customer)	1.21	0.73	1.38
2012-13 transitional service standard (per customer)	0.25	0.25	0.25

Table 6.5 shows that only Cradle Mountain Water met the transitional service standard for the frequency of planned interruptions, whilst all three water corporations exceeded the frequency of interruptions standard in 2012-13 for unplanned water interruptions. Given that the transitional service standards for water interruptions get more stringent over the course of the regulatory period, it appears the water corporations (or TasWater from 1 July 2013) have some way to go before performance in this area meets the standards. The water corporations have until the end of the second regulatory period (30 June 2018) to meet the minimum service standards targets in the Code.

Table 6.6 shows the average duration of interruptions and customer minutes off supply for both planned and unplanned water interruptions, together with the transitional service standards for 2012-13.

The average duration of a water supply interruption is the average length of time that a customer is without supply due to an interruption. Customer minutes off supply is how long, on average, a customer is without sewerage services for the reporting period.

Table 6.6 shows that in 2012-13 all three corporations met the transitional service standard for duration of planned water supply interruptions, with planned interruptions ranging from 2.5 to 4.5 hours. Customers generally experienced less than ten minutes without water supply on average over the course of the year.

Only Ben Lomond Water met the transitional service standard for the average duration of unplanned interruptions in 2012-13. Cradle Mountain Water's performance was impacted by a water main major break in Spreyton that affected over 500 customers for over eight hours.

Typically, customers experienced less than 30 minutes of unplanned water outages throughout the year, with all three water corporations meeting the service standard for customer minutes off water supply (unplanned).

**Table 6.6 Average duration of water interruptions – 2012-13**

	<b>Ben Lomond Water</b>	<b>Cradle Mountain Water</b>	<b>Southern Water</b>
Average duration of planned water supply interruption (minutes)	197	151	267
2012-13 transitional service standard (minutes)	300	200	300
Average planned customer minutes off water supply (minutes)	8	3	9
2012-13 transitional service standard (minutes)	30	30	30
Average duration of unplanned water supply interruption (minutes)	144	195	186
2012-13 transitional service standard (minutes)	180	180	180
Average unplanned customer minutes off water supply (minutes)	17	14	26
2012-13 transitional service standard (minutes)	20	25	30

In 2012-13 water supply was restored to customers within five hours in 98 per cent of unplanned and 84 per cent of planned interruptions. Southern Water failed to restore supply within five hours in 37 per cent of cases of planned interruptions on the water network, which was well below its transitional service standard of 50 per cent.

As the corporations complete compliance programs and replace or renew ageing infrastructure, it is likely that the number of planned water interruptions, and the impact on customers, will increase, with a corresponding reduction in unplanned water interruptions expected.

#### 6.4.2 Sewerage service interruptions

A sewerage service interruption is any event causing a significant reduction of sewerage service due to any cause, and includes both planned and unplanned interruptions. An interruption commences when the water corporation is aware that sewerage services are no longer available and ceases when 'normal' service is restored.

The number of interruptions to the sewerage service is an indication of the condition of the sewerage network and a partial indicator of customer service. The average break/choke repair time is the average time taken to repair a sewer main, from the time of arrival on site to restoration of a sewerage service to customers. This may include bypassing the broken main.

Average interruption duration indicates how long it will take on average to restore supply when an interruption occurs. Average interruption duration is measured as the total duration of interruptions over the total number of interruptions. It does not indicate how many customers were affected by the interruption events.

In 2012-13 there continued to be a high number of sewer blockages reported across the State. Ben Lomond Water reported 945 sewer main blockages, Cradle Mountain Water reported 263 and Southern Water reported 1 461. Three

customers in the southern region experienced more than three sewerage service interruptions over the course of the year.

On average, sewerage blockages and chokes were attended to in just over one hour.

As shown in Table 6.7, Southern Water reported that the average duration of sewerage service interruptions in 2012-13 was 111 minutes (under two hours) and Cradle Mountain Water reported that interruptions lasted, on average, 134 minutes. Ben Lomond Water had the longest duration with sewerage service interruptions lasting 204 minutes on average.

Table 6.7 also shows the transitional service standards for 2012-13 and the minimum service standards outlined in the Code for this indicator. All three corporations met the transitional service standard for 2012-13.

The Code stipulates a minimum service standard for the average duration of sewerage service interruptions of 150 minutes (2.5 hours). Two of the three water corporations would have met the standard in 2012-13.

**Table 6.7 Average sewerage service interruption - duration (minutes) – 2012-13**

	<b>Interruption duration (minutes)</b>	<b>2012-13 transitional service standard</b>	<b>Minimum service standard target</b>
Ben Lomond Water	204	240	150
Cradle Mountain Water	134	240	150
Southern Water	111	180	150

For comparative purposes, the average duration of sewerage service interruptions for interstate urban water utilities was 130 minutes for major utilities (other), and 90 minutes (1.5 hours) for non-major utilities (large).<sup>4</sup>

Sewer spills, when untreated sewage spills or discharges from the sewerage network and escapes into the external environment, can be potentially harmful if not contained or responded to appropriately. Sewer overflows or spills of a serious nature are reported to the environmental regulator.

Whilst some of these spills were minor in nature, even small spills can have significant impacts when they occur in sensitive environments. Major sewer spills or overflows that is, spills that cause or may cause an environmental nuisance, must be reported to the environmental regulator. Such overflows are discussed further in Chapter 8 (section 8.10).

During 2012-13, 1 670 sewer spills were reported across Tasmania, over three times more than in 2011-12. Ben Lomond Water reported 491 spills, Cradle Mountain Water reported 38 spills whilst Southern Water recorded 1 141 spills for the 2012-13 period. As to containment, 94 per cent of sewer spills across Tasmania were contained within five hours of their occurrence.

<sup>4</sup> National Water Commission, National Performance Reporting database.

It is expected that more consistent data on the rate and duration of sewerage service interruptions will become available over time as the corporations introduce reporting systems and processes to comply with the customer service standards stipulated in the Code.

## 6.5 Affordability and hardship

The Customer Service Code places a range of obligations on the water corporations around flexible payment options, customer debt, hardship programs and the application of water restrictions.

Approximately 28 per cent of connected residential properties were in the receipt of a concession as at 30 June 2013. The concession provides a discount on the water and sewerage service charges.

There are a number of flexible payment options available to customers who are experiencing difficulty paying their bill. These include payment plans, instalment plans and deferment. Around 8 378 residential customers were on payment plans at the end of the year, which is roughly 4.3 per cent of residential households across the State. Of the 18 263 customers that were repaying a debt, almost half had a debt greater than \$500.

In 2012-13 the average debt of residential customers across the three corporations was \$433. This represents around two typical quarterly bills for a customer receiving water and sewerage services.

The corporations' hardship programs assist customers who are experiencing financial hardship with the payment of their water bills. In 2012-13, there were 181 customers on a 'hardship program' with the water corporations (173 in 2011-12), with a large number of these customers located in the north-west of the State. The increase is likely due to the corporations progressively implementing debt collection processes during the year. 73 customers on the program were also in receipt of a concession. The average debt of customers on the program was around \$1 880. This level of debt is quite high, representing almost two years of water and sewerage charges for the typical Tasmanian household.

Effective from 1 July 2013, the Regulator will continue to monitor the management and success of TasWater's hardship policies.

### 6.5.1 Restrictions or legal action for non payment of bill

The Customer Service Standards Regulations allow the corporations to restrict or disconnect water supply to residential customers for non-payment in certain circumstances. These obligations, along with other customer service requirements, are stipulated in the Code.

Water restriction is a last resort action after other arrangements such as flexible payment plans have failed.

During the year the corporations began to implement debt collection processes and 241 customers had their water restricted for non-payment of their bill (0.12 per cent of customers). The vast majority of these customers were located in the north of the

State, with Ben Lomond Water reporting 156 customers with water restrictions applied (0.27 per cent of customers).

Compared to other water businesses around Australia the rate of water restriction in Tasmania was relatively low, with major water businesses reporting on average, 0.15 per cent of customers with water restrictions applied in the 2012-13 period.

In 2012-13 around 61 per cent of Tasmanian customers who had their water restricted had the restrictions removed within seven days of being applied.

Of the customers who had their water restricted for non-payment of their bill, 26 customers had been on the hardship program during the previous 24 months. However, all 26 had the restrictions removed within seven days of being applied.

Eleven customers in the north and four customers in the north-west had their water restricted more than once during the previous 24 months.

Once all reasonable steps have been taken to allow a customer to pay an outstanding debt, the water corporation may commence legal action to recover the debt in court. In 2012-13 one customer was subject to legal action by the water corporations for non-payment of a water bill.



## 7 PUBLIC HEALTH

The Department of Health and Human Services (DHHS) is responsible for drinking water quality and safety. DHHS undertakes this function through monitoring and enforcing compliance with drinking water guidelines and policies for fluoridation of drinking water. Under the *Public Health Act 1997* the Director of Public Health is able to issue, and enforce compliance with, guidelines for drinking water quality. The legally enforceable Tasmanian *Drinking Water Quality Guidelines 2005* (DWQG) issued under the Public Health Act support the principles, management practices, preventive measures and guideline values contained in the current Australian Drinking Water Guidelines (ADWG). The current version of the ADWG is the *Australian Drinking Water Guidelines 2011*.

Ben Lomond Water, Cradle Mountain Water and Southern Water have been wholly responsible for water quality for the public drinking water supply systems in their respective regions since 2009.

There were 90 public drinking water supply systems in Tasmania during 2012-13, which is ten fewer than the previous year. This decrease is attributable to:

- the exclusion of the nine bulk supplies managed by Southern Water; and
- changes made by Southern Water to its reporting of data in the greater Hobart supply zone.

All nine bulk supply systems relate to pipelines managed by Southern Water which distribute drinking water around the greater Hobart metropolitan area. None of the pipelines deliver drinking water directly to consumers. Rather, water conveyed via the bulk water supply systems is sent to customers via a reticulation network servicing a water supply system. Each of these bulk water supply systems have been reclassified by Southern Water to include supply zones within the greater Hobart area based on the source of the supply water.

Whilst water quality monitoring of the pipelines occurs, it is not necessarily reflective of the quality of water finally delivered to consumers because compliance monitoring occurs in the reticulation networks at the point of supply within a given supply system. It is for this reason that discussion of the nine bulk supply systems are excluded from this Report. Hence information on the remaining 90 supply systems only will be reported in this chapter of this Report.

Historically, the bulk supply systems have been included in the annual State of the Industry Reports and, as such, a direct comparison of certain assessments between this Report and previous reports cannot be made. Nevertheless, this Report still presents the 2012-13 data and data for previous years.

Specifically, for Southern Water and the overall Tasmanian compliance assessments, the following measures are directly impacted on by the change in reporting:

- the number of supply zones;

- the number of zones where microbial compliance was achieved;
- the percentage of zones where microbial compliance was achieved;
- the percentage of zones where microbial compliance was not achieved; and
- the number of zones where chemical compliance was achieved.

All remaining data is unaffected and, as a result, can be directly compared to previous years. The assessments involving population are not affected as the bulk supply systems do not service any consumers directly. Assessment of the boil water alerts remains unchanged as this assessment is absolute and not relative. This new method of reporting is consistent with changes made to the DHHS's assessment and processes and the presentation of the data within its *Annual Report - Drinking Water Quality of Public Water Supplies in Tasmania* for 2012-13 and is consistent with the assessment undertaken in 2011-12.

In 2012-13 there was no water treatment for 24 per cent of the water corporations' public drinking water supply systems (22 supplies) ie these drinking water supply systems operated with a permanent boil water alert. These were typically small supply systems which together supplied only about one per cent of the Tasmanian population. Another 21 per cent of the systems (19 supplies) provided "disinfection only" in which only one treatment barrier (ie chlorination) was present. These systems are effective against most bacteriological hazards that may be present in the source water. However, chlorination can become ineffective if the source water becomes turbid, which commonly occurs during rain events and/or drought conditions. When chlorination becomes ineffective, a temporary boil water alert is issued.<sup>1</sup>

#### **BOX 7.1 BOIL WATER ALERTS**

When a drinking water supply system has insufficient or no water treatment, or is identified through monitoring as having an unacceptable level of pathogens (bacteria), a boil water alert is issued for the area supplied by the system.

As a precaution, water for consumption should be brought to a rolling boil and then cooled to room temperature or below before drinking and/or use, so as to inactivate pathogenic bacteria, viruses and protozoa.

The remaining 54 per cent of systems (49 systems) had multiple water treatment processes to address public health risks posed by the source water quality. These require effective operation and ongoing maintenance to ensure the water treatment processes are appropriate and adequate.

Furthermore, other barriers beyond treatment are required throughout the drinking water supply system to ensure the water is not re-contaminated. Examples of such barriers include having roofs on reservoirs, good operational procedures to reduce

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<sup>1</sup> Information about the quality of each drinking water supply system can be obtained from the DHHS Annual Drinking Water Quality Report or from water quality reports published by the corporations.

recontamination during mains repairs and installation of backflow prevention devices.

Six per cent of all water supplies (five systems in total) operated under a Public Health Alert, which is put in place when non-compliant water is detected that cannot be rendered safe by boiling. This equated to 0.4 per cent of the serviced population being affected by these alerts.

## 7.1 Bacteriological compliance of water supply systems

Bacteriological compliance monitoring is one way of measuring the effectiveness of the management of drinking water supply systems. Microbiological monitoring of the water demonstrates whether the bacteriological risk associated with each component of the supply system has been adequately managed.

The majority of Tasmanian water supply systems which operate with a permanent boil water alert do not have any water treatment processes in place. That is, even if the source water was of excellent quality, there is no water treatment process (such as disinfection by chlorination) applied to the water to protect against any incidental contamination. The permanent boil water alert informs the public that they must provide the treatment process themselves (ie by boiling the water) to ensure the water is safe to drink.

The determination of the bacteriological compliance of a drinking water supply system is dependent on the collection of sufficient and appropriate microbiological samples. Water suppliers must sample and test drinking water from their drinking water systems in accordance with the sampling requirements prescribed in the ADWG and the Tasmanian DWQG. Sufficient samples and appropriate frequency of sampling demonstrates that monitoring is sufficiently representative of the 'whole' of the water given to the consumer throughout the year. For the purpose of this Report, bacteriological compliance has not been determined for systems which were not sampled to the required level because the level of compliance in such circumstances could not be deemed to be statistically valid.

The 22 drinking water supply systems that operated with a permanent boil water alert are discussed in section 7.2 of this chapter. The data presented in Figure 7.1 relates to the level of bacteriological compliance of all drinking water supply systems (including the 22 supplies with permanent boil water alerts in place) in Tasmania in 2012-13 and is measured against the requirements of the Australian Drinking Water Guidelines.

In 2012-13 each of the water corporations were considered to be adequately monitoring 100 per cent of their systems to enable the level of compliance to be determined.

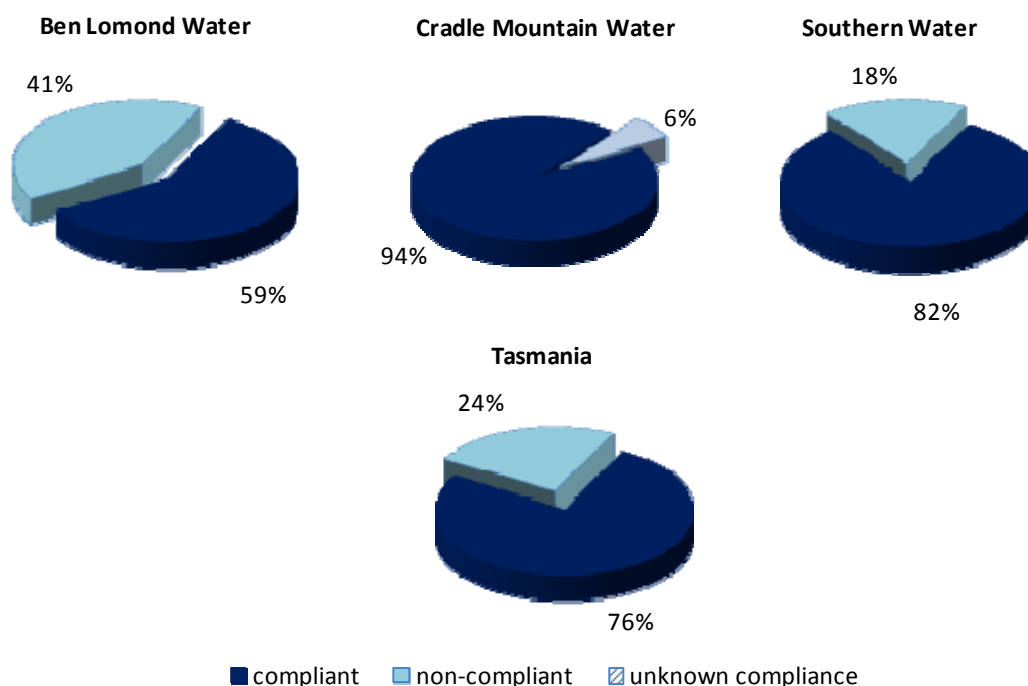
**Figure 7.1 Bacteriological compliance of drinking water supply systems (per cent of systems)**

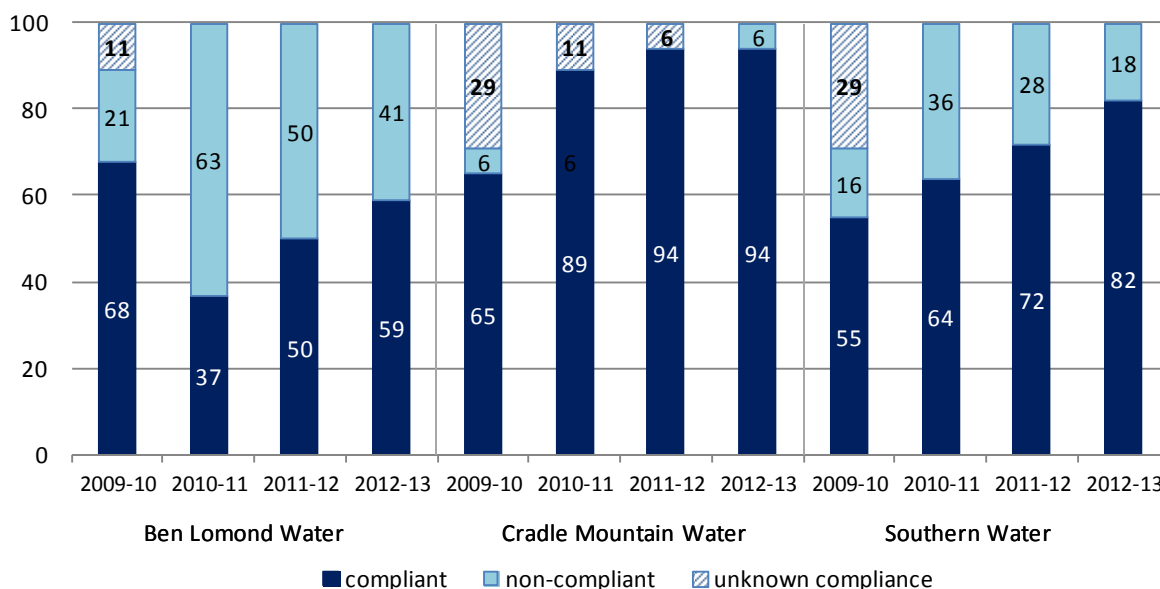
Figure 7.2 compares the level of compliance, non-compliance and unknown compliance (due to insufficient sampling) from 2008-09 to 2012-13 for the three water corporations. As shown in Figure 7.2, in all regions there was a significant improvement in bacteriological compliance compared to previous years, except for Cradle Mountain Water where the level of compliance remained at 94 per cent.

As shown in Table 7.1, between 2011-12 and 2012-13 the level of bacteriologically compliant systems increased for Ben Lomond Water (from 50 per cent to 59 per cent), Cradle Mountain Water remained the same (at 94 per cent) and Southern Water increased from 72 per cent to 82 per cent.

**Table 7.1 Bacteriological compliance of drinking water supply systems (2012-13)**

Water supplier	Number of water supplies	Number of bacteriological compliant systems	Percentage of bacteriological compliance
Ben Lomond Water	34	20	59
Cradle Mountain Water	18	17	94
Southern Water	38	31	82
<b>Total</b>	<b>90</b>	<b>68</b>	<b>76</b>

**Figure 7.2 Bacteriological compliance of drinking water supply systems (per cent of systems), 2009-10 to 2012-13**



Across the three regions, there were no systems that were inadequately monitored, and hence had unknown compliance during 2012-13. The level of non-compliance amongst water supply systems in Tasmania has decreased from 31 per cent in 2011-12 to 24 per cent in 2012-13.

The water corporations have continued to strive to better understand the level of bacteriological compliance within their systems and to manage the risks associated with non-compliant systems. This action is necessary until the corporations can deliver a range of planned capital projects to provide lasting improvements to the bacteriological quality of the supplies.

It is anticipated that key projects, such as the reservoir roofing projects in the southern and northern regions and the Huon Valley regional and Ringarooma Valley water schemes, will continue to address many of the issues with currently non-compliant systems and will improve the level of compliance within the State.

## 7.2 Incidence of boil water alerts

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

Permanent boil water alerts occur in systems that are not able to prevent the contamination. In Tasmania this is usually because the water treatment process is inadequate or there is no water treatment process in the first place such that

individual members of the public are required to take action to protect against contaminated water.

Table 7.2 compares the number of systems which operated with permanent or temporary boil water alerts across all three regions between 1 July 2009 and 30 June 2013. During 2012-13 there were 22 drinking water supply systems where a permanent boil water alert was in place. This is the same number of permanent boil water alerts as reported in the previous year. It should be noted that two of these systems are currently operating on a Public Health Alert (Whitemark and Pioneer) that were previously on permanent boil water alerts and are discussed in Section 7.4. For the purposes of this Report, these two systems have been included in the overall number of permanent boil water alerts.

**Table 7.2 Incidence of boil water alerts**

Region	Number of water supply systems with permanent boil water alerts	Number of water supply systems with permanent boil water alerts	Number of water supply systems with temporary boil water alerts			
	2012-13	2011-12	2012-13	2011-12	2010-11	2009-10
Northern region	16	16	4	4	6	9
North-western region	1	1	0	0	0	1
Southern region	5	5	2	6	6	6
<b>TOTAL</b>	<b>22</b>	<b>22</b>	<b>6</b>	<b>10</b>	<b>12</b>	<b>16</b>

In 2012-13 a total of six drinking water supply systems operated with one or more temporary boil water alerts, which was a decrease from ten reported the previous year. Such temporary alerts are often a result of poor weather resulting in rising flood waters and turbid source water. The alerts are provided as a precautionary measure and usually involve water supply systems that receive chlorination as the only water treatment process. Such chlorination-only systems can become ineffective if the water being chlorinated is very turbid. Avoca was placed on a Public Health Alert in November owing to persistent and elevated levels of lead and cadmium. The Campbell Town / Ross system operated on a temporary boil water alert prior to the commissioning of a new water treatment plant in April 2013, which resulted in the lifting of this alert. Both the Avoca and Campbell Town / Ross supply systems have been included in the overall number of temporary boil water alerts shown in Table 7.2 for the northern region.

### 7.3 Population receiving bacteriologically compliant reticulated water

Approximately 89 per cent of Tasmanians<sup>2</sup> receive their drinking water from a public drinking water supply system. Approximately one per cent of the population is serviced by the 22 small supply systems that operate with a permanent boil water alert.

In 2012-13, 1.1 per cent of the Tasmanian population serviced with reticulated water received non-compliant drinking water. This outcome represents a halving of the percentage reported for 2011-12 (2.2 per cent). This significant reduction is largely due to increased operational management and investment in infrastructure by the water corporations.

### 7.4 Chemical compliance of water supply systems

There were fourteen water supply systems that had chemical contaminants detected above the respective health guideline values (as stated in the ADWG). Temporarily elevated levels of lead were detected in the Barrington water supply system. However, subsequent remedial action by Cradle Mountain Water and re-sampling of that drinking water showed that the lead levels had returned to acceptable levels soon after.

Temporarily elevated levels of copper were detected in the Yolla water supply system. However, subsequent remedial action by Cradle Mountain Water and re-sampling of that drinking water showed that the copper levels had returned to acceptable levels soon after.

Temporarily elevated levels of fluoride (1.92 mg/L) were detected in the Forth water supply system owing to equipment failure associated with water fluoridation. Subsequent remedial action by Cradle Mountain Water and re-sampling of that drinking water showed that the fluoride levels had returned to acceptable levels within 24 hours of the detection.

At Whitemark on Flinders Island a Public Health Warning that was issued during 2011-12 remained in place owing to persistent elevated lead levels detected in that water supply. The Public Health Warning advises residents that the water is not intended for consumption and Ben Lomond Water has made an alternative source of drinking water available for the residents whilst investigations into the source of the lead contamination are undertaken.

The Avoca water supply system showed persistent elevated levels of cadmium and lead detected resulting in a Public Health Warning being issued. The Public Health Warning advises residents that the water is not intended for consumption and Ben Lomond Water has made an alternative source of drinking water available for the residents whilst investigations into the source of the lead contamination are undertaken.

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<sup>2</sup> The Estimated Resident population of Tasmanian was 512 875 as at 31 March 2013 as stated on the ABS Website Publication 3101.0: *Australian Demographic Statistics*. Connection data provided by the water corporations is normalised through the estimated occupancy rate for each Urban Centre locality as sourced from the ABS website through the 'quick stats' link on the 2011 Census page.

A Public Health Warning was also issued for the Pioneer water supply system after persistent elevated levels of lead were detected.

The Ringarooma and Rosebery water supply systems each showed persistent elevated levels of lead and a Public Health Warning was also issued in respect of each system. In the case of Ringarooma, an alternative source of raw water was identified as not containing lead and Ben Lomond Water changed to this supply. A permanent boil water alert was imposed on this alternative supply as there is no treatment barrier in place for disinfection. Subsequent corrective action undertaken by Cradle Mountain Water with respect to the Rosebery water supply system resulted in a compliant supply and the Public Health Warning being lifted after four weeks.

Temporarily elevated levels of disinfection by-products were detected in Southern Water's water supply systems at Colebrook, Hamilton, Ouse, Tunbridge, Ellendale and Wayatinah.

In each of the above cases, human health risk assessments indicated that the risk to public health was low once residents were made aware of the status of their water quality. The health based guideline values are very conservative and incorporate a range of safety factors that err on the side of caution and are considered to be protective of public health. Whilst regular exceedance of a health based guideline value is undesirable, short term or one-off exceedances are unlikely to result in adverse health effects, as the values in the guideline represent the concentration of a chemical constituent that does not result in any significant risk to health over a lifetime of consumption.

## 7.5 Drinking water quality management plans

The requirement for water suppliers to develop and implement drinking water quality management plans for their drinking water systems was established in the Tasmanian DWQG under the Public Health Act and follows the national water quality risk management approach prescribed in the ADWG. The drinking water quality management plans outline the identified public health risks of each drinking water supply system and the water corporation's corresponding systematic and preventative measures to minimise and manage those risks.

The intent is to ensure water quality and protect the public through continuous improvement in the water supply system (whether through capital improvements or improved operational procedures) so that public health risks can be eliminated or reduced to acceptable levels.

All three corporations have a Drinking Water Quality Management Plan for all of their public drinking water supply systems.

## 7.6 Public disclosure of water quality

This indicator reports on whether the performance of the corporations' drinking water supply systems is publicly disclosed thus demonstrating transparency and accountability to the community, government and regulators. The performance of each drinking water supply system can be disclosed by providing it on a public website or in a report which is available to the public.



All corporations submitted their Annual Drinking Water Report for 2012-13 to the Director of Public Health. The public is able to request from a corporation a copy of their Annual Drinking Water Report. Furthermore, the Director of Public Health publicly releases an annual report on drinking water quality of public water supplies in Tasmania for the reporting period. In this report the Director discloses the compliance of each individual drinking water supply system in Tasmania.<sup>3</sup>

## 7.7 Fluoridation of public drinking water supply systems

In nature fluoridation of water can occur 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 carried out to adjust the level of fluoride in the water to a level considered safe and effective in preventing tooth decay.

Over 100 studies in more than 20 countries have shown that fluoridation reduces tooth decay<sup>4</sup> and this has recently been re-affirmed by the National Health and Medical Research Council.<sup>5</sup> Furthermore, water fluoridation has been proven to be the most effective and socially equitable means of achieving community wide exposure to the cavity prevention effects of fluoride.<sup>6</sup>

### 7.7.1 Fluoridation compliance

Fluoridation of Tasmanian public drinking water supply systems commenced in 1953 (in Beaconsfield), making Tasmania the first Australian jurisdiction to do so. Under the *Fluoridation Act 1968* the Minister for Health directs the water corporations (based on recommendations from the Fluoridation Committee) to fluoridate specific public water supplies in a prescribed manner. Included in this Ministerial Direction is the need to monitor the level of fluoride in drinking water on a daily basis.

The corporations are wholly responsible for the operation and maintenance of fluoridation systems and are obliged under the Fluoridation Act to fluoridate the drinking water.

Under the *Fluoridation (Interim) Regulations 2009* the fluoridation concentration range required in the drinking water supply (to achieve optimum tooth decay prevention) is 0.8 to 1.2 milligrams per litre (mg/L) of fluoride whilst the maximum level of fluoride allowed in the water is 1.5 mg/L (ie the maximum level specified in the ADWG). In 2012-13 there were 40 fluoridation systems in operation throughout the State servicing 47 of the reported 90 water supply systems.

A summary of fluoridation system compliance in 2012-13 is presented in Table 7.3. Of the 40 fluoridation systems that operated throughout 2012-13, 38 maintained an average fluoride dose within the required fluoride concentration range. This was an improved performance on the previous year (33 out of 39 in 2011-12). The two

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<sup>3</sup> Reports available at <http://www.dhhs.tas.gov.au/peh/water>

<sup>4</sup> A Systematic Review of the Efficacy and Safety of Fluoridation – Part A: Review of Methodologies and Results. National Health and Medical Research Council, Australian Government, 2007. [www.nhmrc.gov.au/guidelines/publications/eh41](http://www.nhmrc.gov.au/guidelines/publications/eh41).

<sup>5</sup> [www.nhmrc.gov.au/guidelines/publications/eh41](http://www.nhmrc.gov.au/guidelines/publications/eh41)

<sup>6</sup> The Efficacy and Safety of Fluoridation. National Health and Medical Research Council, Australian Government Public Statement, 2007. [www.nhmrc.gov.au/guideline/publications/eh41](http://www.nhmrc.gov.au/guideline/publications/eh41)

non-compliant fluoridation systems at Bridport (0.79 mg/L) and St Marys (0.76 mg/L) achieved fluoride concentration doses below the optimum range. These water supply systems were largely non-compliant owing to operational issues with the dosing equipment such as pump failures and blocked lines.

**Table 7.3 Compliance of fluoridation systems – fluoride concentration and plant compliance**

Water supplier	Number of fluoridation systems	Number of compliant fluoridation systems – yearly average <sup>#</sup>	Number of compliant fluoridation systems – daily results
Ben Lomond Water	12	10	4
Cradle Mountain Water	14	14	9
Southern Water	14	14	8
<b>Total</b>	<b>40</b>	<b>38</b>	<b>23</b>

<sup>#</sup> All daily fluoride samples are averaged for each calendar month and then the monthly averages are averaged again over a 12 month period to result in a yearly fluoride average against which compliance is assessed.

The *Tasmanian Code of Practice for Fluoridation of Public Water Supplies (2007-10)* recommends a compliance level of 90 per cent. This means that the fluoridation system is producing fluoridated water within the target range for 90 per cent or greater of all daily readings taken.

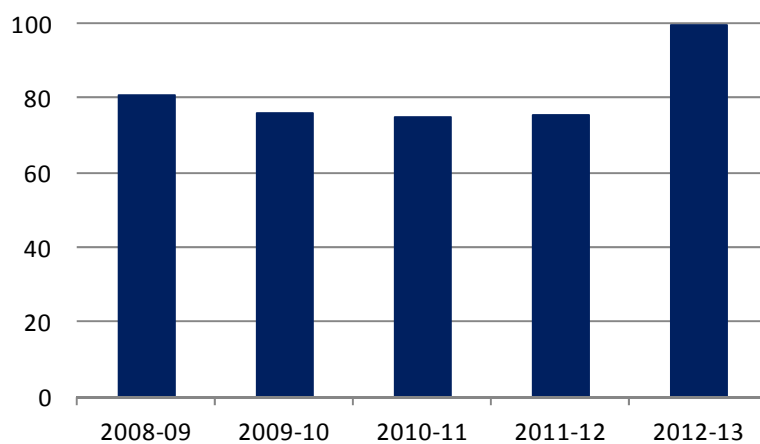
As indicated in Table 7.3, 23 of the 40 fluoridation systems had a compliance level of 90 per cent or greater in 2012-13.

Cradle Mountain Water suspended fluoridation at all fourteen of their systems in December 2012 in order to address environmental, OH&S and public health risks. This involved extensive consultation with DHHS in order to quantify the risks and determine the required level of service to be achieved at each plant. As at 30 June 2013, only the Waratah fluoridation system was operational as Cradle Mountain Water worked towards implementing the works at each of the sites. For the purposes of assessing compliance and reporting for these systems only the periods of time when the systems were dosing have been included in the subsequent calculations and compliance assessments.

### 7.7.2 Population receiving fluoridation-compliant water

The widespread fluoridation of water in Tasmania is conducted in accordance with the *Australian National Oral Health Plan 2004-13* 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 of 500 or more apart from Bicheno and Scamander.

Figure 7.3 shows the percentage of the Tasmanian population serviced by compliant fluoridation systems over the past reporting periods. In 2012-13, 97 per cent of Tasmanians receiving a reticulated water supply received fluoridated water of which 99 per cent received fluoridated water with an average concentration within the prescribed range of 0.8 to 1.2 mg/L. The fluoride level in the drinking water for the population which did not receive fluoridated water with an average concentration within the prescribed range was below the optimum range.

**Figure 7.3 Tasmanian population serviced by compliant fluoridation systems (per cent)**

Note: Population figures based on property connection data provided by the corporations.

The percentage of the population receiving optimally dosed fluoridated water has increased by 24 per cent when compared to 2011-12 owing to greater operational control and management by the water corporations.



## 8 ENVIRONMENT

The Environment Protection Authority (EPA) has responsibility for the management and protection of Tasmania's environment through its administration and enforcement of the *Environmental Management and Pollution Control Act 1994* (EMPCA). The EMPCA provides the regulatory framework to protect Tasmania's environment from pollution. The EPA's board and Director have independent statutory powers under the EMPCA and are supported by the EPA Division, which is part of the Department of Primary Industries, Parks, Water and Environment (DPIPWE).

The EPA regulates Level 2 wastewater treatment plants (WWTPs) in Tasmania. Level 2 WWTPs have a minimum licensed throughput volume of 100 kilolitres per day. In 2012-13 the number of Level 2 WWTPs operating in Tasmania was unchanged from the previous year (82). Of the 82 WWTPs, three were operated by organisations other than the water corporations. For the purposes of this report, only the performance of the 79 WWTPs operated by the water corporations are assessed.<sup>1</sup>

The information in this section does not extend to Level 1 WWTPs which continue to be regulated by local government.

The level of compliance with the discharge limits stipulated by the EPA for WWTPs is a key measure of overall environmental compliance. To demonstrate compliance the EPA requires the water corporations to regularly submit monitoring data in relation to the quality and quantity of effluent discharged by their Level 2 WWTPs. The information in this chapter is based on analysis of this source data which is held in EPA databases. The results are grouped to align with the geographical areas for which each water corporation was responsible during the reporting period.

In Tasmania, discharge limits for Level 2 WWTPs are specified in the environmental conditions issued for each facility by the Director, EPA. Considerable variation exists in relation to the range and restrictiveness of the specified discharge limits depending on the sensitivity of the receiving environment, the volume of discharge and the date the conditions were issued.

These environmental conditions reflect the regulatory framework in place at the time they were issued. Older conditions generally contain a small number of discharge limits determined without consideration of the specific characteristics of the receiving environment, other than differentiating between inland, estuarine/bay and coastal environments. They also reflect the technological standard at the time the conditions were imposed, which has improved considerably over the last decade.

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<sup>1</sup> Whilst the Penna WWTP is classified as a holding lagoon not a treatment plant, the EPA has reported on its performance as it has similar impacts on the environment as a WWTP.

The Tasmanian regulatory framework has changed significantly in the last decade, particularly as a result of the introduction of the *State Policy on Water Quality Management (1997)*.

The aim of the contemporary framework for the regulation of Level 2 WWTPs is to ensure that pollution discharged to the waterways is reduced to the maximum extent that is reasonable and practical having regard to best practice environmental management. In setting discharge limits and associated environmental requirements, environmental regulators take into account factors such as:

- potential toxicity of effluent contaminants;
- mass loads of nutrients and other pollutants, as well as the capacity of the receiving environment to accept these loads; and
- achievable current performance standards, as reflected in Acceptable Modern Technology (AMT) limits.

Contemporary environmental conditions for Level 2 WWTPs generally consist of a suite of 50<sup>th</sup> percentile, 90<sup>th</sup> percentile and maximum limits for a range of potential pollutants. Maximum limits provide the Director, EPA with the ability to issue penalties for specific pollution events which may occur. Percentile limits allow for a defined degree of variability in performance which is expected within the operational context of a WWTP.

The EPA Division's analysis of the performance of the WWTPs in each region during 2012-13 can be found in Appendix 4 of this Report.

## 8.1 Effluent treatment

The accuracy and completeness of wastewater flow data was flagged as an area of concern in previous reports. Improvements to flow reporting were made through flow metering in 2011-12 and further gains have been made during 2012-13. Of the 79 WWTPs operated by the water corporations, 71 reported measured flow data for 2012-13. Where measured flow data was unavailable, wastewater volumes were estimated from surrogate indicators such as the number of connected residences, water consumption or the number of hours of operation for a sewage pumping station.

Fourteen WWTPs reported annual inflows of greater than 1 000 ML for 2012-13, which is the same total number as in 2011-12 (see Table 8.1). Most of these WWTPs service major urban catchments and/or accept large volumes of industrial wastewater (Smithton, Ulverstone, Pardoe Downs and Wynyard). The seven WWTPs reporting the largest volumes of influent remain unchanged from the previous year. Ti-Tree Bend WWTP continues to be the largest wastewater treatment plant in the State by volume of effluent treated, accounting for 50 per cent of wastewater flow generated in the northern region in 2012-13. Newnham WWTP is no longer represented, as flows were reduced to half those previously reported following correction of a flow metering error. Conversely, Queenstown WWTP is a newcomer to this list, with the increase in estimated influent attributable to an improved flow estimation technique.

Consistent with the general trend for 2012-13, annual flows shown in Table 8.1 for 2012-13 are below those reported in 2011-12 apart from minor flow increases at Wynyard and Smithton WWTPs.

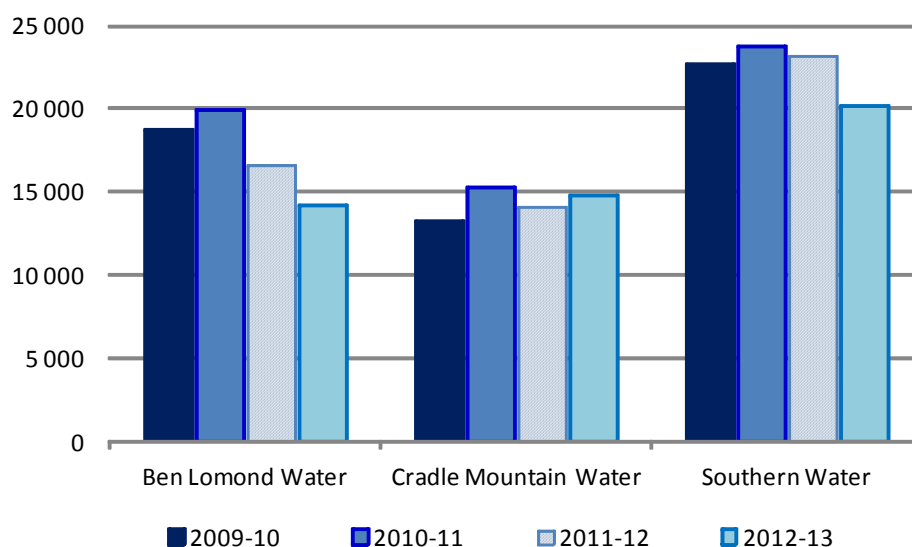
**Table 8.1 Tasmanian WWTPs with annual inflows exceeding 1 000 ML/year**

Operator	Premises name	Catchment area	Total flow 2011-12 ML/year	Total flow 2012-13 ML/year
Ben Lomond Water	Ti-Tree Bend	Launceston	7 266	7 157
Cradle Mountain Water	Pardoe Downs	Devonport	4 474	4 164
Southern Water	Macquarie Point	Hobart	4 171	3 913
Southern Water	Prince of Wales Bay	Hobart	3 684	3 102
Southern Water	Selfs Point	Hobart	3 578	3 070
Southern Water	Rosny	Hobart	2 490	2 244
Cradle Mountain Water	Round Hill	Burnie	2 242	2 232
Southern Water	Cameron Bay	Hobart	1 992	1 739
Cradle Mountain Water	Ulverstone	Ulverstone	1 865	1 676
Cradle Mountain Water	Queenstown	Queenstown	(402)	1 618
Cradle Mountain Water	Wynyard	Wynyard	1 389	1 503
Southern Water	Blackmans Bay	Kingston	1 937	1 449
Cradle Mountain Water	Smithton	Smithton	1 042	1 125
Ben Lomond Water	Hoblers Bridge	Launceston	1 320	1 101

Figure 8.1 shows the volume of wastewater received by the water corporations' WWTPs over the past four years. In 2012-13, as in previous years, the greatest volume of wastewater was treated in the southern region with approximately 20 204 ML (41 per cent of the state total).

Ben Lomond Water in the northern region treated 29 per cent of the total flow (14 247 ML), whilst Cradle Mountain Water in the north-western region treated 14 813 ML, or 30 per cent of the State total.

The total volume of wastewater treated by all Level 2 WWTPs combined was 49 264 ML in 2012-13, a reduction from 53 778 ML reported for the previous period, and the lowest volume reported to date.

**Figure 8.1 Volume of wastewater received / treated (ML/year)**

The reduction in flow from the previous reporting periods is consistent with rainfall patterns for Tasmania for 2012-13, with rainfall across the State classified as “below average” or “very much below average” according to information provided by the Bureau of Meteorology. The influence of rainfall is particularly pronounced in the case of combined catchments (which carry both sewage and stormwater), as found in parts of Launceston and in Queenstown.

Cradle Mountain Water flows went against the climatic trend. The increased flows reported for this region are attributed to much higher flow estimates for Queenstown WWTP than previously estimated (see Chapter 4).

The flow figures represented in the chart above are based on total flows received by WWTPs, rather than flows discharged to waterways which may be different due to effluent recycling reducing the volume discharged to waters. Effluent recycling patterns are discussed separately in section 8.4.4.

## 8.2 Outfalls to the environment

Wastewater treatment plants discharge into inland, estuarine and marine (coastal) environments. The point of discharge is an outfall:

- inland outfalls are those with a discharge into an inland waterway ie a watercourse which is dominated by fresh water and where the water flow is predominantly in one direction;
- estuarine outfalls are those which discharge into the part of a watercourse which is dominated by saline water and where the flow direction is clearly influenced by tidal movements. For the purpose of this report, bays are also included in this category; and
- marine outfalls are those where the discharge is made into non-enclosed coastal waters.

The type of receiving environment provides an initial indication of the sensitivity of the receiving environment and its capacity to cope with pollutants.



Of the 79 Level 2 WWTPs operated by the water corporations during 2012-13, 13 were classified as marine discharge, 32 as estuarine or bay discharge and 34 as inland waters discharge<sup>2</sup>. This categorisation was unchanged from 2011-12.

**Figure 8.2 Discharge by receiving environment (ML/year)**

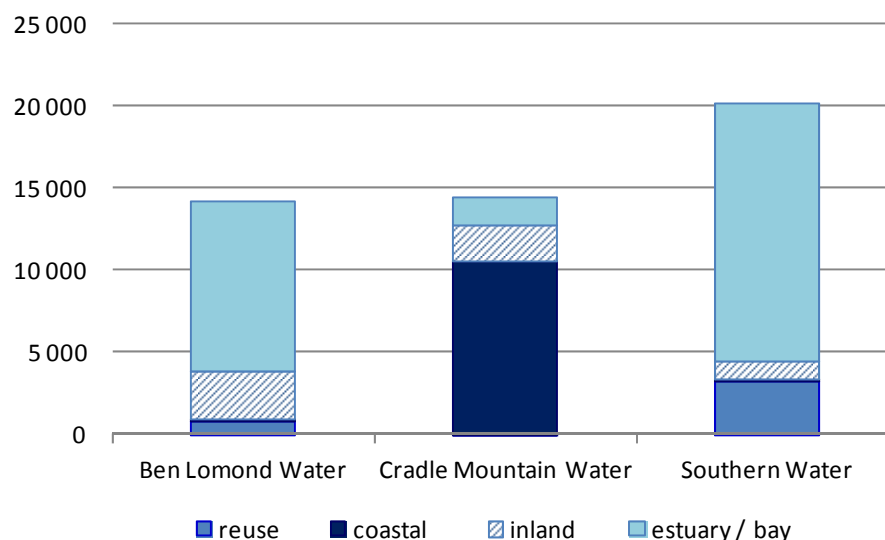


Figure 8.2 shows, by region, the volume of wastewater discharged by Level 2 WWTPs during 2012-13, categorised by receiving environment and the proportion of wastewater that was reused.

Figure 8.3 shows the discharge volume by receiving environment as a percentage of total flow.

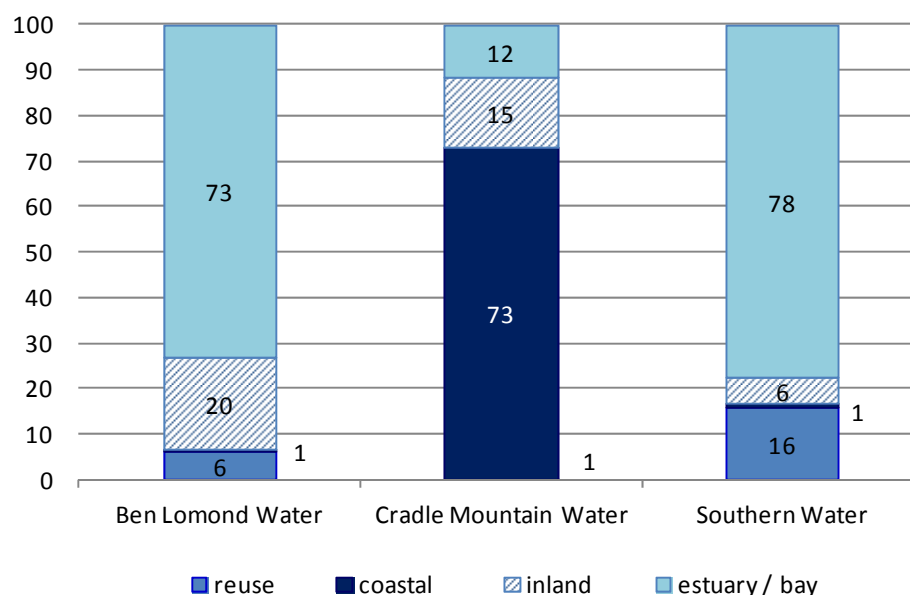
Overall, of the total volume of effluent discharged to waterways, the majority was discharged to estuarine waters (27 776 ML or 57.1 per cent), followed by discharge to coastal waters (10 704 ML or 21.9 per cent) and then inland waters (6 207 ML or 12.8 per cent). In addition 4 147 ML (or 8.5 per cent) of effluent was beneficially reused.

Significant differences exist between the three regions in relation to the receiving environment, in keeping with the different geographical conditions present in each region.

Discharges in the southern and northern regions are predominantly to the Derwent and Tamar estuaries respectively, with smaller volumes to inland watercourses. In the north-western region coastal discharges are the dominant method.

The distribution of treated effluent by receiving environment is largely unchanged from the situation that existed in 2011-12.

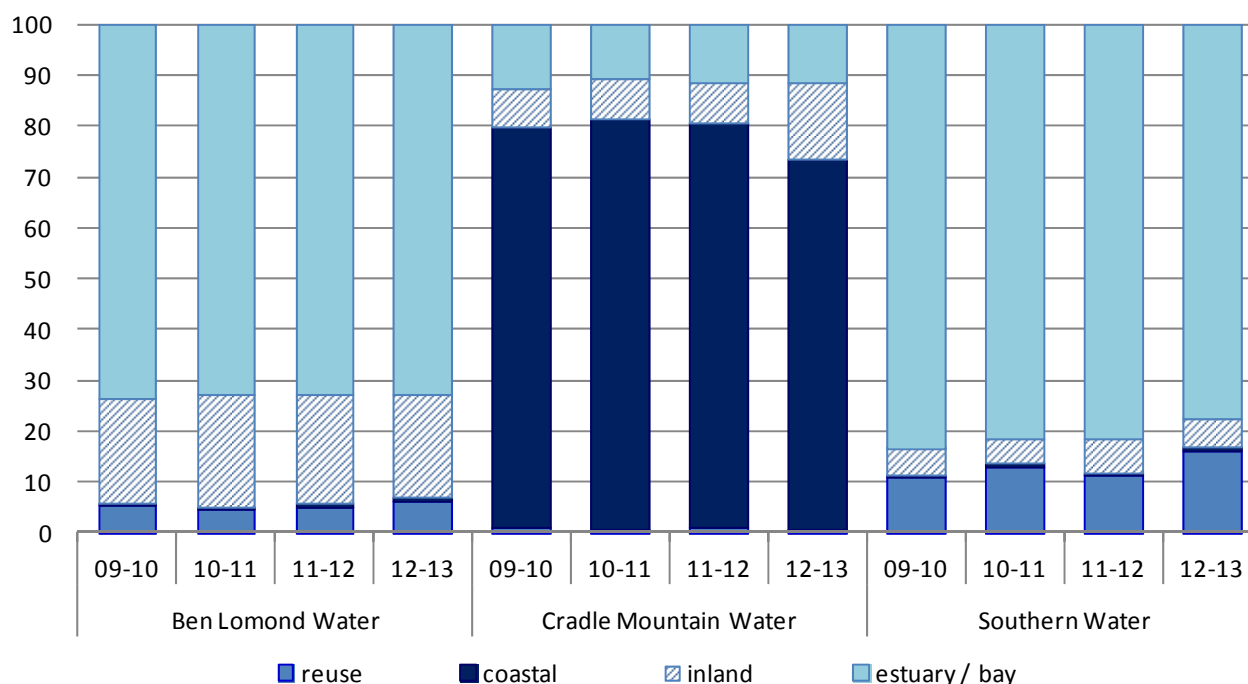
<sup>2</sup> When compared to 2011-12, one level 2 WWTP (Beauty Point) has been re-classified from inland discharge to estuarine discharge to correct a reporting error.

**Figure 8.3 Discharge by receiving environment (percentage of flow) 2012-13**

Based on information provided by the water corporations within their Annual Environmental Reviews to the EPA, in 2012-13 the total volume of recycled water in relation to Level 2 WWTPs was 4 147 ML, an increase over the previous three financial years when the volume recycled was less than 4 000 ML state-wide.

As illustrated in Figure 8.4, the southern region again leads the State in terms of total volume of effluent recycled with 3 229 ML or 16 per cent of Southern Water's total wastewater flow reused. In the northern region 845 ML or 6 per cent of Ben Lomond Water's total wastewater flow was reused. Only one reuse scheme exists in the north-western region, at Railton, which reused 74 ML or 0.5 per cent of Cradle Mountain Water's total wastewater flow in 2012-13.

The Clarence Recycled Water Scheme continued to be the largest in the State. The scheme provides recycled water to the Coal Valley for a variety of uses including irrigation of agricultural and horticultural crops and golf courses, with treated effluent being sourced from the Rosny and Rokeby WWTPs. In 2012-13 the volume of treated effluent utilised in the scheme increased from 1 070 ML (previous year) to 1 565 ML. The second largest scheme was the Brighton/Bridgewater scheme where 660 ML of treated effluent was used for irrigation purposes. This volume was identical to the previous year, although a greater portion was sourced from Brighton WWTP rather than Bridgewater WWTP during 2012-13. As a result of these two schemes operating, a significant volume of treated effluent is diverted from the Derwent Estuary to sustainable reuse.

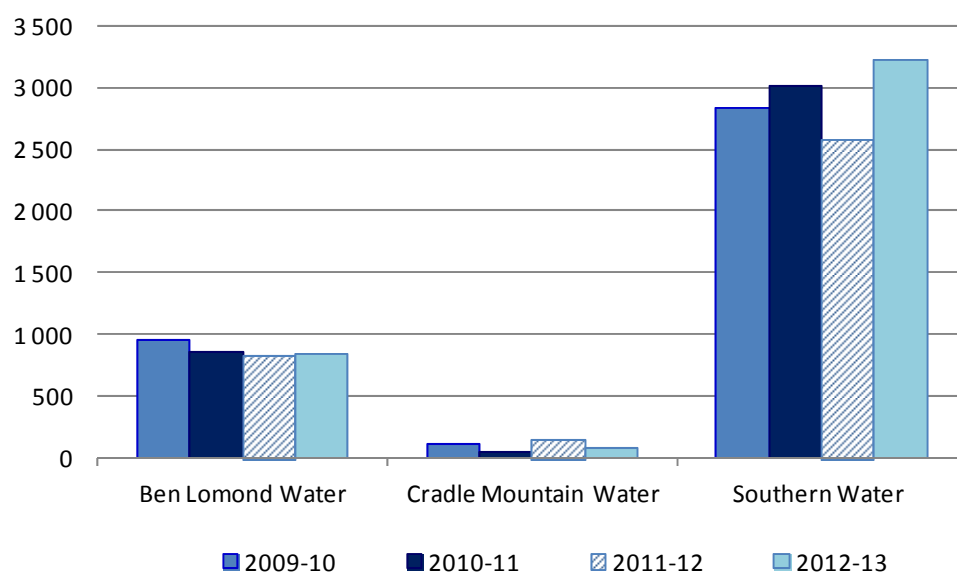
**Figure 8.4 Discharge by receiving environment (percentage of flow)**

To expand the Clarence Scheme further, Southern Water progressed the construction of the 1 000 ML winter storage dam at Tea Tree ('Duckhole Rivulet dam'). The project had been delayed due to difficulties in gaining approval for the construction but was completed in 2012-13. Once the dam is fully commissioned, it is expected that reuse volumes will be substantially increased due to the ability to store water during periods of lower demand and utilise it during higher demand periods.

The largest effluent recycling scheme operated by Ben Lomond Water remains Legana WWTP where 173 ML or 61 per cent of the volume generated was used to irrigate agricultural land.

It is also noteworthy that Ben Lomond Water commissioned a wastewater reuse scheme at Beaconsfield in late 2012. In the longer term it is intended to reuse all effluent and thereby avoiding the discharge of treated effluent from Brandy's Creek. However, during 2012-13, partial reuse only was achieved.

Figure 8.5 shows the trend in relation to volumes of effluent recycled.

**Figure 8.5 Volumes of effluent recycled by water corporation (ML/year)**

The total volume of effluent discharged to reuse schemes increased from the 3 520 ML in 2011-12 to 4 147 ML in 2012-13. The change is essentially due to the expansion of Southern Water's reuse schemes (see Chapter 4 for details).

As effluent reuse schemes in Tasmania involve land irrigation, any fluctuations from year to year are expected to be driven by climatic factors. In this regard 2012-13 was a particularly dry year with conditions likely to maximise irrigation demand.

Additional factors which influence the volume of effluent recycled include:

- ability to store effluent during prolonged wet conditions when soil moisture is too high to permit sustainable effluent irrigation;
- level of salinity either inherent in the wastewater due to trade waste inputs or due to salinity ingress into the sewerage network; and
- availability of suitable land adjacent to the WWTP and / or interest on the part of land owners.

Table A4.3 in Appendix 4 lists the proportion of effluent reused and reuse flow per year for each Level 2 WWTP for each of the 2008-09 to 2012-13 financial years.

### 8.3 Comparative sewage treatment levels

As mentioned in Chapter 5 (Industry infrastructure) there are three categories of sewage treatment which indicate the degree to which sewage is treated.

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

Secondary treatment takes primary treated effluent and, with the aid of mechanical 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. The main aim is to remove nutrients such as nitrogen and phosphorus and further reduce the remaining organic material and harmful micro-organisms in the secondary treated effluent.

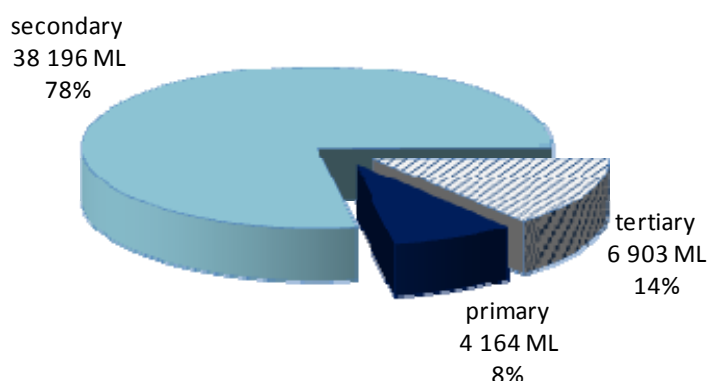
The level of treatment needs to be matched to the sensitivity of the receiving environment, the dilution achieved at the point of discharge, as well as mixing and dispersion characteristics. As a general rule, inland watercourses are considered to be more sensitive than estuarine environments. Coastal outfalls generally require the lowest level of treatment, especially if they are long outfalls discharging into high energy environments offering significant dilution.

Secondary treatment is usually sufficient for effluent discharged to ocean outfalls, where residual pollutants are dispersed rapidly and effectively. Secondary treatment is also considered sufficient for effluent recycling schemes relying on 'Class B' quality effluent provided that the specified disinfection limits can be reliably achieved.

Tertiary treatment is becoming a standard requirement for effluent discharged to waterways which are sensitive to nutrient enrichment, such as inland watercourses or poorly flushed bays. Additional treatment may be necessary to address specific contaminants of concern where effluent recycling is an end use (e.g. improved pathogen removal facilities).

As in previous years the vast majority of Level 2 WWTPs operated by the water corporations (68 of 79) fell into the secondary treatment category, whilst ten WWTPs provided full tertiary treatment. Cradle Mountain Water's Pardoe Beach WWTP in Devonport continued to be the only Level 2 WWTP in Tasmania providing only primary treatment in 2012-13. Effluent from this WWTP is discharged via a long ocean outfall and long-term ambient monitoring has not indicated significant environmental impacts outside the mixing zone.

As a proportion of total treated effluent discharged to the environment, effluent subject to secondary treatment clearly outweighed the other categories as shown in Figure 8.6.

**Figure 8.6 Wastewater treatment level (ML/year, percentage of total volume discharged) 2012-13**

During 2012-13 approximately 38 196 ML or 78 per cent of all wastewater was treated to secondary standard. Tertiary treatment contributed just over 14 per cent of the total effluent volume (6 903 ML) and primary treatment just over eight per cent (4 164 ML). The majority of effluent discharged to reuse schemes continued to be treated to secondary standard although there were some exceptions (eg Rokeby WWTP treats effluent to tertiary standard).

Figure 8.7 illustrates significant differences across the regions in 2012-13 with regards to the volume of effluent treated to the various levels. Southern Water generated the largest overall volume of treated effluent as well as the greatest volume of effluent treated to tertiary standard (4 167 ML). Southern Water also generated the greatest volume of secondary treated effluent (16 037 ML) ahead of Ben Lomond Water (14 084 ML). The entire volume of primary treated effluent in the State (4 164 ML) was generated in the Cradle Mountain Water region.

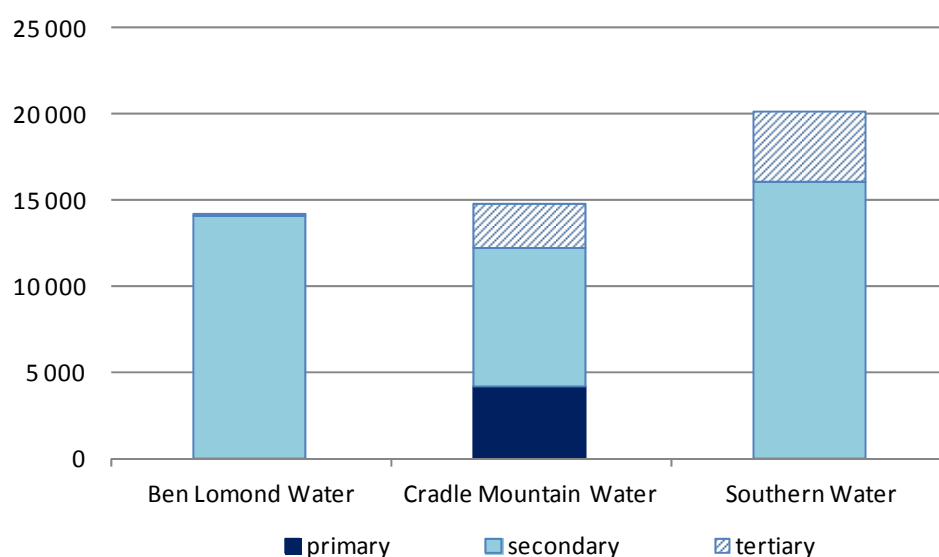
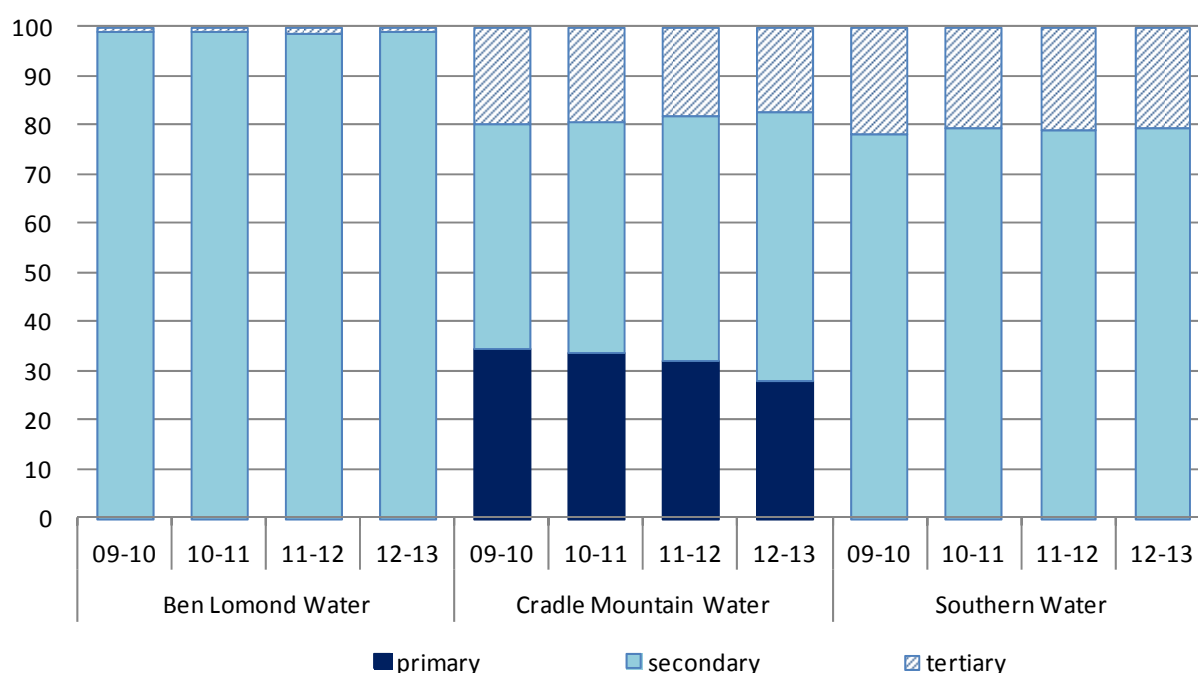
**Figure 8.7 Level of effluent treatment by water corporation (ML/year of total volume discharged) 2012-13**

Figure 8.8 shows the relative proportion of wastewater discharged by each water corporation's WWTPs based on treatment level.

**Figure 8.8 Effluent treatment level by water corporation (percentage of total volume discharged)**

Comparison of the treatment levels in relative terms within each region shows that the proportion of tertiary treated effluent is greatest in the southern region with 21 per cent. Although Cradle Mountain Water achieved a similar proportion of tertiary treated effluent (17 per cent), this was offset by a large percentage of primary treated effluent (28 per cent). Effluent in the northern region was almost entirely (99 per cent) treated to secondary standard.

Overall, these proportions have remained fairly constant since 1 July 2009.

The only noticeable change for 2012-13 was a reduction in Cradle Mountain Water's tertiary treatment percentage from 18.3 per cent to 17.4 per cent, while secondary treatment increased from 49.8 per cent to 54.5 per cent. This change can be attributed to the increase in flow from the Queenstown WWTP which treats effluent to secondary standard.

## 8.4 Sewage treatment plant compliance

Sewage treatment plant compliance is achieved where the treated effluent meets the limits prescribed by the EPA. Non-compliance occurs when there are instances of the limits not being met.

The compliance assessment period now spans a period of five years and as such provides an indication of trends, longer term issues as well as improvements.

Calculations and charts in this section are based on analysis of effluent monitoring data held in an EPA database. Data sets are significantly complete in relation to most parameters. Where more than 50 per cent of samples are missing the relevant parameter is not assessed.

**Box 8.1: 2012-13 Effluent quality data**

During 2012-13, comprehensive and, in most instances, complete effluent monitoring datasets were submitted to the EPA by the water corporations. However, there were occasional instances of samples being missed or of specific parameters being omitted.

Improvements are still required with regards to field measurements of parameters such as chlorine and pH. Flow monitoring remains an area where identified deficiencies are being addressed progressively through installation of flow meters.

The late submission of monitoring data also remains an area requiring improvement, as it can interfere with the EPA's ability to analyse the data and obtain a meaningful and timely response to issues of concern.

Where a facility has approval to discharge to waters as well as to an effluent recycling scheme, different limits usually apply to each discharge point. A facility is assessed against the discharge to waters limits as long as those limits are specified in the environmental conditions, even though there may not have been a discharge to waters in that particular year. This approach is used to reflect the fact that the proportion of effluent discharged to land depends on climatic conditions and may vary considerably from year to year.

Compliance is assessed for each parameter for which a regulatory limit is specified by measuring the number of scheduled samples that complied with the specified limit as a percentage of the total number of scheduled samples analysed in the reporting period. Compliance percentages for all parameters are combined to provide one overall compliance figure for each WWTP. Where both land-based and water-based discharge limits exist, compliance is assessed separately against each limit.

As only a small number of Level 2 WWTPs have been issued with percentile limits in addition to maximum limits, compliance assessment for this reporting period is based on maximum limits. An exception is the thermotolerant coliform limit for effluent recycling schemes which is generally specified as a 50<sup>th</sup> percentile limit. For 50<sup>th</sup> percentile limits, where the number of samples complying as a percentage of the total number of scheduled samples is greater than 50 per cent, compliance is deemed to be 100 per cent.

There have been no significant methodology changes since the previous reporting period (ie 2011-12).

It is worth noting that compliance calculations performed by the EPA Division rely on a slightly different methodology to those adopted internally by the water corporations, and adopted by interstate jurisdictions, which report in line with the National Performance Framework approach, and therefore produce different results.



The EPA Division believes that the current method it employs, the independent limits method<sup>3</sup>, provides a fairer, more representative picture of compliance in the current regulatory environment for the Tasmanian wastewater sector. In the interests of maintaining consistency with regards to longer term compliance assessment, the EPA has decided to continue with the established method unless there are compelling reasons not to do so.

The assessment of compliance is made more difficult by the fact that emission limits to waters for WWTPs with older permits do not adequately reflect the modern technology standards required under the contemporary regulatory framework. In these cases, discharge requirements are in the longer term likely to become more stringent, especially with regards to reducing nutrient emissions.

The assessment against AMT limits is provided as an additional tool to assess compliance against a benchmark which is theoretical (i.e. not all WWTPs may eventually be required to upgrade to AMT standards, depending on the outcome of comprehensive ambient monitoring and investigations into reuse potential) but provides a uniform basis of assessment.

The information in section 8.4.1 represents compliance against the limits currently in place. The information in section 8.4.2 represents compliance against potential future AMT limits.

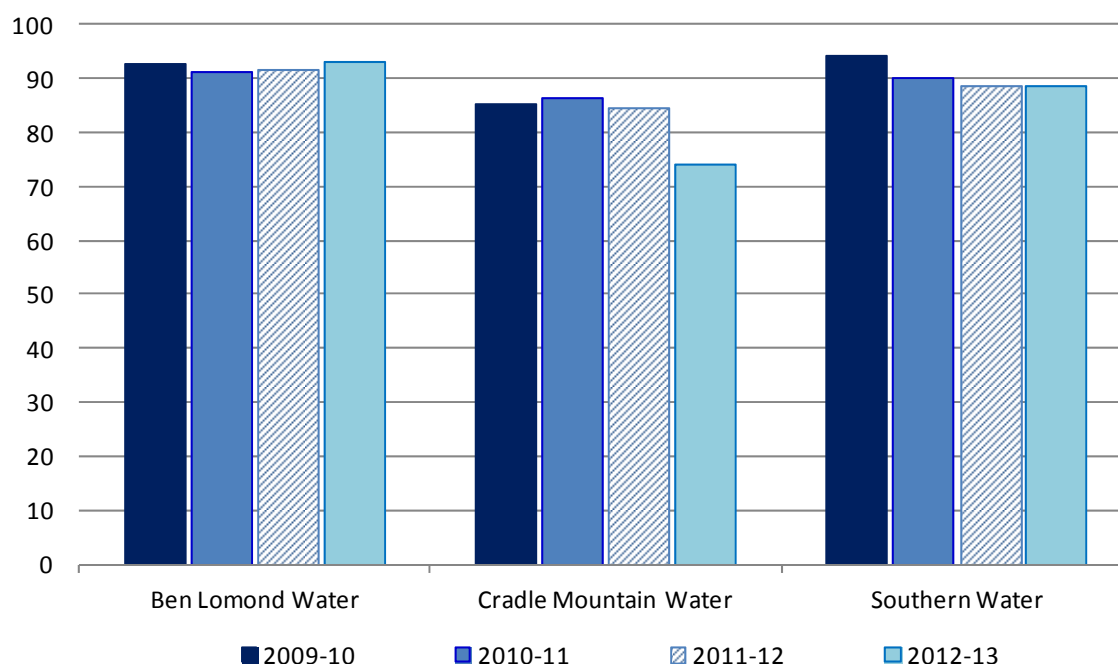
#### 8.4.1 Compliance with current discharge to waters limits

The rollout of Environment Protection Notices (EPNs) continued during 2012-13. EPNs issued for Beaconsfield, Fingal, Hoblers Bridge, Newham, Norwood, Riverside, Ti-Tree Bend, New Norfolk, Margate and Geeveston WWTPs included discharge limits set at levels reflecting current plant capacity under optimised operational practices. Those limits are to be considered as interim limits and may be replaced by more stringent limits once plant upgrades are introduced in line with the longer term strategy as part of the water corporations' Wastewater Management Plans.

Figure 8.9 shows the water corporations' compliance against the specified discharge to waters limits. To account for WWTPs with significantly different hydraulic capacities, the flow weighted average of individual WWTP compliance is used as the value representing corporation compliance.

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<sup>3</sup> The independent method assesses compliance against each individual limit (or parameter), whereas the alternative approach would be to assess compliance against a joint set of limits where one or more failed parameters (limits) for a sample means a failed sample.

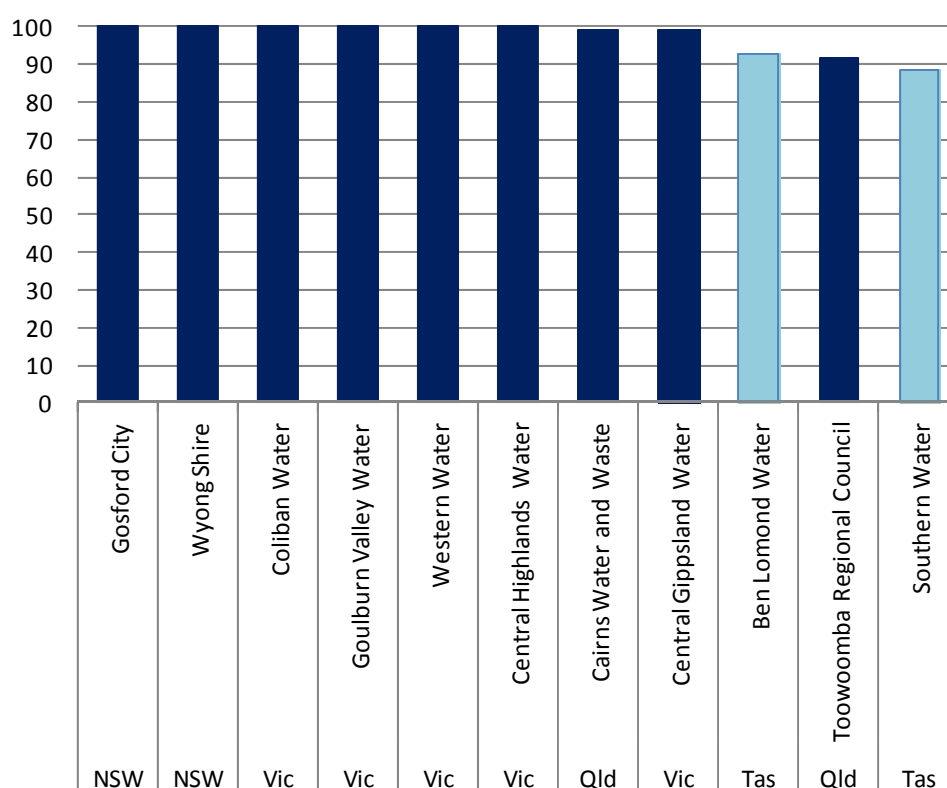
**Figure 8.9 Compliance with discharge to waters limits (per cent)**

In 2012-13 flow-weighted compliance was again highest in the northern region (93 per cent), followed by the southern region (89 per cent) and the north-western region (74 per cent). Cradle Mountain Water's compliance dropped by about ten per cent during 2012-13. This is in contrast to the other two water corporations where compliance either improved slightly (Ben Lomond Water) or remained unchanged (Southern Water). In particular, low compliance achieved by the large Smithton and Ulverstone WWTPs (both <50 per cent compliant) is likely to be responsible for Cradle Mountain Water's disappointing performance against discharge limits.

The performance of the Tasmanian water corporations in comparison to utilities in other states is shown in Figure 8.10 and Figure 8.11.

From these figures, it is evident that the Tasmanian water corporations are still lagging behind their mainland counterparts.

A number of major utilities (ie those serving between 50 000 and 100 000 customers) in other states achieved higher than 99 per cent compliance of sewage treatment whilst Ben Lomond Water and Southern Water reported around 90 per cent compliance.

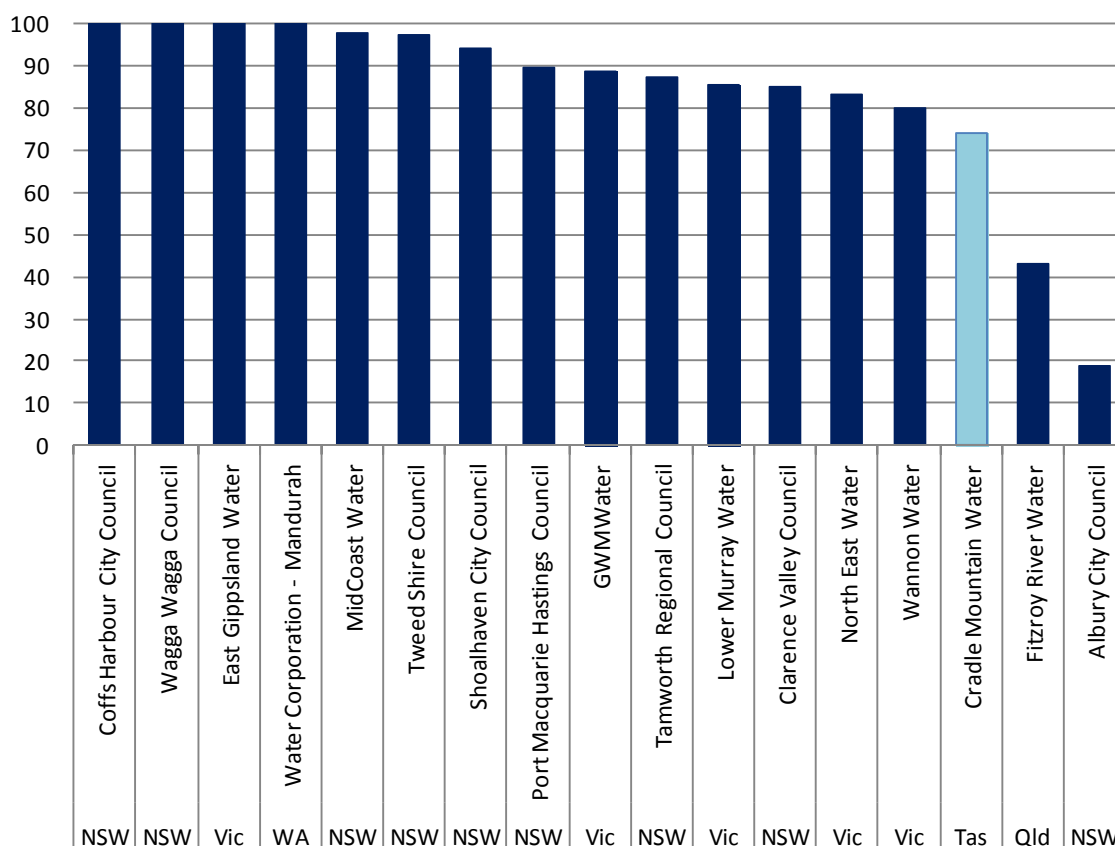
**Figure 8.10 Sewage volume treated that was compliant (per cent) – Major utilities<sup>4</sup>**

Source: WSAA, 2012-13 National Performance Report - Urban water utilities - Database

Similarly, as shown in Figure 9.11, Cradle Mountain Water continues to lag behind other non-major utilities<sup>5</sup> across Australia (ie those serving between 20 000 and 50 000 customers), with only 74 per cent of sewage volume complying with regulatory limits. The majority of similar sized non-major water utilities reported over 85 per cent compliance for treated sewage volume during 2012-13.

<sup>4</sup> The National Performance Framework defines utilities with between 50 000 and 100 000 customers as 'major utilities (other)'.

<sup>5</sup> The National Performance Framework defines utilities with between 20 000 and 50 000 customers as 'non-major utilities (large)'.

**Figure 8.11 Sewage volume treated that was compliant (per cent) – Non-major utilities**

Source: WSAA, 2012-13 National Performance Report - Urban water utilities - Database

Compliance with discharge to waters limits, split up into four compliance categories, is further illustrated in Figure 8.12. For 2012-13, 20 Tasmanian WWTPs were classified as substantially non-compliant (ie less than 75 per cent), two more than in 2011-12. Whilst there were more WWTPs in the lowest compliance category than in the previous year (nine compared to five in 2011-12), this was offset by a corresponding increase in the high compliance category (ie more than 90 per cent) increased slightly, from 29 in 2011-12 to 33 in 2012-13.

Overall, the compliance trends appear stagnant. That is, it appears that there has been little real progress during 2012-13 towards the goal of having the majority of WWTPs represented in the more than 90 per cent compliance group.

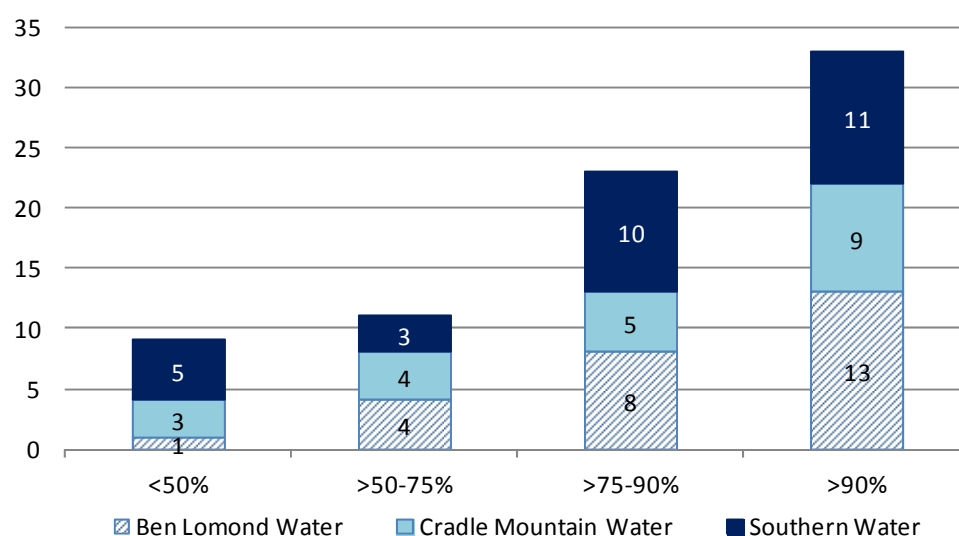
**Figure 8.12 Number of WWTPs compliant with discharge to waters limits by compliance level**

Table 8.2 shows a list of WWTPs that achieved less than 50 per cent compliance against the discharge to waters limits in 2012-13. In total, nine WWTPs across the State fell into this category.

**Table 8.2 WWTPs with less than 50 per cent compliance against discharge to waters limits**

Operator	WWTP	Limit type	Number of limits assessed	Compliance (per cent)
Ben Lomond Water	Bridport <sup>1</sup>	Max/Min	9	47.7
Cradle Mountain Water	Port Sorell	Max/Min	4	39.6
	Smithton	Max	4	43.7
	Ulverstone	Max	1	12.5
Southern Water	Electrona <sup>1</sup>	Max	4	37.5
	Campania <sup>1,2</sup>	Max	4	42.0
	Kempton <sup>1,2</sup>	Max	4	31.3
	Oatlands	Max	4	29.2
	Ranelagh <sup>3</sup>	Max	9	47.4

Notes: 1. Indicates consecutive years of less than 50 per cent compliance.  
 2. Indicates full reuse in 2012-13.  
 3. WWTP was being upgraded during reporting period.

Ulverstone WWTP, which is assessed against only one limit (total suspended solids), showed a significant reduction in compliance. In 2012-13 only one sample out of the eight submitted (12.5 per cent) complied with the specified limit for this WWTP (a reduction from 58 per cent compliance recorded for 2011-12).

Both the Bridport and Ranelagh WWTPs have a comprehensive set of limits and both plants have a history of underperforming. However, with improvement measures being implemented in 2012-13, (de-sludging for Bridport lagoons; process upgrade at Ranelagh) it is expected that the level of compliance will improve in the future.

With the exception of the Electrona WWTP, which is to be decommissioned in the near future, the remaining WWTPs in Table 8.2 are lagoon systems which are most likely compromised by significant sludge accumulation affecting treatment performance.

#### 8.4.2 Compliance against potential future discharge to waters limits

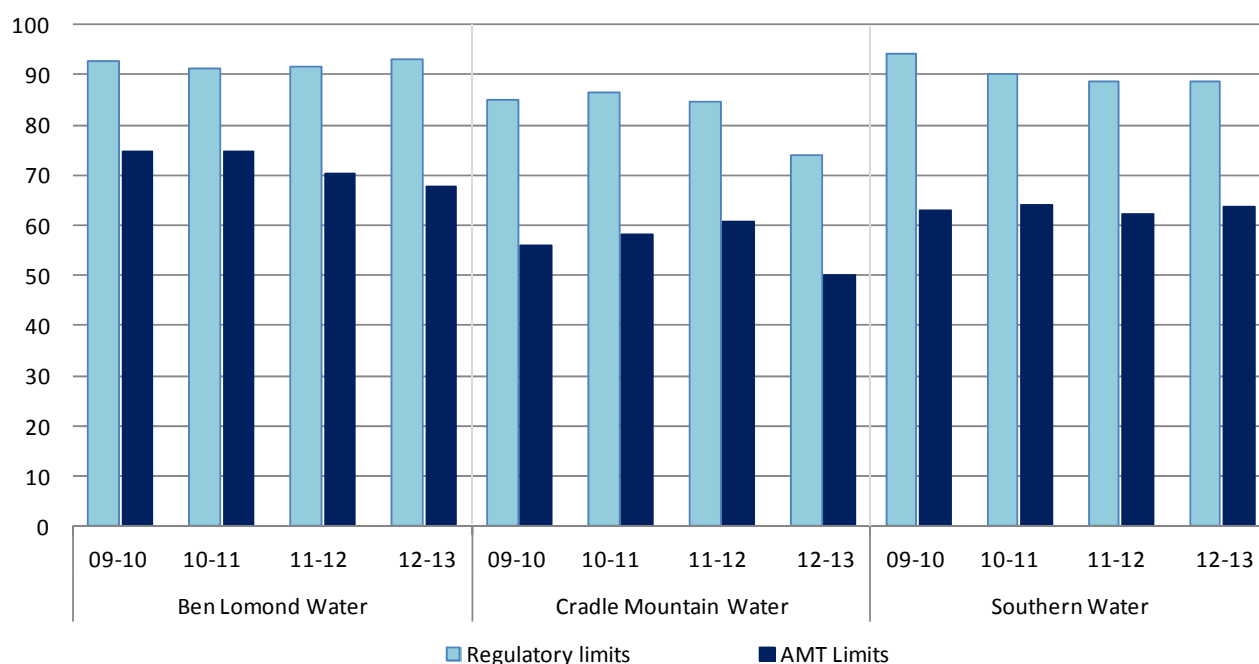
The limits adopted for this analysis represent Accepted Modern Technology (AMT) standards contained in the *Emission Limit Guidelines for Sewage Treatment Plants* (DPIPWE, 2001). AMT limits, which differentiate between fresh water and marine receiving environment, incorporate stringent nutrient emission limits. To achieve nutrients concentrations/loads suitable for discharge to fresh water, tertiary treatment will typically be required. As indicated earlier most wastewater in Tasmania is currently treated to a secondary level only.

As an alternative to AMT limits, site-specific discharge limits which reflect the assimilative capacity of the receiving environment may be adopted in the future. However, the determination of sustainable, evidence-based effluent management practices requires comprehensive ambient monitoring to be carried out as a first step. Until such information becomes available, AMT limits are adopted as an approximation of likely future limits for the purpose of this report.

This analysis provides an indication of likely future compliance within a regulatory framework characterised by the phasing in of stricter regulatory limits. The adoption of more rigorous limits, aimed at bringing about improvements in overall wastewater treatment performance and a reduction in pollutants discharged to the environment, will make the achievement of specified performance limits more challenging.

As in the previous year the data set in relation to AMT-relevant parameters was substantially complete. In particular, nutrient results were submitted for all WWTPs. As such the 2012-13 AMT compliance assessment can be viewed with a high degree of confidence.

Figure 8.13 shows the water corporations' compliance with regulatory limits versus AMT limits as a time series. Not surprisingly, compliance against AMT limits is significantly lower than compliance with regulatory limits for each of the last five financial years. With the exception of a minor positive trend in the southern region, there is no indication that performance against AMT limits is improving.

**Figure 8.13 Compliance with regulatory and AMT discharge to waters limits (per cent)**

Continuing the trend from previous years, flow-weighted AMT compliance percentages per region were highest for Ben Lomond Water (68 per cent), followed by Southern Water (64 per cent) and Cradle Mountain Water (50 per cent). Overall WWTP performance against AMT limits either stagnated or decreased over the course of the last four years, with a few minor exceptions. The large reduction in Cradle Mountain Water's performance against AMT limits in 2012-13 is likely to be associated with performance of large WWTPs such as Smithton and Ulverstone<sup>6</sup>.

Distributing AMT compliance into the same four categories adopted in Figure 8.12, Figure 8.14 shows a significantly different pattern when compared to the compliance distribution for existing regulatory limits.

Based on AMT compliance for 2012-13 there were:

- 25 WWTPs in the less than 50 per cent compliance category compared to nine WWTPs in this category based on existing regulatory limits;
- 32 WWTPs achieving between 50 and 75 per cent compliance. This clearly remains the dominant category for AMT limit compliance, in contrast with regulatory limit compliance which has eleven WWTPs in this percentage bracket;
- 14 WWTPs in the 75 to 90 per cent compliance category compared to 23 WWTPs in this category based on existing regulatory limits; and
- only seven WWTPs in the more than 90 per cent compliance category compared to 33 WWTPs in this category based on existing regulatory limits.

<sup>6</sup> In the case of Ulverstone, the change was also associated with a change in the assessment methodology.

Comparing this to last year's data confirms a decline in performance, with representation in the >90 per cent category reduced by three WWTPs, whilst two additional WWTPs were classified as <50 per cent compliant.

**Figure 8.14 Number of WWTPs compliant with AMT discharge to waters limits by compliance level**

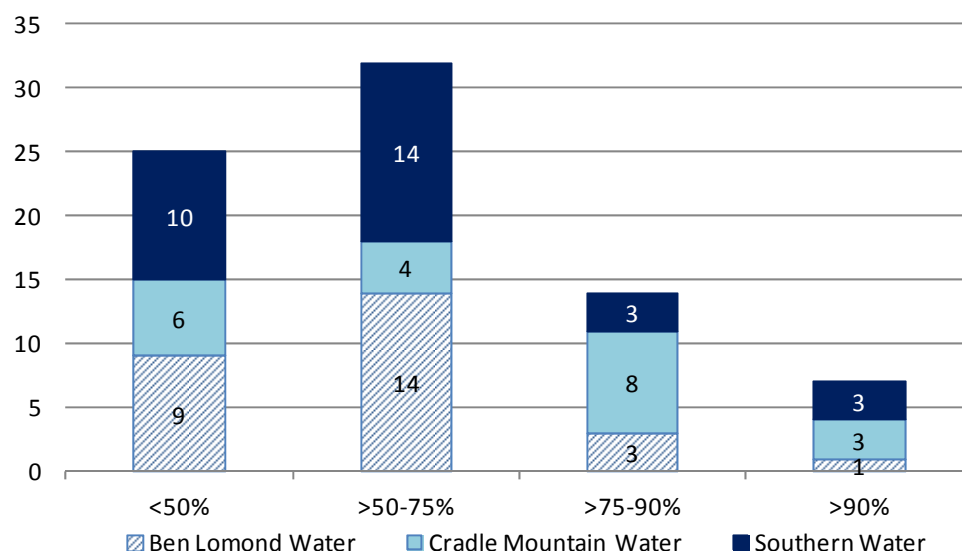


Table A4.1 and Figures A4.1 to A4.3 in Appendix 4 show, for each WWTP, compliance with regulatory limits and AMT limits, and dataset completeness in relation to AMT relevant parameters.

#### 8.4.3 Summary of discharge to waters limits compliance

To date, clear improvements in compliance with regulatory discharge to waters limits are not evident. Whilst Ben Lomond Water has achieved a slight improvement in relation to regulatory limits over the course of the past five years, Southern Water's performance has stagnated and Cradle Mountain Water's compliance levels have decreased, most noticeably during 2012-13.

This effect is much more noticeable in relation to AMT limits, against which all three corporations have shown a decline in compliance levels. Whilst AMT limits are not currently binding compliance against them is, in some respects, a better indicator of performance over time, as these limits have remained unchanged over the last five years.

The observed trend is disappointing as it was expected that minor WWTPs upgrades and better operational practices would be reflected in some improved compliance at this point in time.

Significant compliance improvements will in most cases be linked to major infrastructure upgrades or maintenance works. A range of projects were proposed by each corporation in the context of the strategic, five-year Wastewater Management Plans (WWMPs), which received approval from the Director, EPA, in 2011.



A review undertaken by the EPA in relation to the progress achieved by the corporations against the project identified in their respective WWMPs highlighted the delay of some projects against original timeframes and capital expenditure not reaching the amount originally planned with regards to Southern Water and Cradle Mountain Water. Ben Lomond Water, on the other hand, was able to demonstrate that significant progress had been made against the commitments of the WWMP.

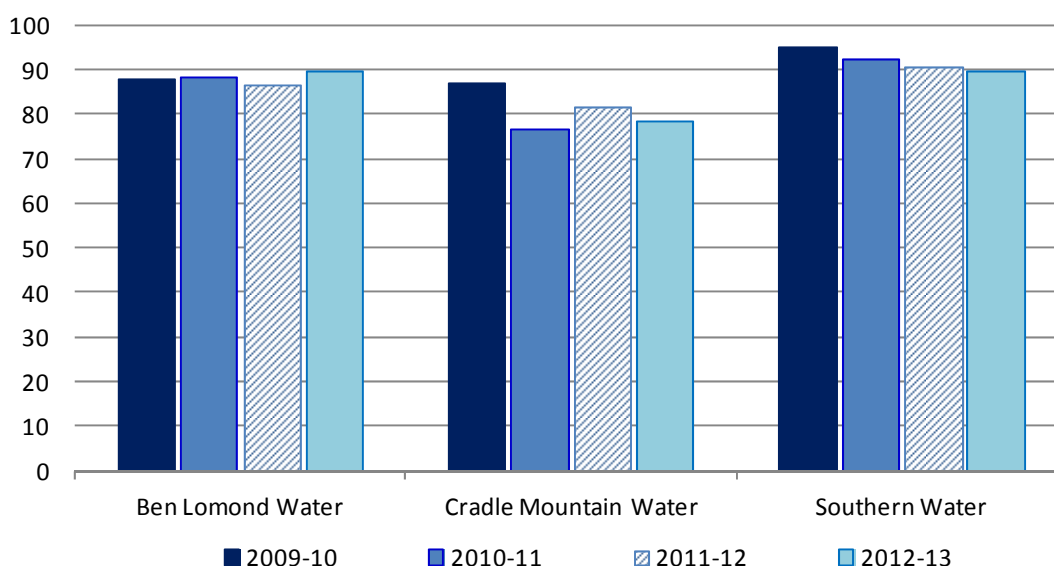
EPA's assessment of progress regarding specific key projects can be found in Chapter 10.

#### 8.4.4 Compliance with discharge to land limits

This section assesses the levels of compliance reported for effluent recycling schemes which utilise treated effluent generated by Level 2 WWTPs. Effluent recycling schemes operated during the reporting period were generally required to comply with 'Class B' quality standards (as outlined in the EPA Division's *Environmental Guidelines for the Use of Recycled Water in Tasmania*).

This assessment was undertaken, therefore, against standard 'Class B' quality expectations rather than specified limits. This approach was adopted to provide a consistent basis for performance comparison, as there is some variance amongst older WWTP conditions with regards to the specified limits. The EPA Division intends to remove this anomaly by reissuing EPNs incorporating modern operating standards.

**Figure 8.15 Compliance with 'Class B' discharge to land limits (per cent)**



A comparison of compliance against 'Class B' quality expectations shows that, for the first time, Ben Lomond Water and Southern Water achieved similar levels of compliance (around 86 per cent). In relation to Southern Water, compliance levels have gradually been declining since 2009-10, whilst Ben Lomond Water managed to slightly improve on compliance with the limits. Cradle Mountain Water operates only one effluent recycling scheme and compliance levels remain significantly lower than those achieved by the other two corporations.

It is emphasised that simple compliance with the specified discharge limits is not a sufficient indicator of the sustainability of effluent recycling schemes. To make a determination on the level of sustainability achieved, comprehensive monitoring of ambient conditions and impacts on the environment (ie soils, groundwater, odour emissions and surface waters) is required. Such monitoring programs are required under the environmental conditions (regulatory limits), and resulting reports are reviewed by EPA to ensure schemes are operated in a sustainable manner.

## 8.5 Number of wastewater treatment plants compliant at all times

The number of Level 2 WWTPs which complied with their respective environmental requirements for treated effluent discharge at all times during the reporting period gives an indication of the overall performance of each corporation's WWTPs and, if problems exist, whether they are localised or widespread. This indicator therefore provides information on how well each corporation is managing its treatment facilities.

Table 8.3 shows that six WWTPs achieved 100 per cent compliance with their respective regulatory discharge limits during 2012-13:

- Stieglitz WWTP (Ben Lomond Water);
- Somerset and Wynyard WWTP (both Cradle Mountain Water); and
- Midway Point, Risdon Vale and Rosny (Southern Water).

Most of these fully compliant WWTPs are subject to older permit conditions which require only a small number of limits to be met. More recent permits and EPNs typically stipulate sets of eight or nine limits to be met. Out of the fully compliant WWTPs in 2012-13, only Rosny fell into this category. A further 27 WWTPs achieved in excess of 90 per cent compliance.

**Table 8.3 WWTPs with 100 per cent compliance with discharge to waters limits**

Operator	WWTP name	Limit type	Number of limits assessed
Ben Lomond Water	Stieglitz	Max	1
Cradle Mountain Water	Somerset	Max	1
	Wynyard	Max	1
Southern Water	Midway Point	Max	4
	Rosny	Max/Min	8
	Risdon	Max	4

None of the water corporations achieved consistent compliance with the specified discharge limits for all Level 2 WWTPs under their control during 2012-13.

## 8.6 Public disclosure of wastewater treatment plant performance

Public disclosure of the each water corporation's wastewater treatment plant performance demonstrates transparency and accountability to the community, government and regulators.

Public disclosure is demonstrated by publishing WWTP performance including detailed results for key parameters in the treatment plant permit.

In the past the environmental conditions for Level 2 WWTPs did not require public disclosure of performance. However, more recent environmental conditions require the preparation of publicly available Annual Environmental Review (AER) reports. AERs must be signed off by the relevant corporation's Chief Executive Officer. The corporations provided AERs for all Level 2 WWTPs in 2012-13. Current EPA policy is to make AERs available to the public upon request although in the future the reports may be made accessible to general public through the EPA website.

## 8.7 Compliance with requirements of the Director, Environment Protection Authority

The purpose of this section is to report on whether the compliance requirements of the environmental regulator (ie the Director, EPA) for Level 2 WWTPs were met for all wastewater treatment plants.

For the purpose of this report, 'non-compliance' is defined as the situation where, during the reporting period, the operator:

- failed to meet the conditions prescribed by the environmental regulator in the permit (or equivalent instrument such as an EPN issued under Section 44(1) of the EMPCA);
- has received a formal written warning from the Director in relation to the activity;
- has received an infringement notice in relation to the activity; or
- was successfully prosecuted by the environmental regulator or its representative.

As discussed in previous sections, none of the water corporations achieved full compliance with the specified discharge limits in relation to all Level 2 WWTPs under their control. Therefore, none of the water corporations were considered to be compliant with permit / EPN requirements and, given this, failed to meet the benchmark outlined in the first dot point above.

With regards to the second and third dot points, the following compliance enforcement actions were taken by EPA against the Tasmanian water corporations in 2012-13:

- Ben Lomond Water received a formal written warning regarding an incident involving significantly non-compliant effluent discharged from the Ti-Tree Bend WWTP in December 2012 – January 2013;

- Cradle Mountain Water received an Environmental Infringement Notice for contravening a requirement of an EPN, in relation to the failure to implement the approved ambient monitoring plan for receiving waters for Tullah WWTP;
- Southern Water received an Environmental Infringement Notice in relation to a raw sewage overflow from the Macquarie Point WWTP in February 2013;
- Southern Water received a formal written warning in relation to the failure to submit ambient monitoring information for Blackmans Bay and Cambridge WWTP; and
- Southern Water received a formal written warning regarding breach of environmental conditions during upgrading works at the Ranelagh WWTP, during which effluent of unacceptable bacteriological quality was released.

## 8.8 Biosolids reuse

The purpose of this section is to report on the level of reuse of biosolids, being the stabilised organic solids that result from sewage treatment processes.

Reuse involves managing biosolids safely and sustainably to beneficially utilise their nutrient, energy or other values. This may include biosolids beneficially used for agriculture (e.g. fertiliser), soil conditioning, mine rehabilitation and other applications recognised as reuse.

According to the *National Performance Framework: Urban performance reporting indicators and definitions handbook*, the information reported should incorporate:

- mechanical or other sewage treatment processes where the biosolids are available for reuse within a short time frame (e.g. less than one month). In this case, the volumes produced for the financial year are included; and
- wastewater treatment processes where the biosolids are only available for reuse within a longer time frame (e.g. lagoon processes of 10-30 years). In this case, the accumulation of biosolids which occurred over the financial year should be reported.

The reuse proportion can then be calculated on the basis of:

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

The water corporations provided estimates of sludge quantities generated at each site and information regarding the end use of this material in the context of AER reports. The level of detail provided was sufficient to calculate the amount of biosolids generated at most WWTPs, along with the proportion beneficially reused. Where sludge was removed from a treatment component and stored on site, it was included in the 'volume generated' calculations. Where necessary, biosolids quantities reported as 'liquid sludge' or 'dewatered sludge' were converted to 'dry solid tonnes'. It is noted that no estimates regarding the volume of sludge accumulated within sewage lagoons were provided.

Table 8.4 below summarises the results of this analysis. Readers will note that large quantities of the biosolids remain in storage, with the final end use to be determined in coming years.

The reuse proportion achieved in the southern region was significantly higher than in the other regions, indicating that the beneficial reuse of biosolids removed from WWTP is reasonably well established in this region.

Calculated reuse percentages achieved by Ben Lomond Water and Cradle Mountain Water are affected by the circumstance that large volumes have been stockpiled awaiting removal once a strategy to achieve beneficial reuse is in place. Also, in the case of Cradle Mountain Water, sludge sent to a commercial composting facility is not recognised as beneficial reuse due to the lack of confirmation regarding the material's final destination / use.

**Table 8.4 Biosolids - volume removed, end use and reuse percentage by corporation**

Corporation	Biosolids removed (dry solid tonnes/year)	Comments	End use / purpose	Biosolids reused (%)
Ben Lomond Water	~ 17 000	Large volumes are stored in sludge drying beds at Ti-Tree Bend WWTP and at Prospect Vale WWTP	Bridport WWTP was desludged and beneficially reused.	2%
Cradle Mountain Water	~ 6,000	Sludge from several WWTPs transferred to Pardoe or Wynyard sludge WWTP. Large quantity stored at Smithton.	Composting (Dulverton) and agricultural reuse	19%
Southern Water	~ 3 300	Prince of Wales Bay sludge reclassified during the reporting period; landfilling now being phased out.	Various agricultural reuse applications, incorporation into commercial composting; landfilling.	87%

For each of the corporations:

- Ben Lomond Water
  - several WWTPs are on a routine sludge removal schedule, with the majority of sludge transferred to Ti-Tree Bend WWTP where it is stored in drying beds. The practice of utilising this material for landfill capping at Remount Road landfill was discontinued during 2012-13 and as result, a large volume of sludge has accumulated at Ti-Tree Bend; and
  - a significant volume of sludge is also stored in an off-line lagoon at Prospect Vale WWTP. Investigations into land application of this material are underway but no firm timelines have been determined. The overall biosolids reuse level achieved in the northern region therefore remains low.

- Cradle Mountain Water

- 1 000 dry solid tonnes of lime amended biosolids generated at Pardoe WWTP was taken to multiple agricultural reuse sites in the vicinity of the plant. The majority of sludge removed from other WWTPs was either stored on site (Ulverstone) or transferred to a composting operation at Dulverton landfill. Pending classification of the end product, its end use remains uncertain and it has therefore not been included in the beneficial reuse category in Table 8.4 above; and
- significant quantities of sludge generated prior to 2012-13 are stored in geotextile bags at the Smithton WWTP site as well as a significant quantity being accumulated within the lagoons. Cradle Mountain Water is to investigate regional or State-wide beneficial reuse options following land application trials in relation to Wynyard, Sheffield and Smithton WWTPs.

- Southern Water

- the majority of the biosolids removed from WWTP premises were beneficially reused on agricultural land or incorporated into commercial/municipal composting operations. No major quantities were stored on WWTP premises;
- due to improvements in Prince of Wales Bay sludge quality which resulted in Zinc levels being sufficiently reduced to allow reclassification of the material as Class 2 Biosolids, landfilling of this material is being phased out; and
- with the exception of liquid sludge transferred to external WWTPs for further treatment, sludge was only removed from mechanical-biological WWTPs, not from lagoons.

#### **Box 8.2 Biosolids management – lagoon desludging**

Preliminary audits carried out by the corporations indicate that large amounts of sludge have accumulated in some lagoon systems. These systems are generally characterised by poor performance. Each of the water corporations have, in the past, indicated their intent to commence lagoon de-sludging programs, with high priority sites as determined in audits to be targeted first.

De-sludging of several lagoon systems previously earmarked as high priority by Southern Water did not occur during 2012-13.

Cradle Mountain Water made limited progress with de-sludging of lagoons identified as high priority (Ridgley). Overall, lagoon de-sludging progressed at a slower rate than initially proposed.

Ben Lomond Water de-sludged one lagoon system (Bridport) during 2012-13.

## 8.9 Net greenhouse gas emissions

The purpose of this section is to report on the impact of water and sewerage activities on greenhouse gas emissions. In doing so, 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.

The water corporations collated information regarding greenhouse gas emissions for the purpose of reporting under the National Performance Framework, consistent with the *Tasmanian Water and Sewerage Industry Performance and Information Reporting Guideline* (September 2011).

According to this information, the corporations generated the following volumes of greenhouse gases in 2012-13 in relation to the sewerage-related aspects of their operations:

**Table 8.5 Volume of greenhouse gases produced (CO<sub>2</sub>-equivalent), 2012-13**

	CO <sub>2</sub> -equivalent (in tonnes)	CO <sub>2</sub> -equivalent (in tonnes / 1 000 properties)
Ben Lomond Water	12 197	247.4
Cradle Mountain Water	10 525	268.5
Southern Water	14 189	166.0

None of the Tasmanian water corporations triggered the reporting threshold under the *National Greenhouse and Energy Reporting Act 2007* (Cwlth) (50,000 tonnes CO<sub>2</sub>-equivalent per facility).

There is no requirement to report greenhouse gas emissions directly to the EPA under the environmental conditions stipulated for WWTPs.





## 9 PRICING AND FINANCE

This Chapter discusses prices and pricing structures and therefore provides an overview of factors affecting the cost and affordability of water and sewerage services.

The financial performance of the water corporations is also presented and includes an analysis of trends in performance over time.

The pricing and finance arrangements and outcomes discussed in this Chapter are for the period 1 July 2012 to 30 June 2013, the first year of independent price regulation. A detailed account of the structure of pricing prior to regulation can be found in previous years' reports whilst the Regulator's Final Report and Determinations<sup>1</sup> contain a detailed account of the prices and pricing structures the water corporations were required to adopt for the first regulatory period (1 July 2012 to 30 June 2015).

### 9.1 Residential tariff structures

Residential water and sewerage tariffs are generally made up of a fixed charge, volumetric charge (two-part pricing) and, in some cases, special levies.

The fixed charge is the component of each residential customer's annual utility bill that does not vary with the amount of water used or sewage disposed. The volumetric charge is the per unit consumption charge levied on a customer for the water they use and is usually expressed as dollars per kilolitre (kL).

#### 9.1.1 Residential water tariff structure

The Regulator's price determinations took effect on 1 July 2012. The determinations included the requirement for two-part pricing to apply to all customers and the consequential removal of free water allowances. The Regulator also required the regulated entities to adopt a single pricing zone for each region, so that there is a consistent set of tariffs across each region.

Water service charges comprise two parts - a fixed charge, which is based on the size of the water connection to the property and a variable water usage charge based on the actual metered water usage at the property.

Usage based charges provide households with some capacity to influence their total bill by reducing water consumption. However, this is usually limited by the structure of the tariff and the cost of the fixed charges in relation to the total bill.

For a typical household in Tasmania with a standard connection and consumption around 200 kL per annum, water usage charges make up between 30 to 40 per cent

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<sup>1</sup> 2010 Price Determination Investigation – Regulated water and sewerage services in Tasmania – Final Report, May 2012.

of the total bill. In other jurisdictions usage charges typically make up around 70 per cent of the total bills issued by large water businesses (ie those with 100 000 connected properties).

### 9.1.2 Residential sewerage tariff structure

From 1 July 2012 sewerage tariffs were applied in accordance with the Regulator's price determination, with all linkages to property values removed and trade waste charges separated from sewerage charges.

Sewerage service charges are calculated on a single fixed charge based on the number of equivalent tenements (ET) assessed for each property.<sup>2</sup> A discount applies for customers on a limited service eg a septic tank effluent disposal (STED) scheme. Tariffs are increased proportionally for properties assessed as having greater than 1ET and/or where the connection size is larger than the standard 100 mm connection.

## 9.2 Prices and charges

This section provides an analysis of movements in the prices charged for water and sewerage services.

In 2012-13 price reforms started to transition customers to target tariffs<sup>3</sup> for water and sewerage charges, with Government mandated caps on annual increases in prices to avoid significant price movements from year to year. However, the price determinations did not address the impact of the rate of change of prices for customers whose prices were significantly above the target tariff, effectively maintaining any cross-subsidies present in the old pricing arrangements.

Customers whose 2011-12 bills were already above the target tariff had their prices frozen for 2012-13 (meaning prices would be maintained at 2011-12 levels) whilst customers below the target tariff had their prices increased by the maximum amount permitted under the price constraint.

The level of the target tariffs differs across regulated entities due to the vast array of pricing arrangements inherited from councils and reform priorities specific to each regulated entity. For example, Cradle Mountain Water adopted target tariffs that transitioned customer fixed charges to a higher level to achieve a greater degree of revenue certainty, whereas Southern Water prioritised transitioning customers to uniform cost reflective water usage charges in conjunction with the rollout of water meters in the southern region.

The actual amount paid by a customer in 2012-13 will depend on the amount they paid in 2011-12. However, the long term objective of price reform is to move

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<sup>2</sup> An ET is a classification used in the Water Services Association of Australia Sewer Code to measure the demand a property will place on infrastructure; for example, a single residential property is rated as one standard ET whilst a hotel may be rated as 50 ETs.

<sup>3</sup> Target tariffs have been determined based on judgments by the regulated entities on a transition path that commences the movement of customers towards uniform cost reflective tariffs.

customers to the target tariffs and for all customers to pay the same price for the same service.

### 9.2.1 Average residential bills

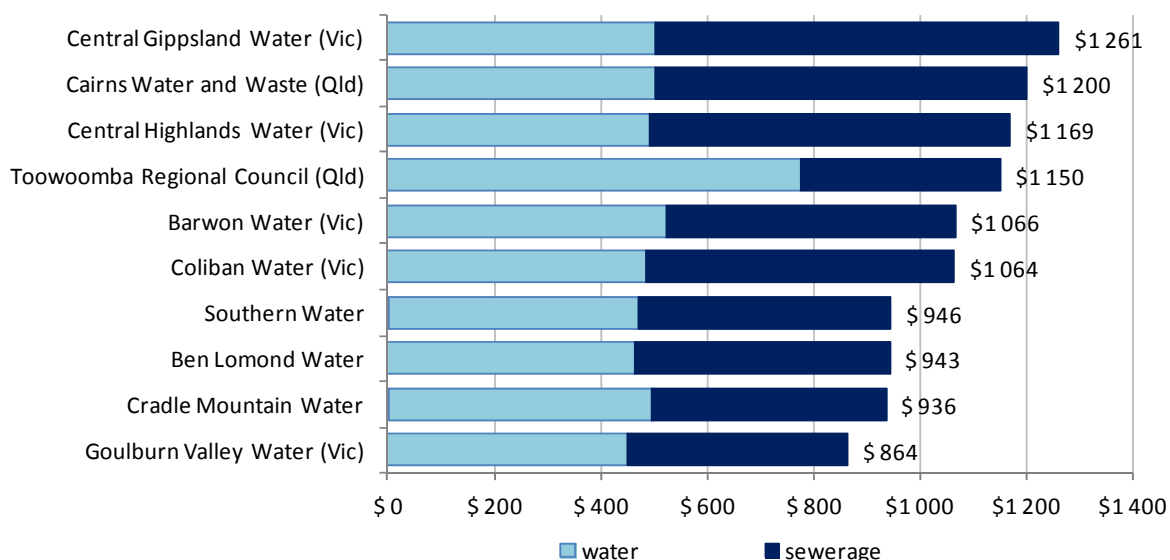
The average residential bills for water and sewerage services shown in Figure 9.1 have been calculated using average consumption in each region and include both the fixed and variable water and sewerage charges.

The typical household bill ranged from \$936 to \$946 per year, with quarterly bills issued over the course of a year. Typically, there was a 50:50 split between water charges and sewerage charges.

Differences in the calculated bills are largely due to the zonal pricing adopted by the water corporations and the proportion of customers above or below the target tariffs. For example, the variable water charges in some zones in the north-western region were as low as 35.26c per kL, compared to the target tariff of 90c per kL. The number of customers below the target tariff also affected the calculation of average residential bills.

Figure 9.1 provides a graphical comparison of the average residential bills of the Tasmanian water corporations with a selection of similarly sized<sup>4</sup> interstate water corporations. The average residential bill for water and sewerage services includes both fixed and variable charges where applicable, and is calculated using average consumption in each region.

**Figure 9.1 Typical average residential bills, 2012-13**



Note: Where businesses have multiple pricing zones, the average residential bill is calculated using the prices in the largest town.

<sup>4</sup> Based on customer numbers.

As shown in Figure 9.1, the average residential bills for 2012-13 for each of the Tasmanian water corporations compare favourably with a selection of interstate water corporations. However, it should be noted that price increases for Tasmanian customers continued to be constrained by the regulated price caps in 2012-13.

For a typical residential customer, fixed (water and sewerage network) charges make up around 80 per cent of the annual bill. This means that customers have a limited ability to reduce their bills by choosing to use less water. However, at 90 cents per kilolitre (target tariff), water usage charges in Tasmania are relatively low compared to mainland providers, which are on average around \$1.60 per kilolitre.

### 9.2.2 Pricing forecast 2012-13 to 2014-15

Over the regulatory period 2012-15, price increases for the majority of Tasmanian residential customers will be around 5.5 per cent per year.

Table 9.1 shows the calculated average residential bill for water and sewerage services for each year of the current regulatory period for a standard 20 mm connection (at target tariff).

**Table 9.1 Average residential bills for 2012-13 to 2014-15 (\$2012-13)**

	Average consumption 2012-13 (kL per household)	\$ 2012-13	\$ 2013-14	\$ 2014-15
Ben Lomond water	200	\$943	\$994	\$1 047
Cradle Mountain	160	\$1 124	\$1 187	\$1 253
Cradle Mountain (new customer connections)	160	\$1 190	\$1 221	\$1 253
Southern Water	190	\$932	\$982	\$1 035

For the majority of residential customers the following price regulation arrangements applied:

- customers whose 2011-12 bills were above nominated target tariffs had their prices frozen for the first two years of the first regulatory period (and will be reduced by five per cent in the final year of the first regulatory period);
- customers whose 2011-12 prices were equal to the applicable target tariff, faced annual increases of six per cent per year over the first regulatory period; and
- customers whose 2011-12 prices were below the target tariff, faced annual price increases capped at the greater of 10 per cent or \$50 per service per year (ie a maximum increase of the greater of 10 per cent or \$100 where a customer has both a water and sewerage connection) until they reach the target tariff.

For larger water customers, the \$50 cap increases in proportion to the size of their water connection.

This means that customers who were already paying prices significantly above the target tariff due to the price structure inherited from their local council will continue to

pay significantly more than other customers receiving the same service over the current regulatory period.

For the second price determination, the Regulator's price and service plan guideline has prioritised transitioning customers paying above the target tariff towards the target tariff and continuing to transition customers to a rational price structure.

### 9.3 Financial performance

Each year the water corporations are required to report to the Regulator on specified financial indicators as part of the State of the Industry Report (SOIR) and also to the National Water Commission (NWC) as part of the National Performance Framework reporting obligations. The Regulator reviews both sets of data, together with the corporations' annual reports, to ensure the consistency and accuracy of the data reported for the SOIR and for National Performance Report (NPR) purposes.

For this year's SOIR and NPR, the Regulator was able to review the submitted data early enough to ensure consistency between the SOIR and NPR.

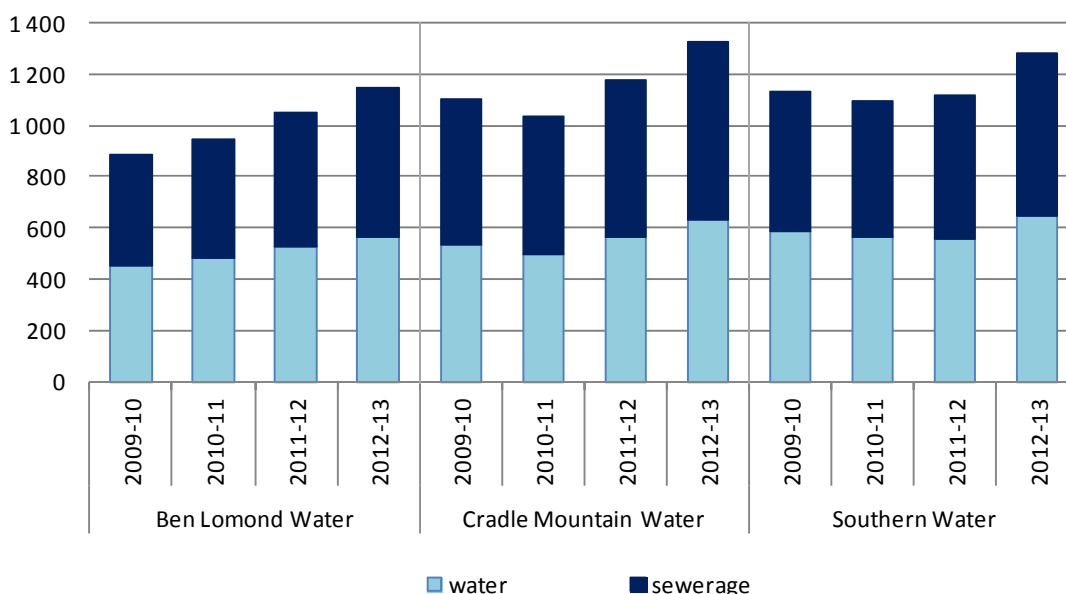
Some comparisons have been made with mainland water businesses identified as being relatively comparable in terms of the scale of their operations. These water businesses are Wannon Water, North East Water, Barwon Water and Goulburn Valley Water, all located in Victoria.

#### 9.3.1 Revenue

The amount of revenue received by each corporation is an indication of how effective planning and management activities have been in meeting the current and future needs of the water and sewerage infrastructure noting that the determinations have capped price increases and, therefore, each water corporation's revenue.

Figure 9.2 shows water and sewerage revenue per property (ie per property connection) for each corporation for each of the 2010-11, 2011-12 and 2012-13 financial years. The revenue data shown for 2012-13 is sourced from audited financial data. However, the number of property connections has not been audited.

It should also be noted that the data shown does not include revenue from third parties, such as Community Service Obligation (CSO) payments or the additional funding the State Government made to the corporations to compensate for the reduced price increases under the Interim Pricing Order (IPO). Revenue from third parties is reported in section 9.3.9.

**Figure 9.2 Revenue per property**

During 2012-13 the average revenue received for water and sewerage services per connected property was \$1 250 for Ben Lomond Water, \$1 466 for Cradle Mountain Water and \$1 333 for Southern Water. Figure 9.2 shows that each corporation received more revenue per property in 2012-13 relative to 2011-12. This increase in revenue reflects the new pricing structure and the application of two-part pricing to areas where it had previously not applied. However, the reduction of the Government's price cap rebate from \$4 million in 2011-12 to \$3.4 million in 2012-13 has limited the increase in total revenue received by the corporations.

In 2010-11 Cradle Mountain Water and Southern Water reported a decline in revenue per property, which was partly attributed to a change in the method of calculating revenue in that revenue for 2010-11 did not include other revenue not directly associated with water or sewerage services. Furthermore, an apparent understatement of Ben Lomond Water's reported revenue per property in 2009-10 for NPR purposes contributed to the extent of the increase in Ben Lomond Water's revenue per property between 2009-10 and 2010-11.

The water and sewerage corporations received revenue from water and sewerage services totalling \$263.5 million during 2012-13, made up as follows in Table 9.2.

**Table 9.2 Revenue for water and sewerage services, 2012-13 (\$millions)**

	Water	Sewerage	Other	Total
Ben Lomond Water	32.95	28.51	11.09	72.55
Cradle Mountain Water	27.00	27.40	8.41	62.80
Southern Water	61.90	54.09	12.12	128.11
<b>TOTAL</b>	<b>121.84</b>	<b>109.99</b>	<b>31.62</b>	<b>263.46</b>

Revenue that could not be allocated to either water or sewerage services has been included as 'Other'. 'Other' includes customer and developer contributions, the Government funded price cap rebate, Government funded concessions and miscellaneous charges.

### 9.3.2 Written down replacement cost of fixed assets

The written down replacement cost (WDRC) represents the value of the fixed assets of the utility, less depreciation, which are used to deliver services and hence derive income.

Not all urban water utilities value assets are based on the WDRC methodology and therefore the comparisons with interstate utilities in this report should be treated with caution.

As shown in Table 9.3, the total WDRC of fixed water assets in Tasmania as at 30 June 2013 was \$1.44 billion, with 58 per cent of the total asset value located in the southern region which services the highest proportion of connected properties.

#### Box 9.1 Long term financial sustainability

The fact that all three water corporations have been required to adopt 'impaired' asset values<sup>5</sup> means that current levels of revenue are insufficient to fund the repair and replacement of existing assets. Without increases in revenue the corporations are not financially sustainable in the long-run based on their existing assets, let alone being able to fund the significant capital expenditure required to meet environmental and public health regulatory requirements.

The total WDRC of fixed sewerage assets in Tasmania was almost \$1.4 billion. Again, Southern Water with 45 per cent had the highest contribution to the total.

The total WDRC of fixed water and sewerage assets in Tasmania was in excess of \$2.8 billion as shown in Table 9.3.

**Table 9.3 Nominal written down replacement cost of fixed water supply and sewerage assets, 2012-13 (\$millions)**

	Water supply assets	Sewerage assets	Combined water and sewerage assets
Ben Lomond Water	329.38	397.78	727.15
Cradle Mountain Water	279.42	352.12	631.55
Southern Water	832.81	619.74	1 452.55
<b>TOTAL</b>	<b>1 441.61</b>	<b>1 369.64</b>	<b>2 811.25</b>

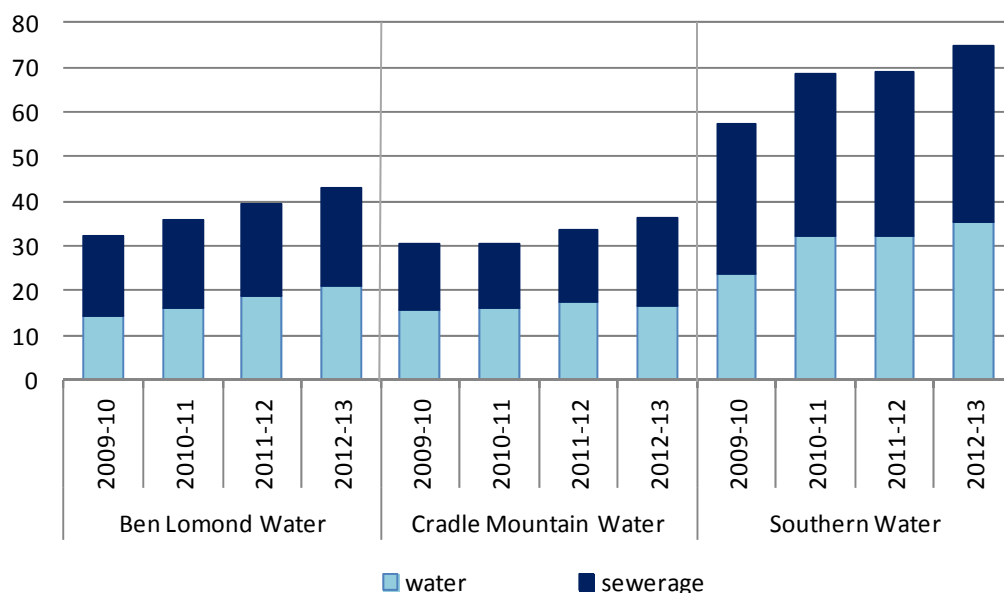
### 9.3.3 Operating costs

Operating costs comprise the water corporations' salaries and wages together with the consumables, operation, maintenance and administration expenses incurred in providing water and sewerage services.

<sup>5</sup> The Australian Accounting Standard AASB136, Impairment of Assets, requires an 'impaired' or reduced asset value to be adopted in an entity's financial statements where an asset is reflected in those statements at more than the amount to be recovered through use or sale of the asset. As a consequence, in these situations, depreciation reported in the financial statements is also based on the impaired asset values.

Figure 9.3 depicts the total operating costs for the water and sewerage corporations over the past four financial years, and the breakdown between water operating costs and sewerage operating costs.

**Figure 9.3 Water and sewerage operating costs (\$millions)**



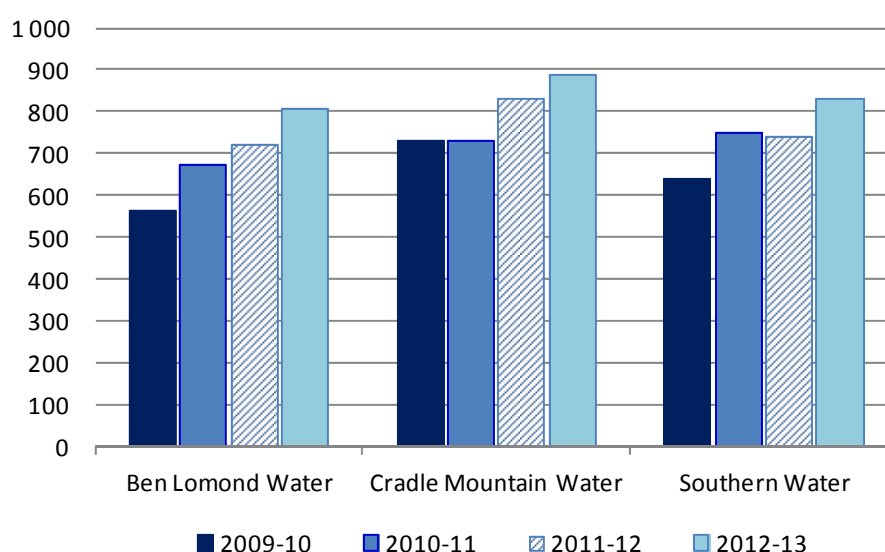
Notes: Ben Lomond Water did not provide a breakdown of operating costs between water and sewerage for 2009-10, therefore the breakdown is based on later years' ratios between water and sewerage operating costs.

Total operating cost for water and sewerage services in Tasmania in 2012-13 was \$154 million compared to \$142 million in 2011-12. On average, operating costs have increased by around 8.3 per cent between 2011-12 and 2012-13.

Southern Water had the highest operating cost of \$74.8 million while Ben Lomond Water and Cradle Mountain Water's operating costs were \$43.0 million and \$36.2 million respectively.

Figure 9.4 shows the total water and sewerage cost per property, based on the property connections in each region, for each of the three water corporations over the past four financial years.



**Figure 9.4 Water and sewerage operating costs per property (\$)**

As shown in Figure 9.4 and Table 9.4, Cradle Mountain Water had the highest operating costs per property in 2012-13 at \$887 per property followed by Southern Water at \$829 per property. At \$809 per property, Ben Lomond Water had the lowest operating costs.

Operating costs per property increased by between seven and twelve per cent from 2011-12 to 2012-13, with the largest increases recorded by Ben Lomond Water and Southern Water. Cradle Mountain Water's operating costs for water actually decreased in the period by around six per cent, but this was offset by a large increase in operating costs for sewerage of around 20 per cent.

The increase in cost per property is largely attributed to increased salary costs and increased general operating costs. Across the three water corporations employee related expenses for 2012-13 increased by around 15 per cent compared to 2011-12, whilst the cost of raw materials and consumables increased by around four per cent. Conversely, Cradle Mountain Water and Southern Water reported significant decreases in their administrative expenses, of seven and 11 per cent respectively for 2012-13 compared to 2011-12.

**Table 9.4 Operating costs— water and sewerage – 2012-13 (\$ per property)**

	Water	Sewerage	Total operating cost
Ben Lomond Water	360	449	809
Cradle Mountain Water	389	498	887
Southern Water	370	459	829

Operations and maintenance expenses also increased significantly from 2011-12 for both Cradle Mountain Water (17 per cent) and Southern Water (6 per cent). Ben Lomond Water's operational costs and administrative costs did not change significantly from 2011-12.

Based on an analysis of NPR data for 2012-13, the operating costs per property for the three Tasmanian water corporations are similar to their mainland counterparts, with costs for water operations slightly lower than mainland water businesses.

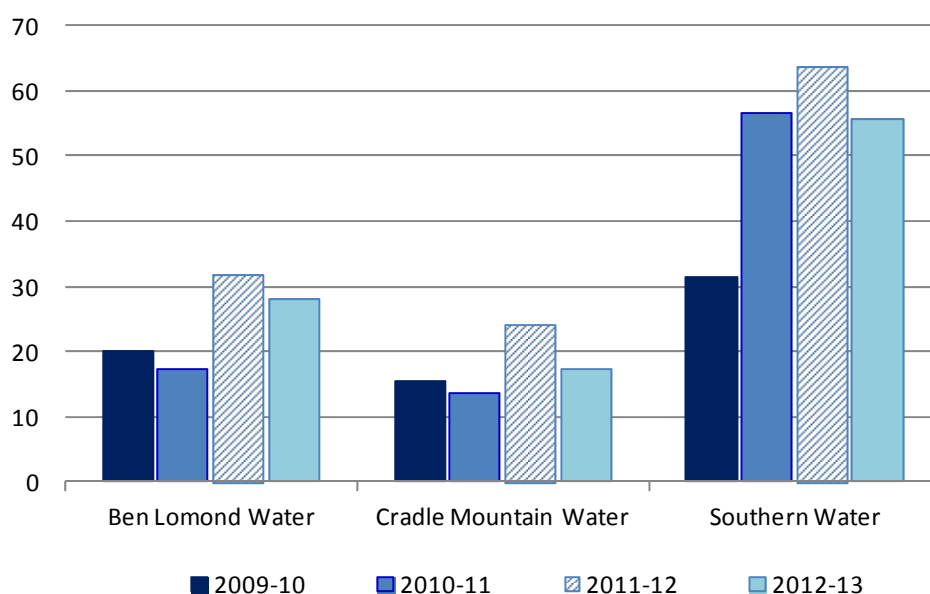
However, it should be noted that the Tasmanian corporations' operating costs are based on their current levels of regulatory non-compliance meaning that they are not directly comparable to mainland providers with relatively higher levels of regulatory compliance i.e. increased regulatory compliance generally leads to an increase in operating costs.

### 9.3.4 Capital expenditure

Capital expenditure (capex) is investment in new assets including expenditure on new works, renewals or replacements and any other expenditure that would otherwise be referred to as capital.

The trend in capital expenditure by the water corporations over the past four financial years is shown in Figure 9.5. Total combined capital expenditure in 2012-13 was around \$101 million.

**Figure 9.5 Total capital expenditure (\$millions)**



Note: Historical capital expenditure totals have been amended to exclude developer charges and gifted assets.

Capital expenditure decreased across all three corporations in 2012-13 compared to 2011-12, indicating that some of the high cost capital projects of 2011-12 were completed or nearing completion. For example, Southern Water's metering project has now been completed, which has significantly reduced the capital expenditure in the period. Some projects have also been deferred to future years.

Capital expenditure is expected to remain fairly constant over the next two years, with the water corporations continuing to focus on projects to improve service standards and meet their regulatory obligations.

Chapter 5 outlines some of the major capital expenditure projects underway or completed by the corporations during 2012-13. Further information on expected future capital investment in water and sewerage assets is included in Chapter 10.

The following sections separate capital expenditure between water and sewerage operations to better understand what areas the water businesses are focusing on.

Figure 9.6 and Figure 9.7 shows the combined capital expenditure for water and sewerage across the three water and sewerage corporations classified as new works, renewals or replacements, gifted assets and other capital expenditure for both water and sewerage infrastructure. Note that gifted assets and developer charges are excluded from the capital expenditure figures reported above.

**Figure 9.6 Total capital expenditure by category (\$millions): Water**

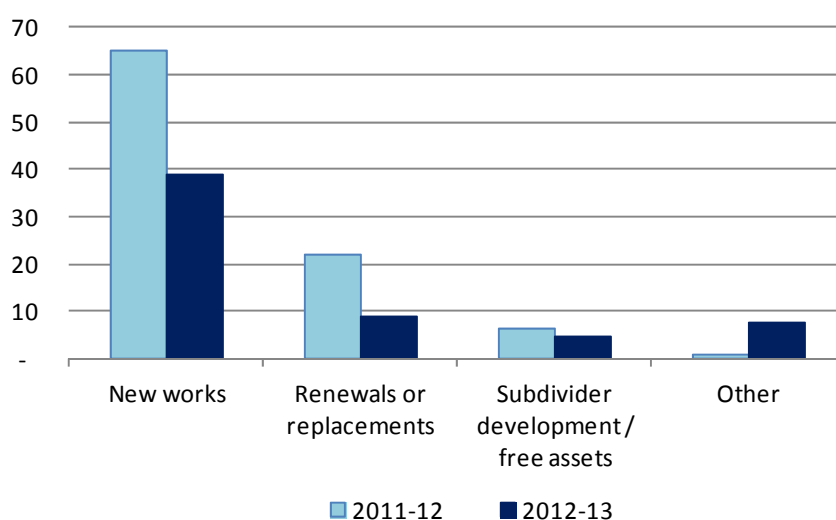
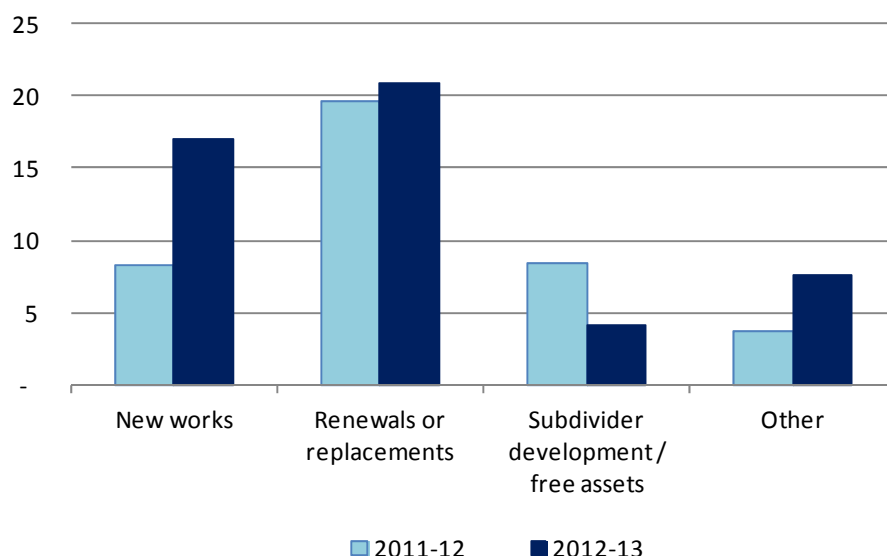


Figure 9.6 shows expenditure on new works made up the highest percentage of expenditure on water in 2012-13, although the amount spent on new works was around \$26 million less than in 2011-12. As discussed above, some significant projects such as Southern Water's metering project have now been completed, resulting in a reduced spend on new works in the period.

As shown in Figure 9.7 capital expenditure on sewerage for new works increased in 2012-13 relative to 2011-12, whilst expenditure on renewals and replacements remained high, with increases in this category reported by all three water corporations.

**Figure 9.7 Total capital expenditure by category (\$millions): Sewerage**

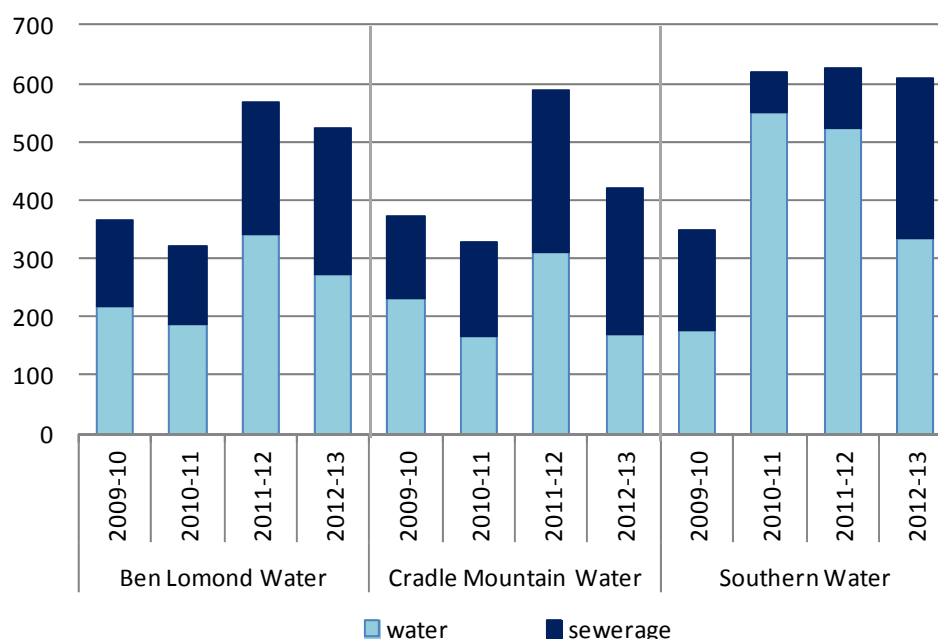
Spending on renewals or replacement remains a significant proportion of capital expenditure on sewerage, due to a number of large projects to upgrade sewerage pump stations and build new sewerage pipelines. The level of spending on renewals of sewerage infrastructure is expected to be sustained over the first regulatory period as projects that aim to improve network reliability are progressed.

In 2012-13 Southern Water purchased its office building and depot properties for around \$13 million, which has been included in the 'other' category, apportioned evenly for both water and sewerage.

In order to analyse the level of capital expenditure between the water corporations, it is useful to look at capital expenditure relative to the size of the customer base.

Figure 9.8 shows the level of capital expenditure per property by each corporation, split between water and sewerage.

In 2012-13 capital expenditure per property ranged from \$422 to \$610, with levels of expenditure generally lower compared to the previous year. Cradle Mountain Water's capital expenditure has dropped significantly in 2012-13.

**Figure 9.8 Capital expenditure per property (\$) - water and sewerage**

In 2012-13 Southern Water's capital expenditure per property on sewerage infrastructure increased roughly in proportion to the reduction in its expenditure on water infrastructure, indicating a shift in the focus of key capital projects towards improving the reliability of its sewerage network. During 2012-13 Ben Lomond Water and Cradle Mountain Water continued to spend relatively equal amounts of capital expenditure on water and sewerage per property.

### 9.3.5 Economic rate of return

The economic rate of return (ERR) demonstrates the extent to which each water and sewerage corporation meets both National Competition Policy and National Water Commission requirements in terms of achieving full cost recovery. The ERR is calculated as follows:

Economic rate of return:		
Revenue from water and sewerage business operations	less	Operating expenses (operation, maintenance and administration expenses) and current cost depreciation)
<hr/>		
Written Down Replacement Cost of operational assets		

For National Performance Reporting (NPR) purposes, the corporations are required to use asset values and, consequentially, depreciation based on the written down replacement cost (WDRC).

As shown in Table 9.5, in 2012-13 all three water corporations reported a positive ERR, indicating a general improvement over the last financial period.

**Table 9.5 Economic Rate of Return – water and sewerage – 2009-10 to 2012-13 (%)**

	2009-10	2010-11	2011-12	2012-13
Ben Lomond Water	0.50	0.91	1.01	1.37
Cradle Mountain Water	-0.49	0.02	-0.24	1.23
Southern Water	0.89	1.36	1.39	0.80

However, if it is assumed that a real rate of return to reflect full cost recovery is 5.32 per cent per annum<sup>6</sup>, then all three water corporations are generating rates of return significantly below full cost recovery. However, comparable water businesses on mainland Australia recorded similar rates of return, ranging from 0.04 to 2.5 per cent, indicating that the performance of the Tasmanian water corporations is comparable to their interstate counterparts. Given that the Tasmanian water industry is in a transitional reform process, it is prudent to expect the rate of return to remain relatively low while the water corporations work towards meeting their respective regulatory obligations.

### 9.3.6 Net Profit after tax

Net profit after tax (NPAT) is the NPAT figure disclosed in annual financial statements.<sup>7</sup> Net profit is driven by the factors that contribute to a corporation's income and expenditure, including pricing structures, water restrictions, government policy, asset condition, climate and scale. Under the National Performance Framework, NPAT is required to be reported as it is reported for statutory accounting purposes and it therefore reflects accounting depreciation but excludes dividend payments and can vary significantly from year to year.

The NPAT ratio shows how much profit the entity makes for every dollar of revenue earned and is calculated as follows:

<p><b>NPAT ratio:</b></p> $\frac{\text{Net Profit less income tax equivalents}}{\text{Revenue from water or sewerage business operations}}$
---

The NPAT ratio assists readers in comparing different sized organisations and is an indicator of the effectiveness of the organisation's pricing strategy and how well it controls costs. Table 9.6 shows NPAT and the profit ratio (ie net profit after tax divided by total revenue) for each of the three water corporations for 2012-13.

<sup>6</sup> This is the rate adopted by the Regulator for the first regulatory period in its Price and Service Plan Guideline (Version 1, October 2011) which was used to calculate the amount of revenue each water corporations requires to transition to full cost recovery.

<sup>7</sup> NWC Handbook, page 96.

**Table 9.6 Profits and profit ratios – 2012-13**

	Net profit after tax (\$'000)	Profit ratio (%)
Ben Lomond Water	8 777	12.10
Cradle Mountain Water	5 215	8.30
Southern Water	8 447	6.59

Table 9.6 shows that all three corporations made a net profit after tax during 2012-13. Ben Lomond Water had the highest dollar profit and the highest ratio of profit to total revenue, whilst the profit ratio for Southern Water was the lowest at 6.59 per cent. Cradle Mountain Water had the lowest profit and its profit ratio was 8.3 per cent.

In 2012-13 Ben Lomond Water significantly outperformed its interstate counterparts as the NPAT ratio for other comparable utilities was around nine per cent.

### 9.3.7 Dividends

The level of dividends indicates the amounts returned to local government shareholders or, conversely, the amounts retained by each water corporation for reinvestment in the business.

The dividend amounts are determined by the local government shareholders in line with the provisions of the *Water and Sewerage Corporations Act 2008* and are paid having regard to the respective Letters of Shareholder Expectations. In accordance with the NPR Handbook definition, 'dividends' also includes amounts paid after 30 June 2013 that relate to the 2012-13 financial year.<sup>8</sup> Table 9.7 shows the dividends payable and the dividend payout ratio (ie dividends payable divided by NPAT) for the three corporations for 2012-13.

**Table 9.7 Dividends and dividend payout ratios – 2012-13**

	Dividends payable (\$'000)	Payout ratio (%)
Ben Lomond Water	1 335	15
Cradle Mountain Water	877	17
Southern Water	10 429	123

Note: Dividends do not reflect all returns to council owners; that is, returns to owners include income tax equivalents and guarantee fees as well as dividends.

Table 9.7 shows that Southern Water had the highest dividends payable and the highest dividend payout ratio returning dividends that significantly exceeded its NPAT to its shareholders, ie southern Tasmanian councils. Ben Lomond Water returned 15 per cent of its NPAT to shareholders. For the first time since 2009-10, Cradle Mountain Water declared a dividend in 2012-13, returning 17 per cent of its NPAT to shareholders.

<sup>8</sup> NWC Handbook, page 91.

### 9.3.8 Debt and Interest

Debt and interest ratios are useful tools in determining the financial sustainability and viability of a business.

The net debt to equity (NDTE) ratio indicates the extent to which a business is funding its activities from external debt sources, rather than from its shareholders (ie through equity).

The NDTE ratio is calculated as follows:

<b>Net debt to equity:</b>	
$\frac{\text{Net Debt}}{\text{Equity}}$	or $\frac{\text{Short term debt} + \text{Long term debt} - \text{Cash} - \text{Other investments}}{\text{Total assets (based on WDRC)} - \text{Total liabilities}}$

The interest cover ratio indicates how easily a business can meet its debt obligations and pay interest on outstanding debt.

The interest cover ratio is calculated as follows:

<b>Interest cover:</b>	
$\frac{\text{EBIT}}{\text{Net Interest Expense}}$	or $\frac{\text{Revenue from operations} - \text{Operating expenses} - \text{Depreciation}}{\text{Total interest expenses} - \text{Interest income}}$

Specifically, the interest cover ratio is a measure of the number of times a business could make the interest payments on its debt with its earnings before interest and tax (EBIT).<sup>9</sup> EBIT is, as the title suggests, a measure of a business' profit that does not take into account interest and income tax expenses.

**Table 9.8: Net debt to equity and interest cover ratios 2012-13**

	Net debt to equity (%)	Interest cover (times)
Ben Lomond Water	5.57	3.94
Cradle Mountain Water	17.07	1.29
Southern Water	12.81	1.15

The lower the interest cover ratio the more the business is burdened by debt and the associated interest expense. If the EBIT calculation is less than zero, the interest cover is reported as nil. If the net interest is zero and the EBIT is greater than zero, the interest cover is reported as being greater than one.

<sup>9</sup> EBIT is calculated using depreciation based on the written down replacement cost (WDRC) of assets. Depreciation calculated on this basis is far greater than depreciation calculated on impaired asset values and therefore reduces EBIT and, in turn, a number of the other financial ratios.



Southern Water's NDTE increased to 12.81 per cent in 2012-13 continuing the upward trend seen over the last four financial years that has seen significant increases in debt to fund capital projects whilst equity has remained relatively steady. Southern Water's interest cover ratio has also declined to 1.15 times due to higher interest expenses and a reduction in earnings (EBIT).

Due to an increase in revenue, Ben Lomond Water's interest cover ratio has improved to 3.94 times, well above the interest cover of the other two corporations. This indicates that Ben Lomond Water can more easily meet its debt obligations and pay interest on debt from its earnings than the other two corporations. However, a large increase in short-term borrowings has increased net debt to \$41.4 million whilst equity has remained static at around \$740 million, resulting in an increase in NDTE in 2012-13. Despite these increases, Ben Lomond Water's NDTE is still very low compared to the other two corporations.

After recording a negative EBIT in 2011-12 (resulting in nil interest cover), in 2012-13 Cradle Mountain Water's earnings increased whilst debt has remained relatively stable, resulting in an improvement in its interest cover ratio to 1.29 times. An increase in net debt and a small reduction in equity also resulted in an increased NDTE of 17.07 per cent in 2012-13.

### 9.3.9 Community service obligations

A community service obligation (CSO) payment is a subsidy provided by the Government to allow for the provision of a good and/or service at less than total cost.

In 2009-10 the State Government established and funded a water and sewerage concession whereby eligible customers received a concession which reduced their water and sewerage bill. In 2012-13 eligible customers were entitled to a concession of up to \$159 (\$79.50 each for water and sewerage). To be eligible, 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:

- Centrelink Health Care Card;
- Centrelink Pensioner Concession Card; or
- Department of Veterans' Affairs Repatriation Gold Card.

These concession arrangements are funded by the State Government and administered by the water and sewerage corporations.

In addition, in 2012-13 the State Government provided funding to the water corporations to assist their short-term financial viability and reduce pressure for price shocks from 1 July 2012 (price cap rebate). Payments from the Government to the water and sewerage corporations was around \$3.4 million in 2012-13 and is expected to be in the order of \$1.9 million in 2013-14.

Table 9.9 shows the amount of State Government funding received by each corporation to cover water and sewerage concessions and price rebates during 2012-13. It includes the proportion of each corporations' revenue that is obtained from the CSOs.

**Table 9.9 Community Service Obligation payments from the State Government**

	Water and sewerage pensioner concession (\$'000)	Price cap rebate (\$'000)	Total (\$'000)	Revenue from CSOs (%)
Ben Lomond Water	2 084	654	<b>2 738</b>	3.8
Cradle Mountain Water	1 722	1 809	<b>3 531</b>	5.6
Southern Water	3 163	962	<b>4 125</b>	2.5
<b>TOTAL</b>	<b>6 969</b>	<b>3 425</b>	<b>10 394</b>	

In 2012-13 a total of 50 275 customers received a concession at a total cost of \$6.97 million. Including price cap rebates, the total value of CSOs in 2012-13 was just over \$10.39 million.

The amounts received for the price cap rebate and pensioner concession are relative to each corporation's size (based on customer numbers). However, as the price caps applied differently to each region and were based on the pre-reform tariff structure, it was the application of the price caps that determined the amount of rebate funding, not the number of customers.

Cradle Mountain Water received \$3.53 million, or 5.6 per cent of its revenue from State Government funded CSOs in 2012-13. Around half of the CSO was attributable to the price cap rebate, indicating that the north-western region had a high number of customers subject to price caps due to their pre-reform tariff structure.

Ben Lomond Water received \$2.74 million, or 3.8 per cent of its revenue and Southern Water received \$4.13 million, or 2.5 per cent of its revenue from CSOs in 2012-13.

### 9.3.10 Capital works grants

Capital works grants are funds received by the water corporations from State or Commonwealth governments to undertake specific capital works.

**Table 9.10 Capital grants – water and sewerage (\$'000)**

	Ben Lomond Water	Cradle Mountain Water	Southern Water	Total
Water	223	550	6 400	7 173
Sewerage	0	0	0	0
<b>TOTAL</b>	<b>223</b>	<b>550</b>	<b>6 400</b>	<b>7 173</b>

In 2012-13 Southern Water received \$6.4 million in Australian Government funding for the Huon Valley regional water scheme.

A total of \$7.17 million was received by the water corporations in 2012-13 for their capital works programs, compared to almost \$14 million in 2011-12. In previous years, funding for the roll out of water meters had been provided by the Australian Government, together with funds for projects identified under the "Water for the Future" initiative.

## 9.4 Financial sustainability

Over the first regulatory period it is expected that the impacts of price reform will result in the water corporations' annual revenue from customers increasing by between three and 13 per cent in real terms over the period 1 July 2012 to 30 June 2015. Actual regulated revenue for 2012-13 remains below a sustainable level for Ben Lomond Water and Cradle Mountain Water, ie regulated revenue in 2012-13 was below the lower revenue limit<sup>10</sup> outlined by the Regulator in its Final Investigation Report (May 2012) for that year.

Although Southern Water's actual revenue in 2012-13 was above the calculated lower revenue limit, its operating and maintenance (OM) costs were much higher than expected ie if the revenue limits were recalculated based on the actual figures for 2012-13 the level of regulated revenue required to reach the lower revenue limit and, therefore, achieve financial sustainability would be higher than originally forecast due to the impact of increased OM costs.

Table 9.11 compares the forecast revenue for each water corporation against the actual revenue reported and lower revenue limit calculated by the Regulator. Actual revenue in 2012-13 was at least two per cent higher than forecast in the Regulator's Final Report, with Cradle Mountain Water reporting revenue that was six per cent higher than expected.

**Table 9.11 Forecast and actual revenue and calculated revenue limit, 2012-13 (\$'000)<sup>a</sup>**

	<b>Forecast revenue 2012-13</b>	<b>Actual revenue 2012-13</b>	<b>Lower revenue limit</b>	<b>Statutory revenue limit</b>	<b>Upper revenue limit</b>
Ben Lomond Water	62 162	64 083	66 264	85 325	100 985
Cradle Mountain Water	55 540	58 923	59 253	75 595	92 823
Southern Water	116 781	119 366	118 489	154 804	191 341

a Regulated revenue; excludes contributed assets and headwork charges, interest earned, Government grants and irrigation income.

<sup>10</sup> The lower revenue limit is the minimum revenue the regulated entity requires to cover its cost of operations and achieve financial sustainability.



## 10 PRIORITIES FOR IMPROVING PERFORMANCE

This Chapter sets out the key priorities for improving the Tasmanian water and sewerage industry's performance.

Opportunities to improve performance have been identified with reference to the customer service standards, and through general monitoring of regulatory compliance. It includes issues related to physical assets through to administrative and management practices.

Whilst the primary focus of this chapter is on the three regional water corporations as service providers, the activities of other participants and stakeholders in the industry such as State Government agencies and local government are also addressed. As such, this Chapter provides:

- an overview of the approach taken by environmental, public health and water and dam safety regulators in identifying future capital expenditure priorities;
- a summary of actions taken by the corporations in 2012-13; and
- future capital expenditure priorities.

Other factors such as demographic and development outlooks are also likely to inform future assessments of opportunities for improving industry performance.

### 10.1 Framework for the identification of priority future projects

The following sections examine the processes and considerations adopted by key industry regulators in relation to identifying priorities for future capital expenditure across the water and sewerage sector.

#### 10.1.1 Environment Protection Authority

##### 10.1.1.1 *Wastewater management plan update*

Under the terms of their interim operating licences, each corporation was required to develop a Wastewater Management Plan (WWMP) for the approval of the Environment Protection Authority (EPA). Such plans were submitted and approved by the Director, EPA in 2011. The WWMPs provide detailed information regarding wastewater related projects including cost break-downs and implementation schedules over a medium-term planning horizon to July 2015.

In addition to guiding decisions taken by the corporations regarding priorities and project funding, the WWMPs also serve as reference documents. Information contained in the plans is, for example, referred to during the development of specific environmental conditions for WWTPs which assists with the roll-out of Environment Protection Notices (EPNs).

Considering the five-year planning horizon of these documents, it is to be expected that deviations from the agreed version of the plan may become necessary due to additional developments, revised priorities or delays in project delivery. Therefore, in 2012, the Director EPA requested that the corporations prepare a WWMP review report to provide an update on progress with the implementation of the identified projects.

Reports delivered by the corporations varied significantly in terms of scope and presentation. With regards to the content covered in the revised plans, the following key issues were identified in the EPA's review:

### **Ben Lomond Water**

- Most significant projects identified in the WWMP were progressed in accordance with the agreed timelines. Overall, significant progress was made against the commitments in the WWMP.
- Much needed works at Longford WWTP were delayed; the 2012-13 reporting period saw plans to improve the plant performance via pollutant source control in form of a commercial partnership to develop a fertiliser plant fail. Plans for relocation of the outfall to a location affording better dilution were delayed and subsequently thrown into doubt and interim operational improvements due to be completed by June 2012 significantly delayed. A final committed strategy to bring this high priority plant into compliance with environmental approval conditions remains elusive.
- Wastewater-related capital expenditure in 2011-12 exceeded the original forecast. Likewise, forecast capital expenditure for 2012-13 was also adjusted upwards from the figures in the WWMP.

### **Cradle Mountain Water**

- Limited progress was made with the implementation of the 2011-12 works schedule.
- Perhaps as a result of the delay in delivering some projects, CMW has not been successful in meeting its own targets with regards to improvements in WWTP compliance levels. The WWMP indicated that full compliance with regulatory discharge limits would be achieved by 2012-13 for the following WWTPs: Boat Harbour, Cradle Valley, Railton, Ridgley, Round Hill (Burnie), Sheffield, Stanley, Sisters Beach, Smithton, Strahan, Tullah and Wynyard.

Appendix 4 of this report contains EPA's analysis of compliance levels for these WWTPs. While compliance levels vary widely, from 44 per cent (Smithton) to 99 per cent (Cradle Valley), it is clear that, overall, significant improvements are still required to meet the identified benchmarks.

- A commitment to carry out the first phase of ambient monitoring programs in relation to approximately half of the CMW WWTPs in 2012-13 was not implemented. The project was postponed by approximately one year. The lack of ambient monitoring will hamper the corporation's ability to determine future upgrading works requirements.

- Unplanned events requiring capital spending were highlighted as a major factor causing delays in WWMP implementation.

### **Southern Water**

- Limited progress was made in terms of implementation of the works schedule for 2011-12 and further delays of key projects originally scheduled for 2012-13 were likely (eg Blackmans Bay and Brighton WWTP upgrade).
- Capital expenditure for the wastewater sector for 2011-12 was significantly lower than planned. Forecast capital expenditure for 2012-13 had also been adjusted down from the figures in the WWMP.
- Reasons provided for such delays included the need for a more thorough investigation/planning phase, conflicting priorities, unplanned events requiring capital spending and project delays caused by external planning and approval issues (eg Duckhole Dam).
- Lagoon de-sludging has not been progressed in accordance with the original timelines. This continues to affect compliance levels of a number of lagoon WWTPs.
- Several major projects were progressed consistent with the original timeline, eg upgrading of Ranelagh WWTP and connection of Tarooma WWTP to Sandy Bay reticulation catchment.
- An inlet works program is to be rolled out in 2013-14, which is likely to have a positive impact on compliance levels.
- Significant progress was made with the development of comprehensive ambient monitoring plans. An ambient monitoring plan in relation to seven WWTPs discharging into the Derwent Estuary was submitted to the EPA in draft form. Following EPA review, a modified version is being developed with a view to conducting the monitoring program in 2014.
- Several smaller scale ambient monitoring programs were conducted in 2012-13 (eg Bicheno, New Norfolk, Cambridge, Margate). However, in some cases these monitoring efforts did not satisfy the EPA's requirements.

The primary focus for the EPA will continue to be to work with Taswater to ensure that appropriate strategic WWMPs are maintained to set appropriately prioritised direction for the company. The EPA will be looking to much improved performance in the implementation of these plans in the coming years given the disappointing progress to date.

#### **10.1.1.2 Environmental conditions updating**

A priority project of the EPA is ensuring that all WWTPs are regulated under a contemporary suite of environmental conditions. The aim is to achieve greater consistency and to phase in modern environmental requirements with regards to technical standards, monitoring practices, reporting arrangements and plant management. The EPA is also gradually removing "legacy" conditions, originally issued to Councils which formerly operated the WWTPs, which contain timeframes

and requirements that have been superseded by more recent agreements, including the WWMPs.

During 2012-13 the EPA continued the process of updating environmental conditions on a plant by plant basis. Ten EPNs were issued during this period and a number of others released in draft form.

Progress in finalising standardised environmental conditions relating to WWTPs will assist in the issue of EPNs. An appeal to the Resource Management and Planning Appeal Tribunal raised by Cradle Mountain Water in relation to a standard condition was ultimately resolved in the Supreme Court in favour of the Director, EPA. This outcome provides greater clarity regarding the permissible scope of environmental conditions issued by the Director, EPA.

Standardised conditions are designed to be consistent with the principles outlined in relevant policy documents, including:

- *State Policy on Water Quality Management* (1997);
- *Environmental guidelines for the reuse of recycled water in Tasmania* (DPIPWE, 2001);
- *Emission limit guidelines for sewage treatment plants that discharge pollutants into fresh and marine waters* (DPIPWE, 2001); and
- *National water quality management strategy* (a suite of documents relating to wastewater management).

#### **10.1.1.3      *Ambient monitoring*<sup>1</sup>**

The EPA had previously identified the lack of comprehensive ambient monitoring around wastewater treatment plant outfalls, and the resulting inability to properly characterise the associated level of risk, as a key issue in the context of environmental regulation in the wastewater sector.

Ambient monitoring programs, prioritised according to environmental considerations, are included as projects in the corporations' respective WWMPs. Corresponding requirements are incorporated into EPNs with timeframes determined for each WWTP according to priority.

During the reporting period, the EPA Division finalised its *Framework for Ambient Monitoring of Receiving Waters in relation to Wastewater Treatment Plant Discharges*. The intent of this document is to clarify the requirements for ambient monitoring programs for proponents and to facilitate efficient turn-around of draft Ambient Monitoring Plans submitted to the EPA.

The framework documents the EPA's preferred methodology for negotiating ambient monitoring programs with the corporations and to ensure that a consistent, logical approach is being followed. The aim is to develop monitoring programs which reflect the level of risk associated with a specific treated effluent discharge. Properly

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<sup>1</sup> Monitoring the surrounding area or receiving environment.



designed ambient monitoring can provide important information regarding the impacts of past practices and the results of such monitoring are crucial for the determination of site-relevant, cost effective solutions consistent with the *State Policy on Water Quality Management* 1997.

#### **10.1.1.4 Sustainable water recycling**

The EPA Division continues to be a participant in the National Recycled Water Regulator's Forum (NRWRF) which provides an important forum for state and territory government agencies to discuss the development, implementation and evaluation of strategies to ensure that water recycling schemes protect both public health and the environment.

The NRWRF provides the opportunity to improve communication between state and territory regulatory agencies regarding health-related and environmental regulatory requirements for safe and sustainable recycled water schemes.

While the Tasmanian guideline - *Environmental Guidelines for the Use of Recycled Water in Tasmania, December 2002* remains a key guidance document for recycled water developments, the more recent risk-based approach of the *Australian guidelines for water recycling: Managing health and environmental risks (Phase 1) - 2006* is also being adopted for recycling in the wastewater sector, particularly for higher risk, Class A recycled water schemes.

#### **10.1.1.5 Biosolids management**

The review of the *Tasmanian Biosolids Reuse Guidelines* is continuing, albeit slowly due to resourcing constraints. Since publication of the original guidelines in 1999, a significant body of research into biosolids has been undertaken both nationally and internationally to:

- investigate the constituent contaminants of concern present in biosolids;
- investigate the risks associated with those contaminants in respect to end use of this material; and
- develop a scientific basis for the regulation and monitoring of biosolids reuse activities.

The outcome of the review will result in a contemporary guideline to ensure sustainable biosolids reuse in Tasmania and appropriate commitment of expenditure to biosolids management.

The EPA Division is a member of the Australian and New Zealand Biosolids Partnership (ANZBP), which is a collective of utilities, consultants, academics and government agencies with an interest in ensuring the sustainable reuse of biosolids. The Division is contributing to the research being undertaken by the ANZBP and has access to the outcomes of that work, as well as a number of useful references. The EPA is utilising ANZBP resources, references and tools in its review of the Biosolids Guidelines.

### 10.1.2 Public health

It is anticipated that by 30 June 2014, all drinking water supply systems within Tasmania will be adequately monitored for both bacteriological and chemical quality. The Department of Health and Human Services (DHHS) will be addressing this matter with TasWater to ensure it complies with this key legislative requirement.

In 2012-13 the water corporations continued to work towards addressing the priority capital works list agreed with DHHS as part of their respective interim operating licences. An ongoing role for DHHS will be to incorporate emerging public health issues and associated risks (which have been identified with the improved monitoring of drinking water supply systems) into the water corporations' decision-making processes when prioritising capital works.

DHHS will implement an independent auditing framework for the verification and validation of the water corporation's drinking water quality management plan.

There have been some delays in finalising the review of the *Tasmanian Drinking Water Quality Guidelines* and the *Fluoridation (Interim) Regulations* (2009). It is anticipated that this work will be finalised by July 2014.

Furthermore, it is expected the revised Tasmanian Code of Practice for the Fluoridation of Drinking Water Supplies will also be completed next year.

DHHS has reiterated its commitment to working with TasWater to ensure that matters of public health are given due consideration in this process now that the water and sewerage sector's activities are managed by a single water corporation.

### 10.1.3 Water allocations/licences and dam safety

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

Before water can be taken directly from a stream or stored in a dam for supply to urban water systems, an allocation licence must be obtained from DPIPWE. The Department, along with TasWater, is continuing a review of all current urban water allocations and licences which were transferred to the regional corporations. The review has focussed on ensuring that the extraction points of water allocations endorsed on licences are correctly designated in terms of the extraction location and the specific resource from which the water is taken, and that the quantum of the allocation reflects the historical entitlement. In the context of expected future urban water demand and supply scenarios, allocations may be adjusted where necessary as licences are renewed.

DPIPWE is also responsible for the assessment of applications for new dam works and for the regulation of dam safety to ensure the owners of existing dams meet their statutory safety responsibilities.

All applications to construct new dams must include a range of information, including full engineering designs, for review by the Assessment Committee for Dam Construction, which decide whether or not to grant approval for an application. This is to ensure that all dams are constructed in accordance with the *Water Management Act 1999* and the *Water Management (Dam Safety) Regulations 2011*.

DPIPWE is responsible for ensuring that owners of existing dams meet their safety responsibilities through on-going surveillance and maintenance of dams and, where necessary, ensuring dams are upgraded to meet contemporary safety standards. The three regional corporations and, more recently, TasWater have been required to undertake a risk analysis of all their dams and develop management plans to manage and mitigate, to within acceptable standards, any safety risks that may be identified. DPIPWE's role as dam safety regulator is to ensure that these plans are developed; that they are to an acceptable standard; and that they are implemented to an agreed schedule. The Delegate for Dam Safety Regulation will monitor and review the management plans for dams to ensure that the required maintenance and risk mitigation tasks are being carried out in accordance with assessed risk priorities.

## **10.2 Major projects commenced or undertaken during 2012-13**

This section provides an overview of the major projects commenced or undertaken by the three water and sewerage corporations during 2012-13. More detail on these projects is available on the TasWater website.

### **10.2.1 Ben Lomond Water**

In 2012-13 Ben Lomond Water funded capital works to the value of \$34.1 million, with the planning of projects driven by the agreed Drinking Water Compliance Plan and Wastewater Management Plan. The highlight of the substantial capital works program was the commissioning and opening of the new Campbell Town Water Treatment Plant that enabled the removal of the boil water alert in Campbell Town and Ross. A number of projects aimed at improving environmental outcomes were undertaken during the year and, in particular, at Beaconsfield a 42 hectare blue gum plantation reuse scheme was commissioned which should substantially improve environmental outcomes.

Ben Lomond Water's Greater Launceston Sewerage Strategy is a major study currently underway to review whether there is a better way to treat sewage than by the seven existing treatment plants. It is expected that the resultant capital works will be significant (\$200 to \$250 million) and take up to ten years to complete.

The following major water and wastewater projects have commenced or were completed by Ben Lomond Water during 2012-13:

#### **10.2.1.1 Water**

##### ***Campbell Town water treatment plant***

Final works on the new \$5.3 million water treatment plant at Campbell Town were completed in April 2013 and the plant is now supplying high quality water to Ross and Campbell Town.

##### ***Scamander water treatment plant***

Further works are in progress at the new Scamander water treatment plant to improve pre-treatment and system capacity to ensure the plant can cope with all weather flows.

*Water meter project*

This \$11.77 million project involved the replacement of ageing water meters and the installation of meters on previously unmetered connections. More than 55 000 meters have been fitted with electronic meter interface units (MIU) to record consumption data and to allow remote meter reading. Larger sized meters still need to be installed on currently unmetered or incorrectly metered water connections which are coupled with fire connections. A separate project is underway to review these connections.

*Lilydale water pipeline*

This project involved the construction of 26 kilometres of pipeline together with a booster pump station and a 1ML roofed in-ground water storage reservoir to provide treated water to 200 existing customers in the town of Lilydale. Owners of properties (about 115) adjacent to the pipeline route will also have access to a treated water supply. The reservoir is expected to be completed in August 2013. The pipeline and pump station is expected to be complete and commence operating in September 2013.

A budget of \$7.6 million has been allocated for the project.

*Westbury water treatment project*

The Westbury treated water project involves the construction of a new 3.1 ML per day water treatment plant, a 5.5ML roofed water storage reservoir, and a 5.7 kilometre long treated water pipeline to Exton. The plant will provide treated water for the towns of Westbury, Hagley and Exton. Total project budget is \$6.7 million.

The reservoir was completed in May 2013 and the new pipeline to Exton was completed in June 2013. The water treatment plant is expected to be commissioned in November/December 2013 and commence supplying treated water to Westbury, Hagley and Exton in January 2014.

*Bracknell and Fingal water treatment plants*

A budget of \$5.5 million has been allocated for the project which will involve the construction of two 0.6ML per day water treatment plants to supply the towns of Bracknell and Fingal. The Bracknell water supply has been subject to temporary boil-water alerts and is therefore on the DHHS priority list. The water supply scheme at Fingal has very poor microbiological compliance and operates under a permanent boil water alert.

Design work is well advanced and site works have commenced for both treatment plants based on a common design. It is planned to commence commissioning of the two plants in December 2013 with proof of performance testing in early 2014.

Ancillary works being undertaken under separate contracts involve the upgrading of raw water pump stations at both towns, and the construction of raw water and treated water pipelines at Fingal. The Fingal pipeline work was completed in July 2013 and the pump station is expected to be completed in October 2013. The upgrade works at the Bracknell raw water pump station will begin in August 2013 and is expected to be in operation by March 2014.

***Mole Creek water treatment plant***

Planning for a new water treatment plant at Mole Creek has commenced, to eliminate temporary boil-water alerts in the town. A budget of \$2.8 million has been allocated for the new WTP and associated works which will include upgrading the existing pipe network.

The plant will utilise ultra violet light as the principal method of disinfection. An amended application for a planning permit for the treatment plant has been lodged with the Meander Valley Council. An agreement to purchase the land on which the new treatment plant will be constructed has been reached subject to the issue of a planning permit. Tender documents are being prepared for a design and construct contract for the treatment plant. Tenders will be invited once the purchase of the land for the plant is finalised. This is expected to be in about May 2014. The plant will be similar to those currently being constructed at Bracknell and Fingal.

**10.2.1.2      *Wastewater******Deloraine wastewater treatment plant upgrade***

The Deloraine Sewage Treatment Plant is a high priority on the EPA's priority list for upgrading in the northern region. The upgrades will increase the capacity and improve the quality of the effluent that is discharged to the Meander River via a refurbished outfall pipe and diffuser. The stage 1 works involving the upgrading of the inlet works and the construction of a new inlet pump station, a large HDPE (high density polyethylene) lined flow balancing storage basin, an anaerobic tank, alum dosing facilities, two sludge drying basins and modifications to the two intermittent decant extended aeration lagoons are expected to be completed in August 2013. This will be followed by a minimum of six months of performance monitoring to determine the need for and the extent of stage 2 improvement works.

***Beaconsfield sewage treatment plant effluent reuse scheme***

Construction of a new 96 ML effluent storage dam has been completed, along with associated works including ripping, mounding, irrigation system pipelines, pump stations and site fencing. A tree plantation of approximately 40 Ha has been established that will receive effluent from the treatment plant, resulting in 100 per cent reuse of the effluent. Treated effluent is now being diverted into the dam and is no longer discharged into Brandy's Creek

***Sewage Pump Station (SPS) Projects***

Approximately \$3.5 million has been budgeted for upgrading a number of sewage pumping stations to reduce the risk of overflows and to address safety issues.

Sewage pumping stations upgraded in 2012-13 included those at Old Bridge Road Perth, Cook Street Hadsen, Franklin Street Campbell Town, Percy Street Fingal, Main Road SPS Conara, Lot 11 SPS Low Head and No. 2 SPS Scamander.

Work is expected to be completed in November 2013 at the Tamar St Launceston combined pump station. Construction is expected to commence in August 2013 on sewage pumping station upgrades at O'Connor's Beach Stieglitz, Arthur Street George Town, Ainslie Low Head and Esplanade South George Town.

### **10.2.1.3 Other**

There are several areas of capital expenditure which were not specifically related to either water or sewerage. These were:

- OHS improvements (\$0.6 million);
- Plant replacement (includes expenditure on vehicles and tools, \$1.1 million); and
- Spatial (GIS platform, \$0.128 million).

### **10.2.2 Cradle Mountain Water**

Cradle Mountain Water spent a total of \$19.8 million on water and sewerage capital works during 2012-13, with the major expenditure incurred on the following projects:

#### **10.2.2.1 Water**

##### ***Water asset renewals (ongoing)***

This is an ongoing program to upgrade the ageing infrastructure in Cradle Mountain Water's area of service. Work was prioritised based on operational requirements as well as on Cradle Mountain Water's asset management plan. Typical projects included replacement of various water mains, mechanical replacements and electrical switchgear upgrades. \$1.45 million was spent in 2012-13 on such works, with \$2 million budgeted for 2013-14.

##### ***Water metering project (ongoing)***

The aim of this project is to meter unmetered properties and to upgrade existing meters on an ongoing basis to improve meter reading, billing, accuracy and efficiency.

The total project budget is \$13.3 million over seven years, with project completion planned for 2018.

##### ***Dam safety and compliance works upgrades***

A five year Dam Safety Plan has been developed which identified and prioritised interventions such as spillway upgrades, seepage monitoring and pipe work upgrades. Major projects that followed from this are:

- Conglomerate Creek Dam (Queenstown) – during an investigation at this site a serious leak was identified around the dam's scour outlet. Temporary risk mitigation measures have been implemented and a strategy is being considered to rehabilitate the asset with a recommended approach to be developed by October 2013.
- Pet Dam (Ridgley) – the upgrade of the outlet and scour pipe work and valving was completed in November 2012 at a cost of \$0.73 million.

- Parting Creek Dam Upgrade – The installation of new outlet pipe, scour, outlet valves and access platform was completed in April 2013 at a cost of \$0.3 million. The dam wall was further improved through the construction of a seepage control filter and weighting berm.

#### ***Mountain Creek water supply at Rosebery***

A primary filter was installed on the water supply at Rosebery to improve the quality of the supplied water. This project included the construction of a shed, installation of two Amiad water filters with auto backwashing systems and links to SCADA system for alarming and monitoring.

#### ***Fluoridation Upgrade***

An audit of all fluoridation installations was done and work was scoped to improve compliance with the Fluoride Code of Practice. The total works are estimated to cost \$1.65 million and is expected to be completed in April 2014. Currently, design work is complete and upgrade of installations commenced in June 2013.

#### ***Don River Crossing***

This project involves the construction of an elevated pipe bridge to improve security of supply to areas serviced by the Paloona Water Supply Scheme by improving the flood immunity of the water supply pipeline over the Don River, Devonport.

#### ***Water treatment plant - critical control points***

The objective of this project is to install instrumentation at the water treatment plants to monitor plant performance at the critical control points. Instrumentation to be installed typically includes turbidity meters, chlorine analysers, dosing pump flow meters and pH analysers. The instrumentation will be connected to SCADA for remote monitoring and alarming.

Works at Tullah and Zeehan WWTPs have been postponed to review the long term upgrade planning of these plants.

### **10.2.2.2 Wastewater**

#### ***Wastewater asset renewals (ongoing)***

Typical projects undertaken as part of the wastewater asset renewals program include replacing various sewerage mains, mechanical replacements and electrical switchgear upgrades.

#### ***Cradle Valley wastewater treatment plant optimisation***

The Cradle Centralised WWTP and the associated sewerage reticulation network commenced operation in October 2010. This project aims to improve the plant elements in terms of efficiency and safety through a range of upgrades and replacements.

#### ***Wynyard wastewater treatment plant***

A project is underway to construct a screen over the aerators to contain aerosols generated by the aerators. The completed works will reduce the potential hazards

associated with transmission of pathogens to site staff through aerosols. Other upgrades to the plant include:

- inflow and infiltration assessments in the catchment area;
- upgrade to inlet works;
- upgrades to flow distribution;
- safety upgrades;
- disinfection; and
- dam safety works associated with the sludge lagoon.

The works will culminate in a plant upgrade scheduled for 2017-18. The total project budget is \$11 million over seven years.

#### ***Sludge handling facility upgrades***

Sludge handling upgrades are being implemented at Pardoe (Devonport); Ulverstone and Burnie WWTPs to improve efficiency and safety of on-site sludge handling and transport. The project includes the installation of sludge conveyor equipment and sludge bins for sludge transport. The project is scheduled for completion in June 2014.

#### ***Sewage treatment plant compliance (ongoing)***

A series of projects were carried out as part of Cradle Mountain Water's ongoing program to improve the treatment efficiency and compliance of sewage treatment plants. Improvements typically include upgrade of controls, process modifications, and upgrade of biosolids disposal infrastructure / screening and metering. This work was undertaken during 2012-13 at the Sheffield, Wynyard, Smithton, Railton, Ulverstone, Burnie, Port Sorell, Tullah and Pardoe (Devonport) plants.

#### ***Helen Street pump station Ulverstone***

The Helen Street pump station in Ulverstone pumps all effluent from the Knights Road WWTP (and Simplot trade waste) to the ocean outfall. The project will replace the pumps, pipe work and control instrumentation which has deteriorated over time resulting in failures in 2012. The project also includes installation of a generator to improve pump station reliability and an odour control system.

A total budget of \$1.65 million has been allocated for this project, and is scheduled for commissioning in September 2013.

#### ***Other projects***

Other ongoing projects include ambient monitoring at WWTPs to monitor and prevent environmental impact, investigation and intervention of inflow and infiltration of ground and storm water, replacement of sewage pump station access ladders and lids, establishment of a standardised telemetry control and monitoring system for CMW operational assets and various occupational health and safety upgrades.



### **10.2.3 Southern Water**

In 2012-13, in its fourth year of operation, Southern Water spent a total of \$55.7 million on water and sewerage infrastructure projects, about ten per cent less than its capital expenditure for 2011-12 of \$61.8 million.

During the year some large projects were delivered. Specifically, the Huon Valley Water Scheme was completed, providing high quality water to customers in the townships of Huonville, Franklin, Geeveston and Cygnet. The water meter installation program was also finalised and Southern Water began a meter replacement program for the remaining old meters.

The Lauderdale pressure sewerage scheme moved a step closer in 2012-13, with more than 200 customers signing connection agreements to enable the corporation to progress to the construction phase of the \$12 million project.

As a result of water meters being installed, pipeline capacity augmentation projects and new reservoirs are waiting for future customer demand requirements to be established.

Some sewage treatment plant upgrades have been delayed to ensure that works are appropriate and adequate consultation with the community and regulators has been carried out. The Tolosa dam project has also been delayed to allow time for Glenorchy City Council to carry out a community consultation on the future master plan for the area.

The following sections provide a summary of Southern Water's capital expenditure for the 2012-13 financial year.

#### **10.2.3.1 Water**

##### ***Huon Valley regional water scheme***

This project involved the construction of a new bulk water system for the Huon Valley supplying the townships of Huonville, Franklin, Geeveston and Cygnet. The scheme comprises a new treatment plant, pump stations, reservoirs, pipelines and control systems. It was built with the assistance of a \$12 million funding grant from the Australian Government, with a total project cost of \$33 million. The scheme began operating in November 2012.

##### **Water metering project**

Southern Water installed approximately 3 000 non-residential meters during 2012-13, which completed the non-residential water metering project, at a cost of \$7.9 million. Approximately 5 000 residential meters were also replaced in the Clarence area.

##### ***Water pipeline and pump station renewals***

Around \$2.4 million of water pipeline renewals were undertaken during 2012-13. These were focused on residential networks on the East Coast and in Hobart and Glenorchy. Additionally a program of pump station electrical renewals (switchboards) has progressed and works totalling \$4.5 million are expected to commence in 2013-14.

### ***Risdon Vale water main***

This project was completed in July 2013 to meet growing demand in the area and to support a new development comprising 176 living units and a community centre as well as future developments totalling around 300 lots. The total project cost was \$1.93 million which includes a contribution of \$0.38 million provided by the Developer.

### **10.2.3.2      *Wastewater***

#### ***Sewer pipelines and pump station renewals program (annual program)***

The cost of sewerage pipeline renewals totalled \$9.1 million in 2012-13. By inserting a structural fibreglass liner into an existing pipe, the structural integrity and longevity of the pipe can be extended for a further 50 years. A program of electrical switchboard renewals also began in 2012-13 to improve reliability.

#### ***Sewerage pump station upgrade (Salamanca and Duck Park)***

The Duck Park pump station (Swansea) was renewed in 2012-13 and the Salamanca pump station (Hobart) was renewed and upgraded to address odour problems, pump station unreliability and a range of other issues associated with ageing infrastructure. Combined expenditure on these projects was \$800 000.

#### ***Lauderdale sewerage scheme***

This scheme extends the Rokeby waste water treatment plant catchment to include all commercial and residential areas in Lauderdale. Connection to the scheme is voluntary, with more than 200 customers already subscribed to the scheme. \$1.8 million was spent in 2012-13 with completion expected in early 2014.

#### ***Sewage treatment plant upgrades***

Designs and approvals progressed during 2012-13 for upgrades to a number of sewage treatments plants, including Blackmans Bay, Turriff Lodge (New Norfolk), Brighton and Cambridge. Upgrades at Blackmans Bay and Brighton have been deferred, with works to commence in 2013-14 and 2014-15 respectively.

#### ***Ranelagh sewerage treatment plant upgrade***

An upgrade to improve plant performance and reliability of the Ranelagh sewage treatment plant began in 2011-12 and was completed in February 2013.

#### ***South East Tasmania reuse scheme (unregulated activity)***

The South East recycled water scheme will divert effluent outfall from the Rokeby and Rosny WWTPs to the Coal River Valley for reuse. It will deliver a renewable water source of approximately 2 700 ML of recycled water to over one hundred horticultural and viticultural users in the Coal River Valley and will significantly reduce effluent discharged into the Derwent Estuary. The scheme involves the upgrading of treatment plants, the construction of new pump stations and a storage dam.

The final part of the scheme, the Duck Hole Rivulet effluent storage dam, was completed in 2012-13 at a cost of \$2.8 million.

This project was fully funded by the Australian Government, with a total project cost of around \$11.1 million.

#### **10.2.3.3 Other**

##### ***Accommodation***

The office and depot properties being leased by Southern Water were purchased for \$13 million during 2012-13. Redevelopment of the depot will be undertaken in 2013-14.

##### ***Vehicles and plant***

\$2.4 million was spent on vehicles and plant in 2012-13. This was primarily on fleet renewals.

##### ***Supervisory control and data (SCADA) acquisition systems***

This project with a total cost of \$1.3 million was completed during 2012-13. These programs will increase the level of automation of assets to improve plant reliability and performance and decrease operational risks.

### **10.3 Future capital expenditure approaches and projects**

This section addresses the approach to capital management and major future capital projects, ie from 1 July 2013 onwards. It outlines the capital investment actions and plans of the water and sewerage corporation. TasWater has forecast over \$106 million in capital expenditure in 2013-14 based on the water corporations' PSPs and TasWater's corporate plan.

It is intended that there will be a comprehensive review of TasWater's capital works program on a statewide basis to ensure appropriate and consistent levels of service, whilst incorporating scale efficiencies by bulking up like projects.<sup>2</sup> This review will form the basis of the capital works plan for the second PSP, due for submission to the Economic Regulator on 29 August 2014.

#### **10.3.1 Water**

The following projects are currently being taken or proposed to be undertaken to improve compliance with drinking water quality standards.

##### ***Ringarooma Valley (incl. Derby, Branxholm) Regional Water Scheme – northern region***

Environmental studies, approvals and design are in progress for a \$9.59 million project to provide a common water treatment plant and interlinking trunk water pipelines connecting towns of Branxholm, Derby, Legerwood and Ringarooma.

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<sup>2</sup> TasWater corporate plan summary 2013-15

***Pioneer treated water supply – northern region***

Option assessment and community consultation is in progress to provide a suitable solution for the provision of treated water to the township of Pioneer in the State's north-east.

***Avoca Treated Water Supply – northern region***

Investigation and consultation is in progress for the provision of treated water at Avoca.

***Whitemark (and Lady Barron) Treated Water Supply – northern region***

Option assessment and testing has been carried out for the provision of treated water on Flinders Island.

***Rosebery water treatment plant – north-west region***

The purpose of this project is to provide a reliable water supply scheme for Rosebery producing water that complies with the ADWG. The proposed upgrades include a WTP, storage reservoir and interlinking pipelines.

Construction is scheduled to commence in 2015, at a total projected cost of \$6.4 million.

***Grassy - Currie water supply scheme – north-west region***

The King Island towns of Currie and Grassy are presently supplied from two separate water supply schemes. The Grassy scheme draws water from the Upper Grassy Dam and the water is treated at the Grassy treatment plant which is old and in need of upgrade works. The Currie scheme draws water from a groundwater scheme and the water is disinfected prior to distribution.

The Grassy-Currie water supply scheme is planned in stages with Stage 1 commencing in 2014. This stage will include algae reduction measures at the Grassy Dam, installation of a raw water pump station, feed tank and generator, and installation of mains from the Grassy Dam to a new 0.5 ML reservoir tank at Gentle Annie. At Currie, chlorine and disinfection units will be installed along with a flow meter and upgrades to security around bore sites and the treatment plant. Both sites will receive upgrades to monitoring and control systems.

The project will improve both the quality and reliability to the water supply to residents.

***Meter renewals – southern region***

The water meter renewal program will continue in the southern region in 2013-14 with approximately 9 000 replacements, primarily in Brighton, Clarence and Glenorchy municipalities. The program has been prioritised to maximise the meter reading efficiencies from automatic meter reading (AMR) technology, with \$4.7 million expenditure planned in 2013-14.

***Pipeline and pump station renewals – southern region***

\$1.6 million has been planned for works on reticulation pipeline renewals in 2013-14. The program of work is informed by asset condition information. Works will commence on the bulk water pump station electrical renewals in 2013-14, with \$1.2 million planned expenditure.

***Tolosa Dam – southern region***

The project to decommission the Tolosa Dam has been deferred so as to allow the Glenorchy City Council to undertake community consultation and master planning on the future use of the site. Works to construct alternative storage is not planned to commence until 2015-16, under an agreement with the Council. To decommission the dam new water tanks will need to be built.

***Water quality monitoring and alarming – southern region***

A program of in-line water quality monitoring is underway and \$1.9 million of works are planned for 2013-14.

***Ridgeway Dam – southern region***

This project provides for the renewal of the existing post tensioned anchors together with the installation of an upstream membrane and is expected to extend the dam's useful life by 100 years. Design activities for the upgrade will commence in 2013-14, with an expected budget of \$1.2 million. The upgrade works are currently scheduled to commence in 2014-15 with an expected total project cost of \$16.7 million.

***Small Towns water supply compliance solutions – southern region***

A packaged WTP solution is proposed for Ouse with a new water pipeline to Hamilton. Expenditure of \$2.8 million is planned in 2013-14, with completion in 2014-15. \$1.75 million has also been allocated for upgrades at the Tunbridge WTP.

Water supply upgrades are also to be progressed at Gretna/Bushy Park/Glenora, and Colebrook, with a combined spend of \$0.5 million planned for 2013-14. Completion of these schemes will occur in 2014-15.

Following the proposed withdrawal of reticulated services at Mountain River this supply will revert to an unregulated irrigation supply. This project is expected to commence in December 2013 and revert to an unregulated irrigation supply by July 2014.

***Pass road – southern region***

A new water main and reservoir is expected to be required to service future growth in Clarence, allowing for the proposed 'Parranville' development.

### **10.3.2 Wastewater**

#### ***Greater Launceston sewerage strategy – northern region***

Around \$2.5 million has been committed to date on a strategy to address the long-term future of seven sewage treatment plants in the Greater Launceston area.

#### ***Ti-Tree Bend sewerage treatment plant - odour improvement – northern region***

Ongoing capital works and investigations are in progress to address odour emissions emanating from the plant and reduce the environmental impact of the WWTP, which is currently operating under an environment protection notice. The project has a budget of \$1.6 million.

#### ***Longford sewage treatment process improvements – northern region***

Option assessment is underway for process improvements and an upgrade of the outfall installation at Longford.

#### ***Wynyard wastewater treatment plant improvements – north-western region***

The project involves progressive works towards improving the treatment efficiency of the plant including inflow and infiltration investigations in the catchment area, upgrade inlet works and screening, upgrades to flow distribution to the plant and safety upgrades. The total project budget is \$7.8 million over 7 years, with a plant upgrade scheduled for 2017-18.

#### ***Rosebery wastewater treatment plant – north-western region***

Rosebery sewage is currently being treated by the Minerals and Metals Group (MMG) under an agreement which ends on 30 June 2015. Planning is being undertaken to establish a new treatment plant and to reconfigure the sewerage network to direct flows to the new site.

The planning and approvals for the project are proceeding and a Development Proposal and Environmental Management Plan (DPEMP) is to be submitted to the EPA in August 2013. The design process is progressing in conjunction with the above. The budget for this project is \$5 million.

#### ***Industrial developments at Burnie – north-western region***

The impact of the Lion cheese factory on the Burnie system is under investigation and significant upgrades to the Burnie sewage conveyance system and treatment plant are foreseen. This project is currently in the planning stage.

#### ***Sewerage pump station upgrades – southern region***

This ongoing program will build an upgraded pump station at Andrew Street (Brighton) at a cost of \$1.9 million. Compliance upgrades to the pump station at Morrison Street (Hobart) are also planned.

***Lauderdale pressure sewerage scheme – southern region***

The Lauderdale scheme will be completed in 2013-14 with \$3.3 million planned expenditure on collection systems (sewer mains) and connections. Customer connections are expected to be ongoing into 2014-15 and beyond.

***Inlet works program – southern region***

A program to install inlet screens for WWTPs will commence in 2013-14. The proposed infrastructure will help address compliance issues such as odours, WWTP bypasses and effluent non-compliance.

***Linear renewals – southern region***

A program of pipeline renewals for poorly performing sewerage pipelines in the Greater Hobart and Derwent Valley municipalities is also underway. The program aims to complete \$4 million of sewer relining works during 2013-14. Seventeen kilometres of sewer main will be renewed to address service standards whilst two kilometres of trunk sewer will also be renewed to minimise the risk of trunk sewer failure.

***Taroona wastewater treatment plant rationalisation – southern region***

The existing Taroona WWTP does not meet modern treatment plant standards and requires a major upgrade. Rather than continue with a WWTP in this location, the Taroona WWTP will be decommissioned and wastewater delivered to the Self's Point WWTP via a pump station and rising main connecting into the trunk sewer system in Sandy Bay.

By mid-2013 the construction of a pump station and sewer main will be completed to enable the Taroona WWTP to be decommissioned by July 2014.

**10.3.3 Other**

A number of other projects have been identified for completion in the next few years:

- Water services optimisation - install large diameter meters on currently unmetered or incorrectly metered water (northern region)
- SCADA upgrade - consolidate SCADA assets into single system for the entire northern region





## APPENDIX 1 PERFORMANCE INDICATORS

Performance indicators used in this report are a subset of those defined in the *National Performance Framework: 2012-13 urban performance reporting indicators and definitions handbook*, July 2013. Performance indicators for which data was requested from water corporations and other regulators for the report are listed below.

Indicator	NPR Reference No.
<b>WATER RESOURCES</b>	
<b>Sources of Water</b>	
Volume of water sourced from surface water (ML)	W1
Volume of water sourced from groundwater (ML)	W2
Volume of water sourced from desalination (ML)	W3
Volume of water sourced from recycling (ML)	W4
Volume of water received from bulk supplier (ML)	W5
Volume of bulk recycled water purchased (ML)	W6
Total sourced water (ML)	W7
<b>Uses of Water Supplied</b>	
Volume of water supplied - Residential (ML)	W8
Volume of water supplied - Commercial, municipal and industrial (ML)	W9
Volume of water supplied - Other (ML)	W10
Total urban water supplied (ML)	W11
Average annual residential water supplied (kL per property)	W12
Volume of water supplied - Environmental flows (ML)	W13
Volume bulk water exports (ML)	W14
Volume bulk recycled water exports (ML)	W15
<b>Sewerage collected</b>	
Volume of sewage collected - Residential sewage, non-residential sewage and non-trade waste (ML)	W16
Volume of sewage collected -Trade waste (ML)	W17
Total sewage collected (ML)	W18
Sewage collected per property (kL per property)	W19

Indicator	NPR Reference No.
<b>Uses of recycled water</b>	
Volume of recycled water supplied - Residential (ML)	W20
Volume of recycled water supplied - Commercial, municipal and industrial (ML)	W21
Volume of recycled water supplied - Agricultural (ML)	W22
Volume of recycled water supplied - Environmental (ML)	W23
Volume of recycled water supplied - On-site (ML)	W24
Volume of recycled water supplied - Other (ML)	W25
Total recycled water supplied (ML)	W26
Recycled water (percent of effluent recycled)	W27
<b>ASSETS</b>	
<b>Water treatment plants</b>	
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
<b>Other water assets</b>	
Number of water pumping stations	
Length of water mains (km)	A2
Properties served per km of water main (No. per km)	A3
Number of water distribution storage facilities	
<b>Sewerage assets</b>	
Number of Level 1 sewage treatment plants	(A4)
Number of Level 2 sewage treatment plants	(A4)
Number of sewage pumping stations	
Length of sewerage mains and channels (km)	A5
Properties served per km of sewer main (No. per km)	A6
<b>Recycled water assets</b>	
Number of recycled water treatment plants	A7
<b>Water supply</b>	
Water main breaks (No. per 100 km of water main )	A8
<b>Water loss</b>	
Infrastructure leakage index (ILI)	A9
Real losses (L per service connection per day)	A10
Real losses (kL per km of water main per day)	A11

Indicator	NPR Reference No.
<b>Sewer main breaks and chokes</b>	
Sewer main breaks and chokes (No. per 100 km sewer main)	A14
Property connection sewer breaks and chokes (No. per 1 000 properties)	A15
<b>CUSTOMERS</b>	
<b>Connected properties and population</b>	
Population receiving water supply services	C1
Connected Residential properties - water supply	C2
Connected Non-residential properties - water supply	C3
Total connected properties – water supply	C4
Population receiving sewage services	C5
Connected Residential properties – sewerage	C6
Connected Non-residential properties – sewerage	C7
Total connected properties – sewerage	C8
<b>Complaints</b>	
Water quality complaints (No. per 1 000 properties)	C9
Complaints meaningfully responded to within ten days (%)	
Water service complaints (No. per 1 000 properties)	C10
Sewerage service complaints (No. per 1 000 properties)	C11
Billing and account complaints – water and sewerage (No. per 1 000 properties)	C12
Total water and sewerage complaints (No. per 1 000 properties)	C13
Average call wait time (seconds)	
Per cent of calls answered by an operator within 30 seconds (%)	C14
Average duration of an unplanned interruption- water (minutes)	C15
Average sewerage interruption (minutes)	C16
Number of sewer spills	
Average break/choke repair time – sewerage (minutes)	
Average frequency of unplanned interruptions – water (No. per 1 000 properties)	C17
Number of restrictions applied for non-payment of water bill (No. per 1 000 properties)	C18
Number of legal actions applied for non-payment of water bill (No. per 1 000 properties)	C19

Indicator	NPR Reference No.
<b>ENVIRONMENT</b>	
Percentage of sewage treated to a primary level (%)	E1
Percentage of sewage treated to a secondary level (%)	E2
Percentage of sewage treated to a tertiary or advanced level (%)	E3
Percentage of sewage volume treated that was compliant (%)	E4
Number of sewage treatment plants compliant at all times	E5
Public disclosure of your sewage treatment plant's performance	E6
Compliance with environmental regulator – sewerage (yes/no)	E7
Percentage of biosolids reused (%)	E8
Greenhouse gas emissions - Water (tonnes CO <sub>2</sub> -equivalents per 1 000 connected water properties)	E9
Greenhouse gas emissions - Sewerage (tonnes CO <sub>2</sub> -equivalents per 1 000 connected sewerage properties)	E10
Total Net Greenhouse gas emissions (tonnes CO <sub>2</sub> -equivalents per 1 000 connected water properties)	E12
Sewer overflows reported to environmental regulator (No. per 100 km of main)	E13
<b>FINANCE</b>	
Total revenue – water (\$)	F1
Total revenue – sewerage (\$)	F2
Total revenue for whole of utility (\$)	F3
Residential revenue from usage charges –water (%)	F4
Revenue per property for water supply services (\$ per property)	F5
Revenue per property for sewerage services (\$ per property)	F6
Revenue per property for whole of utility (\$ per property)	F7
Revenue from Community Service Obligations (%)	F8
Nominal written down replacement cost of fixed water supply assets (\$)	F9
Nominal written down replacement cost of fixed sewerage assets (\$)	F10
Operating cost – water (\$)	F11
Operating cost – sewerage (\$)	F12
Combined operating cost - water and sewerage (\$ per property)	F13
Total water supply capital expenditure (\$)	F14
Total sewerage capital expenditure (\$)	F15
Total capital expenditure for water and sewerage (\$)	F16
Water supply capital expenditure (\$ per property)	F28

Indicator	NPR Reference No.
Sewerage capital expenditure (\$ per property)	F29
Economic real rate of return – water (%)	F17
Economic real rate of return – sewerage (%)	F18
Economic real rate of return – water and sewerage (%)	F19
Dividend (\$)	F20
Dividend payout ratio (%)	F21
Net debt to equity (%)	F22
Interest cover (times)	F23
Net profit after tax (NPAT)	F24
NPAT ratio (%)	F30
Community Service Obligations (\$)	F25
Capital works grants – water (\$)	F26
Capital works grants – sewerage (\$)	F27
<b>PUBLIC HEALTH</b>	
Water quality guidelines	H1
Number of zones where microbiological compliance was achieved	H2
% of population where microbiological compliance was achieved	H3
Number of zones where chemical compliance was achieved	H4
Risk-based drinking water management plan externally assessed (yes/no)	H5
Risk-based drinking water management plan/s in place (e.g. ISO9001, HACCP, ADWG quality assessment)	H6
Public disclosure of drinking water quality performance (yes/no)	H7
<b>PRICING</b>	
<b>Water</b>	
Tariff Structure (description) - water	P1
Free Water Allowance (kL) - water	P1.1
Fixed Charge (basis for charge) - water	P1.2
Usage Charge 1 <sup>st</sup> Step (kL range and \$)	P1.3
Usage Charge 2 <sup>nd</sup> Step (kL range and \$)	P1.4
Usage Charge 3 <sup>rd</sup> Step (kL range and \$)	P1.5
Usage Charge subsequent steps (kL range and \$)	
Special Levies (\$) - water	P1.12
Income from Special Levies Retained by Utility? (Yes/No) - water	P1.13

Indicator	NPR Reference No.
Annual bill based on 250kL per annum - water	P2
Average Residential Consumption - water	P2.1
Typical Residential Bill - water	P3
Number of Meter Readings per annum - water	P3.1
Billing/rating frequency	P3.2
<b>Sewerage</b>	
Tariff Structure - sewerage	P4
Fixed Charge - sewerage	P4.1
Usage Charge - sewerage (kL range and \$)	P4.2
Special Levies (\$) - sewerage	P4.3
Income from Special Levies Retained by Utility? (Yes/No) - sewerage	P4.4
Annual bill based on 250kL per annum - sewerage	P5
Typical Residential Bill - sewerage	P6
Number of Bills per annum - water/sewerage	P6.1
<b>Water and Sewerage</b>	
Annual bill based on 250kL per annum (water & sewerage)	P7
Typical Residential Bill (water & sewerage)	P8

## APPENDIX 2 SEWERAGE SERVICE SUPPLY

Region/area	Site	Licensed flow limit (kL/day)	2012-13 measured flow (kL/day)	Actual flow (per cent of licensed limit)
<b><i>Ben Lomond Water region</i></b>				
West Tamar	Beaconsfield	400	159	40
West Tamar	Beauty Point (Ilfraville)	540	320	59
Dorset	Bridport	1 400	252	18
Northern Midlands	Campbell Town	325	172	53
Meander Valley	Carrick	624	530	85
Northern Midlands	Cressy	240	139	59
Meander Valley	Deloraine	850	751	88
Northern Midlands	Evandale	375	184	49
West Tamar	Exeter	150	62	41
Break O' Day	Fingal	125	77	62
George Town	George Town (Bell Bay)	3 600	1 430	40
Launceston	Hoblers Bridge	4 500	3 016	67
West Tamar	Legana Industrial Park	540	778	144
Launceston	Lilydale	135	56	41
Northern Midlands	Longford	2 700	1 698	63
Launceston	Newnham Drive	3 920	2 600	66
Launceston	Norwood	4 050	2 208	55
Northern Midlands	Perth	450	541	120
Meander Valley	Prospect Vale	1 720	1 235	72
West Tamar	Riverside	2 800	1 353	48
Break O' Day	Scamander	240	94	39
Dorset	Scottsdale	3 200	438	14
Break O' Day	St Helens	1 500	449	30
Break O' Day	St Marys	190	130	68
Break O' Day	Stieglitz	110	52	47
Launceston City	Ti-Tree Bend	25 000	19 608	78
Meander Valley	Westbury	600	616	103

Region/area	Site	Licensed flow limit (kL/day)	2012-13 measured flow (kL/day)	Actual flow (per cent of licensed limit)
<b><i>Cradle Mountain Water region</i></b>				
Waratah/Wynyard	Boat Harbour Beach	170	30	18
Kentish	Cradle Mountain	500	227	45
King Island	Currie	290	250	86
West Coast	East Strahan	1 056	372	35
Waratah/Wynyard	East Wynyard	2 900	4 118	142
Latrobe	Latrobe	1 000	1 494	149
Devonport City	Pardoe Downs	14 000	11 409	81
Latrobe	Port Sorell	961	779	81
West Coast	Queenstown	1 100	4 433	403
Kentish	Railton	600	468	78
Burnie City	Ridgley	110	234	213
Burnie City	Round Hill	9 000	6 116	68
Kentish	Sheffield	250	611	244
Waratah/Wynyard	Sisters Beach	585	62	11
Circular Head	Smithton (Pelican Point)	5 200	3 083	59
Waratah/Wynyard	Somerset	1 200	1 132	94
Circular Head	Stanley	276	146	53
West Coast	Tullah	243	252	104
Central Coast	Turners Beach	600	440	73
Central Coast	Ulverstone	7 500	4 592	61
West Coast	Zeehan	214	331	155
<b><i>Southern Water region</i></b>				
Glamorgan/Spring Bay	Bicheno	450	290	64
Kingborough	Blackmans Bay	4 125	3 970	96
Central Highlands	Bothwell	155	112	72
Brighton	Bridgewater (Green Point)	3 500	2 162	62
Brighton	Brighton	650	716	110
Clarence	Cambridge/ Airport	800	258	32
Glenorchy	Cameron Bay	6 000	4 764	79
Southern Midlands	Campania	136	81	60
Huon Valley	Cygnet	400	256	64
Huon Valley	Dover	360	186	52
Clarence	East Risdon	1 000	701	70



Region/area	Site	Licensed flow limit (kL/day)	2012-13 measured flow (kL/day)	Actual flow (per cent of licensed limit)
Kingborough	Electrona	270	348	129
Huon Valley	Geeveston	300	252	84
Southern Midlands	Kempton	135	118	87
Hobart	Macquarie Point	18 000	10 720	60
Kingborough	Margate	167	473	283
Sorell	Midway Point	810	441	54
Derwent Valley	New Norfolk Turiff Lodge	4 100	1 657	40
Southern Midlands	Oatlands	136	220	162
Glamorgan/Spring Bay	Orford	473	163	34
Glenorchy	Prince of Wales Bay	9 900	8 498	86
Huon Valley	Ranelagh	1 200	1 094	91
Clarence	Richmond	N/A	183	-
Clarence	Rokeby	4 000	1 653	41
Clarence	Rosny	7 500	6 148	82
Hobart	Selfs Point	13 000	8 411	65
Sorell	Sorell	810	675	83
Glamorgan/Spring Bay	Swansea	430	216	50
Kingborough	Taroona	1 150	353	31
Glamorgan/Spring Bay	Triabunna	253	236	93
Sorell	Penna <sup>#</sup>	1 400	767	55

Source: EPA Division database

Notes: N/A – Not available

<sup>#</sup> The Penna WWTP acts as a “polishing plant” for treated effluent from the Midway Point and Sorell WWTP’s, with effluent receiving further treatment prior to being made available for recycled water use.

Actual flow/Licensed flow limit greater than 100 per cent.



## APPENDIX 3 WASTEWATER MANAGEMENT ISSUES

This Appendix presents the Environment Protection Authority's (EPA) overview of some of the environmental management issues associated with Tasmania's wastewater treatment systems. These issues should be adequately dealt with if implementation of Waste Water Management Plans is satisfactorily progressed and the ongoing management and maintenance of the system is put on a more sustainable footing.

### Blue-green algae blooms

Blue-green algae (BGA) blooms are a relatively common occurrence in sewage lagoons. Unlike mechanical-biological WWTPs, sewage lagoons provide a calm, stable water environment high in nutrients which, coupled with suitable climatic conditions, provides a perfect environment for BGA populations to increase. Blooms typically occur in summer and autumn, particularly during periods of prolonged stable weather. Under favourable conditions blooms can persist into the winter months and, as BGA can survive over winter in spore or vegetative forms, they may seasonally disappear but re-establish once suitable conditions return.

Experience with Tasmanian sewage lagoons has shown that BGA are often present at sufficient concentrations to pose a potential risk to stock and human health if toxins are produced and the affected water is released into streams or recycled irrigation. This emphasises the need for caution in managing affected effluent. Not all species of BGA are toxic; the production of toxins is influenced by environmental conditions as well as species composition.

The management of BGA is a complex issue and presents a challenge to all managers of sewage lagoons. Various measures can be used in conjunction with each other and should ideally be based on a contingency management plan specific for each lagoon system.

The majority of Tasmanian sewage lagoons (approximately 40 Level 2 WWTPs have a lagoon component) have been affected by BGA blooms at some point.

The publication of the *Guidelines for Managing Blue-Green Algae (Cyanobacteria) Blooms in Sewage Treatment Lagoons* in March 2011 assist with the preparation of appropriate Contingency Management Plans. The guidelines are accessible via the EPA's webpage at: <http://epa.tas.gov.au/regulation/blue-green-algae-guidelines>

## Reuse scheme management

A large degree of variability exists in relation to the management of effluent reuse schemes around the State. This is partially due to the differences in supplier – user arrangements; for example, the type of end use (eg golf course versus agricultural application) and type of user (eg corporate body or user cooperative versus single user). Historical differences in terms of varying management approaches originally adopted by different councils for reuse schemes are another factor.

The EPA assesses and reviews wastewater reuse schemes associated with Level 2 WWTPs but does not directly regulate these schemes. Environmental conditions for reuse schemes typically require adherence to an approved management plan and compliance with specified discharge limits. However, regular site inspections and premises management are not within the EPA's core function and environmental regulation of these schemes is largely the domain of local government.

Prior to the reform, information required by the EPA in relation to reuse schemes often remained outstanding, suggesting inadequate performance monitoring and management practices at the time. This situation is gradually being addressed by the corporations, with a number of schemes having been audited, and comprehensive monitoring and reporting regimes being implemented for a number of schemes over the past five years.

Whether the rate of uptake of effluent recycling is sufficient requires closer examination for most Level 2 WWTPs. Whilst there may be valid technical or climatic reasons preventing or minimising reuse, the feasibility of effluent reuse needs to be more fully considered, consistent with the *State Policy on Water Quality Management*. Under the policy, effluent reuse needs to be pursued in order to minimise discharge to waters, unless there are valid reasons not to do so. A range of factors, including practical considerations, environmental outcomes and financial implications will be considered to determine whether effluent reuse is viable.

Under the suite of contemporary environmental conditions currently being rolled out to all WWTPs, an effluent reuse feasibility study will be required to be undertaken within six months from the date of issue of an Environment Protection Notice. This will ensure that effluent recycling is considered as an alternative option to simply discharging treated effluent into waterways.

## Biosolids

The EPA has previously identified considerable knowledge gaps in relation to the management of sewage sludge of Tasmanian WWTPs. The EPA identified that:

- better reporting is required in relation to the volume of sewage sludge produced at a site and, where material is transported off site, regarding its destination and end use;
- reuse or other management options for existing biosolids stockpiles need to be identified;
- consideration of beneficial reuse in preference to disposal methods wherever feasible needs to be demonstrated; and

- some lagoons systems need to be de-sludged to maintain or enhance operational capacity.

In 2012-13 progress continued with regards to closing some of the identified knowledge gaps (see Section 8.8 of this report). However, progress with the de-sludging of lagoon systems identified as high priority has not been satisfactory. In addition, large amounts of sewage sludge remain in storage while suitable reuse options are being considered.

### **Conflict with other land or water uses**

A number of Tasmanian WWTPs discharge effluent to waters used for domestic and industrial water supplies, recreational purposes, aquaculture or agricultural irrigation. Conflict with other water users or uses can occur depending on the quality of the effluent discharged, the dilution received at the point of discharge and any exacerbating circumstances such as the presence of harmful substances or organisms. Generally, such situations are managed by the corporations by notifying affected water users, effluent discharge management procedures and the development of improvement options for affected WWTPs. In some cases, the proximity of WWTPs has resulted in odour impacts on adjacent land uses such as residential and recreational areas.

An analysis of the environmental sensitivity of existing wastewater treatment and discharge arrangements has been incorporated into the Corporations' respective Wastewater Management Plans (see Section 10.1.1 of this report).

### **Lack of ambient monitoring**

Ambient monitoring (the monitoring of impacts in the receiving environment) is a key strategy in determining future upgrade options for existing WWTPs. In the past only limited ambient monitoring programs of a satisfactory standard were conducted in relation to Tasmanian Level 2 WWTPs.

Environmental conditions progressively being issued by the EPA contain a suite of requirements in relation to ambient monitoring. As a result, several ambient monitoring plans are under development, with some significant ambient monitoring programs (eg Derwent Estuary) likely to be progressed in the coming reporting period. Such programs will primarily aim to detect and quantify impacts of current WWTP discharge practices, identify mixing zones associated with outfalls and assist with the determination of required improvement measures. In addition, these programs are likely to enhance the general understanding of our waterways, especially when co-ordinated with existing water quality monitoring programs.

### **Flow monitoring and control**

As outlined in Section 8.1 of this report, the continuing roll-out of flow meters by the corporations has resulted in significant improvements in terms of monitoring and controlling flows in areas previously identified as a concern. Further progress is required to ensure that flow meters are regularly serviced, to ensure ongoing accuracy of measurements.

## Capacity restrictions

As outlined in section 4.6 of this report, of those WWTPs reporting on plant flow, 13 WWTPs had reached or exceeded their hydraulic flow limit and another 17 were operating at more than 75 per cent of their regulated capacity.

Operating at or over the hydraulic capacity limit restricts the ability of the system to cope with existing loads. Where seasonally fluctuating loads or trade waste inputs are an additional concern, such capacity issues are further compounded. Operating outside the hydraulic capacity limits may translate to poor compliance and may therefore restrict the potential for further residential or industrial development in a sewerage catchment.

The reticulation network delivering wastewater to the treatment plants may also be subject to capacity concerns. One common concern reported in relation to the Tasmanian wastewater industry is that of inflow and infiltration into the reticulation system. Inflow and infiltration relates to the ingress of water (either stormwater or groundwater) into the sewerage system, thereby increasing the volume transported to the plant for treatment. This may result in overflows of raw or diluted sewage from points in the reticulation system (eg manholes, dedicated emergency overflow pipes and pumping stations) or at the WWTP itself. Alternatively, wastewater may only receive partial treatment during, for example, peak wet weather flow periods. Those areas with old or poorly maintained reticulation systems are particularly affected, as well as those which commonly experience prolonged wet weather periods. The depth of the reticulation infrastructure (ie whether it comes into contact with groundwater) is another factor.

The impacts of sewage overflows from failed or under-capacity reticulation are potentially serious in terms of public and environmental health. Contamination of oysters by sewage (such as happened at Dunalley in early 2013) or overflows in the vicinity of popular swimming areas are two scenarios which can have significant public health consequences.

## Trade waste

Several wastewater treatment systems in Tasmania receive major trade waste inputs from one or more trade waste generators. Often these generators, particularly in the food processing industry, contribute not only a significant hydraulic load but also a sizeable organic and nutrient load.

Whilst some councils had entered into trade waste agreements with trade waste generators, their enforcement was not always successful due to the difficulties in reducing loads at the source, lack of effective trade waste monitoring procedures, and disagreements between client and service providers over interpretation.

There are a number of important considerations related to trade waste in the sewerage system:

- trade waste inputs into the sewerage system can cause fluctuations in wastewater quality and quantity which can be difficult to deal with at the wastewater treatment plant;
- odour issues reported in relation to some Tasmanian WWTPs are often associated with plants receiving major trade waste inputs; and

- plants receiving high trade waste loads generate substantial volumes of sludge which needs to be managed and regularly removed to maintain system efficiency.

Additionally, highly saline trade waste inputs into the reticulation system can make effluent unsuitable for reuse applications, as irrigation with saline effluent can have detrimental effects on soil structure and plant growth.

### **Lagoon systems**

In Tasmania sewage lagoons or systems incorporating sewage lagoons account for almost half of the Level 2 WWTPs. The number of lagoon systems is greatest in the northern region, representing approximately 60 per cent of all Level 2 WWTPs. The southern region, due to a greater number of urban WWTPs, has a slightly lower proportion of lagoons as does the north-west region, with lagoons representing approximately 30 per cent and 50 per cent respectively of all Level 2 WWTPs in those regions.

Sewage lagoon systems represent a simple method of treating wastewater, characterised by low level of technical complexity and low power consumption. They are a popular treatment system in rural areas where the cost of land is not prohibitive and where the limited availability of trained staff to design or operate complex mechanical-biological plants may be an impediment. They provide secondary level treatment, which is generally sufficient in combination with effluent reuse applications and/or where the receiving waterways provide sufficient dilution. In many cases these lagoon systems are operated in conjunction with an effluent reuse scheme.

However, some issues have been identified with Tasmanian sewage lagoons which were reflected in the compliance levels reported for 2012-13. These issues include:

- the periodic growth of algae, including blue-green algae, is a common occurrence in lagoons. Apart from presenting a potential environmental risk in the case of blue-green algae blooms, prevalence of algae in the system may impact on oxygen transfer into the system and increase the turbidity of the effluent;
- accumulation of sludge in sewage lagoons can significantly reduce their treatment efficiency. In a number of lagoon systems, sludge levels have accumulated to a degree where treatment capacity is significantly affected and de-sludging options need to be urgently progressed;
- lagoon liners should be designed and maintained to prevent leaking of sewage into the underlying groundwater. Where liners were not installed to the required specification, or subsequently damaged, groundwater contamination is a potential issue requiring consideration; and
- sewage lagoons can also be prone to flooding and sludge wash-out depending on their location.





## APPENDIX 4 WASTEWATER TREATMENT PLANT (WWTP) PERFORMANCE SUMMARY

As outlined in Chapter 8 of this report, unsatisfactory compliance levels achieved by Level 2 WWTP's in relation to specified emission limits were an issue for the Tasmanian water corporations, with flow-weighted compliance against current limits calculated at 93 per cent (Ben Lomond Water), 74 per cent (Cradle Mountain Water) and 89 per cent (Southern Water). Moreover, across the State, only six WWTPs achieved consistent compliance for the entire reporting period. Additionally, in 2012-13 flow-weighted compliance decreased significantly in relation to Accepted Modern Technology (AMT) limits, with regional compliance levels against this benchmark calculated as 68, 50 and 64 per cent respectively for Ben Lomond Water, Cradle Mountain Water and Southern Water

The information in Chapter 8 aggregates compliance results on a regional, corporation-based level. As it may also be important to understand how the performance of individual WWTPs contributes to corporation-wide performance, more detailed compliance information is provided in this Appendix.

Table A4.1 and Figures A4.1 to A4.3 show, for each WWTP, compliance with regulatory limits and AMT limits, and dataset completeness in relation to AMT-relevant parameters.

Table A4.2 lists the compliance reported for each recycling scheme which utilises treated effluent generated by Level 2 WWTPs. Compliance is measured against 'Class B' quality expectations.

Table A4.3 lists the proportion of effluent reused and reuse flow per year for each Level 2 WWTP from 2009-10 to 2012-13.

Table A4.1 Summary of WWTP discharge to waters compliance results, 2009-10 to 2012-13

Premises name	2012-13		2011-12		2010-11		2009-10	
	Regulatory limits (%)	AMT compliance (%)	Regulatory limits (%)	AMT compliance (%)	Regulatory limits (%)	AMT compliance (%)	Regulatory limits (%)	AMT compliance (%)
<b><i>Ben Lomond Water</i></b>								
Beaconsfield	90.7	53.1 <sup>1</sup>	84.6	50.4	74.5	57.4	66.7	60.4
Beauty Point	91.7	62.0 <sup>1</sup>	84.1	59.6	94.8	63.0	89.6	60.2
Bridport	47.7	47.7 <sup>1</sup>	44.9	44.9	48.2	48.2	52.8	52.8
Campbell Town	89.6	56.5 <sup>1</sup>	87.5	57.4	75.0	47.2	78.1	50.9
Carrick	87.6	57.1 <sup>1</sup>	76.0	50.9	54.2	34.5	44.7	48.2
Cressy	84.4	40.7 <sup>1</sup>	88.4	43.6	88.5	44.4	86.5	51.9
Deloraine	73.5	63.7 <sup>1</sup>	68.9	56.6	84.3	71.3	87.9	74.0
Evandale	67.4	29.9 <sup>1</sup>	71.9	35.2	69.4	37.0	71.3	34.3
Exeter	95.7	41.5 <sup>1</sup>	93.8	38.0	94.8	39.8	97.9	44.4
Fingal	52.4	47.5 <sup>2</sup>	44.7	45.8	45.8	47.2	30.2	43.1
George Town	94.5	82.4 <sup>1</sup>	91.3	65.4	85.7	81.5	92.5	81.3
Hoblers Bridge	95.9	64.8 <sup>1</sup>	91.7	66.7	97.9	69.4	97.9	67.6
Legana	81.4	36.1 <sup>1</sup>	87.1	34.4	95.2	55.6	87.3	77.1
Lilydale	90.7	57.0 <sup>1</sup>	92.6	63.0	90.7	60.2	90.7	56.5
Longford	57.3	32.4 <sup>1</sup>	65.6	39.8	65.6	48.1	55.0	41.1
Newnham	95.8	61.1 <sup>1</sup>	97.9	60.7	97.9	64.8	97.9	67.8
Norwood	97.9	77.8 <sup>1</sup>	97.8	70.8	93.8	69.4	100	77.6
Perth	76.1	27.8 <sup>1</sup>	83.3	31.5	76.1	31.5	71.9	30.6
Prospect Vale	88.0	66.7 <sup>1</sup>	86.1	60.2	47.9	43.5	74.2	59.5
Riverside	91.7	57.4 <sup>1</sup>	80.8	51.4	63.5	39.7	60.4	36.5
Scamander	-	69.6 <sup>1</sup>	-	67.3	-	53.8	-	-
Scottsdale	95.5	70.7 <sup>1</sup>	97.1	70.1	97.1	73.9	96.9	72.2

Premises name	2012-13		2011-12		2010-11		2009-10	
	Regulatory limits (%)	AMT compliance (%)	Regulatory limits (%)	AMT compliance (%)	Regulatory limits (%)	AMT compliance (%)	Regulatory limits (%)	AMT compliance (%)
St Helens	97.2	98.1 <sup>1</sup>	99.1	99.1	97.2	99.1	96.3	98.2
St Marys	77.0	45.0 <sup>1</sup>	58.3	2.8 <sup>2</sup>	84.9	58.5	82.4	58.3
Stieglitz	100.0	64.5 <sup>2</sup>	100	64.3 <sup>2</sup>	100	61.4	100	72.9
Ti-Tree Bend	97.9	73.1 <sup>1</sup>	95.8	84.3	97.9	88.0	100	87.6
Westbury	89.7	89.7 <sup>1</sup>	84.0	84.0	92.6	92.6	96.3	91.7
<b><i>Cradle Mountain Water</i></b>								
Boat Harbour	84.5	77.4 <sup>2</sup>	78.1	76.0	83.3	82.4	77.8	73.1
Cradle Mountain	99.3	99.8 <sup>1</sup>	99.0	99.5	86.9	96.4	-	-
Currie	87.4	59.8 <sup>1</sup>	78.4	50.5	76.1	42.6	76.7	43.5
East Strahan	95.1	83.2 <sup>1</sup>	99.1	84.0	94.4	85.2	93.5	84.3
Latrobe	71.7	51.0 <sup>1</sup>	85.4	57.4	77.1	63.9	91.7	63.6
Pardoe	82.6	19.2 <sup>1</sup>	89.6	20.6 <sup>2</sup>	85.9	22.6	94.4	21.4
Port Sorell	39.6	15.5 <sup>2</sup>	51.0	16.5 <sup>2</sup>	70.8	21.4	68.8	25.0
Queenstown	74.5	76.2 <sup>1</sup>	80.0	79.0	75.0	81.2	61.5	69.2
Railton	91.2	68.0 <sup>1</sup>	94.7	69.8	87.5	68.5	91.7	75.9
Ridgley	93.0	85.5 <sup>2</sup>	85.4	90.5	76.6	78.6	83.4	78.6
Round Hill	93.5	93.5 <sup>1</sup>	98.1	98.1	91.7	93.6	88.0	88.9
Sheffield	94.3	94.3 <sup>1</sup>	66.7	90.7	86.1	92.6	97.2	97.2
Sisters Beach	85.9	89.4 <sup>2</sup>	87.5	94.8	75.0	86.1	58.3	69.5
Smithton	43.7	35.1 <sup>1</sup>	67.8	61.1	56.0	45.4	64.0	57.1
Somerset	100.0	77.8 <sup>2</sup>	91.7	79.2	100	67.6	43.7	52.8
Stanley	66.2	48.7 <sup>1</sup>	82.5	61.8	87.9	65.3	73.2	55.0
Tullah	95.4	84.7 <sup>1</sup>	91.9	82.7	60.0	73.2	31.9	49.9
Turners Beach	71.2	42.3 <sup>1</sup>	76.9	49.1	79.6	47.2	81.5	63.9

Premises name	2012-13		2011-12		2010-11		2009-10	
	Regulatory limits (%)	AMT compliance (%)	Regulatory limits (%)	AMT compliance (%)	Regulatory limits (%)	AMT compliance (%)	Regulatory limits (%)	AMT compliance (%)
Ulverstone	12.5	12.5 <sup>2</sup>	58.3	88.1 <sup>2</sup>	100	86.1	100	90.3
Wynyard	100	71.8 <sup>2</sup>	100	73.3	91.7	69.8	75.0	63.9
Zeehan	76.1	81.6 <sup>1</sup>	79.1	83.7	72.9	82.4	69.4	63.4
<b><i>Southern Water</i></b>								
Bicheno	83.4	59.1 <sup>1</sup>	80.8	59.3	95.9	58.3	72.9	47.6
Blackmans Bay	95.0	64.8 <sup>1</sup>	91.5	57.9	95.1	57.9	93.8	59.3
Bothwel	91.4	77.1 <sup>1</sup>	89.6	68.9	81.3	58.3	88.1	65.5
Bridgewater	91.6	61.7 <sup>1</sup>	97.2	67.6	97.2	63.2	97.2	64.8
Brighton	74.0	39.3 <sup>1</sup>	70.8	37.0	80.4	39.4	91.9	46.5
Cambridge/Airport	77.8	92.9 <sup>1</sup>	83.9	93.1	91.8	93.4	93.0	97.7
Cameron Bay	84.3	62.0 <sup>1</sup>	81.5	65.8	75.9	55.8	88.1	60.7
Campania	42.0	43.9 <sup>1</sup>	33.9	48.2	42.3	35.2	41.7	36.9
Cygnet	91.5	73.0 <sup>1</sup>	96.2	82.6	96.2	80.4	93.9	70.1
Dover	85.3	66.4 <sup>1</sup>	87.7	67.0	66.7	35.7	72.0	34.7
Electrona	37.5	37.9 <sup>1</sup>	42.0	31.9	50.0	42.6	72.9	53.7
Geeveston	91.7	84.2 <sup>1</sup>	97.9	84.6	92.9	77.5	49.1	29.0
Kempton	31.3	35.2 <sup>1</sup>	36.8	34.3	35.9	22.3	45.8	35.7
Macquarie Point	93.0	42.9 <sup>1</sup>	82.2	25.7	90.7	41.0	100	36.1
Margate	79.2	50.5 <sup>1</sup>	66.7	46.9	61.1	36.6	68.8	46.3
Midway Point	100.0	73.7 <sup>1</sup>	97.9	81.7	100	79.8	97.9	76.8
New Norfolk	89.6	53.7 <sup>1</sup>	85.4	41.7 <sup>2</sup>	73.3	32.0	91.4	41.8
Oatlands	29.2	39.1 <sup>1</sup>	54.2	48.0	44.6	37.7	57.7	42.9
Orford	93.5	68.5 <sup>1</sup>	96.5	69.9	94.0	51.2	89.0	64.8
Prince of Wales	87.5	59.4 <sup>1</sup>	93.8	64.4	95.9	68.3	100	61.9

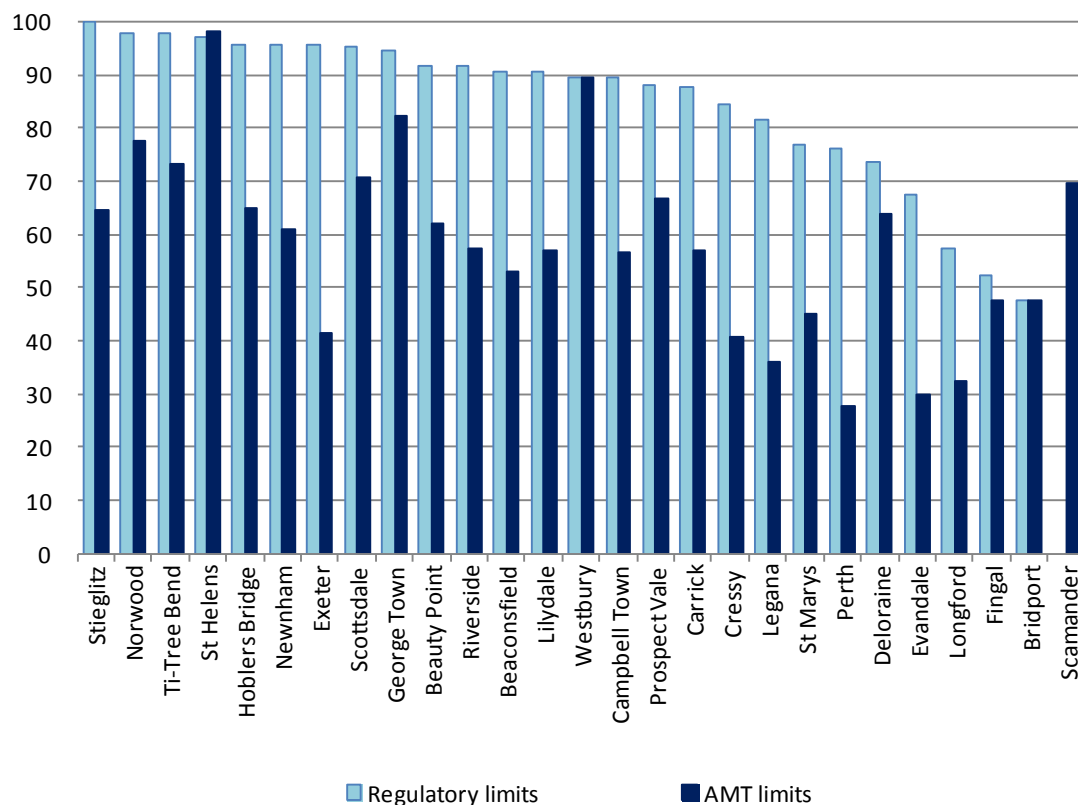
Premises name	2012-13		2011-12		2010-11		2009-10	
	Regulatory limits (%)	AMT compliance (%)	Regulatory limits (%)	AMT compliance (%)	Regulatory limits (%)	AMT compliance (%)	Regulatory limits (%)	AMT compliance (%)
Ranelagh	47.4	47.4 <sup>1</sup>	59.6	59.6	53.6	53.6	54.9	54.9
Richmond	-	41.7 <sup>1</sup>	-	46.8	-	46.0	-	-
Risdon Vale	100.0	93.3 <sup>1</sup>	97.3	91.6	97.9	94.0	100	92.9
Rokeby	87.4	85.2 <sup>1</sup>	93.3	93.6	97.1	97.1	97.6	98.0
Rosny	100	68.8 <sup>1</sup>	99.3	66.7	98.9	67.0	98.5	61.8
Selfs Point	86.4	93.6 <sup>1</sup>	93.9	98.0	92.7	99.0	95.0	98.7
Sorell	91.7	66.3 <sup>1</sup>	93.8	67.3	89.8	61.9	90.4	63.2
Swansea	74.5	42.7 <sup>1</sup>	79.2	45.0	81.0	51.2	91.3	60.7
Taroona	62.5	38.8 <sup>1</sup>	61.2	38.5	51.0	34.9	75.0	45.4
Triabunna	78.2	54.5 <sup>1</sup>	76.1	51.3	82.4	46.2	81.0	57.1

AMT dataset completeness

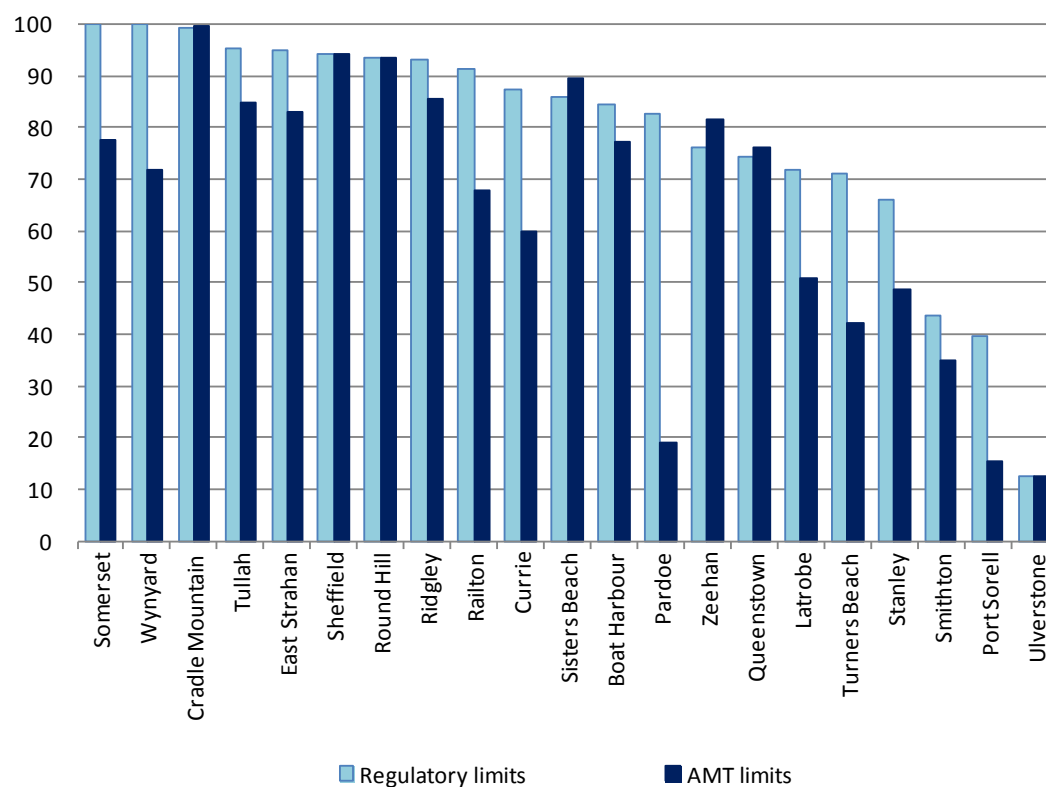
<sup>1</sup> 95-100% complete

<sup>2</sup> 76-94% complete

**Figure A4.1 Ben Lomond Water - WWTP compliance with regulatory and AMT discharge to waters limits, 2012-13 (per cent)**



**Figure A4.2 Cradle Mountain Water - WWTP compliance with regulatory and AMT discharge to waters limits, 2012-13 (per cent)**



**Figure A4.3 Southern Water - WWTP compliance with regulatory and AMT discharge to waters limits, 2012-13 (per cent)**

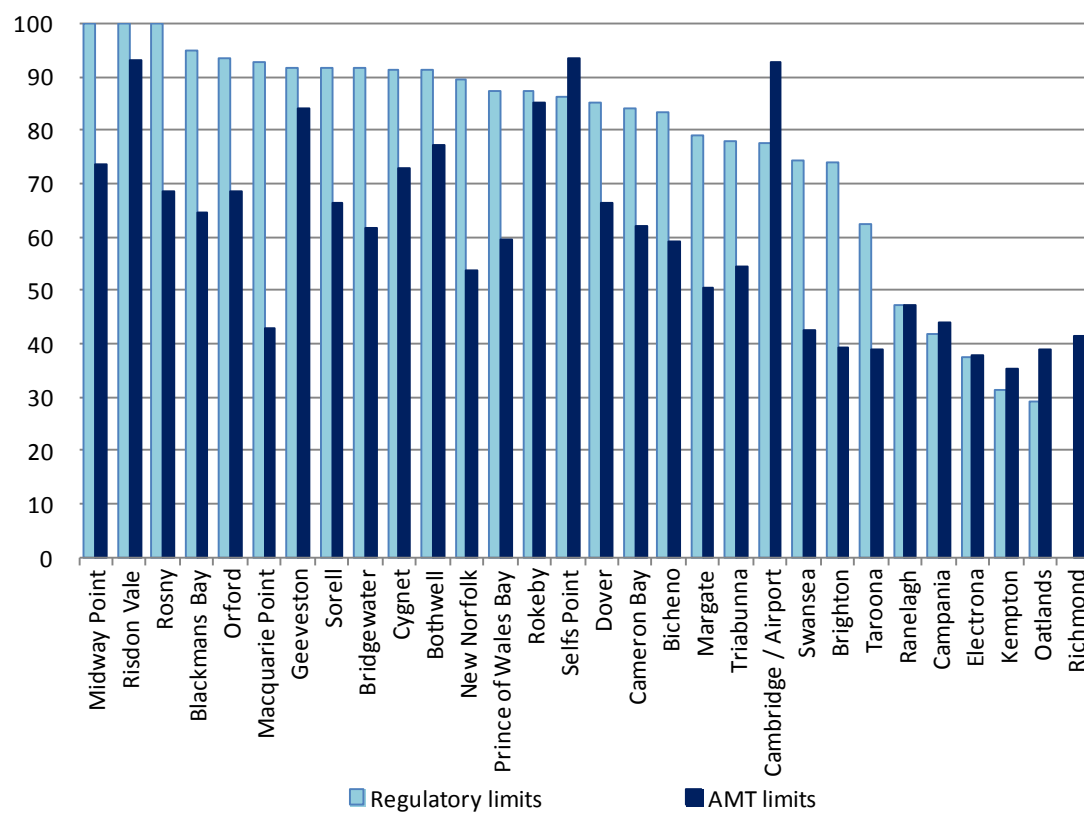


Table A4.2 Compliance with 'Class B' reuse limits

Region	Premises	2012-13	2011-12	2010-11	2009-10	2008-09	2007-08
Ben Lomond Water	Beaconsfield	88.9	--	--	--	--	--
Ben Lomond Water	Beauty Point	91.7	87.3	98.3	88.3	87.2	75.0
Southern Water	Bicheno	93.3	93.4	100	100	91.7	88.9
Southern Water	Bothwell	94.6	93.1	89.6	100	83.3	77.8
Southern Water	Bridgewater	96.7	100	100	100	100	100
Ben Lomond Water	Bridport	91.7	95.2	96.7	98.3	97.2	100
Southern Water	Brighton	81.7	86.7	85.5	93.7	89.3	88.6
Southern Water	Cambridge/Airport	100.0	99.0	100	100	-	-
Southern Water	Cameron Bay	100.0	96.9	98.0	100	100	100
Southern Water	Campania	85.5	78.6	76.9	80.6	68.3	80.0
Ben Lomond Water	Campbell Town	95.0	91.7	80.0	80.0	63.9	72.2
Ben Lomond Water	Carrick	91.4	89.3	-	-	-	-
Ben Lomond Water	Cressy	81.7	90.0	91.7	91.7	94.5	63.9
Ben Lomond Water	Evandale	65.0	63.3	65.0	65.0	83.3	66.7
Ben Lomond Water	Exeter	96.6	78.3	98.3	98.3	89.7	94.4
Southern Water	Kempton	61.7	63.8	72.9	83.3	81.7	80.0
Cradle Mountain Water	Latrobe	65.5	76.7	61.7	81.7	95.0	93.3
Ben Lomond Water	Legana	93.5	96.4	93.3	96.7	94.9	91.7
Ben Lomond Water	Lilydale	93.3	96.7	91.7	91.7	88.9	91.7
Southern Water	Macquarie Point	94.3	100	100	-	-	-
Southern Water	Oatlands	75.0	94.0	78.6	89.7	85.0	73.3
Southern Water	Orford	96.7	96.7	97.2	100	91.7	86.1
Southern Water	Penna	85.7	91.1	98.3	-	-	-
Ben Lomond Water	Perth	80.0	76.7	83.3	76.7	80.5	66.7
Cradle Mountain Water	Railton	88.9	86.2	91.7	91.7	96.7	93.3



Region	Premises	2012-13	2011-12	2010-11	2009-10	2008-09	2007-08
Southern Water	Richmond	80.0	84.4	90.4	-	-	-
Ben Lomond Water	Riverside	100.0	96.5	80.0	91.7	100	100
Southern Water	Rokeby	100.0	99.0	-	-	-	-
Southern Water	Rosny	100.0	100	100	100	100	100
Ben Lomond Water	Scamander	93.3	92.1	77.6	78.3	100	91.7
Southern Water	Selfs Point	100.0	99.3	99.5	100	99.2	100
Ben Lomond Water	St Marys	86.0	61.1	87.9	88.3	96.2	100
Ben Lomond Water	Stieglitz	96.7	95.0	100	95.6	100	100
Southern Water	Swansea	79.0	79.7	88.9	96.3	91.7	83.3
Southern Water	Triabunna	83.9	77.1	94.9	94.4	97.2	83.3

Table A4.3 Reuse proportion per WWTP (per cent proportion and ML/year) 2009-10 to 2012-13

Premises name	2012-13		2011-12		2010-11		2009-10	
	Reuse proportion (%)	Reuse flow ML/year	Reuse proportion (%)	Reuse flow ML/year	Reuse proportion (%)	Reuse flow ML/year	Reuse proportion (%)	Reuse flow ML/year
<b>Ben Lomond Water</b>								
Beaconsfield	69.6	40.4	-	-	-	-	-	-
Beauty Point	73.4	85.7	55.0	82.7	53.0	102.3	78.0	151.5
Bridport	0.5	0.5	0.0	0.0	0.5	0.5	1.4	1.4
Campbell Town	100	62.7	33.6	29.3	98.7	92.2	100	95.3
Carrick	36.5	70.6	9.0	16.0	0.0	-	0.0	-
Cressy	97.8	49.8	57.9	36.8	97.0	70.5	82.0	57.0
Evandale	88.7	59.6	60.2	42.5	86.0	67.2	75.0	64.4
Exeter	58.2	13.2	49.9	8.3	47.0	13.9	87.0	37.9
Legana	60.7	172.5	45.2	150.1	64.0	234.5	72.0	53.0
Lilydale	41.0	8.3	60.0	19.0	85.0	31.4	95.0	39.0
Perth	72.9	143.9	55.3	130.9	47.0	116.5	91.0	243.0
Riverside	8.1	40.0	22.2	111.4	2.0	11.4	18.0	110.7
Scamander	100	17.1	81.5	87.5	23.0	18.2	67.0	27.4
St Marys	100	47.4	47.0	25.8	27.0	15.4	39.0	20.4
Stieglitz	100	19.0	100	74.8	100	83.6	38.0	56.6
Westbury *	6.9	14.0	-	-	-	-	-	-
<b>Cradle Mountain Water</b>								
Railton	43.0	73.5	82.9	141.8	18.0	45.0	63.0	115
<b>Southern Water</b>								
Bicheno	43.3	45.8	22.9	28.2	10.5	13.0	74.0	118
Bothwell	100	41.1	58.0	26.5	100	45.8	89.0	40.6
Bridgewater (Green Point)	54.9	433.4	50.1	455.3	66.0	588.1	72.0	630.7
Brighton	86.5	226.0	74.8	204.4	94.7	253.6	100	304

Premises name	2012-13		2011-12		2010-11		2009-10	
	Reuse proportion (%)	Reuse flow ML/year	Reuse proportion (%)	Reuse flow ML/year	Reuse proportion (%)	Reuse flow ML/year	Reuse proportion (%)	Reuse flow ML/year
Cambridge/ Airport	3.9	3.7	5.2	6.0	5.3	6.2	8.0	9.1
Cameron Bay	4.3	74.8	3.2	63.7	3.8	79.1	4.0	89.8
Campania	100	29.5	100	29.5	100	33.8	100	33.6
Kempton	100	43	100	42.5	100	42.0	100	42.3
Macquarie Point	5.8	225.8	3.8	160.2	2.1	99.4	-	-
Midway Point	67.4	108.4	63.0	81.9	71.8	97.6	56.0	121.4
Oatlands	72.0	57.8	58.0	46.6	97.8	77.3	86.0	68.1
Penna	100	279.9	100	208.0	100	170.0	100	202.9
Richmond	82.4	55.0	100	72.0	100	66.5	100	0
Rosny	52.2	1170.8	31.0	771.9	50.0	1 348.1	40.0	1 096
Rokeby	65.3	393.8	44.2	298.2	-	-	-	-
Selfs Point	0.4	10.7	2.3	83.7	1.4	51.8	1.5	55.0
Sorell	68.7	169.3	64.0	104.8	73.1	91.3	56.0	74.9
Swansea	98.0	77.2	36.0	28.1	23.0	19.4	81.0	93.7
Taroona	4.9	6.3	-	-	-	-	-	-
Triabunna	65.8	56.6	35.0	59.3	97.4	90.1	88.0	63.3

\* The reuse figures for Westbury WWTP refer to emergency irrigation of effluent on adjacent pasture land which occurred during March and April 2013.

