



2023-28 Price Submission

SEPTEMBER 2022

Contents

Message from the Chair and Managing Director	5
Executive summary	7
Delivering value	17
1. Building on a strong foundation	18
1.1 Our performance on customer outcomes, perceptions and service levels	18
1.2 Our financial performance	21
1.3 Customer bills are lower than we said they would be	22
2. Listening to customers and our communities	23
3. Our commitment to customers	37
3.1 What we've heard	38
3.2 Caring for Country approach for all outcomes	40
3.3 Outcome 1 – Safe and pleasant drinking water	42
3.4 Outcome 2 – Reliable water and sewerage services	44
3.5 Outcome 3 – Timely response and repair	46
3.6 Outcome 4 – Service that meets everyone's needs	48
3.7 Outcome 5 – Saving water for the future	51
3.8 Outcome 6 – Looking after our natural environment	54
3.9 Major projects	57
3.10 Performance reporting to customers	59
3.11 Service standards	60
3.12 Performance rebates	61
Prudent and efficient investments now and for the future.	63
4. Developing our best offer for customers	64
4.1 Board involvement and attestation	64
4.2 Planning and economic challenges	65
4.3 Prudent and efficient investments	68
5. Revenue requirement	72
5.1 Operating expenditure	73
5.2 Controllable operating expenditure	74
5.3 Non-controllable operating expenditure – other	76
5.4 Non-controllable operating expenditure – external bulk charges	77
5.5 Capital expenditure	77
5.6 Roll forward of the regulatory asset base	85
5.7 Proceeds from disposals	87

5.8	Regulatory depreciation of assets	87
5.9	Return on assets	88
5.10	Prior period adjustments	88
5.11	Tax liability (allowance)	89
6.	Forecast revenue	90
6.1	Revenue not collected	91
7.	Demand forecasts	93
7.1	Supply and demand scenarios	93
7.2	Growth in customers	94
7.3	Water consumption and sewage disposal	97
8.	Prices and tariff structures	105
8.1	Major products and services	106
8.2	Developer and customer contributions for infrastructure and new services	112
8.3	Additional products and services	115
8.4	Price control	116
8.5	Adjustment to prices	117
	Appendices	118
	Appendix A 2018-23 outcomes in review	119
	Appendix B PREMO assessment	141
B.1	Performance	141
B.2	Risk	152
B.3	Engagement	166
B.4	Management	169
B.5	Outcomes	172
	Appendix C Detailed capital expenditure	180
C.1	Asset renewal and customer service level programs	182
C.2	Customer growth programs	220
C.3	Business improvements and regulatory compliance programs	226
	Appendix D Detailed operating expenditure	246
D.1	Base year adjustments	248
D.2	Net ongoing efficiency	248
D.3	Additional expenditure items	249
	Appendix E Addressing our environmental and safe drinking water obligations	253
E.1	Environmental obligations and expectations	253
E.2	Safe drinking water obligations and guidance	258

Acknowledgement of Traditional Owners/Custodians

Yarra Valley Water proudly acknowledges the Traditional Owners/Custodians of the land and water on which we rely and operate. We pay our deepest respects to their Elders past, present and emerging. We acknowledge the continued cultural, social and spiritual connections that Aboriginal Victorians have with the land and waters and recognise and value the care and protection provided by Traditional Owners/Custodians over thousands of generations. We also recognise and value the continuing rich cultures and contribution of Aboriginal people to the Victorian community.

Language statement

We recognise the diversity of Aboriginal people living throughout Victoria. We have used the term "Aboriginal" to include all people of Aboriginal and Torres Strait Islander descent who are living in Victoria. The use of the words "our" and "we" throughout this document refers to Yarra Valley Water.



How to read this document

This is a price submission document prepared solely for the purposes of meeting our obligations as a regulated water business, including the Essential Services Commission's (the Commission) (ESC) 2023 water price review: [Guidance paper](#).

We have prepared our submission in two interrelated parts.

The first part, our price submission, represents a concise, standalone description of our proposals and commitments across the regulatory period. It sets out the context within which we prepared this submission and how we have addressed key risks including:

- Climate change preparedness and mitigation
- Forecast rate of customer growth
- Deliverability of capital expenditure program
- Coronavirus (COVID-19)

It describes our engagement approach, customer outcomes and commitments, demand forecasts, how Board and Management have approached the management of risk and investment, and our prices.

The price submission should be read in conjunction with the appendices – the second part of our submission. The appendices contain more detailed information about key aspects of our price submission. It also contains our self-assessment under the performance, risk, engagement, management and outcomes (PREMO) framework.

All values presented in the price submission and appendices are in January 2022-23\$ unless otherwise stated. Numbers in tables have been rounded to the second decimal place unless otherwise indicated.

Additional information available upon request

Additional information and supporting documents are referenced throughout the price submission and appendices.

These documents support our proposals and are available to the Commission on request.

Message from the Chair and Managing Director

Welcome to our 2023-28 price submission, which sets out how we'll deliver upon customers' needs and expectations, create additional value and contribute to a brighter future for communities and the natural environment. It builds on our success in delivering the commitments we made to customers in our 2018-23 submission.

Our 2023-28 price submission has been developed during unprecedented times and change in the community, with the challenges of affordability, coronavirus (COVID-19) and climate change. Our submission focuses on the diversity of our customers, the communities we serve and the connected nature of our industry. We stand for reconciliation and embracing a Caring for Country philosophy – working together to deliver a sustainable and economically viable future with a secure water supply.

We're proud of the contribution we make to the local economy and community. Our purpose is to support the health and wellbeing of our customers and create a brighter future for communities and the natural environment. Our 2030 Strategy has been developed to ensure we continue to provide essential water and sewerage services while also helping to build a more sustainable, vibrant and connected community. We're embedding the price submission promises into our strategy so that our staff and community know exactly what our priorities are and our focus for the future.

The challenges of climate change and population growth put pressure on our network and the availability of water. Planning for natural disasters is more important than ever as the impacts of climate change increase. Severe weather events, such as the destructive storms of June 2021, have tested our network and emergency response. We continue to review and improve our approach to emergency management, taking part in industry-wide exercises to ensure we maintain a robust emergency response. We're also investing in our asset maintenance program to strengthen our network to ensure the continued reliable delivery of our essential water and sewerage services.

Using a co-design approach with stakeholders and the community, we've taken our engagement to the next level. We deliberately sought diverse views, especially from customers with lived experience, together with youth and people living at the fringes of our service area. Incorporating the wisdom of our Aboriginal Community Working Group we've developed deep, contemporary insights on what matters most to the community, and we've embedded these in our proposals.

We're committed to being an inclusive and accessible organisation – one that understands and responds to the needs of all customers and people in its community, not just the majority. Through the experience of hearing from and engaging with our customers who have lived experience of barriers to service, we've explored the breadth of what it truly means to consider and accommodate diverse needs in a meaningful way – and we'll continue to work to apply that knowledge in everything we do, including how to measure our improvement.

WaterCare, our flagship financial support program, is built on the belief that everyone must have access to affordable water and sewerage services. Current economic conditions

continue to impact our customers and it's more important than ever that people can connect with support that meets their needs. We've consciously challenged ourselves to ensure we are making our best offer for all customers. While benchmarking shows we're on or close to the efficiency frontier, we're committed to delivering further efficiencies. We believe this submission provides a balanced portfolio of prudent and efficient investments that will deliver increased value to customers, through affordable bills and six major customer outcomes that reflect their priorities.

In real terms, our bills have been declining since 2013-14, and we are pleased that this submission sustains that trajectory for the next pricing period, keeping pressure off households and businesses in a time of rising costs and economic uncertainty.

We've critically examined this plan in context of the current economic conditions, including supply chain and resource constraints. Where there is uncertainty in terms of deliverability, we've sought to mitigate our exposure through smart procurement with valued and long-standing partners – and where prudent we're deferring investment and absorbing the financial risk of bringing it forward, rather than passing it on to customers.

We're committed to achieving the promises we've made to all customers. We have extensive governance processes and procedures that enable us to monitor and manage our progress to ensure we'll deliver on our outcomes, service standards, capital delivery and expenditure commitments.

Once again, we'll back our commitments with a community rebate and a comprehensive guaranteed service level rebate scheme. We'll continue to monitor and track our performance and report our achievements, including where we aim to do better – especially for those customers whose experience is not meeting their needs or expectations, while ensuring levels of satisfaction and value for money remain high.

Our Board has been actively engaged in developing, reviewing and approving the price submission over the past two years including over 30 separate discussions and presentations, so we're confident in providing the following attestation.

As of 30 September 2022, the directors of Yarra Valley Water having made such reasonable inquiries of management as we considered necessary (or having satisfied ourselves that we have no query), attest that, to the best of our knowledge, for the purpose of proposing prices for the Essential Services Commission's 2023 water price review:

- information and documentation provided in the price submission and relied upon to support Yarra Valley Water's price submission is reasonably based, complete and accurate in all material respects;
- financial and demand forecasts are the business's best estimates, and supporting information is available to justify the assumptions and methodologies used; and
- the price submission satisfies the requirements of the 2023 water price review guidance paper issued by the Essential Services Commission in all material respects.



Sue O'Connor
Chair



Pat McCafferty
Managing Director

Executive summary

This document presents our 2023-28 price submission for the five-year regulatory period commencing 1 July 2023. The price submission meets the Commission's regulatory requirements in its 2023 Water Price Review Guidance Paper.

Our price submission is built on a strong foundation of performance during the 2018-2023 regulatory period – where we:

- Achieved a minimum of five of seven customer outcomes we committed to each year and returned \$1.5 million¹ to customers through reduced prices in the subsequent year for any outcomes we didn't meet.
- Improved in each of the customer perception measures – value for money, satisfaction, trust and reputation in the community – that the ESC independently measures on a quarterly basis.
- Increased investment in areas where customers said they saw additional value, to:
 - Reach more than 150,000 customers who experience barriers to accessing our services, through trusted partners and targeted programs to tell them about the support we offer.
 - Implement innovative water education and water conservation behaviour change programs for children and the community. We have also reduced water lost in our network from 10.8 per cent in 2017-18 to 7.8 per cent in 2021-22 through our proactive leak detection and district metering programs.
- Achieved a 1.52 per cent efficiency rate in our operating expenditure – that absorbed the additional costs associated with new cloud-based technologies (excluding these costs we achieved an underlying efficiency outcome of 2.36 per cent).
- Delivered, or are on track to deliver fully, nine² of the 10 major projects we committed to over the period, consciously deferring components of one project to deliver efficiencies.

Overall, we delivered on our commitments and what customers told us they expected and valued. Performance data and independent research confirms that we serve the majority of customers well and meet their expectations in terms of levels of satisfaction, trust, reputation in the community and value for money. As a result, we focused our engagement approach on customers who we may not serve as well, to test if those customers could identify gaps in the products and services we provide.

¹ January 2019\$ – equivalent to \$1.65 million in January 2023\$

² We consciously deferred the wet weather storage tank component of Craigieburn flow storage and distribution project to combine it with the next stage of storage expansion to create efficiencies in delivery. The pipeline part of the project will be completed early 2024-25.

How we engaged with customers

We're committed to building ongoing and genuine relationships with our customers and the communities we serve.

We built upon our previous price submission engagement program to engage more widely, deeply and over a longer period of time. We also sought to empower customers and the community to set the challenge and issues they want us to address in our price submission. We achieved this by:

- Co-designing our engagement program with staff, our Board Directors, stakeholders, regulators and external critical friends³. The process set the context and direction of our engagement program. We unearthed contextual and emerging issues, and identified the voices we needed to hear from.
- Establishing an Aboriginal Community Working Group with the guidance and assistance of our Indigenous Board Directors, Karen Milward and Ian Hamm, and our Reconciliation Leadership Committee. This included Aunty Daphne and Aunty Janet participating in a Yarning Circle with the Citizens' Jury where they talked about their personal connection to Country, and their relationship with water and the environment (refer to break-out box on page 26 for more information on our engagement with Aboriginal people).
- Specifically seeking to identify and engage with customer voices we don't often hear from, including:
 - Customers who are deaf and hard of hearing with support from Auslan interpreters
 - Customers who are blind and have low vision
 - Culturally and linguistically diverse customers, with support from language interpreters
 - Youth (generation Z, aged 16 to 25 years)
 - Residents of the Dandenong Ranges who live at the fringe of our service area who can experience a different level of service compared to other customers, and have recently been impacted by severe storms and are at high risk from bushfires.
- Designing an approach (refer to Figure 1 on page 9) where each deliberative phase built into the next – we brought people together to define the problem; then we brought new people in to identify solutions. We also involved stakeholders at every stage. At critical junctures, we brought customers and our Aboriginal Community Working Group together – the Working Group acted as advisors, guest speakers and a sounding board for the Jury's ideas and draft recommendations.

³ A trusted person who asks provocative questions and offers critiques of work as a friend and is an advocate of the success of the work.

Our engagement journey

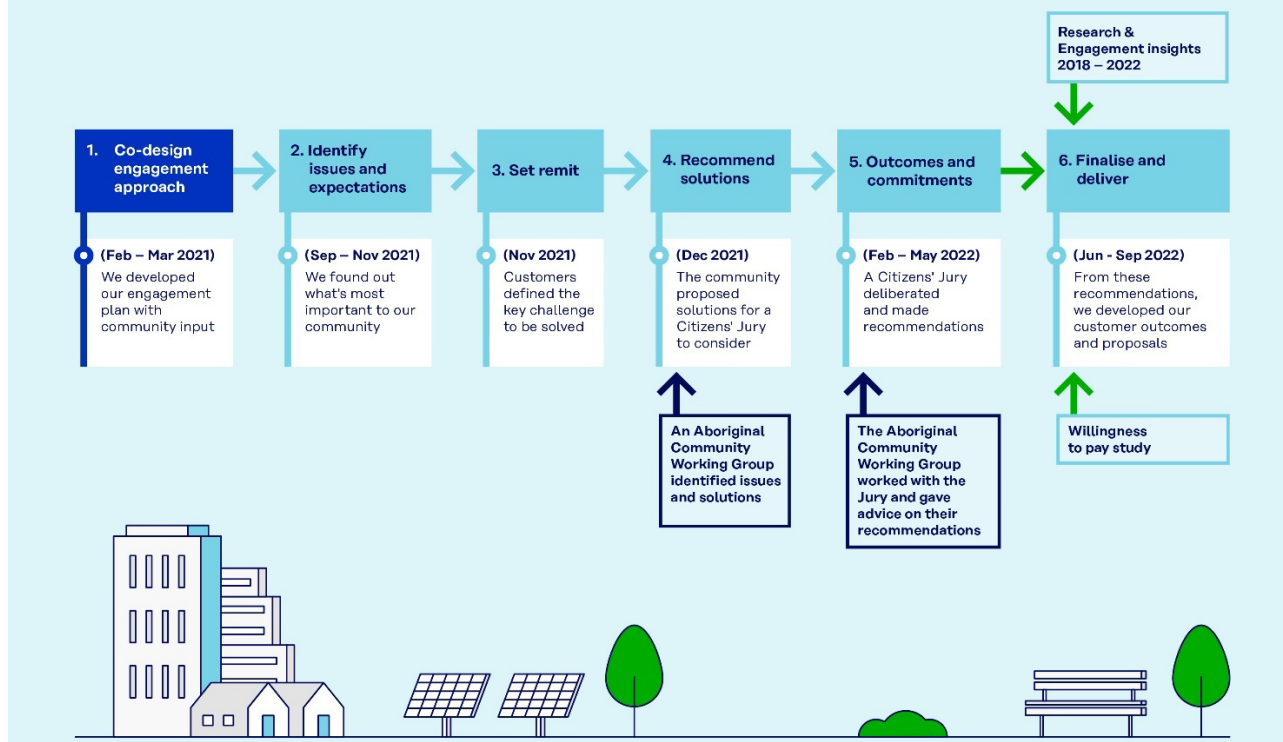


Figure 1: 2023 price review engagement approach co-designed with stakeholders, community representatives and staff

Our ongoing research, community engagement and customer experience insights have been used throughout to provide the foundation of information for the engagement and ultimately our price submission. With more than 39,000 touchpoints with customers since 2018, these programs continuously feed insights for action and improvement opportunities.

We supplemented the engagement program with a small number of bespoke research pieces designed to close the gap in areas which are imperative to the price submission and are topics of known social significance that can directly impact prices, including:

- Tariffs, pricing and affordability – top priorities for customers and often cited as pain points for a variety of reasons.
- Vulnerability and inclusion – to gain a deeper understanding of the barriers faced by people with lived experience, the materiality of the barriers and what they mean for future service design.
- Two quantitative value assessments (willingness to pay studies) – holistic evaluations of customer trade-offs between price, outcomes and value, which we used to independently test other insights gathered from all other forms of research and engagement including the deliberative forums we ran. Our first willingness to pay study was conducted in April and May 2022 when cost of living and other concerns may not have been prevalent. To ensure the validity of results we conducted another survey in late July and early August, following community concerns about cost of living pressures including inflation and successive interest rate rises.
- Testing our final proposals and customer promises, including customer outcomes, measures and targets, guaranteed service levels and performance.

What we heard

The Aboriginal Community Working Group had a profound impact on the outcomes of our engagement process – Caring for Country was the Jury’s number one recommendation for us, clearly stipulating that it needs to underpin all our actions and decision making.

The Jury made 11 other recommendations. We fully accepted 10 of the 12 recommendations, partially accepted another – with a small variation – and committed to continue to explore how to address the remaining recommendation. The engagement journey is available on our website, it details the steps we took, reports we gathered and information we provided – including the Jury’s recommendations and our response – refer to <https://www.yvw.com.au/pricesubmission>.

Consistent with our purpose⁴, customers continue to identify safe drinking water as their number one priority. Other key insights we’ve heard include:

- We don’t always meet all the needs of our diverse customer base, particularly those who experience barriers to our services, which are generally designed and developed for the majority of customers.
- Customers want us to do more to save drinking water. They cite actions such as enabling wider availability of recycled and alternate water sources, offering financial assistance to adopt and install water efficient products and appliances, and working in partnership across business, government and other stakeholders for greater benefit. Customers also want us to take more care of, and protect, the natural environment.
- People want their water and sewerage services to remain affordable and hardship support to be available when needed. They also support a greater emphasis on user pays that enables a step change in water efficiency.
- There is support for more cost reflective funding of infrastructure that provides services to new customers.
- There was less emphasis on further improving on our existing support for financially vulnerable customers (beyond current levels) and less discussion on reducing greenhouse gas emissions.

Insights have evolved our customer outcomes

As a result of everything we’ve heard, we propose evolving the seven customer outcomes we’ve worked towards since 2018-19 into six outcomes, showing delineation between the services we provide to customers now and the action we need to take now, for the future. We’ve also sought to embed a Caring for Country philosophy across all our decisions and outcomes. Refer to Figure 2 on the following page.

⁴ To support the health and wellbeing of our customers, and create a brighter future for communities and the natural environment.

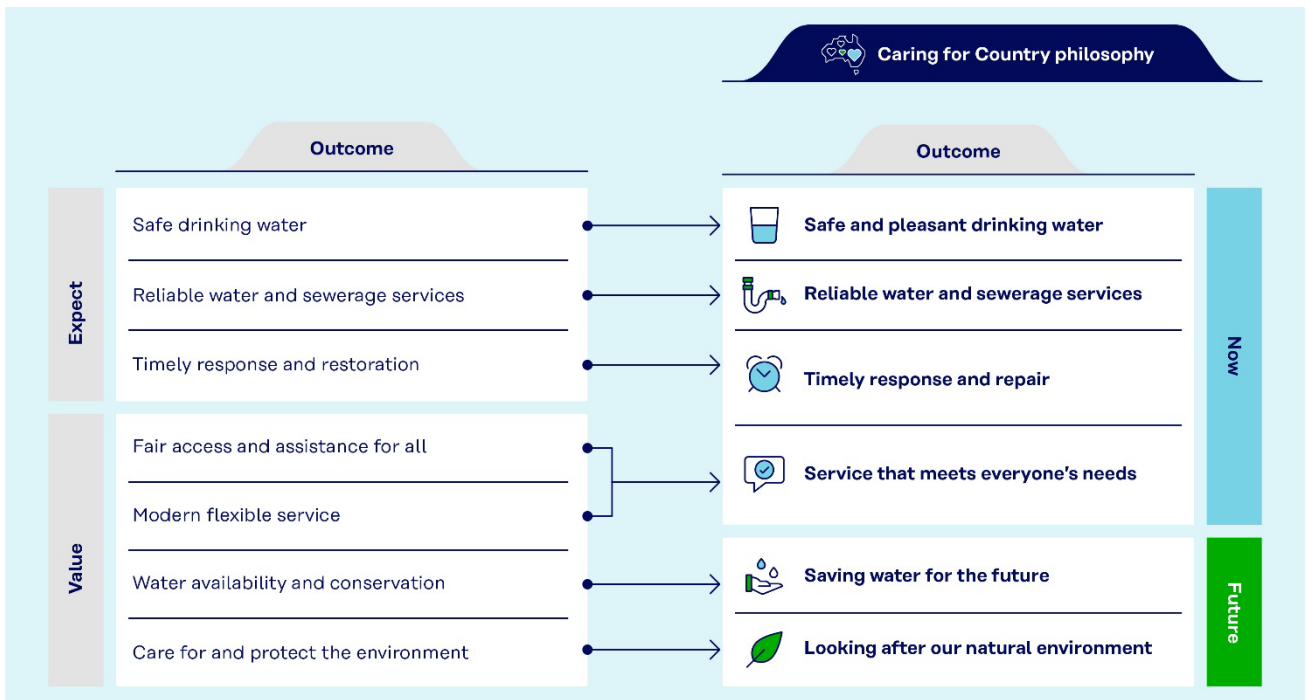


Figure 2: Proposed customer outcomes 2023-28, including evolution from 2018-23

The outcomes have a new set of measures developed from customer insights, fully reflecting the breadth and depth of the outcomes and range of customer experience.

A near to final set of outcomes was tested and refined with customers including members of our current (2022) and previous (2017) Citizens' Juries.

We've evolved our outcomes to:

- Better distinguish the variation in service different customers experience as well as measuring typical or average performance levels.
- Separate water savings targets by use, including household and business use.
- Capture the breadth of customer concerns about the environment.

Figure 3 below outlines the set of outcomes associated measures and targets proposed for the 2023-28 period. Further information can be found about each outcome propose in sections 3.3 to 3.8 from page 42 and Appendix B – Outcomes from page 172.

Caring for Country philosophy for our decisions and actions						
For Now				For the Future		
Outcome	Safe and pleasant drinking water	Reliable water and sewerage services	Timely response and repair	Service that meets everyone's needs	Saving water for the future	Looking after our natural environment
Measure	<p>Compliance with safe drinking water regulations (2015) Target: 100%</p> <p>Customers who agree we provide great drinking water Target: 91%</p>	<p>Customers who experience three or more unplanned interruptions Target: <7000 customers</p> <p>Customers who experienced five or more unplanned interruptions in the last three years, and any interruptions this year Target: <3572 customers</p>	<p>Customers' satisfaction with the restoration of their services (planned and unplanned interruptions) Target: 91%</p> <p>Customers whose water or sewerage service wasn't restored within four hours Target: 4.85%</p> <p>Customers whose water or sewerage service wasn't restored within 12 hours Target: 0.35%</p>	<p>Customers' satisfaction with their most recent interaction with us Target: 86%</p> <p>Customers, who accessed our support services, believe Yarra Valley Water helped them with their bills Target: 92%</p>	<p>Water lost in Yarra Valley Water's supply system Target: 7.3% by 2028</p> <p>Recycled water used in designated areas Target: 11.8% by 2028</p> <p>Average household water use (litres, per property, per day) Target: 396L by 2028</p> <p>Business customers who use more than 100ML (100 million litres) of water a year, who have an active water efficiency plan Target: 100%</p>	<p>Hectares of land we actively manage to preserve and restore biodiversity and natural habitats Target: 47ha by 2028</p> <p>Volume of sewage spills that have a material impact to the environment Target: <5000KL</p> <p>Number of customers who were on septic tanks and are now connected to the sewerage network Target: >200</p> <p>Percentage of energy requirements met from renewables Target: 100% by 2026</p>

Figure 3: Proposed customer outcomes and measures for 2023-28

We have a deepened appreciation of the need to provide accessible and inclusive, non-discriminatory services where customers feel included, respected and have their needs met. We're currently working on further breaking down barriers that exist for some customers. We'll use an inclusive design approach and real-world useability testing to improve the useability and accessibility of our digital, non-digital and communication channels. We will also develop our capability to measure progress against key standards and via feedback from our customers. When we're able, we'll propose a new measure specifically related to accessibility – underpinning the outcome 'service that meets everyone's needs'.

In addition to the evolution of outcomes and measures, customer insights have influenced the development of our best offer for customers, including:

- Confirming that customers value maintaining existing service levels.
- Additional investments for biodiversity outcomes and water conservation products and programs.
- Stronger water use price signal and bill simplification.
- Spreading the forecast price decrease over 2023-24 and 2024-25 after considering the high inflation environment.
- Increasing new customer contributions to reflect the increased cost of growth.
- Our commitment to evolve our community rebate to deliver greater value.

A value package for customers

We've consciously challenged ourselves to ensure we make our best offer for all customers. While benchmarking shows we're on or close to the efficiency frontier, we're committed to delivering further efficiencies. We believe this submission provides a balanced portfolio of prudent and efficient investments that will deliver increased value to customers, through affordable bills and the delivery of six major customer outcomes with their associated measures and targets over the five-year period 2023-24 to 2027-28.

Typical bills today are \$288 lower in real terms than in 2013-14 (25 per cent). In keeping with this trend, we propose a 4.57 per cent real price decrease⁵ for residential and business customers in 2023-24, followed by a 3.04 per cent real price decrease in 2024-25, and then no real increases for the three following years⁶.

Consistent with customers preferences for smooth bills we'll continue to cap any annual real changes in prices to 2 per cent through our revenue cap. In addition, given the current high inflation environment, we'll also commit to cap nominal increases in prices for all water and sewerage customers at 5 per cent in 2023-24 and 2024-25. By 2028, customers will continue to experience lower bills, paying \$352 less per annum than in 2013-14 in real terms and \$34 less in nominal terms⁷.

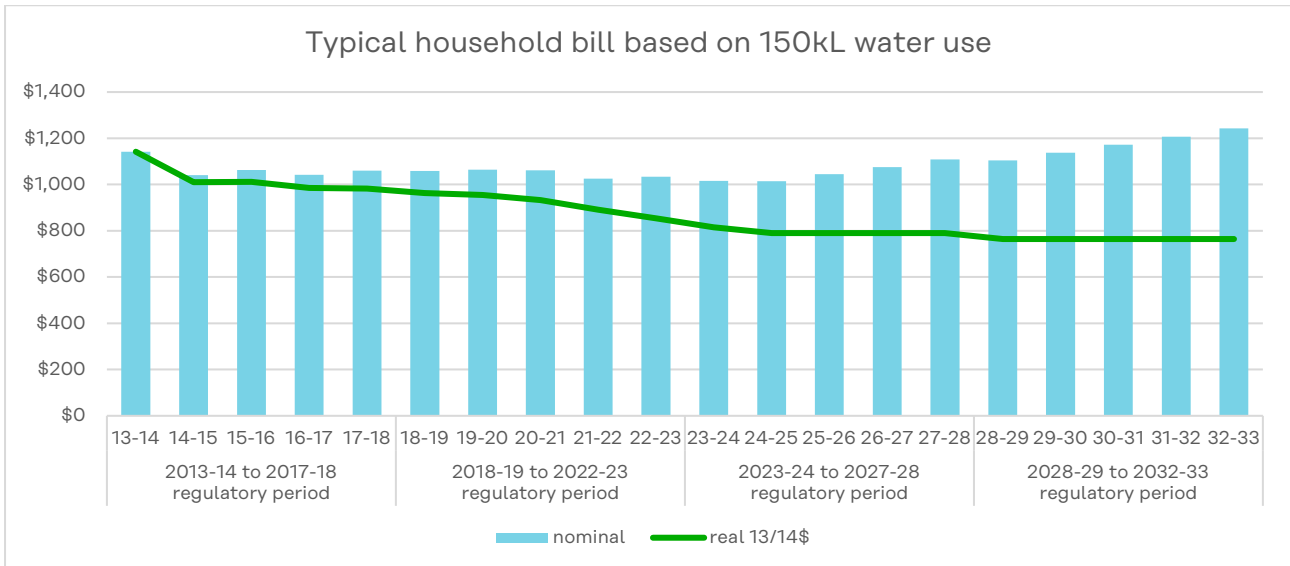


Figure 4: Typical 150 kilolitre household bill 2013-14 to 2032-33 (\$ million January 2023)

We're able to keep bills flat in 2023-28 through:

- A proposed 1.7 per cent per annum operating cost efficiency factor and net cost efficiency factor of 0.26 per cent.
- Proposed forecast growth-related expenditure of \$31.89 million (or about 1.44 per cent per annum compounding), based on the marginal cost to provide services to new customers.

⁵ On average, taking into account the consolidation of water and sewerage usage charges for customers receiving both water and sewerage services.

⁶ Assuming maximum approved prices for 2022-23, prior to an adjustment related to announcement on 23 September 2022 to cease the remainder of the 2022-23 desalination water order.

⁷ Assuming 3.0 per cent inflation per annum consistent with the Commission's template.

- The ongoing forecast benefit of the reduced rolling 10-year average cost of debt and a lower return on equity (4.5 per cent) for an advanced PREMO rating.
- Ensuring our proposed \$1,962.03 million capital expenditure program is prudent and efficient, demonstrated by:
 - Independent rigorous review of business cases that use Monte-Carlo, cost curve analysis incorporating contingency allowances adapted for the stage, complexity and scope of work for our top 10 projects.
 - Independent prudence and efficiency review of 95 per cent of all capital expenditure.
 - A comprehensive process to identify, quantify and determine the most appropriate party to manage risk.
 - An extensive review and adjustment of our proposed capital expenditure in response to the current macro-economic headwinds, including constrained resources, supply chain and deliverability risk.
 - Accepting the financial risk for \$347.33 million of capital expenditure projects where there is significant timing or cost uncertainty, that may be required during the period together with committing to achieve, through better capital delivery, a five per cent packaging and project management efficiency of \$33.13 million across all growth projects.

We're able to keep bills flat while still accommodating:

- Investing \$706.39 million in new infrastructure to provide services predominantly to the Northern Growth Area, including five precinct structure plan areas that have recently opened up to development.
- Capital and operating expenditure to meet ongoing and new regulatory obligations, including climate change adaptation primarily associated with the:
 - Environment Protection Authority (EPA) – refer to Appendix E - Addressing our environmental and safe drinking water obligations on page 253.
 - Department of Health (DH) – refer to Appendix E - Safe drinking water obligations and guidance on page 258.
 - Growth-related operating expenditure to operate new recycled water assets, including the Doncaster Hill recycled water treatment plant and Kalkallo stormwater harvesting facility that will be commissioned during the period.
- Increased information technology costs to support business continuity. Expenditure includes \$18.87 million associated with cloud-based technologies that have traditionally been solutions on-premise, transitioning from capital expenditure to operating expenditure.
- The increased superannuation guarantee levy rate from 10.5 per cent today to 12 per cent from 1 July 2025.
- Additional investments supported by customers, in:
 - Biodiversity that protects and enhances our environment – contributing to the outcome 'looking after our natural environment'.
 - Water efficiency programs that contribute to the outcome 'saving water for the future'.

We also propose to simplify bills and send a stronger water conservation pricing signal.

Consistent with customer insights – customers tell us the sewage disposal charge is difficult to understand and cause for enquiry and contact with us – we propose combining the sewage disposal charge (SDC) with the existing three-tier step water use tariff charges for residential customers. This will create a consolidated water and sewage volumetric, three-step tariff with higher prices that reflect the costs of both water consumption and sewage disposal. Residential customers who only receive a water service, and business customers, won't be affected by this change. Refer to Section 8.1.2 – Proposal to combine volumetric tariffs for households with water and sewerage services page 107 for more information.

Forecast bills for a range of customers using 150 kilolitres of water a year are shown in Table 1 below.

		2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Renter	Real \$	\$504	\$480	\$466	\$466	\$466	\$466
	Nominal \$	\$504	\$495	\$494	\$509	\$524	\$540
Rent provider	Real \$	\$530	\$506	\$490	\$490	\$490	\$490
	Nominal \$	\$530	\$521	\$520	\$536	\$552	\$568
Owner occupier	Real \$	\$1,034	\$986	\$956	\$956	\$956	\$956
	Nominal \$	\$1,034	\$1,016	\$1,014	\$1,045	\$1,076	\$1,108
Water only owner occupier	Real \$	\$456	\$435	\$422	\$422	\$422	\$422
	Nominal \$	\$456	\$448	\$448	\$461	\$475	\$489
Business	Real \$	\$1,575	\$1,503	\$1,457	\$1,457	\$1,457	\$1,457
	Nominal \$	\$1,575	\$1,548	\$1,546	\$1,592	\$1,640	\$1,689

Table 1: Proposed 2023-28 bills for customers using 150kL of water per annum (rounded to nearest \$)

We're proposing a maximum five per cent real year on year increase, capped at 10 per cent nominal, in developer paid contributions for new connections⁸ to reflect the increased costs of providing water and sewerage infrastructure for new customers. Refer to section 8.2.1 - New customer contributions on page 111 for further information.

An 'Advanced' submission

We propose an 'Advanced' self-rating of our submission, which optimises value for customers in terms of 'what they get' and 'what they pay'. Our submission optimises and delivers improved outcomes for our customers at the lowest possible price and focuses on areas that customers value. We have committed to:

- A real price decrease for residential and business customers for the five-year period 2023-28 – capped in nominal terms at 5 per cent for 2023-24 and 2024-25.
- Compounding annual savings in our base operating costs of 1.7 per cent.
- Accepting the financial risk for \$347.33 million of capital expenditure projects where there is significant timing or cost uncertainty, that may be required during the period.

⁸ Known as new customer contribution charges.

- Achieve, through better capital delivery, a five per cent packaging and project management efficiency of \$33.13 million across all growth projects.
- Invest \$1,962.03 million of capital to maintain existing service levels, meet regulatory obligations and service new customers, including:
 - 10 major projects with a total value of \$454.19 million – a significant increase from \$256.4 million for the top 10 projects that will be delivered in the 2018-23 period.
 - Renewal of high-risk and high-consequence water distribution mains based on confirmed risk and condition assessment, together with an increase in the number of risk assessments required due to a 120 per cent increase in the length of main that will reach end of design life by the end of the 2023-28 period.
 - Commencing a meter replacement program for the 62 per cent of meters that will have reached end of life by the end of the 2023-28 period.
 - Significant improvement works required at five of eight local treatment plants to address capacity deficiencies, safety risks and implement process efficiency projects. This includes a full upgrade of Healesville treatment plant that is currently at capacity. This program of works also contributes to meeting our general environmental duty (GED) under the Environment Protection Act.
 - Addressing sewer capacity deficiencies attributed to customer growth, infiltration of groundwater through pipe defects and the impacts of more frequent and severe storm events.
- Additional investments, consistent with customer support, for:
 - Biodiversity outcomes (\$9.41 million⁹) – contributing to the customer outcome ‘looking after our natural environment’, specifically the measure ‘hectares of land we actively manage to preserve and restore biodiversity and natural habitats’. Refer to section 3.8 - Outcome 6 – Looking after our natural environment from page 54.
 - Water conservation products and programs (\$5.25 million) – contributing to the customer outcome ‘saving water for the future’, particularly contributing to the associated measure ‘average household water use’. Refer to section 3.7 - Outcome 5 – Saving water for the future from page 51.
- Retain commitments from the current period to:
 - A revenue cap that ensures customers only pay for the efficient costs of the services we provide, with a real price cap of 2 per cent per annum.
 - Reduce prices to reflect the financing costs saved if we defer a major capital project at any time.
 - Demonstrate our strong commitment to delivering customer outcomes including annually assessing our performance against targets. We’ll return \$1.8 million each year for any outcome we don’t achieve (up to \$10.8 million per annum).
 - Openly and transparently report our performance to customers.

⁹ \$7.82 capital expenditure and \$1.59 operating expenditure.

Delivering value

Linking the voices of customers and community to deliver what matters.



1. Building on a strong foundation

We've been increasing value for customers

This price submission is built on a strong foundation of performance.

We've delivered increased value to customers and the community, demonstrated by our performance during the 2018-23 period and the associated improvement in customer perceptions. Our customers told us what was important to them and we held ourselves accountable to deliver it with \$1.5 million¹⁰ at stake for any outcome not achieved.

It's transformed the way we work by creating a sharp focus on delivering what matters most.

We are proud that, despite the challenges of coronavirus (COVID-19), extreme weather events and most recently, economic and geopolitical uncertainty, we have met five or six of our seven targets each year, and customer bills in 2022-23 are lower than they were in 2017-18, in both real and nominal terms.

1.1 Our performance on customer outcomes, perceptions and service levels

In our 2018-23 price submission, we committed to customers that we'd work to deliver what they value. This is reflected by:

- **Customer outcomes** – what customers told us they expect and value. Insights led to the development of seven outcomes, distinguished by what's important and what's of value to customers. We committed to achieving our seven outcomes and their associated measures and targets over the five-year period 2018-19 to 2022-23. We backed our commitment with a \$1.5 million⁷ community rebate per outcome per year if we didn't meet a target. We return this rebate to customers via lower prices in the following year.
- **Customer perceptions** – how customers feel about us as their service provider across four important indicators – overall customer satisfaction, value for money, reputation in the community and trust.
- **Customer service levels** – associated with measures and minimum standards outlined in the Essential Services Commission's Customer Service Code.

Over the course of the 2018-23 period we have:

- Achieved 21 of 28 (75 per cent) annual customer outcomes over the first four years and forecast to achieve six of seven in the current year. We've already returned to customers

¹⁰ January 2019\$ - equivalent to \$1.65 million in January 2023\$.

through prices, the equivalent of \$10.5 million where we've missed these targets – and anticipate returning another \$1.5 million¹ through 2023-24 prices. Refer to Table 2 below for a summary of our annual performance. Further, a detailed account of how we've delivered the outcomes is available in Appendix A - 2018-23 outcomes in review commencing on page 119.

Outcome	Measure	2018-19	2019-20	2020-21	2021-22	2022-23 (forecast)
Safe drinking water	Compliance with Safe Drinking Water Regulations	✓	✓	✓	✓	✓
Reliable water and sewerage services	Customers who experienced three or more unexpected water or sewerage service interruptions in 12 months	✓	✗	✗	✓	✓
Timely response and restoration	Customers whose interrupted water or sewerage service was restored within four hours	✓	✓	✓	✓	✓
Fair access and assistance for all	Customers who have accessed our services believe we help customers experiencing difficulty paying for their water and sewerage services	✓	✓	✓	✓	✓
Water availability and conservation	Total water use (litres of water used per person per day)	✗	✗	✗	✗	✗
Modern flexible service	Customers who are satisfied with their most recent interaction	✗	✓	✓	✓	✓
Care for and protect the environment	Cumulative reduction in carbon emissions compared to 2016-17 baseline of 34,083 tonnes CO ₂ e	✓	✓	✓	✓	✓
Number of outcomes achieved		5	5	5	6	6
Amount returned to customers (\$M January 2019)		\$3 million	\$3 million	\$3 million	\$1.5 million	\$1.5 million

Table 2: Customer outcomes - annual performance 2018-19 to 2022-23

- Increased ratings for all customer perception measures, overall customer satisfaction, value for money, reputation in the community and trust (as independently polled by the ESC).
- Improved our comparative position among our peers across all customer perception measures. As of August 2022, we'll hold top three positions (rolling 12-month average) for all indicators.

Refer to Table 3 below for a summary of results and trend lines for customer perception measures from September 2018 to August 2022. Further details are available in Appendix B - PREMO assessment commencing on page 141.





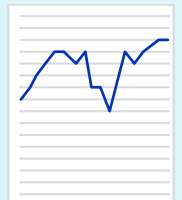

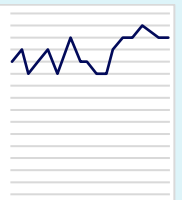

		Overall customer satisfaction	Value for money	Reputation in the community	Trust
Perception score – out of 10 (rolling 12-month average)	September 2018	6.5	5.8	6.4	6.3
	August 2022	7.1	6.5	7.1	7.1
	Change	↑ 0.6	↑ 0.7	↑ 0.7	↑ 0.8
	Trend profile (September 2018 to August 2022)				
Comparative position – out of 16 (rolling 12-month average)	September 2018	8	10	5	7
	August 2022	3	3	3	3
	Change	↑ 5 positions	↑ 7 positions	↑ 2 positions	↑ 4 positions
	Trend profile (September 2018 to August 2022)				

Table 3: Customer perception results 2018-19 to 2021-22 as measured independently by the ESC, using a rolling 12-month average

- Substantially delivered upon targets for key performance indicators and minimum service levels as outlined in the ESC’s Customer Service Code – meeting or exceeding annual targets on 80 per cent of occasions (across 12 indicators). Refer to Appendix B - Service standards on page 144 for further information.
- Substantially improved the service level for five indicators, including:
 - A minimum 45 per cent improvement in the average time to attend bursts and leaks (measured on 5-year average) from 43.7 minutes to 24 minutes for priority 1 events and from 87.9 minutes to 35.6 minutes and 801.7 minutes to 285.5 minutes for priority 2 and 3 events respectively.
 - 42 per cent reduction in both the time taken to attend sewer spills and blockages from 82.3 minutes to 47.4 minutes, and in the average time taken to rectify a sewer blockage from 242.6 minutes to 139 minutes.

1.2 Our financial performance

To deliver upon our customer commitments, we proposed expenditure benchmarks for the 2018-23 period reflecting 50 percentile capital cost estimates, removing uncertain costs and projects. We also pledged an ambitious 2.5 per cent operating expenditure productivity rate despite benchmarking by the Water Services Association of Australia confirming we are on, or very close to, the efficiency frontier¹¹.

In delivery, we've exceeded our benchmark expenditure including:

- 1.52 per cent productivity on operating expenditure compared to 2.5 per cent proposed – noting that after adjusting for cloud-based technology costs that have a lower overall lifecycle cost, (previously capital expenditure) the equivalent efficiency delivered is 2.36 per cent. Refer to Appendix B - Operating expenditure on page 149 for further details.
- \$319.92 million additional capital expenditure (24.66 per cent) or \$76.76 million (5.92 per cent) after adjusting for the \$257.11 million of potential, but uncertain 'at risk' expenditure identified in our 2018-2023 submission.
- Overall our capital investments have delivered value for customers through:
 - \$639.5 million to provide water, recycled water and sewerage services to 75,100 new customers located across our service area – over 4,000 more (0.5 per cent) than we expected.
 - Renewing almost 500km of water and sewerage mains across the network and replacing over 14,500 customers' property service lines, ensuring a more reliable service for those customers who experienced frequent interruptions.
 - Providing 3200 customers – over 250 more than expected, a sustainable sewerage service to connect to, enabling them to disable their septic systems and improving environmental outcomes.
 - Delivering renewable energy projects that now generate almost 70 per cent of our annual energy needs, reducing environmental impacts and reducing costs.
 - Reducing water lost in our network from 10.8 per cent in 2017-18 to 7.8 per cent in 2021-22 through our proactive leak detection and district metering programs.
 - Replacing 5km of distribution mains following confirmation of condition that had reached end of life, reducing the risk and impact of catastrophic failure, prolonged outages and other impacts.
 - A more modern, flexible, and resilient technology foundation, including enabling technology for a simpler single view of the customer and protection against cybersecurity and business continuity threats.

¹¹ Benchmarking shows 74 per cent of cost categories are benchmarked in the first or second quartiles (low cost) and lowest direct costs of participating businesses – 37 per cent of controllable regulated expenditure.

We also pledged to deliver 10 high value projects in our 2018-23 price submission. 90 per cent are now either complete or on track for completion, two ahead of schedule. This result compares favourably to the industry average¹². Where we experienced delays along the way, we have reduced customer prices to return financing costs via our revenue cap. Up to June 2022 we've returned \$1.48 million¹³ dollars to customers.

1.3 Customer bills are lower than we said they would be

Overall, customers' bills have decreased over the current period by 13 per cent in real terms or \$138 for the average household (\$ January 2018). Bills are \$76 lower in real terms in 2022-23 compared to the price path in our 2018 price determination – noting that these decreases have largely been influenced by macro-economic factors.

Our full precis of performance over the current period is contained in Appendix A - 2018-23 outcomes in review commencing on page 119 and Appendix B - PREMO assessment, Performance from page 141.

¹² Essential Services Commission 2021, Status of Major Projects Supplement: Outcomes report 2020–21, 19 October.

¹³ In \$MOD, \$0.139m in 2019-20, \$0.293m in 2020-21, \$0.678m in 2021-22 and \$0.308m in 2022-23, escalated to \$M January 2023, total \$1.48m.

2. Listening to customers and our communities

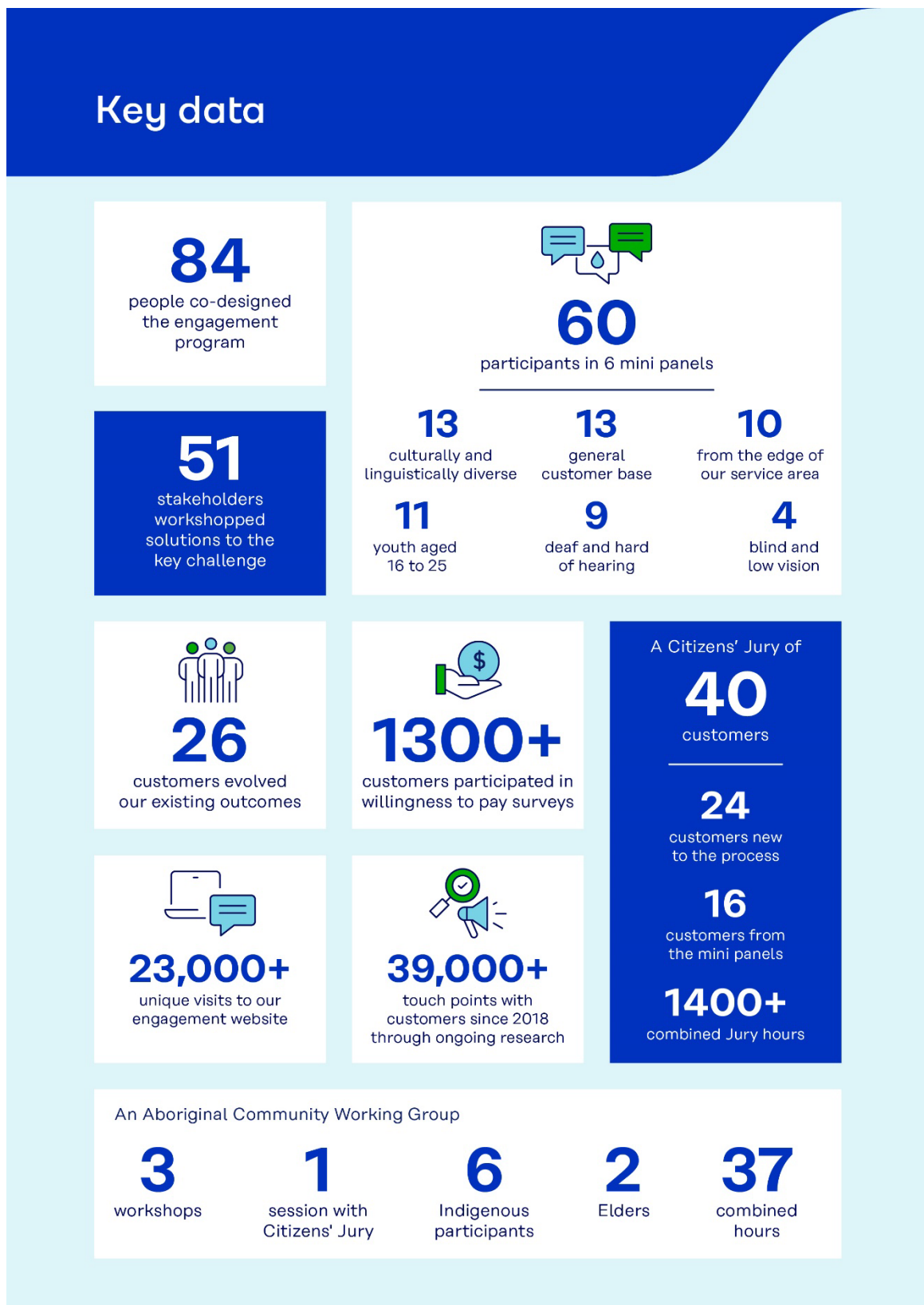


Figure 5: Visual representation of the ongoing and bespoke research and engagement underpinning this submission

Understanding what's important to customers and our communities for the future

We're committed to building ongoing and genuine relationships with our customers and the communities we serve.

This is more important than ever as the number of people experiencing vulnerability, isolation and disruption increases. This has been dramatically highlighted by the impacts of coronavirus (COVID-19) and climate change, noting the 2019 bushfires and extreme weather events of 2020 and 2021.

To build a truly representative and evidence-based price submission, we focused on understanding the priorities of our customers and what's important to them, including the products and services they value. We specifically sought to identify and engage with customer voices we don't often hear from, including the needs of future generations.

We built upon our previous price submission engagement program by co-designing the engagement approach with staff, our Board Directors, stakeholders, regulators and external critical friends. The process set the context and direction of our engagement program, including the principles, scope and objectives together with an engagement roadmap and timetable. We unpacked with our stakeholders what effective engagement with all customers would look like for the price submission. We unearthed contextual and emerging issues and identified the voices we needed to hear from – culminating in our second Citizens' Jury process.

Performance data and independent research confirms that we serve the majority of customers well and meet their expectations in terms of levels of satisfaction, trust, reputation in the community and value for money. Our ongoing research insights and a specific check-in with customers on the appropriateness of current customer outcomes, measures and targets – conducted at the mid-point of our current regulatory period (August 2020) - confirm that the outcomes continue to reflect what's important for customers and that we're consistently delivering upon our commitments. As a result, we focused our engagement approach on including and amplifying the voice of customers who we may not serve as well, to test if those customers could identify gaps in the products and services we provide.

Reflecting the co-design approach, key features of our engagement plan were:

- **Empowering customers and community to set the challenge to be solved.**

Unlike our 2017 Citizens' Jury where we determined the question to be answered, the co-design process enabled customers and community to set the challenge and identify underpinning dilemmas they wanted addressed in our price submission. They also provided recommendations and insights into how the challenge could be solved.

- **Calling on our extensive network to ensure wide representation.**

Leveraging existing and new partnerships with business and community-based organisations – Expression Australia, Vision Australia, Ethnic Communities' Council of Victoria, Victorian Chamber of Commerce and Industry – to help recruit customers, including those with diverse needs and backgrounds.

- **Working with Aboriginal Community Controlled organisations and community members to form an Aboriginal Community Working Group.**

This important working group self-determined the role they would play and had a profound impact on the final recommendations from our Citizens' Jury. See breakout box on page 26 for more information on our engagement with Aboriginal people.

- **Seeking out and listening to voices we don't usually hear from.**

We conducted six customer mini-panels focused on customers we don't usually hear from, to understand their unique perspectives on water and sewerage services and the challenges they wanted us to address in our submission. The panels comprised:

- Customers who are deaf and hard of hearing with support from Auslan interpreters.
- Customers who are blind and have low vision.
- Culturally and linguistically diverse (CALD) customers, with support from language interpreters.
- Youth (generation Z, aged 16 to 25 years).
- Residents of the Dandenong Ranges who live at the fringe of our service area and often experience a different level of service and who have also recently been impacted by severe storm events and are at a high risk from bushfires.
- Customers from across our customer base.

Our engagement with Aboriginal people

The Essential Services Commission's guidance on what constitutes good engagement in a price submission reinforced the need to directly hear the voices of Aboriginal people: the form of customer engagement needs to be tailored to suit the content on which a water business seeks to engage, and to the circumstances facing the water business, its customers and community, including Aboriginal people.

Building relationships and our capability to engage meaningfully have been fundamental parts of our reconciliation journey, and an area where we continue to learn. We're committed to partnering with Traditional Owners/Custodians to progress water justice and rights for access to water in a self-determined way. This has included co-developing actions within the Greater Metropolitan Urban Water and System Strategy (GMUWSS) and the Central and Gippsland Region Sustainable Water Strategy (CGRSWS). In future we will also be guided by the emerging themes from the Yoorrook Commission and Treaty Negotiation process, and in line with government commitments around water justice¹⁴ and self-determination¹⁵, to ensure we address Traditional Owners/Custodians rights and amplify their voices.

For this price submission, an objective was to build on this ongoing engagement and ensure we appropriately collaborated with Traditional Owners/Custodians, as inherent rights holders, and Aboriginal community members. As part of our ongoing engagement with Traditional Owners/Custodians, we asked how they would like to be involved. Advice provided was that the number one priority in relation to engaging with us was to develop a long-term partnership approach.

With guidance and assistance from our Indigenous Board Directors, Karen Milward and Ian Hamm, we established an Aboriginal Community Working Group (Working Group) with Aboriginal Community Controlled Organisations and community members, to extend the opportunity to engage and hear from them more deeply. This also facilitated a working relationship to develop between the Working Group and the Citizens' Jury. All the Aboriginal Community Working Group members are also residents and customers of Yarra Valley Water.

The Aboriginal Community Working Group's contribution to the Citizens' Jury included:

- On the first day of the Citizens' Jury, two nominated Working Group representatives, Aunty Daphne and Aunty Janet, presented to the Jury. They talked about their personal connection to Country and their relationship with water and the environment. They also shared the perspectives of the Working Group, on the key challenge the Citizens' Jury was tasked to solve: "How can water and the environment be protected and respected for and by present and future generations?". They also gave their perspective on one of the dilemmas the customer mini-panels identified: "Caring for Country – acknowledging and valuing Traditional Owners/Custodians and their connection to lands and waterways".
- Aunty Daphne and Aunty Janet's presentation had a profound impact on the Jury – their perspective, discussions and deliberations. The Jury referred to a Caring for Country approach as a key rationale for several draft recommendations.
- Following the Jury's fourth day, three Jury representatives presented their draft recommendations to the Aboriginal Community Working Group for feedback. At the conclusion of the Working Group's discussion, and after hearing views that centred

around Caring for Country and acknowledgement, recognition and impact on Aboriginal peoples, the Jury representatives agreed amongst themselves to propose making Caring for Country a separate recommendation.

- On the final day of the Citizens' Jury, the representatives proposed to create an additional recommendation to "Embed Caring for Country in all decisions" – this was agreed by the Jury.
- "Embed Caring for Country in all decisions" was elevated to be their number one recommendation with almost unanimous support.

Beyond the Citizens' Jury engagement process, Aunty Daphne and Aunty Janet, together with our two Indigenous Board Directors, conducted a Yarning Circle with all other Directors and the Executive Team. This provided an opportunity for our senior leadership to hear directly from the Aunties and understand the importance of Caring for Country and what it means for us.

- **Ensuring we heard from consumer advocates, community and industry partners.**

We conducted five community and stakeholder panels to understand their perspectives about issues impacting the communities our customers are part of - that the six mini-panels of customers should understand and consider. Community and stakeholder representatives and perspectives included:

- Consumer advocates
- Customer and environment groups
- Developers and planners
- Industry and partners

- **Creating a rolling program where each stage of engagement fed into the next and participant cohorts were combined to deepen the exploration of insights and challenges.**

Participant cohorts were combined as follows:

- The six customer mini-panels formed a new, combined panel to consider the insights from all six mini-panels along with insights from the five community and stakeholder panels, to determine the challenge and 12 underlying dilemmas for a Citizens' Jury to deliberate and solve. Our Board endorsed the challenge set by the combined mini-panel: **"How can water and the environment be protected and respected for, and by, present and future generations?"**
- The five community and stakeholder panels proposed solutions to the challenge and dilemmas and identified experts the Jury should hear from during their deliberations. These were all inputs into the Jury process.

¹⁴ Draft Water is Life: Traditional Owner to Access to Water Roadmap: [Water-is-life-Draft-Summary.pdf](#).

¹⁵ Aboriginal self-determination reform strategy 2020-2025: [Pupangarli-Marnmarnepu-Owning-Our-Future-Aboriginal-Self-Determination-Reform-Strategy-2020-2025.pdf \(delwp.vic.gov.au\)](#).

- The mini-panels together with new customers combined to form a 40-strong Citizens' Jury informed by rich customer, community and stakeholder inputs. Around half of the Jury were members of the combined customer panel (representing all six original customer mini-panels) with the remaining jurors drawn from the community and new to the process.

Refer to Figure 6 below for a visual representation of the rolling engagement program from mini-panels to Jury.

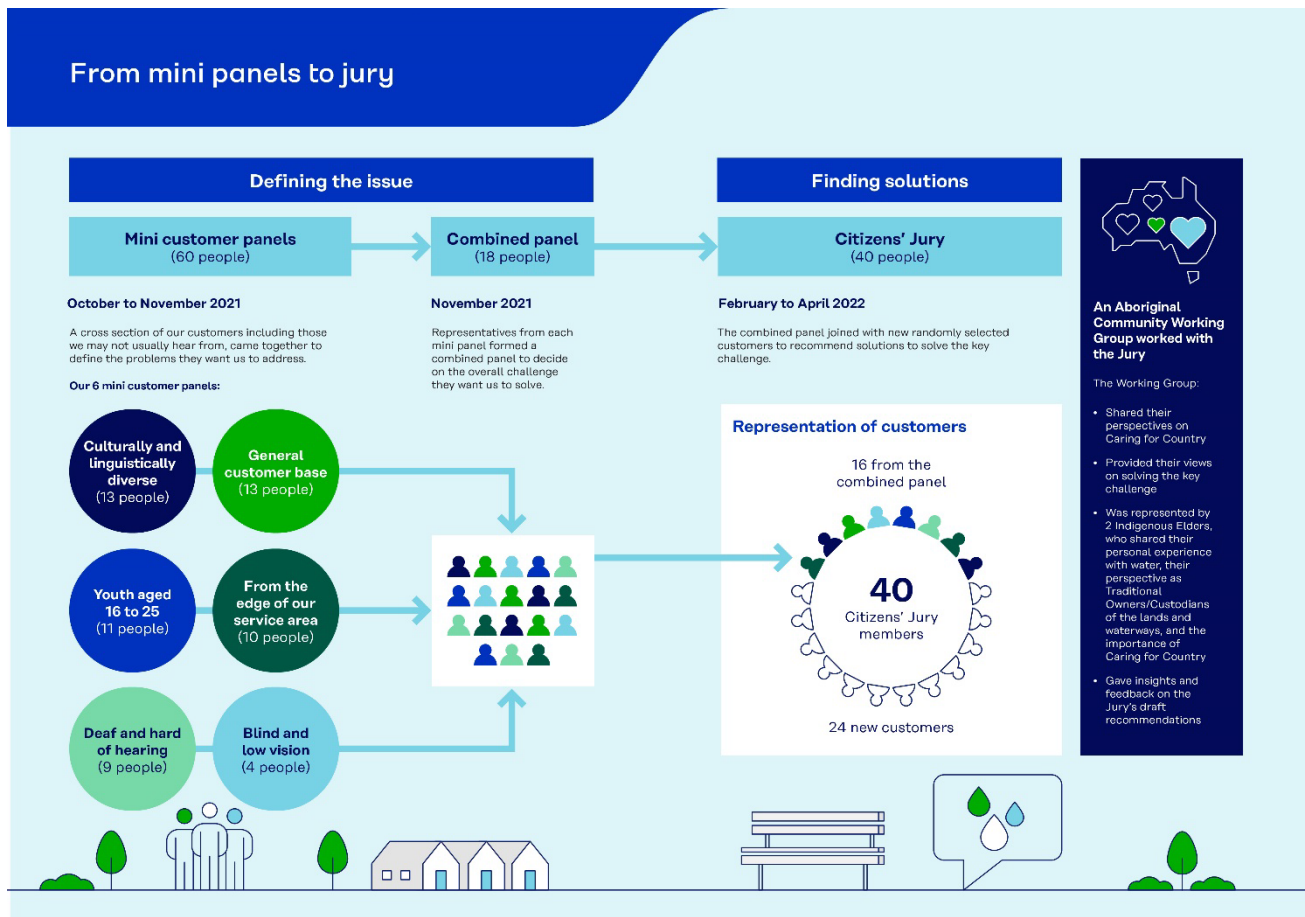


Figure 6: Visual representation of our rolling engagement program where each stage fed into the next and participant cohorts were combined to deepen the exploration of insights and challenges

- **A Citizens' Jury was convened for five days over a two-month period.**

The Jury proposed 12 recommendations to our Board, who accepted 10 recommendations in full, accepted one with a small variation and set aside one recommendation for future consideration. We presented our response to each recommendation to members of the Jury, including what we're committed to doing in the period 2023-28. A summary of the recommendations and our response are outlined in Table 4 commencing on the following page. A copy of the full response document is available on our website <https://www.yvw.com.au/pricesubmission>.

Recommendation

What we said in response

<p>1 Embed Caring for Country in all decision-making processes</p>	<p>What we understood</p>	<p>The Citizens' Jury recognises the value of Aboriginal peoples' knowledge and experience. Better outcomes can be found through these opinions and voices and Caring for Country should be an integral consideration for all recommendations and decisions.</p> <p>The Citizens' Jury expect us to incorporate Aboriginal peoples' knowledge and experience into our business and decision making.</p> <hr/> <p>Our response We fully accepted this recommendation.</p>
<p>2 Continue providing high quality water whilst focusing on price minimisation</p>	<p>What we understood</p>	<p>The Citizens' Jury believes the drinking water they're currently supplied is generally of a high quality and affordable. They expect us to continue to meet the Safe Drinking Water Regulations.</p> <p>The Citizens' Jury expect us to maintain or better the current quality of water they receive without impacting bills.</p> <hr/> <p>Our response We fully accepted this recommendation.</p>
<p>3 Accelerate implementation of digital meters and technologies to assist customers to monitor and control their water usage/spend</p>	<p>What we understood</p>	<p>The Citizens' Jury has a preference for introducing digital water meters as a way for customers to monitor their own water use and manage any faults and leaks on their property. They see it as an education tool for households that would help them use water more efficiently.</p> <p>The Citizens' Jury want a plan on how and when these digital meters will be rolled out, and want a balance between the cost and time to install. They expect us to be clear and transparent on the costs to customers, and to not pass on costs to customers who are experiencing financial hardship or receiving government benefits.</p> <hr/> <p>Our response We partially accepted this recommendation.</p> <p>We couldn't support not passing on digital metering roll-out costs to those receiving government benefits, when it occurs as:</p> <ul style="list-style-type: none"> • We have extensive support programs for customers who are unable to pay. • All customers will ultimately receive the benefit of reduced water use through deferred supply augmentations. • Customers who receive government benefits are eligible to receive a reduction in their water and sewerage services up to \$354.10 per annum. Approximately 30 per cent of our customers receive these benefits. • All other customers' bills would have to increase to cover the cost of digital meters for those customers receiving government benefits.

Recommendation		What we said in response	
4	To utilise the existing technology team, either internal or external, to innovate and facilitate future efficiencies at Yarra Valley Water	What we understood	<p>The Citizens' Jury values introducing new technology and innovations to solve problems.</p> <p>They expect us to explore technologies that we don't currently have to provide benefits in both water savings and business productivity.</p>
		Our response	We fully accepted this recommendation.
5	Give customers the ability to select the tariff system that meets their needs	What we understood	<p>The Citizens' Jury values the ability to have more choice in selecting different water plans.</p> <p>They want more control over their water bills and prices to help encourage water saving.</p>
		Our response	We're unable to implement this recommendation at this time. This was on the basis that extensive previous research failed to demonstrate strong support from customers when it has a negative benefit to administer and results in substantial winners and losers. We have, however, committed to exploring this further with customers.
6	Improve access to information for all customers	What we understood	<p>The systems that connect customers to our business need to be user friendly for all users, including those with differing levels of accessibility needs.</p> <p>The Citizens' Jury expects us to use digital technologies and systems as key enablers to improve all customers' access to information, and their relationship with us.</p>
		Our response	We fully accepted this recommendation.
7	Adopt proactive climate change initiatives	What we understood	<p>The Citizens' Jury proposes initiatives to save water.</p> <p>They see climate change in this context as a reduction in water availability.</p> <p>They value water saving initiatives, and proactive collaboration with stakeholders to reach our water usage targets.</p> <p>They see Yarra Valley Water playing a key role in advocating for the use of stormwater, rainwater and hot water savers in new and existing homes.</p>
		Our response	We fully accepted this recommendation.
8	Strengthen partnerships with community to help people understand the consequences of excessive use of water	What we understood	<p>The Citizens' Jury values awareness and education in relation to water conservation, water resources, impacts of climate change, and the role of water in our ecosystems.</p> <p>They want an increase in education strategies in partnership with other stakeholders including Aboriginal peoples, the Department of Education, and commercial businesses.</p>
		Our response	We fully accepted this recommendation.

Recommendation		What we said in response	
9	Prioritise infrastructure investment based on sustainable environment outcomes	What we understood	The Citizens' Jury values longer-term investments and strategies in our infrastructure to reduce the impacts of climate change and future environmental risks (fire, flood, droughts etc).
		Our response	We fully accepted this recommendation.
10	Partner with others to optimise future infrastructure	What we understood	The Citizens' Jury expects us to work in collaboration with other stakeholders (councils, communities, developers and government) when planning future local infrastructure, while considering water savings and best environmental outcomes.
		Our response	We fully accepted this recommendation.
11	Access, where practical, to sewerage and water services for all customers	What we understood	The Citizens' Jury values every customer consistently receiving the same level of water and sewerage service. They also value equitable access to these services, and any installation, strategy or planning to consider Caring for Country practices and minimisation of environmental damage.
		Our response	We fully accepted this recommendation.
12	Active support for the use of rainwater, treated stormwater and recycled water	What we understood	<p>The Citizens' Jury values using alternate sources of water including stormwater, rainwater, and recycled water. They expect rainwater tanks to be a large part of our water conservation strategy and want us to explore rebates for tanks.</p> <p>Alongside installing water tanks, the Citizens' Jury also valued increased community education on the use of alternate water and the benefits of installing rainwater tanks. They want us to actively encourage installing rainwater tanks, as well as advocate for tanks to be mandated.</p>
		Our response	We fully accepted this recommendation.

Table 4: Summary of the 2022 Citizens' Jury's recommendations and our response

We also utilised the following sources of customer insights to inform our price submission:

- Our comprehensive customer brand and service monitor research program that's been in place since 2012. Conducted quarterly, the program tracks customer perceptions and experiences, and the extent to which we deliver the promise of our customer value proposition.
- Over 50 standalone customer research studies since 2017 covering a variety of topics relating to customer experience and expectations.
- Our Customer Experience program, which manages the ongoing experience of more than 100 customer journeys, measures customers' satisfaction with their experience and makes recommendations to continuously improve those journeys to better align with customer expectations.
- Our long-standing Community Advisory Group comprising representatives from the consumer advocacy sector who continue to provide us with valuable perspectives from the most vulnerable in our community. They also specifically advised and participated in the co-design engagement approach.

- The ongoing relationship we have with major commercial and business customers through our business partnership managers.
- Project based community engagement activities for local projects such as our community sewerage program, Doncaster Hill recycled water project, place-based planning and digital water meter technology trials.
- A small number of bespoke research pieces designed to close the gap in areas which are imperative to the price submission and are topics of known social significance that can directly impact prices, including:
 - Tariffs, pricing and affordability – top priorities for customers and often cited as pain points for a variety of reasons.
 - Vulnerability and inclusion – because we know vulnerable customers and those who face barriers to accessing our services experience us differently. We wanted to gain a deeper understanding of these differences from people with lived experience of barriers to service due to age, language or ability – the impact of barriers and what it means for future service design, including cost and other implications.
 - Two quantitative value assessments (willingness to pay) – holistic evaluations of customer trade-offs between price, outcomes and value, which we used to independently test other insights gathered from all other forms of research and engagement including the deliberative forums we ran. Our first willingness to pay study was conducted in April and May 2022 when cost of living and other concerns¹⁶ may not have been prevalent. To ensure the validity of results we conducted another survey in late August 2022. The work was peer reviewed by Professor John Rose and Professor Arne Risa Hole¹⁷.
 - Testing our final proposals and customer promises, including customer outcomes, measures and targets, guaranteed service levels and performance with members of our 2017 and 2022 Juries.

Our research and engagement approach has been supported by a comprehensive communication strategy. We used varied communication channels, including social media, to extend reach, drive awareness and draw customers, community and stakeholders to a central online hub for information and updates and to give feedback.

At all stages in our engagement process we aimed for sensitive and appropriate engagement. We've assessed our program against the Commission's 10 principles¹⁸ that guide effective, sensitive and appropriate engagement with consumers experiencing vulnerability through a 'universal' and 'inclusive' approach.

¹⁶ Including concerns about high inflation, increasing interest rates, supply constraints and ongoing impacts of COVID-19, the war in Ukraine and tensions with China.

¹⁷ Professor Rose is an international expert in experimental design theory, the econometrics of choice models and the design of choice model surveys. Professor Arne Risa Hole is an international expert in econometric analysis of choice data. Professor Hole supported the econometric analysis of the survey data, and the calculation of the willingness to pay estimates.

¹⁸ Essential Services Commission, Sensitive and appropriate engagement with consumers experiencing vulnerability: Guidance and principles for action, January 2021.

The results of the assessment are presented in Table 5 below.

Principle	What we did
Be inclusive	A single engagement process was run (refer to page 35 for engagement journey). For customers, it started as mini-panels to understand any unique expectations of customers related to their water and sewerage services. Representatives from mini-panels joined together to set one challenge for a Jury to consider.
Collaborate and co-design with consumers	We used existing relationships and developed others to ensure we reached participants from diverse cultural backgrounds and the deaf and blind communities. We sought feedback on the development of sessions from Expression Australia, from participants and interpreters. We used this feedback to improve how sessions were conducted.
Treat engagement as an ongoing process based on relationships	Stakeholders, community groups, partners and staff participated in a co-design process to develop the engagement roadmap. Partners and community groups were involved in the process, including assisting in recruiting customers from communities they represent.
Have a clear purpose	Each engagement activity had a clear purpose stated and presented to participants through material, videos and presentations. All material was impartially presented, and in formats that suited the activity and the audience.
Reflect community diversity	A diverse range of customers participated in engagement activities.
Invest in engagement	We specifically sought to include customers who we've found it difficult to engage with and supported their participation with language and Auslan interpreters and providing technology assistance. All participants were compensated for their time.
Be transparent and offer genuine involvement	We invited participation through social media, bill inserts, community representatives and direct mail. We also recruited participants via established research panels. Interpreter services were made available to assist in participation. Our website openly and transparently reports the process and results of the engagement.
Show respect for individuals, their knowledge and expertise	Each cycle of engagement fed into the next. The Jury made 12 recommendations where at least 80 per cent of participants voted that they could at least 'live with it'. Where the threshold wasn't reached, participants were able to write a minority ¹⁹ report for consideration. We responded to all recommendations, inviting participants back to hear our response directly. We accepted 10 recommendations fully, one partially and we committed to continue to work on the other (tariff choice). In addition, the willingness to pay study identified two areas where customers (all participants and those who self-identified as financially vulnerable) identified value which was supported by other research insights.
Use methods that are universal and flexible	We provided appropriate support to participants including language and Auslan interpreters, close captioning, material in accessible formats. We adapted the process along the way particularly seeking out feedback to improve from session to session. When meeting face-to-face, we were able to accompany blind and low vision participants who preferred to participate virtually, by using laptops to make sure they would not be excluded.
Reflect, adapt, improve	At the conclusion of each session, participants were asked to provide feedback on things for us to start, stop and continue in future sessions. In addition, we conducted useability testing on the willingness to pay study prior to releasing it and further sought participants' views on choices.

Table 5: Assessment of our engagement program against 10 criteria of effective, sensitive and appropriate engagement with consumers experiencing vulnerability

¹⁹ The jury wrote one minority report – available via our website – [Citizens' Jury's recommendations](#).

What's important to customers

The Aboriginal Community Working Group had a profound impact on the outcomes of our engagement process, including the Jury making Caring for Country their number one recommendation and clearly identifying that it needs to underpin all decision making.

Reflecting that we provide our services on Country and use the resources it freely provides, and understanding the impacts this can have on the natural environment, we're committed to exploring how to deliver all our outcomes in the 2023-28 period with a Caring for Country approach.

Consistent with our purpose, customers identify safe drinking water as their number one priority. Other key insights we've heard through development of our 2023-28 price submission include:

- We don't always meet all the needs of our diverse customer base, particularly those who experience barriers to our services which are generally designed and developed for the majority or typical customer. We heard particularly from customers who are blind and low vision and deaf and hard of hearing that important messages (such as precautionary boil water advisories) haven't always considered their needs. As a result, we've combined two of our current outcomes to create a new outcome 'service that meet's everyone's needs'. This recognises that we service a wide range of customers with different needs and expectations. The new outcome focuses on experience and includes customers who have different accessibility needs, are financially vulnerable or require a service offering to be adapted to their individual needs.
- Customers want us to do more to save drinking water and cite actions such as enabling wider availability of recycled and alternate water sources, offering financial assistance to adopt and install water efficient products and appliances and working in partnership across business, government and other stakeholders for greater benefit. Customers also want us to take more care of, and protect, the natural environment.
- Customers want their water and sewerage services to remain affordable and hardship support to be available when needed. They also support a greater emphasis on user pays that enables a step change in water efficiency.
- There is also support for tariff choice and more cost reflective funding of infrastructure that provides services to new customers.

Compared to what we heard from customers in 2017 to inform our 2018-23 price submission, there was less emphasis on further improving our existing support for financially vulnerable customers and less discussion on reducing greenhouse gas emissions.

Our engagement journey

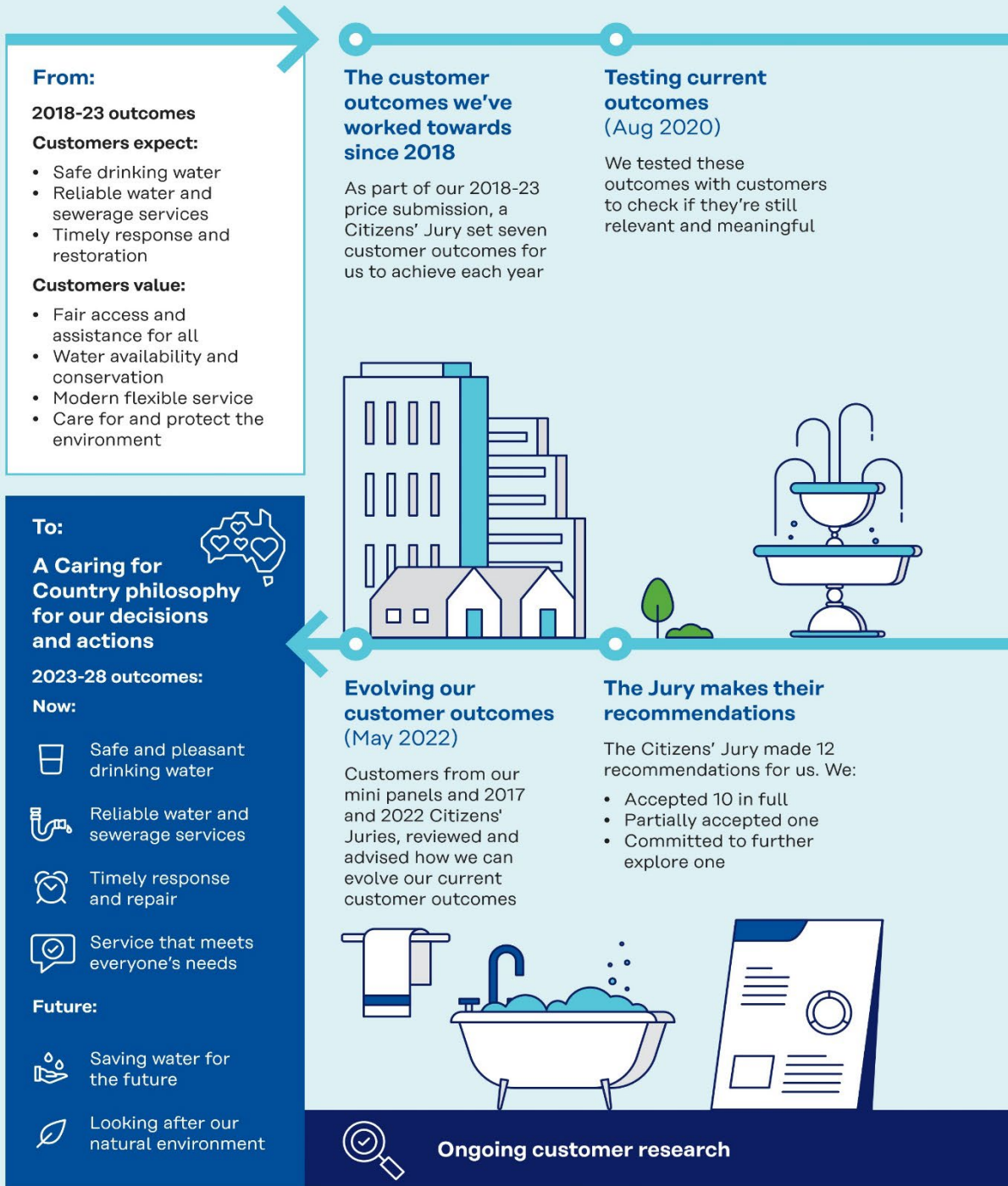
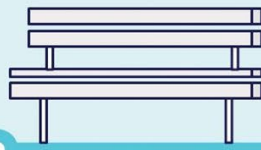
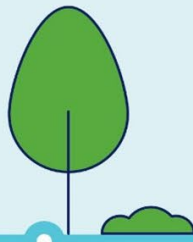


Figure 7: Our engagement journey



Co-designing our engagement (Feb-Mar 2021)

Stakeholders, consumer advocates, environment and community groups advised us on who and how we should engage



Stakeholders and community groups define what matters to the community (Sep-Oct 2021)

Stakeholders, consumer advocates, environment and community groups told us the biggest issues and priorities impacting their communities – our customers



Diverse customer groups tell us what matters to them (Oct-Nov 2021)

Six mini panels of customers, including those who experience physical, social, cultural, and language barriers identified the challenges and problems they want us to solve

An Aboriginal Community Working Group worked with the Jury

The Working Group:

- Shared their perspectives on Caring for Country
- Provided their views on solving the key challenge
- Was represented by 2 Indigenous Elders, who shared their personal experience with water, their perspective as Traditional Owners/Custodians of the lands and waterways, and the importance of Caring for Country
- Gave insights and feedback on the Jury's draft recommendations



A Citizens' Jury deliberates on the challenge (Feb-Apr 2022)

Customers from the mini panels and customers new to the process formed a Citizens' Jury – their role was to provide recommendations to solve the key challenge

Stakeholders and community groups recommend solutions (Dec 2021)

The same stakeholders, consumer advocates, environment and community groups workshoped solutions and ideas to share with the Jury



Customers set the key challenge for a Citizens' Jury to solve (Nov 2021)

A combined panel of customers (from the previous six mini panels) set the challenge for a Citizens' Jury to solve and address

How can water and the environment be protected and respected for, and by, present and future generations?



Our existing and ongoing customer research – including customer experience and satisfaction, what customers value, and their expectations – fed into every stage of our engagement

3. Our commitment to customers

Delivering what matters now and for the future

We exist to enhance the liveability of our community. We have a proud history of programs that put customers and the community at the centre of everything we do.

Extensive customer research and engagement enables us to address what matters most to the diverse communities we serve. At the highest level this is captured by our customer value proposition:

I can rely on Yarra Valley Water to provide great drinking water. They safeguard community health by effectively removing wastewater and running their operations in a way that looks after the environment. They are highly responsive when I need them and they help customers experiencing difficulty paying for essential water and sewerage services. I'm confident they will meet my needs now and in the future.

Following extensive customer research and engagement over the last 18 months, we propose to evolve our seven customer outcomes into six outcomes, framed by a Caring for Country philosophy and distinguished by services we provide to customers and actions for the future. This evolution of outcomes is depicted in Figure 8 below.

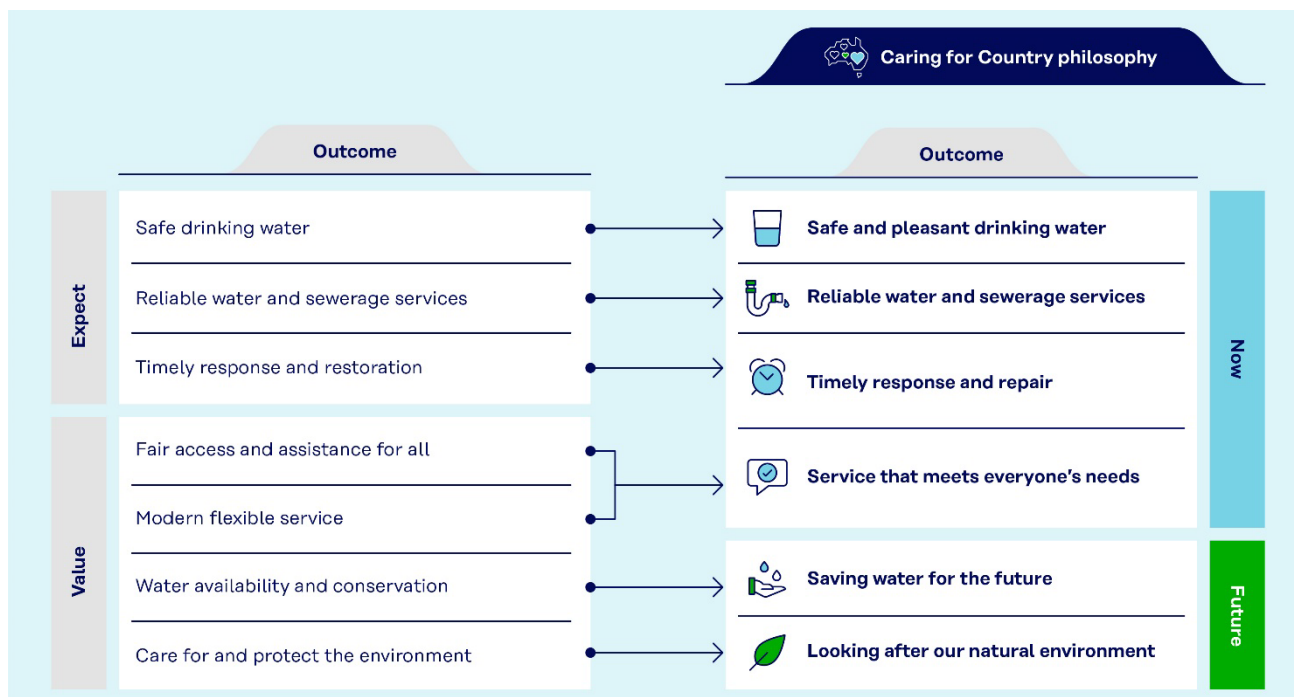


Figure 8: Image reflecting the transition of outcomes proposed in 2018-2023 to 2023-28

We have combined two outcomes 'fair access and assistance to all' and 'modern flexible service' to create a new outcome 'service that meet's everyone's needs'. This is in recognition that we service a wide range of customers with different needs and expectations. The combined outcome is focused on experience and specifically includes customers who have different accessibility needs, are financially vulnerable or require a service offering adapted to their individual need. This new outcome reflects the feedback received from our research and engagement activities.

In addition to measuring typical or average performance levels, we have new measures to better distinguish the range of service experiences and drive our focus to close the gap.

3.1 What we've heard

Since 2018, we've been checking with customers to understand if our commitments remain relevant and reflect the areas they believe are most important. We've also asked customers if there are any gaps in our commitments. Specifically, since 2018 we've:

- Asked customers, including our 2017 jurors, to consider whether the seven outcomes, measures and targets together with performance reporting are in line with their expectations (August 2020)²⁰.
- Reviewed our ongoing research and engagement insights undertaken since 2018, to evaluate the appropriateness, relevance and validity of the existing outcomes, measures and targets. The review also considered if there were new or emerging priorities important to customers (November 2021)²¹.
- Invited all customers, via communication on their bill, to rank the outcomes in order of what was most important to them. We also asked if there was anything missing from the outcomes (July to December 2021).
- Asked our 2022 jurors for their views on the seven outcomes together with any gaps. We sought their views towards the end of the Jury process, informed by their deliberations to solve the remit 'How can water and the environment be protected and respected for and by present and future generations?' (March 2022).

From these discussions, we've learnt:

- That customers feel the existing seven outcomes reflect their priorities.
- Customers want us to act now for the future in the areas of saving water and environmental outcomes.
- Caring for Country and ensuring our services meet customers' accessibility needs are important.
- Safe drinking water is still the number one concern – customers are also concerned about the affordability of services.
- The measures are well correlated to the outcomes. The number of measures should be increased to better reflect the breadth and depth of the outcomes and expressed in a way that improves customers' understanding of performance.

²⁰ Quantum Market Research, Yarra Valley Water Pricing Submission Midpoint Review, September 2021.

²¹ Insightfully, Yarra Valley Water Research Synthesis, November 2021.

- There are opportunities to better describe the outcomes – particularly ‘modern flexible service’.

As a result of these insights, we developed a straw-person proposal²², including additional measures. We invited jurors from our 2017 and 2022 Citizens’ Jury processes to challenge the straw-person and provide advice on whether the outcomes and measures should change. We also asked their advice on what remedy would be appropriate in the event of not achieving our commitments, including guaranteed service levels and our community rebate.

We’ve evolved our commitments for the 2023-28 period, including outlining:

- Outputs and performance measures that better fulfil the breadth and depth of our outcomes.
- Specific actions we propose in response to customer insights and recommendations that deliver customer value.
- Ongoing actions, activities and programs together with their associated costs.

We heard that the outcomes, measures and targets, and associated performance reporting to customers should be expressed more meaningfully for customers. This includes focusing on where we don’t meet customers’ expectations (on average as well as for individual customers) and therefore reporting the number of customers impacted – rather than, or in addition to, percentages.

We also sought to understand whether customers saw value in changing performance levels. Our research and engagement insights do not suggest customers want an increased level of core service, including:

- ‘Affordable’ bill ranks higher in importance than both fixing services if there’s an interruption and customer satisfaction with service interactions²³.
- There’s no clear demonstrated willingness to pay to reduce the number of interruptions experienced, increase the speed to arrive or reduce the period of interruption²⁴.
- The Jury recommended²⁵ we continue to provide high quality water whilst focusing on price minimisation (recommendation 2).

The cost of water is a strong driver of satisfaction: for residential customers and business customers one of the major sources of complaint was ‘costs too high’²⁶. As a result, we propose to maintain existing levels of service except where:

- We have multiple sources (Jury, ongoing research, and willingness to pay studies) supporting a change in service level with clear evidence to pay from customers including those who self-identify as financially vulnerable.
- There’s a new or changing regulatory obligation.
- The increased service level can be delivered at the same or reduced cost.

²² <https://jurypack2022.yvw.com.au/> – the password is yvw2022.

²³ Online customer survey, July to December 2021, <https://yvw.mysocialpinpoint.com.au/thevalueofwater>.

²⁴ Marsden Jacob Associates, Yarra Valley Water’s customer-led price submission customer values research, August 2022.

²⁵ https://media-2.yvw.com.au/inline-files/Citizens%27%20Jury%27s%20recommendations_PS5_102KB.pdf.

²⁶ Quantum market research, Customer tracker complaints analysis, 2018.

Consistent with listening for voices that are often unheard because they can get lost in the averages, we've re-orientated some measures and developed new ones to focus attention on individual customers who don't receive a service experience that meets their needs.

We are committed to ensuring the set of outcomes, measures and targets reflects customers' priorities and will continue to test it for meaningfulness and relevance. If customers show support for changes to outcomes, measures and targets, we will make a proposal to the ESC during the period, including providing evidence of customers' support.

Each outcome is discussed in further detail below and is framed by an overarching Caring for Country approach.

3.2 Caring for Country approach for all outcomes

We provide our services on Country, use the resources it freely provides, and understand the impact this can have on the natural environment. We're committed to exploring how to deliver all our outcomes with a Caring for Country approach, guided by our ongoing engagement and partnerships with Traditional Owners/Custodians and Aboriginal communities.

A useful framing on the meaning of Caring for Country was provided within "The Benefits of Caring for Country" report²⁷.

Caring for Country can be understood generally as Indigenous peoples' approaches to land and water management. It is a reciprocal relationship, as reflected in the familiar saying by Indigenous people that 'if you look after the country, the country will look after you' (Griffiths and Kinnane 2010:iii, 3). Caring for Country centres on the relationships between Indigenous peoples and their Country, which includes their lands, waters, plants, animals, heritage, culture, ancestors, laws, religions and more. By using the word 'care', this activity acknowledges responsibility, ethics, emotion and connection with country (Rose 1992).

People talk about country in the same way that they would talk about a person: they speak to country, sing to country, visit country, worry about country, feel sorry for country, and long for country. People say that country knows, hears, smells, takes notice, takes care, is sorry or happy. Country is not a generalised or undifferentiated type of place, such as one might indicate with terms like 'spending a day in the country' or 'going up the country'. Rather, country is a living entity with a yesterday, today and tomorrow, with a consciousness, and a will toward life. Because of this richness, country is home, and peace; nourishment for body, mind, and spirit; heart's ease (Rose 1996:7).

²⁷ Dr Jessica K Weir, Ms Claire Stacey and Dr Kara Youngetob, The benefits of Caring for Country, June 2011.

To deliver the Citizens' Jury's number one recommendation to "Embed Caring for Country in our decisions" and for this approach to become a centrepiece for how we operate, we will:

- Continue to support:
 - Reconciliation
 - Including Aboriginal Victorians and Traditional Owners/Custodians in how we plan and manage land and water through a self-determination framework
 - Improving our knowledge, understanding and connection to Country
 - Traditional Owners/Custodians access to land and water
- To meet the intent of this recommendation, we will:
 - Acknowledge Traditional Owners/Custodians on our bills and other appropriate communications where it's not currently featured.
 - Develop a formal, long-term partnership agreement with Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation as the Traditional Owners/Custodians of our service area.
 - Ensure all major projects and programs undertake a cultural values study, cultural heritage management assessment and Caring for Country plan as requested by Wurundjeri Woi-wurrung.
 - Ensure that all cultural heritage requirements are met when delivering projects, and explore opportunities that are aligned with our Reconciliation Action Plan and cultural learning strategy, including considering any Integrated Water Management and biodiversity opportunities.
 - Continue to learn from our Indigenous Board Directors and staff, working closely with them to fulfil the Jury's number one recommendation to "Embed Caring for Country in all decisions".
 - Develop ongoing relationships and instigate an advisory forum with Aboriginal Victorian communities such as Mullum Mullum Indigenous Gathering Place, to seek their ongoing input.
 - Partner with other water utilities, governments and councils to strengthen our collective commitment to Caring for Country.
 - Deliver the commitments we made in our Reconciliation Action Plan including – "In collaboration with Traditional Owners/Custodians, support the growth of knowledge and awareness within the community, about the Aboriginal heritage within our area", including participation of Wurundjeri Woi-wurrung and Bunurong peoples to further develop our education program for schools.
 - Share our truth-telling in relation to the past history of water management in Melbourne as a vital step in reconciliation and supporting Treaty.
 - Work with the Wurundjeri Woi-wurrung Narrap Rangers Unit to rehabilitate and manage the land and biodiversity of key sites.
 - Continue to pursue opportunities for Aboriginal businesses to participate in our supply chain.

3.3 Outcome 1 – Safe and pleasant drinking water

We know, and customers confirm, that providing safe clean drinking water is our number one priority – it is a powerful driver of customer trust²⁸. Research also showed that ‘bad taste, smell and appearance of tap water’ was the primary negative driver of customer satisfaction²⁹.

In 2019, a synthesis of several research pieces identified that for customers, water quality means it’s safe to drink, tastes, smells and looks (clarity) good, is tested to be free of toxins, is healthy, ultimately supporting wellbeing³⁰.

Key statistics that demonstrate the appropriateness of safe drinking water as an outcome include:

- 81 per cent of customers who participated in the midpoint review research ranked ‘safe drinking water’ as their highest priority of the seven existing outcomes³¹.
- Customers rated the statement ‘I want my water to taste good and be safe’ the most important outcome³².
- Water Services Association of Australia (WSAA) Understanding Trust (in water) research (July 2019) found ‘good water quality’ was the highest unprompted factor associated with trust in the context of water (59 per cent)³³.
- 90 per cent of 2022 jurors rated the outcome as like it or love it³⁴.
- The Jury recommended a continued focus on providing high quality water while focusing on price minimisation (recommendation 2)³⁵ which was supported by customers, through willingness to pay studies, who prefer maintaining service levels³⁶.

We’re changing the title of this existing outcome from ‘safe drinking water’ to ‘safe and pleasant drinking water’. We will determine success over the period using two measures to reflect both ‘safe’ and ‘pleasant’. We will retain the existing measure and target – 100 per cent compliance with Safe Drinking Water Regulations (2015). To reflect the ‘pleasant’ sentiment, we will measure the extent to which customers agree that we provide great drinking water. This will elevate attention on customers who don’t experience great or pleasant drinking water. We’ll set the target to maintain existing levels of service based on five-year average historical performance.

When presented with these changes, 76 per cent of 2017 and 2022 jurors said they liked or loved it³⁷ – with some concerns expressed associated with the subjective nature of terms like pleasant and great. They also identified the measure ‘compliance with safe drinking water regulations’ as the most important.

²⁸ Forethought, Trust Drivers (Wave 2), April 2021.

²⁹ Nature, Facts & Stories, August 2018, D1: Which of the following have you experienced in your current home? C1: Overall, how satisfied are you with your water provider.

³⁰ Picnic, thematic analysis of customer insights, August 2019, page 14.

³¹ Quantum Market Research, Pricing Submission Midpoint Review, August 2020, Q. Thinking about the seven outcomes, please rank the below in terms of importance that Yarra Valley Water delivers on this.

³² Online customer survey, July to December 2021, <https://yvw.mysocialpinpoint.com.au/thevalueofwater>.

³³ Quantum Market Research, WSAA Understanding Trust, July 2019 Q.7. In your own words, what does trust mean to you in the context of water?

³⁴ MosaicLab, customer outcomes – level of comfort, March 2022.

³⁵ https://media-2.yvw.com.au/inline-files/Citizens%27%20Jury%27s%20recommendations_PS5_102KB.pdf.

³⁶ Marsden Jacob Associates, Yarra Valley Water’s customer-led price submission customer values research, August 2022.

³⁷ MosaicLab, What was said report, June 2022.

Outcome	Safe and pleasant drinking water
Measures and targets	Compliance with Safe Drinking Water Regulations (2015) Target = 100 per cent compliance per annum
	Customers who agree we provide great drinking water Target ≥ 91 per cent per annum
What we'll do	<p>To provide high quality water, we will increase our focus and investment in:</p> <ul style="list-style-type: none"> • Understanding the water quality performance in our network in real time to inform rapid risk assessments and decision-making during incidents. • Proactively improve the disinfection residual levels in our drinking water network. • Increase service and asset resilience, including reliability of power supplies, communication and control systems and cybersecurity protection. • Install secondary chlorination/disinfection facilities where required. • Clean water mains in areas where sediment accumulates. • Build our incident and emergency management capability and surge capacity. <p>We will continue to:</p> <ul style="list-style-type: none"> • Implement a preventative risk management system and a multiple-barrier approach in line with Australian and World Health Organization (WHO) Guidelines and Victorian regulations. • Conduct independent water quality tests to ensure the water customers receive is of high quality. • Inspect our tanks for structural integrity and undertake necessary remediation works. • Resolve customer complaints and escalate to case management when there is an ongoing issue. • Provide advice and education to customers on the quality and safety of our water, including when there is a change in the water source. • Manage and monitor compliance of our bulk water supply agreement at interface points with Melbourne Water. • Promote the health benefits of drinking tap water, including working with cultural community groups.
What it will cost	Operating expenditure \$7.82 million (average annual forecast 2023-28)
	Capital expenditure \$9.85 million (average annual forecast 2023-28)

Table 6: Outputs, activities and costs for safe and pleasant drinking water outcome

3.4 Outcome 2 – Reliable water and sewerage services

We know that customers want water and sewerage services they can rely on. This knowledge has been built up over a long time and we've embedded minimum service levels in our asset renewal programs and our guaranteed service level rebates.

A mid-point check-in with customers confirmed "reliable water and sewerage services are crucial, and the outcome remains relevant as a core component of service outcomes"³⁸. Key statistics that demonstrate the appropriateness of 'reliable water and sewerage services' as an outcome include:

- The second-largest number of service response complaints (26 per cent) relate to 'quality of supply'³⁹.
- 'Reliable, consistent, uninterrupted water supply' was the second highest unprompted factor associated with trust in the context of water (38 per cent)⁴⁰, and emergencies such as spills or floods are very strong negative drivers of satisfaction⁴¹.
- Customers rated the statement 'I want water and sewerage services I can rely on' the second most important outcome⁴².

Currently measured by the percentage of customers who experience three or more water or sewerage interruptions in 12 months – there is evidence that customers consider three interruptions are too many^{43 44}. This view however is not supported by customers' willingness to pay as the benefit is lower than the estimated cost⁴⁵. As a result, we propose to maintain the current level of service using a five-year historical average – although redefining the measure to focus on the number of customers impacted.

We also propose a supplementary measure, the number of customers who experience more than five unplanned interruptions over the last three years, to focus on customers who experience frequent interruptions over a longer period. This will ensure systemic issues are effectively resolved and that these customers have additional care and support. The target has been set to reflect the four-year historical average to remove unreliable data during 2015-2017, associated with the transition of maintenance service providers.

When asked about the straw-person proposal of outcomes and measures, 77 per cent of 2017 and 2022 jurors said they love it or like it^{46 47}.

³⁸ Quantum Market Research, Pricing Submission Midpoint Review, August 2020.

³⁹ Quantum Market Research, Yarra Valley Water Complaints Research, Baseline Survey Report, February 2020

⁴⁰ Quantum Market Research, WSAA Understanding Trust, July 2019 Q.7. In your own words, what does trust mean to you in the context of water?

⁴¹ Melbourne Sewage Strategy, May 2018.

⁴² Online customer survey, July to December 2021, <https://yvw.mysocialpinpoint.com.au/thevalueofwater>.

⁴³ Quantum Market Research, Pricing Submission Midpoint Review, August 2020.

⁴⁴ MosaicLab, What was said report, June 2022.

⁴⁵ Marsden Jacob Associates, Yarra Valley Water's customer-led price submission customer values research, August 2022.

⁴⁶ MosaicLab, customer outcomes – level of comfort, March 2022.

⁴⁷ MosaicLab, What was said report, June 2022.

Outcome	Reliable water and sewerage services
Measures and targets	Customers who experience three or more unplanned interruptions Target < 7000 customers per annum
	Customers who experienced five or more unplanned interruptions in the last three years, and any interruptions this year Target < 3572 customers per annum
What we'll do	<p>Deliver the following key renewal projects for assets that have reached capacity or the end of service life:</p> <ul style="list-style-type: none"> • Healesville sewer treatment plant capacity upgrade by 2027-28 at a total cost of \$30.53 million. • M4 water distribution main renewal by 2027-28 at a total cost of \$45.34 million. • Eltham main sewer by 2026-27 at a total cost of \$29.67 million. <p>Construct the following key projects that provide water, recycled water and sewerage services to new customers:</p> <ul style="list-style-type: none"> • Aurora recycled water treatment plant and transfer system by 2027-28 at a total cost of \$141.32 million. • Mt Fraser drinking water and recycled water transfer system by 2026-27 at a total cost of \$83.59 million. • Craigieburn flow storage and transfer hub stage 3 by 2031-32 at a total cost of \$183.41 million. • Love branch sewer stage 3 by 2025-26 at a total cost of \$17.80 million. • Wallan East branch sewer stage 1 by 2026-27 at a total cost of \$20.76 million. <p>We will continue to:</p> <ul style="list-style-type: none"> • Undertake ongoing preventative maintenance for mechanical and electrical assets across the water supply and sewerage networks. • Renew water and sewerage pipes where they no longer provide a reliable water and sewerage service to customers. • Replace customer water meters which are not accurately recording water usage. • Optimise operation, hydraulic performance and management of the water supply and sewerage network including activities and programs for: <ul style="list-style-type: none"> – Long-term planning and modelling to optimise performance. – Maintaining hydrants, valves, pump stations that have the potential to impact water availability for customers. – Managing water pressure across the network and undertaking remediation works if pressures are found to be low, resulting in customer issues, or high to prevent the occurrence of leaks and water supply interruptions. – Operating and maintaining our local sewage treatment plants in accordance with their EPA licence conditions. – Operating and maintaining odour control facilities to minimise complaints. – Undertaking trade waste compliance and management activities to ensure the protection of sewerage assets. – Undertaking a proactive sewerage main cleaning program to reduce the likelihood of repeat blockages and customer interruptions.
What it will cost	Operating expenditure \$32.80 million (average annual forecast 2023-28)
	Capital expenditure \$234.43 million (average annual forecast 2023-28)

Table 7: Outputs, activities and costs for reliable water and sewerage services outcome

3.5 Outcome 3 – Timely response and repair

Customers appreciate that our services are not infallible – however when something does go wrong, they expect that we'll rectify the issue quickly.

A mid-point check-in resulted in customers ranking the statement 'I want my services to be fixed quickly if there's an interruption' at position six (of eight). There is strong evidence that expectations can be met (or exceeded) by 'being responsive' and 'communicating well'^{48 49}.

Key statistics that demonstrate the appropriateness of 'timely service response and repair' as an outcome include:

- For customers who had experienced water issues in the last 12 months, the most important factor contributing to customer satisfaction was 'reacts quickly to water and sewerage issues'⁵⁰.
- 72 per cent of customers who had experienced a water issue in the last 12 months, and 69 per cent overall, said it was extremely important that we react quickly to water and sewerage issues⁵¹.
- Among customers who were affected by a precautionary boil water advisory event in 2021, satisfaction was seven per cent higher for those who received a follow-up communication (via email) about the event (84 per cent) than those who did not. The biggest driver of positive perceptions was 'quick response' (59 per cent), followed closely by 'good communication' (44 per cent), while the biggest driver of negative perceptions was 'poor communication' (48 per cent)⁵².

Since 2018, we've been measuring this outcome as the percentage of interruptions restored within four hours – however we've heard that percentages aren't as meaningful for customers as the specific number of customers impacted^{53 54}. We'll continue to measure in percentage terms and also report the numbers of customers impacted. We will also re-orientate the target to reflect where we haven't met our commitment, rather than where we have.

We also propose to increase the number of measures for this outcome to focus on customers and instances where services aren't restored over an extended period, and the level of satisfaction of customers when they experience an interruption. All targets have been set to reflect the five-year average historical performance.

⁴⁸ String, Understanding Trust (Confidence), April 2019, page 13.

⁴⁹ Marsden Jacob Associates, Yarra Valley Water's customer-led price submission customer values research, August 2022.

⁵⁰ Nature, Yarra Valley Water Facts & Stories, August 2018.

⁵¹ Nature, Yarra Valley Water facts and figures, August 2018, – Q To what extent is it important to you that your water provider <Insert Provider> is an organisation that...? (n451).

⁵² Quantum Market Research, Brand & Service Evaluation tracking (ongoing) – 'Tracker Extras', October 2021.

⁵³ Quantum Market Research, Pricing Submission Midpoint Review, August 2020.

⁵⁴ MosaicLab, What was said report, June 2022.

Outcome	Timely response and repair
Measures and targets	Customers' satisfaction with the restoration of their services (planned and unplanned interruptions) Target \geq 91 per cent per annum
	Customers whose water or sewerage service wasn't restored within four hours Target $<$ 4.85 per cent per annum
	Customers whose water or sewerage service wasn't restored within 12 hours Target $<$ 0.4 per cent per annum
What we'll do	<p>We will continue to:</p> <ul style="list-style-type: none"> • Provide service fault response and restoration services which are in line with customer expectations, including: <ul style="list-style-type: none"> – 24-hour faults line. – An enhanced customer call back program which now includes an automated SMS, allowing customers to provide feedback and requests for further support following the resolution of a water and sewerage fault. – Online fault map, providing real time information about service outages in a readily accessible way. • Partner with our maintenance service provider for optimal maintenance services consistent with our customer commitments. • Provide site restoration services including: <ul style="list-style-type: none"> – Clean up for spills within a house. – Clean up of a customer's property and/or the surrounding area following works. • Minimise customer inconvenience by: <ul style="list-style-type: none"> – Providing customers a week's advanced notice of a planned interruption. – Not planning service interruptions between 5am and 9am and 5pm and 11pm. – Advising estimated time of arrival and completion of works. – Providing communications during the interruption. – Notifying when works are complete.
What it will cost	Operating expenditure \$39.86 million (average annual forecast 2023-28)
	Capital expenditure \$0 million (average annual forecast 2023-28)

Table 8: Outputs, activities and costs for timely service response and repair outcome

3.6 Outcome 4 – Service that meets everyone’s needs

Our engagement and research that focused on customers whose voices are often unheard, brought home to us on a tangible level the barriers that are faced by customers from different cultural backgrounds, customers with disabilities and those with a range of lived experience.

We have a deepened appreciation of the need to provide accessible and inclusive, non-discriminatory services where customers feel included, respected and have their needs met. We’re currently working on further breaking down barriers that exist for some customers. We’ll use an inclusive design approach and real-world useability testing to improve the useability and accessibility of our digital, non-digital and communication channels. We will also develop our capability to measure progress against key standards and via feedback from our customers.

We propose combining the existing outcomes ‘fair access and assistance to all’ with ‘modern flexible service’ to create a new outcome ‘service that meets everyone’s needs’. This new outcome broadens the focus to ‘everyone’ recognising we service a wide range of customers with different needs and expectations. It also addresses customers’ feedback on the relevance and meaningfulness of the existing outcomes and measures.

When asked, customers said:

- Facilitating good and easy customer experience is felt to be important, but the outcome expression (modern, flexible service) causes confusion and is felt to be vague. While not considered perfect, satisfaction is felt to be the most appropriate and practical way to measure this outcome⁵⁵.
- Their expectation of fair access and assistance for all is about ensuring accessible and affordable water for all customers regardless of background, ability and financial situation. However, the measure didn’t feel suitable and customers worry it doesn’t answer the question of whether those in need are being adequately supported⁵⁶.
- Their expectations can be met by being responsive and communicating well when an incident occurs^{57 58}.
- The statements ‘I want support for customers having difficulty paying their bills’ and ‘I want my interactions to meet my needs’ ranked the least important of all eight statements^{59 60}.

The combined outcome is focused on experience and includes customers who have different accessibility needs, are financially vulnerable or require a service offering adapted to their individual need. Key statistics that demonstrate the appropriateness of this outcome include:

- Convenience (72 per cent), quick interaction/no waiting (59 per cent), people’s general improvement in online account management skills (58 per cent) and control are

⁵⁵ Quantum Market Research, Pricing Submission Midpoint Review, August 2020.

⁵⁶ Quantum Market Research, Pricing Submission Midpoint Review, August 2020.

⁵⁷ String, Understanding Trust (Confidence), April 2019, page 13.

⁵⁸ Marsden Jacob Associates, Yarra Valley Water’s customer-led price submission customer values research, August 2022.

⁵⁹ https://media-2.yvw.com.au/inline-files/Citizens%27%20Jury%27s%20recommendations_PS5_102KB.pdf.

⁶⁰ Quantum market research, Yarra Valley Water Pricing Submission Midpoint Review, August 2020.

important to customers (54 per cent). Competence with technology is behind convenience, quick interaction and no waiting (58 per cent).⁶¹

- Care is also a critical element of great customer service, and means showing empathy to customers, treating them like humans, listening to and understanding their situations.⁶²
- There was a significantly positive correlation found between ease and satisfaction, and care and satisfaction. As these perceptions increased, so did the level of overall satisfaction with their most recent experience. Both correlations were strong (0.727 for ease; 0.624 for care).⁶³
- 65 per cent of what drives trust is within the control of the organisation and primarily, how service interactions are managed over time.⁶⁴
- Customers who struggled to pay scored their water provider lower for value for money than the average (6.0 versus 6.5). However those who contacted their water provider, on average, had a significantly improved perception of value for money and trust. For value for money this rose from 6.0 to 6.7 and for trust this rose from 6.2 to 6.8⁶⁵.
- The Jury made a recommendation to improve access to information for all customers (recommendation 6).

The combined outcome will retain the existing measures from 'fair access and assistance to all' and 'modern flexible service'. Targets have been set to reflect the 5-year average historical performance level.

We plan to add a more specific measure associated with broader accessibility needs – beyond financial vulnerability. We're also exploring new measures for the customer experience to capture voice of customer feedback across more touchpoints and to enable real time feedback mechanisms. If customers show support for changes, we will make a proposal to the ESC, including providing evidence of customers' support.

⁶¹ easyACCESS Development Applications, February 2019.

⁶² Yarra Valley Water Thematic Synthesis, August 2019.

⁶³ Quantum market research, Yarra valley water ease and care research, December 2018, page 3.

⁶⁴ String, Understanding trust, April 2019, page 6.

⁶⁵ Insync for WSAA, Insights report, COVID-19 impact and customer support.

Outcome	Service that meets everyone's needs
Measures and targets	Customers' satisfaction with their most recent interaction with us Target ≥ 86 per cent per annum
	Customers, who accessed our support services, believe Yarra Valley Water helped them with their bills Target ≥ 92 per cent per annum
What we'll do	<p>We will continue to:</p> <ul style="list-style-type: none"> • Provide hardship and vulnerability programs for customers who are unable to pay • Improve awareness of, and access to, services and programs for customers who experience barriers to our services. • Partner with others to ensure customers can access support services more broadly. • Protect customers who may not have a capacity to pay and we will not restrict water supply without first ascertaining ability to pay. • Provide customers with a variety of payment options that suit their circumstances. • Have a customer centred approach to customer contacts and enquiries, including: <ul style="list-style-type: none"> – Maintain a local customer contact centre as the primary avenue for customers supported by various online and social mechanisms. – Ensure the bill design supports improved accessibility of communications and information for customers. – Deliver customers a bill consistent with their preferences. – Maintain customer services and relationships with specific customer segments such as developers, builders, plumbers and trade waste customers. – A range of bill payment options and channels that allow customers to manage their payments in a way that suits them. – Fair and equitable debt management and collection approaches that ensure customers who are unable to pay are identified and supported. – Ensure that customers who want to have a self-serve relationship receive accessible and clear communications. – Provide accessible and inclusive, non-discriminatory services where customers feel included and respected and have their needs met. – Engage with customers, including those segments that have traditionally been hard to reach, to gather insights and reflect on their needs and experiences to continually improve our services.
What it will cost	Operating expenditure \$57.26 million (average annual forecast 2023-28)
	Capital expenditure \$26.93 million (average annual forecast 2023-28)

Table 9: Outputs, activities and costs for customer service that meets everyone's needs outcome

3.7 Outcome 5 – Saving water for the future

Saving water so it's available in the future is a strong theme with customers and is fundamentally linked to our Caring for Country philosophy.

Currently we measure total water purchased from Melbourne Water – expressed as litres per person per day. Customers have told us that this is not meaningful, and they can't reconcile it to the Target 155 goal they're familiar with⁶⁶.

There is no shortage of insights available to demonstrate that customers and the community want action, including:

- 90 per cent of people say it's important to not waste water⁶⁷, and 78 per cent agree recycling sewerage water for non-drinking purposes is a good idea.
- Nearly two-thirds (61 per cent) intend to increase their water saving efforts⁶⁸.
- 35 per cent who moved into a house with recycled water found this an attractive attribute of their new property⁶⁹.
- 68 per cent of customers who saw our campaign, Shower Shorter Save Water, were likely to shorten their showers as a result⁷⁰.
- Poor water and storage management is the third-strongest driver of distrust⁷¹.
- Customers expect us to 'support them to be water efficient'^{72 73}.
- 71 per cent agree with the statement, 'businesses waste a lot of water'⁷⁴
- 59 per cent also say water companies should provide enough information to help me control my water use⁷⁵.

Our 2022 Jury made several recommendations in relation to saving water, including:

- Embed Caring for Country in all decision-making processes (recommendation number 1).
- Accelerate the implementation of digital meters and technologies to assist customers to monitor and control their water usage and spend (recommendation number 3).
- Adopt proactive climate change initiatives (recommendation number 7).
- Strengthen partnerships with community to help people understand the consequences of excessive water use (recommendation number 8).
- Actively support the use of rainwater, treated stormwater and recycled water (recommendation 12).

⁶⁶ Quantum market research, Yarra Valley Water Pricing Submission Midpoint Review, August 2020.

⁶⁷ Nature, Yarra Valley Water facts and figures, August 2018, page 24 – Q to what extent do you agree or disagree with the following statements? (n1,005).

⁶⁸ Nature, WMRG Water Efficiency Tracking August 2021, page 12 – Q And how likely are you to try and reduce the amount of water you use in the next 12 months? (n1,000).

⁶⁹ Quirk, Recycled Water Research, July 2020.

⁷⁰ Shower Shorter Campaign Evaluation Survey Report, July 2021.

⁷¹ Quantum Market Research, WSAA Understanding Trust Full Report, May 2019 – Q17 You gave a rating of disagree/agree in terms of the extent you trust the Australian water industry overall. Why? (n2,500).

⁷² Quantum Market Research, WSAA Understanding Trust, July 2019 Q.18. To what extent do you agree or disagree that the Australian water industry...? (n=2,500).

⁷³ Quantum market research, Yarra Valley Water Pricing Submission Midpoint Review, August 2020.

⁷⁴ Nature, Yarra Valley Water facts and figures, August 2018, page 24 – Q to what extent do you agree or disagree with the following statements? (n1,005).

⁷⁵ Nature, Yarra Valley Water facts and figures, August 2018, page 24 – Q to what extent do you agree or disagree with the following statements? (n1,005).

A recent willingness to pay study⁷⁶ tested four different elements of water availability and conservation to determine the communities' preferences amongst various investment options. The results conclude:

- There is strong willingness to pay from customers, including those who self-identify as financially vulnerable, for digital meters that enable leak detection and notification at customers' properties and rebates for rainwater tanks.
- There is some willingness to pay for increased supply and installation of water saving products and services such as showerheads, water audits and appliance replacement.
- Customers do not demonstrate a willingness to pay to increase water conservation awareness and education programs.

We've proposed to separate the current measure into four, each targeting a customer segment (households⁷⁷ and businesses) or potential contributor to total water savings (leakage and operational water use, and recycled water). When presented with this proposal, 85 per cent of 2017 and 2022 jurors said they liked or loved it⁷⁸.

Proposed investments, forecast demand projections and existing programs have factored into setting the appropriate target for each measure for each year, specifically:

- Water lost targets are consistent with non-revenue water forecasts and investments in water conservation, particularly the district metering program.
- The target for recycled water used in designated recycled water areas, reflects timing and scope of recycled water infrastructure investments that will enable production and delivery of increased volumes of recycled water to customers.⁷⁹
- Average household water use targets are consistent with demand projections.
- Business customers with an active water efficiency plan annual target is set to the 5-year historical average.

Outcome	Saving water for the future					
Measures and targets	Water lost in Yarra Valley Water's supply system					
		2023-24	2024-25	2025-26	2026-27	2027-28
	Target	7.8 per cent	7.5 per cent	7.3 per cent	7.3 per cent	7.3 per cent
	Recycled water used in designated areas					
		2023-24	2024-25	2025-26	2026-27	2027-28
	Target	4.0 per cent	4.6 per cent	4.6 per cent	4.7 per cent	11.8 per cent
	Average household water use (litres, per property, per day (l/pp/pd))					
		2023-24	2024-25	2025-26	2026-27	2027-28
	Target	402 l/pp/pd	402 l/pp/pd	401 l/pp/pd	400 l/pp/pd	396 l/pp/pd
	Business customers who use more than 100ML (100 million litres) of water a year, who have an active water efficiency plan Target = 100 per cent per annum					

⁷⁶ Marsden Jacob Associates, Yarra Valley Water's customer-led price submission customer values research, August 2022.

⁷⁷ Rather than a per capita measure (like Target 155) as it relies on forecast population growth and an estimate of the number of people in each household.

⁷⁸ MosaicLab, What was said report, June 2022.

⁷⁹ At full production and use, the maximum proportion of recycled water use is about 25 per cent.

Outcome	Saving water for the future
What we'll do	<p>We will increase investment to:</p> <ul style="list-style-type: none"> • Provide recycled water services to customers in mandated areas including the following major recycled water capital projects: <ul style="list-style-type: none"> – Doncaster Hill recycled water treatment plant by 2026-27 at a total cost of \$69.72 million. – Aurora recycled water treatment plant and transfer system by 2027-28 at a total cost of \$141.32 million. – Mt Fraser recycled water transfer system⁸⁰ by 2026-27 at a total cost of \$42.73 million. • Conduct a controlled study for a combined water audit and showerhead replacement program with a particular focus on vulnerable and higher water use customers. <p>We will continue to:</p> <ul style="list-style-type: none"> • Provide targeted water conservation resources, education and programs for customers and the community. • Undertake a proactive program that identifies and resolves water losses within our pipe network. • Only impose water restrictions where unforeseeable circumstances require us to ensure the supply of water. • Work with stakeholders and partners to optimise water resource management at a community level, particularly through Integrated Water Management Forums established under the Government's Water for Victoria policy. • Undertake a trial of 25,000 digital water meters which will inform whether we proceed with a full scale roll-out to all customers. • Undertake various demand and bulk water management activities including: <ul style="list-style-type: none"> – Short to medium term demand management at a local and community level. – Preparation of annual Water Outlook for Melbourne with Melbourne Water and other retailers. – Short to medium term supply management, including optimisation of water allocations, management of water entitlements and the annual desalination order process. – Long-term water resource planning for Melbourne together with Melbourne Water and other retailers.
What it will cost	Operating expenditure \$18.91 million (average annual forecast 2023-28)
	Capital expenditure \$67.96 million (average annual forecast 2023-28)

Table 10: Outputs, activities and costs for efficient water use so it's available for the future outcome

⁸⁰ Recycled water components of the Mt Fraser drinking water and recycled water transfer system major project.

3.8 Outcome 6 – Looking after our natural environment

There is an underlying expectation that we're acting in responsible ways.

Overall, when customers think about looking after the natural environment their main concern is climate change and its impact. Nearly two-thirds (63 per cent) of customers are concerned about climate change, and more than one-third (34 per cent) were extremely concerned⁸¹. 76 per cent say climate change is happening⁸².

We know our operations impact the environment in three key areas:

- Carbon emissions
- Extracting water from the environment (refer to section 3.7 - Outcome 5 – Saving water for the future on page 51)
- Uncontrolled sewage spills and discharging treated wastewater

'Care for the environment' is a major driver of trust⁸³ and 41 per cent of customers agree that the quality of local waterways is getting worse⁸⁴.

Our 2022 Jury made several recommendations in relation to preserving and protecting our environment, including:

- Embed Caring for Country in all decision-making processes (recommendation number 1).
- Prioritise infrastructure investment based on sustainable environment outcomes (recommendation number 9).
- Partner with others to optimise future infrastructure (recommendation number 10).
- Access, where practical, to sewage and water services for all customers (recommendation number 11).

A recent willingness to pay study⁸⁵ tested three different environment related elements to determine the communities' preferences among various investment options. The results conclude:

- There is strong willingness to pay from customers, including those who self-identify as financially vulnerable, for:
 - Protecting and restoring habitat for the benefit of endangered plants and animals.
 - Tree planting where trees have been removed due to water and sewerage works.
- Customers do not demonstrate a willingness to pay to accelerate the roll-out of sewerage services to customers with septic tanks – but support the program at its current level.

⁸¹ Nature, WRMS Water Efficiency Tracking, August 2021 – Q. How concerned, if at all, are you about climate change? (n1,000).

⁸² Nature, Yarra Valley Water facts and figures, August 2018, page 24 – Q to what extent do you agree or disagree with the following statements? (n1,005).

⁸³ Forethought, Brand management and Segmentation Report, February 2020.

⁸⁴ Nature, Yarra Valley Water facts and figures, August 2018, page 24 – Q to what extent do you agree or disagree with the following statements? (n1,005).

⁸⁵ Marsden Jacob Associates, Yarra Valley Water's customer-led price submission customer values research, August 2022.

Currently we are measuring our environmental impacts using a single measure and target associated with reductions in greenhouse gas emissions (GHG). By 2025 we will have achieved a net zero position. We will replace it with a broader set of measures and targets to address environmental issues customers have told us they are concerned about, including:

- Loss of biodiversity and degradation of natural environments and habitats⁸⁶
- Pollution of local environment and natural waterways
- Climate change

92 per cent of 2017 and 2022 jurors said they like or loved⁸⁷ the straw-person proposal. They identified the most important measure as the hectares of land we actively manage to preserve and restore biodiversity and natural habitats.

Proposed investments and existing programs have factored into setting the target for each measure for each year, specifically:

- The annual target for the measure of hectares of land we actively manage to preserve and restore biodiversity and natural habitats are consistent with the capital and operating investments planned over the period. Refer to Biodiversity and regenerative land use on page 243 and Additional expenditure items on page 249. These investments are also supported by customers⁸⁸.
- We're used an adjusted three-year historical average to set the target for sewer spills. Measured consistent with the EPA's reporting framework, volumes for 2019-20 and 2020-21 have been eliminated volumes attributed to significant events that would otherwise materially impact the target.
- We've an ongoing capital expenditure program that provides sewerage services in areas where customers are reliant on septic systems for their waste. The target has been developed in reference to the historic connection rate and the timing of proposed investments over the 2023-28 period. Refer to Community sewerage program on page 230.
- Our renewable energy targets have been set consistent with our obligation under the Statement of Obligations (Emissions Reduction) and with regard to our proposed investment program. Refer to Energy generation and emissions on page 242.

⁸⁶ Including making a contribution to DELWP's Biodiversity 2037: Protecting Victoria's Environment. This is Victoria's plan to stop the decline of our native plants and animals and improve our natural environment.

⁸⁷ MosaicLab, What was said report, June 2022.

⁸⁸ Marsden Jacob Associates, Yarra Valley Water's customer-led price submission customer values research, August 2022.

Outcome	Looking after our natural environment					
Measures and targets	Hectares of land we actively manage to preserve and restore biodiversity and natural habitats					
		2023-24	2024-25	2025-26	2026-27	2027-28
	Target	9 hectares	11 hectares	13 hectares	45 hectares	47 hectares
	Volume of sewage spills that have a material impact to the environment Target ≤ 5,000 kilolitres per annum					
	Number of customers who were on septic tanks and are now connected to the sewerage network Target > 200 customers per annum					
	Percentage of energy requirements met from renewables					
		2023-24	2024-25	2025-26	2026-27	2027-28
Target	85 per cent	95 per cent	100 per cent	100 per cent	100 per cent	
What we'll do	<p>We will increase investment to protect remnant biodiversity values and habitat for several threatened fauna species on 14 of our 190 properties. Actions include:</p> <ul style="list-style-type: none"> • Planting, revegetation and habitat restoration • Construction of wetlands • Pest, weed and erosion control <p>We will continue to:</p> <ul style="list-style-type: none"> • Take a long-term planning view of climate change and environmental sustainability and minimise our impacts on the environment to: <ul style="list-style-type: none"> – Reduce GHG emissions each year consistent with our reduction strategy. – Reduce impacts on local waterways that may occur from stormwater, treatment plant failures or discharges and sewage spills. • Comply with our sewage treatment plant licences issued by the EPA and other EPA environmental standards, including wastewater spills incident management and reporting. • Deliver the sewer capacity program of works that includes four hydraulic capacity upgrades and 10 new emergency relief structures that prevent the risk of uncontrolled spills to customer properties and the environment. • Deliver our community sewerage program to provide 3,000 customers with failing septic tanks an alternative sustainable solution – including 1,000 properties in Park Orchards with failing septic tanks, or those not suited to septic tank systems by 2027-28 at a project cost of \$43.09 million (total project cost \$48.71 million). 					
What it will cost	Operating expenditure \$4.84 million (average annual forecast 2023-28)					
	Capital expenditure \$53.24 million (average annual forecast 2023-28)					

Table 11: Outputs, activities and costs for preserving and protecting the environment outcome

3.9 Major projects

Outlined in Table 12 below are the top 10 projects (determined by value) that we'll commence or deliver during the 2023-28 period, accounting for \$457.96 million (23.1 per cent of our total capital program).

Six of these projects are required to service new properties, particularly in five new precinct structure plan (PSP) areas in the Northern Growth Area that are located away from existing infrastructure. We will provide drinking water, recycled water and sewerage infrastructure in these areas to enable the commencement of new areas of development within each PSP.

Project specific cost estimates have been completed for all the top 10 projects by KBR/Aurecon (engineering design consultants) including a Monte-Carlo analysis incorporating contingency allowances adapted for the stage, complexity and scope of work. The P50⁸⁹ cost estimate has been adopted for all projects not yet in construction. For projects in construction the tendered price has been included.

Major project	Specification	Current phase	Year of completion	2023-28 cost (\$M)
Aurora recycled water treatment plant and transfer system (Outcome 2 – reliable water and sewerage services)	Construct new Aurora recycled water treatment plant and recycled water transfer mains including: <ul style="list-style-type: none"> • 10ML/d recycled water treatment plant • 8.5km of recycled water transfer mains • Transfer pump station • Additional 10ML balancing storage 	Functional design	2027-28	\$134.29 (\$141.32 total cost)
Mt Fraser drinking water and recycled water transfer system (Outcome 2 – reliable water and sewerage services and Outcome 5 – saving water for the future)	Construct Mt Fraser drinking water and recycled water tanks and associated pipework consisting of: <ul style="list-style-type: none"> • 30ML drinking water tank • 2.35km of 750mm drinking water mains • One secondary chlorinator • 8.5ML recycled water tank • 2km of 450mm-600mm recycled water mains 	Functional design	2026-27	\$75.14 (\$83.59 total cost)
Doncaster Hill recycled water project (Outcome 5 – saving water for the future)	Construct 750kL per day local underground recycled water treatment facility and reticulation network to provide recycled water to 6,000 properties in Doncaster Hill	Detailed concept design	2026-27	\$62.55 (\$69.72 total cost)

⁸⁹ P50 cost estimate represents 50 per cent likelihood that this cost would not be exceeded.

Major project	Specification	Current phase	Year of completion	2023-28 cost (\$M)
Park Orchards community sewerage project (Outcome 6 – looking after our environment)	Provide reticulated sewerage services to approximately 1000 properties in Park Orchards including: <ul style="list-style-type: none"> 18km of new gravity sewers 9km of new pressure sewers Two sewage pump stations 	Concept design	2027-28	\$43.09 (\$48.71 total cost)
M4 distribution main renewal project (Outcome 2 – reliable water and sewerage services)	Renew existing main with 6km of new DN750 and DN525 pipework and reline 2km of the existing DN750	Functional design	2027-28	\$43.86 (\$45.34 total cost)
Healesville sewage treatment plant capacity upgrade (Outcome 2 – reliable water and sewerage services)	Capacity upgrade to treat average dry weather flow of 2.1ML/d	Detailed concept design	2027-28	\$28.54 (\$30.53 total cost)
Wallan East branch sewer stage 1 (Outcome 2 – reliable water and sewerage services)	Construct 2.3km, 750mm-1050mm diameter branch sewer to service properties in Wallan East	Functional design	2026-27	\$20.39 (\$20.76 total cost)
Craigieburn storage and transfer hub stage 3 – Northern Growth Area sewerage transfer system (Outcome 2 – reliable water and sewerage services)	Design and construct Craigieburn storage and transfer hub stage 3 consisting of: <ul style="list-style-type: none"> Design transfer pipeline and new sewage pump station (to be constructed in the 2028-33 period) Construct tank 3 and tank 4 Design tank 5 and tank 6 (to be constructed in the 2028-33 period) 	Transfer pipeline and sewerage pump station – functional design Tanks 3 and 4 – tender Tanks 5 and 6 – functional design	2031-32	\$20.10 (\$183.41 total cost)
Love branch sewer stage 3 (Outcome 2 – reliable water and sewerage services)	Construct 1.9km long, 6-17m deep, 675mm diameter branch sewer in Epping	Functional design	2025-26	\$17.25 (\$17.80 total cost)
Eltham main sewer rehabilitation (Outcome 2 – reliable water and sewerage services)	Renew 4.6km of sewer main (DN900 to 1600)	Pre-concept design	2026-27	\$9.00 (\$29.67 total cost)
Total				\$454.19

Table 12: Major projects (determined by value) to commence or deliver over the 2023-28 regulatory period (\$ million January 2023)

3.10 Performance reporting to customers

Annually we report⁹⁰ to customers how we're delivering on outcomes, including actions we've taken.

During 2020, as part of a mid-point review⁹¹, we asked customers about performance reporting, particularly what they wanted included in the report. They wanted to know:

- Whether or not we met targets
- Reasons for failing to meet targets and actions to improve and meet the target in the future
- Performance over time
- Number of customers impacted

They also wanted the information to be easily accessible and visually appealing, including using traffic light coding and to cater for customers with different information needs. As a result of this engagement, we adapted our performance reporting.

We will continue to communicate performance through established channels including bill inserts and via the homepage on our website. We will continue to evaluate the cut-through of reporting and evolve our approach to meet customers' needs and expectations.

With the decision to have multiple measures and targets that represent the breadth and depth of each outcome, the process to determine if we've achieved each outcome also needs to evolve. Based on consultation with our long-standing Community Advisory Group (CAG), for the 2023-28 period, we propose to seek recommendations annually from our CAG, or another similar group of customer representatives, on whether we've achieved each outcome. This process will be used to inform Board's decision on any Community Rebate amounts returned to customers and the community.

Our CAG has identified principles that should be considered in assessing if an outcome with multiple measures has been achieved, including:

- Measures identified by our 2017 and 2022 jurors⁹² as the most important should have a stronger weighting when assessing the achievement of an outcome.
- Taking into consideration the degree to which any target was missed.
- The number of targets achieved.
- Consideration of the impact of external factors on the level of performance.
- Actions taken during the year to achieve a target.
- Cumulative results over the period.

Using the proposed set of 2023-28 outcomes, measures and targets and 2022-23 performance, we plan to pilot the methodology to ensure a robust process for customer representatives to advise us on whether our performance has met their expectations and the extent to which we return \$1.8 million dollars per outcome through our Community Rebate.

⁹⁰ <https://www.yvw.com.au/about-us/reports/our-performance-2021-22>.

⁹¹ Quantum Market Research, Pricing Submission Midpoint Review, August 2020, pages 50 and 51.

⁹²

3.11 Service standards

Defined by the ESC's Customer Service Code, service standards specify the minimum service level a customer can expect to receive. We propose annual targets for the 2023-28 period, based on the five-year level of actual performance (2017-22), in Table 13 below.

Customer Service Code standards (current)	Target (2018-23)	Target (2023-28)
Water service standards		
Customers experiencing more than five unplanned water supply interruptions in any 12-month period	165	231
Average time taken to attend priority 1 bursts and leaks	43.7 minutes	24 minutes
Average time taken to attend priority 2 bursts and leaks	87.9 minutes	36 minutes
Average time taken to attend priority 3 bursts and leaks	801.7 minutes	286 minutes
Average time taken to restore customers' water supply – planned	127.5 minutes	113 minutes
Average time taken to restore customers' water supply – unplanned	110.3 minutes	101 minutes
Sewerage service standards		
Customers receiving more than 3 sewer blockages in the year	11	12
Average time taken to attend sewer spills and blockages	82.3 minutes	47 minutes
Average time taken to rectify a sewer blockage	242.6 minutes	139 minutes
% of spills contained within five hours	97.2%	98.7%

Table 13: Proposed targets for current standards outlined in the Customer Service Code based on five-year average performance

We also note the Customer Service Code has recently been reviewed⁹³ with changes due to come into effect on 1 March 2023. It contains amendments to three customer service code indicators. We propose in Table 14 below, the following annual targets for these revised indicators.

Customer Service Code standards (revised)	Current standard	Target (2023-28)	Rationale
Maximum number of unplanned water supply interruptions a customer may experience in any 12-month period	Number of customers experiencing more than 5 unplanned water supply interruptions in the year	2	Aligned to guaranteed service level, informed by customers
Maximum number of sewer blockages a customer may experience in any 12-month period	Customers receiving more than 3 sewer blockages in the year	2	Aligned to guaranteed service level, informed by customers
Maximum time taken to contain a sewer spill (minutes)	Spills contained within 5 hours (per cent)	240 minutes	Aligned to guaranteed service level for sewer spills on a property

Table 14: Minimum annual targets for revised standards following review of the Customer Service Code

⁹³ <https://www.esc.vic.gov.au/water/codes-and-guidelines/customer-service-codes/water-codes-review-2021>.

3.12 Performance rebates

3.12.1 Community rebate

We propose to retain our community rebate and increase its value to \$1.8 million (from \$1.5 million¹ during the 2018-23 period) for any outcome not achieved annually which we return to customers. Some customers have told us they do not value the small reduction in bills⁹⁴ and would prefer any payment to be invested in projects and programs to save water and benefit the environment⁹⁵. During the period, we will explore with customers how we can transition to a mechanism that maximises the value of our community rebate.

3.12.2 Guaranteed service level rebates

We are committed to providing high standards of service. Over time we've continued to evolve our guaranteed service levels (GSL) with customer input. For individual customers who experience a level of service below these levels, we provide a rebate automatically on their next bill.

In May 2022, representatives of our 2017 and 2022 Citizens' Juries reviewed our current GSLs to understand if:

- They reflected the minimum level of services customers expect
- The amounts were appropriate for the circumstances
- A rebate should be paid if a water quality issue occurred
- Anything else was missing.

Following recent water quality incidents where we've issued precautionary water quality advisories, we've deeply considered if and when it's appropriate to introduce a guaranteed service rebate for water quality events – noting that the introduction of any additional GSLs will not impact the benchmark expenditure proposed for the 2023-28 period and therefore the revenue required from customers

We've engaged with customers, community advisors, DELWP, the Department of Health and the Melbourne metropolitan water corporations as we've considered this issue. Paramount in all of these discussions has been the objective to protect public health.

We've been working on several options in relation to this issue and there has been support from our 2017 and 2022 jurors to consider GSLs for a water quality issue.

Given that we play our role in protecting public health within a large, joined-up Melbourne water supply system, we consider it appropriate that any rebate we introduce for water quality events should be consistent with the other metropolitan water corporations. We commit to working together with South East Water, Greater Western Water and Melbourne Water to achieve a consistent Melbourne-wide approach to a defined guaranteed service rebate for water quality events by end November 2022.

⁹⁴ Quantum Market Research, Pricing Submission Midpoint Review, August.

⁹⁵ MosaicLab, What was said report, June 2022.

Expressed from the customers' perspective, we propose the following guaranteed service levels and rebates from 1 July 2023.

Guaranteed service level	Amount	Proposal
Planned interruptions to water and sewer supply		
We interrupt your water for more than five hours	\$50	Retain
The planned interruption is longer than we said it would be	\$50	Retain
We fail to give at least one week's notice of planned water interruptions	\$50	Retain
We interrupt your water between 5am and 9am and/or 5pm and 11pm	\$50	Retain
Unplanned interruptions to water and sewer supply		
Your water supply is lost for more than four hours – you will receive an additional \$50 if this extends to more than 12 hours	\$50	Retain
We fail to restore your sewerage service within four hours – you will receive an additional \$50 if this extends to more than 12 hours. This does not include sewer service interruptions caused by your pipe work	\$50	Retain
You experience more than two unplanned water or sewerage interruptions during any 12-month period – \$50 for the third and each subsequent unplanned interruption	\$50	Retain
If we do not provide an adequate water flow rate (unless there is a restriction in place), we will waive the Water Supply System Charge until we meet the minimum standard rate	n/a	Retain
Sewage spills caused by a fault in our sewerage system		
We fail to contain a sewage spill within your house within one hour of it being reported to us	\$1000	Retain
You experience a subsequent sewage spill in your house within 12 months which isn't contained within one hour of it being reported to us	\$2000	Retain
We fail to contain a sewage spill on your property within four hours of it being reported to us	\$1000	Retain
You experience a subsequent sewage spill on your property within 12 months which isn't contained within four hours of it being reported to us	\$2000	Retain
Water quality		
You contact us about two or more separate water quality issues in a 12-month period – \$50 for the third and each subsequent issue	\$50	Retain
Response to customers		
If we do not reply to your contact within four working days	\$50	Retain
Debt recovery actions		
We commence legal action or take steps to restrict your household's water supply prior to taking reasonable endeavours to contact you and provide information about the help that is available for customers experiencing financial difficulty	\$300	Retain

Table 15: Proposed guaranteed service levels

**Prudent and efficient
investments now and for
the future.**



4. Developing our best offer for customers

We have consciously challenged ourselves to provide our 'best offer' to customers including six outcomes with associated measures and targets together with other commitments over the next regulatory period. Key management actions relate to the Board's attestation, our forecast operating and capital expenditure for the next regulatory period and minimising customers' bills.

4.1 Board involvement and attestation

The Board and particularly the Service, Community, Assets and Regulation (SCAR) Board sub-committee, has been actively involved in the development, review and approval of the price submission. The SCAR Committee has primary accountability on behalf of the Board for regulatory matters to:

- Review the proposed high-level strategy and consider key issues for inclusion in future price submissions.
- Review the revised draft price submission prior to submission to the Board.
- Recommend to the Board to adopt the price submission, for submission to the regulator, the Essential Services Commission.
- Monitor that the business is delivering on the outcomes established in the price determination.

A comprehensive program of papers and briefings was developed for SCAR associated with the price review. Since October 2020, the Board has received briefings at 12 of 17 Board meetings, and in addition all 11 SCAR Committee meetings over the same period have discussed various aspects of the price submission. These briefings related to the Commission's guidance, updates about attestation, our strategic approach to the process and key project and program delivery.

The Board members actively engaged in the development and execution of engagement activities, including as participants and observers to the engagement process and Citizens' Jury, and responded to the recommendations.

To assist Board in their attestation role, an independent advisor to Board was appointed to enable detailed scrutiny of the key elements of our submission and the appropriate assurance, including:

- Independent advice on our approach and plan to produce a price submission and the establishment of robust internal governance arrangements.
- Reviewing the prudence and efficiency of expenditure and demand forecasts.
- Confirming the price submission and information template are accurate, consistent and complete.

4.2 Planning and economic challenges

We developed our 2023-28 price submission during unprecedented times and change in the community, with the challenges and uncertainties of:

- Climate change
- Rate and location of customer growth
- Economic and market uncertainty, including impacts of COVID-19.

Climate change

Climate change risk includes the physical risk which can cause direct damage to assets or property as a result of rising global temperatures as well as transition risks which arise from the transition to the low-carbon economy.

Climate change will create a hotter and drier climate in Victoria, with up to double the number of very hot, high-fire risk days by the 2050s, lower in-flows to our reservoirs and greater variability, including an increased number of storm events with more intense downpours. These challenges will require new approaches in the way we provide our services.

The latest climate projections for Victoria⁹⁶ suggest that:

- By the 2050s, under a high emissions scenario, the state's average annual temperature may increase by up to 2.4°C compared to the 1986–2005 average, with around double the number of very hot days.
- Annual rainfall is projected to decrease, especially in the cool season. However, due to natural variability, extreme rainfall events will still occur and will likely be more intense, potentially increasing the risk of flash flooding in some locations.
- The number of high fire danger days is expected to increase.
- Sea levels will continue to rise. By the 2050s, under medium and high-emissions scenarios, sea levels are projected to rise by about 24cm (relative to 1986-2005).

More storms, more intense rainfall, less rain, drought, higher temperatures, heat stress and fire weather will lead to less water, asset degradation, increased flooding and sewer spills, more electricity disruptions, reduced water quality, and safety and wellbeing impacts.

Responding to changes in climate and weather has been considered across our proposals for 2023-28. Key investments we'll make include:

- Strengthening sector-wide emergency management capability and capacity to prepare for, respond to and recover from acute and chronic incidents and emergencies.
- Resilience measures proposed to increase reliability of power supply to mitigate risk of power outages.
- Additional stormflow storage to cater for intense storms and flash flood impacts due to inflow and infiltration into the sewerage system.
- Introducing climate change scenarios in our hydraulic model using proposed Australian Rainfall-Runoff (ARR) climate change scenarios.

⁹⁶ <https://www.climatechange.vic.gov.au/victorias-changing-climate>.

- Improving resilience in the communication network and control systems used to manage our network facilities, including radio and battery back-up facilities and uninterruptable power supplies.
- Increasing resilience to minimise the impact of severe weather events on water quality, including use of drones and technologies to inspect critical assets during incidents when it is unsafe to physically visit sites. This also includes improved capability to understand the real time water quality performance in the drinking water network to inform rapid risk assessments and decision making during incidents, including issuing and rescinding drinking water advisories.

We'll also continue to invest to reduce, reuse and recycle water including the roll-out of our recycled water network to over 100,000 homes and businesses in the Northern Growth Area.

The risk of climate change has not been factored into emergency maintenance volumes and unit costs despite changes in rainfall patterns and drought that can lead to increased soil movement and displacement at pipe joints allowing for root intrusion into sewers – increasing blockages and also causing increased water supply bursts and leaks.

Further information related to climate change and weather impacts can be found in chapter 7, Demand on page 96, Appendix C - Detailed capital expenditure from page 180 and Appendix D - Detailed operating expenditure from page 246.

Our climate resilience plan is also available on our website <https://www.yvw.com.au/about-us/reports/climate-resilience-plan>. It outlines how we'll tackle climate change and how we'll adapt to a hotter, drier climate.

Servicing customer growth

We build infrastructure networks to provide essential water and sewerage services to customers. We have an obligation to support development and provide services to new customers, and we aim to do this with optimally timed investments.

When developing servicing strategies for growth, we work closely with key stakeholders, customers, community groups and Traditional Owners/Custodians. This approach brings diverse perspectives and ensures a holistic understanding of objectives and needs of each area to enable co-development of servicing solutions that best meet customer, community and environmental outcomes, including affordability.

While uncertainty remains around the extent of the impacts of COVID-19 and other issues that impact growth, the Department of Environment, Land, Water and Planning's Unpublished Victorian Government Projections, 2021 (VIF2021)⁹⁷ are the most up to date data available at a granularity suitable for demand forecasting⁹⁸. We have also:

- Reviewed the first release of 2021 Census of Population and Housing data from the Australian Bureau of Statistics.

⁹⁷ These projections have been supplied by the Department of Environment, Land, Water and Planning (DELWP) and are based on unpublished internal modelling. DELWP is the agency responsible for the development of the official state government population projections, which incorporate the latest population estimates, evidence from the latest Census plus assumptions regarding future births, deaths, migration and local development trends.

⁹⁸ Statistical Area Level 2 (SA2) resolution.

- Reviewed the December 2021 Australian Government Centre for Population Projections⁹⁹ for Melbourne.
- Engaged growth forecasting experts MacroPlan to provide independent forecasts for population and dwellings at a Statistical Area Level 1 (SA1) resolution and advisory services regarding the economic and demographic situation at a macro level and within our service area.¹⁰⁰

We have adopted VIF2021 for growth projections at the scale of our service area.

Refer to Chapter 7 - Growth in customers on page 94 and Appendix C - Customer growth programs on page 220 for further information related to assumptions related to servicing customer growth, and customer growth forecasts.

Economic factors

We have undertaken a comprehensive process to identify, quantify and determine the most appropriate party to manage risk in developing our price submission.

We're cognisant of striking an appropriate balance to ensure we don't take on excessive risk, by deferring or reducing forecast costs where we have a high degree of certainty. This would only result in customers unnecessarily experiencing price increases in the next regulatory period. The submission is consistent with this approach and has been developed considering:

- Short-term constraints in the market, including the availability of materials and staff, caused by low unemployment, the geopolitical environment and COVID-19.
- Higher prices potentially being charged due to market capacity constraints caused by high demand for infrastructure construction in times where there's very low unemployment.
- Who is best placed to manage the financial risk associated with uncertainty and deliverability.

We are constantly reviewing and monitoring market conditions to understand and manage the impacts of current material and labour shortages caused by COVID-19, disruption on the supply chain and high volume of works in the market. We continually adapt our plans to maximise certainty and efficiency of delivery through the period - responding to the current capital delivery market challenges by:

- Direct pre-procuring materials for capital projects when required to provide cost certainty and to prevent excessive risk pricing by contractors. The materials can either be novated to contractors or provided by us. The approach taken for each project will be decided on a project-by-project basis considering the specific risks.
- Providing early and ongoing visibility of our capital program to our contractor partners to enable resource planning and an open dialogue about the best timing for delivery.
- Involving construction contractors in our design processes to maximise efficiency of construction and ensuring designs match with construction skill sets.

⁹⁹ Centre for Population 2021, Population Statement: Capital City and Rest-of-State Population Projections, 2020-21 to 2031-32, the Australian Government, Canberra. December 2021.

¹⁰⁰ Analysis of Existing Forecasts, July 2022 Update. Strategic Advice Prepared for Yarra Valley Water. MacroPlan, 18 July 2022.

- Undertaking early expression of interest processes for large projects to shortlist contractors based on capability and expertise. This creates a more certain competition environment for the contractors. This increases the level of effort put in by contractors and increases the certainty of receiving high quality bids with reduced risk pricing.
- Working with our delivery partners to assess and allocate risk to ensure we achieve value for money for our customers and a sustainable construction market. This includes using rise and fall mechanisms in our contracts that ensure excessive risk is not priced into tenders and keeps escalation in line with selected indices.
- Conducting risk workshops to ensure risk allocation is clearly understood by all parties before contracts are executed.

4.3 Prudent and efficient investments

We're committed to being forward thinking and customer focused in our response to these planning and economic challenges.

We have an ongoing commitment to improve our operating cost efficiency and take pressure off customers' prices. To deliver upon these commitments over 2018-23, we:

- Achieved an annual efficiency of 1.52 per cent over the 2018-23 period equivalent to \$34.0 million. This is net of absorbing \$18.87 million (equivalent to an annual efficiency of 0.8 per cent) of additional digital and technology costs as a part of transitioning to cloud-based technologies.
- Outsourced major inputs to deliver efficiency gains – currently more than 57 per cent of our controllable operating costs are competitively procured to ensure we get the best value for money.
- Undertook benchmarking in relation to our operating costs to enable us to adjust our processes to achieve best practice.
- Participated in national econometric and process benchmarking projects carried out by the Water Services Association of Australia (WSAA) to identify opportunities to improve operating efficiency. Recent benchmarking shows 74 per cent of our cost categories are benchmarked in the first or second quartiles (low cost) that suggest we are on, or very close to, the efficiency frontier. The study also identified that we have the lowest direct costs of participating businesses – 37 per cent of controllable regulated expenditure (refer to Figure 9 on the following page). This conclusion is largely supported by the annual reporting of operating cost per property in the National Performance Report¹⁰¹, indicating that our customers benefit from comparatively low operating costs nationally.

¹⁰¹ <http://www.bom.gov.au/water/npr/>.

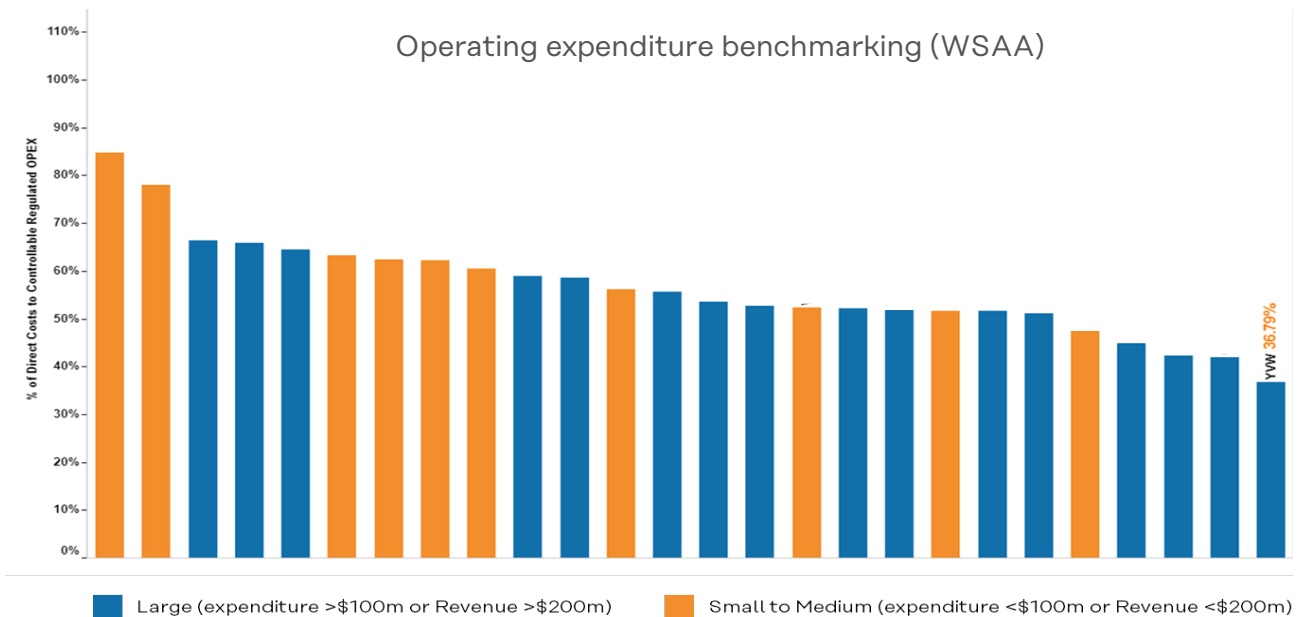


Figure 9: Water Services Association Australia (WSAA) operating expenditure benchmarking 2020

Our controllable operating expenditure is forecast to increase by about 5.86 per cent over the next regulatory period compared to the adjusted base year of \$153.90 million. This forecast includes a proposed net growth and efficiency allowance of 0.26 per cent, reflecting:

- Compounding controllable operating cost efficiency improvement rate of 1.7 per cent per annum, totalling \$38.37 million.
- Additional costs totalling \$31.89 million to service growth that averages 1.44 per cent per annum, reflecting the marginal cost of growth rather than the rate of growth (as per previous price review periods) in customer numbers, that considers the actual costs to:
 - Operate and maintain new major assets to be commissioned during the period.
 - Operate and maintain new assets (excluding major projects).
 - Provide retail services to new customers.
 - Store additional customer data together with additional capacity to meet customer expectations of digital services and communications.
- We'll also invest to:
 - Comply with the general environment duty (GED) under the Environment Protection Act and Safe Drinking Water Regulations.
 - Increase biodiversity, regenerative land use and water conservation outcomes.
 - Implement our future state technology architecture that's built around a cloud platform-based approach for a more modern, flexible, and resilient technology foundation.

Despite an increase in the forecast level of operating expenditure, the cost to serve each customer continues to fall (refer to Figure 10 below), continuing to ensure we maintain our comparative cost efficiency position.

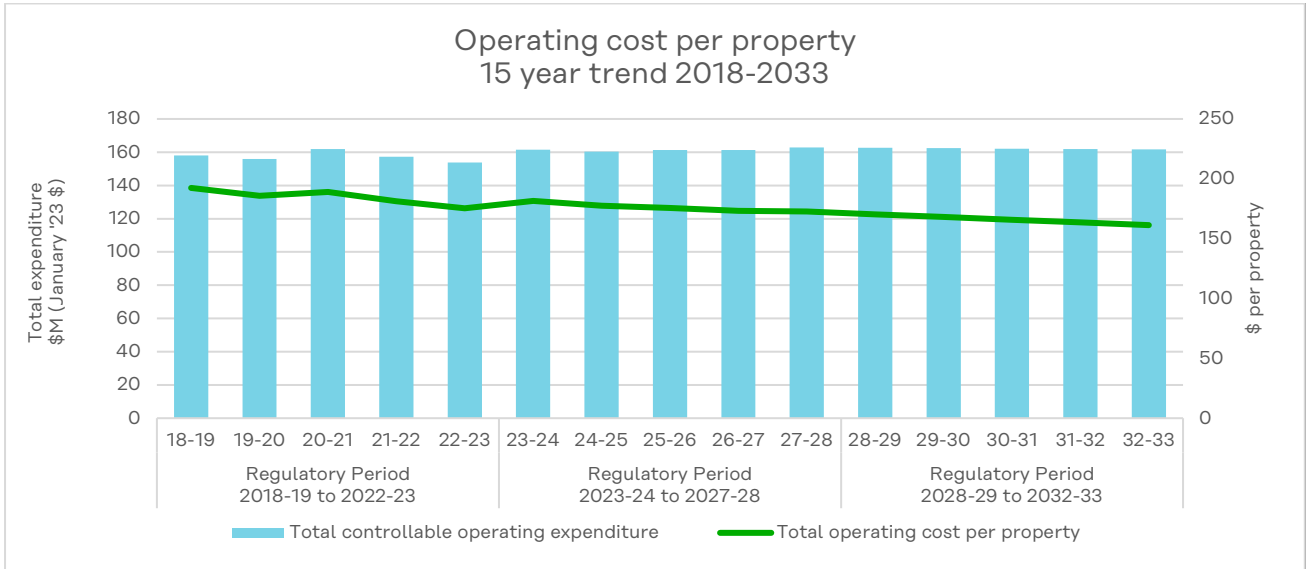


Figure 10: Forecast total operating costs and operating costs per customer 2018-19 to 2032-33 (\$million January 2023)

Our planned capital expenditure is \$1,962.03 million for the 2023-28 regulatory period, to:

- Provide new water, recycled water and sewerage services to growing suburbs.
- Maintain the existing network and technology assets.
- Meet the general environmental duty (GED), Safe Drinking Water Regulations, government priorities, policy directions and other obligations.

To ensure we're well positioned to deliver, we've conducted a deliverability assessment of our capital expenditure program – individually by strategy and collectively using a total investment program view. This review highlighted actions we are now taking to increase delivery certainty and contributed to the balancing of risk we have adopted. Overall, we're:

- Excluding \$380.46 million for projects where we identified significant uncertainty in terms of timing or cost, including a five per cent packaging and project management efficiency of \$33.13 million across all growth projects.
- Adopting a more conservative investment profile, particularly in 2023-24 and 2024-25 where \$84.8 million and \$65.2 million respectively were shifted to latter years. A further \$50 million (equivalent to 2.5 per cent) of projects was moved from 2023-28 into the 2028-33 period.

Refer to Figure 11 below for a comparison of forecast capital expenditure before and following the completion of the deliverability assessment.

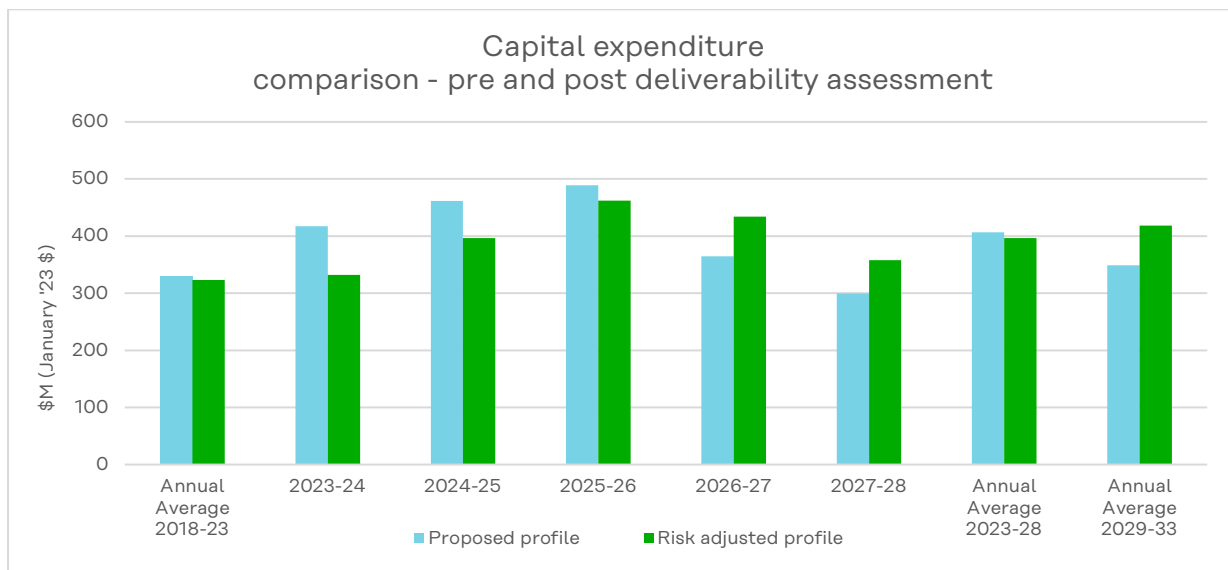


Figure 11: Shift in capital expenditure profile following deliverability assessment (\$million January 2023)

- Assuming P50 cost estimates for all capital expenditure that includes Monte-Carlo analysis incorporating contingency allowances adapted for the stage, complexity and scope of work for all major projects.
- Not forecasting cost increases above inflation.

Delivery of our capital expenditure program is governed by two specialised capital delivery project offices (asset and technology) which are further overseen by an enterprise level portfolio management office (ePMO). The capital delivery project offices are accountable for enabling and monitoring performance to ensure we continue to drive the efficiency and effectiveness of our capital works programs, as well as coordinating the reporting of all capital expenditure performance to both the Executive Team and the Board.

Further detailed information in relation to the prudence and efficiency of our forecast expenditure proposals is located in Appendix C - Detailed capital expenditure from page 180 together with Appendix D - Detailed operating expenditure from page 246.

5. Revenue requirement

The revenue we require to efficiently provide services to our customers and provide a return to our shareholder is calculated using the Commission’s ‘building block’ methodology. The total revenue requirement for the next two regulatory periods is shown in Table 16 below, together with a graph of the 15-year trend in Figure 12.

	Regulatory period 2023-24 to 2027-28					Regulatory period 2028-29 to 2032-33				
	23-24	24-25	25-26	26-27	27-28	28-29	29-30	30-31	31-32	32-33
Operating expenditure	709.08	700.78	701.27	689.09	686.88	685.38	684.46	683.13	682.23	681.74
Return on assets	141.79	133.37	134.16	135.26	136.35	137.73	139.95	147.28	155.24	159.36
Regulatory depreciation on assets	135.66	127.34	126.34	133.28	137.41	137.89	140.37	141.09	131.19	135.14
Adjustments from last period	1.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Non-prescribed revenue offset of revenue requirement	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tax liability	14.22	12.07	11.95	13.08	13.84	16.25	16.43	16.78	15.15	16.30
Total revenue requirement	1,002.40	73.56	973.72	970.70	974.48	977.26	981.20	988.28	983.80	992.54

Table 16: Total revenue requirement 2023-24 to 2032-33 (\$ million January 2023)

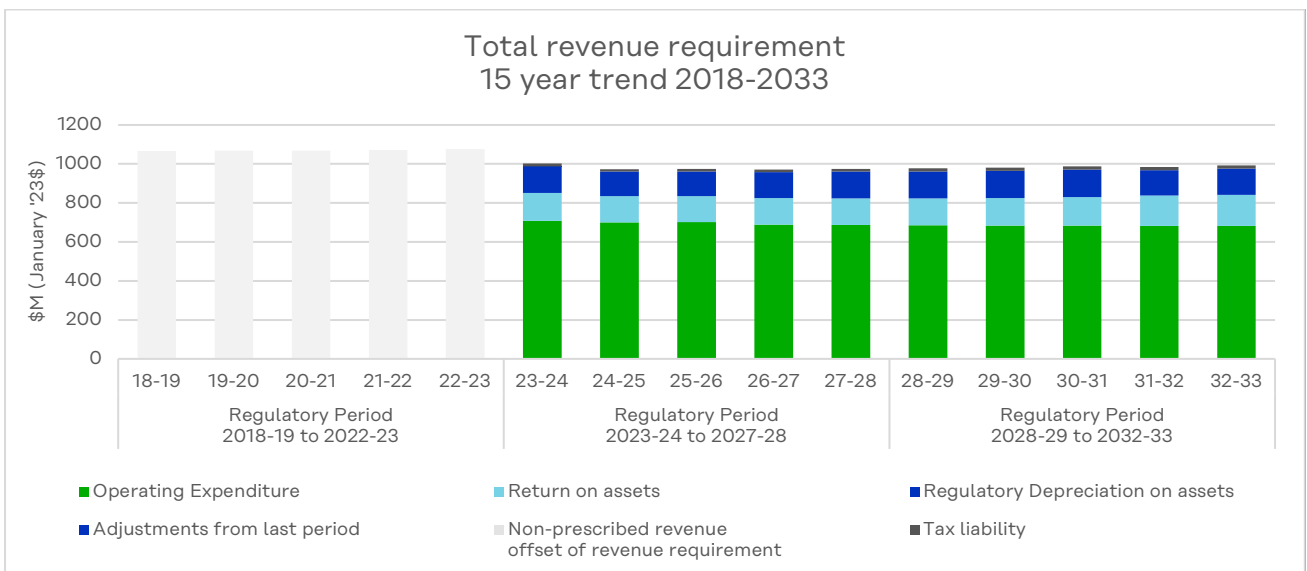


Figure 12: Total revenue requirement – 15-year trend 2018-19 to 2032-33 (\$ million January 2023)

Each element of the building block is discussed on the following pages.

5.1 Operating expenditure

Our prescribed operating expenditure comprises both controllable and non-controllable operating expenditure, plus bulk charges. Details of operating costs can be found in Appendix D – Detailed operating expenditure on page 246 and growth forecasts in Chapter 7 – Demand on page 93.

The allocation of operating expenditure into the major service categories is consistent with the 2021-22 draft regulatory accounts and is further disaggregated in the financial template.

Operating expenditure for each major service category is shown in Table 17 below together with a graph of the 15-year trend in Figure 13.

	Regulatory period 2023-24 to 2027-28					Regulatory period 2028-29 to 2032-33				
	23-24	24-25	25-26	26-27	27-28	28-29	29-30	30-31	31-32	32-33
Controllable operating expenditure										
Water	94.84	93.69	94.09	93.29	92.22	90.79	90.48	90.48	86.83	87.07
Sewerage	61.92	61.83	62.21	62.69	63.01	62.75	62.78	62.31	62.31	61.83
Recycled water	4.81	4.86	4.98	5.31	7.68	9.21	9.22	9.35	12.72	12.76
Total controllable operating expenditure	161.58	160.38	161.27	161.30	162.91	162.75	162.48	162.13	161.86	161.66
Non-controllable operating expenditure										
Environmental contribution	46.05	44.71	43.41	42.14	40.91	39.72	38.56	37.44	36.35	35.29
Licence fees – ESC	0.88	0.88	0.88	0.88	1.18	0.88	0.88	0.88	0.88	1.18
Licence fees – DH	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
Licence fees – EPA	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Total non-controllable operating expenditure	47.34	46.00	44.70	43.43	42.50	41.01	39.85	38.73	37.64	36.88
External bulk charges										
Water	329.06	321.39	318.71	311.77	309.91	309.97	310.35	310.45	310.81	311.18
Sewerage	171.11	173.01	176.60	172.59	171.55	171.65	171.76	171.81	171.92	172.03
Total external bulk charges	500.17	494.40	495.30	484.36	481.46	481.63	482.12	482.26	482.73	483.20
Total operating expenditure	709.08	700.78	701.27	689.09	686.88	685.38	684.46	683.13	682.23	681.74

Table 17: Total prescribed operating expenditure 2023-24 to 2032-33 (\$ million January 2023)

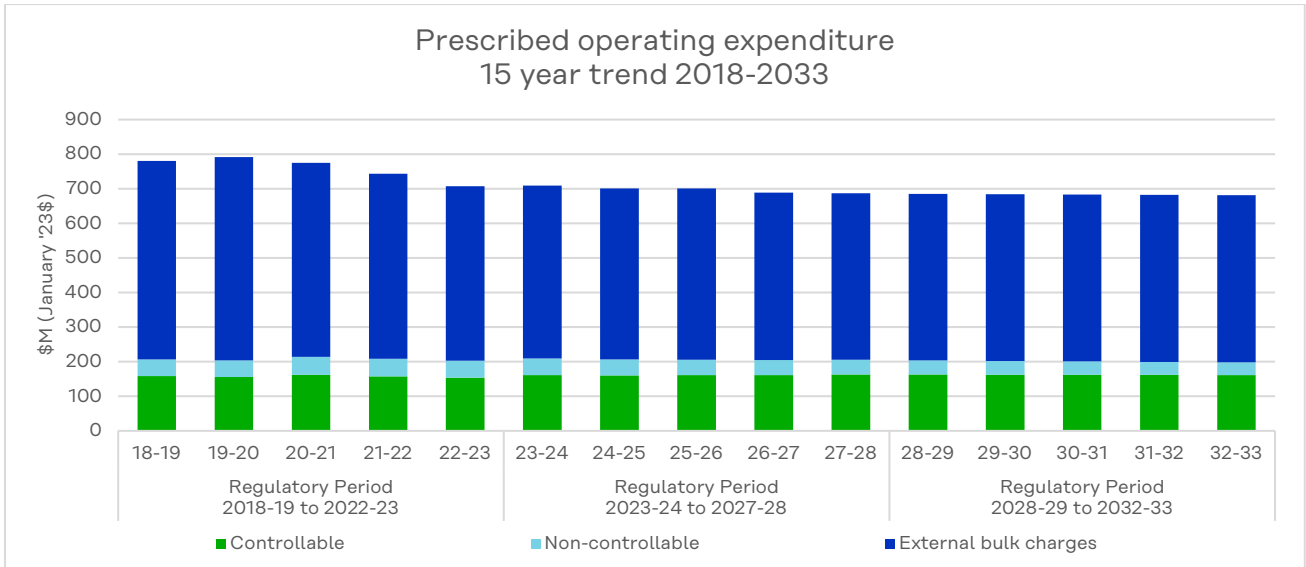


Figure 13: Total prescribed operating expenditure – 15-year trend 2018-19 to 2032-33 (\$ million January 2023)

5.2 Controllable operating expenditure

Our 2021-22 base controllable operating expenditure was \$153.90 million which has been reduced by removing costs associated with one-off projects including engagement and research for this price submission and the draft Greater Melbourne Urban Water and System Strategy (GMUWSS) (\$1.22 million).

The Commission's guidance¹⁰² questioned whether the direct relationship between customer growth and operating expenditure growth has continued or could reasonably be expected to in this price period. We're expected to clearly justify why the chosen expenditure growth rate is most appropriate.

For the 2023-28 regulatory period, we propose a net growth and efficiency allowance of 0.26 per cent, reflecting:

- A compounding controllable operating cost efficiency improvement rate of 1.70 per cent per annum, totalling \$38.37 million.
- Additional costs totalling \$31.89 million to service growth that averages 1.44 per cent per annum, reflecting the marginal cost of growth rather than the rate of growth (as per previous price review periods) in customer numbers, that reflects the actual costs to:
 - Operate and maintain new major assets to be commissioned during the period, including Aurora and Doncaster Hill recycled water treatment plants and Kalkallo stormwater harvesting plant (0.43 per cent per annum).
 - Operate and maintain new assets (excluding major projects) including but not limited to pressure sewer systems¹⁰³, pump stations, chlorinators, solar panels, generators

¹⁰² Section 3.8, page 31.

¹⁰³ A pressure sewer system is a network of sealed pipes and small, below-ground pump stations at some connected properties. The pump stations collect household sewage and pump it to the sewer main located in the street. Pressure sewer systems are

and online sensors. Developed using updated cost curves, the forecasts include additional water quality sampling in line with population growth, net energy needs and chemical costs reflecting increased volumes (0.33 per cent per annum).

- Provide retail services including billing and collection activities, support for customers experiencing financial vulnerability and servicing customer contacts and enquiries (0.36 per cent per annum).
- Store additional customer data together with additional capacity to meet customer expectations of digital services and communications e.g. SMS notifications for planned and emergency works (0.32 per cent per annum).

Further information on Net ongoing efficiency is provided on page 248.

We've also identified above base costs totalling \$44.40 million for:

- Compliance with the general environment duty (GED) and Safe Drinking Water Regulations (\$19.82 million) – that underpin customer outcomes 'safe and pleasant drinking water', 'reliable water and sewerage services', 'timely response and repair' and 'looking after our natural environment'.
- Strengthening emergency management capability and capacity (\$4.20 million) to prepare for, respond to and recover from acute and chronic incidents and emergencies impacting water and wastewater services – contributing to the customer outcome 'timely response and repair'.
- Increased biodiversity and regenerative land use and water conservation outcomes supported by customers¹⁰⁴ (\$6.85 million) – that supports outcomes 'saving water for the future' and 'looking after our natural environment'.
- Cloud-based technologies (\$5.97 million) as we continue implementing our future state technology architecture that's built around a platform-based approach for a more modern, flexible, and resilient technology foundation – that supports the outcome 'service that meets everyone's needs'.
- Other compliance costs (\$7.56 million), associated with gender equality, disaster recovery and superannuation guarantee levy.

used in certain areas because of topography, the unsuitability of ground conditions or the cost of a conventional sewerage system.

¹⁰⁴ Marsden Jacob Associates, Yarra Valley Water's customer-led price submission customer values research, August 2022

Table 18 below shows the calculation of controllable operating expenditure.

	Regulatory period 2023-24 to 2027-28					Regulatory period 2028-29 to 2032-33				
	23-24	24-25	25-26	26-27	27-28	28-29	29-30	30-31	31-32	32-33
2021-22 baseline spend	157.31	157.31	157.31	157.31	157.31	157.31	157.31	157.31	157.31	157.31
Less: 2021-22 adjustments	(1.22)	(1.22)	(1.22)	(1.22)	(1.22)	(1.22)	(1.22)	(1.22)	(1.22)	(1.22)
Plus: Net 2022-23 growth and efficiency allowances	(2.19)	(2.19)	(2.19)	(2.19)	(2.19)	(2.19)	(2.19)	(2.19)	(2.19)	(2.19)
Adjusted base	153.90	153.90	153.90	153.90	153.90	153.90	153.90	153.90	153.90	153.90
Less: Annual efficiency	(2.62)	(5.19)	(7.72)	(10.20)	(12.64)	(14.62)	(16.57)	(18.49)	(20.39)	(22.26)
Plus: Growth allowance	2.90	4.02	5.58	8.02	11.37	13.18	14.87	16.44	18.06	19.73
Plus: Net additional expenditure items	7.39	7.64	9.50	9.58	10.29	10.29	10.29	10.29	10.29	10.29
Total controllable operating expenditure	161.58	160.38	161.27	161.30	162.91	162.75	162.48	162.13	161.86	161.66

Table 18: Controllable operating expenditure forecast 2023-24 to 2032-33 (\$ million January 2023)

5.3 Non-controllable operating expenditure – other

For the regulatory period, we have assumed:

- Essential Services Commission licence fees are \$0.88 million annually and increase to \$1.18 million for the year prior to a new regulatory period (2027-23 and 2032-33) as advised by the Commission.
- Department of Health licence fees are \$0.31 million per annum.
- Environment Protection Authority licence fees are \$0.10 million per annum.
- Environmental contribution will be \$47.43 million (nominal) per annum as advised by the Department of Environment, Land, Water and Planning.

The current tranche of the environmental contribution is due to conclude in 2023-24. We have assumed that the contribution and licence fees continue at the current level.

We have excluded any costs associated with non-prescribed services from the revenue requirement.

5.4 Non-controllable operating expenditure – external bulk charges

Expenditure on bulk charges reflects our demand forecasts and assumptions around future prices. For the regulatory period, we have assumed:

- Melbourne Water's prices change in accordance with the prescribed price movement detailed in Melbourne Water's 2021 determination for the 2021-22 to 2025-26 period and annual adjustment for the cost of debt.
- A zero desalination water order each year.
- Prices are based on the March 2021-22 interest rate of 3.75 per cent to calculate the forecast rolling regulatory rate of return for debt.

Consistent with previous price submission proposals, where Melbourne Water prices differ from those assumed in this submission, including the actual costs of desalinated water orders, there will be a direct pass-through, with the change in costs reflected in customer prices. Refer to section 8.5 - Adjustment to prices on page 117 for more details.

5.5 Capital expenditure

We have a diverse program of capital works ranging from small projects that are completed over a short period to large, complex projects that take multiple years of planning and delivery to complete.

Overall, our planned capital expenditure is \$1,962.03 million for the 2023-28 regulatory period, representing a 21.3 per cent increase compared to 2018-23. The top 10 projects account for \$454.19 million (23.2 per cent) of the total spend.

To ensure we're well positioned to deliver, we've conducted a deliverability assessment of our capital expenditure program – individually by strategy and collectively using a total investment program view. This review highlighted actions we are now taking to increase delivery certainty and contributed to the balancing of risk we have adopted. Specifically, we've:

- Embedded into our capital delivery approach, actions we're taking today to meet the current economic and market challenges. Refer to Section 4.2 - Planning and economic challenges on page 65.
- Adopted a more conservative investment profile, particularly in 2023-24 and 2024-25 where \$84.8 million and \$65.2 million respectively were shifted to later years.
- Pushed a further \$50 million (equivalent to 2.5 per cent) of projects from 2023-28 into the 2028-33 period.

The proposed capital expenditure has been developed using P50 cost forecasts that are underpinned by detailed cost curve information derived from historical costs, previously completed projects and submitted tenders. In addition, project specific cost estimates¹⁰⁵ have been completed for all the top 10 projects including a Monte-Carlo analysis incorporating contingency allowances adapted for the stage, complexity and scope of work.

¹⁰⁵ Undertaken by independent expert cost estimators. Work included updated cost curves and specific detailed cost estimates completed for all major projects including Monte-Carlo analysis.

There are three key drivers of our capital expenditure forecasts:

- **Asset renewal and customer service levels** – Our infrastructure assets service multiple generations and can last for up to 100 years. There is a small proportion of our network nearing the end of its life which will be replaced as there are significant customer and community impacts when these assets fail. Our investments are aimed at maintaining our existing network and technology assets to meet customer service levels and to be resilient to the impacts of climate change and evolving expectation of customer experience.
- **Customer growth** – Servicing customer growth and new development includes providing water, recycled water and sewerage services to new suburbs on the fringe of Melbourne, major urban renewal and infill developments. Our growing northern suburbs between Craigieburn and Wallan will contain over 100,000 new serviced properties in the next 20 years.
- **Business improvements and regulatory compliance** – We are regulated by the Department of Health (DH) and the Environment Protection Authority (EPA) in relation to product quality, including the safety of drinking water and reliability of the sewerage network.

Table 19 below and Figure 14 on the following page details total capital expenditure over a 15-year timeframe categorised by the three key investment drivers of renewals, growth and business improvements and regulatory compliance.

	Average annual spend 2018 to 2023	Regulatory period 2023-24 to 2027-28					Average annual spend	Average annual spend 2028 to 2033
		23-24	24-25	25-26	26-27	27-28		
Asset renewal and customer service levels	144.65	172.31	191.96	200.24	196.87	178.82	188.04	175.61
Customer growth	127.90	95.35	140.22	192.70	164.55	113.56	141.28	190.31
Business improvements and regulatory compliance	50.86	62.22	62.34	65.25	67.01	58.62	63.09	48.34
Total capital expenditure	\$323.42	329.88	394.53	458.19	428.44	351.00	\$392.41	\$414.27

Table 19: Forecast capital expenditure 2023-24 to 2028-33 (\$ million January 2023)

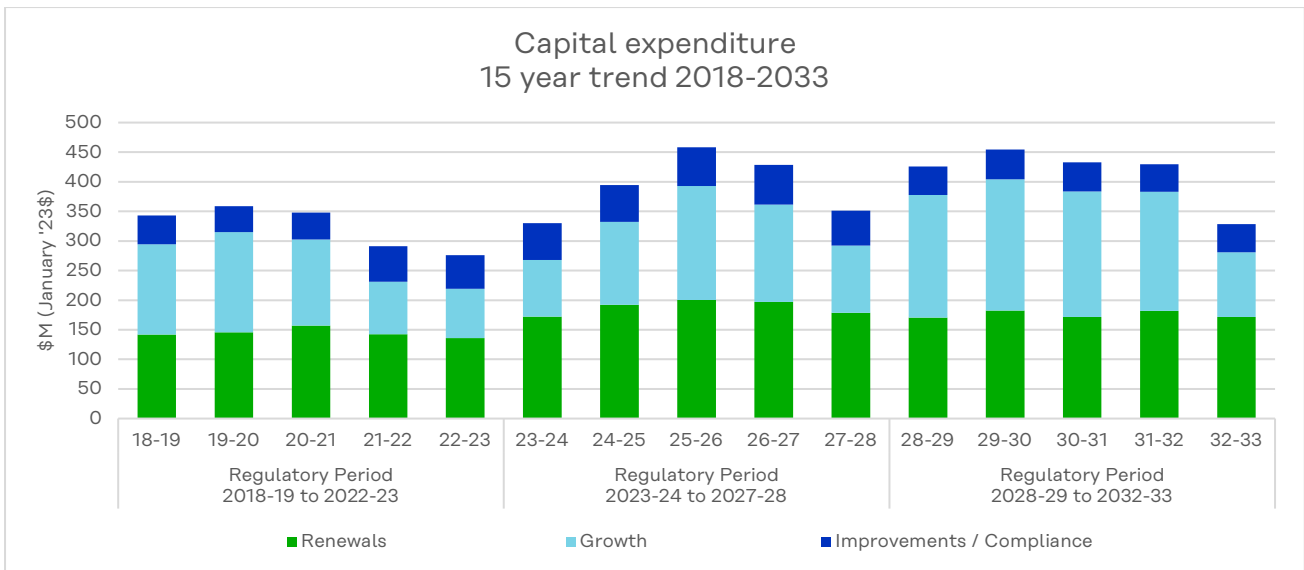


Figure 14: Total capital expenditure – 15-year trend 2018-19 to 2032-33 (\$ million January 2023)

The increase in planned capital expenditure is predominantly driven by:

- The total value of major projects that has increased from \$256.4 million (2018-23) to \$454.19 million (2023-28).
- Renewal of high-risk and high-consequence water distribution mains (increase of \$67.02 million – \$24.64 million excluding the M4 renewal major project) based on confirmed risk and condition assessment; together with an increase in the number of risk assessments required due to a 120 per cent increase in the length of mains that will reach end of design life by the end of the 2023-28 period.
- Commencing a meter replacement program for 62 per cent of meters that will have reached end of life by the end of the 2023-28 period (increase of \$46.29 million).
- Investment to improve resilience and reliability of water assets (civil, mechanical and electrical equipment) that are operating with little or no redundancy (increase of \$62.41 million).
- Significant improvement works required at five of eight local treatment plants to address capacity deficiencies, safety risks and process efficiency projects; together with a full upgrade of Healesville treatment plant (\$26.55 million major project) that is currently at capacity (increase of \$38.74 million). This program also contributes to meeting our general environmental duty (GED) under the Environment Protection Act.
- Addressing sewer capacity deficiencies attributed to customer growth, infiltration of groundwater through pipe defects and the impacts of more frequent and severe storm events. This program also contributes to meeting our GED (increase of \$12.25 million).

In response to customer preferences, we plan to also invest in biodiversity and water conservation programs consistent with our outcomes 'saving water for the future' and 'looking after our natural environment' (refer to sections 3.7 and 3.8 on pages 51 and 54 respectively).

We have categorised our capital expenditure for this period by driver, asset and outcome. The different perspectives show:

- **Driver** – Asset renewals to maintain customer service levels and growth expenditure to service new customers accounts for nearly 84 per cent of total forecast spend.
- **Asset** – Expenditure on water is the primary asset class at 40.9 per cent. This is related to growth infrastructure, resilience and renewal programs, water quality compliance and replacement of meters that have reached end of life.
- **Outcome** – Providing reliable water and sewerage services accounts for 59.7 per cent of our capital expenditure. Capital expenditure also makes significant contributions to the ‘saving water for the future’, ‘looking after our natural environment’ and ‘service that meets everyone’s needs’ outcomes.

Figure 15 below, shows the proportion of capital expenditure through the lens of each perspective of driver, asset and outcome described above.

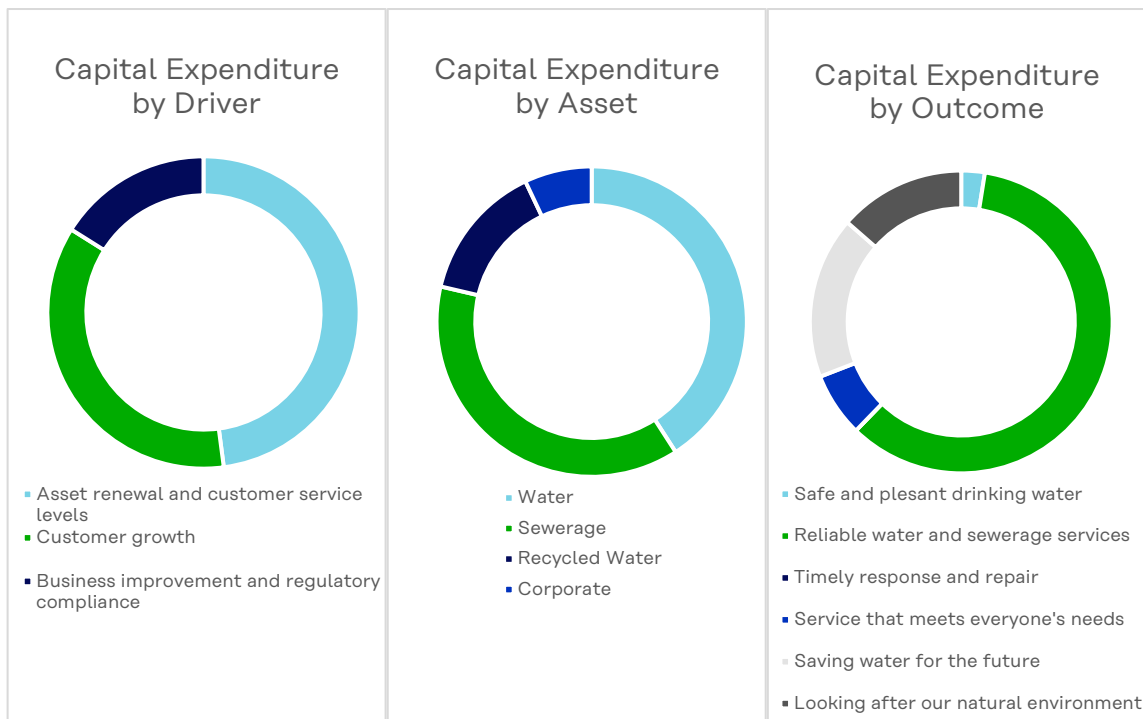


Figure 15: Capital expenditure by different drivers, asset type and customer outcome 2023-28 (\$ million January 2023)

Refer to Appendix C – Detailed capital expenditure on page 180 for additional information about each capital expenditure program, including the top 10 projects and detailed information on prudence and efficiency.

5.5.1 Capital delivery approach

Our approach to capital delivery reflects the complexity and technical input required to deliver our capital program. It is flexible and appropriately matches governance to the level of risks and control required for each project. This allows us to deploy resources and leverage our supply chain in a way that best suits the work being undertaken.

Decisions are informed by our corporate risk management framework. We have an ongoing process of risk identification, quantification, control, monitoring and review (in accordance with the Risk Management Standard ISO 31000:2018). We maintain risk registers, including a strategic risk profile, an operational risk profile, and various functional risk profiles.

We have robust and efficient investment analysis and asset management processes in place to assist in preparing our capital expenditure program. Having established an efficient investment program, we execute our planned capital works in the most cost-effective manner to ensure that overall value is maximised.

There are three broad stages in our capital planning process: planning, design and tendering.

- The planning phase involves high-level analysis that includes scenario planning and options analysis to identify the assets and work required to deliver the desired customer outcome in an efficient manner.
- The design phase builds on the information generated during the planning phase and carries out more specific analysis to develop the specific asset characteristics. It specifies the technical requirements for each asset and includes consideration of constructability, construction methodology, technology and materials.
- The tendering phase provides the opportunity for contractors to put forward their most competitive pricing to deliver the required asset including the proposal of opportunities for innovation and risk mitigation. This phase also provides evidence of market factors that we use to inform planning for future projects.

Our asset management framework (AMF) supports capital delivery by ensuring asset investment decisions are made using accessible, transparent and trusted asset data.

Our strategic commitments are reflected in our asset management objectives via a set of strategic asset management plans (SAMPs) and supporting asset systems and asset class plans. These plans give rigour to the way we develop project business case proposals by enabling a consistent approach to collecting evidence and assessing asset related risks. The asset systems and class plans include risk assessments based on the corporate risk and opportunity framework and are used as the basis for investment prioritisation. This information is summarised in the asset services metrics (ASM) and provides the necessary data to enable projects to be prioritised.

Prudent investment decisions are made by prioritising projects that best manage the relevant risks and align with our strategy. A project score is calculated using the information summarised in the ASM and fed into the Yarra investment prioritisation (YIP) model. The YIP provides a structured method of comparing projects in delivery to ensure we are always investing first in the most prudent and effective projects. Our YIP model allows us to dynamically set the expenditure threshold for the program and categorises expenditure as above or below the line based on priority ranking. Below the line items then become the starting point for conversations around the potential and impacts of shifting timing on these projects.

Overall we're confident our governance and procurement strategies ensure the program is deliverable in its entirety and in the most efficient manner. The key elements of our approach include:

- Strong governance arrangements for all capital projects which include:
 - Board has oversight of all projects above \$10 million and tracks capital expenditure and delivery on an ongoing basis.
 - Executive Team oversight of the entire capital expenditure program.
 - An enterprise portfolio management office (ePMO) supported by technology and asset program offices. These teams are accountable for enabling and monitoring performance to efficiently deliver our capital works programs as well as coordinate reporting of all capital expenditure performance to the Executive Team and the Board.
- A dual engineering design services partnership model to improve efficiency and innovation through greater diversity of thought and skills and to provide competition to deliver more creative and cost-effective solutions. These arrangements minimise overhead costs associated with the tendering process. Having two partners shares the workload and reduces the deliverability risk while creating competitive tension and contributing to a continuous improvement mindset that drives efficiency.
- Competitive tendering of all capital works construction activities, including use of long-standing, pre-qualified partners and panels that ensure streamlined and efficient procurement.
- Using sequential contracts of design and construction, which lowers construction risk and cost by completing the design before the construction tendering process.
- Long-term contracts for ongoing programs of work, such as water and sewerage main renewals. We're also moving toward the use of government contracts that provide consistency, standard contract conditions and procurement efficiencies.
- Using multiple tier 2 contractors that:
 - Capture economies of scale and create comparative performance incentives.
 - Enable consistent planning and delivery of an ongoing work program.
 - Reduces the need to compete for 'tier 1' contractor partners that undertake major state infrastructure projects.

Table 20 below details existing procurement arrangements for each capital expenditure program, including the annual average spend for the 2023-28 period together with the number of delivery partners contracted to execute the program.

Capital expenditure program	Annual average spend	Delivery partners	Maintenance and Services Contract	Reactive maintenance contract	Specialised Panel Arrangements ¹⁰⁶	Direct Procurement ¹⁰⁷
			Contract end	Contract end	Contract end	
Water reliability (reticulation main renewals)	\$40.04	3	● 2025-26	● 2025-26	● 2022-23	
Customer meter replacements	\$15.93	2	● 2024-25	● 2025-26		
Water distribution mains	\$17.39	5			● 2027-28	
Water reliability (civil, mechanical and electrical)	\$24.20	15	● 2024-25 & 2025-26	● 2025-26	● 2023-24 & 2027-28	●
Water conservation	\$4.87					●
Sewer reliability (gravity main renewals)	\$43.08	6	● 2025-26	● 2025-26	● 2022-23	
Sewer reliability (civil, mechanical and electrical)	\$15.59	13	● 2024-25 & 2026-27 & 2027-28	● 2025-26	● 2027-28	●
Digital enablement	\$22.75					●
Facilities	\$1.16					●
Motor vehicles	\$3.02					●
Drinking water, sewerage and recycled water infrastructure	\$125.89	5			● 2027-28	●
New customer meters (financed by others)	\$13.45	1	● 2024-25			
Temporary assets (financed by others)	\$1.93	5			● 2027-28	

¹⁰⁶ Specialist panel arrangements include individual panels for pipes and facilities, water main renewals, sewer main renewals, treatment plant improvement program, community sewerage program and district meter installations.

¹⁰⁷ Direct procurement activities include requests for quote and open tender processes that do not form part of the specialised panel arrangements together with in-house delivered works e.g. digital enablement.

Capital expenditure program	Annual average spend	Delivery partners	Maintenance and Services Contract	Reactive maintenance contract	Specialised Panel Arrangements ¹⁰⁶	Direct Procurement ¹⁰⁷
			Contract end	Contract end	Contract end	
Safe and pleasant water	\$9.85	9	● 2024-25	● 2025-26	● 2027-28	●
Community sewerage	\$24.17	2			● 2027-28	
Sewer capacity	\$4.10	8		● 2025-26	● 2027-28	●
Sewage treatment and recycling	\$22.74	2			● 2027-28	
Energy generation and emissions	\$0.66					●
Biodiversity and regenerative land use	\$1.56	5			● 2027-28	
Total capital expenditure	\$392.41					

Table 20: Ongoing capital delivery partners, procurement arrangements by capital expenditure program 2023-28 (\$ million January 2023)

- Bundling work packages that enables us to leverage the size of our program during procurement and delivery – allowing us to benefit from economies of scale, receive the best pricing available from the market and implement lessons learnt. Our tier 2 contract partners tell us that an ongoing stream of work provides them confidence to employ and retain skilled staff. It also means they're not incentivised to chase other opportunities and can minimise overheads. We've recorded the following comments from recent market sounding conversations:
 - Continuity is essential for good performance.
 - Value in having the same team delivering the works, this is what drives innovation, contractor on/off approach does not allow for continuity of lessons learnt.
 - Lumpiness is hard to manage when one project does not roll into the next, need good visibility of the workload.
 - Allocation provides good foresight and continuity of work allowing investment in plant and attracting good people (can't hire good project managers after you win the job).
 - Longer-term contract with broad scope would give opportunity and allows us to invest in best equipment, lessons learnt, having the right team and can segue into the community engagement space.
 - Long-term partnership model is a key attribute of good performance.
 - Long-term partnership provides surety of work and continuity of people. We are able to employ with surety which is what staff care about. They don't care about profits.

- We optimise our capital delivery processes to minimise the potential for project overruns and delays through:
 - Early dialogue with approval authorities ensuring regulatory approvals and customer consultation requirements are understood early in the delivery process.
 - Stakeholder engagement and completing planning requirements, including cultural heritage management plan, council and other planning approval, and gender impact assessment, are completed during the planning phase of each project.
 - Using accredited capital works construction panels that are familiar with our requirements, reducing the tendering assessment period and potential for pricing uncertainty.
 - Providing a forward view of our works program to contractors to ensure they can undertake capacity planning to support the volumes of work, preventing the need to continuously ramp up and down.
 - Minimising construction risks such as adverse ground conditions by engaging contractors to participate in the design process.
 - Conducting post implementation reviews to identify and capture all lessons learnt to incorporate into future projects.

5.6 Roll forward of the regulatory asset base

The roll forward of the regulatory asset base (RAB) is impacted by actual and forecast capital expenditure, government and customer contributions and proceeds from asset disposals. The return on assets and regulatory depreciation is dependent on the RAB. Regulatory accounts have been used as the source of data to update the RAB.

Table 21 below calculates the updated RAB from 2017-18 to 2021-22, followed by Table 22 on the following page that forecasts the RAB for the period 2022-23 through to 2032-33.

	2017-18	2018-19	2019-20	2020-21	2021-22
Opening RAB	4,416.02	4,583.75	4,766.50	4,946.51	5,132.42
Plus: Gross capital expenditure	315.29	343.85	348.54	347.99	290.94
Less: Government contributions	0.00	0.00	0.00	0.00	0.00
Less: Customer contributions					
New customer contributions	35.99	35.43	39.64	37.27	31.90
Financed works	0.24	1.88	0.70	1.30	1.30
New meter installations	14.90	14.97	15.51	15.67	12.03
Less: Proceeds from disposals	1.20	1.09	0.95	0.48	3.41
Less: Regulatory depreciation	95.24	107.72	111.72	107.35	108.73
Closing RAB	4,583.75	4,766.50	4,946.51	5,132.42	5,265.98

Table 21: Updated regulatory asset base 2017-18 to 2021-22 (\$ million January 2023)

	2022-23	Regulatory period 2023-24 to 2027-28					2028-33
		23-24	24-25	25-26	26-27	27-28	
Opening RAB	5,265.98	5,281.69	5,182.59	5,402.69	5,684.70	5,925.55	6,087.39
Plus: Gross capital expenditure	217.93	329.88	394.53	458.19	428.44	351.00	2,071.33
Less: Government contributions	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Less: Customer contributions							
New customer contributions	28.98	30.37	31.71	33.12	34.58	36.15	208.26
Financed works	0.00	2.21	0.32	1.79	4.31	1.05	0.00
New meter installations	11.00	13.45	13.45	13.45	13.45	13.45	77.77
Less: Proceeds from disposals	50.90	247.30	1.62	1.48	1.98	1.09	7.21
Less: Regulatory depreciation	111.35	135.66	127.34	126.34	133.28	137.41	685.69
Closing RAB	5,281.69	5,182.59	5,402.69	5,684.70	5,925.55	6,087.39	7,179.79

Table 22: Rolled forward regulatory asset base 2022-23 to 2032-33 (\$ million January 2023)

Note, compared to the capital expenditure described in this submission, the financial template has:

- Gross capital expenditure for 2022-23 based on the 2018 determination value of \$217.93 million, which is \$58.29 million less than the current forecast of \$276.22 million. This is consistent with the Commission's guidance that the lesser of the 2018 determination value and the forecast capital expenditure for 2022-23 be rolled forward into the regulatory asset base.
- Removed \$23.1 million associated with the ongoing pilot for digital meters that will be passed through to customers if and when a full scale roll-out proceeds.

Customer and government contributions to capital reduce the RAB and return on assets. Table 22 above shows the forecast contributions by:

- **Government** – there are no contributions forecast.
- **New customer contributions** – forecasts are based on growth in customer numbers and the prices proposed in this submission – refer to section 7.2, Growth in customers on page 94 for further information.
- **New meter installations** – the costs of which are paid via miscellaneous products. The forecasts are based on growth in customer numbers and the prices proposed for mechanical meters. The expenditure is fully recovered and doesn't impact water and sewerage product prices.
- **Financed works, including developer funded temporary works** – are where works are carried out upon the request of other authorities or to facilitate growth where infrastructure isn't yet available. The expenditure and contributions can vary substantially from year to year and are fully recovered from those authorities or developers and don't impact water and sewerage product prices.

5.7 Proceeds from disposals

The regulatory asset base has been reduced for the following asset disposals:

- Land located in Beveridge that will become surplus to operational needs in 2023-24¹⁰⁸.
- Ivanhoe tank site that was sold in July 2022.
- Trade of 3.33GL of Greater Yarra Thomson pool entitlement.
- Disposal of manager and operational vehicles.

Valued at \$275.10 million, disposals in 2022-23 and 2023-24 are significantly higher than the historical annual average and will initially reduce the RAB – impacting both return on assets and regulatory depreciation.

5.8 Regulatory depreciation of assets

Our existing RAB has an opening value in 2023-24 of \$5.28 billion with an average remaining asset life of 68.9 years, varying from one year for computer software to 94 years for sewerage mains and recycled water reticulation assets.

Due to the value of assets with a short remaining life, depreciation in the first year is 2.59 per cent of the average RAB, before reducing to 2.29 per cent by 2027-28. This change is largely attributed to technology asset classes, that are gradually being transitioned to cloud-based technologies – and typically accounted for as operating expenditure.

The rate of depreciation for new assets is consistent with rates in our financial accounts and the useful life of the assets. For new growth assets, we have better matched regulatory depreciation with asset utilisation by deferring the claiming of regulatory depreciation on the net growth-related capital expenditure until the commencement of the 2028-33 regulatory period.

Non-prescribed assets have been excluded from the calculation of regulatory depreciation, which is calculated using a straight-line method of depreciation for all assets. Table 23 below outlines regulatory depreciation of assets for the period 2023-24 to 2032-33.

	Regulatory period 2023-24 to 2027-28					Regulatory period 2028-29 to 2032-33				
	23-24	24-25	25-26	26-27	27-28	28-29	29-30	30-31	31-32	32-33
Depreciation of existing assets	130.03	110.94	100.08	97.68	97.48	97.42	97.42	94.41	79.72	79.72
Depreciation of new assets	5.63	16.40	26.26	35.59	39.93	40.47	42.96	46.68	51.46	55.41
Total depreciation	135.66	127.34	126.34	133.28	137.41	137.89	140.37	141.09	131.19	135.14
Depreciation as a proportion of average RAB	2.59%	2.41%	2.28%	2.30%	2.29%	2.22%	2.18%	2.11%	1.89%	1.90%

Table 23: Regulatory depreciation of assets 2023-24 to 2032-33 (\$ million January 2023)

¹⁰⁸ Non-cash transaction.

5.9 Return on assets

The return on assets is a function of the RAB and the regulatory rate of return.

We propose an 'advanced' rating (refer to Appendix B - PREMO assessment on page 141) which allows a maximum real return on equity of 4.5 per cent with a real regulatory rate of return of 2.71 per cent in 2023-24.

Where the return on assets differs from what's assumed in this submission due to changes in the ten-year trailing average cost of debt, there will be a direct pass-through to our customers. Refer to Adjustment to prices, page 117 for further details.

An outline of the value of the return on assets for each year from 2023-24 to 2032-33 is provided in Table 24 below.

	Regulatory period 2023-24 to 2027-28					Regulatory period 2028-29 to 2032-33				
	23-24	24-25	25-26	26-27	27-28	28-29	29-30	30-31	31-32	32-33
Return on existing assets	138.02	122.17	114.73	108.12	103.09	98.63	94.26	93.41	93.13	91.32
Return on new assets	3.77	11.20	19.42	27.14	33.26	39.10	45.69	53.86	62.10	68.05
Total return on assets	141.79	133.37	134.16	135.26	136.35	137.73	139.95	147.28	155.24	159.36

Table 24: Return on assets 2023-24 to 2032-33 (\$ million January 2023)

5.10 Prior period adjustments

Our revenue cap forecasts excess net revenue as at April each year – returning the excess to customers through prices in the following year. A true up based on June actual net revenue is returned the year after.

In April 2023, in accordance with our revenue cap, we will compare the revenue and wholesaler charges for 2022-23 against the forecast used to set prices. Any difference will be passed through to customers via 2023-24 prices.

We committed to seven outcomes and performance targets for each year in the 2018-23 period. We further committed to reducing bills by \$1.5 million (in \$ January 2019) for any outcome we failed to achieve each year. Based on our performance to date, we have assumed we'll achieve six of the seven targets in 2022-23 and return \$1.65 million (equivalent to \$1.5 million in \$ January 2019) to customers via prices in 2023-24.

Refer to section 8.4 - Price control and section 8.5 - Adjustment to prices on pages 116 and 117 respectively for details of our proposed revenue cap and adjustment mechanisms.

5.11 Tax liability (allowance)

The tax liability has been calculated in accordance with the Commission's guidance and information template. In 2021-22 the income tax expense rate in our Financial Statements was 30.09 per cent and we forecast a 30 per cent tax rate for all years. Our tax liability is \$14.22 million in 2023-24, decreasing to \$13.84 million in 2027-28 and increasing to \$16.30 million in 2032-33.

We're aware of the Full Federal Court's decision in the *Victoria Power Networks Pty Ltd v Commissioner of Taxation*¹⁰⁹, related to new customer contributions and developer gifted assets. The Commissioner is currently assessing the potential impact of the decision on other infrastructure providers and regulated industries such as gas, water, telecommunications, rail and ports. If during the course of the 2023-28 period there is a benefit to customers associated with a change in taxation status of either new customer contributions or developer gifted assets, we will immediately pass that benefit on to customers through lower prices.

¹⁰⁹ A decision impact statement issued by the Australian Taxation Office is available for download here: <https://www.ato.gov.au/law/view/document?docid=LIT/ICD/VID237-240of2019/00001>.

6. Forecast revenue

The vast majority of regulated revenue will be collected via water, sewerage, recycled water and trade waste tariffs.

Non-tariff revenue reduces the amount of revenue required to be collected via tariffs and includes:

- **Sewerage contract revenue** – includes the revenue received from Goulburn Valley Water to treat sewage collected within its service area and treated at our Wallan treatment plant.
- **Water contract revenue** – the revenue received from the sale of water allocations.
- **Recycled water contract revenue** – the sale of bulk class B recycled water to golf courses and irrigators.
- **Miscellaneous services** – the revenue received from the sale of miscellaneous products and is net of costs of providing new meters and carrying out financed works (treated as a contribution to capital expenditure).
- **Other revenue** – the revenue received from recoverable works such as maintenance of council hydrants, damaged and altered assets and the education of sewage in new developments. The associated costs are included in controllable operating expenditure.

Table 25 below forecasts net prescribed revenue for the 10 year period 2023-24 to 2032-33.

	Regulatory period 2023-24 to 2027-28					Regulatory period 2028-29 to 2032-33				
	23-24	24-25	25-26	26-27	27-28	28-29	29-30	30-31	31-32	32-33
Tariff revenue	957.86	940.70	952.72	964.71	976.39	954.07	963.57	969.66	978.76	988.19
Contract revenue										
Sewerage	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Water	4.99	4.99	4.99	4.99	4.99	4.99	4.99	4.99	4.99	4.99
Recycled water	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
Miscellaneous services (net of capital contributions)	20.14	20.26	20.48	20.69	20.92	17.82	16.84	15.90	14.98	14.09
Other revenue	11.68	11.57	11.45	11.34	11.22	11.11	11.00	10.89	10.78	10.78
Less: Revenue not collected	(17.51)	(15.92)	(15.29)	(15.64)	(16.13)	(16.66)	(17.37)	(18.36)	(18.95)	(19.69)
Net prescribed revenue	977.47	961.92	974.67	986.41	997.71	971.64	979.35	983.40	990.88	998.68

Table 25: Forecast net prescribed revenue 2023-24 to 2032-33 (\$ million January 2023)

6.1 Revenue not collected

Revenue not collected is predominantly associated with bad debts and rebates provided to customers and includes:

- **Bad debts** – These increase with growth in the number of customers.
- **Arrange and save rebates** – Associated with our financial assistance and vulnerable customer programs (WaterCare), these are rebates given to customers who enter into payment arrangements and honour their commitment to regular repayments.
- **Electronic bill and direct debit discount** – Implemented in 2018-19, currently almost 62,000 customers receive the discount. As new customers choose this option, the value of the rebates given will be offset by reduced operating expenditure and will have zero impact on prices.
- **Leakage allowance** – This allowance is given to customers who experience an unusually high bill due to an undetected leak in their property. There are guidelines to assess the value of the allowance and limits on the time over which the allowance will be calculated.

Consistent with an Advanced submission, we propose to fund the operating expenditure for biodiversity and water conservation outcomes that customers supported through research and engagement findings and demonstrated willingness to pay. We've offset the expenditure (\$6.85 million) we will incur against revenue not collected to ensure it is not recovered from customers.

Table 26 below summarises the revenue not collected net of expenditure for customer supported outcomes for the period 2023-24 to 2032-33 inclusive.

	Regulatory period 2023-24 to 2027-28					Regulatory period 2028-29 to 2032-33				
	23-24	24-25	25-26	26-27	27-28	28-29	29-30	30-31	31-32	32-33
Bad debts	6.09	4.18	4.24	4.30	4.36	4.42	4.47	4.53	4.58	4.64
Arrange and save rebates	3.37	3.62	3.90	4.20	4.52	4.88	5.26	5.67	6.12	6.60
Electronic bill and direct debit	0.54	0.55	0.56	0.57	0.58	0.58	0.59	0.60	0.61	0.61
Leakage allowance	8.17	8.26	8.35	8.44	8.53	8.63	8.72	8.81	8.91	9.01
Offset: for customer supported outcomes	(0.65)	(0.69)	(1.76)	(1.87)	(1.86)	(1.84)	(1.67)	(1.25)	(1.26)	(1.18)
Total revenue not received	17.51	15.92	15.29	15.64	16.13	16.66	17.37	18.36	18.95	19.69

Table 26: Forecast revenue not collected 2023-24 to 2032-33 (\$ million January 2023)

Figure 16 below summarises the individual elements of the building blocks for our revenue requirement and forecast revenue.

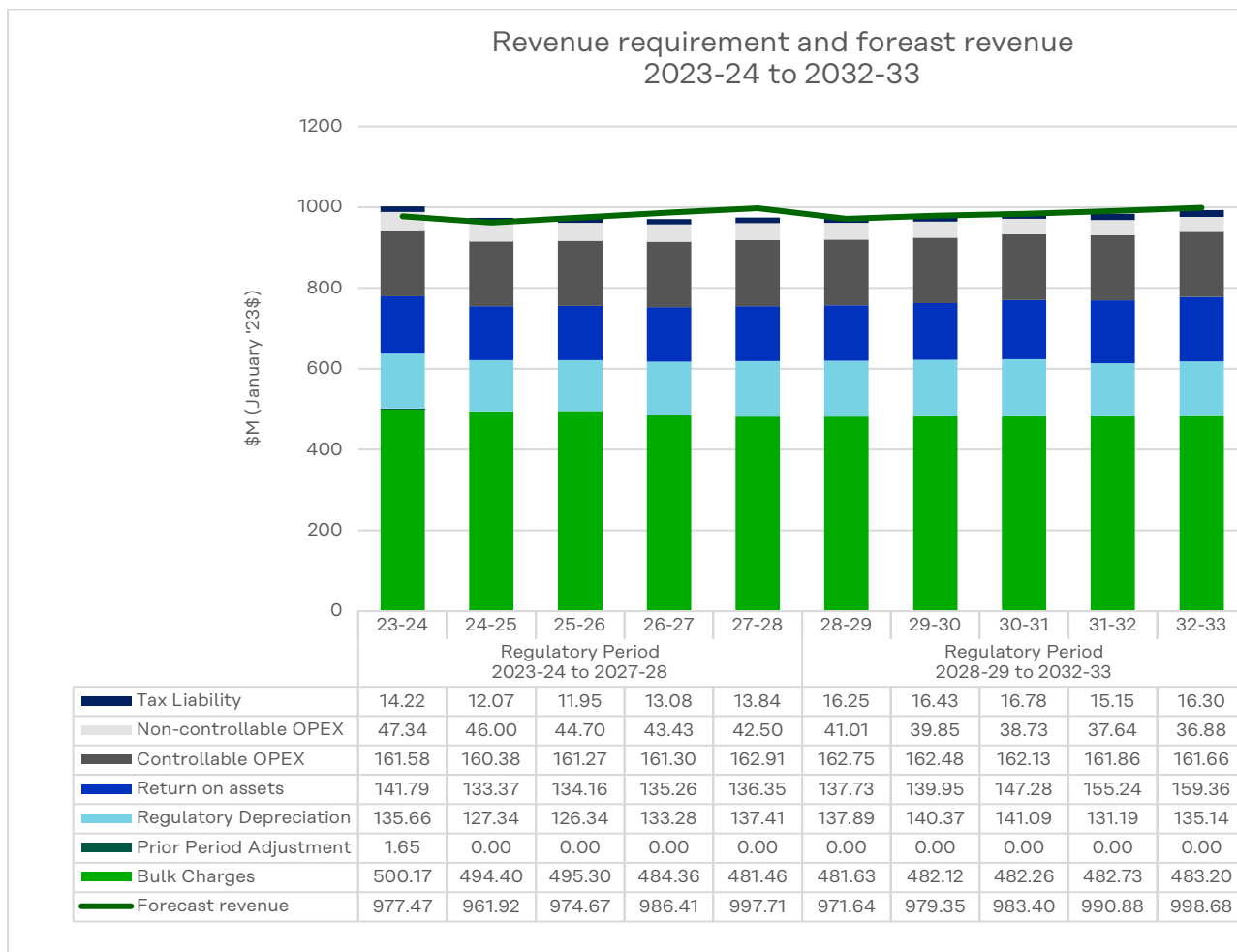


Figure 16: Revenue requirement and forecast revenue 2023-24 to 2032-33 (\$ million January 2023)

7. Demand forecasts

Demand forecasts are a key factor in estimating future customer prices.

With our revenue cap, customer prices reflect actual rather than forecast demand. Increases in prices caused by changes in demand are capped at 2 per cent real and any decreases passed through in full (refer to Section 8.4 - Price control on page 116 and Section 8.5 – Adjustment to prices on page 117 for further details).

The two key demand forecasts relate to the number of customers and water usage. Water usage volume forecasts determine our water usage and sewage disposal revenue.

7.1 Supply and demand scenarios

Greater Western Water, Melbourne Water, South East Water and Yarra Valley Water have collaboratively undertaken modelling of a range of supply and demand scenarios for Melbourne as part of the draft Greater Melbourne Urban Water and System Strategy: Water for Life (GMUWSS) completed in 2022. This modelling has informed the demand forecasts in our price submission.

The GMUWSS highlights that a warmer, drier climate means our water supply reservoirs are already receiving less water from rainfall in our catchments, while water demands continue to grow to meet the needs of a growing city. The Victorian government has developed climate guidelines¹¹⁰ based on the Intergovernmental Panel on Climate Change (IPCC)'s Fifth Assessment Report¹¹¹, and these were used in developing the high, medium and low climate change scenarios modelled in the strategy. Consistent with the guidelines, all three scenarios use Representative Concentration Pathway 8.5 (RCP8.5) and consider the range of results from the suite of Global Climate Models in the IPCC Report.

The Greater Melbourne water corporations projected the possible increase in demand for Melbourne over the next 50 years and produced high, medium and low demand growth scenarios. The medium scenario is aligned to Victoria in Future population projections, while the high and low scenarios consider uncertainty and sensitivity analysis around population growth, per capita water consumption and climate change.

The modelling indicates that under the range of scenarios explored, demand is expected to grow and the availability of existing water supplies will shrink, requiring system augmentations. This is summarised graphically in Figure 17 on page 94.

When developing our demand forecasts, we have also taken into account drinking water demand offset by new recycled water supplies, rainwater tanks installed consistent with government and council requirements, and reductions in consumptive use and network losses as a result of our investment in district metering as part of the water conservation program (see details in Appendix C - Detailed capital expenditure from page 180).

¹¹⁰ The State of Victoria Department of Environment, Land, Water and Planning. Guidelines for Assessing the Impact of Climate Change on Water Availability in Victoria 2020.

¹¹¹ Intergovernmental Panel on Climate Change. 2014 Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report, Climate Change 2014: Synthesis Report. s.l.: Cambridge University Press.

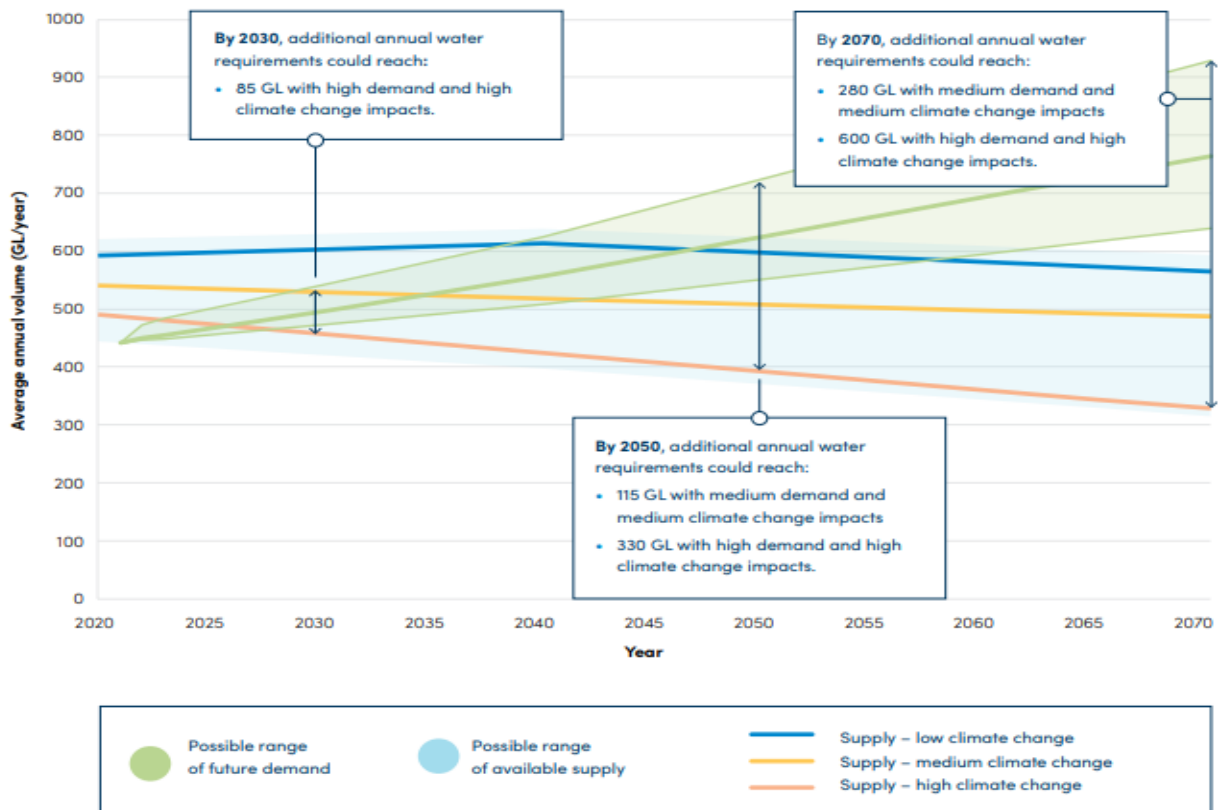


Figure 17: Projected future supply and demand under various climate change scenarios shows an increasing risk of water shortages over the next decade for Greater Melbourne and connected systems. (Source: Draft Greater Melbourne Urban Water and System Strategy 2022).

7.2 Growth in customers

Our residential water customer numbers have grown at an average rate of 2.0 per cent per year over the last decade (2011-12 to 2021-22) driven largely by international immigration.

Australia’s response to COVID-19 from March 2020 onwards, including caps on international arrivals, has significantly reduced international immigration. There has also been increased migration from Melbourne to regional Victoria and interstate over this timeframe.

While uncertainty remains around the extent of the impacts of COVID-19 and other issues impacting growth, the Department of Environment, Land, Water and Planning’s Unpublished Victorian Government Projections, 2021 (VIF2021)¹¹² are the most up to date data available at a granularity suitable for demand forecasting¹¹³. We have also:

- Reviewed the first release of 2021 Census of Population and Housing data from the Australian Bureau of Statistics and the July 2022 release of regional population which

¹¹² These projections have been supplied by the Department of Environment, Land, Water and Planning (DELWP) and are based on unpublished internal modelling. DELWP is the agency responsible for the development of the official state government population projections, which incorporate the latest population estimates, evidence from the latest Census plus assumptions regarding future births, deaths, migration and local development trends.

¹¹³ Statistical Area Level 2 (SA2) resolution

has rebased population estimates as at 30 June 2021 using the 2021 Census¹¹⁴. Melbourne’s population was revised down by 220,000 people, including approximately 80,000 in our service area.

- Reviewed the December 2021 Australian Government Centre for Population Projections¹¹⁵ for Melbourne (noting these are population only and do not provide forecasts for household numbers).
- Engaged growth forecasting experts MacroPlan collaboratively with other metropolitan water corporations to provide independent forecasts for population and dwellings at a Statistical Area Level 1 (SA1) resolution, which they updated in October 2021.¹¹⁶ Given the significant changes to our local and international economic context, we re-engaged MacroPlan in July 2022 to provide advice and commentary regarding the economic and demographic situation at a macro level and within our service area¹¹⁷.

These three population projections, rebased to actual population as at June 2021, are compared in Figure 18 below – indicating that VIF2021 is the most conservative of the three recent forecasts.

We have adopted VIF2021 for growth projections at the scale of our service area.

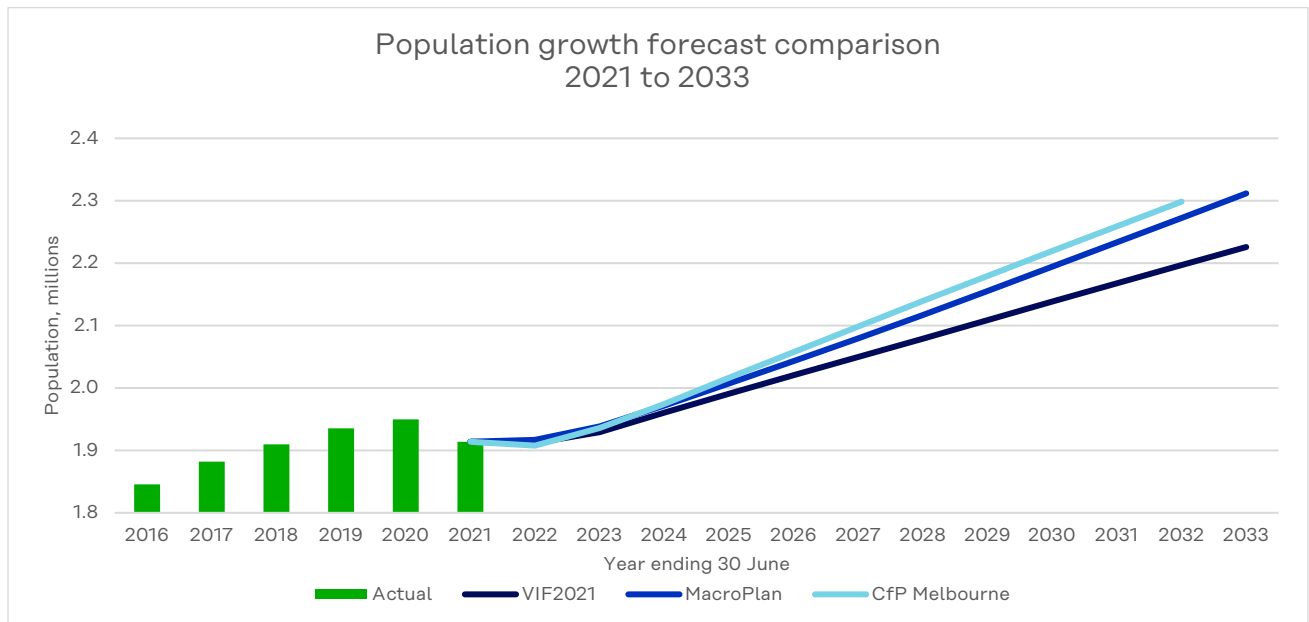


Figure 18: Comparison of population growth forecasts for our service area

¹¹⁴ Australian Bureau of Statistics, Regional population 2021, Released 26 July 2022.

¹¹⁵ Centre for Population 2021, Population Statement: Capital City and Rest-of-State Population Projections, 2020-21 to 2031-32, the Australian Government, Canberra. December 2021.

¹¹⁶ Melbourne Water Yearly Forecasts 2016-2056 COVID19 UPDATE 20211014.

¹¹⁷ Analysis of Existing Forecasts, July 2022 Update. Strategic Advice Prepared for Yarra Valley Water. MacroPlan, 18 July 2022.

We forecast residential customer numbers to grow at the household rate of growth forecast in VIF2021. VIF2021 projects the number of households to grow in our area at the rate of 1.5 per cent per year for the 2023-28 regulatory period and 1.2 per cent in the 2028-33 regulatory period – this is shown in Figure 19 below.

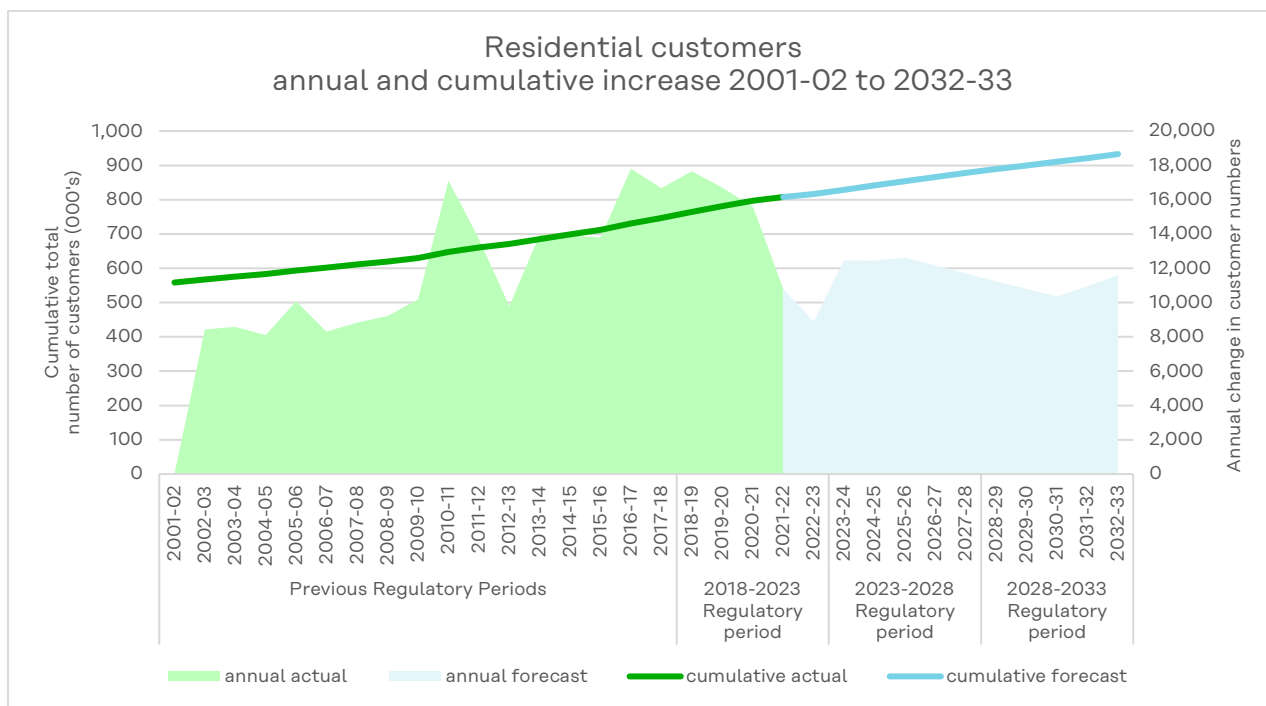


Figure 19: Number of residential water customers with service agreements

The forecast for non-residential water customers has been established from the historical relationship between residential and non-residential customers which has been relatively constant in the last five years. We have therefore adopted a growth rate of 1.5 per cent per year for the 2023-28 regulatory period and 1.2 per cent in the 2028-33 regulatory period as per the residential customer forecast.

The forecast number of sewerage customers is based on a continuation of the historical trend of the ratio between water and sewerage customers. The proportion of water customers without a sewer connection is shrinking as almost all new customers connect to both water and sewerage networks.

7.3 Water consumption and sewage disposal

7.3.1 Water use

Demand comprises residential, non-residential and non-revenue water uses with the components shown in Figure 20 below. Residential (household) use comprises 75 per cent of our total water use. Non-residential water use (17 per cent) includes water used by businesses, government and councils. Non-revenue water (8 per cent) is water not billed to customers because it's lost through operational losses such as leaks, used for firefighting or stolen.

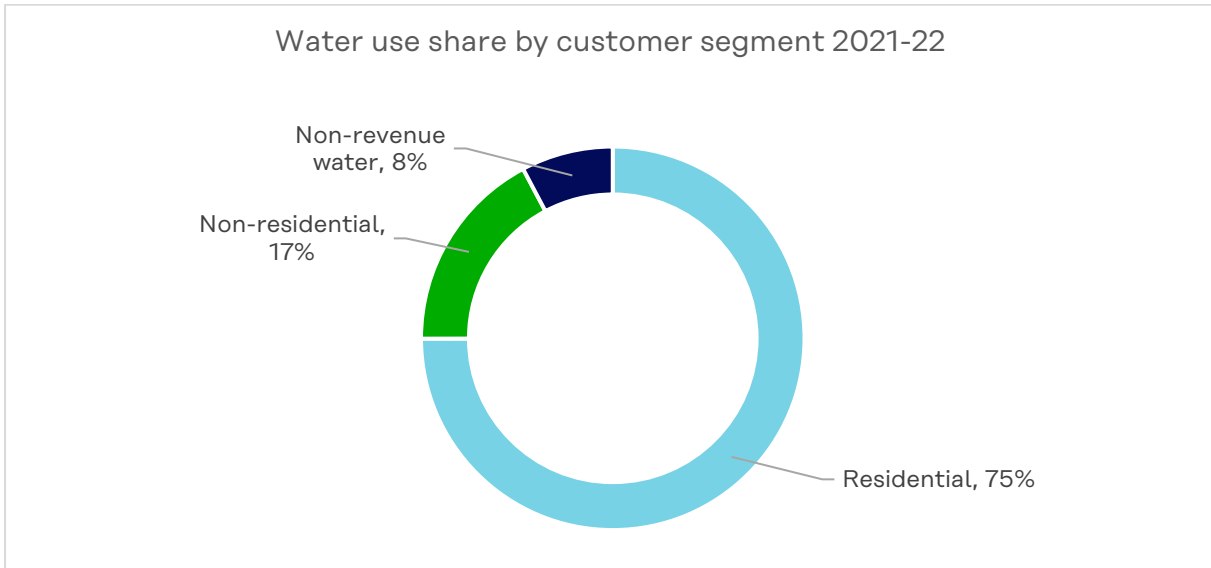


Figure 20: Yarra Valley Water’s water use by customer segment 2021-22

Since 2012, permanent water use rules have been in place and our water use demand forecasts take account of the continuing impact of these rules.

Our water use forecasts also assume that there’ll be no water restrictions between 2023 and 2033, which is consistent with the scenarios contained in the draft Greater Melbourne Urban Water and System Strategy.

7.3.2 Weather impacts

Weather conditions impact our demand forecasts. Figure 21 on the following page shows weather conditions for the seasonal months (October to May) compared to the average. In this chart if a year has average daily maximum temperature and rainfall, it will be positioned around the origin whereas a hot and dry year will be positioned in the bottom right-hand quadrant. As is evident from Figure 21, 2015-16 to 2018-19 were drier and warmer than the long-term average, and 2019-20, 2020-21 and 2021-22 were more similar to the long-term average. Our demand forecasts are based on average conditions in the last five years.

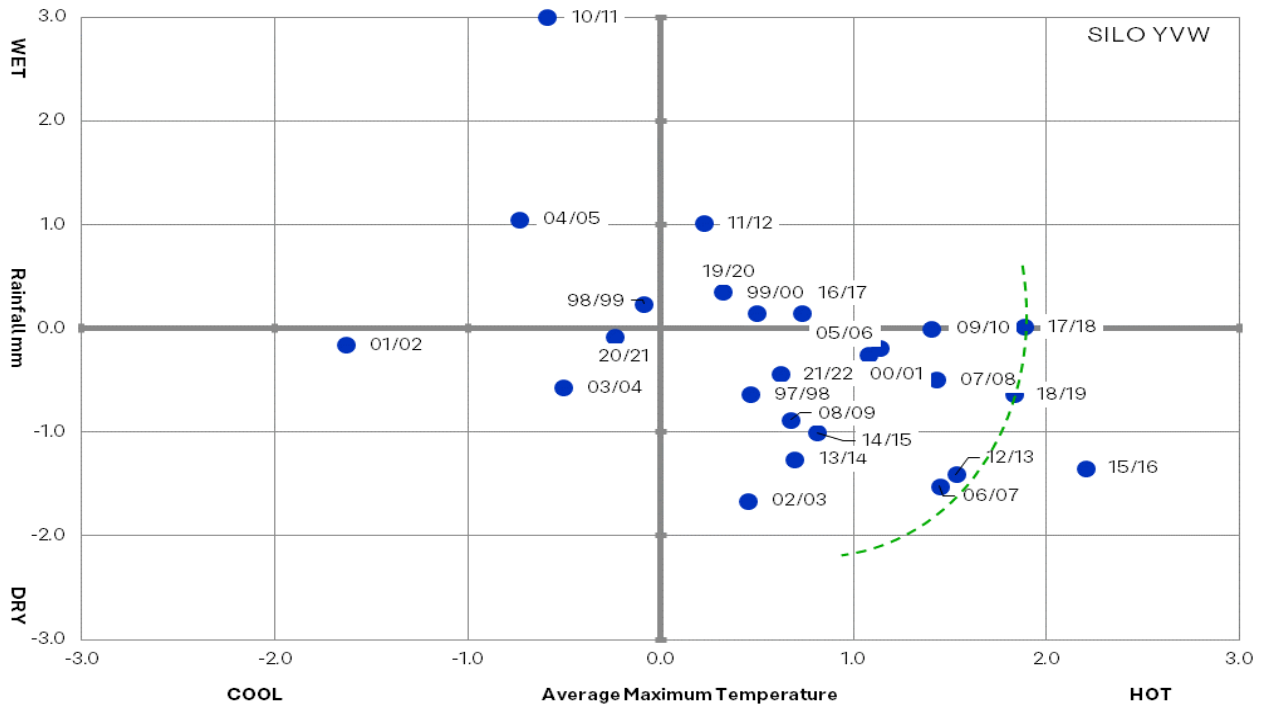


Figure 21: Maximum temperature and rainfall comparison to average (October-March) 1970-22

7.3.3 End use modelling

The primary methodology used to generate water use forecasts is our end use model which uses actual data from a small number of households and models total residential demand for each end use – shower, toilet, clothes washer, dishwasher, taps, evaporative cooler, irrigation and others. The end use model is calibrated against actual billing data up to the base year which in the case of demand forecasting is 2021-22.

End use modelling is the preferred forecasting methodology because it provides a transparent approach for taking account of the continuously changing state of appliance efficiency. By splitting out seasonal uses from non-seasonal uses, it also has the additional benefit of providing an understanding of the considerable variation that can occur from year to year because of variable weather conditions. The same end use modelling methodology was used in previous pricing reviews.

The most recent survey findings incorporated into the model are those from:

- The 2021 appliance stock and usage patterns survey, which was an online survey with a sample size of 5,892 Melbourne households including 2,604 from our area.
- The 2017-20 residential end use measurement study (analysis period September 2017 to August 2018), which disaggregated 12 months of 10 second digital meter data for around 300 households across Melbourne including 105 from our area into end uses.
- Previous residential end use measurement studies we undertook in 2004 and 2010-12.

These studies have all been broadly consistent and have shown incremental improvements in water efficiency over time, increased penetration of water efficient fixtures and fittings, and decreased outdoor water use.

The model is calibrated to 2021-22 usage and the estimated end use shares for this year are shown in Figure 22 below. Over half of residential water use occurs in the bathroom, including shower demand with 29 per cent share, toilets with 19 per cent and baths with 6 per cent. Garden use was 15 per cent in 2021-22 with the average summer temperature slightly warmer and rainfall slightly higher than the long-term average. Taps and clothes washers also make up significant proportions of residential use.

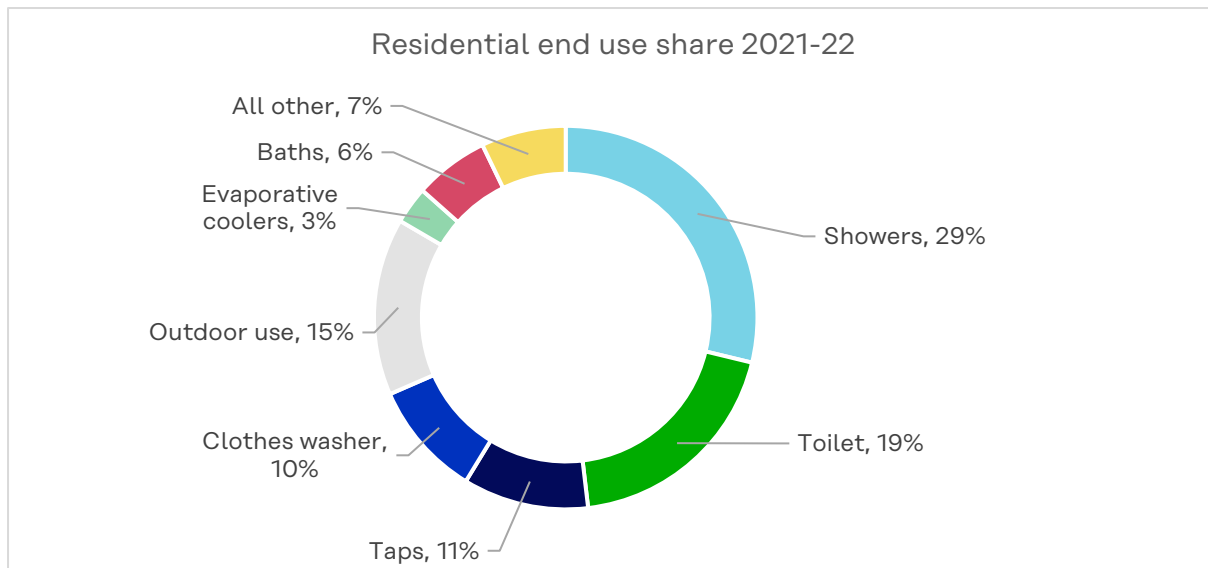


Figure 22: Residential end use shares (2021-22 base year)

7.3.4 Residential water use

Demand forecasts consider specific drivers that impact residential demand. The three main drivers are:

- Population and customer growth.
- Trends in residential property type, informed by data in our billing system for historical actuals, and MacroPlan estimates of the proportion of detached, semi-detached and attached dwellings.
- Trends in appliance efficiency using findings from appliance stock and end use measurement surveys.

Many other factors are also considered, such as the gradual decline in average household size, possible impacts of climate change, reduced garden size of separate dwelling properties, water conservation programs (e.g. Target 155), and the penetration of rainwater tanks.

We haven't included a price elasticity factor into our water use demand forecasts due to:

- Relatively inelastic demand impacts of any price changes – our most recent study¹¹⁸ suggests a residential price elasticity impact of between -0.09 and -0.354.
- Other factors such as weather, changed behaviours with increased working from home during and after COVID-19 restrictions, masking any observed price elasticity impacts.
- Our proposed real price decrease.

Modelled outcomes for per person residential usage forecasts show a decline from the 2021-22 actual of 168 litres per person per day to 165 litres by 2032-33, as shown in Figure 23 below. Taking into account the delivery of new recycled water projects outlined in our Customer growth programs, (refer to Appendix C - Detailed capital expenditure from page 220), drinking water use is forecast to be 160 litres per person per day in 2032-33.

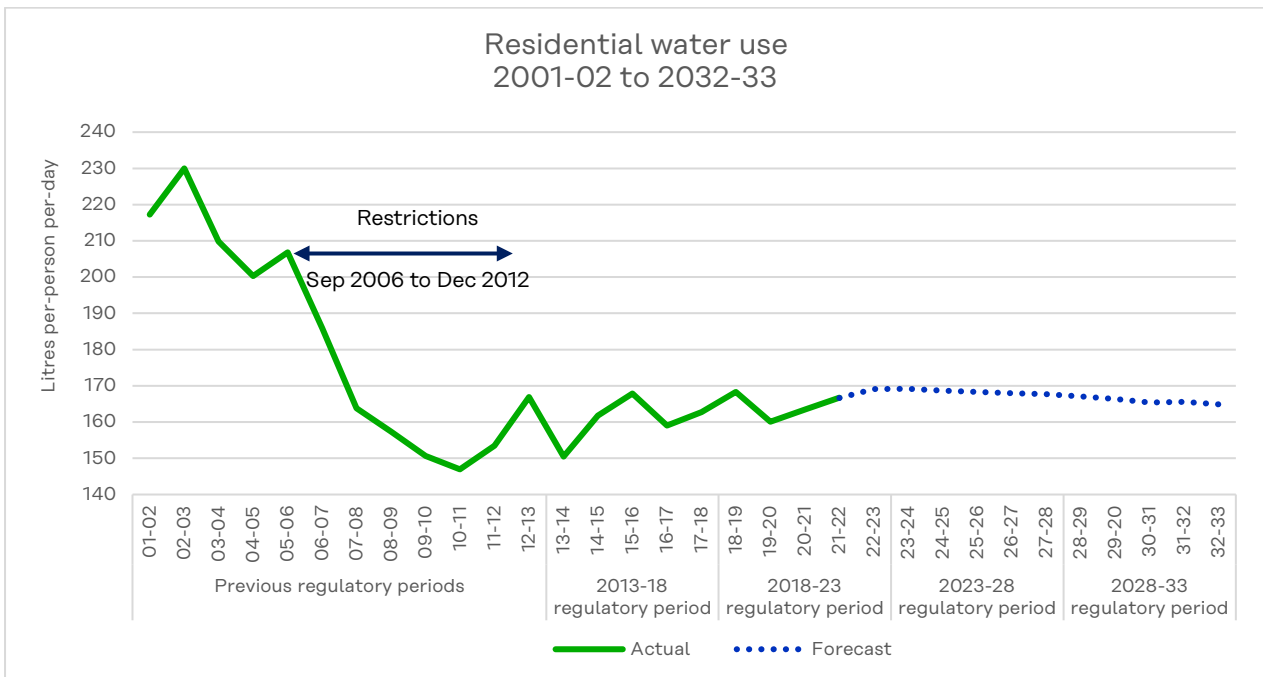


Figure 23: Residential water use (total of drinking and recycled water) average daily litres per person)

As shown in Figure 23 above, residential per person water usage decreased by 30 per cent between 2000-01 and 2010-11 before increasing after 2011-12 with the easing and then removal of restrictions. For the 2023-28 period, average daily per person capita usage is forecast to stay relatively stable.

This forecast takes into account continuing water efficiency gains through in-house appliance efficiencies, reduced garden size with housing consolidation in urban areas and planned water conservation programs.

However, the total residential billed water use volume (drinking water and recycled water) is forecast to grow at an average annual rate of 0.6 per cent due to the growth in customer numbers. The split between residential usage billed in steps 1, 2 and 3 is based on historical trends, taking into account smaller garden sizes and household sizes reducing the

¹¹⁸ Centre for Water Policy Management at La Trobe University and Yarra Valley Water, Estimated Residential Price Elasticity of Demand for Melbourne, February 2016.

proportion of customers entering into steps 2 and 3 gradually over time. The demand forecasts for step 1, 2 and 3 water usage, separated by customers that are only billed for water and customers billed for both water and sewer services, are shown in Figure 24 below.

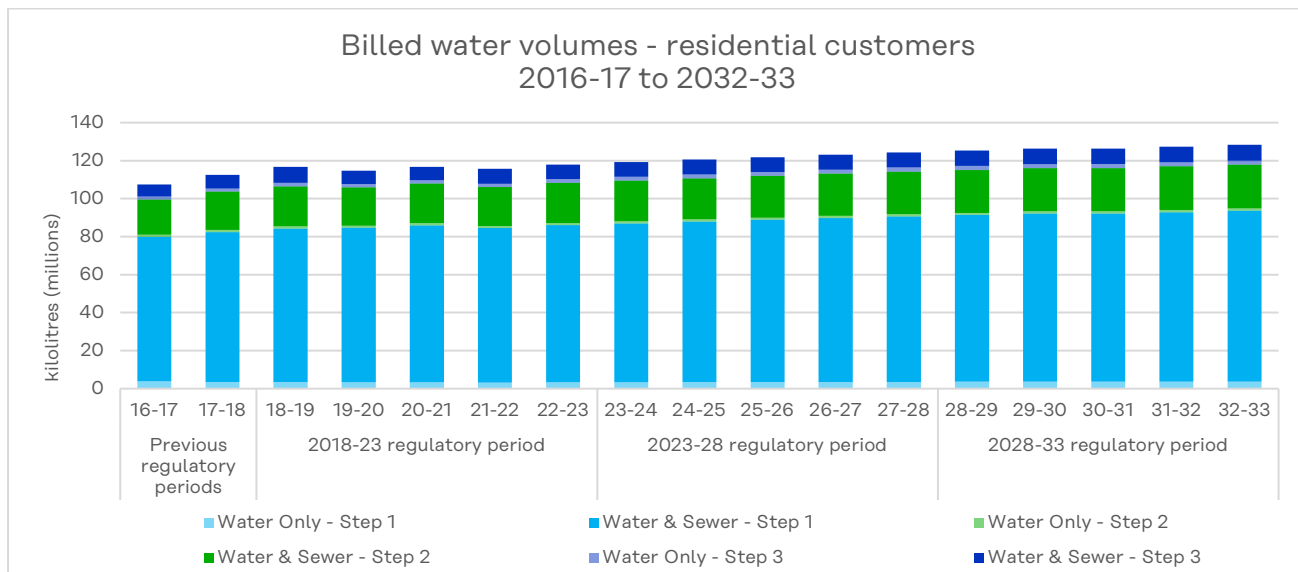


Figure 24: Residential water use (kilolitres per year) by steps, and separated by customers billed only for water and customers with both water and sewer services connected

7.3.5 Non-residential water use

COVID-19 and increased working from home have significantly impacted non-residential water use in our service area in recent years. We expect non-residential usage to slowly recover to levels seen in previous years, but given current uncertain economic conditions and a predicted ongoing level of work from home, we don't expect to return to the previous trend seen between 2016-2019. Our non-residential water use forecast is shown in Figure 25 below.

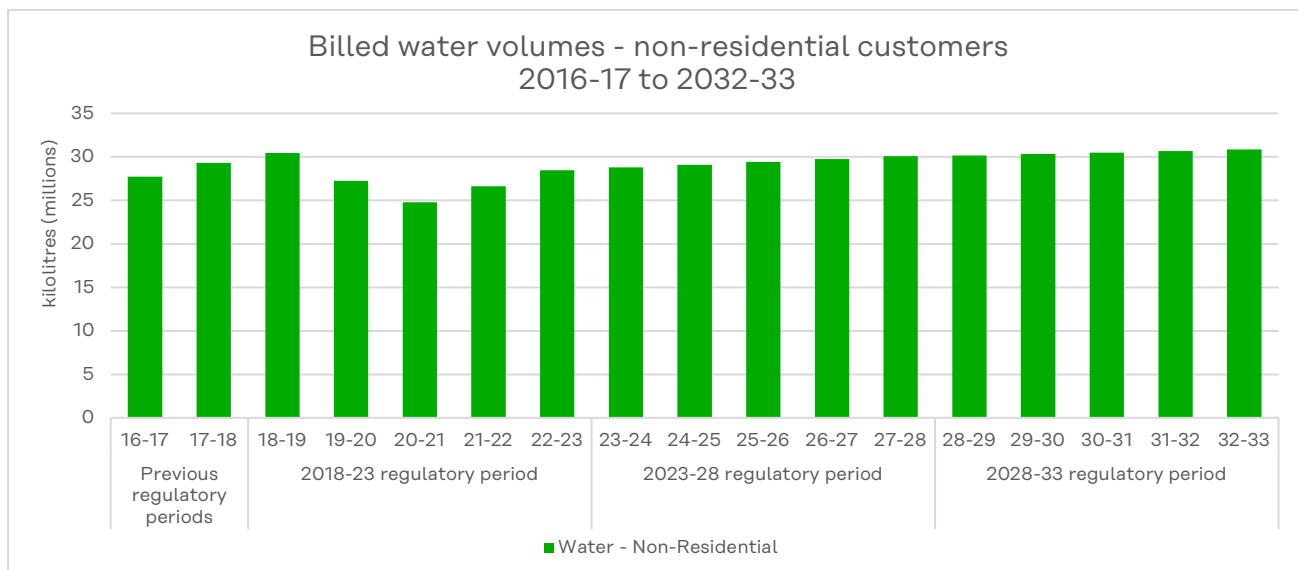


Figure 25: Non-residential water use (kilolitres billed per year)

7.3.6 Sewage disposal and trade waste

For residential customers with water and sewerage services connected, we propose to combine water usage and sewage disposal charges based on the metered volume of water – details are included in section 8.1.2 - Proposal to combine volumetric tariffs for households with water and sewerage services on page 107. For non-residential customers, we don't propose any change to the way sewage disposal is billed. We have projected sewage disposal volumes for non-residential customers based on the observed relationship between a) the ratio of sewage disposal volumes and water usage volumes for non-residential customers and b) the average non-residential usage per customer in recent years. Historic and forecast sewage disposal volumes for residential and non-residential customers are shown below in Figure 26.

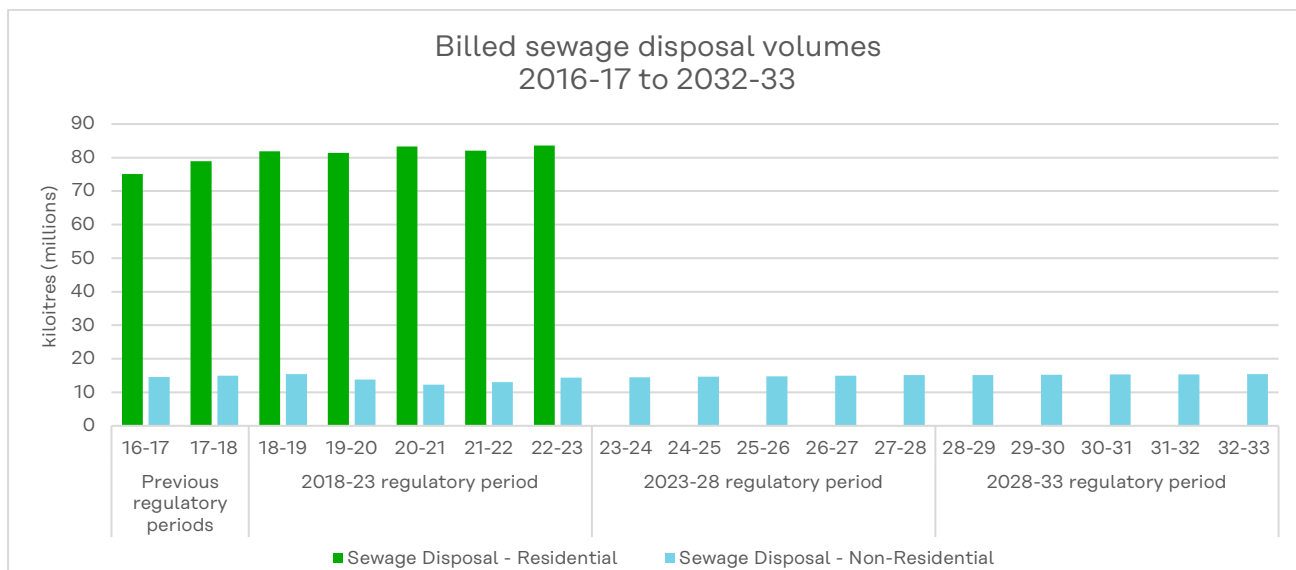


Figure 26: Forecast sewage disposal volumes (kilolitres billed per year)

Trade waste revenue makes up around 2.5 per cent of forecast revenue from major products and services and doesn't fluctuate as much as the other services.

The trade waste forecast has been established in consultation with the commercial services and trade waste teams using the five-year average to inform the forecast. The forecast is then varied for known changes occurring over the forecast period. No material changes were identified.

7.3.7 Recycled water use

Recycled water usage volumes are forecast to grow proportionally with customer growth within our designated recycled water areas.

Recycled water customer growth is derived from our forecasts for specific greenfield areas, discussed in Appendix C - Detailed capital expenditure from page 220. We have calculated recent billed recycled water use per customer and multiplied this by the projected number of customers to derive the forecast. This takes into account that there is some variability in recycled water use due to weather conditions.

It should be noted that in response to customer complaints and for consistency with South East Water, we ceased charging a fixed charge to recycled water customers in 2018-19.

Forecast recycled water usage for residential and non-residential customers is shown below in Figure 27.

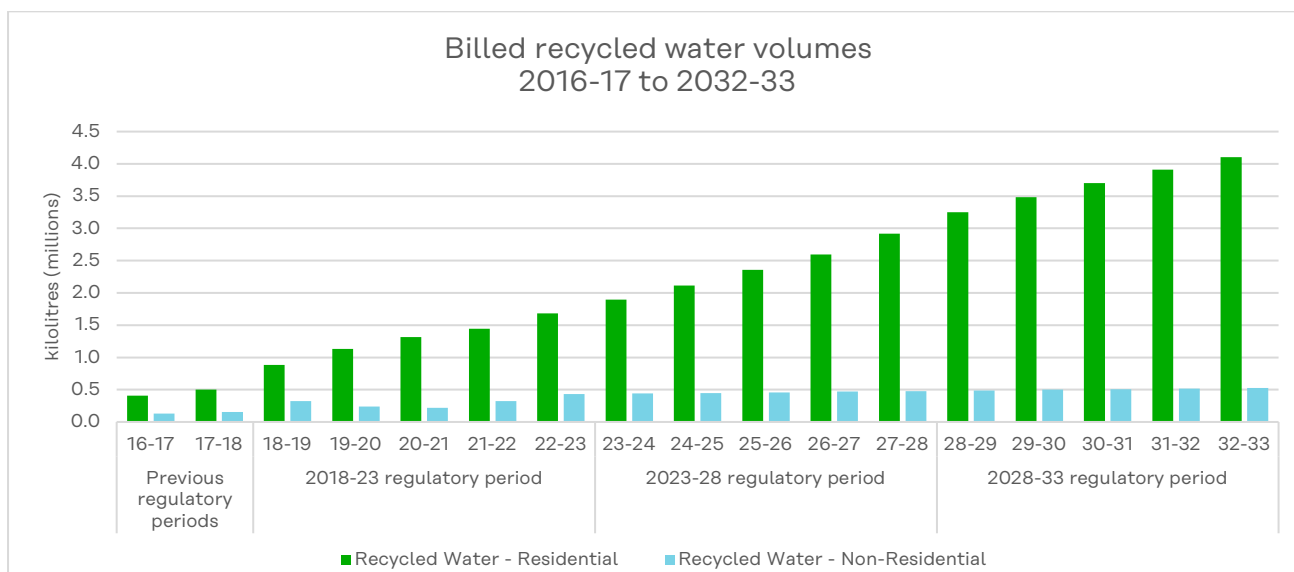


Figure 27: Forecast recycled water use volumes (kilolitres billed per year)

7.3.8 Non-revenue water

Non-revenue water refers to water that we have purchased from Melbourne Water but has been lost before it reaches customers.

It comprises unbilled authorised use, apparent losses and real losses (bursts and leaks). The contribution of leaks and bursts to non-revenue water, whilst trending down, has been consistently responsible for between 70-80 per cent of non-revenue water and the focus of most of our non-revenue water programs.

In recent years we have achieved a steady and sustained reduction in non-revenue water through acquiring reliable and accurate network data to inform key initiatives and target programs.

Without ongoing intervention, network leakage will increase over time because of the increasing length of pipes in growth areas, difficult topography, soil conditions and age of the network. The non-revenue water forecast offsets this expected increase with the estimated savings from completing the roll-out of district metering through our water conservation capital expenditure program (refer Appendix C - Detailed capital expenditure from page 197) and our ongoing investment in proactive leak detection.

The bulk water forecast is calculated from: Residential demand + Non-residential demand + non-revenue-water – demand met from rainwater – demand met from recycled water + drinking water top up of the recycled water network.

The non-revenue water trend is shown in Figure 28 below.

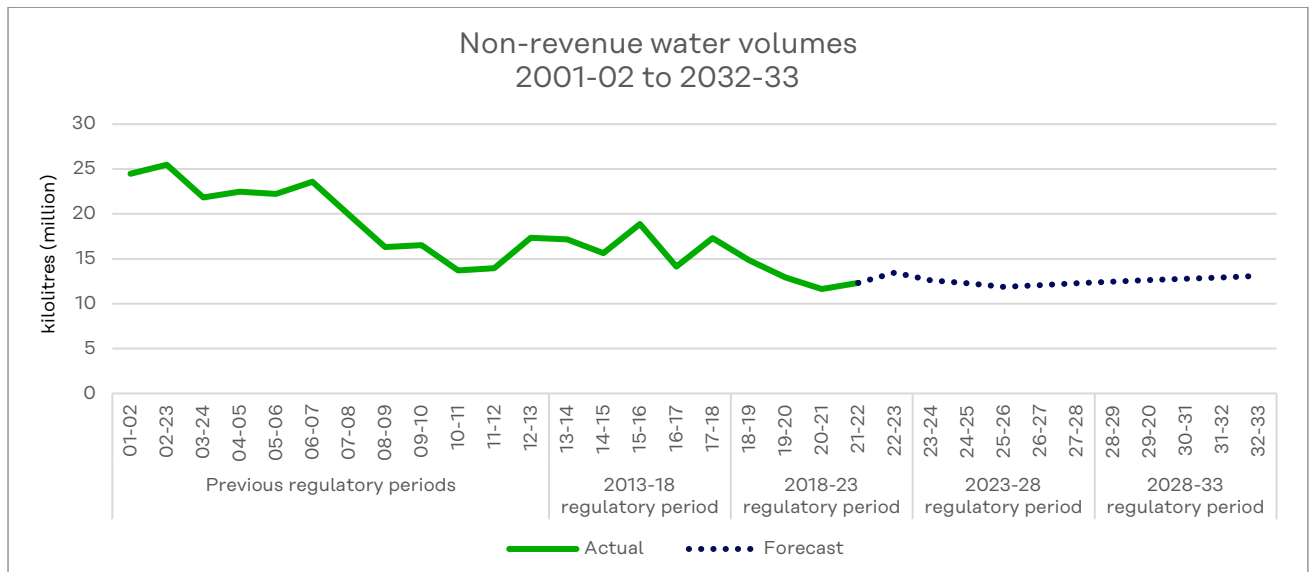


Figure 28: Forecast non-revenue water (million litres per year)

8. Prices and tariff structures

Customers have told us that the most important issue for prices and tariffs is to minimise price increases. In general, through all our research and engagement, customers express preferences to provide financial incentives for water conservation and give customers more control over their bills.

The Reserve Bank of Australia (RBA) is forecasting inflation that will apply to 2023-24 prices to be in excess of 6 per cent, decreasing to around 4 per cent by the following year, before returning to the target band of 2-3 per cent for 2025-26 prices and beyond.¹¹⁹ In response, we propose a price path that mitigates high inflation for two years, with an average 4.6 per cent real price decrease in 2023-24, followed by a 3.0 per cent real price decrease in 2024-25 and no real price changes in the following three years. This proposal, together with changes to our revenue cap formula, will allow us to minimise nominal price fluctuations during the regulatory period. In addition, if inflation is higher than expected, we intend to limit the annual increase to customers' bills in 2023-24 and 2024-25 to 5 per cent in nominal terms and recover the foregone revenue via our revenue cap when inflation is at or near to RBA's target range.

While we believe this approach delivers affordable bills, for some it will not be the case. Consistent with our belief that customers' access to essential water and sewerage services should never be compromised by their ability to pay, we'll continue to support customers experiencing financial hardship through our WaterCare¹²⁰ program.

We also propose to simplify bills and send a stronger water conservation signal by combining the sewage disposal charge with the existing three step water use charges for residential customers receiving both water and sewerage services. With this change, together with the overall real price decrease for customers, over 99 per cent of customers' annual bills (regardless of whether they own or rent the property) will be the same or less in 2023-24 compared to 2022-23¹²¹.

¹¹⁹ Reserve Bank of Australia, Statement on Monetary Policy, August 2022.

¹²⁰ WaterCare contributes towards the overall wellbeing of the community by providing advice and assistance for customers when paying their water bills.

¹²¹ With no change in volume of water used.

Forecast bills for a range of customers using 150 kilolitres of water a year are shown in Table 27 below.

		2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Renter	Real \$	\$504	\$480	\$466	\$466	\$466	\$466
	Nominal \$	\$504	\$495	\$494	\$509	\$524	\$540
Rent provider	Real \$	\$530	\$506	\$490	\$490	\$490	\$490
	Nominal \$	\$530	\$521	\$520	\$536	\$552	\$568
Owner occupier	Real \$	\$1,034	\$986	\$956	\$956	\$956	\$956
	Nominal \$	\$1,034	\$1,016	\$1,014	\$1,045	\$1,076	\$1,108
Water only owner occupier	Real \$	\$456	\$435	\$422	\$422	\$422	\$422
	Nominal \$	\$456	\$448	\$448	\$461	\$475	\$489
Business	Real \$	\$1,575	\$1,503	\$1,457	\$1,457	\$1,457	\$1,457
	Nominal \$	\$1,575	\$1,548	\$1,546	\$1,592	\$1,640	\$1,689

Table 27: Proposed 2023-28 bills for customers using 150kL of water per annum (rounded to nearest \$)

8.1 Major products and services

8.1.1 Household (residential) tariffs

For the period from 1 July 2023, we propose to charge households for the following tariffs:

- Fixed charge for the water service.
- Fixed charge for the sewerage service.
- For customers receiving both water and sewerage services: a three-step volume charge for water incorporating sewage disposal, where the price of each step increases as higher usage thresholds are crossed (refer to section 8.1.2 - Proposal to combine volumetric tariffs for households with water and sewerage services on page 107).
- For customers receiving only water services: a three-step volume charge for water where the price of each step increases as higher usage thresholds are crossed.
- For customers receiving recycled water services: volume charge for recycled water.

Table 28 shows our proposed residential water and sewerage tariffs and prices for 2023-24.

Tariff	Unit	2022-23	2023-24	
			real	nominal
Water service charge (fixed)	per year	\$ 78.97	\$ 75.36	\$ 77.62
Sewerage service charge (fixed)	per year	\$ 451.05	\$ 430.44	\$ 443.35
Water use (volumetric) – for customers receiving both water and sewerage services				
Step 1: 0 to 440 litres per day	per kilolitre	\$ 2.4851	\$ 3.1593	\$ 3.2541
Step 2: 441 to 880 litres per day	per kilolitre	\$ 3.1653	\$ 4.1538	\$ 4.2784
Step 3: 880+ litres per day	per kilolitre	\$ 4.6700	\$ 4.8068	\$ 4.9510

Tariff	Unit	2022-23	2023-24	
			real	nominal
Water use (volumetric) – for customers receiving only water services				
Step 1: 0 to 440 litres per day	per kilolitre	\$ 2.4851	\$ 2.3715	\$ 2.4426
Step 2: 441 to 880 litres per day	per kilolitre	\$ 3.1653	\$ 3.0206	\$ 3.1112
Step 3: 880+ litres per day	per kilolitre	\$ 4.6700	\$ 4.4566	\$ 4.5903
Sewage disposal charge (volumetric)	per kilolitre	\$ 1.1540	n/a	n/a
Recycled water charge (volumetric)	per kilolitre	\$ 1.8489	\$ 1.7644	\$ 1.8173

Table 28: Proposed residential water, recycled water and sewerage tariffs and prices for 2023-24

8.1.2 Proposal to combine volumetric tariffs for households with water and sewerage services

We currently charge residential customers a sewage disposal charge, for an estimated volume of sewage discharged from their property.

The estimated volume of sewage is based on metered volumes of water and recycled water used at each property. Assumptions are made about the volume of metered water used outdoors and therefore not discharged to the sewer. These assumptions vary each month, with a greater proportion of outdoor water used in warmer months compared with winter months. The complex calculation also assumes that large water users have a higher proportion of outdoor use, and therefore a lower discharge factor is applied to calculate their sewage disposal volume.

There is evidence that customers don't support or even understand the sewage disposal charge.

- Our Customer Care team (contact centre) continues to receive customer enquiries and complaints.
- Joint customer research¹²² on the sewage disposal charge revealed a strong preference to remove the charge, provided customers on septic tanks would not pay more as a result. It also confirmed that customers support a three-step usage charge to incentivise water efficiency.
- Our Community Advisory Group supported the removal of the sewage disposal charge.
- The Consumer Advocacy Law Centre supported combining volumetric sewage disposal and water volume charges as the volumetric sewage charges didn't make sense as it wasn't metered. The support was conditional on ensuring that customers eligible for concessions still receive their full entitlements¹²³.

¹²² Insync, Melbourne Metropolitan Water Tariff Review, focus group report, February 2022.

¹²³ Concession customers receive a rebate on their bill from Department of Families, Fairness and Housing. The value of the rebate is apportioned based on the number of services at the property. We've confirmed that combining the volumetric tariffs will not impact concession customers' ability to claim their full concession allowance.

In response to these findings and to provide simpler bills for residential customers, we propose to combine residential water usage and sewage disposal charges into a three-step volumetric tariff that applies to metered volumes of water for customers with water and sewerage connected from the beginning of the 2023-28 period.

To minimise customer bill impacts for all customers we have reflected the current proportion of revenue that is recovered from customers in each water usage step. We also propose to maintain a separate (and lower) three-step tariff for water usage charges for customers who only receive water services.

We have assessed this change against the Water Industry Regulatory Order (WIRO) and believe the proposed tariff better meets each pricing principle – as outlined in the following table.

WIRO pricing principles	How tariff structure meets WIRO pricing principles
11(d) (i) enable customers or potential customers of the regulated entity to easily understand the prices charged by the regulated entity for prescribed services or the manner in which such prices are calculated, determined or otherwise regulated;	Customer engagement findings showed the current approach to calculating the sewage disposal charge is complex and difficult to understand for residential customers. Combining water and sewage disposal charges will simplify bills for residential customers and make the prices charged more easily understood.
11(d) (ii) provide signals about the efficient costs of providing prescribed services to customers (either collectively or to an individual customer or class of customers) while avoiding price shocks where possible; and	Residential customers have indicated that they would more likely respond to the variable price signals if they felt they had control over a greater proportion of their bills. If combined into a single charge, rather than having separate variable water and sewerage charges, customer bills will more clearly show the metered volume of water charged at the higher volumetric price. Additionally, the tariff structure change will not result in price shock for any group of customers, as the customer bill impact will be minimal – see below.
11(d) (iii) take into account the interests of customers of the regulated entity, including low income and vulnerable customers.	As noted above, the tariff structure change is based on feedback from residential customers on the current tariff structure. We have also undertaken a detailed assessment of customer impacts associated with the tariff change across all Yarra Valley Water residential customers. We have found that there will be minimal bill impact across all residential customer segments resulting from the tariff change – see a sample of customer impacts below.

The proposal is also consistent with the Essential Services Commission’s 2023 water price review guidance paper¹²⁴ that considers variable sewerage tariffs difficult to understand and that proposals for a single fixed charge for retail sewage disposal for residential customers would be considered favourably.

¹²⁴ Essential Services Commission 2021, 2023 water price review: Guidance paper, 26 October, page 53.

The graphs in Figure 29 below provide a sample of customer impacts resulting from combining the residential sewage disposal and water usage charges across a sample of customer types. While quarterly customer bill impacts vary depending on each customer's water usage, the annual bill impacts across the residential customer base will be small.

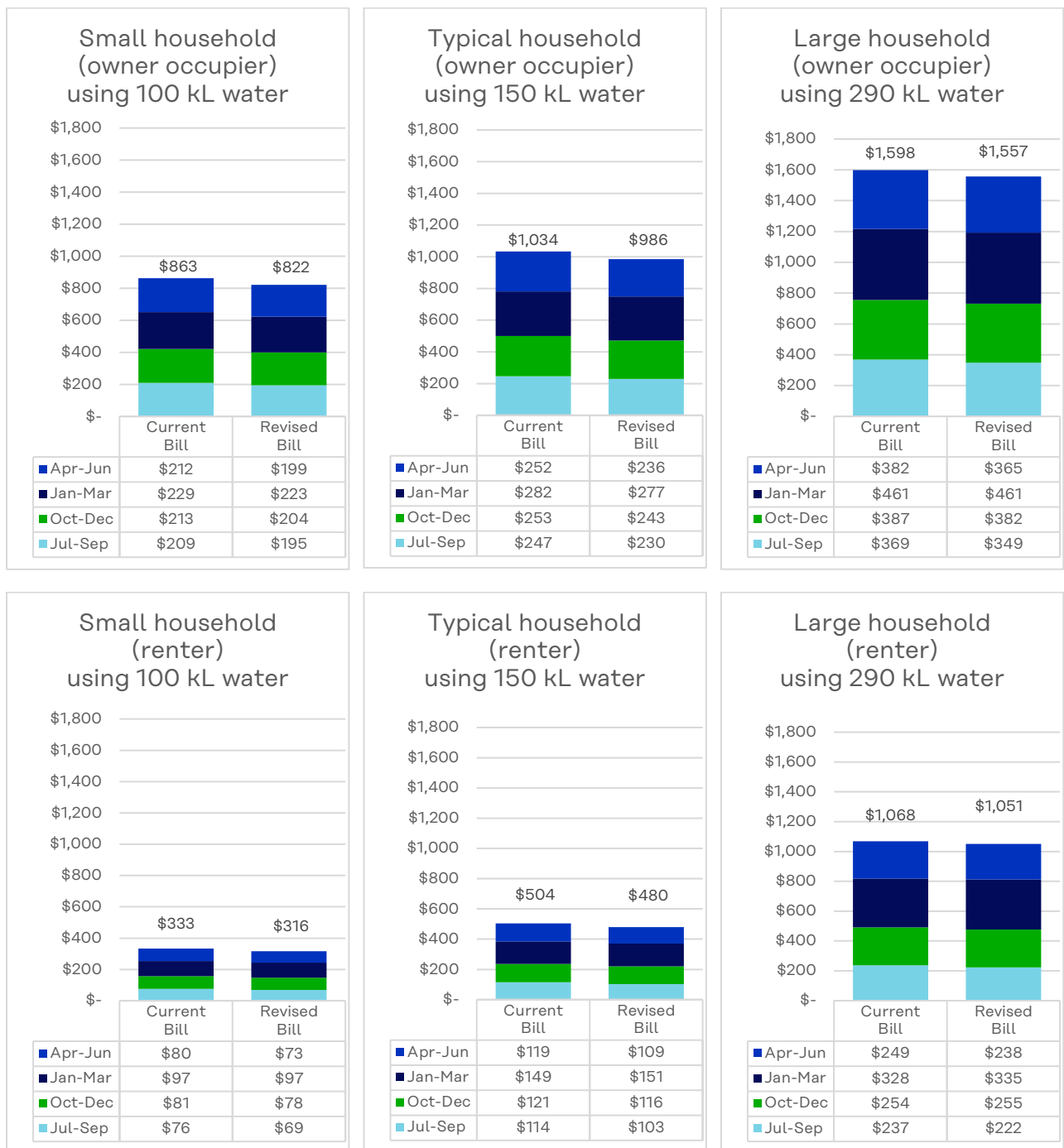


Figure 29: Modelled customer impacts of proposal to combine SDC and water volumetric charges (\$January 2023)

8.1.3 Business (non-residential) tariffs

For the period from 1 July 2023, we propose to charge business customers the following tariffs:

- Fixed charge for the water service.
- Fixed charge for the sewerage service.
- Single-step volume charge for water.
- Volume charge for sewage, known as the sewage disposal charge.
- For customers receiving recycled water services: volume charge for recycled water.

The water and recycled water volume charges are applied to the metered volume of water used by the customer.

The sewage disposal charge is the estimated volume of sewage using the metered water and recycled volumes and a calculation that makes assumptions about the volume of water used for purposes where it isn't discharged to the sewer¹²⁵.

Table 29 below shows our proposed business water and sewerage tariffs and prices for 2023-24.

Tariff	Unit	2022-23	2023-24	
			real	nominal
Water service charge (fixed)	per year	\$ 292.97	\$ 279.58	\$ 287.97
Sewerage service charge (fixed)	per year	\$ 563.48	\$ 537.73	\$ 553.86
Water use (volumetric)	per kilolitre	\$ 2.9474	\$ 2.8127	\$ 2.8971
Sewage disposal charge (volumetric)	per kilolitre	\$ 2.0446	\$ 1.9512	\$ 2.0097
Recycled water charge (volumetric)	per kilolitre	\$ 1.8489	\$ 1.7644	\$ 1.8173

Table 29: Proposed business water, recycled water and sewerage tariffs and prices for 2023-24

¹²⁵ Unlike households, we propose to retain the SDC charge given the different formula and that business customers are likely to have an individual SDC discharge rate.

8.1.4 Trade waste tariffs

Trade waste tariffs comprise two components:

- Volume and load charges
- Annual contract fees.

Table 30 below shows our proposed trade waste tariffs and prices for 2023-24.

Tariff	Unit	2022-23	2023-24	
			real	nominal
Contract fee – risk rank 1	per year	\$ 17,668.21	\$ 16,860.77	\$ 17,366.59
Contract fee – risk rank 2	per year	\$ 15,657.41	\$ 14,941.87	\$ 15,390.13
Contract fee – risk rank 3	per year	\$ 5,888.98	\$ 5,619.85	\$ 5,788.45
Contract fee – risk rank 4	per year	\$ 1,765.98	\$ 1,685.27	\$ 1,735.83
Contract fee – risk rank 5	per year	\$ 588.12	\$ 561.24	\$ 578.08
Health care institution bed charge	per bed per year	\$ 54.00	\$ 51.53	\$ 53.08
Accommodation and restaurant food waste unit ≥ 180W < 400W	per unit per year	\$ 1,536.50	\$ 1,466.28	\$ 1,510.27
Accommodation and restaurant food waste unit ≥ 400W < 700W	per unit per year	\$ 7,868.49	\$ 7,508.90	\$ 7,734.17
Accommodation and restaurant food waste unit ≥ 700W < 1,500W	per unit per year	\$ 15,851.89	\$ 15,127.46	\$ 15,581.28
Trade waste volume	per kilolitre	\$ 0.9941	\$ 0.9487	\$ 0.9772
Biochemical oxygen demand (BOD)	per kilogram	\$ 0.8590	\$ 0.8197	\$ 0.8443
Suspended solids (SS)	per kilogram	\$ 0.5055	\$ 0.4824	\$ 0.4969
Total kjeldahl nitrogen (TKN)	per kilogram	\$ 1.4371	\$ 1.3714	\$ 1.4125
Inorganic total dissolved solids (ITDS)	per kilogram	\$ 0.0356	\$ 0.0340	\$ 0.0350

Table 30: Proposed trade waste tariffs and prices for 2023-24

8.2 Developer and customer contributions for infrastructure and new services

Developers and customers contribute towards the costs of infrastructure, including providing new services.

8.2.1 New customer contributions

New customer contributions (NCCs) are contributions made by developers towards the cost of providing major sewerage, water and recycled water infrastructure for new connections. The required infrastructure can be the expansion of existing networks into growth corridors (special charging areas) or the augmentation of existing networks in our inner urban areas (standard).

Our proposed NCCs are included in Table 31 below.

Tariff	Unit	2022-23	2023-24	
			real	nominal
Standard				
Water	per lot	\$775.08	\$813.83	\$838.24
Sewer	per lot	\$775.08	\$813.83	\$838.24
Recycled water	per lot	\$775.08	\$813.83	\$838.24
Special charging area – new urban growth boundary				
Water	per lot	\$2,776.35	\$2,915.17	\$3,002.62
Sewer	per lot	\$2,776.35	\$2,915.17	\$3,002.62
Recycled water	per lot	\$775.08	\$813.83	\$838.24
Special charging area – Greenvale/ Mickleham				
Water	per lot	\$2,452.99	\$2,381.54	\$2,452.99
Sewer	per lot	\$2,452.99	\$2,381.54	\$2,452.99
Recycled water	per lot	\$775.08	\$813.83	\$838.24
Special charging area – Epping North				
Water	per lot	\$1,131.39	\$1,098.44	\$1,131.39
Sewer	per lot	\$1,131.39	\$1,098.44	\$1,131.39
Recycled water	per lot	\$775.08	\$813.83	\$838.24

Table 31: New customer contributions proposed for 2023-24

Our overarching principle is that new customer contributions should reflect the cost of providing water, sewerage and recycled water infrastructure for new connections and not be set so low that our existing customer base is subsidising development costs. Neither should it be set so high that the total revenue received from new connections subsidises the existing customer base.

We engaged Marsden Jacob Associates to model cost reflective NCCs using the Commission’s methodology and model¹²⁶. The model reflects:

- Updated actual and forecast capital expenditure, bulk charges and revenue.
- The community sewerage program and an allocation of renewals based on the proportion of new customers projected in developed suburbs over the modelling period.
- A portion of historical costs (net of NCC revenue) back to 2013-14 in standard NCC estimates – accounting for regulatory depreciation on those assets that has already been recovered through water and sewerage prices.

We have also reviewed the 2012 SKM assessment of NCCs proposed by urban water businesses for the Commission in 2012¹²⁷ (refer pages 6-7). The approach we have used is consistent with the methodologies identified as being acceptable by SKM.

Modelled charges for the new urban growth boundary NCC have increased significantly primarily because of the higher level of investment required to service the Northern Growth Area compared to what had been previously forecast.

A comparison of the current charges with the modelled charges is provided in Table 32 below that shows our costs to service each new lot exceeds the current new contributions received for each lot in the urban growth boundary (UGB) and infill areas.

	Current charge 2022-23	2022 modelled charge
Standard (per lot), incorporating current Epping and Greenvale special charging areas¹²⁸		
Water and sewerage	\$1,550.16	\$5,577
Recycled water	\$775.08	\$5,927
Special charging area – new urban growth boundary (per lot)		
Water, sewerage and recycled water	\$6,327.78	\$39,867

Table 32: Modelled NCCs for combined water, sewerage and recycled water

There is a significant gap between our current NCCs and the modelled charges that would cause an unacceptable impact to immediately pass-through to developers.

To balance the transition to cost-reflective developer charges while minimising impacts to customers building new homes, we propose to:

- Increase NCCs in the standard and UGB areas in real terms by 5 per cent per annum (capped at 10 per cent nominal per annum by charging below the maximum price if inflation is higher than 5 per cent in any given year) over the 2023-28 regulatory period.
- Integrate the Epping special charging area into our standard NCC charge over the 2023-28 period.

¹²⁶ <https://www.esc.vic.gov.au/water/codes-and-guidelines/new-customer-contributions-guiding-resources>.

¹²⁷ Sinclair Knight Merz, New Customer Contributions review capital and operating expenditure, 16 April 2013.

¹²⁸ As costs to service the remainder of Epping and Greenvale special charging areas are now closer to the standard amount, we have modelled them as being incorporated into the standard charge.

- Hold the Greenvale special charging area NCC charges in nominal terms to allow its integration into the standard NCC charge in a subsequent regulatory period.

In July 2022, as part of our engagement for our draft submission, we discussed the proposal to transition new customer contributions to be more cost reflective over time with representatives of the Urban Development Institute of Australia (UDIA), Department of Environment, Land, Water and Planning (DELWP) and Consumer Action Law Centre (CALC). All discussions were followed by correspondence inviting written feedback on our proposals. UDIA has responded to correspondence without indicating support for or against the proposal. CALC supports cost reflective developer charges.

8.2.2 Gifted assets

Developers build drinking water, recycled water and sewerage reticulation networks to service their developments, which they gift to us for ongoing maintenance and ultimately renewal.

Gifted assets are not included in the regulatory asset base, however their value is considered revenue for the purposes of calculating the tax liability. Refer to section 5.11 - Tax liability (allowance) on page 89.

8.2.3 Financed works

Other authorities like councils and developers require additional capital works. This can relate to construction of temporary assets to enable development ahead of the development front, realignment of assets from roadways or to facilitate other works e.g. removal of level crossings. The incremental costs of these works are fully recovered from the authority or developers at the time they are undertaken, fully offsetting the capital expenditure.

8.2.4 New meter installations

Developers meter new lots as they are developed. The costs of the meters are fully recovered via miscellaneous products and services which fully offset the capital expenditure.

Table 33 below outlines the forecast revenue from growth-related gifted assets, developer and new customer contributions as described in sections above.

	Regulatory period 2023-24 to 2027-28					Regulatory period 2028-29 to 2032-33				
	23-24	24-25	25-26	26-27	27-28	28-29	29-30	30-31	31-32	32-33
Estimated new customer contribution revenue	30.37	31.71	33.12	34.58	36.15	37.90	39.65	41.54	43.52	45.65
Gifted assets	65.01	65.85	66.95	67.12	67.71	74.31	72.21	71.25	72.83	74.82
Financed works	2.21	0.32	1.79	4.31	1.05	0.00	0.00	0.00	0.00	0.00
New meter installations	13.45	13.45	13.45	13.45	13.45	15.55	15.55	15.55	15.55	15.55

Table 33: Forecast growth-related gifted assets, developer and new customer contribution revenue 2023-28 (\$ million January 2023)

8.3 Additional products and services

The Commission has indicated that pricing principles be used for miscellaneous charges.

We have reviewed all products and services for which we currently levy a charge to ensure we continue to recover the costs associated with providing services. If the cost of providing individual products and services to customers can be recovered through charges, this helps reduce the price for the wider customer base.

Our prices have been informed by:

- Our commitment to protect vulnerable customers.
- Our customer service charter and commitments.
- The degree of choice that would be available to customers in regard to the product or service charge.
- Common business practice both in the community and the water industry.
- Customer and stakeholder feedback.

We propose to hold our significant miscellaneous fees and charges for the 2023-28 regulatory period in real terms. These charges are shown in Table 34 below.

Tariff	2022-23	Proposed real price	Real price increase			
			2023-24	2024-25	2025-26	2026-27
New estate connection - combo drinking water and recycled water (includes supply and installation of meters and meter locks)	\$682.58	\$682.58	0%	0%	0%	0%
Complete connection supplement (long)	\$1,977.99	\$1,977.99	0%	0%	0%	0%
Complete connection supplement (short)	\$1,274.07	\$1,274.07	0%	0%	0%	0%
Standard meter and install drinking water (includes supply and installation of meter lock)	\$148.30	\$148.30	0%	0%	0%	0%
Remote supplement	\$229.63	\$229.63	0%	0%	0%	0%
Recycled water audit fee (includes GST)	\$403.24	\$403.24	0%	0%	0%	0%
Multi-unit 2 lot development application	\$478.10	\$478.10	0%	0%	0%	0%
Multi-unit 3 - 19 lot development application	\$627.06	\$627.06	0%	0%	0%	0%
Information statement	\$23.37	\$23.37	0%	0%	0%	0%
Development deed application	\$1,401.73	\$1,401.73	0%	0%	0%	0%
Non-core miscellaneous services	Actual cost	Actual cost	0%	0%	0%	0%

Table 34: Significant miscellaneous fees and charges

8.4 Price control

We propose to maintain a revenue cap form of price control where customer prices will adjust on an annual basis to pass-back excess revenue or recoup the revenue shortfall resulting from variances in customer numbers and demand. This mechanism ensures that customers only pay what is necessary to meet our revenue requirement and means that customer bills can be better smoothed over time, minimising price shocks in any given year.

We propose to modify the revenue cap formula to allow us to smooth nominal prices within period. Specifically, we will continue to cap annual real price increases by 2 percent. In addition we'll also cap the nominal increase in bills at 5 per cent per annum for 2023-24 and 2024-25 and recover any shortfall in the future when inflation is within or near the Reserve Bank of Australia (RBA) target band.

This will provide customers some protection from very high price increases due to the forecast high inflation.

The revenue cap formula calculates the revenue cap adjustment and a positive A_t means a return of excess revenue to customers. Note that the dollar values used in, and calculated by, the formula are in nominal terms.

$$A_t = \left[\left((R_{t-1}^{for} - C_{t-1}^{for}) - (R_{t-1}^{set} - C_{t-1}^{set}) \right) + \left((R_{t-2}^{act} - C_{t-2}^{act}) - (R_{t-2}^{for} - C_{t-2}^{for}) \right) \times (1 + RRR_{t-2}) \times \frac{CPI_{t-1}}{CPI_{t-2}} \right] \times (1 + RRR_{t-1}) \times \frac{CPI_t}{CPI_{t-1}} - A_{t+1}^{carry}$$

Where:

R	is the revenue to be received by Yarra Valley Water and includes: <ul style="list-style-type: none"> water supply system and usage charges sewerage system and sewage disposal charges trade waste charges recycled water usage charges
C	is bulk charges to Yarra Valley Water and include adjustments for: <ul style="list-style-type: none"> Melbourne Water's annual rate of return update changes in desalination contract costs and desalination water orders Melbourne Water's 2026 determination any other changes to Melbourne Water's bulk charges
RRR	is the post-tax real regulatory rate of return for the specified regulatory year
for	is the forecast value at April
set	is the value at the time of determination with revenue cap adjustments and the pass-through of costs/benefits made outside of the revenue cap for: <ul style="list-style-type: none"> annual regulatory rate of return update non-achievement of outcome targets (\$1.8 million nominal per outcome per annum) deferral of top 10 projects adjustment unit rate efficiencies on water main renewals tax ruling changes bulk charges
act	is the actual value at June
t	is the regulatory year
A_{t+1}^{carry}	is an adjustment amount proposed not to be passed through in the regulatory year and to be carried forward to the next regulatory year to allow smoothing nominal prices over multiple years to manage bill impacts for customers

Equation 1: Proposed revenue cap adjustment

Table 35 below details the values assumed in the submission and upon which a decision on the need for a revenue cap adjustment will be determined.

	2023-24	2024-25	2025-26	2026-27	2027-28
Post-tax regulatory rate of return (real)	2.71%	2.52%	2.42%	2.33%	2.27%
Tariff revenue from revenue cap products	957.86	940.70	952.72	964.71	976.39
Bulk charges	500.17	494.40	495.30	484.36	481.46

Table 35: Determination values for revenue cap calculation 2023 – 2028 (\$ million January 2023)

8.5 Adjustment to prices

We propose price pass-throughs for the following events:

- Uncertain and unforeseen events (as per Clause 3 of our 2018 determination)
- Annual update of Melbourne Water’s prices
- Annual update of regulatory rate of return
- Non-achievement of service outcomes
- Savings in financing costs as a result of deferral of top 10 projects, as per Section 3.9 - Major projects on page 57.
- Any unit rate efficiencies together with the financing costs to customers if the market reveals a reduction in the cost of the Water reliability – reticulation main renewals program, more details in Appendix C - Detailed capital expenditure from page 182.
- Savings due to any change in taxation status of either new customer contributions or developer gifted assets, as per section 5.11 - Tax liability (allowance) on page 89.

When calculating the price movement associated with pass-throughs, the latest demand forecasts will be used.

The following formula shall apply for any top 10 project that has been deferred or delayed and the adjustment results in a decrease in customer bills:

$$T10_t^{adj} = \left[\left(\left(CapExT10_{t-1}^{for} - CapExT10_{t-1}^{det} \times \frac{CPI_{t-1}}{CPI_{base}} \right) \times RRR_t \right) + \left(\left(CapExT10_{t-2}^{act} - CapExT10_{t-1}^{set} \right) \times (1 + RRR_{t-2}) \times \frac{CPI_{t-1}}{CPI_{t-2}} \times RRR_{t-1} \right) \right] \times (1 + RRR_{t-1}) \times \frac{CPI_t}{CPI_{t-1}}$$

Where:

$T10_t^{adj}$	is the required adjustment for the deferral of a top 10 project
$CapExT10$	is the capital expenditure of the top 10 projects that have been deferred
RRR	is the post-tax real regulatory rate of return for the specified regulatory year
for	is the forecast value at April
set	is the forecast value at the time of price setting in the previous regulatory year
det	is the forecast value at the time of the price determination
act	is the actual value at June
t	is the regulatory year

Equation 2: Proposed adjustment for Top 10 projects that have been deferred

Appendices



Appendix A

2018-23 outcomes in review

In 2018, our engagement with customers resulted in seven outcomes that customers said they expect and value. With a primary measure and target¹²⁹, we committed to achieving each outcome and reporting our progress¹³⁰ to customers each year.

The outcomes, measures and annual targets we committed to deliver over the 2018-23 period are outlined in Table 36 below.

Outcome	Measure	Target				
		2018-19	2019-20	2020-21	2021-22	2022-23
Safe drinking water	Compliance with Safe Drinking Water Regulations	100%	100%	100%	100%	100%
Reliable water and sewerage services	Customers who experienced three or more unexpected water or sewerage service interruptions in 12 months	0.96%	0.96%	0.96%	0.96%	0.96%
Timely response and restoration	Customers whose interrupted water or sewerage service was restored within four hours	91.1%	91.1%	91.1%	91.1%	91.1%
Fair access and assistance for all	Customers who have accessed our services believe we help customers experiencing difficulty paying for their water and sewerage services	89%	89%	89%	89%	89%
Water availability and conservation	Total water use (litres of water used per person per day)	221	217	213	211	210
Modern flexible service	Customers who are satisfied with their most recent interaction	86%	86%	86%	86%	86%
Care for and protect the environment	Cumulative reduction in carbon emissions compared to 2016-17 baseline of 34,083 tonnes CO ₂ e ¹³¹	4.0%	14.5%	31.5%	46.1%	52.5%

Table 36: Customer outcomes, measures and annual targets we committed to deliver in 2018-23

A detailed account of how we've delivered the outcomes that customers told us were most important is provided on the following pages.

¹²⁹ Targets are measured and reported from April to March.

¹³⁰ <https://www.yvw.com.au/about-us/reports/our-performance-2021-22>.

¹³¹ Compared to our 2018-23 submission, the measure and target for the outcome 'care for and protect the environment' has been rebased to reflect the 2016-17 year in consultation with the Essential Services Commission.

Safe drinking water

Providing safe and pleasant drinking water is our number one priority. Back in 2017, our customers told us they expect water that is safe to drink, and we're committed to achieving our target of 100 per cent compliance with the Safe Drinking Water Regulations.

Based on customers' expectations of safe drinking water, we committed to:

- Undertake ongoing inspections of our water storage tanks and carry out any repairs needed to ensure their integrity.
- Deliver programs that ensure our pipes are clean.
- Undertake independent water quality testing.
- Manage customer complaints and support customers who have ongoing issues until they're resolved.
- Provide advice and education to customers on the quality and safety of our water.
- Work with Melbourne Water to ensure the water our customers receive is of the highest quality.
- Promote the health benefits of drinking tap water.

Our performance

As outlined in Table 37 below, we achieved 100 per cent compliance with the Victorian Safe Drinking Water Regulations (2015). Compliance was measured based on the Essential Services Commission's indicators as follows:

- Zero notifications of non-complying water supplied in accordance with Section 18 of the Safe Drinking Act 2003.
- Zero non-conformances found in the Drinking Water Risk Management Plan regulatory audit, referred to in Section 10 of the Safe Drinking Water Act 2003.

Outcome	Measure		2018-19	2019-20	2020-21	2021-22	2022-23 (forecast)
Safe drinking water	Compliance with Safe Drinking Water Regulations	Target	100%	100%	100%	100%	100%
		Result	100%	100%	100%	100%	100%

Table 37: 2018-23 performance – customer outcome 'safe drinking water'

What we did

In accordance with the regulations, we used a preventative risk management system based on a Hazard Analysis and Critical Control Point (HACCP) process to ensure water quality wasn't compromised. Importantly, our risk assessments and controls aimed for multiple barriers, as well as preventative and proactive planning and management consistent with the Australian Drinking Water Guidelines¹³².

We implemented a comprehensive water quality monitoring program to verify the quality of water we supplied to our customers. This included testing our water for the following three

¹³² National Health and Medical Research Council, Australian Drinking Water Guidelines (2011).

water quality parameters specified in the Regulations as well as a range of other parameters that may pose a risk to human health:

- Escherichia coli bacteria (E.coli) – generally found in the intestines of humans, birds and animals. E.coli is an indicator for potential contamination in the water supply.
- Trihalomethanes (THM) – a disinfection by-product that forms when natural organic matter in the water reacts with chlorine.
- Turbidity – a measure of water clarity which describes the amount of light scattered or blocked by suspended particles in a water sample. Clear water has low turbidity and cloudy or murky water has a higher turbidity.

To ensure the quality of our water met our regulatory obligations and customer expectations, over the last four years we:

- Monitored and tested the water from over 1,200 randomly selected sample taps in 34 different water quality zones annually – an independent laboratory collected and tested over 7,000 water samples for us each year.
- Installed around 60 new sample taps each year (in line with population growth) and maintained or replaced between 50 to 150 taps per year, to enable sampling and testing of the water in accordance with our monitoring program.
- Conducted proactive risk-based inspections and maintenance of our water storage tanks each year, as well as carried out major upgrades as required (e.g. the Panton Hill storage tanks were replaced with a new tank as they were in poor condition and reaching the end of their asset life).
- Installed 14 additional secondary chlorinators with real time monitoring equipment to provide an additional disinfection barrier at our water storage tank sites to ensure we continue to maintain a multi-barrier approach to water quality.
- Completed over 45,000 water audits in areas with recycled water to prevent cross connections with the drinking water network.
- Cleaned hundreds of kilometres of water mains (around 500-600km each year), removing natural sediment that can cause complaints about discoloured water.
- Installed around 30 particle dispersion devices in dead end streets each year. These devices keep the natural sediment in suspension in these low flow areas, thereby reducing complaints about discoloured water.
- Resolved customer complaints and escalated ongoing issues to our dedicated Case Management Team.

As Melbourne Water is responsible for treating and supplying drinking water to Yarra Valley Water¹³³, we also:

- Worked closely with Melbourne Water to review its risk framework to ensure water quality risk management is seamless from catchment to tap.
- Commenced the process to review and update the Bulk Water Supply Agreement to improve the quality of drinking water supplied to us.

¹³³ Melbourne Water is responsible for catchment management, primary treatment and supply of drinking water to the metropolitan retailers (including Yarra Valley Water) in accordance with the Bulk Water Supply Agreement (1999). Yarra Valley Water is responsible for distributing the drinking water through a dedicated network to customers and maintaining its quality.

What we've learnt and how we've adapted

We work to continuously apply our learnings to improve the quality of water supplied to our customers.

Drinking water storage tanks

Tanks are a high-risk asset for the protection of water quality as even tiny breaches in asset integrity can allow microbiological contamination of the water supply to occur. Following historical detection of E.coli in some of our drinking water tanks, coupled with changes in the Safe Drinking Water Regulations in 2015, we undertook a comprehensive review and upgrade of our tank programs. This included developing a risk-based prioritisation tool that considered water quality results and the structural condition of our tanks to inform our inspection, maintenance and cleaning program. As a result, we haven't had any water quality failures in our tanks since 2015-16.

In the 2023-28 regulatory period, we plan to introduce further visual and remote inspections of our high-risk tank roofs (that is, roofs made of light gauge material or in close proximity to trees) to proactively prepare for, and minimise impacts from, severe weather events which are occurring more regularly due to climate change. We're also investigating the use of drone technologies for tank roof inspections.

Disinfection residuals

Maintaining a reliable disinfection residual (in our case chlorine) throughout the distribution system is important – it inhibits growth of biofilms and can provide a barrier against harmful organisms that may enter the system in the event of a short-term failure of another barrier. As chlorine levels decay (reduce) over time, secondary chlorinators are typically required in large and complex pipe networks to boost chlorine levels.

The Australian Drinking Water Guidelines and World Health Organization Guidelines for Drinking Water Quality (2017) recommend a minimum chlorine disinfection residual of 0.2 mg/L¹³⁴. This is challenging to achieve throughout our whole distribution system due to its size and complexity, and because of the higher levels of natural sediment in around 80 per cent of the water Melbourne Water supplies to us, as it's unfiltered.

However, we're working to continually adapt and improve our disinfection residual levels. In the 2018-23 regulatory period, we're installing secondary chlorinators at 14 drinking water tank sites, which will bring our total number of chlorinators to 34.

During 2023-28, we plan to install more secondary chlorinators in our network and scale up our mains cleaning program, as removing the natural sediment from the water improves the efficiency of the chlorination process.

Managing water quality incidents

In 2020 and 2021, two drinking water quality incidents were triggered by severe weather events (storms), requiring us to issue precautionary drinking water advisories. During both events, after issuing the advisory notices, extensive water quality testing was completed. No

¹³⁴ It is important to note that this is a preferred or recommended guideline level not a mandatory requirement, as it is acknowledged that in large and complex systems it is not always practical to achieve. High chlorine residual levels (above 0.6mg/L) can cause taste and odours in the water.

contaminants were found, confirming the water was safe to drink. The number of severe weather incidents is expected to increase in the future due to climate change.

We've made improvements to our incident response and contingency plans, incorporating our learnings from managing these recent incidents and appointed an emergency management coordinator in March 2021. We've worked with Melbourne Water, South East Water and Greater Western Water to make sure our plans are holistic and cohesive given the integrated nature of our water supply system.

A key learning from the two water quality incidents is that Melbourne's water sector needs improved capability to understand water quality in real time. Real time information will inform rapid risk assessments and decision making during incidents, including issuing and rescinding drinking water advisories.

To ensure improved performance in this area, we jointly developed an Online Water Quality Sensor strategy with the other Melbourne metropolitan water companies. We also started trialling different sensor technologies to inform the prudent and efficient installation of permanent water quality sensors across our network in during 2023-28.

We continue to work closely with the Victorian Department of Health (DH), the other metropolitan water companies and the Department of Environment, Land, Water and Planning (DELWP) to progress other improvement opportunities identified during water quality incidents.

Other

Through our ongoing review processes, we identified various areas for improvement including the way we deliver training and how we work with our partners to manage water quality risks. We're redesigning our water quality training into relevant online modules so it's more accessible and engaging, and relevant to different areas and roles across our business. We're improving how we articulate the minimum controls we expect contractors and developers to adopt to manage water quality risk. This work will continue in 2023-28.

Reliable water and sewerage services

Our customers expect water and sewerage services they can rely on. Customers want us to invest in maintaining our current service levels, but in a way that doesn't increase their bills. They want to know they can depend on us, and they want us to deal with repeat interruptions – three interruptions are considered a repeat.

While customers recognise the increasing pressure on water and sewerage networks due to Melbourne's growing population, they want reassurance that we're planning for both now and the future.

Since 2018-19, we have worked towards the target of less than 0.96 per cent of customers experiencing three or more unexpected interruptions in 12 months. We set the target of 0.96 per cent based on the average number of unexpected interruptions over a five-year period, on a rolling five-year average basis. This minimises the impact of significant weather variations.

To achieve this target, we promised customers we'd:

- Continue to replace ageing water and sewerage pipes.
- Undertake ongoing maintenance programs across our water and sewerage network.
- Deliver water that meets minimum flow rates set out in our customer charters.
- Complete major projects to provide water and sewerage services to new customers.
- Fully investigate any sewage spills that occur within a customer's property and support customers to minimise issues in the future.
- Manage customer complaints when customers contact us and support customers until any ongoing issues are resolved.

Our performance

Table 38 below outlines our performance for the outcome 'reliable water and sewerage services' achieved over the 2018-23 period.

Outcome	Measure		2018-19	2019-20	2020-21	2021-22	2022-23 (forecast)
Reliable water and sewerage services	Customers who experience three or more unplanned water interruptions or three or more sewerage service interruptions in 12 months (5-year rolling average)	Target	0.96%	0.96%	0.96%	0.96%	0.96%
		Result	0.94%	0.98%	0.98%	0.88%	0.84%

Table 38: 2018-23 performance – customer outcome 'reliable water and sewerage services'

As we didn't meet our rolling five-year average target of 0.96 per cent in 2019-20 and 2020-21, we returned \$3 million to customers (\$1.5 million per unmet target¹³⁵), via reduced prices in the subsequent years, as promised in our price submission for 2018 to 2023.

¹³⁵ January 2019\$ - equivalent to \$1.65 million in January 2023\$

What we did

To ensure our customers have reliable water and sewerage services, we targeted high failure areas which impact customers.

In the last four years we:

- Renewed 212km of ageing and poor performing water reticulation and distribution mains.
- Renewed 201km of ageing and poor performing sewerage pipes.
- Installed over 2,300 water valves to reduce the potential number of customers whose water could be disrupted.
- Inspected 705km of sewerage pipes to assess their condition and identify potential blockages.
- Inspected 4,822 house connection sewer branches to check the integrity of the pipes.
- Renewed more than 5,243 house connection sewer branches.
- Rectified over 2,830 valves and 1,060 hydrants to reduce the potential number of customers whose water could be disrupted.
- Proved the location of over 4,430 valves and 2,510 hydrants that had been buried or moved, to reduce the number of customers whose water could potentially be disrupted.
- Identified areas with only a single source of water supply where we could introduce an extra back-up source of water to reduce customer impacts when interruptions occur.
- Continued trialling a failure prediction model in the field, using machine learning techniques to increase the likelihood of identifying water and sewerage pipes that need replacing, before they fail.
- Reviewed our delivery processes to identify quality and efficiency improvement opportunities.

What we've learnt and how we've adapted

We work to continuously apply our learnings and innovations to improve the reliability of service to our customers. Some examples in the 2018-23 regulatory period to date include:

- Exploring new technologies and methods that allow us to fix pipes without turning off customers' water in some situations. An example is implementing the hydrant capping and hydrant wizard process for fixing water pipe and hydrant leaks. These processes, where applicable, provide alternatives for otherwise expensive and disruptive shutdowns and have prevented more than 10,000 unplanned customer interruptions in the last four years.
- Exploring climate change impacts on our water and sewer assets. We engaged a specialised consultant, XDI, to undertake a climate change vulnerability and resilience study of our service assets in the Healesville area. The study revealed indicative changes in risk for different climate impacts over time, including a potential three-fold increase in the risk of pipe failures in the Healesville area by the year 2100 due to the impact of climate change. We'd like to confirm through further studies if these results can be extrapolated across our operating areas or whether we need to do the study for our whole region. We'll use this information to form adaptive plans and mitigations in the future.
- Uplifting our large water pipe condition assessment capability and capacity to better inform our renewal plans for these critical assets. With an ageing infrastructure base

and a large cohort of distribution mains anticipated to reach the end of their design life over the next 30 to 40 years, it's imperative we have the right information to ensure we can plan for these replacements in a prudent and efficient manner to ensure the continued reliability of water supply and minimal disruptions.

- Improving our desktop risk assessment process for sewer pipes to enable us to inspect and rectify assets that are more likely to cause failures.
- Implementing targeted proactive cleaning programs for high-risk sewer mains and maintenance holes to prevent sewer overflows which impact both customers and the environment.
- Improving how we track the significant challenges accessing many maintenance holes that are buried, obstructed or in private properties. We're also implementing processes that will facilitate improved access to mains at risk of failure, so they can be inspected and rehabilitated if required.

Timely response and restoration

Customers expect a fast response and effective restoration of their service when they're interrupted. They told us that interruptions lasting four hours or more aren't satisfactory and since 2018-19, we've worked towards restoring 91.1 per cent of customers' water or sewerage service within four hours.

Based on customers' feedback, there are a number of things we've done to lessen the inconvenience of their water or sewerage services being disrupted, including:

- Providing fault response and restoration services including:
 - A 24-hour faults phone line.
 - A call back program to get feedback from customers about their experience.
 - An online fault map that provides up to date information in a readily accessible way.
- Restoring water or sewerage services within four hours.
- Containing all sewage spills in the house within one hour, and containing sewage spills on the property within four hours.
- Providing greater notification and information, and minimising customer inconvenience by:
 - Providing a week's advance notice of a planned interruption.
 - Not planning to turn off water and sewerage services between 5am and 9am, and 5pm and 11pm.
 - Providing a more accurate estimated time of arrival and completion of works.
 - Notifying customers when works are completed.
 - Providing easy access to alternate water supplies.

Our performance

Table 39 below outlines the performance over the 2018-23 period for the outcome ‘timely response and restoration’.

Outcome	Measure		2018-19	2019-20	2020-21	2021-22	2022-23 (forecast)
Timely response and restoration	Customers whose interrupted service (water and sewerage) has been restored with four hours	Target	91.1%	91.1%	91.1%	91.1%	91.1%
		Result	93.9%	95.1%	96.7%	96.1%	94.0%

Table 39: 2018-23 performance – customer outcome ‘timely response and restoration’

What we did

Our goal is to turn water and sewerage services back on as quickly as possible, and our benchmark is to do this within four hours.

The seasonal challenge of getting to, and fixing emergency bursts and leaks quickly, is ongoing as Melbourne experiences greater climate variability. To get on top of this, we continued to focus on service improvements, adjusting processes and procedures to a best practice level and implemented further training and awareness for our staff and contractors’ staff.

To meet this target, over the last four years we:

- Worked closely with our delivery partners to improve their notification and works management performance, which meant customers’ water or sewerage services were restored sooner. In 2021-22, on average we restored water supply following an unplanned interruption within 1.5 hours and sewer blockages within 1.8 hours.
- Established a seasonal escalation strategy to improve how we manage significant volumes of faults and their impact on customers. The strategy focused on improving forecasting, resourcing, addressing logistics and workflow coordination.
- Set up a jeopardy management function to ensure timely intervention in work approaching the four-hour limit, and to support responding to incidents.
- Added and maintained more skilled crews over summer to fix the higher number of emergency bursts and leaks – as warm and dry conditions lead to pipes bursting and leaking more.
- Maintained our focus on sewer blockages to reduce the risk of customers experiencing repeat blockages. This included improving field data analysis and the scheduling of planned and reactive maintenance works.
- Started sending proactive SMS communication in response to customers’ feedback that they want to be kept up to date if their water or sewerage services are impacted – we sent over 800,000 SMS in 2021-22 alone. The SMS:
 - Updates customers who report the fault so they know when it’ll be investigated, when it’s repaired and when the local area will be restored.
 - Updates or reminds residential customers when their water has been turned off due to an emergency or when undertaking a planned repair.

- Updated our online faults map in the following ways, leading to customers accessing faults and interruption information over 99,000 times:
 - Included an additional layer of information to improve its accuracy and usefulness to customers and ensure it's accessible for people with disabilities.
 - Included more real time information about planned water and sewer works to give customers up to date information – data from over 95 per cent of our field works now flows through in near real time. This led to a reduced number of calls about these works as customers were able to access information easily for themselves.
- Started using the Snap Send Solve app to make it easier for people to report faults and issues while on the go – over 6,500 customers made fault reports via Snap Send Solve rather than calling us.
- Introduced PipeTracker, a mobile-friendly website which allows plumbers to check our asset map on mobile phones. This makes it quicker and easier for plumbers to identify sewer points when diagnosing blockages on customer premises, enabling them to restore services sooner.

What we've learnt and how we've adapted

Our learnings in the 2018-23 regulatory period include:

- Strengthening our resource planning, forecasting and service improvement strategies through implementing shared performance reporting with our maintenance delivery partners.
- Developing more agile escalation triggers through improving our understanding of our customers, staff, and maintenance partners' experience through journey mapping.
- Improving clarity around emergency fault prioritisation for field staff, through a deeper review of the scope of specific repair works.
- Enabling longer-term strategic planning across the contract life through establishing continuous improvement key performance indicators.
- Taking learnings into new contracts and partner frameworks to ensure we continue focusing on achieving outcomes customers tell us are important and a valued aspect of the service we provide.

Fair access and assistance for all

Customers told us they value us supporting customers who have difficulty paying their bill. Customers also expect us to improve awareness of, and access to, the support options available to customers experiencing financial difficulty. To meet this target, we promised customers we would:

- Expand our WaterCare program over five years to reach 150,000 new customers who face barriers, such as language, to accessing our support services.
- Not restrict a customer’s water supply without first understanding their ability to pay.
- Provide programs for customers who experience difficulty paying and who have difficulty accessing our services, including culturally and linguistically diverse communities.
- Partner with other organisations to ensure customers can access broader support services.
- Provide customers with a variety of payment options that suit their circumstances.

Since 2018-19, we’ve worked towards achieving the target of 89 per cent of customers, who’ve accessed our hardship and support services, believe that we help customers experiencing difficulty paying for their water and sewerage services.

Our performance

Table 40 below outlines our performance over the 2018-23 period for the customer outcome ‘fair access and assistance for all’.

Outcome	Measure		2018-19	2019-20	2020-21	2021-22	2022-23 (forecast)
Fair access and assistance for all	Customers who, having accessed our support programs, believe Yarra Valley Water helps customers experiencing difficulty paying for their water and sewerage services	Target	89%	89%	89%	89%	89%
		Result	89%	90%	94%	93%	89%

Table 40: 2018-23 performance – customer outcome ‘fair access and assistance for all’

What we did

Our long-running WaterCare program offers a range of options to support customers who are experiencing difficulty managing their bills based on their unique circumstances – from enabling access to entitlements such as concessions and giving support to use water efficiently, to accessing government grants and setting up affordable payment plans.

Since April 2018, we’ve:

- Worked with 33,833 customers experiencing vulnerability.
- Helped transition 19,625 customers back to mainstream payments after a period of hardship.

- Facilitated a 92 per cent increase in the number of Utility Relief Grant (URG) applications approved for customers by the Department of Family, Fairness and Housing (DFFH). This equates to over \$10 million awarded to our customers over the last four years. We've taken more of a concierge approach to URG applications – taking the time to complete application forms while on the phone with customers and submitting on their behalf, and proactively contacting eligible customers.
- Built on our ongoing engagement and outreach programs by running an integrated, multi-channel campaign to drive awareness and consideration of the WaterCare program, and reach people in effective and relevant ways.

We've made significant changes to our debt collection approach:

- In response to the COVID-19 pandemic, and in line with the National Cabinet Principles and the Essential Service Commission's updated Customer Service Code, in early 2020 we stopped restricting customers' water supply and subsequently removed all existing water restrictions. We also modified our bill and reminder notice with a focus towards financial assistance – 'We're here to help'.
- We started engaging with customers earlier in the debt collection process to better understand their circumstances. We ran a pilot visiting customers at home before transferring their debt to a third-party agency, and proactively contacted customers in debt who'd stopped engaging with us.
- We commenced work on a predictive model for hardship to further strengthen our ability to engage customers early in the debt cycle.

We've evolved our support offering to customers, including for culturally and linguistically diverse customers. For example, we:

- Renewed our language services contract to include spoken interpreting and written translations. We also identified and implemented system improvements to enhance this service.
- Actively sought to strengthen the cultural diversity within our customer facing teams.
- Strengthened our staff's capability to engage and respond effectively through training including Aboriginal cultural awareness training; cultural awareness and responsive training with Brotherhood of St Laurence to better understand the journey and experience of settlement for refugees, asylum seekers and migrants; disability awareness training with Scope; Pride in Diversity training and family violence training (including refresher training and working with perpetrators).
- Improved our online self-service offering to include registering concessions and applying for URGs. To achieve this, we worked with DFFH to improve the URG process and updated our systems accordingly.
- Updated policies around debt deferrals and relief including for debt incurred by victim survivors of family violence.
- Invested in system and process improvements to provide a better customer experience, minimise administrative tasks for the specialist WaterCare team and address customers' pain points such as more accurate call routing, updating contact details and checking concession eligibility.
- Conducted research with people with lower English literacy to understand what access and inclusion means to them, and the barriers they face engaging with us.

In response to COVID-19, we revised our processes and developed new support packages to suit customers' changing circumstances and needs. Key actions included:

- Payment extensions up to six months, with a further two years after that to pay the balance.
- Adjustments for customers who used more water due to the directive to stay at home.
- Alerting customers, including refugees and asylum seekers who weren't eligible for other government support or assistance programs, to Utility Relief Grants.
- Affording extra flexibility for rental providers (landlords) whose rental income was impacted due to the moratorium on evictions.
- Waiving trade waste fees and reducing system charges for small business customers.
- Training new staff to ensure we were sufficiently resourced in anticipation of higher call volumes and requests for support.
- Rolling out refresher family violence training for front line staff due to the heightened risk during COVID-19 lockdowns.
- Engaging regularly with community partners, including our Community Advisory Group, to discuss our evolving support approach – to draw on their insights and receive feedback on our approach.

Since 2018-19, we've partnered with a range of organisations to ensure customers can access broader support beyond our organisation. Some key initiatives are:

- The CareRing referral program – we refer over 400 customers a year through CareRing to financial counselling; employment coaching; family violence support and other family services; drug, alcohol, gambling and other addiction support services; housing support and energy advocacy.
- The One Stop One Story Hub – the Hub helps Australians experiencing vulnerability to more easily connect to support across a range of essential services, without having to individually contact multiple organisations. We co-designed the Hub alongside the Thriving Communities Partnership (TCP), Telstra, Commonwealth Bank of Australia, Transurban, Sydney Water and community partners including Anglicare Victoria, Brotherhood of St Laurence, Salvation Army and Westjustice.
- Working closely with recovery agencies and emergency relief networks to promote our support options to customers in the Dandenong Ranges who were impacted by the severe storm in June 2021.

What we've learnt and how we've adapted

- We need to consistently work to overcome the lack of awareness about Yarra Valley Water, our services and the support we offer.
- We need to continue addressing barriers to inclusion and access – such as ensuring accessible and inclusive communications, normalising seeking support to address the shame and stigma associated with seeking help, and understanding and accommodating the specific needs of different communities.
- Continuing to invest in a diverse workforce and key capabilities in inclusion, vulnerability and accessibility is essential to accurately reflect the customers we serve.
- A steady and sustained approach to building community partnerships and relationships based on trust is crucial to deliver significant outcomes for at risk individuals and communities.

Water availability and conservation

Our customers value saving water now so it’s available in the future. They support a more proactive approach to saving water through:

- Reducing water losses in our network.
- Increasing education and awareness about saving water.
- Supporting community-based decision making and community events to encourage efficient use of water.
- Greater use of recycled water and stormwater.

To reflect these expectations, we set a total water use target of 210 litres per person per day by 2023.

To meet this target, we committed to:

- Provide targeted water saving education programs for customers and the community.
- Undertake a proactive program that identifies and fixes undetected leaks in our network.
- Provide recycled water to homes and businesses where it’s practical to do so.
- Support community-based decision making, and working with stakeholders to ensure the best water resource management at a community level.
- Understand and plan for short, medium, and long-term demand and supply needs at a local and wider community level.

Our performance

Table 41 below summarises our performance for the customer outcome ‘water availability and conservation’ over the 2018-23 period.

Outcome	Measure		2018-19	2019-20	2020-21	2021-22	2022-23 (forecast)
Water availability and conservation	Total water use (litres/per person/per day)	Target	221	217	213	211	210
		Result	233	221	214	219	222

Table 41: 2018-23 performance – customer outcome ‘water availability and conservation’

As we didn’t meet our litres/ per person/ per day target from 2018-19 to 2021-22, we returned \$6 million to customers (\$1.5 million¹³⁶ per unmet target) via reduced prices in the following years’ prices, as promised in our price submission for 2018 to 2023.

What we did

This target reflects our customers’ expectations that we achieve ongoing efficiencies to help save water now for the future. Our ambitious water saving target is a holistic measure comprising the water we buy from Melbourne Water, the water customers use at home and

¹³⁶ January 2019\$ - equivalent to \$1.65 million in January 2023\$

at work, water used for firefighting, and water lost due to system leakage, bursts and leaking pipes.

Although we haven't met our annual target we've seen a decrease in water use.

We undertook the following programs and initiatives in support of meeting this target:

- Successfully launched the industry-wide Make Every Drop Count campaign to encourage simple water saving measures at home. Results from the campaign reveal awareness significantly increased with over 50 per cent of customers indicating they took or will take action.
- Worked towards providing recycled water to over 40,000 properties by extending the recycled water main network to over 680km.
- Proactively identified leaks in 9,500km of water mains which saved over 3.5 billion litres of water.
- Installed 296 network flow and pressure monitoring devices in our water supply network to identify network leaks which haven't been observed.
- Successfully ran a campaign, Shower Shorter Save Water, educating customers about the impact showers have on household water consumption and that reducing time spent in the shower can generate significant water savings. 60 per cent of respondents who recalled the campaign claimed to have deliberately taken shorter showers since seeing the ad.
- Developed and launched the Water Watchers campaign and education program – a multi-pronged intervention which spans advertising, a themed school incursion program and the creation of a water saving reminder device that people place on their fixtures at home. Evaluation research respondents who installed a Water Watcher six weeks before participating in the survey claimed to be using less water.
- Successfully piloted a showerhead replacement program with 1,000 ultra low flow water efficient showerheads provided to customers. The showerheads were provided free of charge and were only able to be advertised to two suburbs for a few days before the allocation was exhausted, suggesting that demand far exceeded supply. Through the study we learnt that the majority of customers found the experience of using the showerhead satisfying and that most customers are happy to install them themselves. Further research is being undertaken in conjunction with the University of Queensland, Monash University and South East Water into the household water and energy savings that could be achieved with ultra low flow showerheads.
- Participated in the Community Housing Retrofit Program which has completed over 300 audits since 2018 and replaced over 600 showerheads, 400 toilets, rectified over 2,000 drips and leaks and repaired or replaced 200 hot water systems across Melbourne. The program has saved around 40 megalitres of water a year. We also ran a community water efficiency program over two years to support community organisations to upgrade their plumbing, fixtures and fittings to improve water efficiency and raise awareness about conserving water and energy. Over two years, we supported 39 organisations across our service area including community gardens, disability service providers and community centres.
- Piloted the use of the water blade – a water efficient fitting for taps – in residential accommodation settings such as aged care, education and community facilities resulting in an eight per cent reduction in water use.

- Onboarded more than 80 more schools in our service area to join the Victorian Government's School Water Efficiency Program, which encourages schools to use technology to track their water use. We now have more than 300 schools involved that have collectively saved over 1.7 billion litres of water since 2012.
- Improved reliability of our recycled water treatment plants to maximise recycled water use across the network and therefore minimise drinking water use for laundry, gardens and other suitable purposes.
- Worked with large government authorities like the North East Link and Level Crossing Removal programs to enable recycled water to be used for dust suppression rather than drinking water.
- Trained several staff on water efficiency to better support and inform business customers how they can save water.
- Executed smaller water efficiency campaigns, including Saved It, a partnership with Phillip Withers (renowned for sustainable landscape design), Melbourne Museum school holidays program, Bunnings school holiday stations and pop ups at shopping centres.
- Submitted planning and environmental application approvals for the Doncaster Hill recycled water scheme that will supply 5000 properties and local parks and grounds with recycled water and reduce consumption from the drinking water network.
- Partnered with Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation; Hume, Whittlesea and Mitchell councils; Melbourne Water and the Victorian Planning Authority to develop a draft integrated water management (IWM) plan for the Upper Merri Creek sub-catchment. We're now applying the same innovative approach in other sub-catchments across our service area.
- Collaborated with the other metropolitan water corporations to produce a single joint urban water and system strategy for Melbourne. Known as Water for Life, this strategy outlines plans for securing water supplies over the next 50 years, including specific actions for the next five years. Collectively, we invited community members to share their thoughts and ideas through an online survey and a series of public workshops. The strategy will be finalised in 2022. We're working with DELWP to integrate Water for Life with their Central and Gippsland Region Sustainable Water Strategy (CGRSWS). The CGRSWS takes a 50-year planning view for the wider region's water security and looks at how water is shared among multiple users.

What we've learnt and how we've adapted

In the first four years of the 2018-23 regulatory period, we've learnt a great deal about what our customers value when it comes to water conservation, how to communicate more effectively with customers and how to manage a sustainable and increasingly effective leak reduction program. Specific learnings include:

- There's a high return on investment for television advertising influencing mass awareness (seen during the Make Every Drop Count campaign) but without regular messaging, water availability and conservation are not front of mind for customers. Customers assume they'll hear from us if there's a problem. We propose to continue with broad awareness campaigns and in the case of acute water resource issues, increase expenditure further.
- Customers want to know how to save water but they also want it made easy for them. They see incentives in other areas, like the Victorian solar energy rebates, and wonder what the equivalent is for saving water.

- Due to COVID-19, the government has delivered far more accessible communications to the community than what water companies typically provide, including Auslan interpreters, translation and messaging via culturally and linguistically diverse community leaders. This is now the context against which the community will view our future communications and engagement.
- Due to COVID-19, the government has communicated far more, including many requests and instructions, than in previous years. We've adapted our communications to avoid competing with government messaging and in recognition that customers are already being called to action and asked to change behaviours in so many other aspects of their lives.
- There's value in segmentation and a targeted communications approach to specific audiences.
- There's a need to conduct ongoing customer research to track changing awareness and attitudes.
- It's critical to have flexible solutions that are feasible and effective in lockdown scenarios.
- There's an opportunity to expand our efforts in primary school education programs with a scalable digital solution alongside face-to-face incursions.
- Uptake of recycled water in some cases is limited particularly in culturally and linguistically diverse households. This suggests customers have concerns and trust issues about using recycled water outdoors and indoors, albeit in limited ways.
- Sometimes business customers need some guidance and support to find operational efficiencies in the use of water.
- Many opportunities arise in promoting smart water usage through other projects, programs and operational activities like water bills and field signage.
- There's a high return in reducing our network leakage with the active leak detection and district metering area programs. We've found that the expenditure per megalitre of water leaks found through these programs is very effective and we therefore plan to continue these programs over the next five years and believe we will become even more efficient.
- Maintenance programs for instrumentation and field assets installed to improve network leakage will require longer-term asset lifecycle management and maintenance.
- Integrating and operating the recycled water network as part of our normal business activities is crucial to improving the reliability and efficiency of the third pipe network.

Modern flexible service

Our customers value modern, flexible services and advice that suits their needs. The experience they have with other service providers such as banks, internet, mobile and energy companies, sets the benchmark and dictates what they expect from us.

In 2017, customers told us they support a more flexible and tailored service from us through:

- Incentivising customers to move to e-bills and pay by direct debit, to reduce the environmental impacts of producing paper bills.
- Providing more timely water use information by installing digital water meters for all customers, to help change behaviour and protect our natural resource.
- Increasing education and awareness about all aspects of our services.

To reflect the intent of customers' expectations, in 2018-19 we implemented the target that 86 per cent of customers say they're satisfied with their most recent interaction with us.

To meet this target, we committed to:

- Giving customers a discount when they chose to receive bills by email and pay by direct debit.
- Trialling digital water meters to enable a full scale roll-out when the technology was ready.
- Maintaining a local customer contact centre supported by various online options.
- Providing a range of payment options and channels, allowing customers to manage their payments in ways which suit them.
- Using fair and equitable debt management and collection approaches, to ensure customers who are unable to pay are identified early and supported.
- Developing targeted communications for a variety of customer segments including developers, builders, plumbers and those with trade waste agreements.
- Providing rebates to customers where we haven't met guaranteed service levels.
- Understanding customer needs and expectations to continually improve our services including customers who have traditionally been hard to reach.

Our performance

Table 42 below provides a summary of our performance over the 2018-23 period associated with the customer outcome 'modern flexible service'.

Outcome	Measure		2018-19	2019-20	2020-21	2021-22	2022-23 (forecast)
Modern flexible service	Customers who are satisfied with their most recent interaction with us	Target	86%	86%	86%	86%	86%
		Result	82%	87%	87%	88%	86%

Table 42: 2018-23 performance – customer outcome 'modern flexible service'

As we didn't meet this target in 2018-19, we returned \$1.5 million¹³⁷ to customers, via reduced prices in 2019-20, as promised in our price submission for 2018 to 2023.

What we did

We're committed to providing the best service possible to our customers, creating great experiences, and ensuring customers are satisfied with every interaction they have with us.

In the last four years, we took the following action to work towards and meet this target:

- Introduced a post call survey for customers to give immediate feedback about their experience with our team.
- Gave customers the opportunity to request a call back if they felt their issue wasn't satisfactorily resolved.
- Centralised the management of emergency and fault calls so that our staff can provide specialist support and assistance to customers.
- Reinstated direct debit by credit card as a payment option, resolving a major and enduring cause of customer dissatisfaction.
- Established a common approach for managing complaints across the organisation to ensure we resolve them in a consistent way.
- Removed customer pain points, improved communication with customers, and made it easier for customers to get what they need from us in the following areas:
 - Improved functionality of our website.
 - Introduced proactive communications to make customers aware of potential water supply issues.
 - Simplified online and phone self-service options.
 - Partnered with Snap Send Solve to enable customers to report issues more easily.
 - Implemented new systems to speed up the turnaround time of repairs out in the field and reduce impacts to customers.
 - Identified the key drivers of avoidable contacts to the call centre and eliminated 50 per cent of calls about changing tenants.
 - Optimised interactions by reducing call handling times within our call centre.
- During 2019-21, we significantly deepened our understanding of the customer experience, enabling us to identify priority customer pain points and integrate this understanding into our decision making. We conducted an in-depth review and analysis that led to the creation of customer experience journey maps for 90 of our services. This has provided us with in-depth, quantitative and qualitative insights into how customers currently experience our services and what's most important to them.
- Two examples of customer experience management ensuring customer outcomes are met are the service design projects for our My Account and Land Development Portal replacement projects. Through embedding customer research and human centred service design capability into the projects, as well as scenario mapping, prototyping and iterating the design, both projects have maximised customer benefits along with efficiency gains.

¹³⁷ January 2019\$ - equivalent to \$1.65 million in January 2023\$

- Improved the water mains renewal customer experience delivering improvements and efficiencies to customer communications. The project won a Good Design Award¹³⁸.

What we've learnt and how we've adapted

The investments we've made in the 2018-23 regulatory period and into the next, have led to improvements for both the employee and customer experiences. All customer experience improvements achieved through investing in technology are designed to ultimately achieve efficiency gains and improve the service experience, supporting sustained high customer satisfaction and affordability for customers.

These investments are delivering improvements across the known drivers of customer and employee trust and satisfaction including:

- Effort
- Reliability
- Predictability
- Empathy
- Resolution
- Responsiveness
- Personalisation

A key next step in embedding customer experience management into our organisation is to introduce real time customer experience measurement capabilities. This supports maximising the benefits of our technology investments and will provide us with a more efficient, timely and cost-effective way to monitor and improve the customer experience continuously.

Care for and protect the environment

Our core services are energy intensive – we rely on electricity to pump and treat water and wastewater as well as power our head office. We currently operate close to 400 network connection points that use electricity from the grid and this carbon intensive consumption is the largest source of our emissions.

We know our services impact the environment and our customers are also aware of this impact – 85 per cent of customers tell us that caring for and protecting the environment is important to them. Furthermore, our Aboriginal communities indicate that looking after the natural environment is the most critical aspect of what we do.

As such, we pledged to reduce our reliance on fossil fuels and reduce our greenhouse gas emissions (GHG) by 64 per cent by 1 July 2025 (compared to the 2016-17 baseline). This emissions reduction pledge is our response to lessening the impact of our energy intensive core services, and limiting our contribution to climate change. Our pledge is also our pathway and commitment to using 100 per cent renewable energy by 2025.

¹³⁸ <https://good-design.org/projects/re-imagining-water-mains-renewal/>.

To achieve this, incremental steps are required each year. The year on year reductions we're aiming for, from the baseline of 34,083 tonnes CO₂e in 2016-17, are detailed in the table below.

To achieve this target, we committed to:

- Minimising our impact on the environment through reduced greenhouse gas emissions.
- Complying with our sewage treatment plant licences.
- Completing major projects to provide sewerage services to 3023 properties with failing septic tank systems through our community sewerage program.
- Reducing the impact on local waterways that may occur from treatment plant discharges and sewage spills.

Our performance

Table 43 below outlines performance over the 2018-23 period associated with the customer outcome 'care for and protect the environment'.

Outcome	Measure		2018-19	2019-20	2020-21	2021-22	2022-23 (forecast)
Care for and protect the environment	Cumulative reduction in carbon emissions compared to a baseline of 34,083 tonnes CO ₂ e in 2016-17	Target	4%	14.5%	31.5%	46.1%	52.5%
		Result	4.1%	14.7%	31.7%	46.3%	52.5%

Table 43: 2018-23 performance – customer outcome 'care for and protect the environment'

What we did

To reduce our greenhouse gas emissions by 64 per cent by 1 July 2025, in the last four years we:

- Installed 100kW solar panel systems at three sewage treatment plants (Healesville, Upper Yarra and Whittlesea) – each plant consumes more than 90 per cent of the solar energy produced by the panels with the excess returned to the grid.
- Installed 1,080 solar panels at our Mitcham head office staff car park which generates close to 30 per cent of our onsite energy needs.
- Installed a hybrid solar and battery system at our Kinglake treatment plant that's been supplying the site with renewable energy for 20 hours per day.
- Operated our waste to energy plant in Wollert at full capacity each year, diverting more than 100,000 tonnes of food waste from landfill and producing more than 23 million kilowatt hours of renewable energy. The facility powers itself as well as the adjoining sewage and recycled water treatment plants, with excess energy (about 70 per cent) exported to the grid.
- Took supply of approximately 5,700MWh per annum of renewable energy (20 per cent of our annual energy needs) from Zero Emissions Water Ltd (ZEW), which sources energy from Victoria's largest solar farm in Ouyen – a partnership we formed with 13 other Victorian water corporations in 2018-19. We'll source 20 per cent of our future energy needs from ZEW, at a cheaper rate than we could achieve from other sources.

- Upgraded the hot water systems at our head office to energy efficient heat pumps.
- Installed three 75kW electric vehicle fast chargers at our Mitcham head office to help accelerate our fleet transition to electric vehicles.
- Planned to construct a 1,296kW floating solar system at our Wallan sewage treatment plant in 2022-23 – it'll be four times the size of the solar carpark system at our Mitcham head office. The system will also improve the quality of feedstock water for our recycled water treatment plant by reducing the incidence of algal blooms in the previously uncovered storage.
- Planned and approved a second larger food waste to energy facility in Lilydale, to process food waste and create electricity. The facility will transform up to 150 tonnes of waste per day into 33,000 kWh of renewable energy – around 33 per cent of our energy needs.
- Started exploring how we can harness more energy from our first food waste to energy facility, by realising the benefits of increased biogas production.
- Conceptualised the installation of non-invasive large market ground-mounted solar systems at a further five sites across our network.

What we've learnt and how we've adapted

Our learnings in the four years of the 2018-23 regulatory period include:

- Improve energy productivity to reduce energy consumption – use less.
- Optimise energy contracts to reduce the kWh rates we're charged – pay less.
- Transition away from carbon intensive fuels towards renewables – emissions reduction.
- Investigate where the water sector fits in a new hydrogen economy – energy transition.
- Commit to 100 per cent reduction and net zero emissions from 1 July 2025 – increased ambition.

Appendix B

PREMO assessment

We propose an advanced self-rating for our submission which optimises value for customers in terms of ‘what they get’ and ‘what they pay’.

Our proposal delivers value for our customers with improved outcomes and real price decreases. Our commitments include:

- Continue to maintain our revenue cap form of price control that caps the increase in bills at 2 per cent real and in addition, a 5 per cent nominal increase cap for 2023-24 and 2024-25. This will provide customers with some relief from high nominal price increases caused by inflation. The revenue cap also ensures customers’ bills always reflect the efficient costs of service.
- Demonstrate strong commitment to deliver the six proposed customer outcomes including assessing our performance annually and returning \$1.8 million through a community rebate if we don’t achieve any of our outcomes.
- Reduce prices to reflect the financing costs saved if we defer one of our top 10 capital projects or realise unit rate efficiencies for water main renewals when these services are retendered during the 2023-28 period.
- Provide an open and transparent reporting framework that will evolve to meet the changing needs of customers.

Our self-rating for each element of the performance, risk, engagement, management and outcomes (PREMO) framework is provided in Table 44 below.

Element	Self rating
Performance	Advanced
Risk	Advanced
Engagement	Leading
Management	Advanced
Outcomes	Advanced
Overall	Advanced

Table 44: Self-assessment of each PREMO element and overall ambition

B.1 Performance

In our 2018-23 price submission, we committed to customers that we’d work to deliver what they value. This is reflected by:

- **Customer outcomes** – what customers told us they expect and value.
- **Customer perceptions** – how customers feel about us as their service provider across four important indicators – overall customer satisfaction, value for money, reputation in the community and trust.
- **Customer service levels** – associated with measures outlined in the ESC’s Customer Service Code.

Figure 30 below provides a summary of performance on customer outcomes, perceptions and service levels over the 2018-23 period.

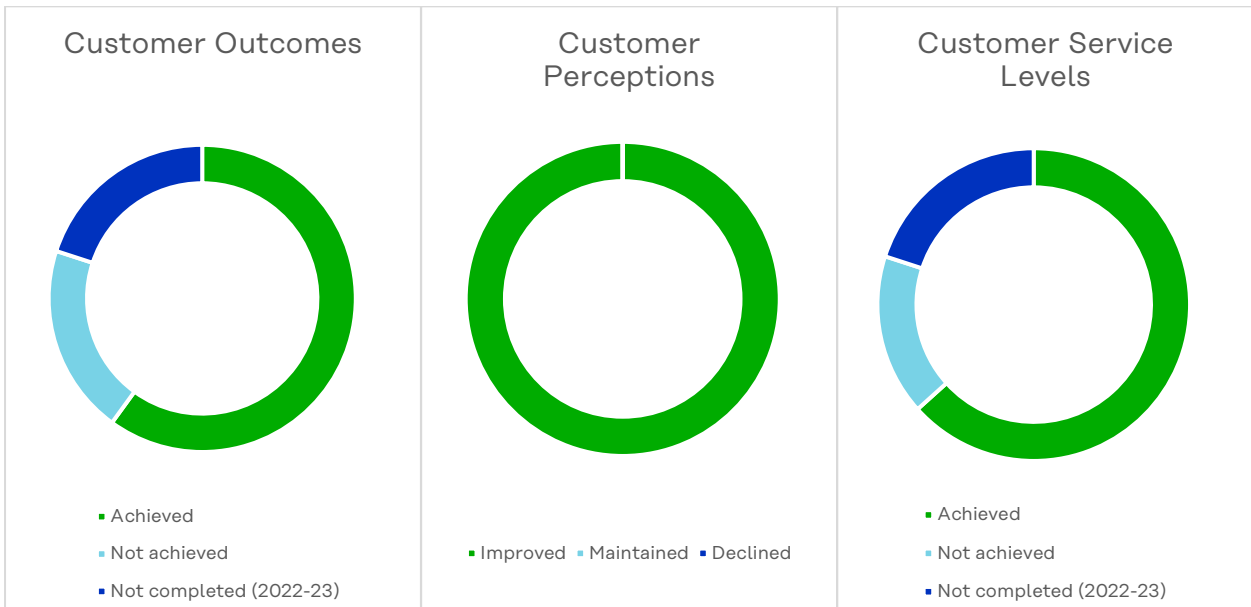


Figure 30: 2018-23 performance on customer outcomes, perceptions and service levels

These outcomes are underpinned by the investments we make to deliver our services.

B.1.1 Customer outcomes

Customer insights were the foundation of our 2018-23 submission. These insights led to the development of seven outcomes, distinguished between what’s important and what’s of value to customers.

We committed to achieving our seven outcomes and their associated measures and targets over the five-year period 2018-19 to 2022-23. We backed our commitment with a \$1.5 million¹³⁹ community rebate per outcome per year if we didn’t meet a target. We return this rebate to customers via lower prices in the following year.

To ensure we focused on achieving our outcomes, we developed specific action plans and established a monthly executive management forum to assess performance and identify actions to meet the outcomes. We also embedded our commitments in our business strategy and planning processes including regular progress reports to Board.

We report our performance annually to customers through our bill and on our website¹⁴⁰. Overall, we’ve achieved the outcomes we proposed to customers. For the first four years of the 2018-23 regulatory period, we’ve achieved 21 of 28 targets and we forecast achieving six of seven targets for 2022-23.

¹³⁹ January 2019\$ - equivalent to \$1.65 million in January 2023\$

¹⁴⁰ <https://www.yvw.com.au/performance>.

Table 45 below provides a reconciliation of the annual performance against target for each outcome over the 2018-23 period.

Outcome	Measure		2018-19	2019-20	2020-21	2021-22	2022-23 (forecast)
Safe drinking water	Compliance with Safe Drinking Water Regulations	Target	100%	100%	100%	100%	100%
		Result	100%	100%	100%	100%	100%
Reliable water and sewerage services	Customers who experienced three or more unexpected water or sewerage service interruptions in 12 months	Target	0.96%	0.96%	0.96%	0.96%	0.96%
		Result	0.94%	0.98%	0.98%	0.84%	0.84%
Timely response and restoration	Customers whose interrupted water or sewerage service was restored within four hours	Target	91.1%	91.1%	91.1%	91.1%	91.1%
		Result	93.9%	95.1%	96.7%	96.1%	94.0%
Fair access and assistance for all	Customers who have accessed our services believe we help customers experiencing difficulty paying for their water and sewerage services	Target	89%	89%	89%	89%	89%
		Result	89%	90%	94%	93%	89%
Water availability and conservation	Total water use (litres of water used per person per day)	Target	221	217	213	211	210
		Result	233	221	214	219	222 ¹⁴¹
Modern flexible service	Customers who are satisfied with their most recent interaction	Target	86%	86%	86%	86%	86%
		Result	82%	87%	87%	89%	86%
Care for and protect the environment	Cumulative reduction in carbon emissions compared to 2016-17 baseline of 34,083 tonnes CO ₂ e	Target	4%	14.5%	31.5%	46.1%	52.5%
		Result	4.1%	14.7%	31.7%	46.3%	52.5%
Number of outcomes achieved			5	5	5	6	6 (forecast)

Table 45: Annual performance 2018-19 to 2022-23

Refer to Appendix A, commencing on page 119, for further details on the specific actions we took in the first four years of 2018-23 to meet each of these outcomes.

¹⁴¹ This indicator is calculated by dividing total bulk water purchases by population to derive a per capita water use figure. The population is based on Census data and the annual forecast population growth. With the release of 2021 Census data, we've recalibrated the population denominator to account for an estimated 80,000 less people in our area.

B.1.2 Service standards

Consistent with the requirements outlined in the Customer Service Code, we proposed ten measures and targets (generally based on five-year average performance).

We've substantially delivered upon targets for key performance indicators and minimum service levels – meeting or exceeding annual targets on 80 per cent of occasions (across 12 indicators). In addition we've substantially improved the service level for five indicators, including:

- A minimum 45 per cent improvement in the average time to attend bursts and leaks (measured on 5-year average) from 43.7 minutes to 24 minutes for priority 1 events and from 87.9 minutes to 35.6 minutes and 801.7 minutes to 285.5 minutes for priority 2 and 3 events respectively.
- 42 per cent reduction in both the time taken to attend sewer spills and blockages from 82.3 minutes to 47.4 minutes, and in the average time taken to rectify a sewer blockage from 242.6 minutes to 139 minutes.

Refer to Table 46 below for a summary of performance for Customer Service Code indicators for each year during the 2018-23 period.

Customer Service Code indicators	Annual Target	2018-19	2019-20	2020-21	2021-22	2022-23 (forecast)
Average time taken to attend priority 1 bursts and leaks	43.7 minutes	22.5 minutes	23.1 minutes	24.8 minutes	25.2 minutes	25 minutes
Average time taken to attend priority 2 bursts and leaks	87.9 minutes	35.4 minutes	34.1 minutes	31.8 minutes	32.5 minutes	32.5 minutes
Average time taken to attend priority 3 bursts and leaks	801.7 minutes	265.9 minutes	253.0 minutes	196.7 minutes	235.7 minutes	250 minutes
Average time taken to restore customers' water supply – planned	127.5 minutes	113.0 minutes	117.7 minutes	112.9 minutes	109.6 minutes	127.5 minutes
Average time taken to restore customers' water supply – unplanned	110.3 minutes	95.0 minutes	105.9 minutes	97.5 minutes	105.4 minutes	107 minutes
Average time taken to attend sewer spills and blockages	82.3 minutes	54.8 minutes	43.9 minutes	37.0 minutes	38.4 minutes	43 minutes
Average time taken to rectify a sewer blockage	242.6 minutes	174.2 minutes	128.8 minutes	106.6 minutes	110.4 minutes	108 minutes
% of spills contained within five hours	97.2%	97.0%	99.0%	99.8%	99.7%	99.5%
Customers experiencing more than five unplanned water supply interruptions in any 12 month period	165	301	308	163	213	231
Customers receiving more than three sewer blockages in the year	11	174	129	107	110	139
Number of indicators achieved		7	8	9	8	8

Table 46: Annual performance of Customer Service Code measures

Consistent with customer research and engagement insights that we maintain over all service levels, we also proposed to maintain, based on a five-year average, the frequency of water and sewerage interruptions per 1,000 customers. Results for each indicator for the 2018-23 period are provided in Table 47 below.

Indicator	Annual Target	2018-19	2019-20	2020-21	2021-22	2022-23 (forecast)
Average frequency of water supply interruptions per customers	0.29	0.31	0.33	0.27	0.28	0.29
Average frequency of sewerage interruptions per customers	0.01	0.01	0.01	0.01	0.01	0.01
Number of indicators achieved		1	1	2	2	2

Table 47: Annual performance for average frequency of customer interruption measures

B.1.3 Perception measures

The ESC independently polls customers each quarter on their perceptions of value, trust, reputation and overall satisfaction. Across all measures, customers' perceptions have positively trended on a rolling 12-month average as shown in Table 48 and Figure 31 below.

	2018-19				2019-20				2020-21				2021-22				
	Sep	Dec	Feb	May	Aug	Nov	Mar	Jun	Aug	Nov	Feb	Apr	Jul	Oct	Jan	Jun	Aug
Value for money	5.8	5.9	5.8	5.9	6.0	6.0	6.2	6.3	6.3	6.4	6.3	6.4	6.6	6.6	6.8	6.7	6.5
Trust	6.3	6.4	6.4	6.5	6.6	6.6	6.8	6.9	6.8	6.9	6.9	7.0	7.2	7.2	7.3	7.2	7.0
Reputation in the community	6.4	6.5	6.4	6.6	6.6	6.6	6.8	6.9	6.9	7.0	6.9	7.0	7.2	7.1	7.3	7.2	7.1
Overall satisfaction	6.5	6.5	6.4	6.6	6.7	6.7	6.8	6.9	6.9	7.0	6.9	7.0	7.2	7.2	7.3	7.2	7.1

Table 48: Customer perception results 2018-19 to 2021-22 as measured independently by the ESC, (rolling 12-month average)

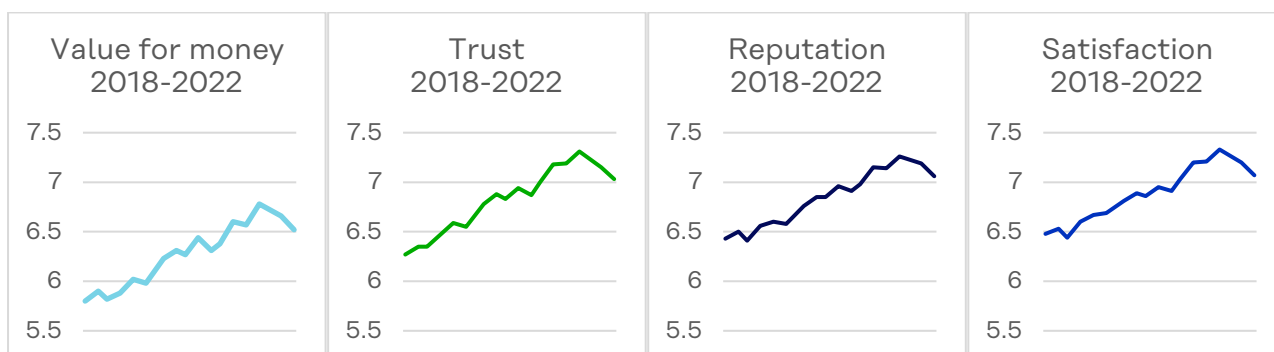


Figure 31: Trend line for individual customer perception results 2018-19 to 2021-22 as measured independently by the ESC (rolling 12-month average)

These results demonstrate we're increasingly delivering what customers and the community value. We complement the ESC's research with our own research, regularly tracking customer sentiment and experience across a number of touchpoints. Our own results are consistent with this performance.

Our comparative position among our peers has also improved over 2018-23. As of August 2022, we held top three positions (rolling 12-month average) for all indicators as shown in Figure 32 below.

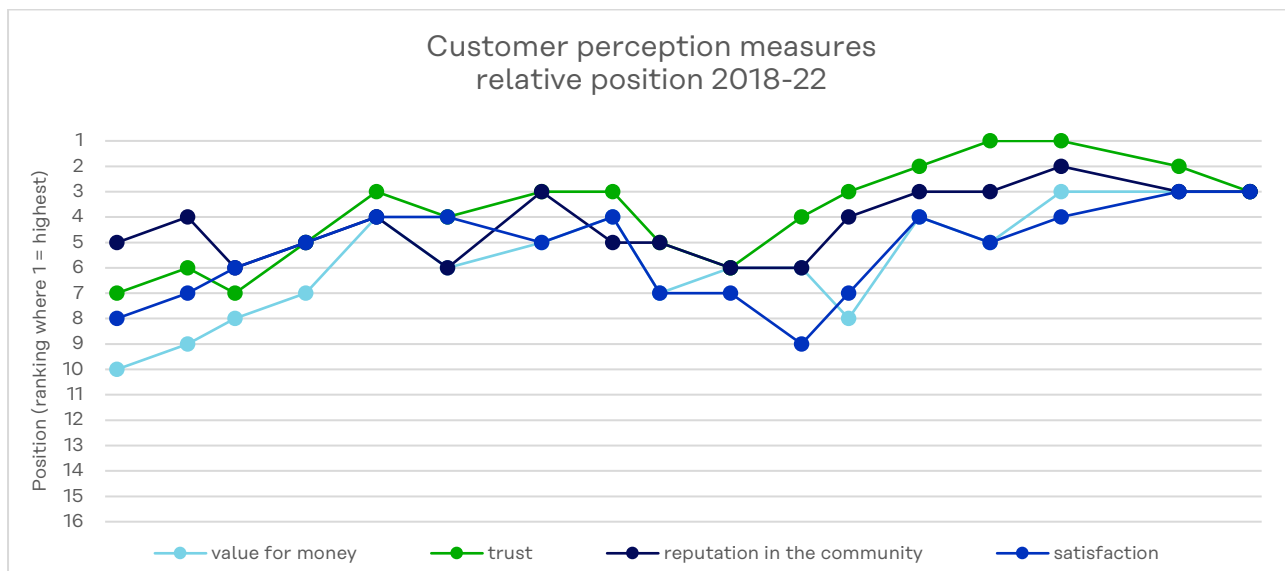


Figure 32: Our relative position (out of 16 businesses) for customer perception results 2018-19 to 2021-22 as measured independently by the ESC, using a rolling 12-month average

B.1.4 Capital delivery and expenditure

Our 2018-23 submission included specific commitments to deliver 10 high-value projects. We embedded these projects in our ongoing monitoring and reporting processes to ensure they're delivered. We're pleased to say we'll complete or be on track to complete nine projects. A specific component of the remaining project, Craigieburn flow storage and distribution hub – Stage 2, has been deliberately deferred and combined with the next stage of storage expansion to create efficiencies in delivery, leading to a better outcome for customers. This project is scheduled to be completed in early 2024-25.

Overall, we're forecast to deliver these major projects for \$247.83 million, \$8.55 million (3.3 per cent) less than the \$256.36i million we originally forecast to be spent over the 2018-23 period.

The current status of our 10 major projects is provided in Table 49 below.

Major project	Specification	Status	Performance
Lockerbie main sewer	The new 9.2km main will transfer sewage flows from Wallan into the Amaroo sewer at Kalkallo – connecting the northern section of the Northern Growth Area to the metropolitan sewerage system	Completed	\$84.95 million (-10.7 per cent)
Monbulk community sewerage program	Providing access to a pressure sewer system for 975 properties currently serviced by onsite wastewater treatment systems	In progress	\$23.35 million (- 26.9 per cent)
Doreen sewer pressure main	The 10km Doreen pressure sewer will service the growing townships of Mernda and Doreen	Completed	\$35.76 million (+14.8 per cent)
Epping branch sewer tunnel	Constructing a 2.4km deep gravity sewer to provide a link between the existing Epping branch sewer and the Merri Creek main sewer	Completed	\$25.06 million (+98.9 per cent)
Kalkallo Creek branch sewer	Part of the Northern Growth Area Servicing Strategy, the 3.3km main connects to the Amaroo main sewer	Completed	\$12.81 million (-1.0 per cent)
Kalkallo to Bald Hill drinking water major assets	Comprising construction of: <ul style="list-style-type: none"> • Pump station at Kalkallo • Main from pump station to tank • Main from Bald Hill tank to feed the existing network at Cameron Street 	Completed	\$21.37 million (-8.5 per cent)
The Patch community sewerage program	Community sewerage area of 280 lots in the Dandenong Ranges, east of Melbourne, and forms part of the overall servicing strategy for the 4,200 lots in the Yarra Ranges currently serviced by onsite wastewater treatment systems	In progress	\$9.18 million (-40.3 per cent)
Sassafras community sewerage program	Community sewerage area of 240 lots in the Dandenong Ranges, east of Melbourne, and forms part of the overall servicing strategy for the 4,200 lots in the Yarra Ranges currently serviced by onsite wastewater treatment systems	In progress	\$8.80 million (-14.8 per cent)
Sherbrooke/Kallista community sewerage program	Community sewerage area of 280 lots in the Dandenong Ranges, east of Melbourne, and forms part of the overall servicing strategy for the 4,200 lots in the Yarra Ranges currently serviced by onsite wastewater treatment systems	In progress	\$8.89 million (-33.8 per cent)
Craigieburn flow storage and distribution hub – Stage 2	Comprising construction of: <ul style="list-style-type: none"> • Stage 1 of the Craigieburn to Epping transfer system (CETS) • 15ML storage tank 	Deferred ¹⁴²	\$17.66 million (+75.2 per cent)

Table 49: Performance report for major projects proposed to deliver over 2018-23 (\$ million January 2023)

¹⁴² The pipeline (stage 2A) for Craigieburn flow storage and distribution system project completed construction in 2021-22 with commissioning to be completed in 2022-23. The wet weather storage portion (tank 3) of the project has been deferred and combined with the next stage of storage expansion to create efficiencies in delivery. This project is scheduled to be completed in early 2024-25.

Totalling \$256.36 million, these major projects accounted for 19.8 per cent of the overall capital expenditure allowance of \$1,297.16 million for the 2018-23 period.

A further \$257.11 million of potential expenditure was flagged in our 2018-23 submission, however due to uncertainty associated with investment timing, costs and benefits, the costs weren't included in the approved expenditure allowance. We accepted the financial risk if the projects proceeded, or the risk was partially or fully materialised.

Over the 2018-23 period overall, we've invested a total of \$1,617.08 million for the benefit of customers, including:

- \$639.5 million to provide water, recycled water and sewerage services to 75,100 new customers located across our service area – over 4,000 more (0.5 per cent) than we expected.
- Renewing almost 500km of water and sewerage mains across the network and replacing over 14,500 customers' property service lines, ensuring a more reliable service for those customers who experienced frequent interruptions.
- Providing 3,200 customers - over 250 more than expected, a sustainable sewerage service to connect to, enabling them to disable their septic systems and improving environmental outcomes.
- Delivering renewable energy projects that now generate almost 70 per cent of our annual energy needs, reducing environmental impacts and reducing costs.
- Reducing water lost in our network from 10.8 per cent in 2017-18 to 7.8 per cent in 2021-22 through our proactive leak detection and district metering programs.
- Replacing 5km of distribution mains, following confirmation that their condition had reached the end of life, reducing the risk and impact of catastrophic failure, prolonged outages and other impacts.
- A more modern, flexible and resilient technology foundation, including enabling technology for a simpler single view of the customer and protection against cybersecurity and business continuity threats.

A reconciliation of actual capital expenditure per annum compared to the benchmark allowance is provided below in Table 50.

	2018-19	2019-20	2020-21	2021-22	2022-23 (forecast)	Total (\$M)
Allowance	267.75	275.65	295.39	240.44	217.93	1297.16
Spend	343.21	358.73	347.98	290.94	276.22	1617.08
Difference	(75.46)	(83.08)	(52.59)	(50.50)	(58.29)	(319.92)
	28.18%	30.14%	17.80%	21.00%	26.75%	24.66%
Risk adjusted spend ¹⁴³						(76.76)
						5.92%

Table 50: Capital expenditure compared to benchmark allowance 2018-19 to 2022-23 (\$ million January 2023)

The over-expenditure of \$319.92 million in 2018-23 is attributed to:

- Carry-over of projects from the 2013-18 period together with providing new water, recycled water and sewerage infrastructure, expanding the network to service an additional 4,000 customers than originally assumed (\$143.17 million).
- Water and sewerage reticulation main renewals (\$103.82 million) associated with higher volumes and higher unit costs than assumed in the original business case to maintain levels of service.
- Digital enablement strategy, including foundational technology platform (\$65.24 million) to implement our future state technology architecture that's built around a platform-based approach, for a more modern, flexible, and resilient technology foundation – that supports the outcome 'service that meets everyone's needs'. This approach has been independently assessed to have a \$14.2 million positive net present value (NPV) when compared to the business-as-usual capital replacement model¹⁴⁴.

B.1.5 Operating expenditure

Despite benchmarking demonstrating we were on, or close to the efficiency frontier^{145 146}, we committed in our 2018-23 submission to achieve compounding productivity improvements equivalent to 2.5 per cent per annum on our controllable operating costs.

In the 2021-22 base year, we have spent \$157.31 million, \$7.19 million over the benchmark allowance set in the 2018 determination – equivalent to achieving a compounding rate of efficiency of 1.52 per cent.

The difference is primarily due to transitioning to cloud-based technologies – \$12.2 million (\$5.15 million above the 2016-17 base). These costs are now treated as operating expenditure compared to on-premise technology costs that are treated as capital expenditure.

¹⁴³ After adjusting for \$257.11 million of potential, but uncertain, 'at risk' expenditure identified in our 2018-2023 submission.

¹⁴⁴ Hamilton Shaw Consulting, Yarra Valley Water foundational technology platform business case review and findings, 1 February 2022.

¹⁴⁵ WSAA operating cost benchmarking utility report, December 2020.

¹⁴⁶ National Performance Report, measure operating cost per property <http://www.bom.gov.au/water/npr/>.

After adjusting for these cloud-based technology costs, the 2021-22 base year is 1.36 per cent higher than the original allowance. Refer to Table 51 below.

Further adjusting for one-off expenditure in the 2021-22 base year (refer to Base year adjustments on page 248), we'll achieve the equivalent of a compounding rate of efficiency of 2.36 per cent – compared to our aspirational target of 2.5 per cent compounding efficiencies.

	2018-19	2019-20	2020-21	2021-22	2022-23 (forecast)
Allowance	153.50	152.46	151.35	150.12	148.79
Total Spend	158.09	155.93	161.86	157.31	153.90
Unadjusted spend variance	(4.59)	(3.47)	(10.51)	(7.19)	(5.11)
	2.99%	2.28%	6.94%	4.79%	3.43%
Less adjustments for above 2016-17 base year expenditure items					
Less: Cloud-based technologies (above base year expenditure)	1.38	2.45	4.21	5.15	5.68
Adjusted total spend	156.71	153.48	157.65	152.16	148.22
Variance to allowance	3.21	1.02	6.30	2.04	-0.57
	2.09%	0.67%	4.16%	1.36%	-0.38%

Table 51: Operating expenditure compared to benchmark allowance 2018-19 to 2022-23 (\$ million January 2023)

B.1.6 Performance assessment

We have self-rated the performance element of PREMO as advanced consistent with our overall 2018-23 PREMO rating, and in accordance with the guidance issued by the Commission¹⁴⁷.

Key considerations for the proposed Advanced rating are presented in Table 52 below.

Guiding question	Key considerations	
<p>To what extent has the business demonstrated delivery of its customer outcomes commitment over the current regulatory period?</p> <p>Did its customers get what they paid for?</p>	For	<ul style="list-style-type: none"> Achieving five of seven annual outcomes per annum for 2018-19 to 2020-21 inclusive, and six of seven targets in 2021-22, and returning \$1.5 million¹⁴⁸ per annum to customers via lower prices, for any unmet target. Open and transparent reporting of annual performance to customers via bills, website home page and social media channels. On track to deliver nine of 10 major projects, and returning financing costs to customers for any delivery delays.
	Against	<ul style="list-style-type: none"> Forecast to achieve a compounding 1.52 per cent efficiency rate, without adjusting for cloud-based technologies against a 2.5 per cent target.
<p>How does actual operating expenditure across the current period compare with the established benchmark allowance, and to what extent has the business rationalised any discrepancies?</p>	For	<ul style="list-style-type: none"> Forecast to achieve a compounding 2.36 per cent efficiency rate after adjusting for and absorbing costs associated with transitioning to cloud-based technologies.
	Against	<ul style="list-style-type: none"> Forecast to exceed 2018-23 capital expenditure benchmark by 24.66 per cent.
<p>How does actual capital expenditure across the current period compare with the established benchmark allowance, and to what extent has the business rationalised any discrepancies?</p>	For	<ul style="list-style-type: none"> Forecast to exceed 2018-23 capital expenditure benchmark by 5.92 per cent after offsetting \$257.11 million put at risk.
	Against	<ul style="list-style-type: none"> Forecast to exceed 2018-23 capital expenditure benchmark by 24.66 per cent.
<p>To what extent does customer sentiment demonstrate satisfaction in the business's performance over the current regulatory period? Are customers happy with the value they receive from their water business?</p>	For	<ul style="list-style-type: none"> In the top quartile of all four ESC customer perception measures, including a positive trend over the period on all measures. Significant outperformance for a majority of the ESC's Customer Service Code measures.
	Against	<ul style="list-style-type: none"> Forecast to exceed 2018-23 capital expenditure benchmark by 24.66 per cent.

Table 52: PREMO performance – key considerations for and against an Advanced rating

¹⁴⁷ Essential Services Commission 2021, 2023 water price review: Guidance paper, 26 October, page 74.

¹⁴⁸ January 2019\$ - equivalent to \$1.65 million in January 2023\$

B.2 Risk

We have self-rated the risk element of PREMO as advanced.

Our best offer in terms of risk is heavily weighted towards us bearing the financial costs of projects and programs that are uncertain in terms of costs and timing. This includes the costs of more frequent and intense weather events than we've experienced to date.

We're cognisant of striking an appropriate balance to ensure we don't take on excessive risk, by deferring or reducing forecast costs where we have a high degree of certainty. This would only result in customers unnecessarily experiencing price increases in the next regulatory period. The submission is consistent with this approach and has been developed considering:

- Short-term constraints in the market, including the availability of materials and staff, caused by low unemployment, the geopolitical environment and COVID-19.
- Higher prices potentially being charged due to market capacity constraints caused by high demand for infrastructure construction in times where there's very low unemployment.
- Who is best placed to manage the financial risk of uncertainty and deliverability.

B.2.1 Our corporate risk management approach

Effective risk management plays an integral role in our decision making and strategic planning and helps us sustain business performance and achieve our strategic goals.

We're committed to managing risks to ensure good corporate governance and to protect our customers, products and services, assets and operations, the environment and our employees and partners. The principal objective of our risk management philosophy is to ensure that no one single event can jeopardise our organisation and our ability to deliver essential services to our customers and community.

Our risk management process is centred on the Risk Management Standard ISO 31000:2018. Implicit in the way we manage risk is our ongoing process of risk identification, assessment, treatment and ongoing monitoring and review. We maintain risk registers, including a strategic risk register, an enterprise operational risk register and various divisional risk registers relating to risk areas such as safety, cyber security, water and sewage quality and the environment.

We have articulated our risk tolerance through our risk appetite statement, which describes our attitude towards risk taking and defines the amount and type of risk we're willing to accept or retain to achieve our strategic objectives.

Our approach encompasses comprehensive, fully defined and clear accountability for risks, associated controls and proposes new risk mitigations. We review risk profiles on an annual basis. If we detect any new strategic emerging risks, a recommendation is made to the Risk Management and Audit Committee and Board to include in the strategic risk profile.

Comprehensive and frequent reporting on significant risks and proposed risk mitigation is part of our corporate governance framework. We comply fully with the attestation requirement of the Victorian Government Risk Management Framework. We contribute to the development of the annual Victorian Water Industry Risk Report.

We undertake an integrated risk-based internal audit program, which is developed annually and submitted to the Board Risk Management and Audit Committee for endorsement. In developing the program, we consider key risks within our risk profiles. When our annual audit

program is developed and endorsed, an assurance map is established linking internal and external audit programs to the risks contained in the profiles. The purpose is to provide confidence that the total audit program covers our organisation’s key risks. Our ongoing commitment to risk management is demonstrated through:

- Full compliance with the attestation required by the Victorian Government Risk Management Framework.
- Contributing to the development of the annual Victorian Water Industry Risk Report.
- Continuous improvement of our processes by benchmarking against best practice and self-scrutiny.
- Embedding the risk management framework into core business e.g. enterprise program management office.

B.2.2 Risk assessment actions for this price submission

We have undertaken a comprehensive process to identify, quantify and determine the most appropriate party to manage risk in developing our price submission.

We maintain a strong commitment to ensure we achieve our corporate objectives within our risk appetite parameters and that any threats are suitably mitigated. To monitor whether we’ve appropriately balanced risks with our customers and shareholder, we refer to customer and community expectations as reflected in the level of government and regulatory intervention, complaints, court rulings and media coverage. We are satisfied that our risks are balanced effectively.

To ensure our expenditure proposal reflects an appropriate sharing of risk, we conducted a series of workshops with senior managers and the Executive Team. The workshops and detailed conversations centred on who is best placed to manage the risks identified in the ESC’s guidance, including articulating when it’s appropriate for customers to pay and when we’d accept the financing risk. The results of the workshops were discussed at Board. Refer to Table 53 below for the full analysis of outputs of the workshop.

When customers would pay	When we would accept the financial risk
<p>Water security</p> <p>Inflow risk, which presents as an inability for water businesses to meet customer demand due to extended low rainfall and inflows.</p>	
<ul style="list-style-type: none"> • Annual desalination water orders to maintain customers’ existing level of water security. • The most efficient augmentations when water security is threatened (once they are built and operating). • Maintaining and where appropriate, increasing investment in water conservation to help customers manage their water use and bills. • Prudent and efficient pursuit of water losses. • Tariffs that send a signal to encourage efficient water use. • Availability of alternate water sources where they’re demonstrated to be the prudent and efficient option to service customers, where customers support investment or it’s government policy. • Optimising existing water supplies including alternate water sources. 	<ul style="list-style-type: none"> • If we’ve failed to manage our water security appropriately and we increase water conservation programs when water security starts to fall (consistent with framework) to avoid water restrictions. • New augmentations when we have water security.

Growth and demand forecasting

Demand forecasting risk results where actual customer demand during a regulatory period differs materially from the forecasts. It can be mitigated through effective demand forecasting and variable tariff structures.

<ul style="list-style-type: none"> • Growth projects that commenced or were completed in the 2018-23 regulatory period. • Growth projects that are certain (or we have a high level of confidence) to be commenced or required in the 2023-28 regulatory period. • Marginal operating cost of customer and asset growth, including operating new assets, servicing and maintaining recent assets, billing and servicing new customers. • Growth projects forecast (timing) to commence in the year we're certain they're required to be started or have been started. 	<ul style="list-style-type: none"> • Growth projects where there is a significant amount of uncertainty about the timing or costs of the project. • Supply augmentations with timing or cost uncertainty. • Growth assets where sufficient alternate supply is available, or the rate of growth means they're not required. • The full expression of developers' forward projections (based on experience).
<p>We think it's appropriate our tariff and sales demands reflect:</p> <ul style="list-style-type: none"> • Average weather conditions. • Modest improvements in water efficiency before (consistent with proposed investments) and after the meter (consistent with behaviour change, ongoing appliance efficiency and meter replacement activities). • Latest available information including from Victoria In Future. • Consistent with draft Greater Melbourne Urban Water and System Strategy and Central and Gippsland Region Sustainable Water Strategy. • Actual desalination water orders. 	<p>We don't think it's appropriate for our tariff and sale demands to reflect:</p> <ul style="list-style-type: none"> • Overly conservative or aggressive assumptions, including extreme weather conditions or restricted water use (water restrictions). • Forecast desalination water orders where there's uncertainty of variations in annual order quantity.

Asset management and service levels

Operational risks such as a water business experiencing a breach of health, environmental or customer performance standards can result from inadequate processes within water businesses, asset failures or external factors. Water businesses manage these risks through managing operating policies, capital investment, maintenance policies, contracts and insurance.

- | | |
|--|--|
| <ul style="list-style-type: none"> • Investments to maintain levels of service and the existing risk of failure. • Increases in service levels and reduced risk of failure with support from customers. • The most efficient or effective solutions to address problems. • Costs to mitigate operational and service risks where the impacts to customers are severe, unacceptable to the community or breach regulatory obligations that would otherwise result in material sanctions. • Investments to renew or replace assets prior to end of economic life where there's a high risk of failure, severe customer impact or assets become inefficient to maintain or operate. • Consistent with our corporate risk framework and risk-based standard. • Guaranteed service level system to recognise service failures to individual customers. | <ul style="list-style-type: none"> • Increases in service levels and reduced risk of failure without customers' support or confirmed change in regulatory obligation. • Projects where there's uncertainty around timing or benefits. • Inefficient or ineffective repairs or investments. • Elimination or mitigation of operational and service risks to a level below the Board and Risk management Audit Committee's appetite. • Repairs and maintenance of customer or community assets we don't own, unless there's an overall positive benefit for our customers. • Costs of managing and restoring services due to extreme weather events. |
|--|--|

Capital forecasting and delivery

Construction risks arise from underestimating costs or project delays. Water businesses can manage these risks through effective forecasting and contract management, as well as including contingency allowances in cost forecasts. Including cost contingencies in water revenue allowances transfers risk of project cost overruns to customers.

- | | |
|--|--|
| <ul style="list-style-type: none"> • Projects and programs with a high degree of confidence in relation to cost and timing. • Growth assets to provide services to customers with firm plans for development. • Expenditure to deliver existing levels of service and risk position of customers. • Expenditure to alter existing levels of service or the risk position of customers – clearly supported by customers. • Prudent and efficient costs of meeting regulatory obligations and legislative requirements. • Prudent and efficient expenditure already incurred, including any brought forward. • The cost of investing to renew or replace assets just prior to end of economic life or the cost to extend useful life where appropriate. | <ul style="list-style-type: none"> • Unregulated activities and ventures. • Inefficient or imprudent costs of meeting service levels, regulatory obligations and legislative requirements. • Projects where the timing or costs are highly uncertain (e.g. based on growth uncertainty, impacts of COVID-19, economic conditions, developer optimism, unrealistic timeframes, market conditions, availability of resources) or fall outside the next price period. • Financing costs where developers want to bring forward projects out of sequence or from a future regulatory period. • Wholesaler assets or full cost of assets where other customers or government will contribute towards construction (e.g. government grants, partnerships). • The cost of projects where benefits can't be articulated. • The cost of improvement initiatives to change or improve service levels that are deemed inefficient or not supported by customers. |
|--|--|

Regulatory obligations

Regulatory and policy risks result from changes in laws and regulations that materially affect a water business' costs or revenue potential and are typically mitigated via a pass-through mechanism.

- | | |
|--|---|
| <ul style="list-style-type: none"> • Prudent and efficient costs of meeting existing regulatory obligations. • Prudent and efficient costs of meeting new regulatory obligation. • Costs of meeting regulatory obligation where there's strong stakeholder and customer support or willingness to pay. • Reasonable cost of technologies which protect our critical systems and information from cyber attacks. • The cost of governing and managing our core business information to ensure compliance with Office of Victorian Information Commission directives. | <ul style="list-style-type: none"> • Unconfirmed changes in regulatory obligations or perceived change in risk posture of regulators. • Imprudent approaches to eliminate (rather than minimise or manage) risk of failure. • Inefficient or imprudent costs of meeting regulatory obligations and legislative requirements. • Service levels or outcomes exceed obligations without demonstrating prudent and efficient costs or support from customers. |
|--|---|

Economic

Financial risks are those arising from factors which affect the whole economy, such as rising interest rates or economic downturn. These risks are reflected in the cost of debt which forms part of the regulatory rate of return.

- | | |
|---|---|
| <ul style="list-style-type: none"> • Current financing costs for new debt. • Annual price changes adjusted for inflation. | <ul style="list-style-type: none"> • Financing costs associated with: <ul style="list-style-type: none"> – Unregulated activities, imprudent or inefficient expenditure. – Major capital expenditure projects subsequently deferred or delayed capital expenditure brought forward at the request of developers. – Decisions made to exceed regulatory benchmark expenditure allowances without clear demonstration of prudence or efficient spend within the regulatory period. |
|---|---|

Competitive advantage and reputation

Business risks result from a loss of revenue due to new technology or a change in the competitive landscape. Water businesses can mitigate some of these risks through innovative business practices and continually seeking cost efficiencies.

- | | |
|--|---|
| <ul style="list-style-type: none"> • Projects that deliver evidenced based or proven increased community value in areas supported by customers and the community. • Investing and trialling new technology –that have the potential to make a step change in service outcomes or cost efficiency – once a successful outcome is reached or they proceed to implementation. | <ul style="list-style-type: none"> • Investing and trialling new technology that aren't yet proven to have the potential to make a step change in service outcomes or cost efficiency. |
|--|---|

Table 53: Assessment of ESC risk area

In developing our submission, we have assessed risk from the viewpoint of certainty, and where there’s uncertainty about costs or timing, we’ve moved to accept that financial risk on behalf of customers. We have particularly assessed the risk of outcome delivery in terms of the price impact on our customers.

Areas where risk-based decisions or considerations have been made in developing this submission include:

- Capital expenditure programs.
- Demand and growth forecasts.
- Tariff structures and price control mechanism.
- Efficiency and productivity commitment.
- Customer expectations and guaranteed service levels.

Each area is explored in detail in the following sections.

Capital expenditure

We have robust and efficient investment analysis and asset management processes in place to assist in preparing our capital expenditure program. Having established an efficient investment program, we execute our planned capital works in the most cost-effective manner to ensure that overall value is maximised, including:

- Using an industry best practice approach to cost estimation including Monte-Carlo analysis for all top 10 projects by value and P50 cost estimates. These have been prepared by cost estimation experts including advice on the appropriate level of contingency allowance given project stage and scope. Forecasts for all remaining infrastructure capital expenditure are based on cost curves.
- Optimising contingency amounts – reflecting the asset type and project stage including risks and project maturity. Table 54 below provides a guide to setting contingencies. The contingency applied is then adjusted to reflect project specific risks.

	Contingency by phase		
	Conceptual	Design and tender	Construction
Sewer and water infrastructure	20%	15%	10%
Developer	20%	15%	10%
Renewal and emergency works	0%	0%	10%
Reliability	20%	15%	10%
Tanks	25%	20%	10%
Treatment and recycling	25%	20%	10%
Community sewerage program	20%	15%	10%
Major projects	25%	20%	10%

Table 54: Guide to setting contingency amounts based on the asset type and project phase

- Specifically testing our inputs against the criteria for PREMO including:
 - Explicit testing of proposed investments against the corporate risk framework.
 - Ensuring all business cases specifically addressed or considered risk and were independently reviewed for both prudency and efficiency. In May 2022, the Board approved \$340 million be removed from the capital expenditure program due to timing or cost uncertainty.
- Conducting a deliverability assessment of our capital expenditure program – individually by strategy and collectively using a total investment program view, including:
 - A desktop review, in February 2022, that assessed deliverability of each capital expenditure program using five key principles¹⁴⁹ of deliverability adapted from Infrastructure Australia’s guide to writing business cases.
 - Re-examining the key assumptions in business cases for each program to ensure the risks identified in the initial deliverability assessment were adequately mitigated.
 - Conducting a series of deep dives with our engineering service partner, Ripple, during July 2022, to further challenge assumptions aimed at reducing, deferring, delaying or removing projects within the 2023-28 period. A more conservative investment profile was adopted, particularly in 2023-24 and 2024-25 where \$84.8 million and \$65.2 million respectively were shifted to latter years. A further \$50 million of projects were moved from 2023-28 into the 2028-33 period.
 - Analysis of success filling vacant engineering and other technical roles. The review concluded there hasn’t been a discernible difference in filling vacant engineering and technical positions that erode confidence around deliverability. Refer to Table 55 below for results from this analysis.

	2020	2021	2022 (Jan - Jul)
Number of roles (engineering and technical)	32	41	17
Average number of applicants	15	12	13
Average time to fill (days)	37	28	39

Table 55: Analysis of applicants and days to fill for engineering and technical roles, by calendar year (2020 to 2022)

- Implementing an investment prioritisation tool that enabled us to identify where to reduce expenditure to achieve the benchmark capital expenditure of \$1,962.03 million across the 2023-28 period.
- Excluding \$380.46 million for projects where we identified significant uncertainty in terms of timing or cost – these are outlined in Table 56 below.

¹⁴⁹ <https://www.infrastructureaustralia.gov.au/sites/default/files/2021-07/Assessment%20Framework%202021%20Stage%203.pdf>, page 62 – that identifies the five themes of deliverability of ease of implementation, capability and capacity, project governance, managing risk and lessons.

The financial risks we're accepting		Value (\$M)
Projects with significant timing or cost uncertainty	Upper Central Creek main sewer is forecast to be required in 2027-28. Given this is the last year of the regulatory period, we'll assume commencement in 2028-29. If growth proceeds ahead of forecast and the sewer is required, we'll commence earlier and recover the costs at the beginning of the 2028-33 period.	\$70.25
	Darebin sewer tunnel has all the attributes of a wholesaler asset. We're currently working with Melbourne Water and the other retailers to review and agree the principles and interface points between the wholesale and retail networks that will determine ultimate ownership of this asset. In the meantime, we'll continue to undertake preliminary work associated with upgrading this asset to ensure it's delivered to meet our environmental obligations regardless of its ultimate ownership.	\$120.84
	Digital metering pilot of 25,000 meters and a full scale roll-out commencing in 2024-25. We propose instead, the costs of replacing meters that have reached end of life with a like for like meter. Refer to Customer meter replacements on page 187 for further details.	\$75.39
	Aurora recycled water treatment plant based on an increased cost estimate. This project is due to be delivered at the end of the 2023-28 period. As the project is in its early stages and noting the significant amount of detailed design and associated work to come, we have identified the additional cost estimate amount at risk and will recover in the 2028-33 period if costs are realised.	\$31.21
	Business case dependent IT investments where the timing, costs and benefits are uncertain.	\$22.07
	Eltham main sewer, where renewing a 1600mm diameter section of main that was reaching end of life hasn't been included, as the last inspection showed it's deteriorating at a slower rate than the section proposed for renewal. It is next scheduled for inspection in 2024, following which a further inspection will either be scheduled or result in the main then being placed on the renewal program.	\$10.16
	Lockerbie north main sewer, based on an increased cost estimate. As the project has not yet commenced functional design or field investigations, the additional cost estimate amount has been identified at risk and will be recovered in the 2028-33 period if costs are realised.	\$4.20
	Craigieburn sewer transfer hub tank 5 is forecast to be required by 2027-28, however given the uncertainty on the growth rate in the area, we've delayed the cost until 2028-29.	\$13.21
	5 per cent packaging and project management efficiency across all growth projects that we're committed to achieving through better capital delivery.	\$33.13
Total	\$380.46	

Table 56: Financial risks we're accepting (\$ million January 2023)

There are other risks, unable to be quantified, that we're also accepting until the commencement of the 2028-33 period, including:

- Potential climate change impacts or regulatory changes associated with:
 - Safe Drinking Water Regulations that sunset in 2025 which will trigger a mandatory review and potential changes to obligations.
 - Sewage treatment plant licence conditions that are due for review in 2022.

- Implementation costs associated with the draft Greater Melbourne Urban Water and System Strategy (GMUWSS) and Central and Gippsland Region Sustainable Water Strategy (CGRSWS), including integrated water management (IWM) projects for:
 - Expanding South East Water’s Dingley recycled water scheme, to support the growth expected in the Monash and Glen Waverley precincts in our area.
 - Potential stormwater harvesting through regenerating a natural wetland, Herne Swamp, at the Wallan sewage treatment plant. This will lead to improved stormwater quality, which could be supplied for non-drinking water purposes, including irrigation for agricultural purposes in the region.
 - Planning assessments, feasibility studies and concept designs for projects listed in the GMUWSS or those leading to commitments in the IWM Catchment Scale Action Plans.
 - Engaging with Traditional Owners/Custodians to investigate water entitlements to undertake cultural flows activities, and initiatives that embed Caring for Country.
 - Any additional investments will be subject to approved business cases. The capital expenditure costs will be recovered from customers at the commencement of the 2028-33 regulatory period.

Further details on our approach to capital delivery together with our proposed capital expenditure investments during 2023-28 are contained in Appendix C - Detailed capital expenditure from page 180.

In keeping with our 2018-23 price submission, we propose to not claim any regulatory depreciation in the 2023-28 period for capital investments required to service new customers. Therefore, customers aren’t taking on financial risk associated with a slow-down in growth expenditure. This approach also better matches the recovery of costs with the utilisation of the assets.

Demand and growth forecasts

Customer prices and tariffs are set to recover the prudent and efficient costs based on forecasts of customer numbers and product demand. The typical cause of short-term demand fluctuations is weather conditions and over the medium term, the rate of customer growth stemming from development.

Demand and customer growth forecasts have been developed and independently reviewed using the latest available information including:

- End use model studies undertaken at a household level.
- Government projection of population and households (Victoria in Future 2021) and recently updated to reflect a slight softening of the lot forecast by MacroPlan, growth forecasting experts.
- Trends in residential property type, informed by Australian Bureau of Statistics residential building approvals data for detached houses and flats.
- Trends in appliance efficiency using findings from appliance stock surveys.
- Water leakage and loss informed by proposed programs such as leak detection, network sensors, meter replacement programs and technological advancements.
- Continuing permanent water saving rules and ongoing promotion of Target 155.

- Price elasticity studies that continue to show that price has limited influence on changes in demand.

Further details on our demand forecast are contained in Chapter 7 - Demand on page 93.

Tariff structures and price control mechanism

The risk to customers that actual demand is higher than initially forecast, and therefore customer prices are higher than necessary, is mitigated through our price control mechanism.

We propose to:

- Maintain a revenue cap form of price control where customer prices will adjust on an annual basis to ensure that customers only pay what's required to meet our forecast revenue requirement. In addition we'll:
 - Annually cap any real increase to 2 per cent for variances in both demand and desalination orders from the forecast in the price determination.
 - Fully pass back to customers all price decreases due to variances in demand compared to forecast in this submission.
 - Cap the nominal price increase in 2023-24 and 2024-25 to 5 per cent.

We acknowledge the Commission's view that our revenue cap transfers risk from the business to customers on the basis we are best placed to manage that risk however, consistent with the community's expectations, we would never encourage higher water consumption. In addition, both customers and stakeholders expect us to actively promote water efficiency and conservation. Therefore, we believe customers are best placed to manage their demand.

- Continue with a five-year regulatory period and existing price pass-through mechanisms that also benefit customers, including:
 - Community rebate that returns \$1.8 million to customers per outcome not achieved each year.
 - Any net benefit of a delay in delivering our top 10 capital expenditure projects.
 - Unit rate efficiencies captured for water main renewals when these arrangements are retendered during the 2023-28 period.
- Combine sewage disposal charges (SDC) and water use tariffs for residential customers – and create a lower water use tariff for water only customers. This proposal:
 - Sends a stronger water conservation signal as expected by customers.
 - Maintains the existing proportion of fixed and variable charges for households.
 - Addresses the concern expressed by a third of our customers¹⁵⁰ when tested, of adverse impacts for water only customers.

¹⁵⁰ Insync, Melbourne Metropolitan Water Tariff Review, focus group report, February 2022.

- Doesn't impact customers' eligibility for the full concession amount that's determined by the number of services received at their property.

We modelled various pricing scenarios to minimise customer impacts of this proposed change. The proposed price changes ensure no single customer segment is disproportionately affected. With this change, together with the overall real price decrease for customers, over 99 per cent of customers' annual bills will be the same or less in 2023-24¹⁵¹ – albeit customers will experience some variability in quarterly bills as the seasonality factor inherent in the SDC charge is removed. In percentage terms, customers with water use of 290 kilolitres per annum who are renting receive the smallest reduction in annual bills of 1.6 per cent against an average decrease of 4.6 per cent. Refer to Table 57 below for a comparison of bill impacts for a range of residential customers.

Category	2022-23 bill	2023-24 bill	Quarterly bill impact				Annual bill change	
			Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	\$	%
Small household (owner occupier) using 100 kL per annum	\$863	\$822	-\$13	-\$9	-\$6	-\$13	-\$41	-4.8%
Small household (renter) using 100 kL per annum	\$333	\$316	-\$7	-\$3	\$0	-\$7	-\$17	-5.1%
Typical household (owner occupier) using 150 kL per annum	\$1,034	\$986	-\$17	-\$10	-\$4	-\$16	-\$48	-4.6%
Typical household (renter) using 150 kL per annum	\$504	\$480	-\$11	-\$4	\$2	-\$10	-\$24	-4.7%
Typical household (recycled water connected, owner occupier) using 150 kL per annum ¹⁵²	\$1,000	\$924	-\$24	-\$17	-\$14	-\$22	-\$76	-7.4%
Typical household (water only customer, owner occupier) using 150 kL per annum	\$456	\$435	-\$5	-\$5	-\$6	-\$5	-\$21	-4.6%
Typical household (water only customer, renter) using 150 kL per annum	\$377	\$360	-\$4	-\$4	-\$5	-\$4	-\$17	-4.6%
Large household (owner occupier) using 290 kL per annum	\$1,598	\$1,557	-\$20	-\$5	\$1	-\$17	-\$41	-2.6%
Large household (renter) using 290 kL per annum	\$1,068	\$1,051	-\$14	\$1	\$7	-\$11	-\$17	-1.6%

Table 57: Modelled customer impacts of proposal to combine SDC and water volumetric charges (\$January 2023)

¹⁵¹ Assuming no change in water use volume.

¹⁵² Assumed 110 kilolitres of drinking water and 40 kilolitres of recycled water.

The proposal is supported by:

- Joint customer research¹⁵³ on the sewage disposal charge that revealed a strong preference to remove the charge.
- Our Community Advisory Group.
- The Consumer Advocacy Law Centre, conditional on ensuring that customers eligible for concessions still receive their full entitlements¹⁵⁴.

The proposal is also consistent with guidance identifying the Commission's view that the current variable sewerage tariffs for residential customers are difficult for customers to understand and are not cost reflective¹⁵⁵. It also meets the requirements of the WIRO as it will:

- Have better regard to the ability of customers to understand the tariff and be able to respond to price signals.
- Deliver on customer preferences for simpler tariffs.

Efficiency commitment

We propose a compounding annual 1.7 per cent efficiency factor applied to operating expenditure.

Overall, considering allowances for customer growth and additional expenditure items, forecast operating expenditure per customer is expected to decline in real terms over the 2023-28 period.

Due to business case uncertainty, we won't pass on \$30.35 million of possible technology cloud costs. There are other risks that are unable to be quantified, that we're also accepting until the commencement of the 2028-33 period, including:

- Any above inflation costs due to labour and material shortages that arise during the period.
- Further changes in regulatory requirements.
- Commitment to maintaining service levels and efficient cost base, including guaranteed service level payments.
- Costs and restoration of services from extreme weather events.

We independently verify our financial viability through a credit rating review every three years. Our last review was undertaken by Fitch Ratings in June 2021¹⁵⁶.

¹⁵³ Insync, Melbourne Metropolitan Water Tariff Review, focus group report, February 2022.

¹⁵⁴ Concession customers receive a rebate on their bill from Department of Families, Fairness and Housing. The value of the rebate is apportioned based on the number of services at the property. Based on discussions we understand that combining the volumetric tariffs will not impact the concession customers' ability to claim their full concession allowance.

¹⁵⁵ Essential Services Commission 2021, 2023 water price review: Guidance paper, 26 October, page 53.

¹⁵⁶ Fitch Ratings, Credit opinion of Yarra Valley Water Corporation, June 2021.

Customer expectations and guaranteed service levels

We're committed to providing high standards of service. Over time we've continued to evolve our guaranteed service levels (GSL) with customers. For individual customers who experience a level of service below these levels, we provide a rebate automatically on their next bill.

Throughout our engagement with customers, we explored minimum service standards and the mechanism of guaranteed service level schemes more broadly.

Customers are generally unaware of the GSL scheme; they acknowledge the appropriateness of a gesture payment or rebate to individuals affected by performance that drops below a minimum standard.

In May 2022, representatives of our 2017 and 2022 Citizens' Juries reviewed our current GSLs. They also specifically considered the circumstances when rebates should be paid to customers if we issued a water quality advisory.

Armed with these insights, we propose to:

- Retain all existing GSLs including the value of rebates paid to customers.
- Continue to work together with South East Water, Greater Western Water and Melbourne Water to achieve a consistent Melbourne-wide approach to a defined guaranteed service level rebate for water quality events by end November 2022.
- At a minimum we'll provide customers, impacted by a water quality advisory, with a seamless way to claim any costs associated with buying bottled water.

Overall, we've self-rated the risk element of PREMO as advanced. Key considerations for the proposed rating are provide below in Table 58.

Guiding question	Key considerations	
To what extent has the business demonstrated a robust process for identifying risk, and how it has decided who should bear these risks? i.e. such that customers are not paying more than they need to.	For	<p>Our 2023-28 submission is consistent with this approach and has been developed considering:</p> <ul style="list-style-type: none"> • The current high inflation environment. To provide customers with some relief from high nominal price increases caused by inflation we'll cap bill increase at 5 per cent (nominal) in 2023-24 and 2024-25. • The series of workshops with senior managers and the Executive Team we conducted to ensure our expenditure proposal reflects an appropriate sharing of risk with customers. • \$347.33 million of forecast capital expenditure isn't included in benchmark expenditure forecasts for 2023-28. • \$30.35 million of additional operating expenditure for business case dependent digital enablement projects. • Net efficiency of 0.26 per cent that is consistent with Advanced PREMO rating proposals in 2018 price submissions. • Adopting a 5 per cent (\$33.13 million) efficiency factor on growth in the face of current cost pressures. • Absorbing above inflation unit rate increases. • Multifaceted testing of deliverability of the capital expenditure program. • Ongoing commitment to: <ul style="list-style-type: none"> – Return \$1.8 million (increase from \$1.5 million¹⁵⁷ in 2018-23 period) for each annual outcome not achieved. – Not immediately recover from customers the regulatory depreciation associated with capital expenditure to service new customers. – Return financing costs for major projects that are delayed.
	Against	<ul style="list-style-type: none"> • Proposed retention of our revenue cap that the ESC considers passes on the demand risk to customers. However, we'll continue to pass on to customers in the next year, the benefits of higher demand and cap any increase at 2 per cent (real) per annum.
To what extent does the proposed guaranteed service level (GSL) scheme provide incentives for the business to be accountable for the quality of services delivered, and provide incentives to deliver valued services efficiently?	For	<ul style="list-style-type: none"> • We're retaining all our existing guaranteed service level rebates. • Comparatively, our guaranteed service level rebate scheme is more extensive (range and value of rebates) than our peers. • We've been working on several options for a water quality guaranteed service level rebate and we'll work with South East Water, Greater Western Water and Melbourne Water to develop a consistent Melbourne-wide approach by end November 2022.

Table 58: PREMO risk – key considerations for and against an Advanced rating

¹⁵⁷ January 2019\$ - equivalent to \$1.65 million in January 2023\$

B.3 Engagement

A detailed outline of our engagement process is provided in Chapter 2 Listening to customers and our communities from page 23.

We have self-rated the engagement element of PREMO as leading.

We've undertaken a comprehensive engagement process with our customers and stakeholders to gain insights which led to developing our outcomes and outputs. This culminated in a willingness to pay study and Citizens' Jury who made recommendations to increase value for customers.

We've addressed each matter of the Commission's guidance on engagement, and believe we have demonstrated leading engagement, evidenced by:

- Our outcomes have evolved from seven to six, with the number of measures and targets increasing from seven to 17 based on insights from customers.
- The Aboriginal Community Working Group (Working Group) we established with the guidance and assistance from our Indigenous Board Directors, Karen Milward and Ian Hamm, to extend the opportunity to engage and hear from Aboriginal people directly and more deeply. The Working Group comprised Aboriginal Community Controlled Organisations and community members. This also facilitated the development of a working relationship between the Working Group and the Citizens' Jury.
- Participant and stakeholder involvement at various stages in the engagement program – including setting the key challenge to be solved in our price submission.
- Information provided to customers was appropriate for their role and provided in formats, e.g. video and accessible content, that met the specific needs of customers with diverse needs. We also provided language and Auslan interpreters to ensure customers could fully participate.
- A willingness to pay study conducted with 945 customers who considered different service offerings and trade-offs. Professor John Rose reviewed the survey before we approached customers, testing the efficacy of the information, choices and process. This enabled us to adapt it before launching to customers. Participants also responded to questions in relation to understanding and consequentiality including:
 - 91 per cent agreed with the statement “I understood the idea of making choices between different outcomes”.
 - 90 per cent understood the outcomes described, 84 per cent said they were given enough information to decide – 87 per cent said they understood all the information provided.
 - 67 per cent thought their choices would impact on the services and prices we propose in our price submission with 78 per cent thinking bills would increase if the ESC approved some or all proposals.
- Proactive and specific engagement with hard to reach customers to ensure that disadvantaged and underrepresented customer segments were included in our research.

- Testing the relevance of the seven outcomes established for our 2018-23 submission on four occasions, including:
 - In August 2020, with jurors from our first Citizens' Jury in 2017 plus other customers to understand "Are the seven price submission outcomes, measures, targets, performance reporting still in line with current customer expectations?"¹⁵⁸
 - A synthesis of 48 separate pieces of research conducted since 2018, to evaluate the appropriateness, relevance and validity of the existing outcomes, measures and targets. It also considered whether there are any new or emerging dimensions important to customers that are inadequately addressed in the outcomes, measures and targets¹⁵⁹.
 - In March 2022, as part of our second Citizens' Jury, we asked participants to review each outcome, consider their level of support and comment on changes to improve it.
 - In May 2022, utilising the previous three pieces of work, we brought representatives of our 2017 and 2022 Juries together to recommend how our outcomes and measures should evolve, and to have their say about guaranteed service levels and the form of the community rebate.
- Reaching the outer extremities of each element of the Commission's customer engagement diagram:
 - **Form** – we involved all customers through other aspects of our engagement program including research, an engagement portal and information included in bills. The Jury was empowered to make recommendations resulting from its deliberations. We also collaborated with stakeholders and key business customers who were also empowered to decide on speakers the Jury should hear from.
 - **Timing** – formal engagement began in February 2021 and continued into May 2022, culminating with the Citizens' Jury who considered all research insights. Our engagement strategy also drew from customer insights and customer experience data we've gathered since 2018, to be able to influence our services and programs from a customer lens. All engagement and research insights were used to identify the services to be examined through willingness to pay.
 - **Content** – our engagement activities have been broad in scope, determined by customers, community and stakeholders through a co-design process, and included project-based and single-issue engagement activities.

¹⁵⁸ Quantum Market Research, Yarra Valley Water Pricing Submission Midpoint Review, September 2021.

¹⁵⁹ Insightfully, Yarra Valley Water Research Synthesis, November 2021.

Key considerations for the proposed leading rating for the engagement element of PREMO are presented in Table 59 below.

Guiding question		Key considerations
To what extent has the business justified how the form of engagement suits the content of consultation, the circumstances facing the water business and its customers?	For	<ul style="list-style-type: none"> • Took a step back from setting the agenda and instead, empowered customers to determine the key challenge they want us to address in our price submission, and our future prices and services • Conducted a unique co-design of the engagement approach with stakeholders, community representatives, customers, staff and business partners. • Participants and stakeholders set the key challenge to be solved in our price submission for the Jury to address.
To what extent has the business demonstrated that it provided appropriate instruction and information to customers about the purpose, form and content of the customer engagement?	For	<ul style="list-style-type: none"> • Co-design approach comprised stakeholders, community representatives, customers, staff and business partners. • Presented and provided information on the building block model and PREMO to mini-panels and the Jury. • Participants who co-designed the engagement program also identified experts to present to the Jury. • Customers identified the challenge to solve in our price submission and potential solutions.
To what extent has the business demonstrated that the matters it has engaged on are those that have the most influence on the services provided to customers and prices charged?	For	<ul style="list-style-type: none"> • Customers determined the challenge and problem areas for the Jury to address. • Jury provided with a handbook including customer research, existing outcomes and performance. • Our response to the Jury’s draft recommendations included what we understood, what difference it makes and the cost.
To what extent has the business explained how it decided when to carry out its engagement?	For	<ul style="list-style-type: none"> • Conducted a mid-point check with customers to confirm the relevance of outcomes, measures and targets. • Commenced co-design in February 2021 that enabled our second Citizens’ Jury to convene during February and April 2022. • Representatives from both our 2017 and 2022 Juries workshopped final outcomes and measures in May 2022 feeding into our draft price submission. • Undertook a willingness to pay study in May and June 2022 and retested results in August 2022 to ensure the results were still valid given higher inflation and cost of living concerns.

Guiding question	Key considerations	
To what extent has the business demonstrated how its engagement with customers has influenced its submission?	For	<ul style="list-style-type: none"> The Jury proposed 12 recommendations to our Board, who accepted 10 recommendations in full, accepted one with a small variation and set aside one recommendation for future consideration. The Citizens' Jury's number one recommendation was "embed Caring for Country in all decisions". We recognise we need to continue to expand and build on relationships with our Aboriginal customers to ensure we deliver all our outcomes through a Caring for Country principle.
	Against	<ul style="list-style-type: none"> Of the Jury's 12 recommendations, we couldn't accept one relating to tariff choice. This was on the basis that extensive previous research failed to demonstrate strong support from customers when it has a negative benefit to administer and results in substantial winners and losers. We have, however, committed to exploring this further with customers.
To what extent has the business demonstrated that its engagement was inclusive of consumers experiencing vulnerability?	For	<ul style="list-style-type: none"> Focus on inclusion and prominence of different voices and perspectives, including people who experience a different level of service due to language and other barriers, living on the fringe of our service area and age. Customers participating in the willingness to pay study were able to self-identify as financially vulnerable. When assessing willingness to pay for additional items, we confirmed increases were supported by those who self-identified.
To what extent has the business demonstrated that its engagement was inclusive of First Nations people?	For	<ul style="list-style-type: none"> Building on existing relationships we established an Aboriginal Community Working Group - the Working Group were advisors, guest speakers and a sounding board for the Jury's ideas and draft recommendations. The Working Group's input contributed to the Jury identifying 'Caring for Country' as their number 1 recommendation.

Table 59: PREMO engagement – key considerations for and against a Leading rating

B.4 Management

We have self-rated the management element of PREMO as Advanced.

- We've consciously challenged ourselves to provide our best offer to our customers. Our best offer stems from focusing on the products and services that are important to customers, that we can deliver at an efficient cost and provide value for money. The Board and particularly the Service, Community, Assets and Regulation (SCAR) Board sub-committee, have been actively involved in developing, reviewing and approving our price submission.
- A comprehensive program of papers and briefings was developed for SCAR and to assist Board with their attestation role, an independent advisor to Board was appointed to enable detailed scrutiny of the submission's key elements and the appropriate assurance.

- Our Board has provided the appropriate attestation statement.
- We have business cases for 95 per cent of capital expenditure and all have been independently reviewed for prudence and efficiency. The cost estimates for all capital expenditure have been developed using cost curves based on actual costs. All major projects have a P50 forecast and Monte-Carlo analysis incorporating contingency allowances adapted for the stage, complexity and scope of work. All business cases are available upon request.
- We've assessed the deliverability of each project and program individually and also at a business level. We've identified \$380.46 million of financial risk we're prepared to absorb for projects where there's uncertainty in term of timing or cost, or where we've confirmed supply chain constraints.
- The vast majority (if not all) of our capital program will be delivered by embedded tier 2¹⁶⁰ business partners.
- Despite being on the efficiency frontier, we've committed to ongoing annual operating expenditure efficiencies of 1.7 per cent with a net efficiency of 0.26 per cent after allowing for the incremental costs of servicing new customers. This is marginally below the growth allowance that would have been assumed in previous price review processes.
- Additional operating expenditure is either directly supported by customers or delivers on regulatory and government policy. The increased value customers experience is through increases or improvements in:
 - Water conservation
 - Biodiversity and nature restoration
 - Water quality
 - Preparedness and response in emergencies
 - Gender equality
 - Cybersecurity
- Our operating and capital expenditure provides value for money for customers through:
 - Continuous provision of safe and pleasant drinking water and increasing provision of recycled water to customers.
 - Maintaining current levels of water interruptions including mitigating the risk of prolonged widespread interruptions through proactive and reactive asset renewal and maintenance programs for the water network.
 - Maintaining current levels of sewerage service interruptions and protecting customers, community and the natural environment from sewage spills through proactive and reactive asset renewal and maintenance programs for the sewerage network.
 - Ensuring business continuity for our staff and partners to meet customer expectations through a suite of information technology and operational technology applications and infrastructure.

¹⁶⁰ Tier 2 partners are smaller contractors who tell us they value constant work so they can invest in attracting, training and retaining staff.

- Providing water and sewerage services to new customers through the timely delivery of infrastructure for new developments.
- Reducing our impact on the natural environment through a decrease in greenhouse gas emissions of 11,664 tCO₂-e by 2025.
- We sought to confirm willingness to pay results with customers in August 2022¹⁶¹ following interest rate rises and other cost of living pressures. We've only included additional investments where customers unequivocally supported investment – including customers who self-identified as financially vulnerable.
- Our demand forecasts are consistent with VIF2021 and consider recent demographic analysis completed by MacroPlan in 2022. We're unable to locate any other information that suggests the basis for our forecasts is materially over or under stated.

Key considerations for the proposed Advanced rating are presented in Table 60 below.

Guiding question	Key considerations	
To what extent has the business demonstrated how its proposed prices reflect only prudent and efficient expenditure?	For	<ul style="list-style-type: none"> • Business cases completed and independently reviewed for 95 per cent of capital expenditure. • P50 Monte-Carlo analysis with an appropriate contingency allowance given each project's stage and scope for all major projects. • \$347.33 million excluded from capital projects due to uncertain costs and timing. • Deferred and smoothed capital expenditure to reflect the current external environment. • Our proposed expenditure provides value for money for customers through either increased value or the maintenance of service that customers have told us is important.
	Against	<ul style="list-style-type: none"> • Forecast capital expenditure is \$592.81 million (43 per cent) higher than identified for the 2023-28 period in our 2018-23 submission.
To what extent has the business justified its commitment to cost efficiency or productivity improvements?	For	<ul style="list-style-type: none"> • Operating costs are at or near the efficiency frontier supported by WSAA benchmarking and reporting via the National Performance Report. • Maintaining our position on the frontier through annual operating expenditure efficiency commitments of 1.7 per cent and 0.26 per cent net. • Only including the marginal costs of servicing new customers. • 5 per cent efficiency for growth projects.

¹⁶¹ Marsden Jacob Associates, Yarra Valley Water's customer-led price submission customer values research, August 2022.

Guiding question	Key considerations	
To what extent has the business justified or provided assurance about the quality of the submission, including the quality of supporting information on forecast costs or projects?	For	<ul style="list-style-type: none"> Business cases completed and independently reviewed for 95 per cent of capital expenditure.
To what extent has the business provided evidence that there is senior level, including Board level, ownership and commitment to its submission and its outcomes?	For	<ul style="list-style-type: none"> Strong Board and sub-committee involvement with over 30 papers and meetings, including workshops on expenditure, risks and trade-off. Senior Executive attested to all business cases and met over 50 times on the submission. Board has provided the appropriate attestation.
To what extent has the demonstrated its price submission is an "open book"?	For	<ul style="list-style-type: none"> There is an auditable trail of supporting information and evidence available for access. Regular meetings with Commission staff to discuss any issues of concern and mutual understanding.

Table 60: PREMO Management – key considerations for and against a 'Advanced' rating

B.5 Outcomes

A detailed outline of our outcomes is provided in chapter 2

We have self-rated the outcomes element of PREMO as advanced.

The Citizens' Jury's number one recommendation was "embed Caring for Country in all decisions". We will need to continue to expand and build on relationships with our Aboriginal people to ensure we deliver all outcomes through a Caring for Country approach.

We constantly checked in with customers to determine whether our outcomes were still relevant and provided value for customers. Our research and engagement insights showed customers didn't value an increase in core water and sewerage quality, reliability and customer service levels¹⁶².

Where customers saw additional value was an increased focus on saving water for the future and protecting the natural environment. This was supported by ongoing research, our Citizens' Jury and willingness to pay studies. There is clear evidence of willingness to pay from the majority of customers and those who self-identify as financially vulnerable.

When we invited Jurors from our 2017 and 2022 Citizens' Jury processes together to assess the relevance of our outcomes, they told us the outcomes, measures and targets and associated customer reporting should be expressed more meaningfully for customers. This includes focusing on where we don't meet customers' expectations (on average and for individual customers) and therefore reporting the number of customers impacted – rather

¹⁶² Marsden Jacob Associates, Yarra Valley Water's customer-led price submission customer values research, August 2022.

than, or in addition to, percentages. As a result, we have re-orientated some measures and developed new ones to focus on customers who do not experience our typical service.

Outlined in Table 61 below are the proposed set of outcomes, measures and targets for the 2023-28 period, together with historical performance, where available, over the 2017-22 period.

Outcome	Measure	Performance (Past = 2017-18 to 2021-22 actual performance) (Future = 2023-24 to 2027-28 regulatory period)						
		Past	2017-18	2018-19	2019-20	2020-21	2021-22	
Safe and pleasant drinking water	Compliance with Safe Drinking Water Regulations (2015)	Past	100%	100%	100%	100%	100%	
		Future	100%	100%	100%	100%	100%	
	Customers who agree we provide great drinking water	Past	92%	91%	91%	91%	91%	
		Future	≥91%	≥91%	≥91%	≥91%	≥91%	
Reliable water and sewerage services	Customers who experience three or more unplanned interruptions	Past	8,600 customers	8,734 customers	6,502 customers	5,231 customers	5,939 customers	
		Future	<7,000 customers	<7,000 customers	<7,000 customers	<7,000 customers	<7,000 customers	
	Customers who experienced five or more unplanned interruptions in the last three years, and any interruptions this year	Past	n/a	4,449 customers	4,030 customers	3,120 customers	2,689 customers	
		Future	<3,572 customers	<3,572 customers	<3,572 customers	<3,572 customers	<3,572 customers	
	Timely response and repair	Customers' satisfaction with the restoration of their services (planned and unplanned interruptions)	Past	91%	90%	93%	91%	92%
			Future	≥91%	≥91%	≥91%	≥91%	≥91%
Customers whose water or sewerage service wasn't restored within four hours		Past	6.97%	4.88%	4.65%	3.46%	4.28%	
		Future	≤4.85%	≤4.85%	≤4.85%	≤4.85%	≤4.85%	
Customers whose water or sewerage service wasn't restored within 12 hours	Past	0.44%	0.21%	0.22%	0.36%	0.50%		
	Future	≤0.35%	≤0.35%	≤0.35%	≤0.35%	≤0.35%		

Outcome	Measure	Performance (Past = 2017-18 to 2021-22 actual performance) (Future = 2023-24 to 2027-28 regulatory period)					
		Past	2021-22	2022-23	2023-24	2024-25	2025-26
Service that meets everyone's needs	Customers' satisfaction with their most recent interaction with us	Past	84%	82%	87%	87%	88%
		Future	≥86%	≥86%	≥86%	≥86%	≥86%
	Customers, who accessed our support services, believe Yarra Valley Water helped them with their bills	Past	89%	88%	94%	95%	93%
		Future	≥92%	≥92%	≥92%	≥92%	≥92%
Saving water for the future	Water lost in Yarra Valley Water's supply system	Past	10.8%	9.0%	8.3%	7.4%	7.8%
		Future	≤7.8%	≤7.5%	≤7.3%	≤7.3%	≤7.3%
	Recycled water used in designated areas ¹⁶³	Past	1.4%	6.0%	6.6%	3.9%	5.8%
		Future	≥4.0%	≥4.6%	≥4.6%	≥4.7%	≥11.8%
	Average household water use (litres per property per day)	Past	413	424	404	408	405
		Future	≤402	≤402	≤401	≤400	≤396
	Business customers who use more than 100ML (100 million litres) of water a year, who have an active water efficiency plan	Past	100%	100%	100%	100%	100%
		Future	100%	100%	100%	100%	100%

¹⁶³ The maximum per cent possible is estimated at 25 per cent.

Outcome	Measure	Performance					
		(Past = 2017-18 to 2021-22 actual performance) (Future = 2023-24 to 2027-28 regulatory period)					
Looking after our natural environment	Hectares of land we actively manage to preserve and restore biodiversity and natural habitats	Past	n/a	n/a	n/a	n/a	1 hectare
		Future	9 hectares	11 hectares	13 hectares	45 hectares	47 hectares
	Volume of sewage spills that have a material impact to the environment	Past	n/a	n/a	34,259 ¹⁶⁴ kilolitres	29,392 ¹⁶⁵ kilolitres	3,547 kilolitres
		Future	≤5,000 kilolitres	≤5,000 kilolitres	≤5,000 kilolitres	≤5,000 kilolitres	≤5,000 kilolitres
	Number of customers who were on septic tanks and are now connected to the sewerage network	Past	123	353	294	290	242
		Future	>200	>200	>200	>200	>200
	Percentage of energy requirements met from renewables	Past	23%	26%	35%	50%	66%
		Future	85%	95%	100%	100%	100%

Table 61: Proposed outcomes, measures and targets for the 2023-28 period, including five years of historical performance 2017-22

Each of the measures has been developed to ensure it is measurable and delivers upon the intent expressed by customers.

Refer to Table 62 below for an outline about how we propose to calculate each outcome measure

Outcome	Measure	Target set in reference to	Measurement
Safe and pleasant drinking water	Compliance with Safe Drinking Water Regulations (2015)	Five-year average historical performance	Measured using ESC indicator DWQ 2
	Customers who agree we provide great drinking water	Five-year average historical performance	Customers who respond strongly agree/somewhat agree to the question "to what extent do you believe that Yarra Valley Water delivers great drinking water" as measured by our ongoing tracking research program.

¹⁶⁴ Includes spill volume associated with undetected asset failure at Craigieburn treatment plant in 2020 – if excludes volume = 4,289.

¹⁶⁵ Includes spill volume associated with major storm event with multiple power failures between 9-13 June 2021 – if excludes volume = 4,505.

Outcome	Measure	Target set in reference to	Measurement
Reliable water and sewerage services	Customers who experience three or more unplanned interruptions	Five-year average historical performance	Count of customers experiencing three or more unplanned interruptions of their water or sewerage service in the year. Measured using ESC indicators REW9 and RES5.
	Customers who experienced five or more unplanned interruptions in the last three years, and any interruptions this year	Four-year average historical performance	Count of customers with experiencing five or more unplanned interruptions of the water and/or sewerage service in the year. Measured using ESC indicators REW7 (unplanned) and like RES5.
Timely response and repair	Customers' satisfaction with the restoration of their services (planned and unplanned interruptions)	Five-year average historical performance	As measured by our ongoing tracking research program - customers responses (weighted average) to the question "Overall, how satisfied are you with your most recent experience with YVW with regards to X?" – where X represents: <ul style="list-style-type: none"> • Emergency Fault Repair. • Scheduled Maintenance – property connection branch. • Water and Sewer Renewals.
	Customers whose water or sewerage service wasn't restored within four hours	Five-year average historical performance	Number of customer interruption where water and sewerage service wasn't restored in 4 hours measured RES9 + like REW 10 divided by total number of customer-interruptions as measured by RES9 + REW 10
	Customers whose water or sewerage service wasn't restored within 12 hours	Five-year average historical performance	Number of customer interruption where water and sewerage service wasn't restored in 12 hours measured like RES9 + like REW 10 divided by total number of customer-interruptions as measured by RES9 + REW 10
Service that meets everyone's needs	Customers' satisfaction with their most recent interaction with us	Five-year average historical performance	As measured by our ongoing tracking research program - customers responses (weighted average) to the question "Overall, how satisfied are you with your most recent experience with YVW with regards to X?" – where X represents all interaction points surveyed.
	Customers, who accessed our support services, believe Yarra Valley Water helped them with their bills	Five-year average historical performance	As measured by our ongoing tracking research program - customers responses to the question "To what extent do you believe that YVW assisted you with your water bills?".

Outcome	Measure	Target set in reference to	Measurement
Saving water for the future	Water lost in Yarra Valley Water's supply system	Timing and scope of proposed investments	Measured using ESC indicator REW 13 divided by BED 9.
	Recycled water used in designated areas	Timing and scope of proposed investments	Volume of recycled water supplied and used as a proportion of total water (drinking and recycled) used in designated recycled water areas.
	Average household water use (litres per property per day)	Forecast demands	Measured using ESC indicator BED 10a divided by BED 5 (annual average) divided by number of days in the year * 1,000,000.
	Business customers who use more than 100ML (100 million litres) of water a year, who have an active water efficiency plan	Five-year average historical performance	Consistent with annual reporting of major non-residential water users (Section 122ZJ of the Water Act 1989)
Looking after our natural environment	Hectares of land we actively manage to preserve and restore biodiversity and natural habitats	Timing and scope of proposed investments	Hectares of our land where we have implemented a specific approach for the habitat to be protected and preserved at each site.
	Volume of sewage spills that have a material impact to the environment	Three-year historical performance adjusted for extreme events	Consistent with EPA reportable spill - measured consistent with EPA reporting assessment tool
	Number of customers who were on septic tanks and are now connected to the sewerage network	Timing and scope of proposed investments	Count of the number of properties that connect to the sewerage network located within a Community Sewerage Program area, irrespective of the year in which the area was declared.
	Percentage of energy requirements met from renewables	Timing and scope of proposed investments	Measured consistent with our Statement of Obligations.

Table 62: Outline of how we propose to calculate the outcome measures and targets

We also propose to:

- Retain our community rebate – increasing the amount from \$1.5 million¹⁶⁶ to \$1.8 million for any outcome not achieved annually, returning it to customers. However some customers have told us they do not value the small reduction in bills. We will explore with our long-standing Community Advisory Group, how we can transition to a mechanism that maximises the value of our community rebate.
- Seek recommendations annually from our Community Advisory Group, or another similar group of customer representatives, on whether we've achieved each outcome. We'll pilot the process during 2022-23 to ensure we establish a robust process that enables customer representatives to advise us on:
 - Whether our performance has met customer expectations.
 - The extent to which we return \$1.8 million dollars per outcome through our Community rebate.

Key considerations for the proposed advanced rating are presented below in Table 63.

Guiding question	Key considerations	
Has the business provided evidence that the outcomes proposed have taken into account the views, concerns and priorities of customers?	For	<p>We've evolved our outcomes to reflect customers' priorities.</p> <ul style="list-style-type: none"> • Business wide adoption of Caring for Country principles in delivering our services to the community and looking after the natural environment. • The Jury proposed 12 recommendations to our Board, who accepted 10 recommendations in full, accepted one with a small variation and set aside one recommendation for future consideration. • Our proposed expenditure provides value for money for customers through either increased value or the maintenance of service that customers have told us is important. <p>We've included in our proposals:</p> <ul style="list-style-type: none"> • Continuation of current levels of service supported by willingness to pay analysis. • Additional expenditures items where customers, including those self identifying as financially vulnerable, have clearly provided support through a variety of avenues including willingness to pay analysis. Results of willingness to pay analysis were re-confirmed in August 2022 following successive interest rate increases.
	Against	<ul style="list-style-type: none"> • Whilst customers have said we need to focus on ensuring our services are widely accessible and meet everyone's needs, they also said accessibility was beyond meeting a standard. We haven't yet identified a meaningful measure and target for accessibility. We'll continue to explore this with customers, developing a suitable measure during the period.

¹⁶⁶ January 2019\$ - equivalent to \$1.65 million in January 2023\$.

Guiding question	Key considerations	
Has the business provided sufficient explanation of how the outcomes it has proposed align to the forecast expenditure requested?	For	<ul style="list-style-type: none"> • Evolved our outcomes to reflect customers' priorities from our extensive engagement and research. • For each outcome we have defined 'what we do' in terms of actions, activities and operating and capital expenditure, • All expenditure is linked to the delivery of the six outcomes.
Has the business proposed outputs to support each of its outcomes, which are measurable, robust and deliverable?	For	<ul style="list-style-type: none"> • Measures and targets are usually based on five-year historical performance and reflect any changes due to increased expenditure and growth in customer numbers. • New measures reflect the range of customer experiences, including those who receive services that are significantly different to typical customers or require a different service to meet their needs.
Has the business provided evidence that the outputs it has proposed are reasonable measures of performance against stated outcomes?	For	<ul style="list-style-type: none"> • Our outcomes, measures and targets maintain service levels consistent with what customers have said. • We've matched targets for biodiversity to the commitments we've made – and tested with customers through willingness to pay studies. • Targets for saving water are matched to our demand forecasts and are consistent with investments we'll make during the 2023-28 period. • Measures are clearly defined and unambiguous – they are expressed in customer language and have been tested with customers.
Has the business demonstrated a process to measure performance against each outcome and to inform customers?	For	<ul style="list-style-type: none"> • We're committed to empowering customers to advise Board on whether outcomes have been achieved on an annual basis. • The business has an established customer performance reporting approach that is targeted to customer needs. • Retaining and extending our community rebate of \$1.8 million for any outcome not achieved annually.
	Against	<ul style="list-style-type: none"> • In 2022-23 we're piloting the process that will enable customers to advise Board on whether outcomes have been achieved on an annual basis.

Table 63: PREMO outcomes – key considerations for and against an advanced rating

Appendix C

Detailed capital expenditure

There are three key drivers of our capital expenditure forecasts:

- **Asset renewal and customer service levels** – Our infrastructure assets service multiple generations and can last for up to 100 years. There is a small proportion of our network nearing the end of its life and will be replaced as there are significant customer and community impacts when these assets fail. Our investments are aimed at maintaining our existing network and technology assets to meet customer service levels resilient to the impacts of climate change and evolving expectation of customer experience.
- **Customer growth** – Servicing customer growth and new development includes providing water, recycled water and sewerage services to new suburbs on the fringe of Melbourne, major urban renewal and infill developments. Our growing northern suburbs between Craigieburn and Wallan will contain over 100,000 new serviced properties in the next 20 years.
- **Business improvements and regulatory compliance** – We are regulated by the Department of Health (DH) and the Environment Protection Authority (EPA) in relation to product quality, including the safety of drinking water and reliability of the sewerage network

Table 64 below outlines in detail forecast capital expenditure forecasts for the five years 2023-24 to 2027-28. In addition, to provide context, the annual average investment for each program over each five-year period 2018-19 to 2032-33 inclusive.

	Average annual 2018 to 2023	Regulatory period 2023-24 to 2027-28					Average annual spend	Average annual spend 2028 to 2033
		23-24	24-25	25-26	26-27	27-28		
DRIVER: Asset renewal and customer service levels								
Water reliability (reticulation main renewals)	\$38.57	\$36.99	\$40.04	\$41.06	\$41.06	\$41.06	\$40.04	\$40.04
Customer meter replacements	\$6.68	\$5.42	\$11.83	\$21.15	\$20.81	\$20.45	\$15.93	\$8.69
Water distribution mains	\$3.99	\$6.19	\$19.07	\$21.20	\$20.72	\$19.77	\$17.39	\$20.32
Water reliability (civil, mechanical and electrical)	\$11.72	\$21.26	\$24.44	\$25.05	\$25.30	\$24.95	\$24.20	\$22.10
Water conservation	\$3.99	\$7.43	\$7.32	\$7.29	\$1.65	\$0.67	\$4.87	\$0.60
Sewer reliability (gravity main renewals)	\$38.87	\$41.29	\$41.29	\$42.34	\$49.23	\$41.29	\$43.08	\$45.42

	Average annual spend 2018 to 2023	Regulatory period 2023-24 to 2027-28					Average annual spend	Average annual spend 2028 to 2033
		23-24	24-25	25-26	26-27	27-28		
Sewer reliability (civil, mechanical and electrical)	\$11.12	\$16.65	\$15.79	\$15.34	\$15.01	\$15.16	\$15.59	\$11.65
Water and sewerage financed works (financed by others)	\$0.90	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Digital enablement	\$25.63	\$33.14	\$27.79	\$22.70	\$18.00	\$12.14	\$22.75	\$22.75
Facilities	\$0.98	\$1.16	\$1.16	\$1.16	\$1.16	\$1.16	\$1.16	\$1.16
Motor vehicles	\$2.21	\$2.78	\$3.23	\$2.95	\$3.95	\$2.18	\$3.02	\$2.89
DRIVER: Customer growth								
Drinking water infrastructure	\$22.00	\$13.82	\$31.04	\$39.47	\$26.92	\$28.17	\$27.89	\$32.80
Sewerage infrastructure	\$81.01	\$43.56	\$35.75	\$40.10	\$35.92	\$19.28	\$34.92	\$88.52
New customer meters (financed by others)	\$13.83	\$13.45	\$13.45	\$13.45	\$13.45	\$13.45	\$13.45	\$15.55
Temporary assets (financed by others)	\$0.00	\$2.21	\$0.32	\$1.79	\$4.31	\$1.05	\$1.93	\$0.00
Recycled water infrastructure	\$10.29	\$22.31	\$59.67	\$97.89	\$83.95	\$51.61	\$63.09	\$53.44
Other	\$0.76	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
DRIVER: Business improvements and regulatory compliance								
Safe and pleasant water	\$8.08	\$8.54	\$9.17	\$9.79	\$10.65	\$11.10	\$9.85	\$11.52
Community sewerage	\$24.47	\$24.17	\$24.17	\$24.17	\$24.17	\$24.17	\$24.17	\$24.17
Sewer capacity	\$1.65	\$2.93	\$3.31	\$3.43	\$5.93	\$4.91	\$4.10	\$4.04
Sewage treatment and recycling	\$14.99	\$22.26	\$22.56	\$26.35	\$25.65	\$16.89	\$22.74	\$8.43
Energy generation and emissions	\$1.41	\$2.38	\$0.26	\$0.56	\$0.00	\$0.11	\$0.66	\$0.00
Biodiversity and regenerative land use	\$0.25	\$1.94	\$2.87	\$0.95	\$0.61	\$1.44	\$1.56	\$0.19
Total capital expenditure	\$323.42	\$329.88	\$394.53	\$458.19	\$428.44	\$351.00	\$392.41	\$414.27

Table 64: Forecast capital expenditure by program 2023-24 to 2032-33, including annual average spend 2018-19 to 2032-33 (\$ million January 2023)

Details for each program are provided in the following sections.

C.1 Asset renewal and customer service level programs

C.1.1 Water reliability – reticulation main renewals

We currently operate and maintain a large network of water reticulation mains providing water services to approximately 800,000 customer properties. If the reticulation network isn't maintained, there's an increasing risk of failure leading to service interruptions and other significant impacts.

Our 2018-23 commitments include the outcome 'reliable water and sewerage services', and we've confirmed it remains a priority for customers¹⁶⁷. The water reticulation mains program forms part of the inputs required to deliver upon our commitment (refer to page 44) that is measured by the number of customers who experience multiple interruptions.

To maintain current customer service levels, an ongoing asset renewal program is required for:

- Water reticulation mains – replacing long sections of pipe which distribute water to customers.
- Water main to meter – the property service line that connects the water main to the property water meter.
- Reactive replacements – emergency works that result in replacing sections of water mains, stop valves and valves at the offtake to the main to meter (ferrules).

Water reticulation main renewals

Context

Water reticulation mains are pipes less than 300mm in diameter that transfer drinking water from larger distribution mains to customer properties. The network consists of 9180km of pipes, over 800,000 service connections and represents almost 93 per cent of our water supply network.

As reticulation mains age, the likelihood of experiencing a pipe failure increases.

Failures can lead to service interruptions causing customer dissatisfaction, public safety issues, damage to property and the environment. The design life of a reticulation main is around 100 years but the actual life of a pipe can be longer or shorter depending on the pipe material, soil type, operating conditions, and other environmental impacts.

Water reticulation main failures account for about 60 per cent of customer interruptions and are the predominant cause of complaints about water supply reliability. Mains are replaced when the impact to customers from repetitive bursts reach unacceptable levels.

Prudency, efficiency and deliverability

Ageing assets are known to have more frequent failures as they approach the end of their life. Our asbestos cement (AC) pipes constructed between 1930 and 1940 and cast iron (CI) pipes constructed between 1950 and 1960 have the worst failure rates, despite still being within their 100-year design life. AC pipes fail when the cement holding the asbestos fibres together leaches out, whereas CI pipes fail due to external corrosion as the metal used post

¹⁶⁷ Insightfully, Yarra Valley Water Research Synthesis, November 2021.

WWII was of a lesser quality due to availability of materials. Once these pipes fail, there's a high likelihood they'll fail again due to their material properties.

Mains are greatly impacted by ground movement caused by cyclical wetting and drying of soils, which is expected to increase in the future due to climate change. In turn, this is likely to increase the length of mains targeted for replacement.

When reticulation mains fail, our immediate response is to undertake a repair, which results in a service interruption for connected customers. Typically, a repair takes three to six hours and affects about 30 customers. If a pipe has a number of breaks within a defined period based on a risk-based assessment – generally two to three a year – it is programmed for replacement. When the replacement is triggered, the mains are placed on the mains renewal program. Under our current contracts, it takes approximately three to six months from identification to replacement.

Decisions around the renewal investment program are based on modelling in the Pipeline Asset and Risk Management System (PARMS) software. PARMS uses actual pipe failure data in combination with predictive modelling of pipe breaks and other derived asset management metrics (by way of example, TOTEX¹⁶⁸, risk and criticality, service levels, cost effectiveness) to determine replacement priorities and justify individual investments.

PARMS supports a data-driven asset management framework, helping to align strategic and tactical planning with capital delivery. PARMS is accepted by the industry as a sophisticated tool to analyse and justify our investment needs and target mains for replacement.

Consistent with the 2018-23 period, we're assuming \$500.20 per kilometre of main renewed, with a total estimated investment of \$130.05 million over the 2023-28 period (6.1 per cent or \$7.5 million more compared to 2018-23) with the increase attributed to increased volumes identified by PARMS. Our key program assumptions include:

- An assumed average length of 250m per renewal, reduced from 350m, to optimise the set-up costs associated with site and traffic management.
- Renewal of an entire shut off block (usually the same age and material), creating efficiency in capital delivery, decreasing the risk of reduced services to customers and removing the potential for service delivery impacts due to repeat attendances and repairing bursts and leaks.
- A rate of \$500.20 per metre that's been calculated using the average water main renewal rate over the last five financial years that captures efficiencies in structuring renewal packages and contractor delivery and allows for:
 - Stricter requirements required under recent Environment Protection Act 2017 reforms and increased costs of soil disposal and water run-off management.
 - Additional water quality testing and disinfection to manage water quality risks associated with works, identified by a recent Hazard Analysis and Critical Control Point (HACCP) review¹⁶⁹ and consistent with the Department of Health's expectations to continuously improve water quality risk management practices and address risks identified by risk management plans¹⁷⁰.

¹⁶⁸ TOTEX takes into account the total base expenditure and includes both operating and capital expenditure.

¹⁶⁹ HACCP internal audit, April 2019.

¹⁷⁰ Department of Health Guidance for the 2023 Water Price Review, Guidance for water agencies - October 2021, p2.

- Extra requirements from councils that have increased the volume of road reinstatement work required.
- Greater frequency of hydro-excavation to locate assets without damaging them. This has resulted in a 245 per cent increase in these costs over 2018-23.
- No allowance for the impacts of climate change on water reticulation pipe failures – where we’re accepting the financial risk due to the uncertainty of the limited data available on the specific climate change impacts on buried water pipe failures. Additional studies have been planned to increase our understanding of the impacts of climate change. If network performance deteriorates during the 2023-28 regulatory period and we’re unable to maintain our levels of service for interruptions, we will adjust our program accordingly.

We have several long-term delivery partnerships, established via open tender process. The primary benefits of establishing these long-term partnership style contracts include:

- Obtaining delivery and procurement efficiencies via reduced frequency of tendering.
- Ensuring contractor skills, qualifications, experience and ability to deliver via a thorough tendering process.
- Ability to leverage contractor skills and experience through joint learnings and improvements.
- Embed long-term improvement metrics and key performance indicators into contracts.
- Maintaining a steady stream of work so our partners have confidence to employ, train and retain staff.
- Our demonstrated ability to deliver, in partnerships, the annual length of renewals we’ve proposed over the 2023-28 period.

We are due to test the market early in the 2023-28 period. If the market reveals a reduction in the cost of the program, we will return any unit rate efficiencies together with the costs to customers immediately through our revenue cap, as described in Section 8.5 Adjustment to prices on page 117.

In response to current economic and market concerns, we’ve risk adjusted the profile of this program to account for resourcing constraints due to current macro-economic conditions that could limit our partner’s ability to ramp up as quickly as originally planned. These changes have resulted in a gradual ramp up in volumes delivered over the period with an overall reduction of \$4.9 million per annum (15.9 per cent forecast over the 2023-28 period as shown in Figure 33 below.

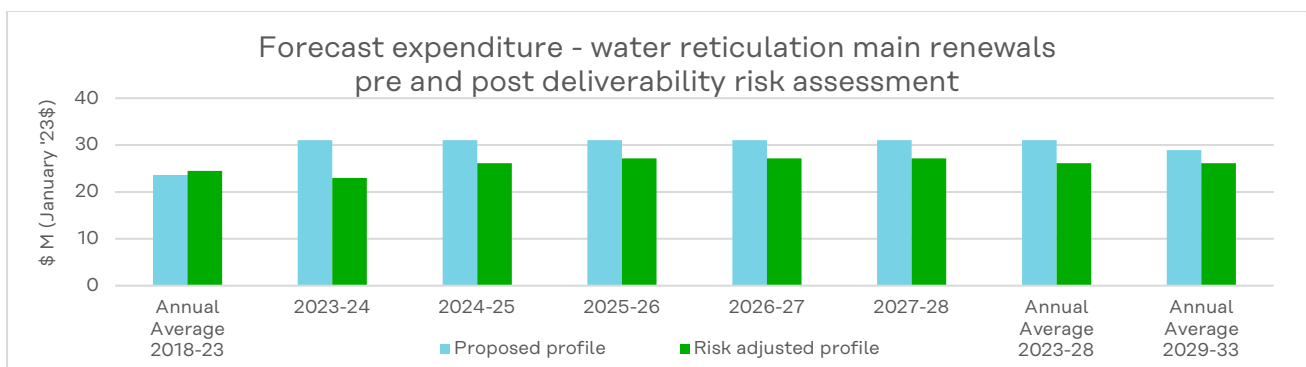


Figure 33: Risk adjusted reticulation main renewals program capital expenditure profile 2023-24 to 2027-28 (\$ million January 2023)

Table 65 below shows our forecast capital expenditure over the next two regulatory periods, that increases by \$1.5 million per annum due to an additional 3km renewed per annum as identified by PARMS.

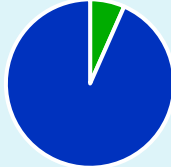
		Annual average			% of total capital expenditure
		2018 to 2023	2023 to 2028	2028 to 2033	
Water reticulation main renewals	kilometres	49	52	52	
	unit cost	500.20	500.20	500.20	
	\$ millions	24.51	26.01	26.01	

Table 65: Forecast average annual water reticulation main renewals program capital expenditure 2023-24 to 2032-33 (\$ million January 2023)

Water main to meter renewals

Context

Water main to meters are smaller pipes that connect from the water reticulation main to the customer meter and provide service to a single property or multiple properties within a subdivision. The pipe diameters range from 15mm to 50mm and have an average length of 10m. Pipe materials are typically polyethylene but include problematic copper and galvanised iron.

Water main to meters have a design life of only 50 years due to their material and susceptibility to construction related impacts due to their shallower depth. We replace an average of 887 main to meters each year.

When water main to meter failures require repair the water supply to the individual property is typically interrupted for one to three hours. However, if the valve at the offtake from our water main can't be isolated to complete the repair, the water main must be shut down. When this occurs, a larger number of customers are affected for three to six hours.

Prudency, efficiency and deliverability

The water main to meter program is an ongoing reactive maintenance program, impacted by weather and soil conditions.

When there's a report of failure or a leak on a main to meter, a spot repair is typically undertaken, unless it's determined that the asset is beyond repair, in which case a renewal of the service is required. Repair and renewals of main to meters are carried out by our maintenance contractor.

Some of the common issues with main to meters are:

- When main to meter pipes made of aged copper start to degrade, they'll rapidly fail i.e. one pin hole leads to many.
- Galvanised iron (GAL) main to meters can deteriorate rapidly. Rust builds up inside the pipe and severely restricts or blocks flow completely. The life of GAL varies considerably due to soil conditions and proximity to electrical fields.
- Tree roots wrapping around pipes and cracking or breaking them.
- Fences or brick walls built over the pipe can cause damage due to their weight.

- Other utilities damaging our services during their work in road reserves.
- The practice of the Melbourne Metropolitan Board of Works, prior to Yarra Valley Water’s formation, to push copper service lines through existing GAL service lines, in an attempt to remove GAL lines from the network. These are challenging pipes to repair and renew.

Based on historical average cost, we’re assuming \$4,002 per main to meter renewed, with a total estimated investment of \$17.75 million over the 2023-28 period – the same as for the 2018-23 period. Overall, this ongoing program is efficient and deliverable as:

- Reactive maintenance programs are delivered by our long-term maintenance partner, Ventia, procured via a comprehensive competitive tendering process.
- Our reactive maintenance teams work in collaboration with our maintenance partner to ensure continuous improvement in the way these works are delivered.
- The Civil Water Maintenance Benchmarking 2019 study¹⁷¹ conducted by Marchment Hill, indicated that Ventia’s rates are some of the most efficient in the water industry which is supported by the following:
 - Use of optimally sized and flexible crews
 - Flexible work arrangements in place
 - Implementation of alternative delivery models
 - Performance driven culture.

Table 66 below shows our forecast capital expenditure over the next two regulatory periods – the same in quantity and cost when compared to the 2018-23 period.


		Annual average			% of total capital expenditure
		2018 to 2023	2023 to 2028	2028 to 2033	
Water main to meter renewals	number	887	887	887	
	unit cost	4002	4002	4002	
	\$ millions	3.55	3.55	3.55	

Table 66: Forecast average annual water main to meter renewals program capital expenditure 2023-24 to 2032-33 (\$ million January 2023)

Reactive replacements

Context

Reactive replacements cover the emergency replacement of short sections of pipe at a burst location when the maintenance crew deems the pipe can’t be spot repaired and replaces defective stop valves and ferrules. It’s an ongoing reactive maintenance program and is impacted by weather and soil conditions.

¹⁷¹ Marchment Hill Consulting, Civil Water Maintenance Benchmarking 2019, March 2019.

Prudency, efficiency and deliverability

We're assuming a total estimated investment of \$52.55 million over the 2023-28 period consistent with the 2018-23 period.

Consistent with the water main to meter program above, the reactive replacement program is delivered by our long-term maintenance partner, Ventia, who was appointed following a comprehensive competitive tendering process. We work in collaboration with Ventia to ensure continuous improvement in the way these works are delivered. A 2019 benchmarking study¹⁷² indicated that Ventia's rates are some of the most efficient in the water industry.

Table 67 below shows our forecast capital expenditure over the next two regulatory periods, that remains the same in both quantity and unit price.

		Annual average			% of total capital expenditure
		2018 to 2023	2023 to 2028	2028 to 2033	
Emergency water main replacement	number	1320	1320	1320	
	unit cost	5175	5175	5175	
	\$ millions	\$6.83	\$6.83	\$6.83	
Stop value replacement	number	10282	10282	10282	
	unit cost	235	235	235	
	\$ millions	\$2.42	\$2.42	\$2.42	
Ferrules replacement	number	950	950	950	
	unit cost	1330	1330	1330	
	\$ millions	\$1.26	\$1.26	\$1.26	
Total	\$ millions	\$10.51	\$10.51	\$10.51	

Table 67: Forecast average annual reactive replacement renewals program capital expenditure 2023-24 to 2032-33 (\$ million January 2023)

C.1.2 Customer meter replacements

Context

A water meter is installed on each property to accurately measure the volume of water that is used – which is subsequently used for billing.

The current meter fleet is made up of 869,476 mechanical meters, 97 per cent of which are 20mm and 25mm in size (92 per cent and 5 per cent respectively). Of this total 38,997 are recycled water meters, 99 per cent of which are 20mm in size.

We also have 101,349 remote read devices which are attached to existing mechanical meters, predominately in high rise buildings, properties with locked gates, and shops where access to the meter for face reading is difficult. In this case remote means the meter reading

¹⁷² Marchmont Hill Consulting, Civil Water Maintenance Benchmarking 2019, March 2019.

can be downloaded when the meter reader comes within close proximity of the meter (typically within 50m).

Historically, we've used mechanical meters to measure the aggregate volume of water supplied to each property, which are then manually read (typically every three months) with the reading used to calculate how much water each property has consumed over the period since the previous reading.

Over time, a meter's accuracy declines to a point at which it breaches the required level of service defined in AS3565 (which is accuracy within +/- 4 per cent), requiring the meter to be replaced. Replacing water meters is an ongoing program.

Determining an individual water meter's accuracy requires it to be removed from service and sent away for testing at an approved facility. Given it's not practicable to remove every single meter for testing, a statistically significant sample of meters from each cohort¹⁷³ are removed and tested. The results determine if all meters within the cohort require replacement – or when the next test should take place.

There are two categories of meter replacements:

- Unplanned – stolen, damaged or faulty meters.
- Planned – replacing meter populations which have failed accuracy testing.

Mechanical meters typically have a life of 15 years, which based on historical evidence is the point they would fail the AS3565 testing. Currently 42 per cent of our meter fleet is 15 years or older. By the end of the 2023-28 period – if we were to do nothing, the number of meters at 15 years will be 62 per cent. As the meter fleet ages, there's an increased likelihood of:

- Non-compliance with metering standards (AS3565).
- Inaccurately billing customer usage leading to increased customer complaints.

Prudency, efficiency and deliverability

Since 2018, we've been exploring the possibility of digital meters. We have conducted three separate trials with around 800 meters currently installed at customer properties in Vermont South. We plan to run an extended trial of 25,000 meters commencing in 2023-24. The extended trial is designed to assess the end-to-end operating model of digital metering inclusive of meter installation.

At the conclusion of the extended trial, we expect that we'll be able to confirm the following:

- We have access to a proven digital meter at the right price point.
- Deliverability of the program, including the capacity of our installation partner(s) and the operation of our supporting IT systems and processes.
- A positive NPV business case that includes:
 - The amount and value of water savings
 - Confirmed costs and schedule
 - Demonstration of continued customer support
 - Any learnings from other digital meter roll-outs throughout the state (and country).

¹⁷³ Cohorts are defined as meters of a certain type installed within a similar time period.

The current business case option for the roll-out of digital meters shows a positive NPV of \$47.07 million. At the conclusion of the 25,000 meter extended trial, we will make a decision about whether we roll out digital meters or proceed with replacing existing meters with a new mechanical meter.

If we proceed with digital metering, the forecast capital expenditure for the roll-out in 2023-28 period is \$155.06 million. Given the uncertainty and consistent with the age profile of the existing meter fleet the forecast expenditure reflects the costs of a planned replacement program of 550,000 mechanical meters with a similar meter. The forecast profile of installations significantly increases following the end of the extended trial.

Due to the age of the meter fleet, the number of unplanned meter replacements will be higher than the historical average (8,501 per annum compared to 2,227 per annum in the current regulatory period), at an estimated annual cost of \$1.74 million. It should be noted that as the planned replacement of meters proceeds, the number of unplanned meter replacement will ultimately fall below the historical average.

Table 68 below shows our forecast capital expenditure over the next two regulatory periods, that is almost seven times (673 per cent¹⁷⁴) more in 2023-28 than 2018-23 as we haven't undertaken proactive replacement of meters while exploring the possibility of digital meters. We'll commence a replacement program for the 62 per cent of meters that will be at end of life by the end of the 2023-28 period.

		Annual average			% of total capital expenditure
		2018 to 2023	2023 to 2028	2028 to 2033	
Unplanned meter replacements	number	2227	8501	3071	
	unit cost	204.16	204.16	204.16	
	\$ millions	0.45	1.74	0.63	
Planned replacement of mechanical meters	number	13,219	109,801	48,265	
	unit cost	121.67	129.30	167.12	
	\$ millions	1.61	14.19	8.06	
Digital metering pilot	\$ millions	4.62	0.00	0.00	
Total	\$ millions	6.68	15.93	8.69	

Table 68: Forecast average annual customer meter replacement program capital expenditure 2023-24 to 2032-33 (\$ million January 2023)

Consistent with our 2018-23 submission we won't recover the costs associated with the pilot of digital meters before confirmation of the business case¹⁷⁵.

¹⁷⁴ Excluding digital meter pilot costs.

¹⁷⁵ Yarra Valley Water, response to draft decision, March 2018 - <https://www.esc.vic.gov.au/sites/default/files/submissions/2018-water-price-review-submission-yarra-valley-waters-response-to-draft-decision-20180320.pdf>.

C.1.3 Water distribution mains

Context

We have a large network (1,042km) of large diameter water distribution mains (typically 300mm diameter and larger), that are responsible for transferring drinking water from tanks and service reservoirs to the water reticulation network that services customers. These mains are mostly constructed out of mild steel, ductile iron and cast iron.

The weighted average age of the asset cohort is 43 years, however 37km of mains are greater than 100 years old with some even constructed in the late 1800s (up to approximately 150 years old). Approximately 20km of mains have been assessed¹⁷⁶ in the extreme¹⁷⁷ risk category.

Distribution mains are typically designed to last around 100 years. The useable life of any water main differs due to operational pressures, soil type, pipe material and other external impacts like traffic loadings and proximity to electrical fields. Regular inspection and maintenance activities are required to ensure that customer and public health service requirements are achieved.

Our 2018-23 commitments include the outcome 'reliable water and sewerage services', and we've confirmed it remains a priority for customers¹⁷⁸. The water distribution mains program forms part of the inputs required to deliver upon this outcome (refer to Outcome 2 – Reliable water and sewerage services on page 44) that is measured by the number of customers who experience multiple interruptions.

Prudency, efficiency and deliverability

These mains fail more frequently as they approach the end of their usable lives and will fail catastrophically¹⁷⁹ if they're not proactively renewed or replaced. Catastrophic failures can't be repaired, instead they require complete replacement of a section of the main before service can be restored.

Catastrophic failure can lead to cascading failures into other parts of our network, with the following consequences:

- Prolonged widespread service interruptions as these repairs are generally complex, very costly and can take multiple days to complete.
- Damage and disruptions to roads, public transport and other key infrastructure.
- Risk to public safety including potential death or injury.
- Localised flooding and damage to properties, the environment and areas of public use.
- Increased risks of compromising water quality and public health.

Our proactive, ongoing water distribution renewal program is designed to avoid catastrophic failure of these mains. The program is risk-based and includes regular condition and risk assessments prior to confirming renewal. While there'll always be some ongoing residual risk

¹⁷⁶ Yarra Valley Water Controlled Document: YREF0126 Water Distribution Pipeline Risk Ranking.

¹⁷⁷ Mains that are assessed as extreme risks are those that have reached the end of their serviceable life and have deteriorated to the point that they are unserviceable and where failure has significant impacts including proximity to properties, transport and environmentally sensitive areas and the number and type of customers potentially impacted by a major failure (e.g. hospitals).

¹⁷⁸ Insightfully, Yarra Valley Water Research Synthesis, November 2021.

¹⁷⁹ Catastrophic failures are those that occur suddenly and result in total failure or collapse of the main.

of distribution main failures, this risk is significantly reduced by this proactive risk-based and verified condition approach that ensures we only renew as required.

Taking a proactive approach to these distribution main renewals will ensure we have adequate time for early planning, options assessments, and engineering investigations to achieve best-for-project outcomes and maximise customer value. In contrast, taking a reactive approach would mean:

- More frequent catastrophic failures.
- Increased costs associated with complex emergency repairs, estimated to be in the order of 11 per cent.
- Fast-tracking renewals at a higher overall cost due to the high priority of the works.

To help quantify the benefits of implementing a proactive program, a series of hypothetical net present cost (NPC) assessments have been conducted – the results support the proactive program under all scenarios.

This program will be more important than ever, as we head into an unpredictable climate with an ageing asset base (with a 120 per cent increase in the length of distribution mains that will reach end of life by 2028), increasing water demands and more stringent regulatory obligations.

The renewal program we proposed for the 2018-23 regulatory period focused on completing condition assessments and commencing functional designs for the highest risk distribution mains, with a view to commencing required renewals in 2023-28. During the 2018-23 period, some mains were identified and immediately renewed to minimise risk and impact to our customers, which required spending approximately \$16.0 million that wasn't included in the 2018 determination due to timing, cost and condition uncertainty. Works included renewing:

- 2.8km of the M52 distribution main (Kew)
- 0.2km of the M80 (Bundoora)
- 0.1km of the M47 (Kooyong)
- 1.9km of the M360 to be completed in 2022-23 at an estimated cost of \$3 million.

We're assuming a total estimated investment of \$86.95 million over the 2023-28 period (a 330 per cent increase compared to 2018-23). The increase in expenditure is largely driven by confirmation of the poor condition of the following extreme risk mains, which now require renewal:

- 5.3km of the 750mm diameter M4 in Coburg and Brunswick – a major project, planned for completion in 2027-28 (refer to section 3.9, Major projects on page 57 for additional detail).
- 2.0km of the 600mm diameter M47 distribution main in Kooyong and Hawthorn East, planned for 2024-25 to 2025-26.
- 1.4km of the 600mm diameter M21 in Glen Waverley planned for 2024-25 to 2025-26.
- 3.6km of the 300mm diameter M360 in Arthurs Creek planned for 2026-27 to 2027-28.

The M4 renewal project has already undergone a thorough options assessment process, and will be shortly commencing design – with the remaining mains commencing planning and options investigations soon.

The M21 and M4 renewal projects have been cost estimated by our project management office in conjunction with the project team and includes a P50 Monte-Carlo analysis with an

appropriate contingency allowance given each project’s stage and scope. The remaining renewal project costs are based on individual project cost estimates using historical costs from comparative projects.

Based on the estimated contract value, each renewal project (excluding the M4) can be procured via our existing panel of pre-qualified construction partners. Depending on how the M4 renewal project is packaged, it may also be procured via our existing panel, otherwise it will be procured via an open tender process.

In addition to mains identified above, we’ve desktop risk assessed another 14km of mains as extreme but haven’t had them condition assessed yet. If these mains require renewal during the 2023-28 regulatory period, we’ll proceed with the renewal, absorbing the associated financing costs and include the actual capital cost in the opening regulatory asset value for 2028-33.

We propose to increase the length of mains assessed from about 4km to 21km per year, reflecting the significant increase in the number of distributions mains approaching the end of their asset life (120 per cent increase by the end of 2028). We currently have one delivery partner undertaking condition assessments with the intention to increase capacity with the appointment of an additional one or two partners this year. We have recognised that there’s some delivery risk associated with the uplift expected for this program and therefore have reduced the proposed investment in the first two years of the 2023-28 period by \$3.9 million.

The expected unit cost of our condition assessments is expected to increase slightly across the 2023-28 period, as we move away from opportunistic assessments that aren’t as detailed.

We’ve risk adjusted the profile of this program to account for:

- Resourcing constraints due to current macro-economic conditions that could limit our ability to deliver projects as quickly as first estimated.
- De-risking delivery overall through increasing consultation and approval times with customers, stakeholders and regulators.

These changes have resulted in a shift of \$10 million from 2023-24 and 24-25 to later in the 2023-28 period as shown below in Figure 34.

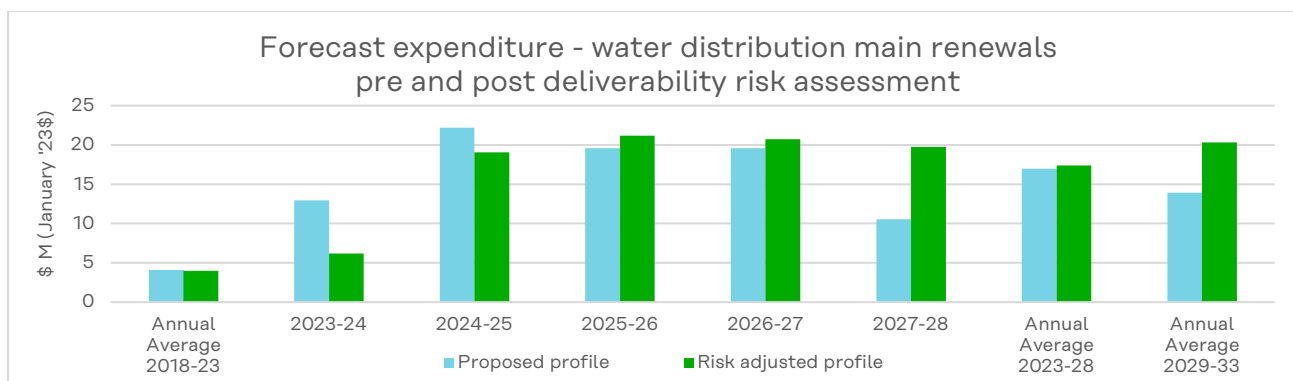


Figure 34: Risk adjusted water distribution main renewal program capital expenditure profile 2023-24 to 2027-28 (\$ million January 2023)

Table 69 below shows our forecast capital expenditure, including the M4 water main renewal project, over the next two regulatory periods. As indicated above, there is a forecast increase in capital expenditure associated with a rise in the number of distribution mains that have been confirmed, by inspection, to require renewal – together with an increased condition assessment program, reflecting the growing number of ageing mains reaching end of life.

		Annual average			% of total capital expenditure
		2018 to 2023	2023 to 2028	2028 to 2033	
Condition assessment program	number	3.9	21.1	26.0	
	unit cost	0.13	\$0.17	\$0.17	
	\$ millions	\$0.51	\$3.59	\$4.42	
Distribution main renewal projects	\$ millions	\$3.20	\$5.00	\$15.90	
M4 main renewal (major project)	\$ millions	\$0.30	\$8.80	\$0.00	
Total	\$ millions	\$4.01	\$17.39	\$20.32	

Table 69: Forecast average annual water distribution mains renewal program capital expenditure 2023-24 to 2032-33 (\$ million January 2023)

C.1.4 Water reliability (civil, mechanical and electrical)

Context

We operate a water network which relies on civil, mechanical and electrical assets to sustain levels of service. These assets supply directly to customers or ensure effective operation and management of the network. With unique drivers, requirements, and different works programs to manage them, the water reliability strategy covers many different assets, separated into two categories:

- Civil assets that don't typically have independent movement or an electrical current and include:
 - Hydrants and filling stations, critical points of access to water for firefighting purposes, water carters and operational use such as water flushing.
 - Above ground mains, sections of pipes that are above ground and exposed to the environment, including those attached to road or rail bridges.
 - Valves that allow water mains to be isolated whilst allowing supply to continue to surrounding parts of the network.
 - Hydraulic and computer models of water pressure zones in the drinking and recycled water networks that identify the need for network upgrades to rectify any deficiencies.
- Mechanical and electrical assets that have a range of independent movement or electrical components and include:
 - Water pump stations that fill service reservoirs or provide additional hydraulic gradient networks where topography may result in insufficient pressures. They're

usually located in above ground buildings and comprise pumps, motors, electrical assets, control and monitoring equipment, pipework and cranes.

- Electrical assets that ensure the safe provision and management of power to devices at water pump stations, reservoirs and pressure reducing stations.
 - Network flowmeters located at key locations in networks providing flow data for day-to-day operation of networks.
 - Cathodic protection assets that are applied to steel pipelines and tanks to prevent them from corroding.
 - Pressure reducing valves that control pressure from higher pressure sources in networks.

Prudency, efficiency and deliverability

These assets have a shorter design life¹⁸⁰ than the networks they support and require regular inspection and preventative and reactive maintenance. Renewal or replacement is required more regularly than the networks they support to ensure reliability. When key assets fail, they result in a loss of water for customers, including critical customers like hospitals, aged care facilities and schools. Impacts of failure can be extensive, including duration, and largely depend on the type and location of assets and their functionality in the network. Appropriate levels of maintenance and replacement are also required to manage safety risks to ensure we fulfill our occupational health and safety (OHS) obligations.

The type of program and methodology depends on the risk profile for the asset type. Higher risk assets may require a preventative maintenance program. Lower risk assets are effectively managed by relying on reactive maintenance or repairing in a timely manner. Renewal or replacement is undertaken for high and low risk assets when multiple failures occur, when their performance no longer meets service level needs or when modelled risk of failure is deemed unacceptable.

Current preventative, reactive and renewal programs are based on good operating practice and industry standards.

Some components of the reliability sub-strategies require increased expenditure to achieve this strategy's objectives as follows:

- Maintaining level of service interruptions to customers.
- Ensuring compliance with OHS legislation and mitigating public safety risks.
- Providing asset resilience to reduce the impacts from climate change.

Factors driving the increases in expenditure required for 2023-28 are summarised below:

- **Age profile of assets** – a larger portion of our assets are now beyond their expected life and whilst still operating, have an increased likelihood of failure. Standby equipment has also increasingly been used to sustain levels of service when an asset has failed and reached end of life. There are now extended periods where critical assets are operating

¹⁸⁰ Civil, mechanical and electrical assets typically have a design life ranging from 10 to 40 years, compared to network pipes which have a design life of 100 years.

with little to no redundancy, increasing the risk of interruptions and reduced service to customers. Driving the increase at an asset class level is:

- Water pump stations – \$18.8 million increase, with a significant proportion allocated to the rebuild of six stations that are essential to maintain service levels to customers, particularly maintaining the level of supply interruptions as well as ensuring supply flows and pressures are maintained to customer charter standards.
 - Flowmeters – \$5.4 million to replace, on average, 19 flowmeters per annum that provide important information for day-to-day operation of distribution networks and play a crucial role during individual events such as large bursts and water quality incidents.
 - Cathodic protection – \$3.4 million that is a preventative measure to slow or halt the rate of corrosion of an asset – prolonging its effective life.
 - Changing standards – equipment constructed to outdated standards and practices are not considered as safe to operate – particularly electrical safety and design standards (\$9.2 million).
- **Growth within our catchments and networks**– infill development has increased flows and velocities in our network and will lead to reduced levels of service to customers. This is exacerbated by degradation of our ageing pipe network. An additional \$13.6 million for hydraulic capacity works is proposed for the 2023-28 period.
 - **Climate change** – the Department of Health¹⁸¹ requires a greater focus by water authorities to ensure systems are more resilient to future shifts in weather patterns and severe weather events, to ensure public health is protected and the safety of water supply maintained. Climate change impacts will result in more frequent power outages at key sites and reliance on back-up power sources for longer periods than originally designed. More frequent extreme weather events will place increased pressure on our network assets, leading to increased asset vulnerability, degradation and failures. All of the above impacts the reliability of the service we provide to our customers and are increased risks to public health. This includes increased investments for:
 - Electrical rectifications required to improve the resilience of assets and preparedness for increased numbers and durations of power outages during more frequent extreme weather events caused by climate change.
 - Extending hydraulic models to encapsulate water quality (\$4 million). In accordance with the Department of Health’s expectations, the models will also optimise network planning and system performance assessments, sizing new infrastructure, conducting rapid root cause analyses and responding to incidents.

Engineering options have been considered for each asset in this strategy to meet its objectives, including business needs identification and risk management approach in the form of ongoing programs or one-off projects. Different approaches at varying levels of service were then explored for each program or project to ensure the most appropriate option was selected.

¹⁸¹ Department of Health guidance for the 2023 Water Price Review – Guidance for Water Agencies – October 2021 – Page 1.

The majority of programs with this strategy are already being delivered and are based on long-term historical trending of actual costs. For programs, quantities have been forecast based on current age profile, condition indicators and long-term trends. Project cost estimates have been developed through front end works including options assessments and functional design reports.

We've risk adjusted the profile of this program to account for:

- Recent projects where we've experienced supply chain issues and significant delays (up to 12 months) of some critical equipment.
- Some programs that will require additional time for contractors and us to source additional resources to deliver higher volumes.

These changes have resulted in a reduction of \$7.1 million in 2023-24 and a reduction of \$0.3 million overall forecast over the 2023-28 period as shown below in Figure 35.

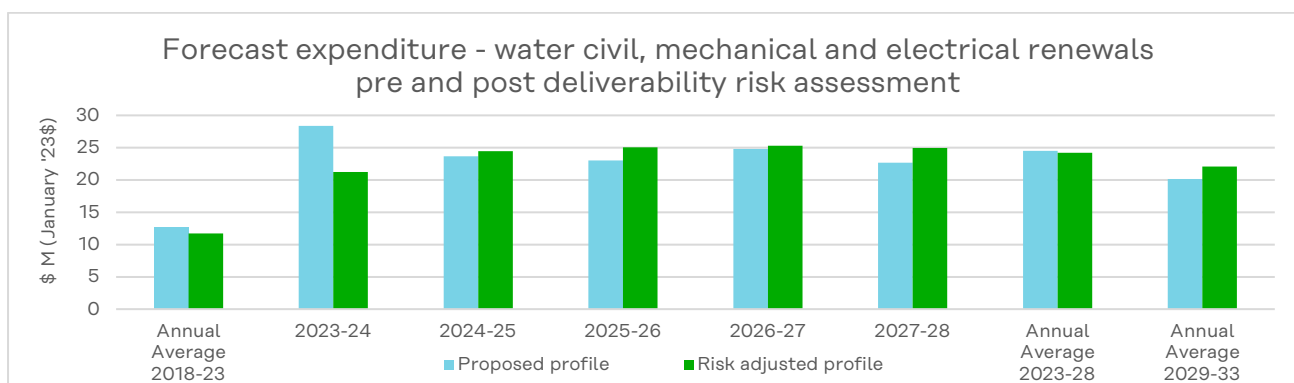


Figure 35: Risk adjusted civil, mechanical and electrical water renewal program capital expenditure profile 2023-24 to 2027-28 (\$ million January 2023)

The expenditure proposed for the 2023-28 regulatory period is required to maintain the levels of service forecast, in line with what customers have told us is important to them. Table 70 below forecasts a doubling of the investment required over the 2023-28 period compared to 2018-23, due to:

- **Hydraulic capacity** – driven by growth within our catchments and degradation in our network.
- **Water pump stations** – driven by the age profile of assets. The performance of these assets has seen an increase of reactive works required for continued operation, with several sites no longer capable of renewal and requiring major overhaul or full replacement.
- **Hydraulic modelling** – driven by a need to address changing water quality needs.
- **Electrical** – driven by changing standards. Based on investigations, a large proportion of electrical assets do not meet current design requirements. This is due to changes in standards, materials and operational practices which were originally acceptable when the assets were constructed, but now lead to higher safety and reliability risks.
- **Flowmeters** – driven by the age profile of assets. The performance of these assets has seen an increase in reactive works required for continued operation.
- **Cathodic protection** – driven by the age profile of assets. Testing of the current cathodic protection system demonstrates a large proportion of failures for protection of key assets.

		Annual average			% of total capital expenditure
		2018 to 2023	2023 to 2028	2028 to 2033	
Civil assets	\$ millions	7.09	11.90	12.80	
Mechanical and electrical assets	\$ millions	4.63	12.30	9.30	
Total	\$ millions	11.72	24.20	22.10	

Table 70: Forecast average annual water reliability program capital expenditure 2023-24 to 2032-33 (\$ million January 2023)

C.1.5 Water conservation

Context

Consistent with the outcome 'saving water for the future', we're focused on improving the efficient use of water in accordance with customer expectations across all forms of engagement¹⁸² and our obligations under the Water Act.

The millennium drought during 2001-2009 highlighted the challenges of meeting customer demand with a water resource that may be substantially diminished by climate impacts. Looking forward, the Central and Gippsland Region Sustainable Water Strategy and draft Greater Melbourne Urban Water and System Strategy have confirmed the value of water conservation and that there are substantial benefits to customers in terms of avoided or deferred augmentation costs.

Since 1997, average inflows into Melbourne's water storages have been 433 gegalitres per annum – a shortfall of around 70 gegalitres per annum on average that must be met by desalination or using water from reserves. Since 2016-17, the Victorian Desalination Plant has been an integral part of our supply system. Water storages would be around 25 per cent lower without desalinated water¹⁸³. Historical and average inflows to Melbourne Water's harvesting storages are shown in Figure 36 below. Figure 37 on the following page shows projected future supply and demand under various climate change scenarios.

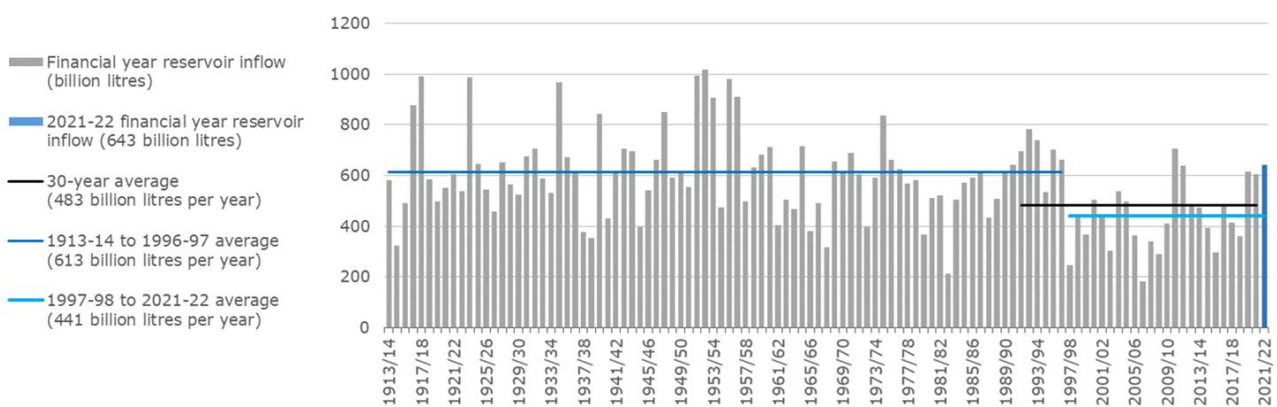


Figure 36: Long-term inflows to Melbourne's major harvesting storages (Thomson, Upper Yarra, Maroondah and O'Shannassy Reservoirs)

¹⁸² Refer to section 3.7, outcome 5 – saving water for the future.

¹⁸³ Draft Greater Melbourne Urban Water and System Strategy 2022.

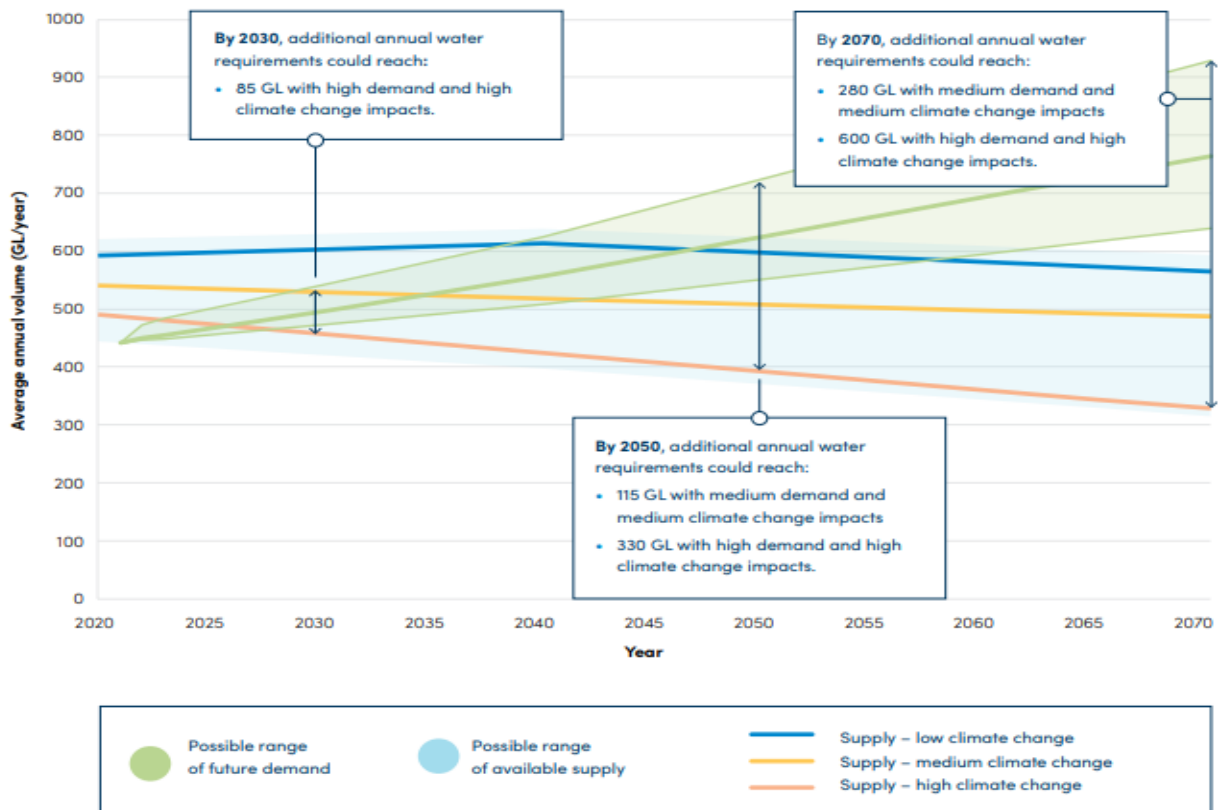


Figure 37: Projected future supply and demand under various climate change scenarios show an increasing risk of water shortages over the next decade for Greater Melbourne and connected systems. Source: Draft Greater Melbourne Urban Water and System Strategy 2022.

In our 2018-23 price submission and supported by customers¹⁸⁴, we committed to an additional \$1 million per annum operating expenditure to provide additional water conservation advice, information and programs for customers and the community.

Water education initiatives we have delivered include the Make Every Drop Count campaign¹⁸⁵ (together with other metropolitan water businesses), a showerhead replacement pilot program, several targeted water efficiency campaigns and our Water Watchers¹⁸⁶ primary school education program.

We also committed to invest in network leakage initiatives and set a target level of annual non-revenue water for 2022-23 of 13.5 gegalitres (a saving of 2.5 gegalitres from a baseline of 16 gegalitres). We are on track to meet this target. Without ongoing intervention, network leakage will increase over time because of the increasing length of pipes in growth areas, difficult topography, soil conditions and age of the network.

District metering, that reduces the size of metered areas from up to 50,000 connections to around 3000 connections or 30km of pipe, enables more efficient and effective identification of undetected network leaks via proactive monitoring. We'll be able to achieve further incremental benefits when digital meters are rolled out, enabling a real time water balance. By the beginning of 2023-24, 36 per cent of our network will be monitored for leaks

¹⁸⁴ Nature, Yarra Valley Water: Conjoint Choice Modelling Research Debrief, June 2017.

¹⁸⁵ <https://www.makeeverydropcount.com.au/>.

¹⁸⁶ <https://www.yvw.com.au/water-watchers>.

in real time with the remainder of district meters installed with active monitoring by the end of 2025-26.

During the 2023-28 period, we propose three initiatives that contribute to more efficient water use:

- Proactively addressing network leakage by delivering the remainder of the district metering initiative commenced in the 2018-23 period (water conservation capital expenditure program with associated operating expenditure).
- Continuing operating expenditure on our behaviour change initiative that provides water conservation advice, information and programs for customers to encourage and help save water now for the future. This program also informs customers about Melbourne's water security position and the role the water sector and customers play in maintaining and improving that position. These costs are reflected in the efficient 2021-22 operating expenditure base (refer to Water availability and conservation from page 132).
- New operating expenditure for delivering efficient water products, where we propose to conduct a controlled study with approximately 5000 households, confirming the costs and benefits of a household water audit program, including installing water efficient showerheads with a 5-star WELS rating. This program has the potential to deliver annual water savings per household of 20 kilolitres, saving about \$150 per annum across water and energy bills¹⁸⁷. The program will also reduce greenhouse gas emissions associated with heating water¹⁸⁸. We'll then use the lessons from the pilot to ensure we maximise the benefits of a wider roll-out of household water audits and showerhead replacements during 2023-28. We plan to commence the wider roll-out, together with our meter replacement program (mechanical or digital), in 2026. The additional cost of \$5.25 million is supported by customers. It's reflected in the forecast operating costs for 2023-28 (refer to Additional expenditure items on page 248).

Prudency, efficiency and deliverability

Based on current projections and assuming there isn't a significant drought that brings forward an augmentation, Melbourne's next supply augmentation is likely to be required in the 2028-2033 regulatory period, followed by further augmentation in the subsequent five-year period¹⁸⁹ ¹⁹⁰. A partial deferral of these augmentations could deliver substantial benefits to customers.

We compared the cost of these initiatives with the benefits of water savings determined by Melbourne Water's bulk water supply model, that compares water supply augmentation costs for various supply and demand scenarios consistent with the GMUWSS. We haven't quantified wider economic benefits such as a reduction in the:

- Volume of wastewater treated and released to the environment with benefits to sewerage system upgrades.

¹⁸⁷ Associated with heating water for use.

¹⁸⁸ There's also a smaller amount of greenhouse gas emissions associated with pumping water and sewage and the treatment of sewage that are factored into the business case for this program.

¹⁸⁹ Central and Gippsland Region Sustainable Water Strategy: Final Strategy, The State of Victoria Department of Environment, Land, Water and Planning 2022.

¹⁹⁰ Water for Life: Greater Melbourne Urban Water and System Strategy, Draft, 2022.

- Amount of energy used in households or businesses.

The water conservation initiatives deliver a net benefit to customers, as the costs of increasing water efficiency are less than the costs of providing the water, particularly as we face costs of new desalination plant capacity and network infrastructure. Proposed investments also reflect customers’ expectations that we should work with them and the broader community to save water^{191 192}, particularly given the impact of climate change and growth on water security, and the significant cost of adding new desalination plant capacity.

District metering involves the installation of flow and pressure sensors to break our network up into smaller zones to enable the identification and repair of hidden leaks and bursts. The district metering initiative is an ongoing program that’s delivered by a panel of contractors selected following an open tender process in 2020. The panel ensures a dedicated construction capacity is sustained for the full program delivery period, with the specialist skills necessary to install the sensors. We are due to refresh the panel arrangements during the 2023-28 period.

We have worked with our construction partners to ensure an achievable forward plan, that aligns with supply chain capacity and availability of network access. The expenditure proposed for the 2023-28 regulatory period is associated with the completion of the district metering program, as shown in Table 71 below.

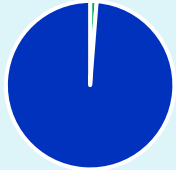
		Annual average			% of total capital expenditure
		2018 to 2023	2023 to 2028	2028 to 2033	
District metering	\$ millions	3.99	4.87	0.60	
Behaviour change	\$ millions	Refer to operating expenditure Water availability and conservation, page 132			
Promoting efficient water products	\$ millions	Refer to operating expenditure, page 246			
Total	\$ millions	3.99	4.87	0.60	

Table 71: Forecast average annual water conservation program capital expenditure 2023-24 to 2032-33 (\$ million January 2023)

Over the 2023-28 regulatory period, we will split the remaining 64 per cent of the water network into smaller district metered areas by installing flow and pressure sensors and creating new zone boundaries. Creating new district metered areas involves different levels of complexity depending on the location within the network, the construction conditions and the size and number of sensors required. For program planning and cost estimation purposes, we have adopted four levels of complexity for district metered areas, with level 1 being the simplest to implement and level 4 being the most complex.

During 2018-23 we established the design standards, systems and contractor panel to deliver the program, in addition to implementing 128 district metered areas of an estimated total required of 336. Over the 2023-28 period we will implement the remaining 208 district metered areas to enable easy leakage identification and repair across the entire water network. The additional delivery capacity is enabled by having well established standards and delivery partners, along with over 60 per cent of the remaining district metered areas to

¹⁹¹ Greater Melbourne Urban Water and System Strategy: Water for Life wider engagement report May 2021.

¹⁹² Yarra Valley Water 2023 Price Submission Community and Stakeholder Panel Reports, November 2021.

be delivered sitting within the simple complexity level categories. In estimating the cost to deliver the program, we have utilised actual construction costs from early delivery packages and are continually updating our unit costs based on completed works and anticipated price increases.

To understand the risk of identifying the wrong level of complexity for the different areas, we looked at the impact on the program cost if 50 per cent of the planned district metered areas were increased in complexity by one level. The impact on the program would be a 20 per cent increase in costs, however the impact on overall return for the program was marginal. A sensitivity analysis was also undertaken to understand the risk of our cost estimates being underestimated based on forecast price increases across the board. The sensitivity analysis showed that construction costs could increase by 400 per cent and operational costs by 200 per cent simultaneously, before impacting the positive nature of the business case.

C.1.6 Sewer reliability – gravity main renewals

We currently operate and maintain a large network of sewerage pipes which collect sewage from approximately 800,000 customer properties, transferring about seven per cent of the waste collected to our nine local treatment facilities and the remainder into Melbourne Water's sewerage system. If the sewerage network isn't maintained, there's an increasing risk of failure, leading to service interruptions and significant impacts to the natural environment. To maintain current service levels and protect the natural environment, an ongoing asset renewal program is required for:

- **Main and branch sewers** – large transfer mains (≥ 300 mm diameter).
- **Reticulation sewers** – smaller mains (< 300 mm diameter).
- **Property connection branch sewers** – pipes connecting customers' sewerage pipes to the reticulation sewer network.
- **Emergency relief structures and effluent outfall pipes** – pipes that transfer flows from the sewerage system to the drainage network or a waterway, either after treatment or in an emergency situation.

The type of activity required for each type of sewer pipe is based on the asset's risk profile and would typically include activities such as preventative and reactive maintenance (cleaning of mains), regular inspections of high-risk mains and renewal or replacement (relining of the main, replacement of sections). The risk profile for each main is developed based on the size (diameter) of the sewer pipe, assessment of the consequences and likelihood of failures as well as the economic impact of failures.

Despite strategies for sewerage pipes, there are still a proportion of pipes in the lower risk categories that will fail. When this happens, the assets are remediated, and customers' services are restored under our emergency works maintenance contract.

Customers want to know they have access to reliable water and sewerage services – as such, we established an outcome 'reliable water and sewerage services' in our 2018-23 submission. More recently we checked in with customers to see if their priorities have changed. In 2021 customers rated the statement 'I want water and sewerage services I can rely on' the second

most important outcome¹⁹³ –further confirmed by the second-largest number of service response complaints (26 per cent) received which relate to ‘quality of supply’¹⁹⁴.

Main and branch sewer renewals

We own and operate about 930km of main and branch sewers.

We have a zero to extremely low tolerance for any breach of our environmental regulatory obligations. With a large and ageing infrastructure base, there are assets at higher risk of not meeting our regulatory obligations. We therefore continue to prioritise and mitigate the risk as far as reasonably practicable through asset repair, renewal or replacement and by exploring offsets and innovative products and services to avoid and mitigate impacts.

Failure of a main or branch sewer can cause land subsidence, sinkholes or significant sewage spills resulting in damage to property, the natural environment, infrastructure and public health and safety. Depending on the size of the pipe, when a failure occurs it can take up to 80 hours to contain and redirect sewage flows before the repair can commence. These impacts could also result in loss of confidence by our customers and regulatory actions such as infringement notices or fines.

We have an ongoing targeted branch sewer inspection program to inspect all main and branch sewers in the medium risk category every 10 years, and those in the high-risk category every seven years. The WSAA Conduit Inspection Reporting Code of Australia (2008) is used to score each main, with mains rated either five or four determined suitable for repair or renewal.

Prudency, efficiency and deliverability

Over the 2023-28 period we will inspect 215km of main and branch sewers at a total cost of \$2.1 million and renew an average of 6km per annum at a total cost of \$6.1 million per year.

Sewer mains for inspection are identified on the theoretical conditions of each asset and are only renewed based on confirmed closed circuit television (CCTV) condition assessment to the WSAA standard¹⁹⁵.

We have a panel of long-standing delivery partnerships with contractors who have been selected through an open tender process. We are due to refresh the panel arrangements during the 2023-28 period. There are upward of five contractors with these skills that currently undertake these works for water authorities. We regularly review our program and processes to improve efficiency and mitigate delivery risk, including:

- Completing a rate review of renewal contracts to confirm the efficiency of contracted costs in 2021, resulting in some restructuring of rate costs. All cost estimates are based on actual costs incurred via these contracts.
- Increasing the number of contractors to three for main and branch renewals, improving competition for work and confidence of delivery.
- Improved CCTV prioritisation due to new desktop metrics such as hydrogen sulphide (H₂S) risk score that’s more efficient than previous techniques demonstrated by the ratio of CCTV inspection to renewals.

¹⁹³ Online customer survey, July to December 2021, <https://yvw.mysocialpinpoint.com.au/thevalueofwater>.

¹⁹⁴ Quantum Market Research, Yarra Valley Water Complaints Research, Baseline Survey Report, February.

¹⁹⁵ WSAA Conduit Inspection Reporting Code of Australia (2008).

- Better network modelling in preparation for planned works that ultimately results in reduced bypass pumping and night works that come at a premium cost.
- Accepting the financial risk associated with the renewal of the DN1600 section of Eltham main that, based on CCTV inspection in 2021, was observed to be deteriorating slower than the section required for immediate renewal.

We've risk adjusted the profile to balance the quantity of work to be delivered, including the timing of a section of the Eltham main sewer renewal project. These changes reduced by \$5.5 million (12.1 per cent) the 2023-28 forecast as shown in Figure 38 below.

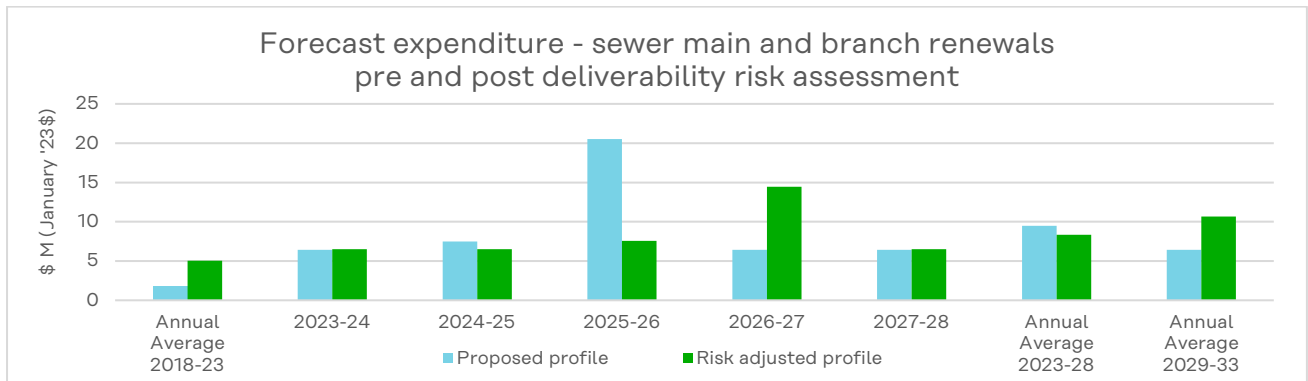


Figure 38: Risk adjusted main and branch sewer renewal program capital expenditure 2023-24 to 2027-28 (\$ million January 2023)

The expenditure proposed for the 2023-28 regulatory period is required to maintain the levels of service forecast, in line with what customers have told us is important to them. Table 72 below identifies that the increase in expenditure for 2023-28 compared to 2018-23 is attributed to the Eltham main sewer renewal (major project) and the increase in larger pipe size projects that are substantially more expensive on a per unit basis.

		Annual average			% of total capital expenditure
		2018 to 2023	2023 to 2028	2028 to 2033	
Inspect main and branch sewers	kilometres	54.5	43	43	
	unit cost (\$000)	9.59	9.59	9.59	
	\$ millions	0.52	0.41	0.41	
Renew main and branch sewers (300-375mm)	kilometres	3.94	2.97	2.97	
	unit cost (\$000)	404	404	404	
	\$ millions	1.59	1.20	1.20	
Renew main and branch sewers (> 375mm)	kilometres	1.68	2.83	2.83	
	unit cost (\$000)	1731	1731	1731	
	\$ millions	2.91	4.90	4.90	
Eltham main sewer renewal (major project)	\$ millions	0.00	1.81	4.14	
Total	\$ millions	5.02	8.32	10.65	

Table 72: Forecast average annual main and branch sewer renewal expenditure 2023-24 to 2032-33 (\$ million January 2023)

Reticulation sewer renewals

Context

We have approximately 8,900km of reticulation sewerage mains.

Sewers are designed to last 100 years. The older a main is, the more likely it is to collapse. Other factors impacting when a main reaches end of life include ground movement from reactive soils, corrosion by sewer gases, third party damage and pipe material.

Reticulation main failures can cause sewage spills, odour complaints or issues with customer plumbing. The two main causes of interruptions to customers' sewerage services are structural failure of the pipes and blockages.

Pipe blockages are caused by the contents of sewage (e.g. fats or objects) as well as tree roots intruding from structural defects, joints in the pipe or from the property connection branch.

We have approximately 1,219km of mains (14 per cent of the total network) with a condition rating of four or five (defined in the Sewer Reticulation Mains Asset Class Plan).

Mains which score a structural condition rating of four or greater are described in the code as having 'significant defects affecting structural integrity', and these pipes are more likely to experience a service failure from both blockages and structural failure reasons.

There are approximately 3,500 reticulation pipe failures each year. About 57 per cent of failures result in a sewage spill, with 2 per cent of these occurring in a house or other building.

We have several intervention programs including:

- **Proactive inspection and renewal** – where based on desktop risk ranking, the sewer main is inspected and renewed following confirmation of end of life through CCTV inspection.
- **Semi-reactive renewal** – where the sewer main renewal is triggered by emergency works that identify relining to immediately address the condition of the main.
- **Pipe cleaning and inspection** – proactive main cleaning programs near waterways where previous spills have occurred and other locations where repeat blockages have been experienced. The cleaning programs are expanded in the 2023-28 period due to being assessed as reasonably practicable measures, under our general environmental duty, to reduce impacts to the natural environment and human health.

Prudency, efficiency and deliverability

We have a panel of long-standing delivery partnerships with contractors who have been selected through an open tender process. We are due to refresh the panel arrangements during the 2023-28 period. There are upward of five contractors with these skills that currently undertake these works for water authorities.

We regularly review our program and processes to improve efficiency and mitigate delivery risk, including:

- A rate review of renewal contracts completed in 2021 to confirm the efficiency of contracted costs, resulting in revising some unit rates. All cost estimates are based on actual costs incurred via these contracts.

- Improved CCTV prioritisation due to new desktop metrics such as H₂S risk score that is more efficient than previous techniques demonstrated by the ratio of CCTV inspection to renewals.
- Reactive maintenance programs delivered by our long-term maintenance partner, Ventia, who was procured via a comprehensive competitive tendering process in 2015-16. This contract is up for renewal in 2025-26.
- Works are generated, controlled and receipted via our asset management system.
- Our reactive maintenance team collaborates with our maintenance partner to ensure continuous improvement in the way works are delivered.
- Recent benchmarking of rates indicate they are some of the most efficient in the water industry¹⁹⁶.

These changes, predominantly associated with revised unit rates, have resulted in an annual reduction of \$2.1 million (8.9 per cent) over the 2023-28 period as shown in Figure 39 below.

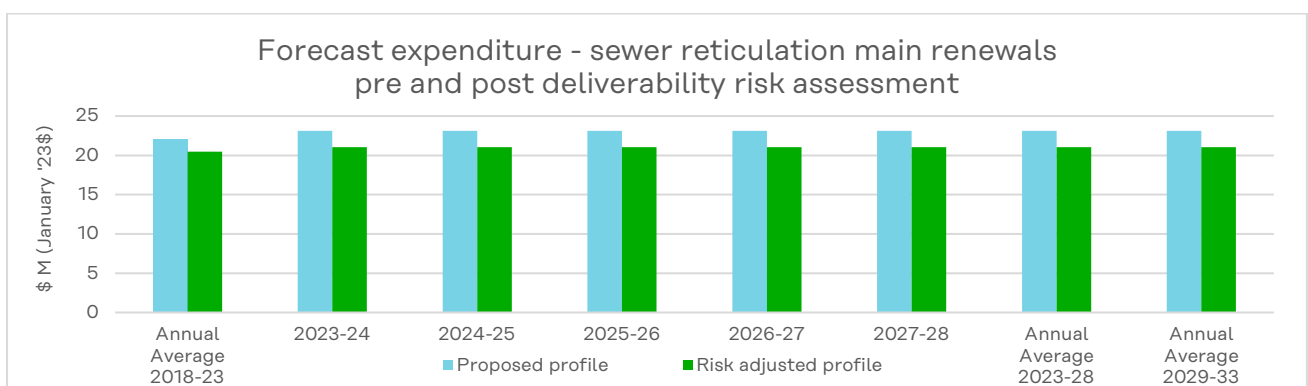


Figure 39: Risk adjusted reticulation sewer renewal program capital expenditure profile 2023-24 to 2027-28 (\$ million January 2023)

The expenditure proposed for the 2023-28 regulatory period is required to maintain the levels of service forecast, in line with what customers have told us is important to them.

Table 73 below summarises our forecast expenditure, noting:

- Reduced renewal unit rate, that captures the benefit of improvement initiatives completed over the 2018-23 period.
- Increased volumes of pipe cleaning – assessed as being a reasonably practicable environmental protection measure following review of our general environmental duty (GED) under the EP Act (2017).

¹⁹⁶ 2019 Civil Water Maintenance Benchmarking study conducted by Marchment Hill.


		Annual average			% of total capital expenditure
		2018 to 2023	2023 to 2028	2028 to 2033	
Inspection reticulation sewers	kilometres	140.5	165.3	165.3	
	unit cost (\$000)	12.95	12.95	12.95	
	\$ millions	1.82	2.14	2.14	
Renew reticulation sewers	kilometres	43.8	42	42	
	unit cost (\$000)	306.9	298.6	298.6	
	\$ millions	13.44	12.54	12.54	
Pipe cleaning and inspection	kilometres	4.8	40	40	
	unit cost (\$000)	12.3	11.0	11.0	
	\$ millions	0.06	0.44	0.44	
Emergency repair	number	3120	3623	3623	
	unit cost (\$000)	1.64	1.64	1.64	
	\$ millions	5.13	5.94	5.94	
Total	\$ millions	20.45	21.06	21.06	

Table 73: Forecast average annual reticulation sewer renewal program capital expenditure 2023-24 to 2032-33 (\$ million January 2023)

Property connection branches

Context

A property connection branch is a short sewer pipe, which connects customer plumbing to the reticulation sewer network. The property connection branch ends one metre inside a customer's property or at the first inspection opening inside the property boundary. We have about 800,000 property connection branches.

Property connection branches fail in the same ways as reticulation mains, with structural failures or blockages potentially leading to sewage spills, odour complaints or issues with the customer's plumbing. These spills are more likely to occur on a customer's property and can be very impactful to those individual customers.

There are about 5,600 property connection branch failures each year. On average, more than 2,000 (approximately 36 per cent) result in a sewage spill with about 30 (0.5 per cent) spills occurring within the customer's house.

We have an ongoing semi-reactive approach to property connection branch renewals that repairs or replaces the pipe after a second service interruption in a 12-month period, or when we identify they have already failed.

In addition, we have a proactive approach that targets pipes that would be costly to repair if they fail. These are generally deep underground or in difficult to access areas such as under tram tracks.

Prudency, efficiency and deliverability

We have long-standing arrangements with two delivery partners selected through an open tender process and we regularly review our program and processes to improve efficiency and mitigate delivery risk.

For our planned works program, we regularly assess our asset performance measured by repeat interruptions for individual customers and adapt the scale of the program accordingly.

Reactive maintenance programs are delivered by our long-term maintenance partner, Ventia, who was procured via a comprehensive competitive tendering process in 2015-16. This contract is up for renewal in 2025-26. Overall:

- Works are generated, controlled and receipted via our asset management system.
- Our reactive maintenance team collaborates with our maintenance partner to ensure continuous improvement in the way works are delivered.
- Recent benchmarking of rates indicate they are some of the most efficient in the water industry¹⁹⁷.

A detailed post implementation review of the proactive inspection program, undertaken in 2021, confirmed the inspection to renewal ratio assumed in our 2018-23 submission. Each planned renewal reduces the likelihood of a high-cost emergency repair. Examples include:

- 25 property connections located under major road, train or tram lines were proactively renewed in the first 12 months. Based on average emergency renewal rates, it's estimated the proactive renewal cost are up to 50 per cent less than a reactive approach.
- Avoiding emergency renewal costs of up to \$80,000¹⁹⁸ where there are site, environmental and construction complexities.
- Finding about 180 potential high-cost emergency repairs on average each year and converting them into lower cost proactive renewals.

The expenditure proposed for the 2023-28 regulatory period is required to maintain the levels of service forecast, in line with what customers have told us is important to them.

¹⁹⁷ 2019 Civil Water Maintenance Benchmarking study conducted by Marchment Hill.

¹⁹⁸ Actual cost of emergency renewal of individual property connection branches of up to \$80,000 due to environmental and construction complexities. Since moving to a proactive program, there have been no individual instances of extreme property connection branch costs.

Table 74 below identifies a 2.2 per cent increase in total expenditure associated with an increase in volumes for proactive and emergency inspection activities.

		Annual average			% of total capital expenditure
		2018 to 2023	2023 to 2028	2028 to 2033	
Emergency renewal	number	493	493	493	
	unit cost (\$000)	6.84	6.84	6.84	
	\$ millions	3.37	3.37	3.37	
Proactive and semi-reactive renewal (relining)	number	1603	1603	1603	
	unit cost (\$000)	4.81	4.81	4.81	
	\$ millions	7.71	7.71	7.71	
Proactive inspection	number	1305	1400	1400	
	unit cost (\$000)	0.24	0.24	0.24	
	\$ millions	0.31	0.34	0.34	
Emergency inspection and clean	number	4199	4773	4773	
	unit cost (\$000)	0.48	0.48	0.48	
	\$ millions	2.01	2.29	2.29	
Total	\$ millions	13.40	13.71	13.71	

Table 74: Forecast average annual property connection branches renewal program capital expenditure 2023-24 to 2032-33 (\$ million January 2023)

Effluent outfall assets

Context

Effluent outfall assets are made up of emergency relief structure pipes and facility outfall pipes.

Emergency relief structures are designated points within the sewerage system where spills are permitted to occur in severe wet weather, generally into a waterway or drain. During these events, emergency relief structures reduce the risk of spills occurring within customer properties, and reduce environmental impact compared with uncontrolled spills. We have about 400 pipes with an average length of 12m.

The facility outfall pipes transfer treated sewage from a treatment plant to their outfall point, usually a waterway. We have 15 pipes with an average length of 54m.

As these pipes were built alongside the sewerage gravity network and are made of the same materials, they are a similar age and subject to similar mechanisms of failure.

Prudence, efficiency and deliverability

Due to the relatively low criticality and likelihood of failure of these assets, we don't propose a proactive program for 2023-28. If these assets fail, we'll immediately repair them as part of our reactive emergency works program.

C.1.7 Sewer reliability (civil, mechanical and electrical)

Context

We operate a sewerage network which relies on civil, mechanical and electrical assets to sustain levels of service. These assets provide sewerage services for customers or ensure effective operation and management of the network. With unique drivers, requirements and different works programs to manage them, the sewerage reliability strategy covers many different assets, separated into two categories:

- Civil assets that don't typically have independent movement or an electrical current, including:
 - Maintenance holes and other sewer access points such as maintenance shafts and inspection shafts, that enable quick access to the sewer for various inspection and repairs of the pipe.
 - Rising mains and air valves are pressurised sewers from pumping stations that transfer sewage where gravity sewers are not viable, and the associated valve that releases entrapped air that builds up and allows for efficient sewage flow.
 - Vent stacks that provide ventilation of the sewer network by either inducting or educting air that extends asset life and provides a safer atmosphere for maintenance staff.
 - Odour control facilities that treat air expelled from sewers to prevent or reduce odours and reduce corrosion of sewer pipes.
 - Siphons, a type of gravity pipe that allow sewage to pass under low points such as creeks and rivers without the need for pumping.
 - Pumping stations and flow control facilities (civil assets only) such as cover wet wells, valve chambers, inlet maintenance holes and emergency storages.
 - Above ground pipes that convey sewage over creeks and roads where it isn't feasible to pass underground and are often exposed and supported by load structures such as bridges and foundations.
 - Access tracks that provide maintenance vehicle access to sewer asset sites. They are a mixture of sealed and unsealed roads and tracks, culverts, drainage assets, access locks and gates.
 - Hydraulic modelling – computer models of the sewerage network under various conditions and scenarios that can lead to network upgrades to rectify any deficiencies.
- Mechanical and electrical assets that have a range of independent movement or electrical components, including:

- Switchboards and associated electrical enclosures are complicated assets with many electrical components, including power distribution, electrical switching and control, and telemetry functions.
- Submersible pumps, sewage pump stations and flow control facilities that are designed to move sewage through the network particularly where gravity pipes aren't feasible.
- Compliance assets that have a critical safety function such as emergency stops, anchor points, lifting chains and safety rails. These are typically located at pump stations and flow control facilities.
- Generators that provide back-up electrical supply and provide critical redundancy protecting against electricity network failures.
- Pressure sewer assets installed on the customer's property as part of the community sewerage program (refer to page 230), consist of a small tank, pump and valve kit, and provide a cost-effective alternative to traditional gravity sewerage options in outer lying areas with steeper slopes and larger blocks.
- Ancillary items are other assets within sewer pump stations and flow control facilities and include pipework, valves, penstocks, instrumentation and power cables.

These sewer reliability programs are required to meet the following objectives:

- Maintain customer service levels through reliable collection and disposal of sewage with public health and safety risks effectively managed, including odours.
- Protect the environment through proactive and preventative activities, including:
 - Avoiding preventable sewage spills as far as reasonably practicable, through proactive risk management, to meet our general environmental duties (GED) associated with the Environment Protection Act (2017).
 - Timely response to any sewage spills to minimise customer and community impact.
 - Due consideration to climate change impacts in developing asset management programs, including maintaining service reliability within a less reliable electricity grid and protecting electrical equipment that's exposed to higher temperatures.
- Provide a safe working and operating environment for our staff and partners, customers, and the wider community.

Customers want to know they have access to reliable water and sewerage services. As such, we established an outcome 'reliable water and sewerage services' in our 2018-23 submission. More recently we checked in with customers to see if their priorities have changed. In 2021 customers rated the statement 'I want water and sewerage services I can rely on' the second most important outcome¹⁹⁹ – further confirmed by the second-largest number of service response complaints (26 per cent) received relating to 'quality of supply'²⁰⁰.

Customers also want to know we're looking after the environment. When they think about the environment their main concern is climate change and its impact. We propose to include

¹⁹⁹ Online customer survey, July to December 2021, <https://yv.mysocialpinpoint.com.au/thevalueofwater>.

²⁰⁰ Quantum Market Research, Yarra Valley Water Complaints Research, Baseline Survey Report, February.

measures for the outcome 'looking after our natural environment' associated with the impacts of unreliable sewerage systems.

Prudency, efficiency and deliverability

We propose to continue business as usual programs, adjusted for growth and compliance requirements. This approach proposes continuing existing renewals and maintenance programs and includes mandatory electrical safety improvements.

In January 2021, in response to several high potential electrical near misses, we conducted an electrical gap analysis²⁰¹ of our approach to assessing and managing our electrical hazards. 42 gaps were identified and classified into two key types – asset gaps and process or system gaps – and are summarised by risk ranking²⁰² in Table 75 below.

Risk rank	Asset gaps	Process/system gaps
Medium	11	9
Low	12	10
Total	23	19

Table 75: Summary of risks discovered during electrical gap analysis

The resultant electrical safety improvement strategy is required to ensure our electrical equipment and assets meet Energy Safe Victoria legislation. The strategy addresses resourcing, upskilling, technical support and all the electrical assessment and rectification programs required to achieve our objectives. We commenced assessment and rectification works in 2021-22. Originally planned for completion over three years, we’ve extended the delivery timeframe by three years due to the current electrical supply constraints. We’ll maintain effective and ongoing controls to ensure the safety of our people while rectifications are underway. The rectification program related to replacing switchboards, emergency stops, generators and arc-flash assessment, accounts for \$2.4 million additional investment per annum over the 2023-28 period. This doesn’t include replacement of end of life switchboard replacements, which are completed as required.

We’re already experiencing the impacts of climate change on network reliability – predominantly due to a less reliable power grid and more extreme temperatures. A 2019 study²⁰³ forecast a significant increase in the probability of failure of electrical equipment related to heatwave hazards in the future as a result of climate change.

With the increasing impact of climate change, electrical outage events are occurring more frequently (and for longer durations). A driver of increased expenditure (about \$1 million per annum) on mechanical and electrical assets in 2023-28 is the inclusion of climate change and resilience initiatives, such as providing back-up generators at critical sites and heat proofing critical electrical switchboards that are shown to fail at extreme temperatures.

During 2018-23, we have underspent on the benchmark allowance related to the civil program (\$7.2 million per annum spent against the benchmark allowance of \$11.2 million per annum). The underspend is primarily due to a risk-based reprioritisation of activities across our asset management strategies. This resulted in a delay commencing the proactive portion

²⁰¹ Yarra Valley Water Gap analysis of Yarra Valley Water’s electrical assets, systems and processes, January 2022.

²⁰² As per our Corporate Risk framework.

²⁰³ XDI systems, cross dependency initiative, Infrastructure Risk Assessment & Adaptation, 2019.

of the maintenance hole program (approximately \$2.6 million per year) and reduced costs in the vent stack rehabilitation program achieved by using innovative and cost-effective repair solutions (\$1.1 million per year). Funds were redirected towards high priority asset management activities (such as water distribution mains) and regulatory compliance (such as electrical hazard rectifications). During the 2018-23 period we focused on completing the condition assessment activities that have informed the optimisation of the program for 2023-28.

All other asset programs remain unchanged relative to historical volumes and investments.

We have a panel of long-standing delivery partnerships, including our maintenance service provider, with contractors who have been selected through an open tender process. We'll also increase delivery capacity during 2022-23 with the creation of a new electrical works panel. This will support our existing delivery partnerships.

We've risk adjusted the profile of this program to account for:

- Advice from delivery partners about challenges in the supply chain for:
- Steel tubes for the vent replacement program.
- Electrical parts for hazard rectifications.
- Additional time to scale up, including resources required to deliver higher volumes.

These changes have resulted in a small shift of \$4.3 million from the beginning of the period into latter years of the 2023-28 period as shown in Figure 40 below.

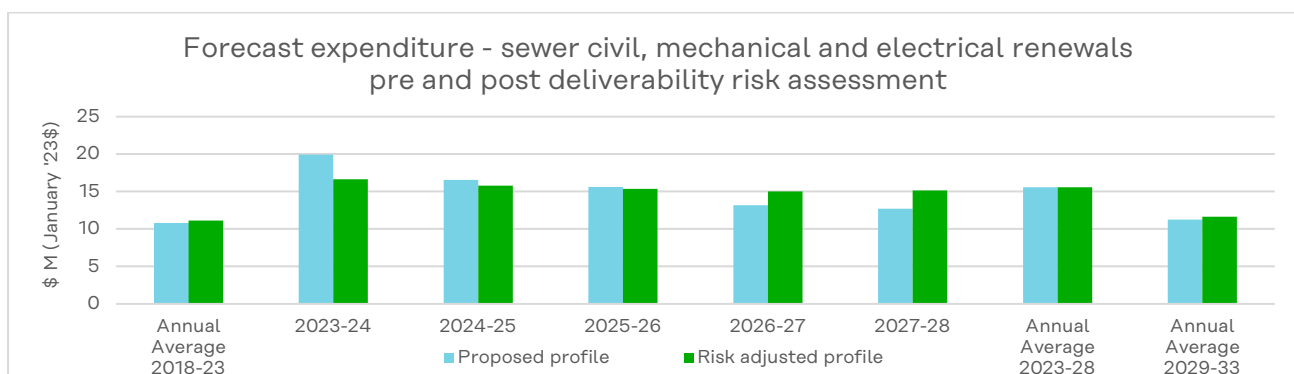


Figure 40: Risk adjusted annual sewer reliability civil, mechanical and electrical renewal program capital expenditure profile 2023-24 to 2027-28 (\$ million January 2023)

Table 76 below shows our forecast capital expenditure over the next two regulatory periods which is increasing largely due to electrical hazard rectification works.

		Annual average			% of total capital expenditure
		2018 to 2023	2023 to 2028	2028 to 2033	
Civil assets	\$ millions	7.20	9.25	8.11	
Mechanical and electrical assets	\$ millions	3.92	6.34	3.54	
Total	\$ millions	11.12	15.59	11.65	

Table 76: Forecast average annual sewer reliability civil, mechanical and electrical program capital expenditure 2023-33 (\$ million January 2023)

C.1.8 Digital enablement

Context

We manage a suite of information technology (IT), operational technology (OT) applications and infrastructure which support business continuity and ensure we're able to:

- Deliver uninterrupted water and sanitation services to customers by providing staff and service delivery partners access to the technology and insights they need to do their jobs, including communicating directly to customers in near real time.
- Ensure critical customer and business data, and business systems are protected against cybersecurity threats, including the proper classification, storage and governing of critical business information in accordance with the Security of Critical Infrastructure Act (2020).
- Deliver valued products and services through new technologies to meet customers' needs.
- Use technology to improve business productivity where there's a positive return on the investment.

We run two on-premise data centres – the primary (production) inside Fujitsu's Noble Park data centre, and the secondary (test and development) at our Mitcham office. We have also commenced locating both hardware and software assets in the cloud, with most of our current servers now located in Microsoft's data centre.

The pace of digital change is rapid, reflected by the relatively short hardware and software asset lives (typically between five and 10 years). Our future state architecture that we've been implementing since 2019, is built around a platform-based approach²⁰⁴, resulting in a more modern, flexible, and resilient technology foundation. This allows us to respond to changes in the external environment while keeping costs as low as possible, minimising the amount of customisation we need to do to our core applications and enabling us to interact with our partners and suppliers in a more secure and efficient way.

Currently we have over 700 operational technology sites across our service area which are considered mission critical²⁰⁵. We're also installing more low cost sensors across our networks that are classified as business critical. These sensors are used for asset intelligence and planning purposes, as well as providing proactive alerts to customers about network faults and cover devices such as digital water meters²⁰⁶, sewer level sensors, water quality sensors, and water pressure at customer properties.

Key assumptions which underpin our investment program ensure:

- We continue to meet customers' expectations.
- Compliance with regulatory policies and directives, including the Privacy and Data Protection Act, the Victorian Protective Data Security Framework, and requirements for management of critical business information²⁰⁷.

²⁰⁴ Which leverage our core business applications, combining the information from them into 'single panes of glass' related to customers, physical assets and employees.

²⁰⁵ Mission critical devices require a higher level of security, availability and have the potential to be used to control the physical asset.

²⁰⁶ We have 800 digital meters deployed in the network as part of the Vermont South trial.

²⁰⁷ Outlined by the Office of the Victorian Information Commissioner and the Security of Critical Infrastructure Act.

- Digital investments align with our corporate risk management framework and Board approved risk appetite.

Customers identify technology as a key enabler of service. We've committed to the outcome 'service that meets everyone's needs' that focuses on experience and includes customers who have different accessibility needs, are financially vulnerable or require a service offering adapted to their individual need (refer to section 3.6, Outcome 4 – Service that meets everyone's needs starting on page 48).

Prudency, efficiency and deliverability

Given the ever-changing nature of technology, we need to embed continuous improvement into our plans, or we risk missing out on the opportunities available – both productivity and experience. Remaining on outdated technologies for too long ultimately results in expensive upgrades and replacements, which increase our exposure to cybersecurity threats.

Historically, we've invested in our core applications (i.e. billing, asset management, land development etc) and heavily customised them to align with the multitude of services we provide to customers. We've commenced stripping out these customisations – configuring our core platforms and simplifying the core applications so they are as close to 'out of box' as possible. This will make them more easily upgraded or replaced in the future – ultimately reducing the financial risk of significant and lumpy end of life replacement projects.

We engaged a specialist technology advisory firm to prepare a comparative financial analysis²⁰⁸ of two options.

- Option 1 – Continue to invest in our core applications in a business as usual manner. This included extending the life of core applications until they're no longer supportable, and their subsequent replacements.
- Option 2 – Transition to a cloud-based platform approach which builds a base level of functionality at industry standard, supportable platform(s) which satisfy our data, integration, and security requirements and enable customisations to be removed from core applications, in line with the update and replacement cycle.

The analysis included whole of life costs for each option, including benefits which could be confidently monetised – the results of the analysis concluded:

- Over a 15-year evaluation period, option 2 had a more favourable NPV of \$14.2 million.
- The break-even point was 2029, despite the bulk of the investment being between 2018-19 and 2022-23.
- The key financial benefits of option 2 driving the favourable NPV result were reduced costs for:
 - Our next billing system replacement, by moving the customised functionality from the existing billing system to the customer platform enabling a simpler billing engine to be procured when needed.
 - Infrastructure costs to host the billing system and supporting applications.
 - SMS based on an immediate reduction and future savings based on projected growth.

²⁰⁸ Hamilton Shaw Consulting, Yarra Valley Water Foundational Technology Platform Business Case Review and Findings, February 2022.

- Development by establishing in-house squads, reducing the reliance on more expensive vendor support.

In the past, most of our IT hardware and software was owned by us and housed in our on-premise data centres. In the recent past, vendors have started to offer a range of cloud-based services including software as a service (SaaS), infrastructure as a service (IaaS), and platform as a service (PaaS) which have meant that the ownership model has changed from the utility to the provider, with the utility effectively leasing back the asset. As such, there has been a shift from CAPEX investments to OPEX investments, both achieving the same outcomes. As such, TOTEX is seen as the only way to accurately benchmark, as each water business in Australia is on a different point in their migration to cloud-based technologies which makes straight operating expenditure or capital expenditure extremely poor comparators.

Benchmarking undertaken by the Water Services Association of Australia in March 2020 shows we compare favourably to others in the industry. The comparison included data from 14 Australian water businesses.

Investment timing is predominately driven by the asset lifecycle and our internal resource capacity to support delivery. This determines our available capacity to deliver projects and may supplement our own workforce with vendor or contract resources as required. However, as most projects are reliant on our core team, prioritisation and timing of investment is governed by resource availability and the business' capacity to accept change.

The proposed investment program for the next regulatory period has classified all projects as either:

- **Mandatory** – projects related to maintaining business (and conversely service level) continuity, predominately end of life replacements, and updating existing assets, or projects which relate to regulatory compliance and obligations.
- **Discretionary projects with a high business case certainty** – projects where the business case has already been established and the benefits are well defined.
- **Discretionary projects with a low business case certainty** – projects where there's a defined problem statement, but it is not yet certain whether the costs outweigh the potential benefits.

Based on the project classifications, it is proposed that only mandatory and discretionary (high confidence) projects are funded by customers in 2023-28. This represents capital expenditure of \$113.8 million and operating expenditure of \$88.6 million – or total expenditure of \$202.4 million. Conversely, this means that capital expenditure of \$22.1 million and operating expenditure of \$30.3 million – or total expenditure of \$52.4 million is being flagged as at risk, subject to the identification or realisation of a positive business case outcome. If we decide to proceed, capital expenditure above \$113.8 million will be recovered at the beginning of the 2028-33 regulatory period. These are further separated into four investment categories:

- **Business continuity** (75 per cent) – through ensuring digital assets remain licenced, supported and are replaced at end of life. Our approach is to maintain the currency of assets for as long as possible to maximise life, applying regular vendor upgrades. There are circumstances where support can be extended beyond the period defined by the vendor by using third party providers. Although we don't have an aggressive cloud migration strategy (we'll move to cloud when it makes financial sense to do so),

sometimes we have limited choice when an existing vendor chooses to stop offering an on-premise option.

- **Cybersecurity** (7 per cent) – we have an obligation to protect our customers, employees, and business from cybersecurity threats. We've improved our security posture over the 2018-23 period, including addressing issues identified in the 2019 Victorian Auditor General review²⁰⁹. We'll continue to mature our cybersecurity posture where necessary to manage the emergence of new threats as they arise. Our cybersecurity plan is critical to ensuring business continuity, especially given our classification as a critical infrastructure provider (under the Security of Critical Infrastructure Act) and the ever-changing global threat landscape which makes us a potential target for hackers.
- **Managing critical business information** (10 per cent) – ensuring all customer and critical business information is appropriately²¹⁰ stored and governed – so it's correctly classified, maintained, and accessible to those who need it when they need it.
- **Leveraging digital for value creation** (8 per cent) – aimed at our core service offering to customers, including delivering new products and services requested by customers, improving productivity, and minimising or eliminating our environmental impact. This expenditure is subject to the development and approval of robust business cases which demonstrate value creation or customer support.

To minimise the impact on customer bills and affordability, we have a structured and rigorous approach to the planning, cost estimation, and approval of digital investments. Key elements of this approach include:

- Significant work to build out our configuration management database (CMDB)²¹¹.
- Engagement within our business to identify its respective requirements, with careful consideration of customer problems that require solving, as well as a detailed understanding of outcomes and benefits.
- Bottom-up resource planning for each project, taking into account internal and external labour, hardware, licensing, maintenance and support costs – ensuring the program proposed can be delivered and that resources are neither under nor over allocated.
- Estimating vendor costs based on quotes and tenders where possible, however when these don't exist, leverage historical costs (book values), discussions with vendors, advice from Gartner, or advice from peers who have undertaken similar projects.
- Ongoing portfolio, program and project governance in accordance with global best practice:
 - The prioritised portfolio is approved and reviewed by the Portfolio Control Board (chaired by the Managing Director) on a quarterly basis.
 - Review all project business cases by our internal IT project management office.
 - Each business case clearly articulates the business need, confirms consistency with our enterprise architecture and identifies all upfront and ongoing costs for each project.

²⁰⁹ Victorian Auditor-General's Office, Security of Water Infrastructure Control Systems, May 2019.

²¹⁰ In accordance with the Privacy and Data Protection Act (2014), expectations of the Office of the Victorian Information Commissioner and The Security of Critical Infrastructure Act.

²¹¹ A database that contains all relevant information about the hardware and software components used in an organisation's IT services and the relationships between those components.

- All projects are approved by a range of stakeholders in accordance with our Who Can Authorise Register.
- Business cases and benefits are tracked to ensure benefits are captured.

We are continuously assessing opportunities to reduce the operating costs associated with licensing, maintenance and support costs including:

- Consolidating contracts where multiple contracts exist with a single vendor which often involves aligning contract end dates and retendering.
- Leveraging various government pricing deals and panels which we have access to.
- Renegotiating contracts based on our actual usage – enabled through real time monitoring of contract charging clauses via our CMDB.
- Usage based pricing where it makes sense to do so – we only pay for what we use with relevant ceiling protections in place.

Table 77 below shows our forecast total expenditure over the next two regulatory periods which is forecast to increase by \$2.5 million per annum (6.6 per cent).

		Annual average			% of total capital expenditure	
		2018 to 2023	2023 to 2028	2028 to 2033		
Capital expenditure						
Business continuity	\$ millions	16.92	17.05	17.05		
Cybersecurity	\$ millions	0.84	1.61	1.61		
Managing critical business information	\$ millions	0.35	2.17	2.17		
Leveraging digital for value creation	\$ millions	7.51	1.92	1.92		
Total capital expenditure	\$ millions	25.62	22.75	22.75		
Operating expenditure						
Licensing, maintenance and support	\$ millions	12.35	17.72	17.72		
Total expenditure	\$ millions	37.97	40.47	40.47		

Table 77: Forecast average annual digital enablement program total expenditure (excluding business case dependent expenditure) 2023-33 (\$ million January 2023)

C.1.9 Facilities

Our Mitcham site provides office space and facilities for about 800 staff and contractors in multiple buildings, along with two maintenance depots located at Mitcham and Coburg (primarily used by our maintenance service provider). The sites include chemical and fuel storage, gardens and access paths, fire safety and emergency response and management equipment.

Operating and managing facilities to ensure a safe working environment is governed by regulatory requirements set out in, but not limited to:

- Occupational Health and Safety Act 2004 (OHS Act)
- Building Act 1993
- Building Regulations 2018 – Schedule 8 Fire protection.

These legislative requirements support our duty of care for personnel and those visiting our sites by ensuring premises are built to regulation, are safe, well maintained and contain adequate fire protection as well as provide site improvements where required. In addition, for the two maintenance depots, we have a specific duty of care to contractors under our lease agreement with Ventia (our maintenance partner) to ensure the depots meet the same standards we set for our own staff.

We meet our duty of care requirements through ongoing structural improvements and general maintenance inspection, cleaning and rectification activities at each site. This includes business as usual operational activities, planned preventative maintenance and replacement of end of life assets, and unplanned reactive maintenance where needed.

Table 78 below shows our forecast total expenditure, remaining fairly constant over the next two regulatory periods.


		Annual average			% of total capital expenditure
		2018 to 2023	2023 to 2028	2028 to 2033	
Facilities	\$ millions	0.98	1.16	1.16	

Table 78: Forecast average annual facilities program capital expenditure 2023-33 (\$ million January 2023)

C.1.10 Motor vehicles

Context

We have a fleet of 199 motor vehicles, that supports the delivery of operational activities.

Vehicles are replaced every four to five years, to balance efficiency (disposal price, maintenance costs and reliability), whilst ensuring our employees are driving motor vehicles that meet safety (5-star ANCAP) standards and providing a fit for purpose, reliable tool of trade. Vehicles fall into two categories:

- Field vehicles – used by field staff to commute on and between sites. These vehicles are an operational requirement to ensure we can service our customers, manage our infrastructure and deliver projects.
- Manager vehicles that fulfil two purposes:
 - Pool vehicle – available for all staff to use for work purposes during working hours reducing requirements to maintain and operate vehicles in a general pool, or relying on staff driving their own vehicles that may not be safe or well maintained, for business purposes.
 - Employee benefit – where in accordance with individual employment contracts, managers can salary package a vehicle, contributing 67 per cent of all costs including fuel, maintenance, tyres, e-tags, decline in value, finance costs and fringe benefits tax. The employee’s contribution is netted off their labour costs as part of salary packaging.

Prudency, efficiency and deliverability

All vehicles are procured by tender on an online portal which fosters competition amongst dealerships. Pricing is based on the State Purchasing Contract (Victorian Government contract) terms and conditions and includes discounts on the recommended retail price.

Table 79 below shows our forecast total expenditure remaining fairly constant over the next two regulatory periods – with the small increase in the 2023-28 period due to the planned replacement of vehicles delayed by global supply constraints.


		Annual average			% of total capital expenditure
		2018 to 2023	2023 to 2028	2028 to 2033	
Motor vehicles	\$ millions	2.21	3.02	2.89	

Table 79: Forecast average annual motor vehicle program capital expenditure 2023-33 (\$ million January 2023)

C.2 Customer growth programs

C.2.1 Drinking water, recycled water and sewerage infrastructure – for a growing Melbourne

Context

We build infrastructure networks to provide essential water and sewerage services to customers. We have an obligation to support development and provide services to new customers, and we aim to do this with optimally timed investments. If we don't provide this investment, the risks we would then face include:

- Breach of service obligations to new customers.
- Inadequate services to existing customers including not meeting our customer charter.
- Unacceptable environmental outcomes, including sewage spills due to system capacity constraints.
- Inability to support development in a timely manner consistent with government policy or objectives.

When developing servicing strategies for growth, we work closely with key stakeholders, customers, community groups and Traditional Owners/Custodians. This approach brings diverse perspectives and ensures a holistic understanding of objectives and needs of each area to enable co-development of servicing solutions that best meet customer, community and environmental outcomes, including affordability.

In 2010, the Victorian Government expanded the urban growth boundary (UGB) to cater for significant population growth within Melbourne by 2050. This included expansion of the Northern Growth Area (NGA) within our service area, between Craigieburn and Wallan.

The NGA is the largest of four major greenfield growth areas in Melbourne.

Water supply to the area is from Melbourne Water's transfer system via Silvan reservoir or Sugarloaf reservoir. Major transfer infrastructure from Melbourne Water's system is currently being constructed to secure long-term water supply to the area. We're building extensive water and sewer infrastructure to ensure all future customers in the NGA can receive essential drinking water, recycled water and sewerage services.

We rely on land development consultants and contractors to deliver some of our distribution assets that are primarily located within their estates as it's more efficient and less disruptive to deliver these at the same time as other infrastructure required to service their estates. We reimburse developers for the cost to design and build these assets. Developers also build drinking water, recycled water and sewerage reticulation networks to service their developments, which they gift to us for ongoing maintenance and ultimately renewal.

Prudency, efficiency and deliverability

In response to the pandemic, in mid-2020, the Victorian Planning Authority (VPA) fast tracked six precinct structure plan (PSP) areas within Melbourne's greenfield areas. Five of these are in the NGA. The completion of a PSP is a clear signal that commencing development in this area is supported by government and an expectation that the area is serviced.

The location of the fast tracked PSP areas are spread throughout the NGA and encourage out of sequence development. Developers indicate they will commence development in

these areas as soon as the PSPs are gazetted which requires significant transfer and distribution infrastructure to be constructed. The five fast tracked PSP areas are shown in Figure 41 below.

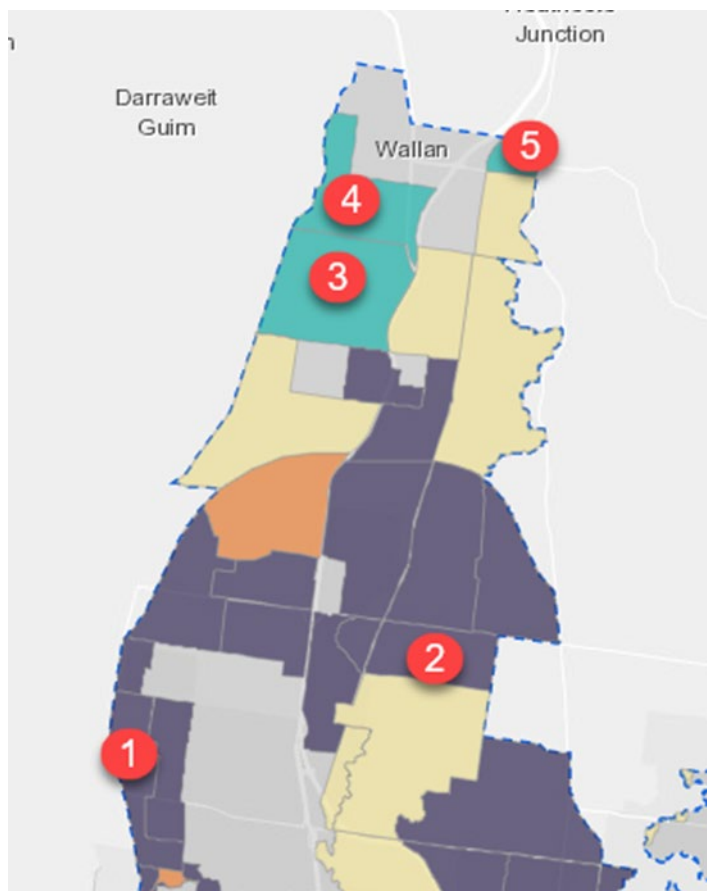


Figure 41: Map showing location of five fast tracked PSP areas in the Northern Growth Area
Key: 1 = Craigieburn West, 2 = Shenstone Park, 3 = Beveridge North West, 4 = Wallan South, 5 = Wallan East Part 1

Two of the NGA PSP areas have already been gazetted, the remaining three PSP areas are expected to be gazetted by mid 2023²¹² – with delivery of first stages in 2024, supported by water, recycled water and sewerage infrastructure, including:

- Craigieburn West and Shenstone Park – both gazetted in January 2022, with delivery of first lots due in late 2022 and 2023 respectively.
- Beveridge North West, expected to be gazetted in September 2022, with delivery of first lots in 2024.
- Wallan South PSP expected to be gazetted in early to mid 2023, with delivery of first lots in 2024.
- Wallan East PSP expected to be gazetted in mid 2023, with delivery of first lots in 2025.

While lot forecasts can impact infrastructure investment in greenfield areas, the main driver of expenditure during the 2023-28 regulatory period is the location of multiple development fronts in the NGA. This is driving significant expenditure regardless of the extent of lots

²¹² Based on advice received from the VPA, July 2022.

developed and includes five of the major capital investment projects (refer to Table 12 on page 58) to commence or be delivered over the 2023-28 period. This includes:

- Love branch sewer stage 3
- Wallan East branch sewer stage 1
- Craigieburn storage and transfer hub stage 3
- Mt Fraser water transfer system
- Aurora recycled water treatment plant and transfer pipelines.

In late 2021, we engaged a growth forecasting expert, MacroPlan, to provide their view on forecast growth in the NGA during the 2023-28 period²¹³ – and we recently revalidated this work with MacroPlan²¹⁴.

In addition to MacroPlan's advice, to assist in the development of the growth forecasts for the 2023-28 regulatory period, we also reviewed the Department of Environment, Land, Water and Planning's Victoria in Future 2021 (VIF) growth forecast.

We also have a land development database which is continually updated as new information is provided to us through frequent discussions with developers and stakeholders (e.g. councils and VPA).

Using these three sources (MacroPlan, VIF and our land development database), we:

- Developed high, medium and low growth forecast scenarios for the NGA for the 2023-28 period where:
 - The high growth scenario reflects the land development database that projects 29,320 lots to be delivered.
 - The medium growth scenario uses the November 2021 MacroPlan profile and VIF forecast which estimates 24,166 lots. The medium growth scenario is about 20 per cent lower than the high growth scenario.
 - The low growth scenario applied a further 20 per cent reduction, resulting in a forecast of 18,125 lots to be delivered – practically this would mean a number of developments that are already in flight would slow significantly or developers are unwilling to commence new estates in new PSP areas during the period.
- Developed a confidence rating methodology to assist in developing the relative timing for delivery of each asset – considering location, PSP status and progression of estate master planning. This provided the roadmap of asset sequencing to service the NGA that could be applied to each growth forecast scenario.
- Adopted the medium growth scenario for proposed growth related capital expenditure – and lot numbers, for the 2023-28 period. We've also reflected this in our demand projections (refer Chapter 7 - Demand on page 93).

Further investment will be required beyond 2023-28 to support greenfield development in the NGA. It is also expected that significant expenditure will be required to service infill development during and beyond the 2028-33 period, as we reach capacity within our existing

²¹³ Analysis of Existing Forecasts and Macroeconomic Headwinds, MacroPlan, Nov 2021

²¹⁴ Updated Analysis of Existing Forecasts and Macroeconomic Headwinds, MacroPlan, July 2022.

network. Detailed servicing plans for infill development areas will be prepared during the 2023-28 regulatory period.

MacroPlan has recently revised down their forecast new dwellings in the NGA during the 2023-28 regulatory period by 5.4 per cent. In addition, discussions with developers in June and July 2022 indicate there's been a drop in sales due to uncertainty with inflation and interest rates. Lot sales are forecast to return to a realistic baseline over the next few years.

Recent media has drawn attention to the collapse of some major developers or the cessation of planned developments. These aren't greenfield developers and therefore don't impact the planned assets or expected delivery of lots in the NGA.

We're confident the growth program represents prudent and efficient investment. We have:

- Accepted the financing risk associated with the scenario that's based on our land development database including developers' forecasts and information from local councils and VPA (high growth scenario), at an estimated cost of \$218.6 million more than the adopted medium growth scenario.
- Access to a diverse range of partners across our asset life cycle – including an additional engineering service partner that will provide sufficient capacity for efficient asset design.
- Commenced the process to establish a new construction panel with a key focus on consolidating work packages and development of closer partnership arrangements with several construction companies to deliver the suite of infrastructure works during the 2023-28 regulatory period. This is due to come into effect prior to the period commencing.
- An internal major projects team with extensive experience delivering large projects, and a growth projects team with vast experience in delivering similar projects over the last 10 years.
- Some major growth projects that attract tier 1 contractors, enabling us to leverage their capacity and resources.
- Developed cost estimates using cost curves provided to us by specialist engineering consultants and received detailed risk adjusted P50 cost estimates for the major projects, including a Monte-Carlo assessment that includes advice on the appropriate level of contingency allowance given project stage and scope.
- Assumed, based on typical asset delivery arrangements, that developers will fund and deliver 27 per cent or \$171.3 million of these works alongside other infrastructure required to service their estate, and will contribute any incremental financing costs for assets that they require earlier than planned.

We've also risk adjusted the profile of this program to account for:

- Revised advice from MacroPlan, growth forecasting experts, reducing their November 2021 forecast for the NGA by 5.4 per cent (1,235 new dwellings).
- Pushing 10 per cent of expenditure past the planned commissioning dates for some of the larger and more complex projects to account for a potentially extended commissioning, defects and handover expenditure.
- Spreading the reimbursement of large (>\$1 million) developer delivered assets over two years, accounting for potential:
 - Supply chain delays.
 - Further slow-down in growth due to a slower than normal return to normal immigration levels, or inflationary and cash rate pressures.
 - Reduction in development stage sizes resulting in assets being delivered over multiple stages.
- Extending the delivery program for some projects we'll deliver to account for potential supply chain delays and competing demands for materials and contractors.

We've also reflected a 5 per cent efficiency across all growth projects (including the major projects) reflecting our targeted savings through project and program management improvements including a greater emphasis on packaging and partnerships. This is equivalent to \$33.13 million over the 2023-28 period.

These changes have resulted in smoothing investments at the beginning of the period reducing the forecast over 2023-26 by \$107.2 million and reducing the total amount forecast over the 2023-28 period by \$51.5 million (7.6 per cent) as shown in Figure 42 below.

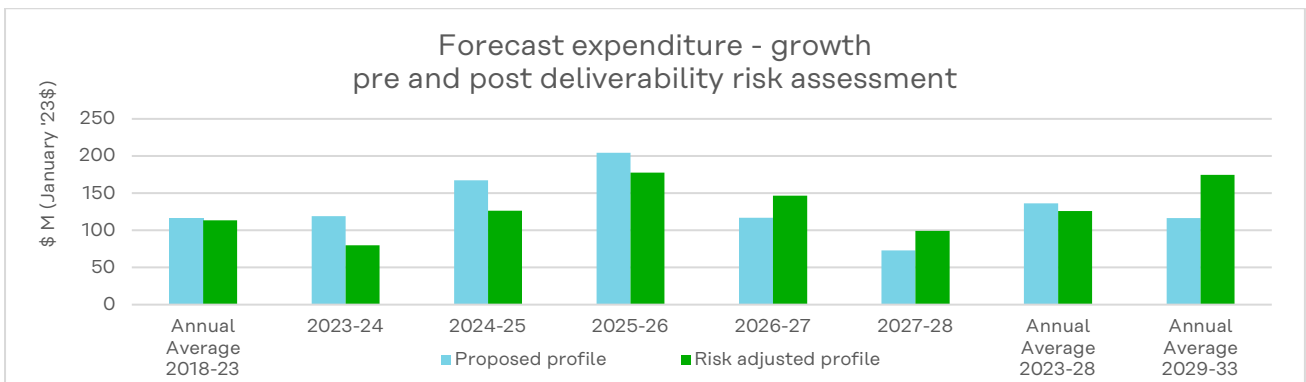


Figure 42: Risk adjusted growth program capital expenditure profile 2023-24 to 2027-28 (\$ million January 2023)

Table 80 below outlines our proposed investments for the 2023-33 period, relative to actual and forecast spend over the 2018-23 period.

		Annual average			% of total capital expenditure	
		2018 to 2023	2023 to 2028	2028 to 2033		
Drinking water infrastructure						
Growth assets	\$ millions	22.00	19.71	32.80		
Mt Fraser drinking water transfer system (major project)	\$ millions	0.00	8.17	0.00		
Total water infrastructure and projects	\$ millions	22.00	27.88	32.80		
Recycled water infrastructure						
Growth assets	\$ millions	5.76	16.86	49.84		
Mt Fraser recycled water transfer system (major project)	\$ millions	1.69	6.86	0.00		
Aurora recycled water treatment plant and transfer system (major project)	\$ millions	1.41	26.86	0.00		
Doncaster Hill recycled water treatment plant (major project)	\$ millions	1.43	12.51	0.00		
Total recycled water infrastructure and projects	\$ millions	10.29	63.09	53.44		
Sewerage infrastructure						
Growth assets	\$ millions	80.64	23.37	56.05		
Craigieburn storage and transfer hub – stage 3 (major project)	\$ millions	0.19	4.02	32.47		
Love branch sewer – stage 3 (major project)	\$ millions	0.11	3.45	0.00		
Wallan East branch sewer – stage 1 (major project)	\$ millions	0.07	4.08	0.00		
Total sewerage infrastructure and projects	\$ millions	81.01	34.92	88.52		
Total	\$ millions	113.30	125.89	174.76		

Table 80: Forecast average annual growth program capital expenditure 2023-33 (\$ million January 2023)

C.2.2 New customer meters

Developers meter new lots as they are developed. The costs of the meters are fully recovered via miscellaneous products and services which fully offset this capital expenditure.

Consistent with the customer meter replacement program (refer to page 187), forecast costs reflect the purchase of mechanical meters. If the business case for digital meters is proven during the period, we'll commence installing digital meters at new properties and recover the additional costs at the commencement of the 2028-33 regulatory period.

Table 81 below outlines our proposed investments for the 2023-33 period, relative to actual and forecast spend over the 2018-23 period.

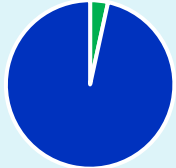
		Annual average			% of total capital expenditure
		2018 to 2023	2023 to 2028	2028 to 2033	
New customer meters	\$ millions	13.83	13.45	15.55	

Table 81: Forecast average annual new customer meter capital expenditure 2023-33 (\$ million January 2023)

C.3 Business improvements and regulatory compliance programs

C.3.1 Safe and pleasant water

Context

We provide safe and pleasant drinking water and recycled water to customers that meet regulatory obligations for public health and customer expectations.

For drinking water, Melbourne Water is responsible for catchment management, primary treatment, and supply of the water to the metropolitan retailers (including Yarra Valley Water) in accordance with the Bulk Water Supply Agreement (1999). We work closely with Melbourne Water to understand and mitigate any water quality risks, however the upstream catchment, treatment processes, and bulk transfer network assets are beyond our direct control as they are owned and managed by Melbourne Water. For recycled water, however, we own the sewage catchment and treatment assets and are directly responsible for their performance.

We distribute drinking water and recycled water to customers through separate, dedicated water supply distribution and reticulation networks and must ensure that water quality is maintained. These networks include storage tanks, distribution pipelines, pump stations, water quality management assets (such as secondary chlorinators and water quality monitoring analysers), reticulation pipework and sample taps.

As water travels through our networks its quality can be compromised, making it unsafe or unpleasant to drink or use. This can occur due to:

- Asset failures or events (e.g. treatment process failures, storms and bushfires).
- Ingress through our storage tank roofs.

- Ingress into our pipes (when the network is depressurised).
- Inadequate disinfection residual allowing biofilms to grow (some of which can be potentially harmful to human health).
- Inadequate backflow prevention²¹⁵ at customer water meters.
- Cross connections between the drinking and recycled water systems or other services.
- Water main breaks, operational changes and planned or emergency works stirring up naturally occurring sediment leading to dirty or discoloured water.

We use a preventative risk management system based on multiple barriers and proactive controls²¹⁶ to maintain water quality and protect public health. If a risk management barrier fails and contamination (or potential for contamination) occurs, appropriate incident control procedures and information to inform corrective actions are required to protect public health. This can include issuing drinking water advisories (such as 'boil water' or 'do not drink' notifications) to customers.

We implement a range of ongoing capital and operating expenditure programs in addition to targeted infrastructure projects. Our ongoing capital expenditure programs include:

- Tank integrity programs. Tanks are a high-risk asset for the protection of water quality as even tiny asset breaches can allow ingress of contaminants into the water supply. Our tank programs comprise:
 - Proactive risk-based inspections and improvement works program.
 - High-risk tank works program for more major refurbishment or replacement works.
 - Occupational health and safety compliance program.
- Sample tap installation and maintenance programs, that ensure sufficient sample taps are located within the network enabling water quality sampling.
- Installation of particle dispersion devices to prevent natural sediment accumulating in low flow areas of our network, which can cause dirty water complaints.
- Recycled water cross connection program to proactively identify cross connections between drinking water and recycled water pipes.
- Water zone improvement works program to address water quality issues and minimise customer complaints.

Targeted capital infrastructure projects such as secondary disinfection facility installations are also important to improve the chlorine residual levels in our network, as per Australian and World Health Organization drinking water guideline recommendations.

Further details on how we're addressing our safe drinking water obligations are provided in Appendix E - Addressing our environmental and safe drinking water obligations on page 253.

Prudence, efficiency and deliverability

During the 2018-23 price period we increased our capital expenditure to enhance our tank programs and install several new secondary disinfection facilities to ensure continued

²¹⁵ Restricting the movement of water backwards towards the meter, preventing contaminated water from properties to be drawn back into the main water supply system.

²¹⁶ Preventative risk management, multiple barriers and proactive controls are required under Victorian regulations and are in line with Australian and World Health Organization drinking water guidelines.

compliance with more stringent requirements introduced in the Safe Drinking Water Regulations in 2015.

We also issued two precautionary drinking water advisories, in consultation with the Victorian Department of Health (DH) to ensure the protection of public health during two severe storm events.²¹⁷ An increase in drinking water advisories was seen across Victoria also, with several issued in response to climate related incidents such as bushfires and storms.²¹⁸ Therefore, it is DH's expectation that in the 2023-28 regulatory period, water authorities will:

- Have a greater focus on building asset resilience to severe weather events, to ensure the safety of the water supply is maintained.²¹⁹
- Improve their capability to respond rapidly during water quality incidents. Information is expected to be immediately available to inform rapid risk assessments and decision making, including issuing and rescinding drinking water advisories.²²⁰

Accordingly, we propose to increase our capital expenditure in the 2023-28 regulatory period as follows:

- Tank inspection and improvement works program – average annual increase of \$0.47 million per annum, to build asset resilience by allowing for:
 - Annual visual inspections of our 24 higher risk tank roofs, given the time between formal inspections can be three to five years. High risk tank roofs are those made of light gauge material or located in densely treed areas. These inspections will help us better prepare the tanks for severe weather events thereby minimising negative impacts to water quality.
 - Structural assessments of our ageing tank asset base during offline inspections (typically eight per year). This information will inform major tank works required in the future to ensure ongoing tank asset integrity and water supply network resilience.
- High risk tank program – average annual increase of \$0.35 million per annum, to allow for replacement of the Kew Reservoir which is well beyond its asset life, and major refurbishments required to several other tanks based on their asset age and inspection findings.
- Online water quality sensor installations (new targeted infrastructure project) – increase of \$4.6 million to install sensors in our network to provide real time information on our water quality performance. This data will be used to inform rapid risk assessments and decision making during water quality incidents.

²¹⁷ A 'boil water notice' was in August 2020 due to failure of Melbourne Water's primary disinfection process at Silvan Reservoir during a storm. A 'do not drink notice' was issued due to depressurisation of part of our network during a storm event in June 2021.

²¹⁸ Department of Health letter dated 12 Jan 2021 to water agency Chairpersons, Managing Directors and Chief Executive Officers on obligations under the Safe Drinking Water Act (2003) and Safe Drinking Water Regulations (2015), Ref HHSD/20/608788.

²¹⁹ Department of Health Guidance for the 2023 Water Price Review, Guidance for water agencies - October 2021, p. 1, 4-5.

²²⁰ The DH draft "Guidance on Drinking Water Advisories" (Dec 2020) includes requirements for information to be immediately available to allow rapid risk assessments to be made during water quality incidents.

We also need to increase our expenditure to cater for expansion of our water supply networks due to growth as follows:

- Sample tap program – slight average annual increase of \$4,200 per annum, to allow for more sample tap installations in line with population growth (specific regulatory obligation).
- Recycled water cross connection prevention program – average increase of \$0.17 million per annum, with a significant proportion allocated to the installation of electrical conductivity sensors in the recycled water network (predicted to approximately double in size) to assist with proactive detection of cross connections with the drinking water network.

We propose to maintain our spend on other ongoing capital programs, as well as on the installation of new secondary disinfection facilities. The latter will enable us to continue to improve the disinfectant residual levels in our drinking water network. This is in line with DH expectations that water businesses should proactively work to maintain a reliable residual throughout their distribution systems.²²¹

Cost estimates for our ongoing capital programs have been developed based on a review of actual past expenditure and unit rates under current contracts. Cost estimates for targeted projects have been based on historical tender prices and project costs, supplier quotes and contingency amounts appropriate for projects in concept phase development²²². The proposed works and costs are based on meeting current confirmed regulatory obligations.

There is some uncertainty regarding future legislative requirements due to the next sunset of the Safe Drinking Water Regulations in 2025 which will trigger a mandatory review and potential changes to obligations. We have assumed regulatory impact assessments will be undertaken for any significant changes and we'll be provided an appropriate timeframe to plan and implement any new works required to meet changes. If new requirements eventuate during the 2023-28 regulatory period, we would undertake the required works to ensure compliance.

As the works in this program are either compliance (public health) or customer satisfaction driven, there is limited opportunity to delay works without good reason. However, due consideration has been given to deliverability risks, current macro-economic conditions and smoothing out the investment profile wherever possible. We've risk adjusted the profile of this program to account for minor adjustments in the delivery of:

- Kew Reservoir replacement project based on current project status, complexity of the works and site constraints (heritage overlay).
- Proposed secondary chlorinator installations to allow more time for land acquisition, planning and design of supporting site infrastructure (e.g. power supply).

²²¹ The DH draft "Guidance on Drinking Water Advisories" (Dec 2020) includes clear expectations that Victorian water authorities will, "proactively maintain a reliably detectable residual at all locations throughout the distribution system at all times; or at least as far as reasonably practical; and particularly within and as water leaves treated water storage tanks." (p. 11). In addition, the DH Guidance for the "ESC 2023 Price Review" (Oct 2021) includes that water agencies must improve secondary disinfection systems in line with recognised best practice (p.4).

²²² Contingency estimates are based on the Association of Advancement of Cost Engineering (AACE) estimating framework. We have taken on some financial risk by adopting amounts at the lower end of the recommended contingency ranges, so that financial uncertainty is not passed onto customers.

These changes have resulted in a small shift (\$1.3 million) in expenditure from the first three years of the 2023-28 period as shown in Figure 43 below.

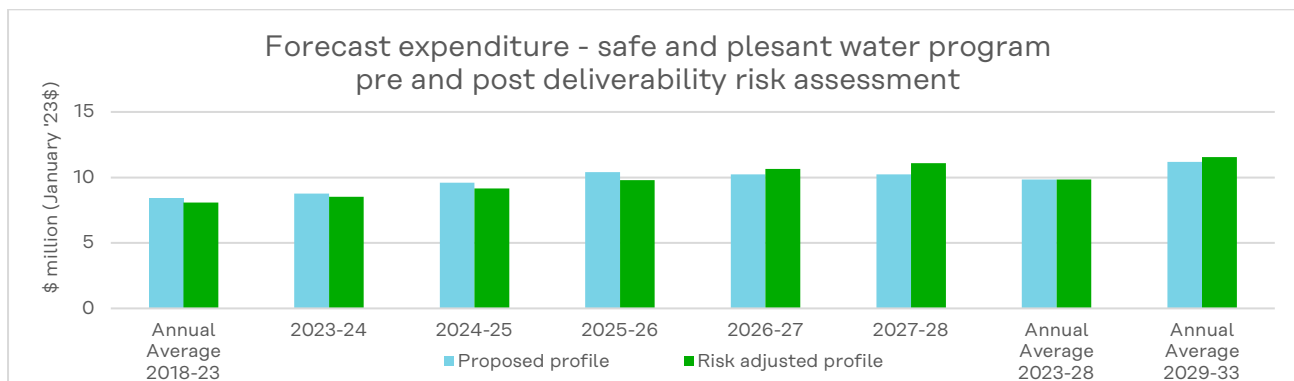


Figure 43: Risk adjusted safe and pleasant water capital expenditure profile 2023-24 to 2027-28 (\$ million January 2023)

Table 82 below outlines our proposed investments for the 2023-33 period, relative to actual and forecast spend over the 2018-23 period.

		Annual average			% of total capital expenditure
		2018 to 2023	2023 to 2028	2028 to 2033	
Ongoing tank programs	\$ millions	5.91	6.63	7.46	
Ongoing other programs	\$ millions	0.38	0.49	0.69	
Targeted infrastructure projects	\$ millions	1.79	2.73	3.37	
Total	\$ millions	8.08	9.85	11.52	

Table 82: Forecast average annual safe and pleasant water capital expenditure 2023-33 (\$ million January 2023)

C.3.2 Community sewerage program

Context

Since 1995, we’ve been delivering sustainable sewerage services to customers who have inappropriate onsite sewerage systems that are unable to contain their wastewater onsite.

6,295 properties in our area have been identified as a high risk of being unable to contain wastewater on their property and we’re required to provide them with a sustainable sewerage service. These properties are generally located in the outer northern and eastern suburbs within our area, and don’t currently have access to a sewerage service – having been developed prior to any sewerage system network being available.

Under current legislative frameworks, onsite wastewater management systems are owned and installed by property owners, under the oversight of local councils. Legacy systems which don’t meet modern day standards can’t be compelled to be upgraded unless a planning permit is triggered for new works, such as extensions and subdivisions.

Onsite systems require monitoring and ongoing maintenance to ensure they continue to meet the requirements set out by the EPA Code of Practice for Onsite Wastewater Management.

Local councils, with onsite systems in their area, are required under the Environment Protection Act's State Environment Protection Policy 2018 (SEPP)²²³ to develop a Domestic Wastewater Management Plan (DWMP) which outlines a high-level management approach to identify and mitigate the risks of onsite systems within their area. The DWMP should also identify those properties which are not considered capable of containing their wastewater onsite.

When wastewater isn't treated and contained onsite, the impacts include:

- Pollution of local drains and waterways and increased nutrient discharges to sensitive receiving environments.
- Reduction of local amenity arising from offensive odours, unsightly discharges and boggy lawns.
- Public health risks arising from the contamination of drinking water, or primary or secondary recreational contact with human pathogens from mismanaged wastewater.

We have an obligation under the SEPP, to identify and prioritise preferred servicing solutions for the provision of a sustainable sewerage system to properties identified within DWMPs.

In total, over 3,000 properties will be provided a connection point during the 2023-28 period, including properties in Park Orchards, Kallista, Lower Plenty, Lilydale, Olinda, Yarrambat, St Andrews, Panton Hill, Diamond Creek and Humevale. The Park Orchards sewerage project is a major project for the 2023-28 period to provide sewerage services to 1,000 properties (refer to Major projects section on page 57).

The community sewerage program is highly valued by the customers who receive new sewerage services and is consistent with the outcome 'looking after our natural environment'. This support is demonstrated by numerous customer research reports and recommendations from both 2017 and 2022 Citizens' Juries²²⁴, indicating customers support community-based solutions for localised needs.

Prudency, efficiency and deliverability

Properties are grouped together into community sewerage areas (CSAs) and prioritised for servicing through a model which considers the performance of existing systems in an area and the risks posed to amenity, public health and environment, as well as customer support for servicing and the cost of sewerage servicing.

During the 2018-23 regulatory period, we've focused on enhancing the reliability and efficiency of delivering the program, including planning, design and construction. This approach has delivered new sewerage services for over 3,200 properties, exceeding the forecast of 2,927 properties. We plan to maintain an ongoing annual investment of \$24.17 million to service about 3,000 properties over the five-year period.

6,295 properties remain on the program, with the potential for a further 3,714²²⁵ properties to be offered a sewerage connection as they're adjacent to our works. A total remaining

²²³ The SEPP is due to expire in 2023 and it's likely to be replaced by an obligation in our Statement of Obligations.

²²⁴ Recommendation number 9 – "Investigate and pursue community-based solutions for localised needs" (2017 Jury) and recommendation number 11 – "Access, where practical, to sewerage and water services for all customers" (2022 Jury).

²²⁵ Our obligations to service under this program are focused on those properties at greater than a low risk of being unable to contain wastewater onsite when assessed by the risk classification process. However, in practice low risk properties are

investment of up to \$450 million is expected to be required to complete the program by 2040. An additional investment is required by each property owner (typically \$3000-\$6000) to complete private plumbing works to connect to new sewerage infrastructure.

Pressure sewer technology now allows for servicing areas that were previously cost prohibitive using a traditional gravity sewerage scheme.

Costs to deliver the community sewerage program have generally increased over time due to rising construction costs and greater complexity due to challenging topography and distance from existing sewerage networks. 35-40 per cent of the works during 2023-28 will take place in Park Orchards, which has known difficult ground conditions. These were evident in 2018-23, where Park Orchards incurred 30 per cent higher costs per property when compared to Eltham, and 275 per cent higher cost per property compared to the favourable conditions found in Monbulk. Communality sewerage areas to the north (accounting for 10-15 per cent of works) will be predominantly in volcanic areas with hard basalt and quartz rock.

To identify the most efficient sewer servicing methodology for each of the identified community sewerage program properties, we've worked in conjunction with a consultant to develop an algorithm to iteratively determine the lowest cost reticulated sewer servicing solution for each group of properties.

This process facilitated the grouping of community sewerage program properties into 55 CSAs which were then prioritised for servicing. Councils, Melbourne Water, DELWP and EPA were consulted on the reprioritisation process. Initial data mining and prioritisation preferences led to a workshop where agreement was reached on evaluation measures, criteria weighting and the ultimate prioritisation framework for 2023-28. Within the framework, existing system performance and proximity to recreational sites were the two biggest drivers for prioritisation – followed by other drivers of onsite containment potential, proximity to stormwater, community lifecycle cost, geographical constraints, and customer enquiries. Each of these drivers were allocated a weighted set criterion for scoring the CSA against, and each of the 55 new CSAs underwent the prioritisation assessment.

Once connected, community sewerage program customers are charged ongoing sewer service and usage charges. Community support for the community sewerage program is generally high, however historically, connection rates haven't exceeded 65-70 per cent. Based on customer research we are currently preparing to pilot initiatives which will address the two key barriers to connection: upfront connection costs and challenges in engaging plumbers to complete this work. We aim to increase connection rates to over 80 per cent in the 2023-28 period.

All community sewerage projects are delivered under our asset delivery framework for capital infrastructure. Community sewerage program projects to service given CSAs will be broken into logical packages of work for tendering and construction, based on size, scope and value. Packages of works will allow works to be undertaken concurrently by separate contract partners, while also allowing the sewerage network to be brought online progressively as works are completed.

interspersed amongst higher risk properties that do require sewerage connection. Up to 3,714 properties identified as alignment properties will be able to be serviced at low cost by new sewerage networks being constructed as part of our community sewerage program.

We have high confidence in delivering this program. We have strong partnerships with dedicated and specialised design and construction contractors. This allows collaborative forward planning to proactively address any emerging supply chain and resourcing challenges. These partnerships will deliver all four major community sewerage projects over the 2018-23 period (refer to Table 49 on page 147 for further details).

We'll continue to investigate further trials to improve customer, environmental and safety outcomes. Table 83 below outlines our proposed investments for the 2023-33 period, relative to actual and forecast spend over 2018-23 period.

		Annual average			% of total capital expenditure
		2018 to 2023	2023 to 2028	2028 to 2033	
Community sewerage program	\$ millions	23.34	15.55	24.17	
Park Orchards community sewerage area (major project)	\$ millions	1.13	8.62	0.00	
Total	Lots serviced	640	600	600	
	\$ millions	24.47	24.17	24.17	

Table 83: Forecast average annual community sewerage program capital expenditure 2023-33 (\$ million January 2023)

C.3.3 Sewerage capacity

Context

The sewerage system is designed to carry a projected capacity (volume of sewage) that is regularly assessed and updated using hydraulic models of the sewerage system and recorded flow volumes.

The projected capacity of the system is based on design guidelines²²⁶ including the actual and projected number of customers connected and design allowances for peak flows during normal operating conditions and wet weather events. These design guidelines are intended to ensure that the sewerage system can collect and transfer sewage safely within the system, with the risk of sewage spills being minimised during wet weather or eliminated during normal conditions.

We've identified and prioritised areas within our sewerage system with current capacity deficiencies – where actual current volume exceeds design capacity and requires rectification. These capacity deficiencies are attributed to:

- Accelerated customer growth in some areas.
- Increased flows into the sewer from groundwater or stormwater, caused by asset defects²²⁷ such as cracks, failing joints, corroded assets and unsealed maintenance holes in the sewerage system (this includes both private plumbing and our assets).
- Increased flows into the sewer from illegal stormwater connections.

²²⁶ Including, Sewerage Planning and Design Principles (YVW, 2017), Management of Sewer Surcharge and Philosophy for Hydraulic Capacity Upgrades YBUS0179 (YVW,2013) and WSA 02-2002 Sewerage Code of Australia MRWA Edition.

²²⁷ Influenced by the age, corrosion, ground conditions, construction quality and material of the assets, ground movements, and asset maintenance.

Where actual volumes exceed the capacity of the sewer main, this can result in overflow of sewage to the surrounding environment that can impact private property, public areas or waterways. These spills will occur at maintenance holes, customer properties, or emergency relief structures (ERS) installed to control potential spills and minimise their impacts. This ongoing program is required to:

- Protect customers, by upgrading sewer system capacity, mitigating the risk of sewage spills and reducing the risk to human health and potential impacts on private property and public spaces.
- Protect the environment, including stream and water dependent ecosystems (including threatened and native species habitat) through elimination or mitigation of spill risks.
- Meet our regulatory obligations under the Environment Protection Act (2017), including the general environmental duties (GED), that requires all Victorians to take reasonable and practical steps to reduce the human and environmental health risks of their activities.

Care for the environment is a major driver of trust²²⁸ and 41 per cent of customers agree that the quality of local waterways is getting worse²²⁹. Customer insights have placed high importance on preserving and protecting the environment, so we created the outcome 'looking after our natural environment'.

Prudency, efficiency and deliverability

We have taken a risk-based approach, consistent with ISO31000:2018, to mitigate the risk of sewerage system capacity deficiencies. This approach builds on the traditional hydraulic modelling approach using network attributes to determine likelihood of sewage spills – and enhances the approach through identification of threats to the waterway values, our customers and community.

We assess these threats using a risk assessment framework focusing on the health of humans and environmental values. This risk-based approach aligns with the Sewerage Management Guidelines (SMG)²³⁰ risk assessment framework, developed by industry and the EPA. Used to determine the risk score of each spilling location, it considers likelihood and frequency of spill events together with the consequence of spills – volume, pathogenic load and environmental, social and water use values of the receiving waterway.

The SMG provides a hierarchy of controls that enables water utilities to take appropriate action and implement risk management measures proportional to the risk level of their sewerage system capacity deficiencies, and mitigate the risks to the expected level of their GED.

²²⁸ Forethought, Brand management and Segmentation Report, February 2020.

²²⁹ Nature, Yarra Valley Water facts and figures, August 2018, page 24 – Q to what extent do you agree or disagree with the following statements? (n1,005).

²³⁰ 1701.1 Sewerage Management Guidelines (EPA October 2020) <https://www.epa.vic.gov.au/about-epa/publications/1707-1>.

We've used this risk-based approach outlined in the SMG to develop the specific actions identified in Table 84 below. All investments planned are aimed at delivering these appropriate actions for identified risks.

Risk level	Actions
Extreme	<ul style="list-style-type: none"> Extensive and continuous monitoring Develop operational plans and controls to mitigate risks Implement traditional sewer augmentation as soon as possible
High	<ul style="list-style-type: none"> Extensive and frequent monitoring Reduce impact using alternate measures including inflow reduction and screening of spills Commence planning for traditional sewer augmentation
Moderate	<ul style="list-style-type: none"> Intermittent monitoring Investigate feasibility of impact reduction via inflow reduction and screening of spills Investigate options for direct waterway improvements in the area of influence (i.e. higher value waterway improvements) Intermittent reassessment of feasibility of traditional sewer augmentation
Low	<ul style="list-style-type: none"> Intermittent monitoring Investment options for direct waterway improvements in areas of influence (i.e. higher value waterway improvements) Intermittent reassessment of feasibility of traditional sewer augmentation

Table 84: Measures to mitigate wet weather risks that are aligned to SMG guidance

We've introduced climate change scenarios into our hydraulic models. Depending on the climate change scenario, it is predicted that our sewerage system would experience 7.5 per cent to 12 per cent more intense rains, which increases the peak wet weather flows and inflow rates to our sewerage system in storm events.

Recently an independent risk assessment²³¹ of sewage spills from our system was completed. The risk assessment was structured consistent with EPA publication 1695.1²³² and addressed an EPA Victoria approved scope. Our sewerage system was risk assessed under future (2030 and 2050), low (RCP 4.5) and high (RCP 8.5) climate change scenarios. This risk assessment confirmed that climate change has a small but discernible effect on the profile of spill-related environmental risks across the system. This assessment also suggests that short-term metrological cycles²³³ (more intensified and more frequent due to climate change impacts in recent decades) and the physical condition of assets play a more significant influence on the sewerage system capacity's risk profile in the future.

Currently, our sewer system does not have any identified dry weather capacity constraints. However, substantial growth is forecast (MacroPlan 2021 and Victoria in Future 2021). Our

²³¹ Risk Assessment of YVW Sewerage Network Spills by Telford Environmental Services, (May 2022).

²³² 1695.1: [Assessing and controlling risk: A guide for business](#) (EPA,2019).

²³³ Such as oscillation between El Niño and La Niña conditions.

hydraulic model results for future growth scenarios indicate that we will experience some dry weather-related capacity constraints if we do not proactively plan to implement risk mitigation measures.

We've calculated the overall risk of spill scores for all our branch sewers and ranked them.

Before we implement any interventions, we confirm the reason for the predicted spill is a capacity deficiency. This verification process includes site visits, reviewing model results, and checking other available information sources including nearby sewer system monitor records, historical spill records and any evidence that confirms non-compliance spills. Branches where occurrences of non-compliance spills can't be verified are omitted from the traditional sewer capacity program's risk mitigation process.

This program includes different types and sizes of projects. Some of the works within this strategy are a continuation or scaling of current programs. As such, for these types of projects, the cost estimates that have been developed are based on past expenditure and unit rates in current contracts. For each large or medium scale capital project, a project specific cost estimation has been carried out by our independent cost estimation partner. The estimation is based on the bill of quantities from their respective hydraulic option assessment reports.

All high value works with an estimated value above \$250,000 will be procured via open tender, with works below that value procured via a request for quote process – requiring a minimum of three quotes. We're exploring packaging works to ensure the efficiency and optimisation of delivery.

We've risk adjusted the profile of this program to account for:

- The global material supply shortages that may impact delivery of our hydraulic upgrade projects.
- Potential delays caused by cultural heritage risks, easement and land acquisition risks, additional time required for obtaining approvals and permits from external stakeholders and engagement with stakeholders and customers.
- The large quantity of work (at the portfolio level) flagged to be delivered in the earlier years of 2023-28. As such, some project timelines were shifted to improve deliverability of the overall capital program.

These changes have resulted in an adjusted profile – shifting \$10.6 million from 2023-25 to later in the period and a reduction of \$0.6 million in the overall forecast over the 2023-28 period as shown in Figure 44 below. We will continue to manage any environmental risks using all reasonable and practicable mitigation controls.

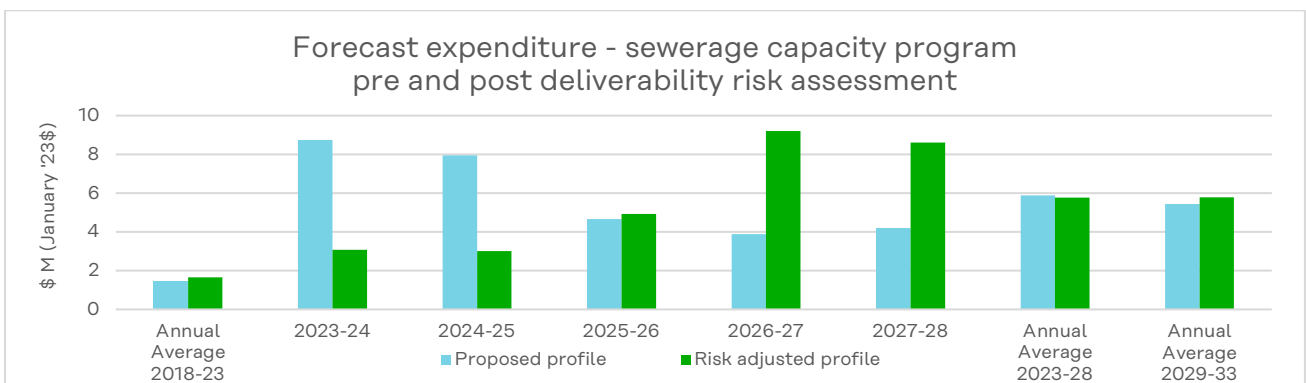


Figure 44: Risk adjusted sewerage capacity program capital expenditure profile 2023-24 to 2027-28 (\$ million January 2023)

During the 2018-23 period, we focused on detailed investigations and risk assessments of our sewerage system assets to define our investment requirements for the 2023-28 period. Based on our revised risk assessment framework, which considers the values of the receiving environment, the SMG risk-based approach and our GED obligations, we have identified those sewer branches with hydraulic capacity deficiency that can pose extreme and high risks to human health and the environment.

Risk mitigation of these capacity deficiencies, requires an increase in the levels of investment in order to protect human health and the environment, meet our service obligations to customers and achieve compliance with the GED.

It is anticipated that investment throughout the 2028-33 regulatory period would be required to be maintained at similar levels to continue to meet our service and regulatory obligations to human health and the environment.

Table 85 below outlines our proposed investments for the 2023-33 period, relative to actual and forecast spend over 2018-23 period – with the increase wholly attributed to capacity upgrade projects identified during the 2018-23 period.

		Annual average			% of total capital expenditure
		2018 to 2023	2023 to 2028	2028 to 2033	
Capacity upgrade projects (extreme and high risks)	\$ millions	0.00	2.65	2.65	
ERS construction and screening, inflow and infiltration reduction and sewer monitoring (moderate and low risks)	\$ millions	1.65	1.44	1.39	
Total	\$ millions	1.65	4.10	4.04	
Darebin sewer tunnel (at risk) ²³⁴	\$ millions	0.00	24.17	12.13	
Total (including at risk)	\$ millions	1.65	28.27	16.17	

Table 85: Forecast average annual sewerage capacity program capital expenditure 2023-33 (\$ million January 2023)

Based on the risk assessment framework, the Darebin Creek main has been identified as an extreme risk and requires traditional augmentation. The preferred solution to address the hydraulic deficiency is through the construction of the Darebin sewer tunnel, and we're committed to its delivery.

The Darebin sewer tunnel has all the attributes of a wholesaler asset, so we are not including the costs of the project in our submission. We're currently working with Melbourne Water and the other retailers to review and agree the principles and interface points between the wholesale and retail distribution networks that will determine ultimate ownership of this asset. In the meantime, we'll continue to undertake preliminary work associated with upgrading this asset to ensure it's delivered to meet our environmental obligations regardless of its ultimate ownership.

²³⁴ Refer to Table 56 on page 155 for further details.

We're in the concept design phase and expect that the tunnel alignment and functional design will be completed by June 2023. The objective for the 2023-28 period is to build the Darebin sewer tunnel to mitigate the risk of harm of wet weather spills to the environment and our customers in the Darebin catchment.

C.3.4 Sewage treatment and recycling

Context

We own and operate nine sewage treatment plants (STP) and three recycled water treatment plants (RWTP) which provide essential services to customers and protect the environment by producing an effluent quality that meets our discharge and recycled water supply obligations.

STPs are complex systems made up of civil, mechanical and electrical assets to support chemical and biological treatment processes. Assets within an STP have their own unique design lives, e.g. concrete and steel structures have much longer life expectancies compared to many small expensive electrical, mechanical and chemical dosing components that don't operate reliably beyond 20 years.

Each treatment plant requires regular intervention for its operation, maintenance, renewals, and improvements to ensure the continuity of reliable, safe, efficient, and compliant services. We also need to ensure our assets are safe and prevent harm or injury to the public and our staff.

STPs treat sewage to a standard suitable for discharge to the environment. At RWTPs, the treated effluent is further refined through advanced treatment processes to produce Class A²³⁵ standard recycled water, which is returned for use to customers as recycled water through a dedicated network.

Our STP operating licence conditions are scheduled to be reviewed in 2022. Should new licence conditions be applied, we will review and adjust our asset investments and operational controls.

Prudency, efficiency and deliverability

As these assets near end of life, there's an increased likelihood of operational problems and additional costs, from frequent repair and replacement of components, to ensure that the plant continues to operate efficiently. Investments are also required as these assets reach capacity constraints and require upgrade to continue to accept customers' waste, including new trade waste customers, consistent with our regulatory requirements and to support economic growth.

The recent updates to the Environment Protection Act 2017 (EP Act) have moved environmental obligations from a consequence-based model to a more prevention-based model. As such, we're required to demonstrate that adequate measures have been undertaken to minimise the environmental and public health risks that may arise from unreliable asset performance. Reliable asset performance is achieved through prudent and

²³⁵ For more information on recycled water classifications, visit <https://www.yvw.com.au/help-advice/recycled-water/recycled-water-classifications>.

data driven decision making, reliant on the planning and implementation of more effective maintenance, renewal, and upgrade strategies.

STP assets are generally replaced under individual asset class renewal programs over time, unless a major capacity upgrade is required, or multiple major components require upgrade or replacement at the same time. The Healesville treatment plant is an example of a major capacity upgrade project to be delivered by 2027-28 (refer to section 3.9 - Major projects on page 57).

Our STP asset management expenditure can be divided into two categories:

- Planned asset upgrades and replacements – to ensure each treatment plant can meet its treatment obligation and is maintained as a safe workplace for staff and contractors. Works include long-term capacity expansions, proactive renewal and replacement of process equipment, and provision of additional storage capacity to accommodate wet weather flows considering the impacts of climate change.
- Unplanned asset management upgrades – when an asset fails requiring repair, restoration or replacement. The extent of unplanned asset management is a consequence of the age and condition of assets, and the effectiveness of planned asset upgrades and replacements previously undertaken.

Asset management interventions at our treatment plants are based on demonstrated need.

In September 2021, GHD, an independent engineering consultant, developed capacity assessment and condition reports (known as Master Plans²³⁶) for each STP. Each report identified scope and timing of capital investments until 2032-33, required for:

- Repair or replacing assets that have reached end of life.
- Upgrades to address capacity deficiencies and efficiency.

The works required during 2023-28 informed by these reports can be summarised at a high level as follows:

- Significant improvement works are required for five of the eight plants²³⁷ for this strategy.
- Healesville STP is currently at capacity and requires a capacity upgrade.
- Approximately 96 per cent of the investment is needed for us to deliver on our environmental and safety related regulatory obligations. Examples of this include:
 - Wet weather storage upgrades at five of our plants to minimise impact to waterways during high intensity storm events.
 - Supervisory control and data acquisition (SCADA), communication and control system upgrades at all STPs to ensure continued reliability of plant operations to meet licence requirements.
 - Aeration system upgrades at three STPs to ensure adequate and reliable treatment to meet our licence requirements.

²³⁶ Developed by GHD, including assessment of capacity using BioWin modelling software, each report documents the outcomes from investigations pertaining to influent characterisation, plant capacity, and asset condition and replacement. Further information is available upon request.

²³⁷ Aurora STP upgrades are covered in the growth strategy business case.

- Inlet pumping stations and inlet screen upgrade works at Lilydale STP to ensure continued reliability of plant operations.
- UV disinfection upgrade works at three plants to ensure adequate treatment to meet our licence requirements.
- Irrigation system installation works at Whittlesea STP to avoid non-compliant emergency discharge to waterways.
- Chemical dosing system upgrade works at three plants to improve safety risks for our operators and delivery partners.
- Electrical hazard compliance inspection and rectification program at all treatment plants to improve safety risks for our operators and delivery partners in addition to ensuring reliability of plant operations.
- Reactive maintenance asset replacements to ensure reliability of plant operations.

In developing this program of works, due consideration was given to optimising the timing of the works and smoothing out the investment profile wherever possible. As a large majority of the works in this strategy are regulatory and compliance driven, there's limited opportunity given the associated non-compliance risks and consequences if works are unreasonably delayed without good reason. As an example, we explored the delivery of our wet weather storage improvement works over two pricing periods but have dismissed this as we've deemed the non compliance and customer impact risks of not meeting our general environmental duties during wet weather storm events to be too high.

The works within this strategy are based on Master Plans or similar works carried out during 2018-23. As such, all cost estimates have been developed based on past expenditure and unit rates from:

- Master Plan reports developed by GHD.
- Electrical condition assessment reports.
- Contactors quotes.
- Cost estimates based on 2018-23 data.

The Healesville capacity upgrade is in the preliminary design phase. P50 cost estimates, incorporating a Monte-Carlo analysis, have been developed by our project management office and will be delivered via an open tender process supported by our capital delivery team.

All planned works with an estimated value above \$250,000 will be procured via open tender, while works below that value will be procured via a request for quote process – requiring a minimum of three quotes. We're exploring packaging works to ensure the efficiency and optimisation of delivery.

Our unplanned asset management upgrade program will be delivered under the existing maintenance contract.

Current macro-economic conditions reveal some possible constraints regarding resources and material availability. We have reviewed the profile to take into account the uncertainties of the current economic conditions – as result we've risk adjusted the profile of this program to account for:

- Impact on delivery of components and materials that are sourced from overseas.
- Optimising the establishment of a construction panel for program delivery.
- Increased consultation and approval times with customers, stakeholders and regulators.

These changes have resulted in a shift of forecast expenditure in the first two years (2023-25) of \$23.4 million and a reduction of \$1 million overall over the 2023-28 period as shown in Figure 45 below. We will continue to manage any occupational health and safety and environmental risks using all reasonable and practicable mitigation controls.

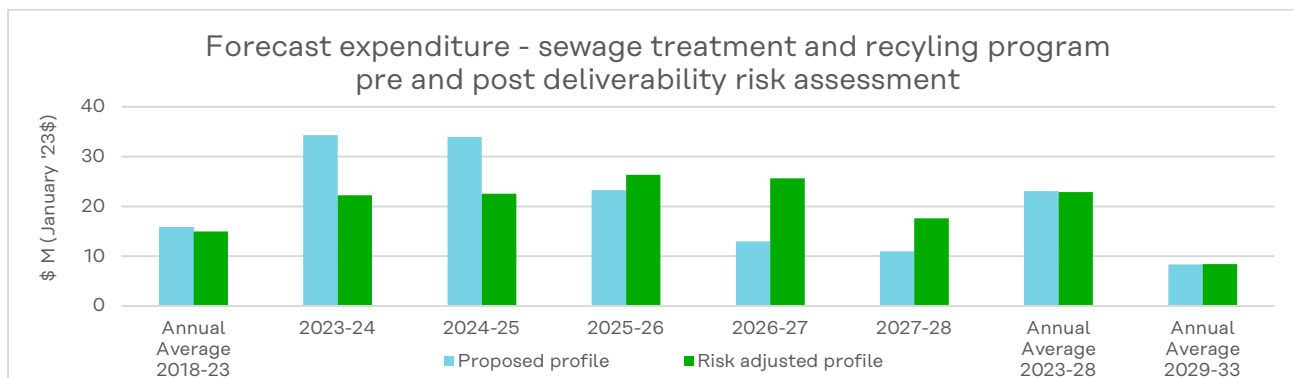


Figure 45: Risk adjusted sewage treatment and recycling program capital expenditure profile 2023-24 to 2027-28 (\$ million January 2023)

Table 86 below outlines our proposed investments for the 2023-33 period, relative to actual and forecast spend over 2018-23 period.

		Annual average			% of total capital expenditure
		2018 to 2023	2023 to 2028	2028 to 2033	
Planned asset upgrades and replacements	\$ millions	11.18	13.88	5.28	
Unplanned asset management upgrades	\$ millions	3.41	3.15	3.15	
Healesville sewage treatment plant upgrade (major project)	\$ millions	0.40	5.71	0.00	
Total	\$ millions	14.99	22.74	8.43	

Table 86: Forecast average annual sewage treatment and recycling program capital expenditure 2023-33 (\$ million January 2023)

C.3.5 Energy generation and emissions

Context

We operate a network of assets that provide services to customers, which require energy to operate.

We have traditionally sourced and consumed fossil-fuel-based energy directly in the form of petrol, diesel and natural gas, or from non-renewable 'black' electricity purchased through the grid. Our consumption of energy derived from fossil fuels leads to emissions of greenhouse gas into the atmosphere, contributing to climate change.

We have an obligation under the Statement of Obligations (Emission Reduction) to achieve net zero emissions by 2030 with an interim emission reduction target of 11,664 tCO₂-e to achieve by 2025. This commitment sits within a broader set of operational and regulatory obligations including:

- Victorian Climate Change Strategy (2021) – the roadmap to net zero emissions and a climate resilient Victoria by 2050. Targets to reduce the state's greenhouse gas emissions from 2005 levels by 28-33 per cent by 2025 and 45-50 per cent by 2030.
- Victorian Renewable Energy Action Plan (2020) – sets the long-term renewable energy policy agenda and pathway. It connects a suite of initiatives that are driving investment and action in renewable energy.
- Ministerial Letter of Expectations – Water for Victoria outlines performance expectations after positioning the Victorian water sector to play a key role in supporting the broader government plan for climate change adaptation and to reduce carbon emissions.

Overall, when customers think about looking after the natural environment their main concern is climate change and its impact. Nearly two-thirds (63 per cent) of customers are concerned about climate change, and more than one-third (34 per cent) were extremely concerned²³⁸. 76 per cent say climate change is happening²³⁹.

Prudency, efficiency and deliverability

Our energy and emissions strategy balances efficient operating costs with delivering improved environmental outcomes through lower greenhouse gas emissions. To achieve this, we:

- Avoid and reduce energy consumption ensuring we get the most out of every unit of energy we consume.
- Switch from carbon intensive fuels.
- Offset any emissions that can't be avoided, reduced or switched.
- Propose to make capital investments in renewable energy generators that will reduce operational costs and provide a hedge against market prices for green electricity. We've identified six onsite solar generation opportunities that will deliver energy and emissions benefits with a positive business case (refer to Table 87 on the following page). The solar systems will produce low cost 'green' electricity that will be mostly consumed behind

²³⁸ Nature, WRMS Water Efficiency Tracking, August 2021 – Q. How concerned, if at all, are you about climate change? (n1,000).

²³⁹ Nature, Yarra Valley Water facts and figures, August 2018, page 24 – Q to what extent do you agree or disagree with the following statements? (n1,005).

the meter, displacing more expensive carbon intensive 'black' electricity being sourced from the grid.

Solar system location	Capacity (kW)	Generation (kWh/pa)	Consumption (kWh/pa)	NPV (\$)	Timing
Water pump station (WPS615) Epping North (Quarry Hill)	250	350,000	297,500	\$437,695	2023/24
Water pump station (WPS616) Yuroke (Greenvale)	500	700,000	595,000	\$889,483	2023/24
Water pump station (WPS620) Craigieburn	250	350,000	297,500	\$437,695	2023/24
Sewage flow control facility (SFC006) Mill Park	50	70,000	59,500	\$76,264	2024/25
Sewage flow control facility (SFC745) Craigieburn sewer hub	150	210,000	178,500	\$256,979	2024/25
Head office complex Mitcham	133	186,200	158,270	\$250,273	2025/26
Total	1333	1,866,200	1,586,270	\$2,418,858	

Table 87: Onsite solar generation opportunities proposed for 2023-28 (\$January 2023)

Table 88 below outlines our proposed investments for the 2023-33 period, relative to actual and forecast spend over 2018-23 period.

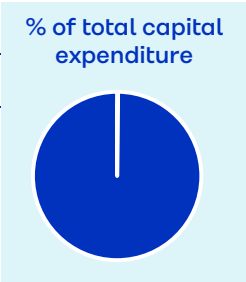
		Annual average			% of total capital expenditure
		2018 to 2023	2023 to 2028	2028 to 2033	
Energy generation and emissions	\$ millions	1.41	0.66	0.00	

Table 88: Forecast average annual energy generation and emissions program capital expenditure 2023-33 (\$ million January 2023)

C.3.6 Biodiversity and regenerative land use

Context

Historically we've managed our sites for their operational purposes.

There are increasing expectations regarding land management, including:

- The Flora and Fauna Guarantee Act 1988, amended in 2019, that requires the Department of Environment, Land, Water and Planning (DELWP) to prepare a biodiversity strategy with action statements for each threatened species.
- DELWP's Protecting Victoria's Environment – Biodiversity 2037, which sets a state-wide target of a net improvement in the outlook across all species by 2037, as measured by change in suitable habitat. It also sets a key priority of engaging with Traditional

Owners/Custodians to include traditional ecological knowledge in biodiversity planning and management.

- The new Environment Protection Act 2017 which commenced in July 2021 and transitions from the previous consequence-based Act (1970). It requires us to take all reasonably practicable steps to prevent harm to the environment and human health, not just respond to environmental harm when it occurs, according to our general environment duty.
- The Threatened Species Strategy 2021-2031 – the Australian Government’s strategic plan to protect and recover Australia’s threatened plants, animals and ecological communities.

Customers also expect that we’re caring for and protecting the environment. Based on research and engagement insights, we’re broadening the measures in our environmental outcome. When asked, Jury representatives from 2017 and 2022 identified the most important measure was the hectares of land we actively manage, to preserve and restore biodiversity and natural habitats.

A recent willingness to pay study²⁴⁰ tested three different environment related elements to determine the community’s preferences among various investment options. The results conclude there is strong willingness to pay from both typical and financially vulnerable customers for:

- Protecting and restoring habitat for the benefit of endangered plants and animals.
- Tree planting where trees have been removed due to water and sewerage works.

Prudence, efficiency and deliverability

In 2021, we engaged Nature Glenelg Trust Consulting to conduct a biodiversity audit of 1,527 hectares of land we owned across 190 sites. The audit identified threatened species on or near our land and listed the properties with high value remnant vegetation. Key findings were:

- 36 properties have remnant biodiversity values, including tall native trees, native grasslands, rock outcrops and waterways.
- 33 threatened fauna species have been recorded (including Growling Grass Frog, Eltham Copper Butterfly, Powerful Owl and threatened waterbirds).
- 39 properties have restoration potential for habitat either by revegetation or hydrological restoration, such as reinstating natural wetland features.
- The audit also identified ten sites as the highest priority strategic restoration areas and developed concept plans for each site.

Over 2023-28, we propose to focus on three high priority restoration sites including:

- Upper Yarra treatment plant where we’ll provide a habitat corridor for the critically endangered Lowland Leadbeater’s Possum and Helmeted Honey Eater.
- Lilydale treatment plant and adjacent Coldstream property where we’ll develop a treatment wetland that will both improve discharge water quality and restore habitat for threatened water bird species.

²⁴⁰ Marsden Jacob Associates, Yarra Valley Water’s customer-led price submission customer values research, August 2022.

- Aurora treatment plant where we'll develop a community farm that will grow Indigenous seedlings for the area, establish a native seed production facility, provide regenerative agriculture and conservation courses, rehabilitate the Curly Sedge Creek on site and engage Wurundjeri Woi-wurrung's Narrap Rangers to manage the site's endangered grasslands.

P50 estimates have been prepared by Greening Australia based on the restoration plans developed by Nature Glenelg Trust Consulting. Grant or in-kind funding will be secured as a contribution towards revegetation, habitat restoration and operation of the community farm – totalling \$4.96 million that is not included in the 2023-28 forecast.

Table 89 below outlines our proposed investments for the 2023-33 period, relative to actual and forecast spend over 2018-23 period.


		Annual average			% of total capital expenditure
		2018 to 2023	2023 to 2028	2028 to 2033	
Biodiversity and regenerative land use	\$ millions	0.25	1.56	0.19	

Table 89: Forecast average annual biodiversity and regenerative land use program capital expenditure 2023-33 (\$ million January 2023)

Appendix D

Detailed operating expenditure

We have an ongoing commitment to improve our operating cost efficiency and take pressure off customers' prices. To deliver these commitments, we:

- Delivered an annual efficiency of 1.52 per cent over the 2018-23 period equivalent to \$34.0 million. This is net of absorbing \$18.87 million (equivalent to an annual efficiency of 0.8 per cent) of additional digital and technology costs as a part of transitioning to cloud-based technologies. This transition will enable us to better meet customers' increasing expectations of digital experiences, deliver ongoing efficiencies and ensure that software upgrades are automatically applied when available to reduce the risk of critical systems being unsupported. Some costs associated with the development and ongoing management of cloud-based technologies are accounted as operating expenditure when previous on-premise software has been accounted for as capital expenditure.
- Outsourced major inputs to deliver efficiency gains – currently more than 57 per cent of our controllable operating costs are competitively procured to ensure we get the best value for money.
- Undertook benchmarking in relation to our operating costs to enable us to adjust our processes to achieve best practice. This approach provides a high degree of confidence that opportunities are identified, and we can deliver improvements to ensure our actual costs are consistent with efficient practices.
- Participated in national econometric and process benchmarking projects carried out by the Water Services Association of Australia (WSAA) to identify opportunities to improve operating efficiency. Recent benchmarking shows 74 per cent of our cost categories are benchmarked in the first or second quartiles (low cost) that suggests we are on, or very close to, the efficiency frontier. The study also identified that we have the lowest direct costs of participating businesses – 37 per cent of controllable regulated expenditure (refer to Figure 46 on the following page). This conclusion is largely supported by the annual reporting of operating cost per property in the National Performance Report²⁴¹, indicating that our customers benefit from comparatively low operating costs nationally.

²⁴¹ <http://www.bom.gov.au/water/npr/>.

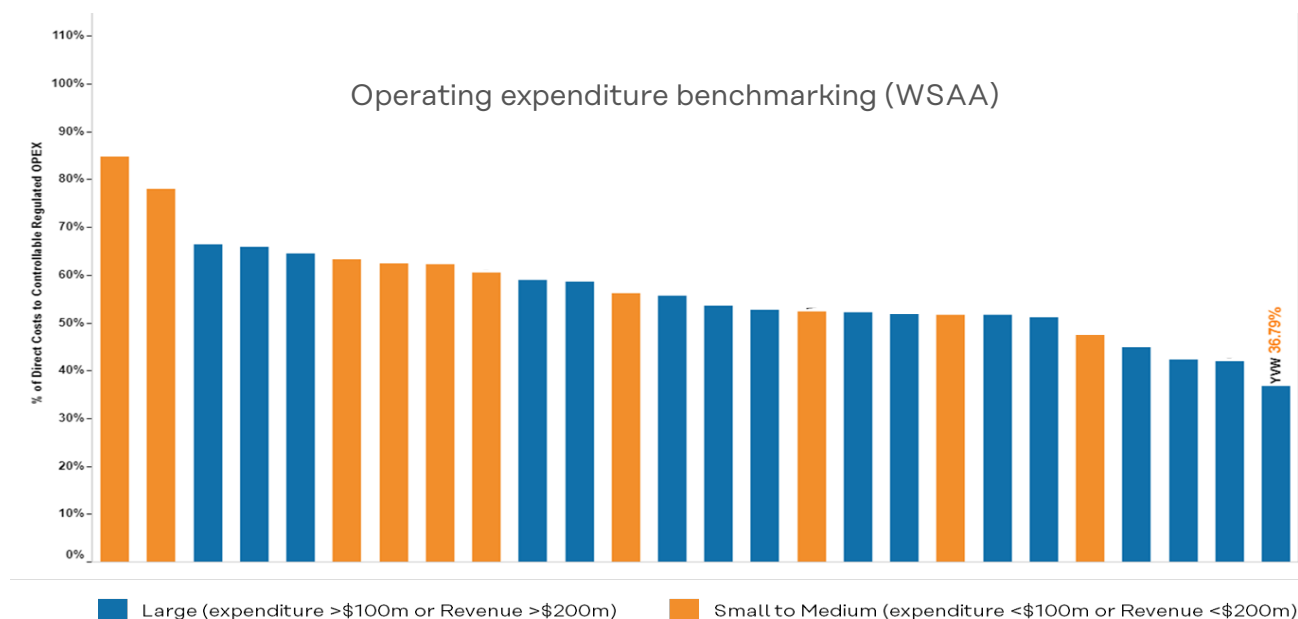


Figure 46: Water Services Association Australia (WSAA) operating expenditure benchmarking 2020

Our controllable operating expenditure is forecast to increase by about 5.9 per cent over the next regulatory period compared to the adjusted base year of \$153.90 million as shown in Table 90 below.

	Regulatory period 2023-24 to 2027-28					Regulatory period 2028-29 to 2032-33				
	23-24	24-25	25-26	26-27	27-28	28-29	29-30	30-31	31-32	32-33
2021-22 baseline spend	157.31	157.31	157.31	157.31	157.31	157.31	157.31	157.31	157.31	157.31
Less: 2021-22 adjustments	(1.22)	(1.22)	(1.22)	(1.22)	(1.22)	(1.22)	(1.22)	(1.22)	(1.22)	(1.22)
Plus: Net 2022-23 growth and efficiency allowances	(2.19)	(2.19)	(2.19)	(2.19)	(2.19)	(2.19)	(2.19)	(2.19)	(2.19)	(2.19)
Adjusted base	153.90	153.90	153.90	153.90	153.90	153.90	153.90	153.90	153.90	153.90
Less: Annual efficiency	(2.62)	(5.19)	(7.72)	(10.20)	(12.64)	(14.62)	(16.57)	(18.49)	(20.39)	(22.26)
Plus: Growth allowance	2.90	4.02	5.58	8.02	11.37	13.18	14.87	16.44	18.06	19.73
Plus: Net additional expenditure items	7.39	7.64	9.50	9.58	10.29	10.29	10.29	10.29	10.29	10.29
Total controllable operating expenditure	161.58	160.38	161.27	161.30	162.91	162.75	162.48	162.13	161.86	161.66

Table 90: Controllable operating expenditure forecast 2023-24 to 2032-33 (\$ million January 2023)

D.1 Base year adjustments

The 2021-22 baseline expenditure has been reduced by \$1.22 million for costs associated with one-off projects including engagement and research for this price submission and the draft Greater Melbourne Urban Water and System Strategy (GMUWSS) and the Central and Gippsland Region Sustainable Water Strategy (CGRSWS).

D.2 Net ongoing efficiency

To ensure customers continue to have as low as possible prices, we'll drive ongoing cost efficiencies through the pursuit of emerging technologies and process improvements.

Using a net efficiency calculation that considers both the efficiency factor and the marginal cost of growth associated with servicing new customers, we propose a net efficiency of 0.26 per cent (\$6.48 million). This commitment benchmarks well against 2018 advanced price submissions that proposed on average a 0.21 per cent net efficiency²⁴². The components of the net ongoing efficiency include:

- Efficiency factor – We are committed to continuing to achieve compounding productivity improvements of 1.70 per cent per annum on our controllable operating costs, amounting to approximately \$38.37 million over the course of the 2023-28 regulatory period.
- Cost of customer growth – The Commission's guidance²⁴³ questioned whether the direct relationship between customer growth and operating expenditure growth has continued or could reasonably be expected to in this price period. We're expected to clearly justify why the chosen expenditure growth rate is most appropriate. We have calculated the marginal cost to serve new customers – who are forecast to increase at an annual average rate of 1.47 per cent.
- We propose an annual equivalent cost growth rate, based on marginal cost, equivalent to 1.44 per cent (\$11.37 million in 2027-28 and \$31.89 million overall) that considers the actual costs to:
 - Operate and maintain new major assets to be commissioned during the period, including Aurora and Doncaster Hill recycled water treatment plants and Kalkallo stormwater harvesting plant (\$3.47 million in 2027-28, equivalent to 0.43 per cent per annum).
 - Operate and maintain new assets (excluding major projects), including but not limited to pressure sewer systems²⁴⁴, pump stations, chlorinators, solar panels, generators and online sensors. Developed using updated cost curves, the forecasts include additional water quality sampling in line with population growth, net energy needs and chemical costs considering increased volumes (\$ 2.48 million in 2027-28, equivalent to 0.33 per cent per annum).

²⁴² 2018 price submissions of eight businesses who proposed an advanced PREMO rating.

²⁴³ Section 3.8, page 31.

²⁴⁴ A pressure sewer system is a network of sealed pipes and small, below-ground pump stations at some connected properties. The pump stations collect household sewage and pump it to the sewer main located in the street. Pressure sewer systems are used in certain areas because of topography, the unsuitability of ground conditions or the cost of a conventional sewerage system.

- Provide retail services including billing and collection activities, support for customers experiencing financial vulnerability and servicing customer contacts and enquiries (\$2.90 million in 2027-28, equivalent to 0.36 per cent per annum).
- Store additional customer data together with additional capacity to meet customer expectations of digital services and communications e.g. SMS notifications for planned and emergency works (\$2.51 million in 2027-28 million in 2027-28, equivalent to 0.32 per cent per annum).

D.3 Additional expenditure items

We propose additional expenditure of \$44.40 million, supported by customers through research and engagement and demonstrated willingness to pay, or required by specific regulatory obligations.

Supported by customers

- **Biodiversity and nature restoration** (\$1.58 million or \$0.32 per customer). This was supported by customers during engagement activities, including the Citizens' Jury and willingness to pay study²⁴⁵. The willingness to pay study revealed a minimum willingness to pay of \$1.34 at the 95th confidence level across the 945 customers surveyed. Additional investment was also supported by customers who self-identified as financially vulnerable, who revealed a minimum willingness to pay of \$1.15. Accordingly, we propose to invest in the following activities and outcomes over the 2023-28 regulatory period:
 - Manage the 10 properties with high remnant biodiversity value²⁴⁶.
 - Plant trees in community spaces, especially where we've had to remove trees from nature reserves during works.
 - Transition to a model of engaging Wurundjeri Woi-wurrung's Narrap Rangers²⁴⁷ in a long-term contractual relationship to look after some of our properties using a Caring for Country approach.
 - Monitor waterway quality to better understand the current condition of the receiving environment and the vulnerability of its habitat and surrounding areas to predicted wet weather sewage spills.

These activities are consistent with the new Environment Protection Act which commenced in July 2021. The Act requires us to take a preventative approach and exercise general environmental duty to minimise any risks from activities which can cause harm to human health or the environment, and asks us to look for opportunities for improvements alongside prevention.

In our proposed outcome 'looking after the natural environment', we've committed to a specific measure and target to track our performance delivering outcomes consistent with this additional investment.

²⁴⁵ Marsden Jacob Associates, Yarra Valley Water's customer-led price submission customer values research, August 2022.

²⁴⁶ NGT Consulting, Biodiversity Management Framework – Phase 1: Biodiversity Audit, Planning and Restoration Assessment, September 2021.

²⁴⁷ <https://www.wurundjeri.com.au/services/natural-resource-management/narrap-country-team/>.

2017 and 2022 jurors, who came together to explore outcomes and measures in May 2022, identified the most important measure for the outcome 'looking after the natural environment' as the hectares of land we actively manage to preserve and restore biodiversity and natural habitats. Refer to Outcome 6 – Looking after our natural environment on page 54.

- **Water conservation** – household water audit (\$5.25 million or \$1.06 per customer) that results in saving water for the future and maximises the value of a wide-scale water efficiency program. We propose to first pilot a household water audit including exchanging showerheads with approximately 5,000 customers by partnering with other aligned organisations. We'll then use the lessons from the pilot to ensure we maximise the benefits of a wider roll-out of household water audits and showerhead replacements during 2023-28. We plan to commence the wider roll-out, together with our meter replacement program (mechanical or digital), in 2026.

This is supported by customers who took part in the Citizens' Jury and our willingness to pay study²⁴⁸ which revealed a minimum willingness-to-pay of \$7.05 at the 95th confidence level across the 945 customers surveyed. This was also supported by customers who self-identified as financially vulnerable who revealed a minimum willingness to pay of \$6.03. Refer to Outcome 5 – Saving water for the future, page 51).

Table 91 below provides a summary of forecast expenditure for customer supported activities over the 2023-28 period.

	2023-24	2024-25	2025-26	2026-27	2027-28	Total
Biodiversity and nature restoration	0.23	0.27	0.29	0.40	0.39	1.58
Water conservation	0.42	0.42	1.47	1.47	1.47	5.25
Total	0.65	0.69	1.76	1.87	1.86	6.83

Table 91: New regulatory obligations forecast expenditure 2023-24 to 2032-33 (\$ million January 2023)

New regulatory obligations

- **Strengthening emergency management capability and capacity** (\$0.84 million per annum) to prepare for, respond to and recover from acute and chronic incidents and emergencies impacting water and wastewater services, to meet new regulatory expectations and legislative requirements. This meets the guidance from the Department of Health for increased response capability²⁴⁹ and ensures compliance with our designation under the Victorian Critical Infrastructure Framework and Emergency Management Act 2013 Part 7A250.
- **Proactively improving the disinfection (chlorine) residual levels** in our drinking water system by installing, maintaining and operating secondary chlorinator facilities and cleaning additional water quality zones that currently have low levels of chlorine

²⁴⁸ Marsden Jacob Associates, Yarra Valley Water's customer-led price submission customer values research, August 2022.

²⁴⁹ The Department of Health guidance for the 2023 Water Price Review Guidance for water agencies – October 2021.

²⁵⁰ <https://www.emv.vic.gov.au/our-work/critical-infrastructure-resilience> and <https://www.emv.vic.gov.au/critical-infrastructure-resilience/ministerial-guidelines-for-critical-infrastructure-resilience>.

disinfection residual²⁵¹ (\$2.09 million per annum). This is consistent with the Victorian Department of Health's expectations that water businesses will proactively work to maintain a reliable residual throughout their distribution systems, and to improve their secondary disinfection systems in line with recognised best practice²⁵².

- **Installing online water quality network sensors** (\$0.38 million per annum) to improve our capability to understand the water quality performance in our network in real time and inform rapid risk assessments and decision making during incidents²⁵³. This action is consistent with a key recommendation from the Silvan Disinfection Failure incident reviews²⁵⁴. The Draft Guidance for Drinking Water Advisories issued by DH (Dec 2020) includes requirements for information to be immediately available to allow rapid risk assessments to be made to inform decision making during water quality incidents. We plan to install several new online water quality sensors in our network to achieve this.
- **Microbial risk research** – A recommendation from the Silvan Disinfection Failure incident was that the Melbourne water sector should research, monitor and assess the microbial risk in the drinking water system to improve disinfection effectiveness. Specific actions were agreed to implement this recommendation as detailed in the post incident Joint Action Plan²⁵⁵ which was developed by DH, DEWLP and the metropolitan water businesses to be endorsed by the deputy secretary of DH (\$0.26 million per annum).
- **Gender equity action plan** (\$0.17 million per annum), required as part of our obligations under the Gender Equality Act 2020 that came into effect on 31 March 2021.
- **Increased superannuation guarantee levy** from 10.5 per cent (at 1 July 2022) to 12 per cent on 1 July 2025 (equivalent to \$0.73 million per annum).
- **IT disaster recovery preparation and testing** (\$0.61 million per annum) designed to address gaps identified from audits that have flagged remediation work to ensure digital assets are set up, regularly tested and recoverable. This work has become more pressing due to the heightened global threat levels and introduction of the Security of Critical Infrastructure Act.
- Capital expenditure programs, with compliance drivers, including:
 - Sewage treatment plants and recycling (equivalent to \$0.46 million per annum), that aligned to occupational health and safety of staff and the community and the Environment Protection Act (2017), including the general environmental duties.
 - Sewer reliability (\$0.11 million per annum), for air value inspection program.
 - Sewer capacity program (equivalent to \$0.33 million per annum) for baseline water quality monitoring and minimising the impacts of overflows.
 - Safe and pleasant water quality program (equivalent to \$0.32 million per annum).

²⁵¹ Below preferred Australian and World Health Organization drinking water guideline levels for the protection of public health.

²⁵² The DH draft "Guidance on Drinking Water Advisories" (Dec 2020) includes expectations that Victorian water authorities will, "proactively maintain a reliably detectable residual at all locations throughout the distribution system at all times; or at least as far as reasonably practical; and particularly within and as water leaves treated water storage tanks." (p. 11). In addition, the DH Guidance for the "ESC 2023 Price Review" (Oct 2021) includes that water agencies must improve secondary disinfection systems in line with recognised best practice (p.4).

²⁵³ Key recommendation and agreed action from review of the Silvan Primary Disinfection Failure water quality incident that occurred in 2020 and resulted in a boil water notice being issued to around 80 suburbs across Melbourne.

²⁵⁴ Victorian DH, DELWP, Melbourne Water, Yarra Valley Water, South East Water, Greater Western Water, Silvan Disinfection Failure Incident Joint Action Plan (Draft 2, 7 April 2022).

²⁵⁵ Victorian DH, DELWP, Melbourne Water, Yarra Valley Water, South East Water, Greater Western Water, Silvan Disinfection Failure Incident Joint Action Plan (Draft 2, 7 April 2022).

Table 92 below provides a summary of forecast expenditure required to meet new regulatory obligations over the 2023-28 period.

	2023-24	2024-25	2025-26	2026-27	2027-28	Total
Emergency management capability and capacity	0.84	0.84	0.84	0.84	0.84	4.20
Improved disinfection (chlorine) residual levels and backflow prevention	2.13	2.13	2.06	2.06	2.06	10.44
Online water quality network sensors	0.15	0.11	0.36	0.53	0.86	2.01
Research, monitor and assess microbial risk in drinking water system	0.26	0.26	0.26	0.26	0.26	1.30
Gender equity action plan	0.17	0.17	0.17	0.17	0.17	0.85
Superannuation guarantee levy	0.48	0.71	0.82	0.82	0.82	3.65
IT disaster recovery preparation and testing	0.61	0.61	0.61	0.61	0.61	3.05
Capital expenditure programs with compliance drivers	1.25	1.05	1.27	1.06	1.46	6.09
Total	5.89	5.88	6.39	6.35	7.08	31.59

Table 92: New regulatory obligations forecast expenditure 2023-24 to 2032-33 (\$ million January 2023)

Appendix E

Addressing our environmental and safe drinking water obligations

E.1 Environmental obligations and expectations

Investing in and managing assets to deliver the services our customers and community expect are core to our business. We take a holistic and long-term approach to managing impacts to the environment, across the breadth of our services and activities. We use the following integrated frameworks to help guide us in our asset and environmental management:

- The Asset Management Accountability Framework (AMAF)²⁵⁶ – the Victorian Government’s policy framework for asset management.
- Our environment management system (EMS), developed, maintained, and certified in accordance with ISO14001.

Well established asset and risk management practices and processes enable prudent asset investment decisions to be made while balancing risks associated with ageing infrastructure, growth, climate change, regulatory compliance, and customer service.

Our submission utilises the AMAF and EMS to develop investment proposals that address environmental issues, obligations and expectations including:

- General environmental duties
- EPA licence commitments
- Climate change adaptation and preparedness
- Biodiversity degradation

Table 93 on the following page, outlines these environmental issues, obligations and expectations, together with the actions we’ll take and investments we propose over the 2023-28 period to ensure we continue to reduce the risk of harm to human health and the environment, so far as reasonably practicable.

²⁵⁶ <https://www.dtf.vic.gov.au/infrastructure-investment/asset-management-accountability-framework>.

General environmental duties (GED)

The Environment Protection (EP) Act (2017) is a prevention-based act and transitions from the previous consequence-based EP Act (1970).

We understand our obligation is to take all reasonably practicable steps to prevent harm to the environment and human health – not just respond to environmental harm when it occurs.

A GED lens is applied to all aspects of the asset management lifecycle to ensure long-term management and maintenance of the asset can meet GED principles.

Community sewerage

Over 30,000 properties within our service area rely on onsite wastewater management systems.

For many this is appropriate. If unsuitable or not properly installed and maintained, properties will discharge untreated or partially treated wastewater offsite causing environmental, public health and amenity impacts.

Local councils with onsite systems in their area are required under the Environment Protection Act's State Environment Protection Policy 2018 (SEPP), clause 29, to develop a Domestic Wastewater Management Plan (DWMP) which outlines a high-level management approach to identify and mitigate the risks of onsite systems within their area.

The DWMP should also identify those properties which aren't considered capable of containing their wastewater onsite.

We have a regulatory obligation, under the SEPP clause 30, to identify and prioritise preferred servicing solutions to provide a sustainable sewerage system to properties identified within DWMPs.

6,295 properties have been identified under the DWMP as not having a sustainable sewerage solution. These properties have been prioritised in our community sewerage program. Approximately 3,700 properties located adjacent to works will also be offered a sewerage connection.

Our objective is to maintain an ongoing investment until 2040 when it's expected all properties will have access to a sustainable sewerage solution. We estimate that a total remaining investment of \$470 million is required.

Over the 2023-28 period, we propose to provide a service to about 3,000 properties at a cost of \$120.9 million.

Each property owner is required to complete private plumbing works to connect to new sewerage infrastructure (typically \$3,000-\$6,000).

Sewer capacity and containment

We operate and maintain an extensive sewerage network. The system includes a wide variety of assets including 10,000km of sewer pipes (including gravity and pressure), 106 sewage pumping stations, flow control facilities, maintenance holes, and assets already installed to manage wet and dry weather sewage flows and prevent potential sewage spill risks, including emergency relief structures.

The sewerage system is designed to service a volume of sewage including an allowance for peak flows during normal operating conditions and wet weather events.

This includes escape (spillage) of sewage outside the system being minimised (during wet weather) or eliminated (during normal conditions).

Where actual volumes exceed the design capacity, sewage spills may occur at maintenance holes, customer properties, or emergency relief structures installed to control potential spills and minimise their impacts.

These spills can impact private property, public areas or waterways.

We've undertaken detailed investigations and risk assessments of our sewerage system assets to define our investment requirements for the 2023-28 period.

Based on our risk assessment framework, which considers the values of the receiving environment, our GED obligations and the Sewerage Management Guidelines (EPA October 2020), we propose investments of \$20.5 million over the 2023-28 period to:

- Upgrade hydraulic capacity to cater for increased flows due to growth and unexpected inflows into our system.
- Reduce inflow and infiltration to preserve capacity for sewage flow.
- Install new emergency relief structures and screening, to contain and manage spills when they occur.
- Install continuous sewer level monitors to help us spot problems before they impact the environment
- Undertake research and waterway improvement programs.

Darebin sewer tunnel is also part of this strategy, and we're committed to its delivery. We're in the concept design phase and expect the tunnel alignment and functional design will be completed by June 2023.

The objective for the 2023-28 period is to build the Darebin sewer tunnel to mitigate the risk of harm of wet weather spills to the environment and our customers in the Darebin catchment.

Based on the Bulk Water Supply Agreement this asset is considered to align with the criteria for a wholesale asset owned by Melbourne Water – as such we don't propose the costs of the project in our submission. This won't impact the progress and delivery of works that are expected to cost \$120.8 million in the 2023-28 period.

Sewer reliability programs

We operate an extensive sewerage network comprising sewer mains, sewer access points, sewage pumping stations, flow control facilities, gauging stations, odour control facilities, vents, rising mains, siphons, emergency relief structures and pressure sewer networks.

The overall reliability of the sewerage network is managed via three asset types including:

- Gravity mains
- Civil assets
- Mechanical and electrical assets

Reliable asset performance is achieved through prudent investments based on data driven decision making and planning, and implementing effective strategies including:

- Proactive inspections, focusing on high-risk assets based on remaining asset life, current condition assessment or online monitoring.
- Cleaning activities.
- Scheduled renewal, or replacement of assets based on prior program works including inspections.
- Responding to reports of failed assets.

We have a range of programs to ensure the reliability of our network assets and to minimise the risk of sewage spills to the environment.

Focusing on high environmental risk sites, over the 2023-28 period we'll undertake the following works at an estimated cost of \$272.3 million:

- Continue inspecting, cleaning, renewing and repairing our sewerage gravity mains and property connection points.
- Continue inspecting, maintaining and upgrading our sewer mechanical and electrical assets to maintain reliability (e.g. pump stations, pressure sewer units and generators).
- Continue inspecting, maintaining and upgrading our sewer civil assets to maintain reliability (e.g. vents and maintenance holes).
- Install more online leak detection devices on our sewer rising mains for early notification of issues to rectify.
- Install additional generators at critical sewage pumping station sites to improve operational resilience during power outages.
- Undertake odour and gas management improvements to ensure we continue to minimise impacts to our communities and the environment.
- Ensure our sewer network hydraulic models are updated and fit for purpose to inform our decision making.

Meeting our EPA treatment plant licence commitments

Sewage treatment and recycling

We have nine sewage treatment plants and three Class A recycled water treatment plants operating under EPA permissions with specific requirements, in addition to our general environmental duties.

We also note, our operating licence conditions are scheduled to be reviewed in 2022. Should new licence conditions be applied, we will review our asset investments and operational controls.

We have a range of programs to ensure the reliability of our treatment plants, to meet our licence conditions and reduce environmental impacts so far as reasonably practicable. Over the 2023-28 period, we propose to undertake the following works at an estimated cost of \$241.6 million:

- Capacity upgrade at our Healesville treatment plant (\$28.6 million).
- Build a new sewage and recycled water treatment plant at our Aurora site to cater for expected growth, improve water security and resilience, and support liveability by providing fit for purpose recycled water to the community (\$127.8 million).
- Improve asset reliability including decommissioning assets, increasing wet weather storage, upgrading treatment processing equipment, plant safety and performance improvement (\$85.2 million).

Climate change mitigation and adaptation

We're committed to preparing for and responding to climate change impacts.

We published our first Climate Resilience Plan in 2018. Since then, we have increased our capacity in adaptive planning and have deepened our understanding of climate resilience.

Our Climate Resilience Plan is about embedding climate resilience into everything we do and ensuring our business systems and processes are equipped to handle the challenges of the coming years. It captures our actions in the areas of water security, service resilience, service reliability and impacts on people and finance as climate change risks increase (e.g. fires, storms, floods, heatwaves and droughts). Ultimately, our plan will contribute to a more resilient community.

Our updated Climate Resilience Plan was published in July 2022.

To deliver our Climate Resilience Plan we propose investments of \$134.0 million over 2023-28 to:

- Improve water security through water efficiency education and behavioural change programs and campaigns, supplying water efficient products and reducing network leakage.
- Reduce our carbon emissions by reducing energy use from fossil fuel derived sources, replacing energy with renewable sources (direct purchase or generation on site) and using emissions offsets.
- Improve the resilience of our services and assets to manage the current and future impacts of climate change, including severe weather events by:
 - Improving reliability of power supplies to mitigate the risk of prolonged power outages that can impact network operations and lead to spills to the environment, as well as supply interruptions for our customers.
 - Installing more generators and thermal protection of switchboards along with a range of other measures.
 - Completing upgrade works to increase the resilience of our communications network and our control systems at network facilities. This includes upgrading all sites to 4G to increase our intelligent monitoring, remote configuration and fault diagnostics.
 - Building additional resilience into our secondary communications by implementing a reliable radio network.
 - Installing more powerful back-up batteries at our sites and additional battery storage in high-risk zones.
 - Increasing cybersecurity protection.
 - Improving our emergency planning, response and recovery approach.

Biodiversity land management improvements

We recently commissioned an extensive biodiversity audit, finding that 10 of our 190 properties have high remnant biodiversity values and habitat for several threatened fauna species.

We've commenced investigating specific actions to manage the 10 properties.

We propose to undertake this work through a Caring for Country approach in collaboration with Traditional Owners/Custodians, together with other stakeholders and community groups.

We propose capital investments of \$7.8 million together with operating expenditure of \$0.2 million over the 2023-28 period.

Proposed work includes:

- Weed management and revegetation.
- Pest control such as guarding vegetated areas from rabbits and deer.
- Erosion control such as soil stabilisation on slopes.
- Commissioning ecological surveys and advice where required.

Improved biodiversity outcomes received strong customer and community support during the development of our 2023-28 price submission.

Table 93: Actions and investments in 2023-28 to meet environmental obligations and expectations (\$ million January 2023)

E.2 Safe drinking water obligations and guidance

Customers continue to tell us, and we know, that the most important outcome we deliver is safe and pleasant drinking water. In our 2018-23 price submission, we established a customer outcome and target to achieve 100 per cent compliance with the Safe Drinking Water Regulations (2015). We backed our commitment with a \$1.5 million rebate²⁵⁷ to the community in the form of a price reduction in the following year, if we don't meet it.

The primary drivers of our safe and pleasant water programs are to:

- Deliver high quality, safe and pleasant water to our customers in accordance with the requirements specified under the relevant legislation.
- Maintain our levels of customer complaints for water quality and minimise widespread complaints.
- Meet all our regulatory obligations.

For drinking water, Melbourne Water is responsible for catchment management, primary treatment and supplying water to the metropolitan retailers (including Yarra Valley Water) in accordance with the Bulk Water Supply Agreement (1999). Whilst we work closely with Melbourne Water to understand and mitigate any water quality risks, the upstream catchment and treatment assets are beyond our direct control.

We distribute drinking water to customers through a dedicated water supply distribution and reticulation network. This network includes storage tanks, distribution pipelines, pump stations, secondary chlorinators, reticulation pipework and sample taps.

²⁵⁷ January 2019\$ - equivalent to \$1.65 million in January 2023\$

As the water travels through the network, its quality can be compromised by severe weather events and asset failures, contamination entering our storage tanks or pipelines, growth of biofilms due to inadequate disinfectant levels in the water, works on the network stirring up natural sediment, inadequate backflow prevention or cross connections with other services.

To manage water quality, we implement a preventative risk management system and a multiple-barrier approach in line with Australian and World Health Organization (WHO) Guidelines and Victorian regulations.

We're working with Melbourne Water to review its risk framework to ensure water quality risk management is seamless from catchment to tap, as well as to review and update the Bulk Water Supply Agreement to improve the quality and continuity of drinking water supplied to us, as well as the resilience of the water supply network.

The type of activity we apply to our own assets is based on a risk profile and includes proactive condition inspections and risk assessment. Well targeted capital infrastructure projects such as storage tank refurbishments or renewals and secondary disinfection facility installations are also necessary. Our activities also include ongoing programs such as mains cleaning to reduce sediment levels (for improved water aesthetic value and disinfection effectiveness) and water quality monitoring to verify the quality of the water we supply.

During the 2018-23 price period we increased our capital expenditure to enhance our tank programs and install several new secondary chlorinators to ensure continued compliance with more stringent requirements introduced in the Safe Drinking Water Regulations in 2015.

Table 94, commencing on 262 outlines the actions we'll take and investments we propose over the 2023-28 period to ensure we continue to meet our obligations and customers' expectations.

Safe and pleasant drinking water

We have a range of ongoing programs to meet our customers' expectations and regulatory obligations for safe and pleasant drinking water.

These programs include:

- Water tank and sampling tap inspection and rectification programs to ensure asset integrity.
- Recycled water cross connection prevention program.
- Water zone improvement works program and customer case management to minimise customer complaints.
- Particle dispersion devices installation program to prevent sediment accumulation in water pipes.
- Targeted mains cleaning and flushing program to minimise objectionable colour, taste, and odour issues for customers.
- Backflow compliance program to manage backflow risks.
- Secondary chlorinator operation and maintenance program to maintain our disinfection barriers.
- Water quality sampling program to monitor our network's performance and incident response.
- Water quality awareness and competency training programs.
- Continuous improvement and research and development program and projects.

We propose \$49.3 million capital expenditure together with an annual increase in operating expenditure of \$3.73 million over the 2023-28 period to:

- Continue our ongoing safe and pleasant water programs to meet our customers' expectations and regulatory obligations. Some programs will be scaled up to accommodate population growth and minimise the impacts to water quality from severe weather events due to climate change.
- Continue to improve chlorine residual levels in our drinking water network by installing additional chlorinators and expanding our mains cleaning program in targeted areas to improve the effectiveness of the chlorination process.
- Install online water sensors in our network to improve our understanding of the network's water quality performance in real time to inform rapid risk assessments and decision making during incidents.
- Research the microbial risk in the metropolitan distribution network in biofilms and other sources, including emerging threats from climate change. This research will be used to review and update our distribution system monitoring program.

Water reliability

We operate an extensive network of water supply assets, including pipes, tanks, and various other civil, mechanical and electrical assets to sustain levels of service.

These assets supply water directly to customers or ensure effective operation and management the network. When these assets fail, there is a potential water quality risk.

We propose a total investment of \$408 million for the 2023-28 period to ensure the reliability of our water network assets.

Our reliability programs aim to provide a continuous and reliable supply of safe and pleasant drinking water to customers by planning for and mitigating unacceptable asset failures and hydraulic deficiencies. Programs include:

- Updates to our hydraulic models to support network upgrade projects and understand our water quality performance, particularly during water quality incidents. This will also include improvements to enable better tracking of water through our network.
- Water reticulation and distribution mains renewal programs to maintain customer service for both reliability and drinking water aesthetics (as failures can lead to dirty water complaints due to the natural sediment in the unfiltered water supplied to us by Melbourne Water).
- Upgrade the capacity and redundancy of our network.
- Renewing and replacing water pump stations, valves, hydrants, flowmeters and electrical equipment when near or at the end of their asset life or due to poor condition.
- Renewing our cathodic protection systems to reduce corrosion and extend the asset life of our water storage tanks and critical distribution mains.

Service and asset resilience

There is greater focus and emphasis to ensure assets are more resilient to future shifts in weather patterns and severe weather events. This therefore ensures we protect public health and maintain the safety of the water supply.

We propose a total investment of \$25.4 million for the 2023-28 period to improve the resilience of our services and assets to:

- Increase the reliability of our power supplies to mitigate the risk of prolonged power outages. We'll install more generators, provide thermal protection of switchboards, install more powerful back-up batteries at our sites and include additional battery storage in high-risk areas.
- Upgrade the resilience of our communications network and control systems. This includes upgrading all sites to 4G and increasing our ability for intelligent monitoring and remote configuration.
- Upgrade our existing chlorinators to the latest SCADA standards and technology and to integrate remote control functionality.
- Build additional resilience into our secondary communications by implementing a reliable radio network as our back-up.
- Increase the cybersecurity protection across our IT and OT networks.

Program and approach

The actions we'll take and the costs we propose

Emergency response capacity and capability

With incidents increasingly occurring over recent years due to impacts of climate change, we're committed to enhancing our capacity and capability for preparing for, responding to, and recovering from incidents and emergencies – both acute and chronic in nature.

We propose an additional investment of \$5.3 million for the 2023-28 period to:

- Increase our emergency management governance by developing and implementing a principles-based framework to support staff and our community to better prepare, respond to, and recover from emergencies.
- Further build our incident and emergency management capability and surge capacity across the organisation and the metropolitan water sector by delivering high quality incident and emergency management training and exercises.
- Build and foster effective relationships and partnerships with other water corporations, emergency management service agencies, government and not for profit organisations to improve community resilience.
- Address increased regulatory obligations and expectations based on our recent experience responding to large-scale climate related incidents and emergencies.

Table 94: Actions and investments in 2023-28 to meet safe drinking water obligations and guidance (\$ million January 2023)