



URBAN WATER STRATEGY

2022



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ABORIGINAL ACKNOWLEDGEMENT

We respectfully acknowledge Aboriginal and Torres Strait Islander peoples as the Traditional Owners and custodians of the land and water on which all Australians rely.

We pay our respects to Dja Dja Wurrung, Taungurung, Yorta Yorta, Barapa Barapa, their Elders past, present and future, as Traditional Owners and the custodians of the land and water on which we rely and operate.

We acknowledge and respect the continued cultural, social and spiritual connections of all Aboriginal Victorians. We also acknowledge the broader Aboriginal and Torres Strait Islander community and their connections with lands and waters, and recognise and value their inherent responsibility to care for and protect them for thousands of generations.

We acknowledge Aboriginal Victorians as Traditional Owners and, in the spirit of reconciliation, we remain committed to working in partnership with Traditional Owners to ensure meaningful, ongoing contributions to the future of land and water management. We commit to empower Aboriginal peoples, wherever our actions impact their lives, by firstly coming to them. We will not form a view until we have heard their view. We will ensure that the aspirations of Aboriginal peoples are embedded in our business. We recognise we have much work to do to make this a reality.



(L-R) Damian Wells, Managing Director, Coliban Water and Rodney Carter, Chief Executive Officer, Dja Dja Wurrung Clans Aboriginal Corporation, Dja Dja Wurrung Enterprises Pty Ltd.



On behalf of Coliban Water, thank you for an taking interest in our Urban Water Strategy.

The Strategy serves to support the liveability of our region for decades ahead across the 49 towns we serve in central and northern Victoria.

I acknowledge the Traditional Owners of the land and water of our region. We continually seek to take action to advance Aboriginal self-determination. We have taken many positive steps in partnership with Traditional Owners in our region however we recognise that there is a lot more that must be delivered including actions stated in this Strategy.

This Urban Water Strategy considers a 50-year outlook on what we need to plan for to ensure the long-term future of water in our region is secure. Our Urban Water Strategy is updated every 5 years to ensure we respond to the changes in communities during that time.

Population growth and climate change are the key water service challenges to meet so that we can support the fantastic liveability of our region. We will take further action now to build on what we have today. There will be increased demand for water and wastewater services in a hotter and drier climate that will continue to experience declines in water availability and water quality.

Our core business is providing safe drinking water and sanitation services to protect public health and the environment. We need to build and maintain high quality assets to underpin our services. Many of our assets are aging and are undersized to meet current demand and standards. We will significantly increase our capital program in order to renew and augment our network of assets so that we may deliver the water service needs of the communities we serve. All of the action we will take will be evidence based.

In developing this Strategy, we went to significant lengths to embed the views and voices of our customers and communities. There will always be risks to be managed and trade-offs to consider as we build the resilience of our assets and services. As we implement this Strategy, we are committed to ongoing engagement with our stakeholders and customers to ensure we meet their evolving needs and expectations.

The coming decades will be challenging and invigorating and we look forward to delivering 'the goods' so that our communities have Water to Live, Grow and Enjoy – now and into the future.

Damian Wells
Managing Director

GLOSSARY

Augmentation: increase in size and/or number, for example of assets in a water supply system.

Aquaculture: the farming of aquatic organisms including fish, molluscs, crustaceans and aquatic plants.

Aquifer: an underground layer of rock or sediments which holds groundwater or allows water to flow through it.

Managed aquifer recharge: injection of water into the aquifer to store for later use.

Biosolids: organic solids derived from sewage treatment processes that can be managed to sustainably utilise their nutrient, soil conditioning, energy, or other value.

Class A, B & C recycled water: the class of recycled water relates to the end quality of the water and the treatment processes it goes through. Class A is the best quality of the three and can be used for residential dual pipe garden watering. Class B and C have more restrictions around what they can be used for.

Environmental flow: the streamflow required to aid environmental values in a waterway.

Environmental watering: the provision of water to support environmental values and ecological processes.

Gigalitre (GL): one thousand megalitres / one billion litres.

Hydraulic capacity: the maximum possible flow through a treatment plant or pipeline.

Inflows: water flowing into a storage.

Levels of Service: water security objectives based on community expectations about the appropriate use of water.

Megalitre (ML): one million litres.

Potable: water of suitable quality for drinking.

Regulated system: systems where the flow of the river is regulated through the operation of large dams or weirs.

Unregulated system: a river system that does not contain any dams or major diversion weirs which control the flow of water in the river.

Water cycle: the cycle of processes by which water circulates between the earth's oceans, atmosphere, and land, involving precipitation as rain and snow, drainage in streams and aquifers, and return to the atmosphere by evaporation and transpiration.

Water entitlement: the volume of water authorised to be taken and used (or stored) by an individual, water corporation or other authority. Water entitlements include bulk entitlements, environmental entitlements, water shares, surface water and groundwater licences.

Water market: market in which the trade of entitlements and allocations is allowed under certain conditions.

Water shares: a legally recognised, secure share of the water available to be taken from a water system that can be traded permanently or leased.

Water reclamation plant: A facility that produces recycled water from sewage.

Water treatment plant: A facility that produces potable water from untreated water.

System Yield: the average volume of water that can be supplied by a water supply system subject to operating rules and typical demands that satisfies the levels of service objectives.

ACRONYMS

DELWP: Department of Environment, Land, Water and Planning

EPA: Environment Protection Authority

GL: Gigalitres

IAP2: International Association for Public Participation

ML: Megalitres

North Central CMA: North Central Catchment Management Authority

RAP: Reconciliation Action Plan

UWS: Urban Water Strategy

VEWH: Victorian Environmental Water Holder

WTP: Water Treatment Plant

WRP: Water Reclamation Plan

TIMEFRAMES

In this strategy, we have listed initiatives and attached timeframes for further investigation and/or implementation. For the purpose of this strategy, we have defined short, medium and long-term as:

Short-term	Medium-term	Long-term
0 – 5 years	5 – 20 years	20 – 50 years



THE URBAN WATER STRATEGY

This Urban Water Strategy (UWS) outlines a 50-year plan to identify the best mix of actions to provide water and sewerage services in our towns and cities now and into the future.

It aims to support the development of resilient and liveable communities and balance social, environmental and economic costs and benefits for proposed actions. It is important to consider all elements of the water cycle in this process from where our raw water comes from, through to how it is treated and supplied to customers and then how we receive, treat and reuse wastewater from our various water reclamation plants throughout our region.

This Strategy aims to ensure a secure water future for each of the systems in our region as well as to provide more information to customers around how our water systems operate and some of the challenges we are likely to face over the next 50 years. This is done while considering a range of factors such as population growth, changes in climate and expected usage demands of our customers and communities.

We have sought input from the community and our key partners to understand the values each of us place on water in our region. These values and ideas have been incorporated into this UWS and help to shape our proposed actions and recommendations.

This Strategy is adaptive in nature, with a revision undertaken every 5 years to provide our customers and communities an opportunity for renewed feedback on what we have planned. It also allows us to consider any additional information that we received from our key partners, including changes in legislation, updated council growth plans and updates on predicted future climate conditions. Each year we also release our Annual Water Outlook that provides information on our water security position as well as how we are tracking against priority actions highlighted within this Strategy.

URBAN WATER CYCLE



OUR VISION



Our region is critically impacted by our changing climate, and we must continually adapt to the anticipated consequences of predicted shifts in our climate. Our *Strategy 2030* identifies four strategic directions that address our future challenges and opportunities in achieving our vision of: Water to Live, Grow and Enjoy.

WATER SECURITY AND ZERO CARBON

Water is our greatest asset and an essential resource for the communities that we service.

Our *Strategy 2030* focuses on securing our region's water supply in a constrained environment through innovation, education and carbon reduction.

HEALTHY PEOPLE AND ENVIRONMENT

Communities in our region expect to have access to clean and safe drinking water and wastewater services.

Our *Strategy 2030* focuses on providing clean, affordable water for human and environmental needs, including for Aboriginal cultural values.

GREEN AND ACTIVE COMMUNITIES

Water underpins liveability.

Our *Strategy 2030* focuses on Working with community and partner agencies to sustain attractive green spaces and recreational water access for our communities.

PROSPEROUS ECONOMIES

Water underpins economic prosperity.

Our *Strategy 2030* focuses on partnering with industry and government to plan and build water services that supports business, industry and employment.



OUR REGION

The area we service is over 16,500 square kilometres of Aboriginal land, which is the lands of Dja Dja Wurrung, Taungurung, Yorta Yorta and Barapa Barapa peoples.

The service area covers 49 towns in supply systems defined by the water source, extending from Cohuna and Echuca in the north to Kyneton and Trentham in the south, and from Boort, Wedderburn, Bealiba and Dunolly in the west to Heathcote and Tooborac in the east.

Our water supply systems, defined by their water source, are:

- Campaspe
- Coliban Northern
- Coliban Southern
- Elmore
- Goulburn
- Loddon Wimmera
- Murray
- Trentham

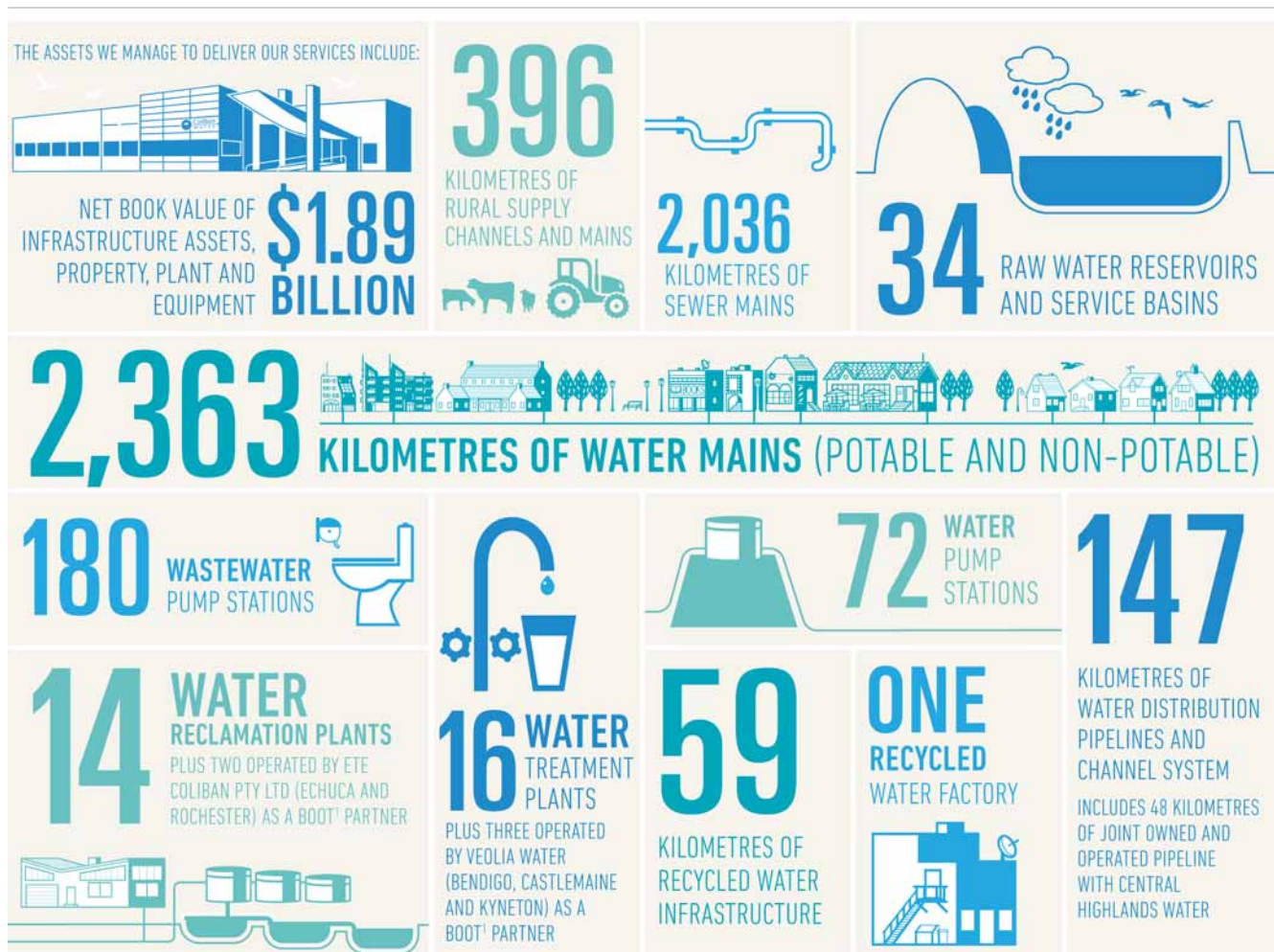
The local government areas serviced within our region include:

- City of Greater Bendigo
- Macedon Ranges Shire Council
- Hepburn Shire Council
- Loddon Shire Council
- Mitchell Shire Council
- Campaspe Shire Council
- Gannawarra Shire Council
- Central Goldfields Shire Council
- Mount Alexander Shire Council

We work collaboratively with Local Aboriginal Land Councils and Traditional Owners who hold registered Indigenous Land Use Agreements under the Native Title Act in our area of operations, including primarily:

- The Dja Dja Wurrung Clans Aboriginal Corporation (Djaara)
- Taungurung Land & Waters Council
- Yorta Yorta Nation Aboriginal Corporation

OUR ASSETS



We hold bulk entitlements in the Campaspe, Coliban, Goulburn, Loddon, Murray and Wimmera surface water systems and groundwater extraction licences in Elmore and Trentham (Groundwater supply systems). We also hold high and low reliability water shares in the Goulburn and Campaspe systems.

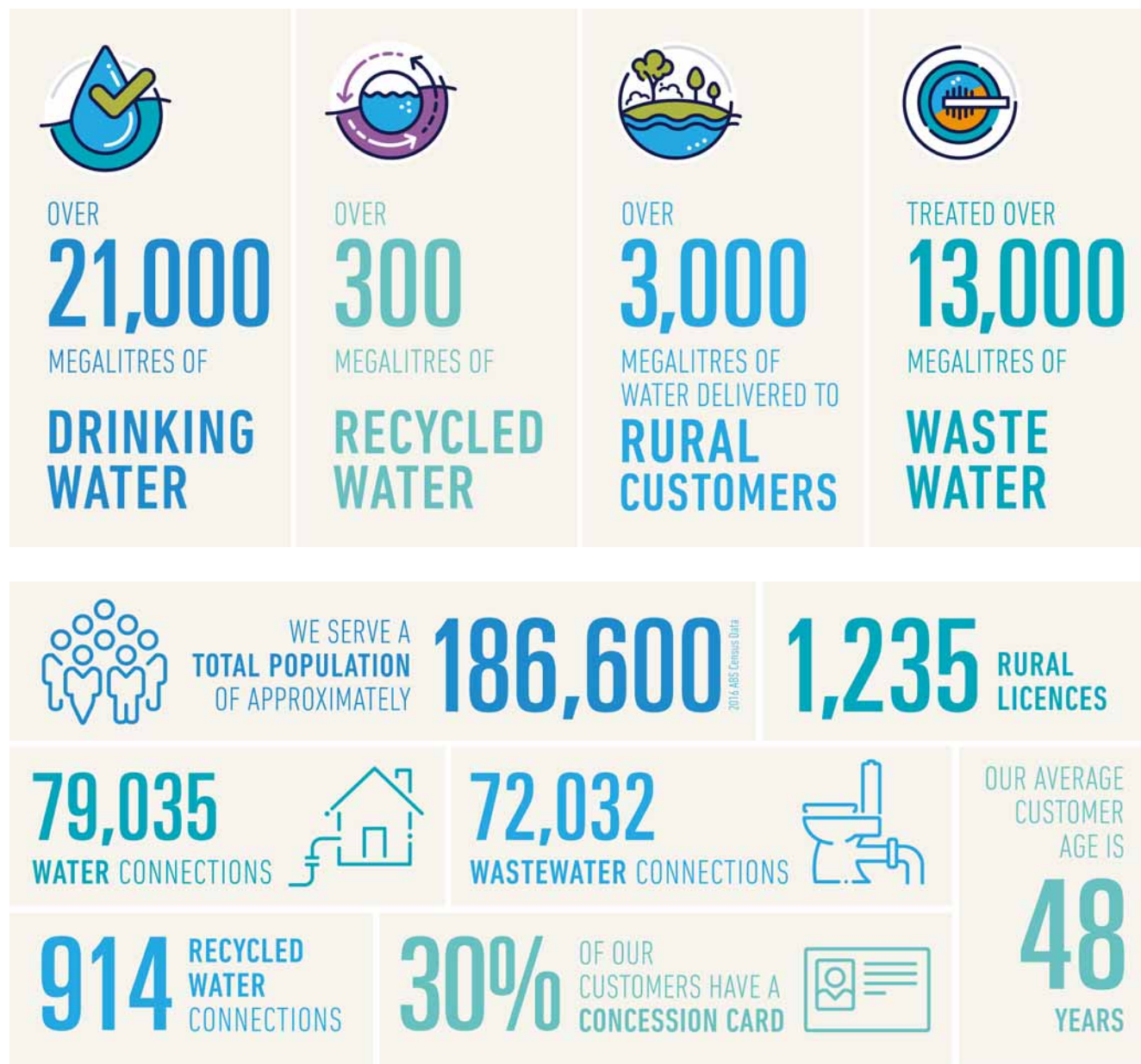
REGIONAL DIAGRAM



OUR CUSTOMERS

We deliver drinking water, sewerage, trade waste and recycled water services to over 180,000 residents and close to 7,000 businesses, and raw water to around 1,300 farming, agricultural and rural customers.

Each year we provide the following services to our customers:

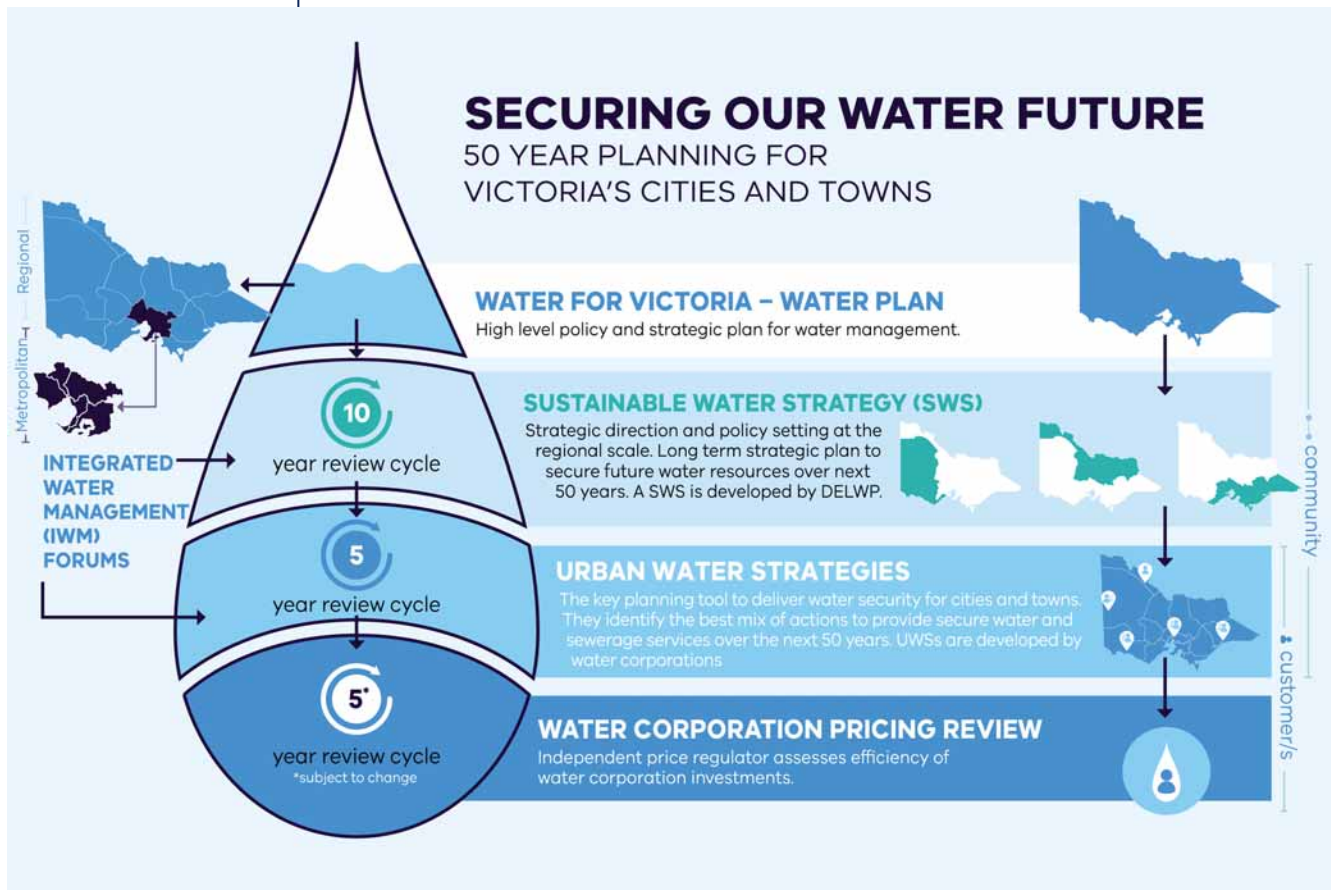


STRATEGIC CONTEXT

This UWS aims to deliver a plan to meet customer and community urban water needs for the next 50 years. We prepare this with actions and recommendations aimed at water supply systems or individual towns and cities.

Sitting alongside the UWS is the *Northern Region Sustainable Water Strategy* (NRSWS). This is a strategy prepared by the Department of Environment, Land, Water and Planning (DELWP) which focuses on whole of community water needs including Traditional Owners, urban, agriculture, environment and recreation. Issues are considered at a regional scale. Essentially, the NRSWS sets the broad direction and policy setting for the region, while the UWS includes more specific programs of action. The two strategies work together to secure water for our community's future needs. Planning for the next iteration of the NRSWS is due to commence soon.

Following on from the UWS, we are also currently developing our *Pricing Submission 2023* which identifies the key strategies, projects and operational requirements that will be delivered in the period 2023–2028. The development of this UWS aims to inform some of the projects which will be seen, with actions noted as required in the short term (0–5 years) flowing through to the Pricing Submission.



URBAN WATER STRATEGY 2017 AND KEY INITIATIVES

Our UWS 2017 highlighted the challenges of population growth and climate change in our region with respect to providing water services.

The UWS has evolved from the Water Supply and Demand Strategies of the past. The Strategy is to be renewed every five years, with 2017 being the first iteration of the UWS in its current form. Changes included the consideration of the best use for water by incorporating our sewer services and recycled water into the vision for the future.

These changes were sparked by the release of Water for Victoria 2016 and an increase in the weight given to fit for purpose water, and the liveability of our urban centres.

Key initiatives delivered through UWS 2017 include:

- An urban supply bore was installed to increase Trentham's water by 55 megalitres per year.
- Connection to the South West Loddon Pipeline at Bridgewater, with future connection at Laanecoorie enabling greater reliability for the combined Loddon and Wimmera Systems.
- Purchase of almost 700 megalitres of low reliability water shares to improve security of supply in the Murray System.
- Reduced the trigger reserve in the Coliban Northern System from 24 months to 12 months of supply to align with other systems that have access to the water market
- Demand management strategies were implemented through reducing water leaks in customer homes by offering low-income households free water audits and free plumbing to repair damaged pipes and fittings.
- Roll out of a Digital Metering Program that will allow the identification of undetected leaks in our networks and customers' properties.
- Secured funding through the National Water Grid Authority to commence preparation of a business case for rural modernisation.
- Developed a business case for the Lake Eppalock Hydroelectric project that aims to release more water from Malmsbury Reservoir for environmental and cultural benefits to the Coliban River, and off-set the power costs of transferring the water from Lake Eppalock to Bendigo by installing a hydroelectric plant at Lake Eppalock.



OUR KEY CHALLENGES

CLIMATE CHANGE

WHERE WE ARE NOW

We can expect to live in a climate that is warmer, with different patterns of rainfall, less available moisture retained in the soil and more severe storms. However, we need to deliver a level of service that considers the resilience of assets, people and systems.

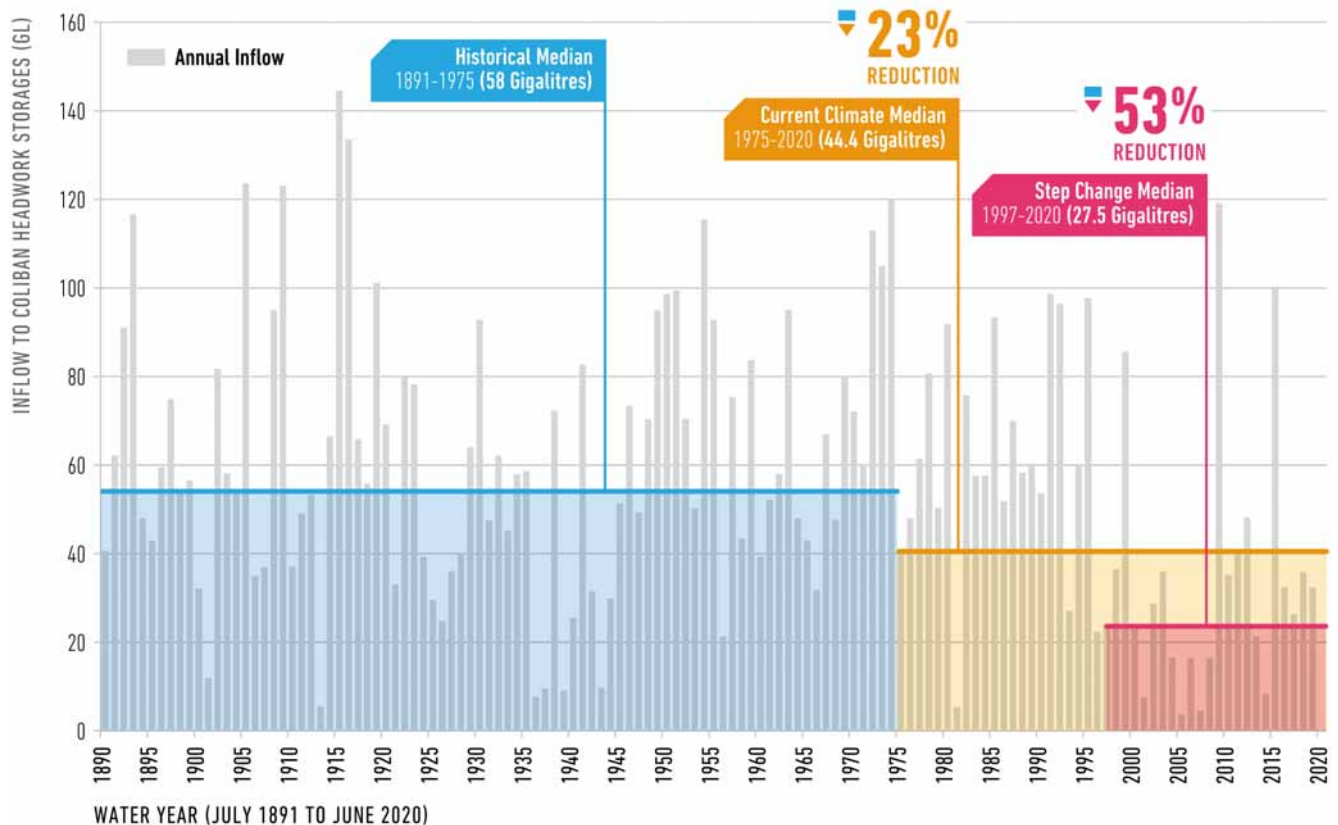
The graph below highlights the issue in terms of available water supply. We cannot simply rely on the assumption that the prevailing climate will be more or less the same as it was in the past.

The Victorian Government has set clear expectations that water corporations need to respond to climate change through both net-zero emissions targets and adaptation actions through the

development of the Victorian Climate Change Strategy (2021), Water Sector Climate Adaptation Plan (2022) and Statement of Obligations (Emissions Reduction),

The water sector is well placed to respond to reducing greenhouse gas emissions through the lens of the Carbon-Water-Energy Nexus. Through advocacy and regional partnerships, we can support residential and commercial customers to reduce carbon emissions and water usage leading to more effective climate responses.

COLIBAN STORAGES ANNUAL INFLOW



WHAT WE ARE DOING

This Strategy is underpinned by our Climate Change Strategy, as well as Victorian Government policy. We have undertaken detailed scenario modelling of water availability to inform the Strategy.

The Climate Change Strategy is implemented through the Climate Change Action Plan that identifies actions to address climate risks and mitigation opportunities. This plan helps us to prioritise which risks need to be addressed to ensure we can continue to deliver high-quality services to customers.

In addition, we continually monitor the quality of water drawn from reservoirs, waterways and groundwater, which can be affected by climate events such as blue-green algae outbreaks and bushfires.

We are responding through catchment protection measures, active operational management and upgrades to our treatment systems.

ACTION

1. We will implement our Climate Change Action Plan and review the Plan annually.

A GROWING POPULATION

WHERE WE ARE NOW

Water underpins social health and wellbeing and has a strong impact on the types and success of industries that can operate in the region. Population growth impacts on water demand and supply.

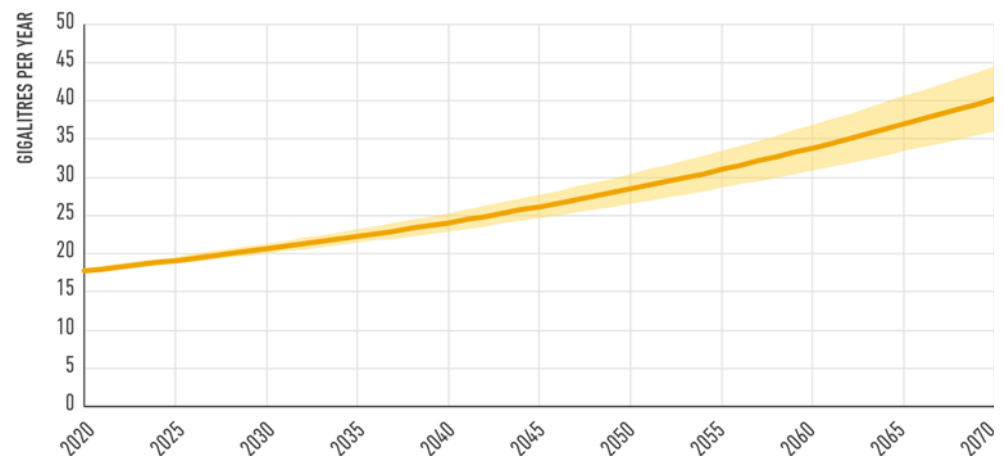
Many urban populations are growing quickly – for example the City of Greater Bendigo is forecast to grow by over 30% by 2036. There is similar growth in our other larger towns. Smaller communities require quality water and sewerage services. The challenge for us is to ensure all communities and industries are supported by sustainable water services.

There is also growth in our water supply catchment in areas that are not serviced by Coliban Water. In many cases these landowners seek to install private dams. While these dams can provide a range of benefits to individual landowners, an unintended consequence is the interception of flows that would otherwise have carried through to downstream waterways – thus reducing inflows to our storages and leaving less water for the environment. This issue is expected to be investigated further as part of the Sustainable Water Strategy process.

WHAT WE ARE DOING

We do scenario modelling that considers the potential range of population growth that will influence future demand. We also undertake regular reviews of population growth and work closely with Councils to understand how we can continue to service the growing region. This helps to give a better understanding of the complex factors contributing to future demand and aids our planning.

The graph below shows forecast demand for our largest system Coliban Northern out to 2070. In this time, demand from residents and businesses is expected to more than double from current levels.



WHAT WE HEARD

Large business/industrial customers can use large volumes of water in their business processes. Another drought causing restricted access to water would be harmful to many businesses. Some are planning to become less reliant on our services but continue to need a secure water supply.

To help address this challenge, we are pursuing innovative ways to maintain our water security position. This includes:

- Managed aquifer recharge, where excess water is stored within the aquifer for later use.
- Optimise management of available resources e.g. reduced trigger reserve in the Coliban Northern System from 24 months to 12 months' supply.
- Wastewater recycling.
- Purchasing of additional water shares.
- Water auditing and efficiency programs.
- Reducing channel leakage.

Small to medium business customers said water is essential to many of them and they expect to have a reliable water supply. Most businesses are happy with the quality of their water supply, with only a few indicating improvements in quality and pressure are required.

This significant level of growth also has impacts to our water and sewer infrastructure. It is important to get our long-term planning right to ensure that our treatment plants and transfer mains are sized appropriately to handle expected growth in the region, but to also deliver any necessary upgrades in a staged manner in a way that provides the best value to customers.

To support this process, it is essential that we also look for opportunities, wherever possible, to improve water efficiency and reduce losses to ensure there is available supply for our growing customer base. One way we are doing this is through the Digital Metering Program, which commenced in 2018 and is expected to be completed next year. In this program water usage data is collected and analysed to identify high water usage and possible leaks. Significant savings both in terms of water volume and customer bills have already been identified since project inception. We are working towards providing customers with access to their own consumption data to track their usage in the future. Using data from across our region, we can better plan and prioritise capital works.

Coliban Water has a key role working with our partner organisations to help facilitate sustainable development in our region. An example of this is the advice we provide to councils and developers on how services may be provided to new developments. This involves considerations around ensuring that levels of service are maintained to existing customers and that we continue to protect the environmental value of our catchments. We also strive to support employment opportunities in the region. An example of this has been working closely with City of Greater Bendigo on working through options to supply the Bendigo Regional Employment Precinct.

ACTIONS

1. We will implement the Urban Water Strategy actions to ensure that water supply meets demand.
2. We will work with stakeholders through the Sustainable Water Strategy process to determine the impact of increased private dams in our water supply catchments on inflows to our storages.

WHAT WE HEARD

With significant growth expected in the region, Land Developers need to know that major infrastructure can accommodate future developments.

A lack of planning can hold up land developments and have a negative impact on their ability to service the growth of the region.



RECOGNISING AND SUPPORTING ABORIGINAL CULTURAL VALUES

WHERE WE ARE NOW AND WHAT ARE WE DOING

We have developed a Reconciliation Action Plan (RAP) to further our knowledge and understanding of Aboriginal and Torres Strait Islander peoples and to build relationships with local Aboriginal and Torres Strait Islander communities.

Our first RAP prepared in 2017 aimed to provide a foundation for ongoing reconciliation efforts. The RAP enables us to contribute to greater awareness and respect for the diversity of Aboriginal and Torres Strait Islander peoples, values, cultures and ideas. It is a guide for how we work towards achieving outcomes including a more culturally respectful workforce. We are currently working on developing our second RAP.

We partner with Djaara on a wide range of projects and programs including A Healthy Coliban Catchment, which focuses on the health of the Coliban River and its tributaries upstream of Malmsbury River in addition to capital investments, land management and maintenance of our rural channel system.

We hold monthly meetings with Djaara. We discuss strategic issues, ongoing projects and explore opportunities to maintain and build the strong partnership between our organisations.

WHAT HAVE WE HEARD

Engagement with Traditional Owners was a key priority for the development of the Urban Water Strategy. We held valuable discussions with Djaara and staff from the Taungurung Land and Waters Council. We considered Country Plans from our region and the Traditional Owner objectives and outcomes in the Northern and Murray Victoria Water Resource Plan.

This is what we heard:

- Traditional Owners want to be involved as a partner in water management, not just be part of the process for the development of strategies like the UWS. There needs to be a partnership model approach to enable this.
- Adequate and equitable water rights are important to meet social, cultural, spiritual, economic and environmental needs. Potential uses include water for aquaculture, tourism, fibre and bush tucker.
- Traditional Owners want us to help ensure all our waterways are healthy and pass clean water to neighbouring nations. We need to look at upper catchment health and the function and purpose of the landscape as opposed to separating the roles of water and land management.
- Coliban Water needs to consider Traditional Owner cultural values in decision making. For instance: when we hold and release water from dams and water reclamation plants to waterways, we should not only consider environmental values, but cultural values too.
- We were asked whether water savings found by Coliban Water through water efficiency projects, can be considered for cultural purposes. We were asked whether there was an opportunity to redefine water ownership at least for a small area and investigate options over the next few years.
- Coliban Water should educate customers and communities to appreciate water further, to understand what water is and what it represents to Country – as well as display mindfulness in usage and consumption.

- Coliban Water should seek to better understand Traditional Owner projects and initiatives and ensure, where possible, that we support specific initiatives such as aquaculture and environmental watering such as Tang Tang Swamp (located near Dingee) and the Boort wetlands
- We received feedback on several initiatives in the Strategy including ongoing support for the Lake Eppalock Hydro project, which considers an environmental water release from Malmsbury Reservoir to the Coliban River to enhance environmental and cultural values, while also utilising releases via a hydroelectric scheme at Lake Eppalock.

ACTIONS

1. We will recognise Traditional Owner values and include these values in water planning. We will continue to build our relationship with Djaara. We will arrange regular conversations with Taungurung Land and Waters Council. We will further seek to engage with Yorta Yorta Nation Aboriginal Corporation and Barapa Barapa.
2. We will explore avenues to embed Traditional Owner knowledge in our Governance processes including Coliban Water's Environment and Sustainability Committee.
3. We will work in partnership to address social, cultural, spiritual, economic and environmental needs through supporting Traditional Owner access to water.
4. We will explore measures to make water available for Traditional Owner purposes.
5. We will work with DELWP and Traditional Owners to investigate alternative water ownership models for an area of the catchment.
6. We will incorporate Aboriginal cultural values of water in water education programs.
7. We will have a second RAP endorsed by Reconciliation Australia and commence implementation (2-year lifespan) by July 2022.



LIVEABILITY AND RECREATION

WHERE WE ARE NOW

Water supports the wellbeing of rural and regional communities. It makes towns more liveable and provides places to relax, unwind and reconnect with nature.

Water is fundamental to creating greener, cooler and more attractive urban spaces. Water restrictions and periods of extreme heat place stress on many gardens and green assets in public spaces. We supply water to maintain the condition of home gardens, sports fields, parks, green spaces, water bodies and public trees. Because customers expect to be able to maintain green assets during dry period, we need to work with communities and land managers to ensure our urban landscapes are green and water sensitive.

WHAT WE ARE DOING

Coliban Water recognises the importance of water to community liveability and wellbeing.

There are clear benefits in working with the various stakeholders that have a role in delivering water cycle services. As our region grows and evolves, the integration of land and water planning is critical to ensure places are sustainable and liveable.

We are an active member of the Coliban Integrated Water Management Forum, which bring together a range of stakeholders such as neighbouring water authorities, councils, Traditional Owners and the North Central Catchment Management Authority (North Central CMA). These forums aim to investigate and pursue projects with shared benefits that can contribute to increased water efficiency and community liveability. As part of this process, Coliban Water will work with Councils to identify priority green spaces and key assets with recreational value to provide water security during dry periods. This information and actions will be incorporated into our Drought Response Plans.

We have also been a partner organisation in the development of the Water Sensitive Bendigo program through the Cooperative Research Centre for Water Sensitivity Cities. A key outcome of this program was the development of a vision and transition strategy for a Water Sensitive Bendigo which outlines the broad steps Bendigo needs to take to transition toward a water sensitive future. The principles developed within the Transition Strategy help to inform the UWS and other key planning decisions.

Some Coliban Water assets are used for recreational activities including picnicking, fishing, on water recreation, bird watching and education. Considering recreational values in water management will ensure that we can provide water services that improve the recreational value of public spaces. Working in partnership with other organisations will be crucial to ensuring communities have access to water for relaxation, play and adventure.

ACTIONS

1. We will work with partner organisations to secure water supply for priority green spaces and key assets with recreational value during dry periods through an integrated water management approach.
2. We will continue to strive to support recreational access to Coliban Water's assets whilst protecting the primary purpose of these facilities.

WHAT WE HEARD

Councils in our region look to prioritise sustainable water practices that secure the water supply. This also benefits the environment and assets they provide and maintain for the community.

Many customers experiencing vulnerability attempt to save water in the home to keep costs down. Having a garden is the only indulgence for some customers, so water restrictions could lead to a decrease in wellbeing.



SUPPORTING ENVIRONMENTAL HEALTH

WHERE WE ARE NOW

Water resource management must balance the needs of competing uses, including the needs of the environment. It is recognised that some waterways, such as the Coliban River, would benefit from additional environmental flows, particularly as the impacts of climate change are likely to reduce stream flows across the region in the future.

We are committed to the philosophy and practices of environmental stewardship and sustainability. This is outlined in our Environment and Sustainability Policy Statement. Key objectives of this statement are:

- build readiness and capacity to mitigate and manage climate change
- ensure the protection and improvement of waters and lands influenced by our operations
- respect and protect Traditional Owner values and cultural heritage
- comply with all environmental laws, regulations and licence conditions
- meet Victoria's 'General Environmental Duty'
- seek the highest possible standards of environmental performance
- be transparent and proactive in sharing information about our environmental performance.

WHAT WE ARE DOING

We harvest water in accordance with the conditions of bulk entitlement agreements, which provides flows for the environment. We also work with stakeholders to co-ordinate releases from storages to provide the greatest benefit to the environment with the resources available.

We work closely with partner organisations, such as the North Central CMA, the Victorian Environmental Water Holder (VEWH), councils and Traditional Owners to improve environmental health. One example of this is through the Healthy Coliban Catchment project. We also utilise these partnerships to explore further opportunities to operate our headworks systems so that environmental and Aboriginal cultural values are supported, such as through the Lake Eppalock hydro project.

Significant upgrades are occurring or are planned for several of our major water reclamation plants. This is to keep pace with the growing region while ensuring we are meeting our obligations to the environment.

As our climate dries, there is a growing need to ensure all water use is fit for purpose. This includes looking at opportunities to increase recycled water use where appropriate, such as for irrigation. To do this, we need to fully understand the environmental benefit associated with releases from our water reclamation plants, including how much recycled water is needed for maintaining and improving existing environmental health and how much can instead be used to substitute for other potable or raw water demands.

Long-term resource assessments and Sustainable Water Strategies planned by the Victorian Government in coming years will identify priorities for environmental water. We are committed to exploring further opportunities to help meet those needs.

ACTIONS

1. We will work with the North Central CMA, VEWL and Traditional Owners to explore further opportunities to operate our headworks systems so that environmental and Aboriginal cultural values are supported e.g. Lake Eppalock hydro project.
2. We will proactively monitor, operate and upgrade water reclamation plants to identify and address environmental risks.
3. We will explore the environmental benefit of releases from our water reclamation plants and how this informs the volume of water available for recycling.

OUR PROCESS

The 2022 UWS has been in development for more than 18 months. It has involved detailed water resource modelling, options analysis and significant engagement with customers and stakeholders on potential opportunities for our region.

As part of this development, we recognised the significant customer strategies requiring completion in 2022 (including this UWS and the development of our next Pricing Submission 2023-2028). We therefore began a comprehensive process to ensure we hear from the communities with serve on a range of topics, in addition to our usual engagement activities.

Insights captured from this have been used to inform our UWS development. An outline of our process is listed below.

PROJECT PHASE	DESCRIPTION	DATE
1 Investigation and discovery	Our Water Resource team conducted investigative works to inform the UWS. They consulted with stakeholders and reporting on the risks, limitations, and opportunities of our previous 2017 Urban Water Strategy. They made recommendations on what actions need to be taken to maintain the current level of service.	Oct 2020 – Jan 2021
2 Build water knowledge	Additional content was made available to the community through electronic and printed material. Information on raw water sources, water treatment, and wastewater. A communications package was developed for each water system to explain current situations, challenges, and opportunities.	Jan 2021 – Ongoing
3 Public participation	<p>Each township within the Coliban Water region was engaged to participate in the development of the UWS. Key stakeholders, including local government, government departments, authorities, and strategic partners, were engaged at the plan's critical stages. An emphasis was placed on Traditional Owner engagement to ensure Aboriginal cultural values and objectives are considered throughout the development and delivery of the UWS.</p> <p>Stakeholders shared their opinions and ideas on:</p> <ul style="list-style-type: none"> • Appropriate levels of service and willingness to pay • Possible initiatives to address any imbalance between supply and demand • Values and uses of water • Cost-benefit and trade-offs of adopting initiatives • Initiatives we should choose to implement, and when • Drought preparedness and response. <p>These investigations and stakeholder engagements have been collated and published as part of the Urban Water Strategy 2022.</p>	Nov 2020 – Jan 2022
4 Online engagement	Following the project's initial public participation phase, we published a summary of the UWS in November 2021. All stakeholders had an opportunity to provide comments to be considered in the final UWS document	Nov 2021 – Dec 2021
5 The UWS document	Final submissions of each water corporation's UWS are submitted to the Minister for Water. Once approved, a copy of the final document will be made available permanently on our website. We commit to closing the loop on what we heard from our engagement program for this UWS and, use the insights to drive ongoing conversations with our customers and stakeholders.	Jun 2021 – Ongoing

OUR COMMITMENT TO ENGAGEMENT

As a customer funded business our goal is to identify and create opportunities to involve our customers and the community in our decision-making process. We recognise that our communities are key stakeholders in our business and value the contributions they make. We want to use their feedback to help improve our services and provide the best value for money that we can.

We use the International Association for Public Participation (IAP2) framework when conducting community engagement activities and strive to be accountable and build lasting relationships with the customers and communities.

IAP2 Spectrum of Public Participation



IAP2's Spectrum of Public Participation was designed to assist with the selection of the level of participation that defines the public's role in any public participation process. The Spectrum is used internationally, and it is found in public participation plans around the world.

INCREASING IMPACT ON THE DECISION					
	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of the public.
PROMISE TO THE PUBLIC	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.

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In addition to targeted actions, we have an ongoing engagement program which covers:

CONNECT COLIBAN

Connect Coliban is our online engagement platform that launched in April 2021. This online platform allows us to interact with customers in an online setting. We will use it to create a space that is easy to access, provides information and seeks feedback and ideas, which can be used to help shape our planning and decision making.

COMMUNITY POP-UPS

This program offers a face-to-face, informal opportunity for our staff to chat with customers and community members. It allows us to learn more about our customers, understand issues at a local level and respond to enquiries.



CUSTOMER COMMITTEES

We work with customer committees and community groups to consider current issues or identify emerging ones and look for opportunities to work together. We also use them as a sounding board for what the community value and expect from us and to promote local projects and initiatives.

These groups and committees include:

- The Rural Customer Advisory Group meets quarterly with a focus on rural engagement for future prices and services, rural operations, water trading rules, equity between urban and rural customers and seasonal forecasts.
- We continue to work closely with local progress associations and community groups to identify and address local issues.
- The City of Greater Bendigo Farming Advisory Committee, which has a focus on the challenges and opportunities for rural communities in and around the greater Bendigo area.

COMMUNITY CONNECT

We connect with existing community groups who provide valuable feedback and insights into the customer experience. This approach allows us to adapt to the individual needs of the community, be open to ideas and suggested improvements, and work with the community to improve outcomes. COVID-19 has meant less opportunity for these groups to meet however we have made ourselves available to participate online.

ANNUAL CUSTOMER FORUM

We hold an Annual Customer Forum to get feedback on our performance as well as take the opportunity to get feedback from them on current issues.

FESTIVALS AND COMMUNITY EVENTS

We attend community and partner events which provide us with insights and information from our customers and the broader community. Any feedback we receive is documented into our internal database, Voice of the Customer. This ensures we always have customer feedback available to us when making business decisions.

PROJECT ENGAGEMENT

We develop communications and engagement plans for each of our capital projects. We identify opportunities for influence and feedback from our customers and stakeholders.

EDUCATION

Our Education Officer delivers interactive and informative programs about the natural and urban water cycle, water efficient behaviours and the benefits of tap water to a range of audiences. We have delivered in-person and online Water Heroes and Flushed! incursions to children in kindergartens across the region, encouraging water-saving behaviours, tap water as the preferred drink option, and only flushing the 3 Ps – Poo, Pee and (toilet) Paper. We have continued our partnership with Dental Health Victoria's Smiles 4 Miles program, providing water bottles and teaching resources.






REGIONAL ADVISORY GROUPS

We are also planning to establish four Regional Advisory Groups in 2022 that will have representation from across our entire region. The purpose of these groups will be to have an ongoing role that helps us deliver on our promises to customers and assist with future planning.

ENGAGEMENT FOR THIS URBAN WATER STRATEGY

In preparation for this UWS, and the consideration of other key customer strategies being developed, we initially looked at any gaps and opportunities in our engagement program. In considering the challenges we face and the initiatives looking to deliver, we needed to ensure insights from specific customer groups were captured and understood further.

As a result we carried out the following activities:

	Expressions of interest were sent to community and business stakeholders to find out what was important to them. We received 27 responses from customers across the region which initiated the conversation.
	We held 16 Community Pop-Ups which captured 256 surveys and allowed us to have 400+ conversations about water knowledge and feedback.
	We met with and interviewed key stakeholders such as local councils and two of the four Traditional Owners in our region.
	Feedback was sought from the community on proposed actions and recommendations through the Strategy in Brief document uploaded to Connect Coliban on our website. We had 1,095 views and 44 contributors.
	We shared the Strategy in Brief on Facebook over 44 posts which reached 8,233 people and resulted in 174 interactions.



STAGE	TIMING	DESCRIPTION
Engagement planning, execution and evaluation	Sep 2020 – Mar 2021	Traditional Owners were consulted on the overall engagement plan and invited to participate in key engagement activities. DELWP were consulted on the draft engagement plan and progressively informed.
Community engagement	Mar 2021 – May 2021	Communities were segmented into urban water supply systems. Each segment was informed of how the current system operates, current levels of reliability and drought preparedness. This stage focused on attention to water knowledge and inclusivity. Communities were consulted on their willingness to pay for reliability and triggers to water restrictions. We collaborated with communities to collect a long list of options to decrease demand and increase supply.
Shortlisting actions	Jun 2021 – Nov 2021	We worked to shortlist options from the long list incorporating feedback received from stakeholders and the community.
Prioritise actions	Jun 2021 – Nov 2021	We prioritised the shortlist for further investigation and/or implementation over the short-term (0–5 years), medium-term (5–20 years) and long term (20–50 years).
Draft consultation	Nov 2021 – Dec 2021	Feedback was sought from the community on proposed actions and recommendations through the Strategy in Brief document uploaded to Connect Coliban on our website. Targeted meetings were held with key partners for stakeholder feedback.
Close the loop	Sep 2020 – Ongoing	Stakeholders will be informed of each outcome as they are decided. An annual update of how we are tracking against recommendations and actions will also be provided in the Annual Water Outlook.

We asked customers “what is the most important issue for your town?”. The single most important issue for customers related to water security and supply, with just over 45% of 217 responses to this question.

When asked about water restrictions and the level of appropriate restrictions, over 90% of the 227 customers responding indicated there was a place for Stage 4 restrictions in the event of severe drought or low levels in our storages. This feedback has contributed to the chosen level of service for each of our systems and impacts the timing of our planning and proposed actions.

While water pressure is not in scope for the UWS, customers raised this as an important service we provide. We plan for the delivery of projects relating to water pressure through our network augmentation plans which look at how we can service customers in our water networks over the next 25 years. This feedback from customers will inform our Pricing Submission 2023.

WHAT WE ARE DOING

We will continue our engagement program to ensure we hear the voices of our customers and community. With this ongoing understanding, we can shape our engagement to maintain the conversation. This feedback helps inform our planning for projects relating to water security and resources.

Whilst the UWS is reviewed every 5 years, our engagement program allows us to check in about our performance, customer sentiment and concerns.



ACTIONS

1. We commit to close the loop on what we heard from our engagement program for this UWS.
2. We will continue our engagement program to capture ongoing insights and concerns from customers. We will use this feedback to always advocate for the customer.
3. With the listed initiatives in this strategy, we commit to communicating progress on these with our customers, communities and stakeholders.

ACTIONS ON KEY CHALLENGES

- 1 We will implement our Climate Change Action Plan and review the Plan annually.
- 2 We will implement the Urban Water Strategy actions to ensure that water supply meets demand.
- 3 We will work with stakeholders through the Sustainable Water Strategy process to determine the impact of increased private dams in our water supply catchments on inflows to our storages.



- 4 We will recognise Traditional Owner values and include these values in water planning. We will continue to build our relationship with Djaara. We will arrange regular conversations with Taungurung Land and Waters Council. We will further seek to engage with Yorta Yorta Nation Aboriginal Corporation and Barapa Barapa.
- 5 We will explore avenues to embed Traditional Owner knowledge in our Governance processes including Coliban Water's Environment and Sustainability Committee.
- 6 We will work in partnership to address social, cultural, spiritual, economic and environmental needs through supporting Traditional Owner access to water.
- 7 We will explore measures to make water available for Traditional Owner purposes.
- 8 We will work with DELWP and Traditional Owners to investigate alternative water ownership models for an area of the catchment.
- 9 We will incorporate Aboriginal cultural values of water in water education programs.
- 10 We will have a second RAP endorsed by Reconciliation Australia and commence implementation (2-year lifespan) by July 2022.

- 11 We will work with partner organisations to secure water supply for priority green spaces and key assets with recreational value during dry periods through an integrated water management approach.
- 12 We will continue to strive to support recreational access to Coliban Water's assets whilst protecting the primary purpose of these facilities.
- 13 We will work with the North Central CMA, VEWB and Traditional Owners to explore further opportunities to operate our headworks systems so that environmental and Aboriginal cultural values are supported e.g. Lake Eppalock hydro project.



- 14 We will proactively monitor, operate and upgrade water reclamation plants to identify and address environmental risks.
- 15 We will explore the environmental benefit of releases from our water reclamation plants and how this informs the volume of water available for recycling.
- 16 We commit to close the loop on what we heard from our engagement program for this UWS.
- 17 We will continue our engagement program to capture ongoing insights and concerns from customers. We will use this feedback to always advocate for the customer.
- 18 With the listed initiatives in this strategy, we commit to communicating progress on these with our customers, communities and stakeholders.

OUR ADAPTIVE PLAN

Planning for what our assets will look like in 50 years can be extremely challenging. We need to consider what our customers need now, where and how much growth is expected in different areas of our region as well as what changes we can expect to see from a changing climate. These are just some of the variables that come into play and each can have a big impact on what will be required in 2070.

Adaptive planning allows us to consider what is needed now and to be flexible with our longer-term planning with an awareness around what will be needed in 20, 30 and 50 years-time. By doing this we can better stage works to strike a balance between value for money and improved service. This means that our planning often involves works for which there are varying degrees of certainty. Through this document, proposed actions will be given a timeframe of short, medium or long-term. We are very comfortable with short-term works and delivery of these works is needed to maintain high quality services. These projects flow through to our Pricing Submission and are underpinned by detailed planning.

Moving toward the medium-term works, for these we expect that works will very likely be needed in the 5–20-year period, but further investigation is needed to refine the timing and sizing of potential assets. These represent our requirements based on all the available information we have now but may change as new information arises. An example of this would be potential projects may be needed earlier than expected if there is greater than expected growth in the region.

Longer-term works are more speculative. As they represent projects which are likely 20 years away, there is still a fairly high level of uncertainty around timing, sizing and they are even subject to potential technological advancements in the future. It is possible that these longer-term projects will look quite different in 20 years-time due to innovation or changing community requirements. For projects in this category, we are confident that something will be needed to meet the needs of a growing customer base, but exactly what these projects will look like is still subject to more investigation.

An adaptive planning approach means that we have what is called a path of ‘least regret’ which builds system resilience and means there are a range of actions which could be implemented at different timings so that we can respond to unexpected events or changing conditions. This type of planning approach means that we can be better prepared to manage operational emergencies, or the evolving needs of the community or environment and to do respond more quickly when these issues arise.

WHAT WE HEARD

Customers know that droughts happen from time to time and are prepared to make sacrifices. On the whole, they don't expect the region to be completely drought proof. They expect us to manage water carefully, even when there isn't a drought. Customers want water restrictions to be introduced gradually, rather than being infrequent and severe.



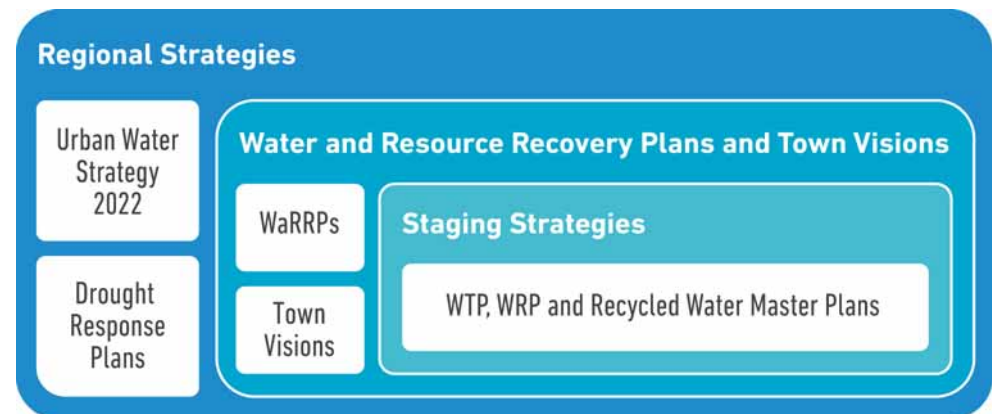
OUR LONG-TERM PLANNING

The UWS brings together a range of our planning processes and documents.

Over the last 3 years we have prepared Town Visions for our major urban centres which provide a long-term strategic approach to the development of urban water supply and wastewater infrastructure. The Town Visions provide guidance on the future direction of growth areas and major infrastructure requirements including treatment plants as well as water, sewer and recycled water networks. As they are intended to align with the UWS they consider a 50-year planning horizon. We have collaborated with council on these plans to understand key growth fronts so that the overall social, environmental and economic needs of the communities are addressed.



OUR LONG-TERM PLANNING DOCUMENTS AND PROCESS



Alongside these Town Visions we develop Master Plans for each of our water and sewer treatment plants. These look at a 25-year planning period and have much more of a detailed focus on capacity constraints and upgrade requirements for each plant. Each of these documents has been important in the development of the UWS and helped to inform priority actions and their proposed timing.

OUR FORECASTING

Our plans and actions are informed by comprehensive modelling of our systems. We consider a range of plausible future climate scenarios as identified by the Victorian Government through the *Guidelines for Assessing the Impact of Climate Change on Water Availability* (DELWP 2020). This data helps us to generate a series of yield curves which represent our best estimates of the supply for each of our systems over the next 50 years while satisfying the agreed levels of service.

In producing a demand projection, We consider recent usage trends, and then extrapolates this based on climate outlooks and growth projections in customer connections to generate the 'demand forecast'. A key input to future demand projections is the inclusion of growth estimates in the region, which are based on our long-term new connection data collected at a suburb level.

Once these future forecasts for yield and demand are developed, we can see where any shortfalls are likely to occur over the next 50 years and the scale of work which may be needed to ensure that we can continue to meet agreed levels of service.

These levels of service have been set to find a balance between the needs of the customer and the cost involved in implementing that level of service. As a result, customers have a critical role in helping to inform this decision.

Our UWS has been developed based on the following levels of service:

1. Agreed level of service – unrestricted demand, 95% of the time.
2. Minimum level of service – Coliban Water will always be able to meet Stage 4 urban demands and meet the equivalent rural allocation.

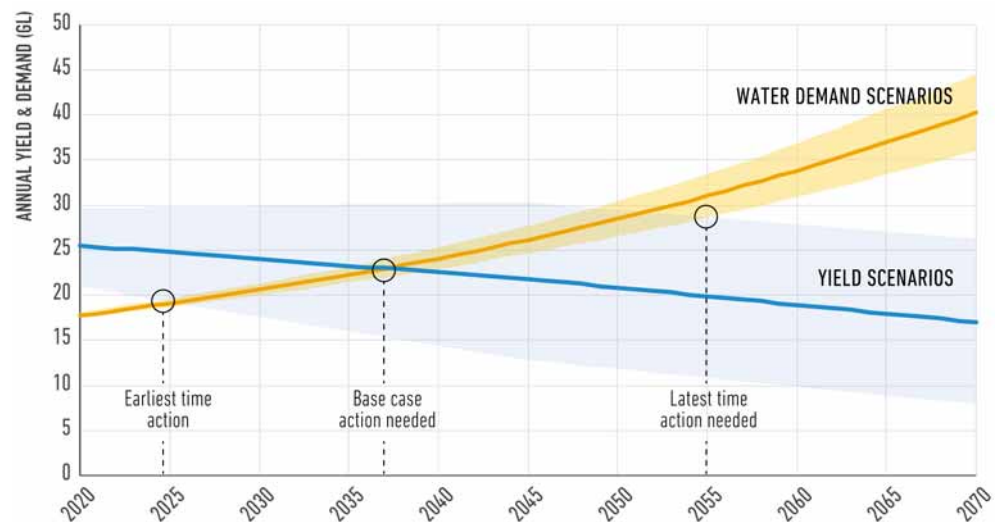


In a similar way, while a range of climate and growth scenarios have been considered a balance is needed between investment and service delivery. If we were to plan for a low growth and climate change scenario, we would face a high risk of not delivering our level of service to customers, while a high-growth and climate change scenario may have a large impact on pricing levels and customer bills to provide an additional level of security. For this reason, the medium growth and climate change scenario is considered the base case for each of our systems. This isn't to say that it is the only scenario we look at in our planning, but to effectively prioritise works across each of our systems, this is the target scenario for investment decision making.

An example of this is in the Coliban Northern and Southern Systems. Our base case for planning indicates that action is needed by 2037 to meet any imbalance between supply and demand. For this we would plan for works to be completed by 2037, but as the high growth and climate change scenario indicates this shortfall could occur earlier, our planning is currently underway on the suite of projects that could be implemented to help if we do need to deliver these projects earlier than expected.

To demonstrate how a supply demand balance is used to estimate how the levels of service are met, an annotated example is shown below. The centreline in the supply and demand graphs represent the medium climate change and growth scenarios, while the extremes represent the low and high climate change and growth scenarios respectively.

YIELD AND DEMAND CURVE WITH POTENTIAL ACTION TIMINGS



In developing potential options to address any imbalance between supply and demand, we start with a long list of potential options, which range from very simple to very complex. Through initial high-level estimates of potential costs, risks, environmental, social and technical benefits we reduce this very long list to a short list of viable options for further consideration. An options assessment process occurs and after completion we are left with a list of recommended actions and initiatives for each system which aim to address current or future supply issues. This list will then be regularly reviewed to ensure the proposed recommendations continue to be considered the most viable course of action.

TYPE OF OPTIONS CONSIDERED

Our technical analysis has enabled us to consider more than 70 ideas to help us find or save water. These can be broadly classified as either demand or supply initiatives. Demand initiatives are those which reduce potable water usage either now or into the future. Supply initiatives are those that provide an additional supply or yield to the system. An overview of the types of options which we have considered is shown below.

DEMAND MANAGEMENT

GROUP	SUBGROUP	DESCRIPTION
Water efficiency	Leak detection and renewals programs	Detection of leaks in the network allows for reduction in water losses and replacement of ageing infrastructure
	Digital metering	Data loggers on customer meters allows us to understand typical customer usage helping to identify potential leaks when they arise
	Water efficient fittings	Installation of water efficient fittings within new and existing homes to reduce water usage
Water knowledge		Increased awareness of need for water saving practices and the effectiveness of water efficient fittings e.g., Smart Water Advice; Target Your Water Use
Water restrictions		Use of water restrictions in times of drought to save water
Rainwater tanks		Installation of rainwater tanks on new developments to reduce potable water demand
Evaporation loss reduction		Use of covers on water bodies to reduce evaporation
Fit for purpose water use	Recycled water	Use of water sources other than potable water to reduce pressure on the drinking water system including recycled water, raw water and stormwater
	Raw water	
	Stormwater	

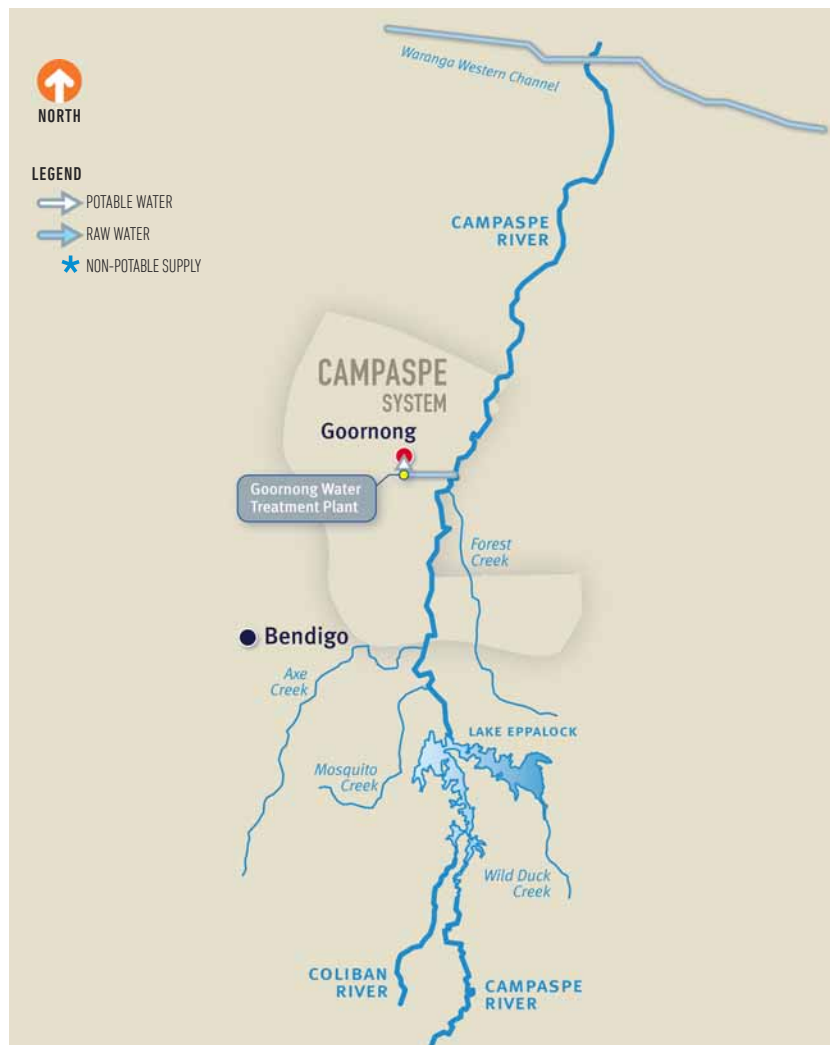
SUPPLY AUGMENTATION

GROUP	SUBGROUP	DESCRIPTION
Connection to another system	Pipeline to other system	Pipeline to another system e.g., pipeline from Bendigo to Castlemaine
	Pipeline to system outside Coliban Water region	Pipeline to system outside Coliban Water region e.g., connection to South West Loddon Pipeline
Water market		Purchase of water shares
Groundwater		Identifying a groundwater supply and obtaining a licence to take water for urban supply
Indirect potable reuse		Treatment of recycled water to a drinking water standard before reintroducing to the water system upstream of the water treatment plant. Using recycled water in our drinking water supply is not currently a permitted use under Victoria's Recycled Water Guidelines.
Additional source	Recycled water	Increased recycled water production for toilet/garden use in residential settings and other non-residential uses such as irrigation of public open space
	Stormwater	Production of treated stormwater for use in irrigation/public open space

OUR SYSTEMS

CAMPASPE SYSTEM

The Campaspe System supplies the town of Goornong. Raw water is supplied from the Campaspe River.



INVESTMENTS IN THIS SYSTEM

Since our last Urban Water Strategy in 2017 we have invested in the following projects:

- Commenced installing digital data loggers on existing water meters across the region.



Source water

Raw water for the township of Goornong is sourced from the Campaspe River, approximately 7 kilometres to the east. Water is pumped from the river to the Goornong service basin which can hold up to 6 megalitres.



Treated water

The Goornong Water Treatment Plant is located on the Goornong-Fosterville Road (near the intersection with Bagshot Street) in the west of the town. The plant can treat up to 80 kilolitres a day. The treated water is held in four clearwater storages with a total capacity of 220 kilolitres and pumped to the Goornong elevated tank and into the water network.



Water reclamation

There is no wastewater network for the township of Goornong. Townships without wastewater systems generally have septic tanks or other onsite wastewater systems to treat and dispose of or recycle domestic wastewater at unsewered sites. Local council is responsible for the developing and managing domestic wastewater programs and plans for onsite wastewater management.



Water reuse

There is no water reuse in the Campaspe System as there is no wastewater service.



WATER CONNECTIONS

192



WASTEWATER CONNECTIONS

NIL



POPULATION

650



RESIDENTIAL GROWTH

AROUND **1.02%** PER YEAR



WATER RESOURCE

Raw water for the township of Goornong is sourced from the Campaspe River.

The bulk entitlement (Campaspe – Coliban Water) Conversion Order 1999 allows us to take up to an annual volume of 349 ML from the Campaspe River, subject to Campaspe System water allocations, with a minimum allocation of 174.5 ML (50%).

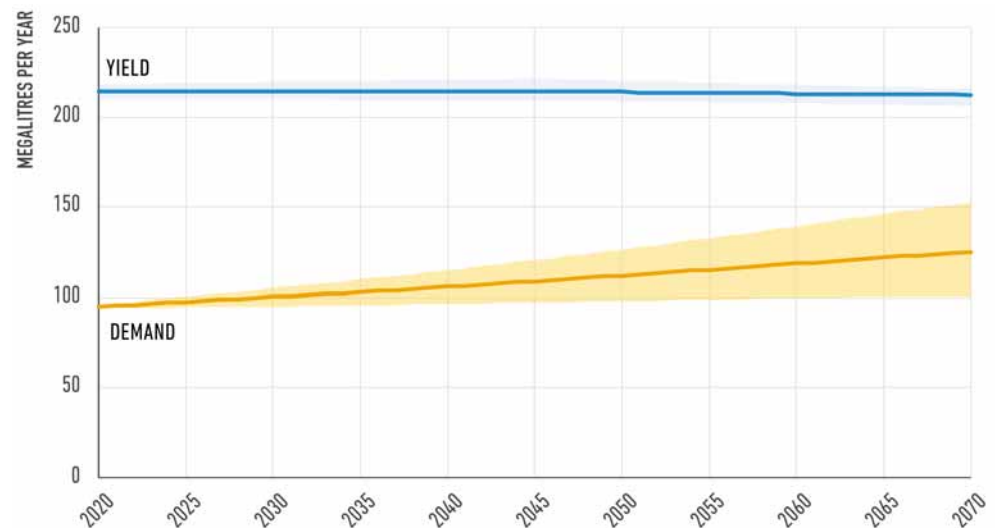
Total demand in the Campaspe System is currently 96 ML per year. This is predominantly residential demand and non-revenue water.

DEMAND OUTLOOK	TOTAL DEMAND (ML/YEAR)	RESIDENTIAL (ML/YEAR)	COMMERCIAL/ INDUSTRIAL (ML/YEAR)	COMMUNITY/ PUBLIC SPACE (ML/YEAR)	NON-REVENUE (ML/YEAR)
Current	96	35	8	4	49
2070	125	48	8	4	65

FUTURE OUTLOOK

Demand is not expected to exceed yield until after 2070, even under a high climate change scenario. This is shown in the graph below.

YIELD AND DEMAND CURVE FOR THE CAMPASPE SYSTEM



The supply and demand curve above does not mean that restrictions will not be required, rather the chances of water restrictions are low. Restrictions may still be implemented during periods of drought.

A summary of the system requirements under different climate change scenarios is shown in the table below.

	CLIMATE CHANGE SCENARIO		
	LOW	MEDIUM	HIGH
Year that demand equals yield	Later than 2070	Later than 2070	Later than 2070
Additional yield required in 2045 (ML)	0	0	0
Additional yield required in 2070 (ML)	0	0	0

Under both a medium and high climate change scenario, no additional water will be required by 2070.



OUR PLAN

The following projects relating to water resources are planned in the short or medium-term:

WATER RESOURCE ACTIONS	TIMEFRAME
<p>We will investigate groundwater as a source of water for Goornong Water Treatment Plant (WTP).</p> <p>The Campaspe System has one water source, the Campaspe River. While there is enough available water forecast in the network long-term, a second water source can help to reduce treatment costs and provide operational flexibility in the event of algal blooms.</p>	Short-term
<p>We will investigate demand initiatives such as water efficiency measures and leak detection in order to reduce the high amount of non-revenue water generated within the Campaspe System.</p> <p>Water losses occur due to leaks, bursts and as a by-product of the water treatment process. The higher the value of non-revenue water the less water is available to our customers. Existing projects such as digital metering and leak detection can have a real impact in reducing water losses and will help to contribute to improving water efficiency in the system.</p>	Short-term

WATER TREATMENT

Raw water is treated at the Goornong WTP and supplied to customers through the water supply network.

FUTURE OUTLOOK

Planned works will be delivered at the Goornong WTP in the short to medium-term to improve treated water quality and address a range of asset issues. These works are not capacity related. This project may also involve using water from a different source such as groundwater to improve operational flexibility.

WATER TREATMENT PLANT	WHEN CAPACITY AUGMENTATION IS EXPECTED TO BE REQUIRED
Goornong	Medium-term

OUR PLAN

The following project is planned in the short to medium-term relating to water treatment:

WATER TREATMENT ACTIONS	TIMEFRAME
<p>We will deliver planned renewals at the Goornong WTP.</p> <p>Key components within the Goornong WTP are approaching end of life and need replacement to ensure that the plant continues to treat water to a high-quality standard in line with drinking water regulations. New infrastructure will also allow for decreased operational costs and increased ability to deal with poor water quality events, such as algal blooms.</p>	Medium-term

COLIBAN NORTHERN SYSTEM

The Coliban Northern System supplies the towns of Bendigo, Axedale, Huntly, Raywood, Sebastian, Heathcote and Tooborac.



INVESTMENTS IN THIS SYSTEM

Since our last Urban Water Strategy in 2017 we have invested in the following projects:

- Renewed the Bendigo Water Treatment Plant (WTP) micro-filtration systems.
- Current upgrade to sludge drying beds at the Bendigo WTP.
- New wastewater pipeline from Bendigo WTP to connect to the Bendigo sewage system.
- Completed planning to improve water supply and pressure for Marong, Maiden Gully, Huntly and Strathfieldsaye.
- Renewed significant sections of the Bendigo sewer mains and introduced a sewer blockage reduction program.
- New large sewage pump station to be installed in Strathfieldsaye East.
- Re-commenced cropping of farmland at the Bendigo WTP, enabling reuse of recycled water and improve the quality of the site soils.
- Decommissioned Jackass Flat rural system to reduce water losses.
- Completed the Bendigo Town Vision and Water and Resource Recovery Plan (WARRP), which considers long term needs of the town.
- Completed Bendigo Groundwater Project on behalf of DELWP and commenced groundwater dewatering and treatment.



Source water

Raw water is supplied by the major Coliban Water storages including Upper Coliban, Malmsbury and Lauriston Reservoirs, Lake Eppalock or the Waranga Western Channel via the Goldfields Superpipe.



Treated water

The system is serviced by the Heathcote and Bendigo Water Treatment Plants. The treated water for Bendigo, Axedale, Huntly, Raywood and Sebastian is stored in the Sandhurst clearwater storage which has a capacity of 40 megalitres before it is piped to the reticulation system. The treated water for Heathcote and Tooborac is pumped from the clearwater storage to an elevated 1.6 megalitre storage tank and distributed to the townships.



Water reclamation

Wastewater in this region is treated at the Bendigo, Axedale and Heathcote Water Reclamation Plants. There is no wastewater network for the townships of Sebastian, Raywood or Tooborac. Townships without wastewater systems generally have septic tanks or other onsite wastewater systems to treat and dispose of or recycle domestic wastewater at unsewered sites.



Water reuse

The recycled water produced at our water reclamation plants is supplied to local irrigators. Bio-solids are reused for agricultural purposes. Bendigo has a Class A recycled water scheme that includes residential, industrial and public open space usage.



WATER CONNECTIONS

50,614



WASTEWATER CONNECTIONS

47,583



POPULATION

124,000



RESIDENTIAL GROWTH

AROUND 2.14% PER YEAR
WITH MOST OF THESE NEW CUSTOMERS
TO BE BASED IN BENDIGO AND
SURROUNDING SUBURBS



WATER RESOURCE

Raw water for the Coliban Northern System is supplied from our major storages including Upper Coliban, Lauriston and Malmsbury Reservoirs and Lake Eppalock or Waranga Western Channel via the Goldfields Superpipe.

Our bulk entitlement from the Campaspe River allows an average annual take of 50,260 ML over 3 consecutive years. This includes a share of flows from Lake Eppalock, which must not exceed an average annual take of 17,440 ML over any consecutive 3 years.

Our bulk entitlement from the Campaspe River accounts for the supply of all urban commitments and rural entitlement, as well as water losses within the distribution system and passing flows. In addition, we hold water shares in the regulated Campaspe and Goulburn systems as noted below.

SYSTEM	HIGH RELIABILITY WATER SHARES (ML/YR)	LOW RELIABILITY WATER SHARES (ML/YR)
Goulburn	22,790	2,861
Campaspe	2591	646

Recycled water is also supplied from the Bendigo WRP for use by irrigation and residential dual pipe customers.

Total demand in the Coliban Northern System is currently 14,104 ML per year, with the majority made up of residential demand. Note that this table does not include demands from our rural systems.

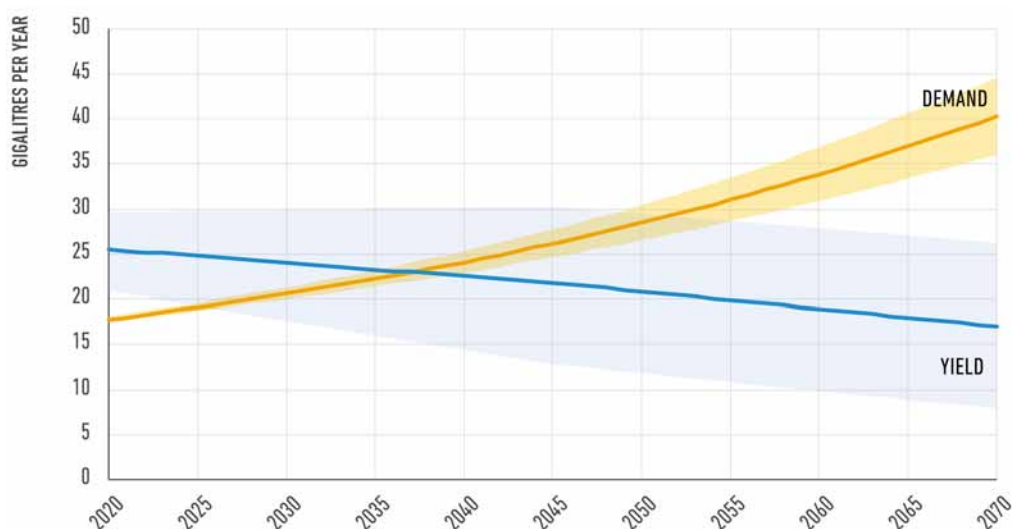
DEMAND OUTLOOK	TOTAL DEMAND (ML/YEAR)	RESIDENTIAL (ML/YEAR)	COMMERCIAL/ INDUSTRIAL (ML/YEAR)	COMMUNITY/ PUBLIC SPACE (ML/YEAR)	NON-REVENUE (ML/YEAR)
Current	14,104	9,296	2,249	1,224	1,335
2070	35,589	27,042	3,213	1,755	3,579

FUTURE OUTLOOK

Without further action, demand is expected to surpass yield in the Coliban Northern System by 2037 under medium climate change conditions. Action is needed in the short to medium-term to ensure that we can continue to meet agreed levels of service to our customers in the event of drought.

A summary of the outlook for the Coliban Northern System is shown below.

YIELD AND DEMAND CURVE FOR THE COLIBAN NORTHERN SYSTEM





The yield and demand curve does not mean that the system will run out of water in 2037, rather the chances of water restrictions becoming more frequent and severe will increase. The projected timing of when demand equals supply as well as the quantity of shortfalls is shown in the table below.

	CLIMATE CHANGE SCENARIO		
	LOW	MEDIUM	HIGH
Year that demand equals yield	2055	2037	2024
Additional yield required in 2045 (GL)	0	4.3	15
Additional yield required in 2070 (GL)	10	25	35

The Coliban Northern System is currently projected to need augmentation by 2037 to ensure there is sufficient yield to meet our agreed level of service with customers. Action may however be required as early as 2024 under high climate change conditions. Planning is underway on the suite of projects that could be implemented if we do need to deliver these projects earlier than expected.

Under a medium climate change scenario, 25 GL per year will be required by 2070. Under high climate change conditions an additional 35 GL of water per year is required.

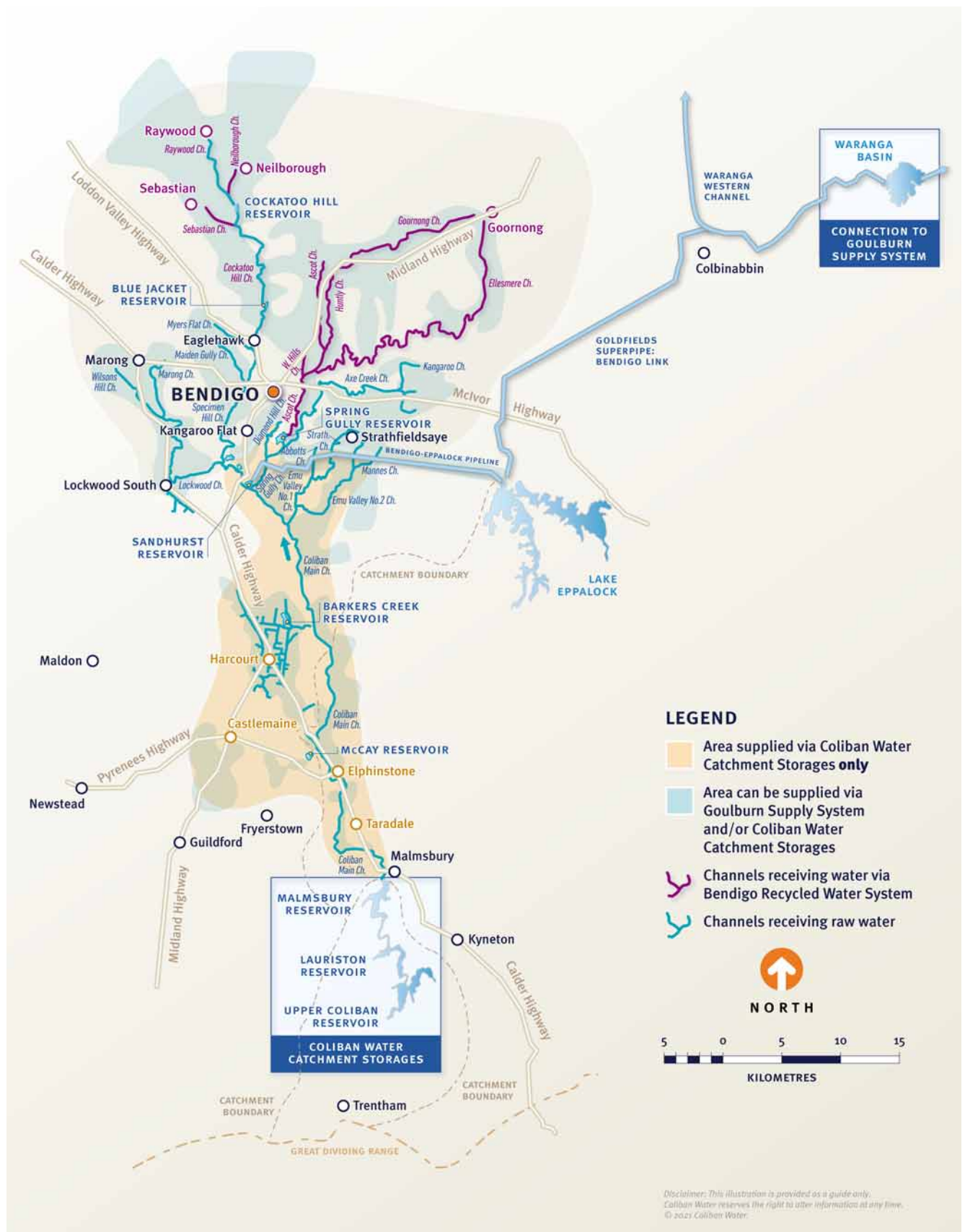
OUR PLAN

The following projects relating to water resources are planned in the short or medium-term:

WATER RESOURCE ACTIONS	TIMEFRAME
<p>We will investigate options to address future water demand/supply imbalance.</p> <p>We are currently investigating the possibility of managed aquifer recharge in the vicinity of Lake Eppalock through the Integrated Water Management Forum. Managed aquifer recharge involves injecting water during times where supply is greater than demand and storing it there until needed. In addition to this, participation in the water market to secure additional entitlement and trade surplus water represents business as usual practices and one potential option to provide additional yield in the system.</p>	Short-term
<p>We will investigate further modernisation of the rural channel network to reduce water losses over the short-term.</p> <p>Many of our existing rural channels are over a hundred years old and experience high levels of water losses. An efficient rural supply network will benefit all Coliban Water customers (urban and rural). The efficiency gained by replacing leaking channels with, for example a piped system, will result in water savings that may become available for productive, cultural or environmental purposes.</p>	Short-term
<p>We will increase Class A recycled water production to 1.5 GL/year in Bendigo and seek additional recycled water customers to offset potable and raw water use.</p> <p>More consistent generation of Class A recycled water as well as the planned upgrades to the class A recycled water network will allow for new recycled water customers to connect and to maximise the fit for purpose use of water. This will help to offset some potable and raw water uses, to free this water up for other purposes.</p>	Short-term
<p>We will fit digital data loggers to customer meters to assist in determining leaks in customers' homes, saving on water and reducing costs to customers.</p> <p>We are currently rolling our Digital Metering Program to homes across our region, with the program due to be completed in 2023. This program will allow measurement of customer water usage on an hourly basis, helping to identify difficult to detect leaks, improve water efficiency and return lower customer bills as a result.</p>	Short-term

RURAL SYSTEM

The Coliban Northern System supplies raw or recycled water to over 720 customers across 7 rural systems around Bendigo. These range from smaller stock and domestic type users to much larger farming operations. Over the last three years, these customers have used between 2,600 to 3,100 ML/year of their current total annual entitlement of 5,749 ML/year.



FUTURE OUTLOOK

A project has recently commenced to consider opportunities to modernise the rural system. We are committed to continuing to provide a service to our wide base of customers, and this needs to be undertaken as part of a long-term sustainable water strategy. Another important project in this space is the review of the rural allocation framework which considers service levels applicable to rural customers.

OUR PLAN

In addition to the project looking at developing a preliminary business case for our rural systems, outlined in the water resource section above, the following rural project is planned for the short-term:

RURAL SYSTEM ACTIONS	TIMEFRAME
We will review the process of determining rural system allocations to equitably share the available resource or optimise available water resources. There are currently differences in the level of service provided to potable water customers and rural channel customers. Consideration is needed to understand if historic levels of service provided to rural customers are still appropriate, that benefits and impacts of different options are weighed up and available resources are suitably shared during times of drought.	Short-term



WATER TREATMENT

Raw water is treated at our Water Treatment Plants (WTPs) in Bendigo and Heathcote and supplied to customers through our water supply network. The two treatment plants service the following towns and suburbs:

WATER TREATMENT PLANT TOWNS SERVICED

Bendigo	Bendigo Axedale Marong Huntly Strathfieldsaye Raywood Sebastian
Heathcote	Heathcote Tooborac

FUTURE OUTLOOK

Work is needed in the medium term to ensure that the Bendigo WTP has enough capacity to continue to meet the demands of a growing population. This will be completed progressively over time. The Heathcote WTP has sufficient capacity to meet long-term demand.

WATER TREATMENT PLANT	WHEN CAPACITY AUGMENTATION IS EXPECTED TO BE REQUIRED
Bendigo	Medium-term
Heathcote	Long-term



OUR PLAN

The following projects are planned in the short or medium-term relating to water treatment:

WATER TREATMENT ACTIONS

TIMEFRAME

We will implement progressive upgrades of the Bendigo WTP to maintain capacity.

The Bendigo WTP is due to be upgraded within the next ten years to ensure that capacity at the plant can meet growing demand within the town. These upgrades will be rolled out in stages to ensure that we are flexible to any changing requirements in growth and conditions, such as an increase in regional growth.

Medium term

WASTEWATER MANAGEMENT

Wastewater is treated at three Water Reclamation Plants (WRP):

- Bendigo WRP treats wastewater to Class B standard to supply the gold mine at Fosterville, the local livestock exchange and environmental releases to Bendigo Creek consistent with our Environment Protection Authority (EPA) licence for the site. The plant also treats water to Class A level to supply the Class A recycled water network. Class C recycled water produced through the lagoon system supplies local irrigators and is used for on-site irrigation.
- Axedale WRP treats wastewater to Class B standard for reuse by the local golf course.
- Heathcote WRP treats wastewater to Class C standard for reuse by the local golf course.

Our plants treat wastewater from commercial sites in accordance with trade waste agreements and consents. These businesses range from cafes to food processing and other large industries.

There is no wastewater network for the townships of Sebastian, Raywood or Tooborac. Townships without wastewater systems generally have septic tanks or other onsite wastewater systems, which are managed by their local council.

The recycled water produced at Bendigo WRP is supplied to a range of uses. Bendigo has a Class A recycled water scheme that includes residential, industrial and public open space usage. Biosolids are reused for agricultural purposes.

FUTURE OUTLOOK

The Bendigo WRP is close to capacity. Works are needed to increase capacity in the short-term, as well as to reduce odour at the site. This will be accomplished by an upgrade of the sludge treatment systems. Additional treatment capacity for Bendigo will be needed in the medium-term. Planning of this work is well underway, including discussions with key stakeholders. A focus area for the plant is consistent production of Class A recycled water and exploring opportunities for additional recycled water customers.

A project is underway to reconfigure the Class A recycled water network in Bendigo. The project will see a tank installed at Spring Gully Reservoir to improve water quality and pressure delivered to customers in the network.

A key objective of the recent Heathcote WTP upgrade was to reduce the volumes of wastewater discharged to sewer. The impact of this will be assessed to determine future upgrade requirements of the Heathcote WRP.

The Axedale WRP will require some augmentation on the short to medium-term.

WATER RECLAMATION PLANT

WHEN CAPACITY AUGMENTATION IS EXPECTED TO BE REQUIRED

Axedale	Short to medium-term
Bendigo	Short term with further upgrades to occur in medium-term
Heathcote	Under review following recent change

OUR PLAN

The following projects are planned in the short or medium-term relating to wastewater management and recycled water:

WASTEWATER RESOURCE ACTIONS	TIMEFRAME
<p>We will upgrade the Bendigo Class A recycled water network.</p> <p>We will be delivering a project which will see a new recycled water storage tank located at Spring Gully reservoir. This will help to increase security of supply in the recycled water network and protect the high quality of recycled water which is produced.</p>	Short-term
<p>We will implement the Bendigo Water Reclamation Plant (WRP) sludge treatment project to increase capacity of the WRP, reduce odour emissions and to enable consistent production of Class A recycled water.</p> <p>Upgrades at the Bendigo WRP are urgently needed. This project will allow us to treat increased inflows as a result of the rapidly expanding population, with containment of treated wastewater as per our EPA licence. These upgrades will occur within the next 5 years and represent a significant but necessary investment for the business. Consistent production of Class A recycled water plays an essential role in our ability to meet growing potable water demands into the future.</p> <p>Minimising any odours leaving our sites is an important aspect in the management of our plants and pump stations. The existing biosolids stabilisation process at the site is not meeting plant requirements and needs to be replaced. As well as reducing odour, this project will also help to reduce operational costs of the plant and to improve the hydraulic capacity.</p>	Short-term
<p>We will implement further progressive sewage treatment capacity upgrades for Bendigo. This may include development of a second WRP for Bendigo.</p> <p>Upgrade works at the Bendigo WRP will occur in stages over time to keep pace with growth in the system. Planning for this expanded population can be challenging, with a second treatment plant an option for the future. While a large investment, the benefits of a second plant could include local reuse of recycled water for public open space, generation of energy, reduced cost of new trunk main infrastructure and reduced odour in the network.</p>	Medium-term
<p>We will explore the environmental benefit of releases from Bendigo WRP to Bendigo Creek to inform the volume of water available for recycling.</p> <p>Environmental releases from the Bendigo WRP provide ecological value to downstream Bendigo Creek. We anticipate additional demand for recycled water from customers which could lead to a decrease in the amount of water released to waterways. It is therefore important to understand the minimum environmental flows which are needed within these waterways to sustain ecological values.</p>	Short-term
<p>We will prepare a recycled water reuse strategy for Bendigo</p> <p>There is potential for increased recycled water reuse for agricultural and other purposes in the region. Increased reuse will also support measures to meet EPA licence requirements at the Bendigo WRP.</p>	Short-term
<p>We will assess current performance of the Heathcote WRP to determine future upgrade requirements.</p> <p>Recently we have completed the Backlog Sewer Project for Heathcote which has seen a number of new customers connect to the network. We have also delivered upgrade works at the Heathcote WTP to reduce the flows of by-products of the treatment process releasing to the sewer network – performance thus far has been excellent and increased capacity at the WRP, however this needs to be confirmed over a range of operating scenarios. Further work is needed to assess the long-term requirements of the plant.</p>	Short-term
<p>We will upgrade treatment and reuse capacities at the Axedale WRP.</p> <p>Upgrades are needed at the Axedale WRP in the next ten years to ensure there is sufficient treatment, recycled water storage and reuse capacity.</p>	Short to medium-term

COLIBAN SOUTHERN SYSTEM

Our Coliban System Southern supplies the towns of Castlemaine, Kyneton, Maldon, Newstead, Malmsbury, Harcourt, Elphinstone, Tylden and Taradale.



INVESTMENTS IN THIS SYSTEM

Since our last Urban Water Strategy in 2017 we have invested in the following projects:

- Renewal of Castlemaine Water Treatment Plant (WTP) micro-filtration systems.
- Significant renewals of Castlemaine Water Reclamation Plant (WRP) including renewal of Castlemaine WRP Ultra Violet (UV) system.
- Decommissioned Poverty Gully rural system to reduce water losses.
- Renewal of Kyneton WTP micro-filtration system
- Kyneton WRP solution project upgrades – trade waste treatment, storage and reuse.
- Kyneton WRP offsets project.
- Renewal of Kyneton WRP UV system.
- Renewal of Jeffrey St sewage pump station rising main.
- Installed new town water pressure boosting system at Tilwinda Views and Church St.
- Completed the Kyneton, Castlemaine and Trentham Town Vision and Water and Recovery Resource Plan projects which look at the long term needs of each town.
- Taken on management of some standpipes in the region.
- Commenced installing digital data loggers on existing water meters across the region.
- Improved visitor facilities and land management at reservoirs.



Source water

Raw water is supplied by our Coliban River catchment storages: Upper Coliban, Lauriston and Malmsbury Reservoirs, located near Kyneton.



Treated water

Raw water is treated at our water treatment plants in Castlemaine and Kyneton and supplied to customers through our water supply network.



Water reclamation

Wastewater is collected through our sewer network and treated at our water reclamation plants at Castlemaine and Kyneton.

Our plants also treat wastewater from commercial sites in accordance with trade waste agreements and consents. These businesses range from cafes to large industries.



Water reuse

The WRP produces treated Class B recycled water that's used to irrigate local farmland, the Kyneton racecourse, sports grounds and botanic gardens as well as the extensive irrigation system onsite at the WRP



WATER CONNECTIONS

11,675



WASTEWATER CONNECTIONS

9,649



POPULATION

21,000



RESIDENTIAL GROWTH

AROUND **1.46%** PER YEAR



WATER RESOURCE

Raw water for the Coliban Southern System is supplied from the Upper Coliban, Lauriston and Malmsbury reservoirs.

We are entitled to all the storage capacity of the Upper Coliban, Lauriston and Malmsbury Reservoirs under the bulk entitlement for the Campaspe River, with an average annual take of up to 50,260 ML (which includes an average annual take of 17,440 ML from Lake Eppalock).

The bulk entitlement from the Campaspe System accounts for the supply of all urban commitments and rural entitlement, as well as water losses within the distribution system and passing flows.

Total demand in the Coliban Southern System is currently 3,761 ML per year, with the majority made up of residential demand in Kyneton and Castlemaine. Note that this number does not include rural water use.

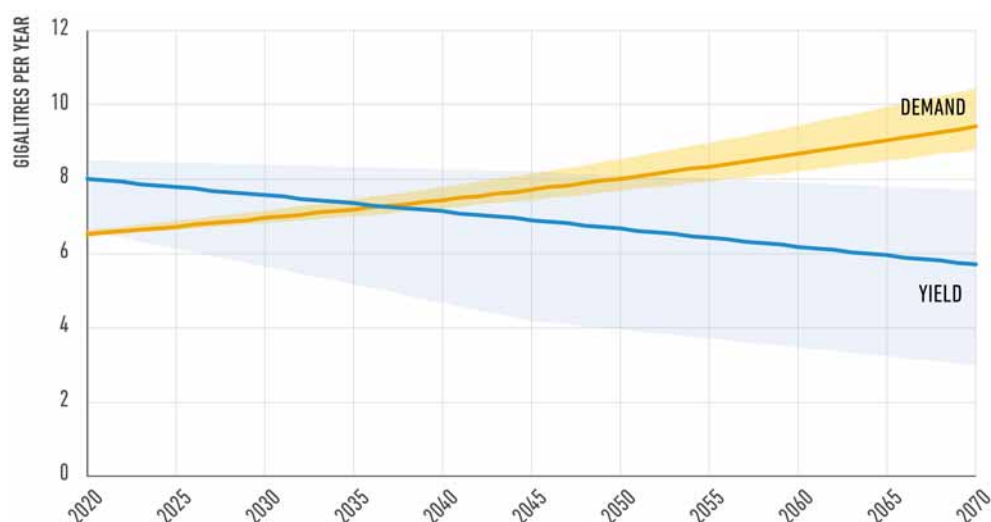
DEMAND OUTLOOK	TOTAL DEMAND (ML/YEAR)	RESIDENTIAL (ML/YEAR)	COMMERCIAL/ INDUSTRIAL (ML/YEAR)	COMMUNITY/ PUBLIC SPACE (ML/YEAR)	NON-REVENUE (ML/YEAR)
Current	3,761	1,843	1,105	285	528
2070	6,537	3,671	1,480	377	1,009

FUTURE OUTLOOK

Without further action, demand is expected to surpass yield in the Coliban Southern system by 2037 under medium climate change conditions. Action is needed in the short to medium-term to ensure that we can continue to meet agreed levels of service to our customers in the event of drought.

A summary of the outlook for the Coliban Southern System is shown below.

YIELD AND DEMAND CURVE FOR THE COLIBAN SOUTHERN SYSTEM



The yield and demand curve does not mean that the system will run out of water in 2037, rather the chances of water restrictions becoming more frequent and severe will increase. The projected timing of when demand equals supply as well as the quantity of shortfalls is shown in the table below.

	CLIMATE CHANGE SCENARIO		
	LOW	MEDIUM	HIGH
Year that demand equals yield	2057	2037	2020
Additional yield required in 2045 (GL)	0	0.8	3.9
Additional yield required in 2070 (GL)	1.1	3.7	7.4



The Coliban Southern System is currently projected to need augmentation by 2037 to ensure there is sufficient yield to meet our agreed level of service with customers. Action may however be required soon under high climate change conditions. Planning is underway on the suite of projects that could be implemented if we do need to deliver these projects earlier than expected.

Under a medium climate change scenario, 3.7 ML per year will be required by 2070. Under a high climate change conditions, an additional 7.4 ML of water per year is required.

OUR PLAN

The following projects relating to water resources are planned in the short or medium-term:

WATER RESOURCE ACTIONS	TIMEFRAME
<p>We will further investigate other options to address a demand/supply imbalance over the short-term such as a groundwater supply for Kyneton</p> <p>A groundwater supply in Kyneton would provide a second source of water for the Coliban Southern System and delay the need for further works in the system. A groundwater source would supplement the existing source and be used alongside other projects to meet long-term demand. The upfront costs involved are relatively low and the cost of treating groundwater water to drinking water standards is also likely to be relatively low.</p>	Short-term
<p>We will further investigate other options to address a demand/supply imbalance over the short term such as supply of water to Castlemaine from Lake Eppalock and the Waranga Western Channel via the Goldfields Superpipe.</p> <p>A connection between the Coliban Northern and Southern Systems via a pipeline will instead secure the system long-term. This would allow the system to be supplied from Lake Eppalock via the Goldfields Superpipe. This connection however requires a large upfront investment and may delay the delivery of other works in our region to maintain or improve service to customers.</p>	Short-term
<p>We will investigate further modernisation of the rural channel network to reduce water losses over the short-term.</p> <p>Many of our existing rural channels are over a hundred years old and experience high levels of water losses. An efficient rural supply network will benefit all Coliban Water customers (urban and rural). The efficiency gained by replacing leaking channels with, for example a piped system, will result in water savings that may become available for productive, cultural or environmental purposes.</p>	Short-term
<p>We will continue to implement the A Healthy Coliban Catchment Project</p> <p>North Central CMA and Coliban Water, together with Djaara, are implementing a 20 year plan, A Healthy Coliban Catchment Project, to protect the upper section of the Coliban River and its long-term water supply, while boosting habitat connectivity, sustainable land use practices, and building cultural and lifestyle value across the region.</p>	Ongoing



RURAL SYSTEM

The Coliban Southern System supplies raw water to over 600 customers across 5 rural systems. These range from smaller stock and domestic type users to much larger agricultural operations. Over the last three years, these customers have used between 1,800 to 2,400 ML of their current total annual entitlement of 10.1 GL. For further information around the rural system and proposed actions refer to the Coliban Northern System.



WATER TREATMENT

Raw water is treated at water treatment plants (WTPs) in Castlemaine and Kyneton and supplied to customers through the water supply network. The two treatment plants service the following towns and suburbs:

WATER TREATMENT PLANT TOWNS SERVICED

Castlemaine	Castlemaine Elphinstone Taradale Maldon Newstead Harcourt Guildford Fryerstown
Kyneton	Kyneton Malmsbury Tylden

FUTURE OUTLOOK

The Kyneton and Castlemaine WTPs are both close to capacity limits, with upgrades expected to be needed in the short to medium-term to keep pace with growth in both towns.

WATER TREATMENT PLANT	WHEN CAPACITY AUGMENTATION IS EXPECTED TO BE REQUIRED
Castlemaine	Short to medium-term
Kyneton	Short to medium-term

OUR PLAN

The following project is planned in the medium-term relating to water treatment:

RURAL SYSTEM ACTIONS TIMEFRAME

<p>We will implement progressive upgrades of the Castlemaine and Kyneton WTPs to maintain capacity over the short to medium term.</p> <p>The Castlemaine and Kyneton WTPs are due to be upgraded within the next 10 years to ensure that capacity at the plant can meet growing demand within the town. These upgrades will be rolled out in stages to ensure that we are flexible to any changing requirements in growth and conditions, such as an increase in regional development.</p>	Medium-term
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WASTEWATER MANAGEMENT

Wastewater is treated at two Water Reclamation Plants (WRPs):

- Castlemaine WRP treats wastewater from Castlemaine, Harcourt, Maldon and Newstead for reuse at the Castlemaine Golf Course and environmental releases to Campbells Creek consistent with our EPA licence.
- Kyneton WRP treats wastewater via two process streams:
 - › Domestic treatment plant for treatment of largely residential wastewater from Kyneton, Trentham, Tylden and Malmesbury. Treated water is reused through the Kyneton Class B recycled water network for irrigation or environmental releases to the Campaspe River consistent with our EPA licence.
 - › Trade waste treatment plant for trade waste customers in Kyneton. Treated wastewater is reused for irrigation.

Our plants also treat wastewater from commercial sites in accordance with trade waste agreements and consents. These businesses range from cafes to food processing and other large industries.

The recycled water produced at our water reclamation plants is supplied to a range of local uses. Biosolids are reused for agricultural purposes. Castlemaine recycled water is reused at the golf course. Kyneton has a Class B recycled water network which supplies customers in the local area for watering of public open space and for agricultural irrigation. Class C recycled water is reused onsite for irrigation.

FUTURE OUTLOOK

We are currently delivering the Kyneton Solutions Project to provide additional capacity at our Kyneton WRP.

Work is needed to upgrade the sludge treatment process at the Castlemaine WRP to reduce odour at the site and improve the quality of recycled water. This will help to facilitate additional recycled water customers in the future. This project is needed in the short-term, with further upgrades likely to occur at the site over time.

Current water use at our Castlemaine WRP is high. By installing a recycled water system at the site, we will be able to greatly reduce the water used at the site, freeing up supply for other uses.

WATER RECLAMATION PLANT	WHEN CAPACITY AUGMENTATION IS EXPECTED TO BE REQUIRED
Castlemaine	Short to medium-term
Kyneton	Increase in recycled water reuse capacity in the short-term



OUR PLAN

The following projects are planned in the short or medium-term relating to wastewater management and recycled water:

WASTEWATER MANAGEMENT ACTIONS	TIMEFRAME
<p>We will continue to monitor outcomes from the Kyneton Offsets project</p> <p>The Kyneton Offsets Project aims to have a positive impact on water quality and catchment health. 14.3 kilometres of environment improvement works were completed along Post Office Creek and the Campaspe River in Kyneton, with the sites now being maintained.</p> <p>To support the project, annual monitoring is occurring through to 2023, targeting periods when the Campaspe River is flowing to better understand the positive impacts of this project to waterway and catchment health.</p>	Short-term
<p>We will implement the Castlemaine WRP sludge treatment project to improve recycled water quality and reduce odour emissions.</p> <p>Minimising any odours leaving our sites is an important aspect in the management of our plants and pump stations. The existing biosolids stabilisation process at the site is not meeting plant requirements and needs to be urgently replaced. As well as reducing odour, this project will also help to reduce operational costs of the plant and to improve the hydraulic capacity.</p>	Short-term
<p>We will implement further progressive sewage treatment upgrades for Castlemaine to improve capacity and the quality of recycled water to enable further reuse.</p> <p>The Castlemaine WRP will be progressively upgraded to keep pace with increasing inflows to the site due to growth. Upgrades at the plant are expected to enable supply to new recycled water customers into the future, helping to provide additional capacity to the water network by offsetting existing uses.</p>	Short to medium-term
<p>We will install an on-site recycled water system at Castlemaine WRP to reduce potable water usage.</p> <p>Currently the Castlemaine WRP uses significant volumes of potable water for inlet screen cleaning. By installing an on-site recycled water system, this will allow the plant to instead use a fit-for-purpose supply and free up potable water for other customers in the region.</p>	Short to medium-term
<p>We will explore the environmental benefit of releases from Castlemaine and Kyneton WRP to downstream waterways to inform the volume of water available for recycling.</p> <p>Environmental releases from the Castlemaine and Kyneton WRP provide ecological value to downstream waterways. We anticipate additional demand for recycled water from customers which could lead to a decrease in the amount of water released to waterways. It is therefore important to understand the minimum environmental flows which are needed within these waterways to sustain ecological values.</p>	Short-term
<p>We will build a new recycled water pipeline north of the Kyneton WRP to increase reuse of recycled water from Kyneton WRP.</p> <p>Increasing the availability of recycled water to customers helps to reduce the volume of treated wastewater which needs to be stored at the water reclamation plant and to free up potable water supplies for other uses by customers.</p>	Short-term

ELMORE SYSTEM

The Elmore system only supplies the town of Elmore.



INVESTMENTS IN THIS SYSTEM

Since our last Urban Water Strategy in 2017 we have invested in the following projects:

- Established a biosolids processing facility at the Elmore Water Reclamation Plant (WRP) to enable future local reuse of this valuable material.
- Commenced installing digital data loggers on existing water meters across the region.



Source water

Water for Elmore is sourced from two groundwater bores. Groundwater Resources are managed by Goulburn-Murray Water under the Lower Campaspe Valley Water Supply Protection Area Groundwater Management Plan.



Treated water

Raw water is treated at our water treatment plant in Elmore and supplied to customers through our water supply network.



Water reclamation

Wastewater is collected through our sewer network and treated at our water reclamation plant at Elmore.



Water reuse

Recycled water is reused on-site. Biosolids are periodically removed from the lagoons and reused in accordance with EPA requirements.



WATER CONNECTIONS

453



WASTEWATER CONNECTIONS

403



POPULATION

770



RESIDENTIAL GROWTH

AROUND **0.57%** PER YEAR



WATER RESOURCE

Water for Elmore is sourced from two groundwater bores. Groundwater Resources are managed by Goulburn-Murray Water under the *Lower Campaspe Valley Water Supply Protection Area Groundwater Management Plan*.

WATER SOURCE	LICENCE VOLUME (ML/YR)
Groundwater	284

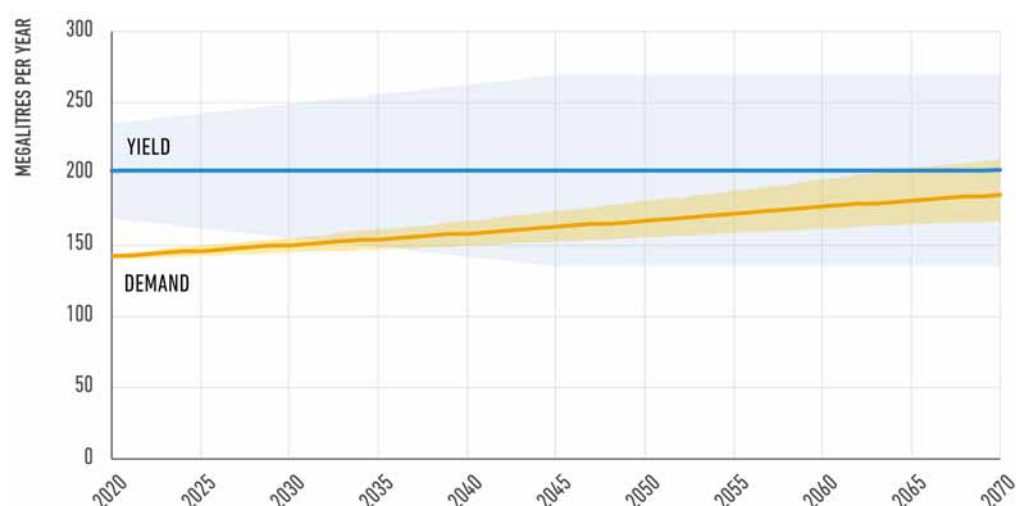
Total demand in the Elmore System is currently 142 ML per year. This is predominantly residential demand.

DEMAND OUTLOOK	TOTAL DEMAND (ML/YEAR)	RESIDENTIAL (ML/YEAR)	COMMERCIAL/ INDUSTRIAL (ML/YEAR)	COMMUNITY/ PUBLIC SPACE (ML/YEAR)	NON-REVENUE (ML/YEAR)
Current	142	72	19	27	24
2070	185	103	21	28	33

FUTURE OUTLOOK

Demand is not expected to exceed yield until after 2070 in the Elmore System. This is shown in the graph below.

YIELD AND DEMAND CURVE FOR THE ELMORE SYSTEM



The supply and demand curve above does not mean that restrictions will not be required, rather the chances of water restrictions are low. Restrictions may still be implemented during periods of drought.

A summary of the system requirements under different climate change scenarios is shown in the table below.

	CLIMATE CHANGE SCENARIO		
	LOW	MEDIUM	HIGH
Year that demand equals yield	Later than 2070	Later than 2070	2030
Additional yield required in 2045 (ML)	0	0	39
Additional yield required in 2070 (ML)	0	0	75

ELMORE

Under a medium climate change scenario, no additional water per year will be required by 2070. Action may however be required as early as 2030 under high climate change conditions. Further investigation and planning will occur to allow for such projects to be delivered ahead of schedule should a high climate change scenario eventuate. .

OUR PLAN

The following project is planned in the short or medium-term:

WATER RESOURCE ACTIONS	TIMEFRAME
<p>Further investigate the options available to contribute to water supply security for the Elmore System.</p> <p>Although modelling under the medium climate scenario indicates that the system is secure through to 2070, further investigation and planning for options is needed to ensure we can meet agreed levels of service into the future should we experience high climate change conditions.</p>	Medium-term



WATER TREATMENT

Raw water is treated at the Water Treatment Plant (WTP) in Elmore and supplied to customers through the water supply network.

FUTURE OUTLOOK

The Elmore WTP has capacity to meet long term demand in the town without major upgrade works.

WATER TREATMENT PLANT	WHEN CAPACITY AUGMENTATION IS EXPECTED TO BE REQUIRED
Elmore	Long-term

OUR PLAN

There are no short or medium-term actions proposed for the Elmore System relating to water treatment.



WASTEWATER MANAGEMENT

Sewer in Elmore is a hybrid Septic Tank Effluent Drainage (STED) system, with liquids drained to sewer for subsequent treatment and solids collected in septic systems. Waste is then pumped to the water reclamation plant (WRP) near Elmore for treatment.

Our plants also treat wastewater from commercial sites in accordance with trade waste agreements and consents. These businesses range from cafes to food processing and other large industries.

Recycled water is reused onsite for irrigation. Biosolids are periodically removed from the lagoons and reused in accordance with EPA requirements.

FUTURE OUTLOOK

The Elmore WRP has capacity to meet long-term expected inflows.

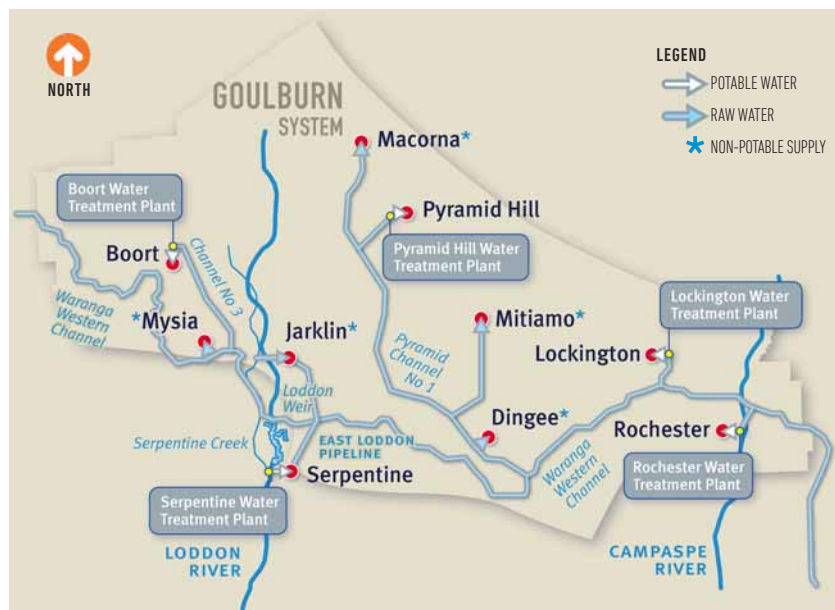
WATER RECLAMATION PLANT	WHEN CAPACITY AUGMENTATION IS EXPECTED TO BE REQUIRED
Elmore	Long-term

OUR PLAN

While are no short or medium-term actions proposed for the Elmore System relating to wastewater management, we will continue to engage with customers around the management of STED systems in the town through the Pricing Submission 2023 process.

GOULBURN SYSTEM

Our Goulburn System includes the towns of Rochester, Pyramid Hill, Boort, Lockington, Mitiamo, Serpentine, Dingee, Jarklin, Mysia and Macorna.



INVESTMENTS IN THIS SYSTEM

Since our last Urban Water Strategy in 2017 we have invested in the following projects:

- Upgraded capability to pump water from Campaspe River to the Rochester Water Treatment Plant (WTP).
- Continued to reuse 100% of recycled water from the Rochester WTP to support agricultural production.
- Reduced energy usage at the Serpentine WTP by 25%.
- Renewed inlet pumps and Programmable Logic Controller (PLC) at the Boort WTP.
- Installed tanks in our raw water towns to enable tankering of water during blue green algae incidents.
- Connect directly to the raw water pipeline and store raw water in tanks in Mitiamo. There is a planned upgrade to this storage.
- Commenced installing digital data loggers on existing water meters across the region.



Source water

Water is sourced from the regulated Goulburn River System via the Waranga Western Channel, which is managed by Goulburn-Murray Water. Serpentine and Jarklin are connected to the East Loddon Pipeline; and Mitiamo is connected to the Mitiamo Pipeline.



Treated water

Raw water is treated at our water treatment plants in Boort, Lockington, Pyramid Hill, Rochester and Serpentine and supplied to customers through our water supply network. Water in Mitiamo, Dingee, Jarklin, Mysia and Macorna is untreated, non-drinking water.



Water reclamation

Wastewater is collected through our sewer network and treated at our water reclamation plants at Boort, Rochester and Pyramid Hill. There is no sewerage system for Serpentine, Mitiamo, Dingee, Jarklin, Mysia and Macorna. Lockington has a hybrid sewerage system: all properties have onsite septic tanks which discharge to our sewer system. Sewage is treated at the Lockington Water Reclamation Plant (WRP).



Water reuse

The recycled water produced at our water reclamation plants is supplied to local irrigators. Biosolids are reused for agricultural purposes.



WATER CONNECTIONS

2,760



WASTEWATER CONNECTIONS

2,315



POPULATION

6,000



RESIDENTIAL GROWTH

AROUND **0.48%** PER YEAR



WATER RESOURCE

The primary source of raw water for the Goulburn Supply System is the Waranga Western Channel, which is managed by Goulburn-Murray Water. Rochester also has the added flexibility of drawing water from the Campaspe River. For Serpentine and Jarklin, raw water is pumped via the Goulburn Murray Water East Loddon Pipeline.

The Goulburn System has a bulk entitlement of 2,420 ML. The Goulburn System bulk entitlement supply is very reliable and receives 100% allocation in most years.

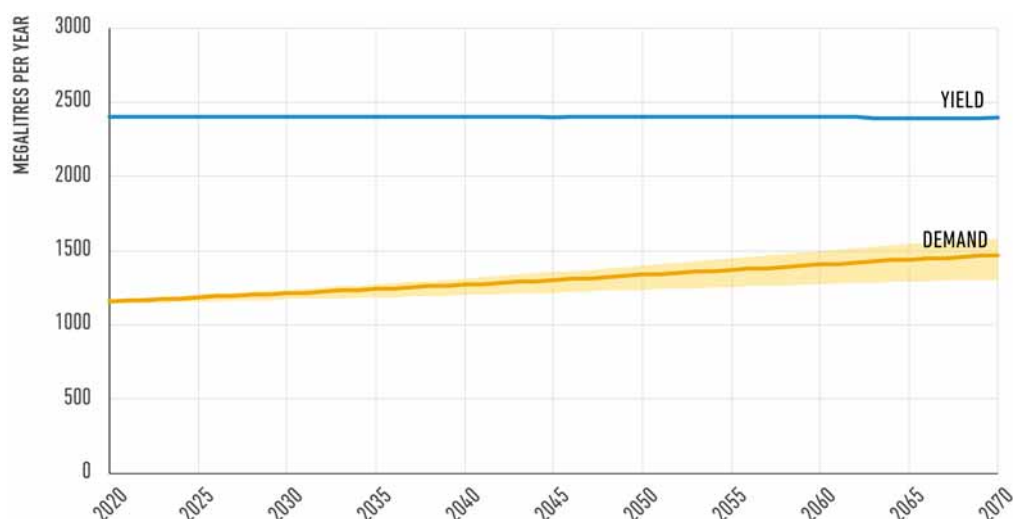
Total demand in the Goulburn System is currently 1,158 ML per year. Residential demand contributes the vast majority to this total. The Goulburn System includes a mix of towns with a drinking water supply and others with an untreated non-potable water supply.

DEMAND OUTLOOK	TOTAL DEMAND (ML/YEAR)	RESIDENTIAL (ML/YEAR)	COMMERCIAL/ INDUSTRIAL (ML/YEAR)	COMMUNITY/ PUBLIC SPACE (ML/YEAR)	NON-REVENUE (ML/YEAR)
Current	1,158	620	100	90	348
2070	1,465	806	118	103	438

FUTURE OUTLOOK

Demand is not expected to exceed yield until after 2070, even under a high climate change scenario. This is shown in the graph below.

YIELD AND DEMAND CURVE FOR THE GOULBURN SYSTEM



The supply and demand curve above does not mean that restrictions will not be required, rather the chances of water restrictions are low. Restrictions may still be implemented during periods of drought.

A summary of the system requirements under different climate change scenarios is shown in the table below.

	CLIMATE CHANGE SCENARIO		
	LOW	MEDIUM	HIGH
Year that demand equals yield	Later than 2070	Later than 2070	Later than 2070
Additional yield required in 2045 (ML)	0	0	0
Additional yield required in 2070 (ML)	0	0	0



OUR PLAN

The Goulburn System is currently considered secure and there are no actions relating to water resource for the short or medium-term. One option of investigation for the Murray System is a connection to the Goulburn System via a pipeline. Due to the much larger demand from the Murray System, this option would require the purchase of additional water resource in the Goulburn System to be viable. The investigation into this project will consider the impacts to both systems to ensure the long-term security for all our customers is retained.

WATER TREATMENT

Raw water is treated at Water Treatment Plants (WTPs) in Boort, Lockington, Pyramid Hill, Rochester and Serpentine and supplied to customers through our water supply networks.

FUTURE OUTLOOK

All WTPs in the Goulburn System have capacity to meet projected growth until at least 2043. A key focus for this system is around managing the risk of blue-green algae and fluctuating raw water quality due to changing climatic conditions.

Recently we have connected Mitiamo to a raw water supply from the Mitiamo pipeline. To ensure a high-quality supply from this pipeline, and allow for operational flexibility, we will be undertaking a project to install tanks at the current Mitiamo basin site to store this water before supplying to customers.

WATER TREATMENT PLANT	WHEN CAPACITY AUGMENTATION IS EXPECTED TO BE REQUIRED
Boort	Long-term
Lockington	Long-term
Pyramid Hill	Long-term
Rochester	Long-term
Serpentine	Long-term

OUR PLAN

The following projects are planned in the short or medium-term relating to water treatment:

WATER TREATMENT ACTIONS	TIMEFRAME
<p>We will review the capability of Goulburn System WTPs to handle blue-green algae blooms similar to that experienced in 2018.</p> <p>In recent years the Goulburn System has been subject to several blue-green algae events which can impact the supply to customers. These events can make it challenging to deliver consistent high quality treated water and are likely to occur more frequently due to changing climate conditions into the future. We need to assess options which can provide increased resilience to the WTPs in the system to minimise any disruptions to customers.</p>	Short-term
<p>We will install tanks at the Mitiamo basin to store water obtained directly from the Mitiamo pipeline.</p> <p>A water storage will help to provide increased security of supply to customers and ensure a supply is held even when the pipeline is not in operation. Having a storage means that supply interruptions are minimised in the event of a pipe burst or during poor water quality events such as algal blooms.</p>	Short-term



WASTEWATER MANAGEMENT

Wastewater is collected through the sewer networks and treated at water reclamation plants at Boort, Lockington, Rochester and Pyramid Hill. Most systems feature a conventional gravity sewer system with the exception of Lockington which has a hybrid Septic Tank Effluent Drainage (STED) system, with liquids drained to sewer for subsequent treatment and solids collected in septic systems.

There are no sewerage systems for Serpentine, Mitiamo, Dingee, Jarklin, Mysia and Macorna. Townships without wastewater systems have septic tanks or other onsite wastewater systems. Local councils are responsible for developing and managing domestic wastewater programs and plans for these towns.

Rochester WRP treats wastewater to Class B level, while Boort, Lockington and Pyramid Hill treat water to Class C level. The recycled water produced at water reclamation plants is supplied to local irrigators. Biosolids are reused for agricultural purposes.

FUTURE OUTLOOK

There are no major wastewater system issues within the Goulburn System.

WATER RECLAMATION PLANT	WHEN CAPACITY AUGMENTATION IS EXPECTED TO BE REQUIRED
Boort	Long-term
Lockington	Long-term
Pyramid Hill	Long-term
Rochester	Long-term

OUR PLAN

While there are no short or medium-term actions proposed for the Goulburn System relating to wastewater management, we will continue to engage with customers in Lockington around the management of STED systems through the Pricing Submission 2023 process.



LODDON WIMMERA SYSTEM

Our Loddon Wimmera System includes the towns of Borung, Wychitella, Korong Vale, Wedderburn, Bridgewater, Inglewood, Laanecoorie, Tarnagulla, Dunolly, Bealiba.



INVESTMENTS IN THIS SYSTEM

Since our last Urban Water Strategy in 2017 we have invested in the following projects:

- Connected the Bridgewater and Korong Vale Water Treatment Plant (WTP) to the South West Loddon Pipeline and secured additional water entitlements.
- Upgraded the Bridgewater WTP and Laanecoorie WTP to ensure greater water security.
- Renewed the Bridgewater WTP groundwater bore, ensuring there is a backup supply of water.
- Renewed the Laanecoorie WTP Programmable Logic Controller (PLC).
- Planned new raw water storages and pump station for Laanecoorie WTP to take water from the South West Loddon Pipeline.
- Added solar power to the Korong Vale WTP.
- Planned an upgrade at the Korong Vale WTP.
- Network disinfection for Bealiba was upgraded.
- Commenced installing digital data loggers on existing water meters across the region.



Source water

Water for the towns of Borung and Wychitella is sourced from the Wimmera Mallee Pipeline. Korong Vale, Wedderburn, Bridgewater and Inglewood are supplied from the Wimmera Mallee Pipeline and South West Loddon Pipeline. Laanecoorie, Tarnagulla, Dunolly, Bealiba are currently supplied from the Loddon River.



Treated water

Raw Water is treated at our water treatment plants in Korong Vale, Bridgewater and Laanecoorie and supplied to our customers through our water supply network. Non-potable water is supplied to Borung and Wychitella.



Water reclamation

Wastewater is collected through our sewer networks and treated at our water reclamation plants in Wedderburn, Bridgewater and Dunolly. There is no sewerage service in Korong Vale, Borung, Bealiba, Tarnagulla or Laanecoorie. Our plants also treat wastewater from commercial sites in accordance with trade waste agreements and consents. These businesses range from cafes to large industries.



Water reuse

The recycled water produced at our water reclamation plants is supplied to local irrigators. Biosolids are reused for agricultural purposes.



WATER CONNECTIONS

2,055



WASTEWATER CONNECTIONS

1,412



POPULATION

3,700



RESIDENTIAL GROWTH

AROUND **0.3%** PER YEAR



WATER RESOURCE

The Korong Vale potable system, which includes Wedderburn, is supplied from either the Wimmera Mallee Pipeline or the South West Loddon Pipeline. The South West Loddon Pipeline can source water from either the Wimmera Mallee Pipeline or the Waranga Western Channel.

The Bridgewater potable system, which includes Inglewood, is supplied from the South West Loddon Pipeline, but can also draw from the Loddon River.

The Laanecoorie potable system, which includes Tarnagulla, Dunolly and Bealiba is supplied from the Loddon River.

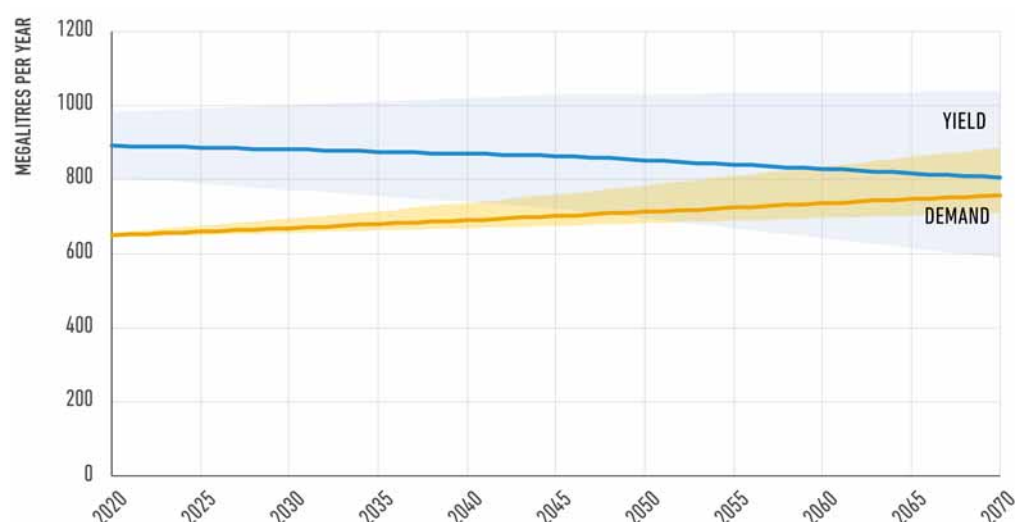
Wycheitella and Borung receive a non-potable supply from the Wimmera Mallee Pipeline.

DEMAND OUTLOOK	TOTAL DEMAND (ML/YEAR)	RESIDENTIAL (ML/YEAR)	COMMERCIAL/ INDUSTRIAL (ML/YEAR)	COMMUNITY/ PUBLIC SPACE (ML/YEAR)	NON-REVENUE (ML/YEAR)
Current	654	266	71	49	268
2070	882	352	105	72	353

FUTURE OUTLOOK

Demand is not expected to exceed yield until after 2070 in the Loddon Wimmera System. This is shown in the graph below.

YIELD AND DEMAND CURVE FOR THE LODDON WIMMERA SYSTEM



The supply and demand curve above does not mean that restrictions will not be required, rather the chances of water restrictions are low. Restrictions may still be implemented during periods of drought.

A summary of the system requirements under different climate change scenarios is shown in the table below.

	CLIMATE CHANGE SCENARIO		
	LOW	MEDIUM	HIGH
Year that demand equals yield	Later than 2070	Later than 2070	2040
Additional yield required in 2045 (ML)	0	0	37
Additional yield required in 2070 (ML)	0	0	300

Under a medium climate change scenario, no additional water per year will be required by 2070. Action may however be required as early as 2040 under high climate change conditions. Further investigation and planning will occur to allow for such projects to be delivered ahead of schedule should a high climate change scenario eventuate



OUR PLAN

The following projects relating to water resources are planned in the short or medium-term:

WATER RESOURCE ACTIONS	TIMEFRAME
<p>We will construct a raw water storage at Laanecoorie and connect to the South West Loddon Pipeline.</p> <p>Building a storage in Laanecoorie will allow for connection of the town to the South West Loddon pipeline. The storage is necessary to ensure there is a consistent supply even when the pipeline isn't operating. This will provide additional security of supply to customers and allow for easier operation during poor water quality events, such as algal blooms.</p>	Short-term
<p>We will investigate demand initiatives such as water efficiency measures and leak detection to reduce the high amount of non-revenue water lost within the Loddon Wimmera System.</p> <p>Water losses occur due to leaks, bursts and as a by-product of the water treatment process. The higher the volume of non-revenue water the less water is available to our customers. Existing projects such as digital metering and leak detection can have a real impact in reducing water losses and will help to contribute to improving water efficiency in the system.</p>	Short-term
<p>Further investigate the options available to contribute to water supply security for the Loddon Wimmera System.</p> <p>Although modelling under the medium climate scenario indicates that the system is secure through to 2070, further investigation and planning for options is needed to ensure we can meet agreed levels of service into the future should we experience high climate change conditions.</p>	Medium-term



WATER TREATMENT

Raw water is treated at Water Treatment Plants (WTPs) in Korong Vale, Bridgewater and Laanecoorie and supplied to customers through our water supply networks. A summary of the treatment plants below.

Water supplied to Borung and Wychitella is untreated non-potable water.

WATER TREATMENT PLANT TOWNS SERVICED

Bridgewater	Bridgewater Inglewood
Laanecoorie	Laanecoorie Tarnagulla Dunolly Bealiba
Korong Vale	Korong Vale Wedderburn



FUTURE OUTLOOK

All water treatment plants in the Loddon Wimmera System have capacity to meet long-term demand without major upgrades.

Currently the Bridgewater and Korong Vale WTPs store water from the South West Loddon Pipeline (SWLP) in raw water storages upstream of the treatment process. In order for Laanecoorie to connect to the SWLP, a raw water storage is needed to provide operational flexibility and to ensure a high quality of water.

WATER TREATMENT PLANT	WHEN CAPACITY AUGMENTATION IS EXPECTED TO BE REQUIRED
Bridgewater	Long-term
Laanecoorie	Long-term
Korong Vale	Long-term

OUR PLAN

There are no short or medium-term actions proposed for the Loddon Wimmera System relating to wastewater management.

WASTEWATER MANAGEMENT

Wastewater is collected through the sewer networks and treated at Water Reclamation Plants (WRPs) at Bridgewater, Wedderburn and Dunolly. The Bridgewater WRP also treats sewage from Inglewood. Our plants also treat wastewater from commercial sites in accordance with trade waste agreements and consents. These businesses range from cafes to large industries.

There is no sewerage system in Korong Vale, Wychitella, Borung, Bealiba, Tarnagulla nor Laanecoorie. Townships without wastewater systems generally have septic tanks or other onsite wastewater systems. Local councils are responsible for the developing and managing domestic wastewater programs and plans.

The Class C recycled water produced at our water reclamation plants is reused for irrigation. Biosolids are reused for agricultural purposes.

FUTURE OUTLOOK

The Wedderburn WRP requires upgrades in the short to medium-term to the aeration and irrigation systems in order to continue to effectively treat wastewater for reuse.

The Bridgewater and Dunolly WRPs have capacity to meet long-term expected inflows.

WATER RECLAMATION PLANT	WHEN CAPACITY AUGMENTATION IS EXPECTED TO BE REQUIRED
Bridgewater	Long-term
Dunolly	Long-term
Wedderburn	Short to medium-term

OUR PLAN

The following projects are planned in the short or medium-term relating to wastewater management:

WASTEWATER MANAGEMENT ACTIONS	TIMEFRAME
<p>We will upgrade aeration and irrigation capacities at Wedderburn WRP.</p> <p>Upgrades are needed at the Wedderburn WRP in the next 10 years to ensure that the treatment and irrigation processes at the plant remain sustainable and readily able to treat, contain and reuse inflows into the future. The aeration system at the plant can experience issues during times of high flows and upgrading this process would improve operational flexibility at the plant.</p>	Short to medium-term

MURRAY SYSTEM

Our Murray System includes the towns of Cohuna, Echuca, Gunbower and Leitchville.



INVESTMENTS IN THIS SYSTEM

Since our last Urban Water Strategy in 2017 we have invested in the following projects:

- Purchased Murray Low Reliability Water Shares.
- Installed new treated water tanks in Echuca West and at the Cohuna and Gunbower Water Treatment Plants.
- Commenced installing digital data loggers on existing water meters across the region.
- Planned an upgrade of Echuca Water Treatment Plant due to start in 2021.
- Completed the Echuca Town Vision which looks at long-term needs to the town.
- Continued to reuse 100 per cent of recycled water from Echuca to support agricultural production.
- Replaced more than 800 metres of water mains in Cohuna to reduce the number of unplanned bursts and reduce water losses.



Source water

Water is sourced from the regulated Murray System managed by Goulburn-Murray Water. We have a bulk entitlement as well as low and high reliability water shares in the regulated Murray System. Raw water is taken from Gunbower Creek for Cohuna, the Murray River for Echuca, Taylors Creek for Gunbower, and the Cohuna Channel and Gunbower Creek for Leitchville.



Treated water

Raw water is treated at our water treatment plants in Cohuna, Echuca, Gunbower and Leitchville and supplied to customers through our water supply network.



Water reclamation

Wastewater is collected through our sewer network and treated at our water reclamation plants at Cohuna, Echuca and Gunbower. Wastewater from Leitchville is treated to the Gunbower Water Reclamation Plant. Our plants also treat wastewater from commercial sites in accordance with trade waste agreements and consents. These businesses range from cafes to large industries.



Water reuse

The recycled water produced at our water reclamation plants is supplied to local irrigators. Biosolids are reused for agricultural purposes.



WATER CONNECTIONS

9,250



WASTEWATER CONNECTIONS

8,500



POPULATION

17,000



RESIDENTIAL GROWTH

AROUND 1.58% PER YEAR
WITH MANY OF THESE NEW CUSTOMERS TO BE BASED IN ECHUCA



WATER RESOURCE

Water is sourced from the regulated Murray System managed by Goulburn-Murray Water. We have a bulk entitlement as well as low and high reliability water shares in the regulated Murray System. Raw water is taken from Gunbower Creek for Cohuna, the Murray River for Echuca, Taylors Creek for Gunbower, and the Cohuna Channel and Gunbower Creek for Leitchville.

ENTITLEMENT TYPE	ENTITLEMENT (ML/YEAR)
Bulk entitlement	6,285
High reliability water shares	55
Low reliability water shares	722

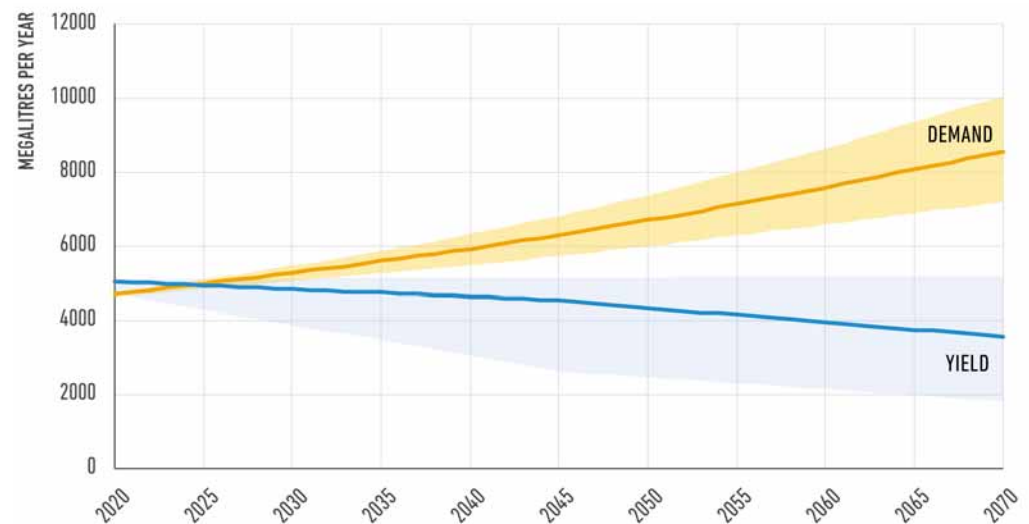
Total demand in the Murray System is currently 4,707 ML per year. Residential and commercial demands dominate the demand. Industrial demand is mostly confined to Echuca. The Cohuna, Leitchville and Gunbower Systems also supply water to the surrounding region for rural stock and domestic use under supply by agreement arrangements.

DEMAND OUTLOOK	TOTAL DEMAND (ML/YEAR)	RESIDENTIAL (ML/YEAR)	COMMERCIAL/ INDUSTRIAL (ML/YEAR)	COMMUNITY/ PUBLIC SPACE (ML/YEAR)	NON-REVENUE (ML/YEAR)
Current	4,707	2,213	1460	275	758
2070	8,452	4,591	2159	413	1,290

FUTURE OUTLOOK

Without further action, demand is expected to surpass yield in the Murray System by 2024, as shown below. Action is required within the next five years to ensure that we continue to meet agreed levels of service to our customers in the event of drought.

YIELD AND DEMAND CURVE FOR THE MURRAY SYSTEM



MURRAY

The yield and demand curve does not mean that the system will run out of water in 2024, rather the chances of water restrictions becoming more frequent and severe will increase. The projected timing of when demand equals supply as well as the quantity of shortfalls is shown in the table below.

	CLIMATE CHANGE SCENARIO		
	LOW	MEDIUM	HIGH
Year that demand equals yield	2033	2024	2020
Additional yield required in 2045 (ML)	600	1,800	4,200
Additional yield required in 2070 (ML)	2,000	5,000	8,200

Under a medium climate change scenario, 5,000 ML of additional water per year will be required by 2070. In high climate change conditions, an additional 8,200 ML of water per year will be required.

OUR PLAN

To address the imbalance between yield and demand the following projects have been identified as required in the short or medium-term:

WATER RESOURCE ACTIONS	TIMEFRAME
<p>Purchase additional water resources through the water market.</p> <p>Action is needed within the Murray System in the next 5 years to ensure that we can continue to meet our agreed level of service with customers. Our options assessment process for the Murray System considered a range of options including a groundwater supply in Echuca and Cohuna, a pipeline connection to the Goulburn System, recycled water reuse, use of stormwater and rainwater tanks in new developments. After assessing these options, further investing in the water market for the Murray System was considered the best approach to provide additional water in the short term. This option is relatively low cost and can be purchased in stages, meaning it is highly flexible to changing climate or market conditions and avoids a large upfront capital spend, which ensures that other much needed projects across our region can be delivered to improve service to customers.</p>	Short-term
<p>Investigate the feasibility of supplying recycled water to Echuca West in partnership with Campaspe Shire Council.</p> <p>Significant growth is expected in Echuca's West. Recycled water is a possibility to provide a supply for public open spaces and reduce the strain on the potable water network. A feasibility project is being delivered through the Integrated Water Management Forums to assess the merits in supply this area with recycled water.</p>	Short-term
<p>Further investigate the options available to contribute to water supply security for the Murray System.</p> <p>A pipeline connection between the Murray and Goulburn Systems will also be investigated further. Changes in water market conditions in the two systems could make this option more attractive in the future.</p>	Short-term





WATER TREATMENT

Raw water is treated at our Water Treatment Plants (WTPs) in Cohuna, Echuca, Gunbower and Leitchville and supplied to customers through our water supply network.

FUTURE OUTLOOK

Major works are in progress to provide capacity upgrades and performance improvements at the Echuca WTP. Upgrades are needed at each of the Cohuna, Gunbower and Leitchville plants over the next 10-15 years.

Blue-green algae blooms in the Murray System can impact on the palatability of drinking water. This requires further investigation and planning as this risk is likely to increase over time due to the changing climate.

We are also investigating the release of high-quality supernatant water, a by-product generated during the treatment process, to local waterways in Echuca and Cohuna, rather than to sewer.

WATER TREATMENT PLANT WHEN CAPACITY AUGMENTATION IS EXPECTED TO BE REQUIRED

Cohuna	Medium-term
Echuca	Current upgrade underway will provide capacity through to the long-term
Gunbower	Medium-term
Leitchville	Medium-term

OUR PLAN

The following works are planned to improve our water treatment capacity in the Murray System in the short or medium-term:

WATER TREATMENT ACTIONS

TIMEFRAME

Complete the upgrade of the Echuca WTP in 2022. Once complete, the plant upgrades will improve capacity, storage and disinfection at the plant, whilst ensuring Echuca's security of supply. The increased treatment capacity will also help address growing demand in the region.	Short-term
Plan for capacity increases for the Cohuna WTP investigate opportunities to consolidate the treatment plants at Cohuna, Gunbower and Leitchville. Some capacity upgrades are required at the Cohuna WTP to ensure it can keep pace with supplying the town. There are also expected future works needed at both the Gunbower and Leitchville plants. Given the relatively close proximity of the three towns, there may be an opportunity to connect one or more of the towns via a treated water pipeline, which would significantly reduce operational costs associated with running multiple treatment plants.	Short to medium-term
Investigate the release of high-quality supernatant water from the Echuca and Cohuna WTPs to local waterways to provide environmental benefit rather than release this water to sewer and seek credit for returns to the Murray River. This project has a range of potential benefits. Releasing this volume to sewer means that a potentially valuable resource is lost and there is an additional cost associated with end treatment at the Echuca WRP. If instead we release this water to local waterways there is an opportunity to promote environmental health in a drying climate and a potential to claim this water as a credit in our water balance for the Murray System.	Short-term
Upgrade Echuca, Cohuna and Leitchville WTPs to reduce the impact of blue-green algae blooms on treated water taste and odour. In recent years the Murray System has been subject to several blue-green algae events which can impact the supply to customers. These events can make it challenging to deliver consistent high-quality treated water and are likely to occur more frequently due to changing climate conditions into the future. Upgrading these plants will provide customers with better quality better during these events.	Short to medium-term



WASTEWATER MANAGEMENT

Wastewater is treated at three Water Reclamation Plants (WRPs):

- Cohuna WRP treats wastewater from Cohuna. Treated water is evaporated in lagoons.
- Gunbower WRP treats wastewater from Gunbower and Leitchville and has on-site reuse of Class C recycled water via irrigation.
- Echuca WRP treats wastewater from Echuca which produced Class B recycled water that is transferred approximately 15 km south to winter storages at Singer Road for supply to recycled water customers who use it to supplement their irrigation water needs.

Our plants also treat wastewater from commercial sites in accordance with trade waste agreements and consents. These businesses range from cafes to large industries.

The recycled water produced at our WRPs is supplied to local irrigators. Biosolids are reused for agricultural purposes.

FUTURE OUTLOOK

Works to address capacity issues and seepage are required at the Cohuna WRP within the next 5 years. Gunbower and Echuca currently have no capacity concerns.

WATER RECLAMATION PLANT	WHEN CAPACITY AUGMENTATION IS EXPECTED TO BE REQUIRED
Cohuna	Short-term
Echuca	Long-term
Gunbower	Long-term

OUR PLAN

The following works are planned to improve our wastewater management capacity in the Murray System in the short or medium-term:

WASTEWATER MANAGEMENT ACTIONS	TIMEFRAME
<p>Upgrade Cohuna WRP to increase capacity and address leaking lagoons.</p> <p>The Cohuna WRP has historic issues with seepage. This is not sustainable in the long-term and needs to be addressed to ensure that we are meeting the needs of nearby residents and the conditions of our Environment Protection Authority (EPA) licence for the site. Works at the site will also allow us to ensure that the lagoons are sized to accommodate long-term growth within Cohuna.</p>	Short-term

MURRAY



TRENTHAM SYSTEM

The Trentham System supplies the town of Trentham.



INVESTMENTS IN THIS SYSTEM

Since our last Urban Water Strategy in 2017 we have invested in the following projects:

- Completed the Trentham Town Vision and Water Resource and Recovery Plan (WARRP), which looks at the long term needs of the town.
- Installed new groundwater production bores and increased the license volume by 55 megalitres per year.
- Renewed Trentham Water Treatment Plant (WTP) filters.
- Installed facilities to enable tankering of water to the WTP if required.
- Commenced installing digital data loggers on existing water meters across the region.



Source water

Raw water for the township of Trentham is sourced from spring discharge into two reservoirs, which have a combined capacity of 91 megalitres, and supplemented by groundwater bores.



Treated water

Raw water is treated at the Trentham Water Treatment Plant located on Lagoon Road, in North Blackwood, southeast of the Trentham. The water treatment process includes ultrafiltration, granular activated carbon filter and chlorination.



Water reclamation

Wastewater from customers in Trentham is treated at the Kyneton Water Reclamation Plant, located north of Kyneton on the Kyneton-Redesdale Road. The Kyneton Water Reclamation Plant consists of two treatment systems. Wastewater from the townships of Kyneton, Malmesbury, Trentham and Tylden is treated in the domestic wastewater treatment plant.



Water reuse

Tertiary treated Class B recycled water is used to irrigate the Kyneton racecourse, sports grounds, botanic gardens, Hardwick's farm and onsite irrigation. In winter, water is stored in the onsite lagoons awaiting irrigation over summer or released to the Campaspe River in accordance with our EPA licence. Biosolids are reused for agricultural purposes.



WATER CONNECTIONS

707



WASTEWATER CONNECTIONS

649



POPULATION

1,180



RESIDENTIAL GROWTH

AROUND 3.29% PER YEAR



WATER RESOURCE

All water supplied to Trentham is sourced from a natural spring at the WTP site or from nearby groundwater bores.

The Bulk Entitlement (Trentham) Conversion Order 2012 allows us to take up to 360 ML over three years (averaged to 120 ML/year) from two reservoirs. We have a licence to take and use up to 103 ML/year of groundwater from three bores.

WATER SOURCE	ENTITLEMENT (ML/YEAR)
Reservoirs	120
Groundwater bores	103

Total demand in the Trentham System is currently 149 ML per year. This is predominantly made up of residential demand. The Trentham System is currently experiencing the highest rate of growth of any system within our region.

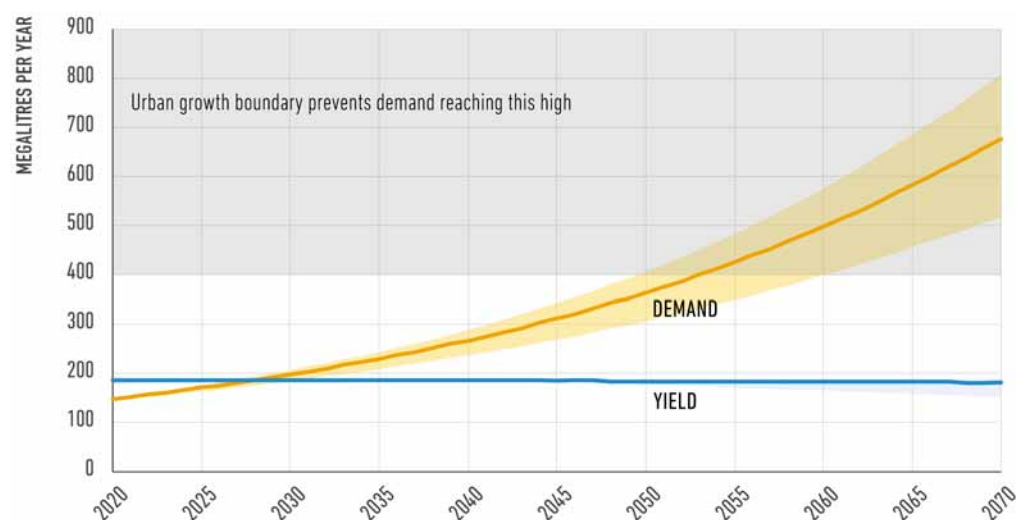
DEMAND OUTLOOK	TOTAL DEMAND (ML/YEAR)	RESIDENTIAL (ML/YEAR)	COMMERCIAL/ INDUSTRIAL (ML/YEAR)	COMMUNITY/ PUBLIC SPACE (ML/YEAR)	NON-REVENUE (ML/YEAR)
Current	149	85	7	14	43
2070	656	420	11	24	201

FUTURE OUTLOOK

Without further action, demand is expected to surpass yield in the Trentham System by 2027. Action is required within the next 5 years to ensure that we continue to meet agreed levels of service to our customers in the event of drought.

A summary of the outlook for the Trentham System is shown below.

YIELD AND DEMAND CURVE FOR THE TRENTHAM SYSTEM



The yield and demand curve does not mean that the system will run out of water in 2027, rather the chances of water restrictions becoming more frequent and severe will increase. The projected timing of when demand equals supply as well as the quantity of shortfalls is shown in the table below.

	CLIMATE CHANGE SCENARIO		
	LOW	MEDIUM	HIGH
Year that demand equals yield	2027	2027	2027
Additional yield required in 2045 (ML)	79	126	157
Additional yield required in 2070 (ML)	330	490	670

Under a medium climate change scenario 490 ML per year will be required by 2070. In high climate change conditions, an additional 670 ML of water per year is required.

OUR PLAN

The following projects relating to water resources are planned in the short or medium-term:

WATER RESOURCE ACTIONS	TIMEFRAME
<p>We will continue to explore opportunities for additional groundwater in Trentham.</p> <p>Groundwater is an excellent water resource option for Trentham. The high quality of the groundwater in the area means that treatment costs for this water source are low, while the proximity of groundwater to the existing water treatment plant means that the transfer and energy costs as well as construction footprint associated with this option is low.</p> <p>Bores are also able to be installed in stages, meaning it is possible to deliver works as required to coincide with growth in the area.</p>	Ongoing
<p>We will investigate connecting Trentham to the Coliban Southern System to provide additional water to supplement the current resource.</p> <p>Additional water from Tylden or Kyneton may be required in addition to groundwater as an additional source. A pipeline connection between Kyneton and Trentham would secure the long-term water supply for Trentham. While this option is more costly than a groundwater supply, both in terms of initial and ongoing costs, it provides a high level of security and flexibility for the system under a range of growth scenarios.</p> <p>Having access to the existing spring and groundwater supplies as well as a supplement from a pipeline to Kyneton allows for a number of water source options when algal blooms occur.</p> <p>Further planning is required to ensure a suitable pipeline alignment is found which minimises environmental, social and cultural impacts during construction.</p> <p>Another option for further investigation is the potential for a link to the Goldfields Superpipe via a connection from Daylesford which was raised as an option during discussions with Central Highlands Water on the UWS.</p>	Short-term



WATER TREATMENT

Raw water is treated at the Trentham WTP and supplied to customers through the water supply network.

FUTURE OUTLOOK

Trentham is subject to high levels of growth. The current WTP requires capacity upgrades to keep pace with this growth which will be delivered in the medium-term. There is also a short-term need for additional storage at the Trentham WTP to allow for sufficient security of supply to customers and operational flexibility on high demand days.

WATER TREATMENT PLANT WHEN CAPACITY AUGMENTATION IS EXPECTED TO BE REQUIRED

Trentham	Short to medium-term
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OUR PLAN

The following projects are planned in the short or medium-term relating to water treatment:

WATER TREATMENT ACTIONS TIMEFRAME

We will install additional treated water storage at Trentham WTP. Storage at the plant helps to ensure there is sufficient available treated water for customers in the event of particularly high demand or in the case of emergency events such as storms that can lead to treatment plant outages and damage the water reticulation network. Growth in Trentham means that our existing storages are undersized and increasing this volume will reduce the risk of outages to customers.	Short-term
We will upgrade Trentham WTP to meet additional capacity requirements. The Trentham WTP can experience capacity issues in the height of summer with water carting utilised in the past during asset failures. This is a short-term fix and not sustainable as Trentham continues to expand. Additional capacity is needed to provide extra water during peak demand times and to accommodate additional growth in the township.	Short to medium-term
We will review measures to manage blue-green algae blooms in the local water supply to the Trentham WTP. In recent years, algal blooms have been experienced in the two reservoirs at the Trentham WTP. This can impact the treatment process and has the potential to affect treated water quality supplied to town. Changing climatic conditions means that these types of events are likely to occur more frequently in summers into the future. Potential ways to reduce the risk of algae are to be reviewed including catchment and reservoir management.	Medium-term



WASTEWATER MANAGEMENT

All wastewater from Trentham is collected in the local sewer reticulation and pumped to the Kyneton Water Reclamation Plant (WRP). Refer to the Coliban Southern System for more information on the Kyneton WRP and associated recycled water reuse.



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You can contact us by telephone, email, mail or in person.

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ONLINE FORM > www.coliban.com.au

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POST > Box 2770, Bendigo DC Victoria 3554

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