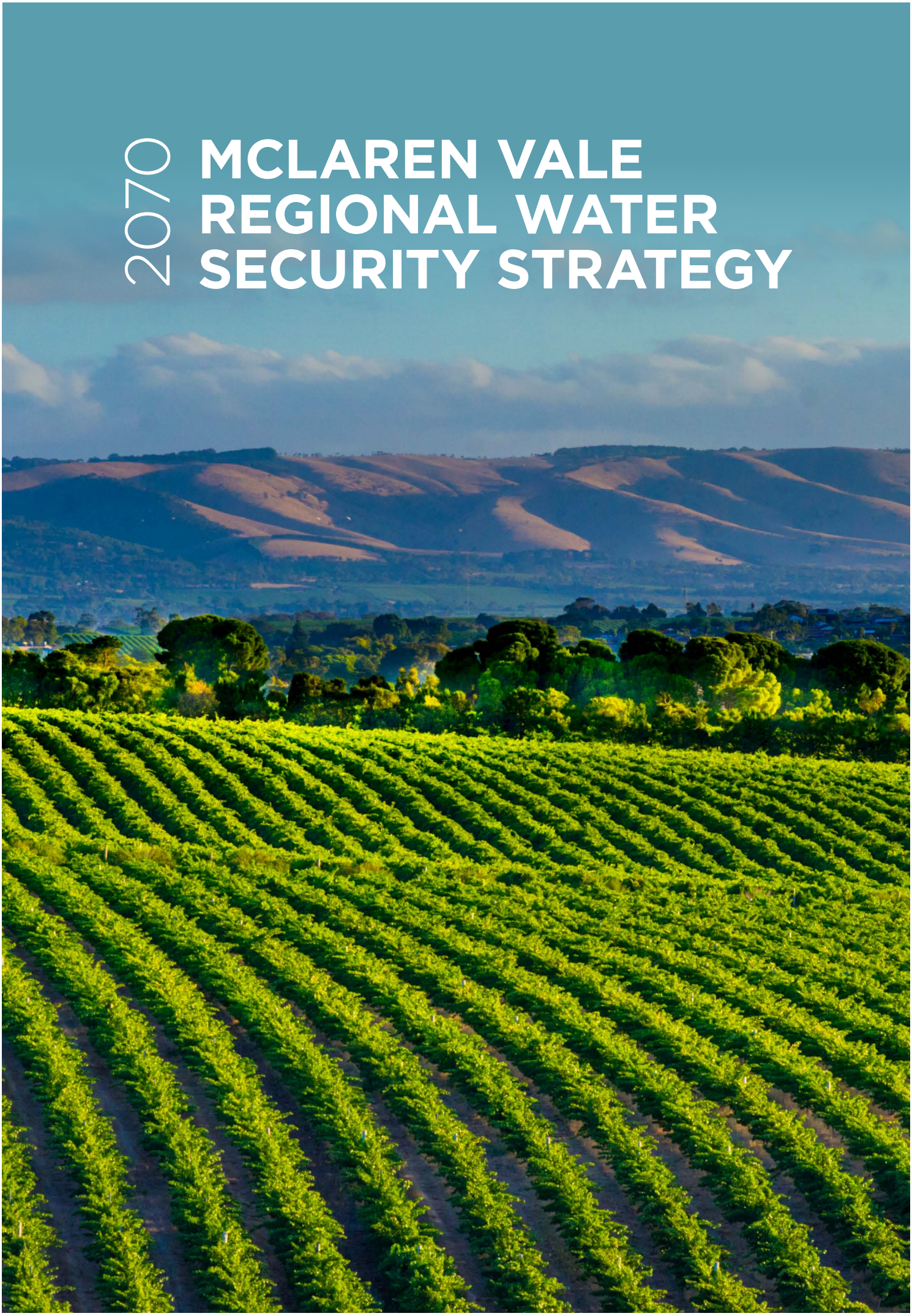
2070

MCLAREN VALE REGIONAL WATER SECURITY STRATEGY



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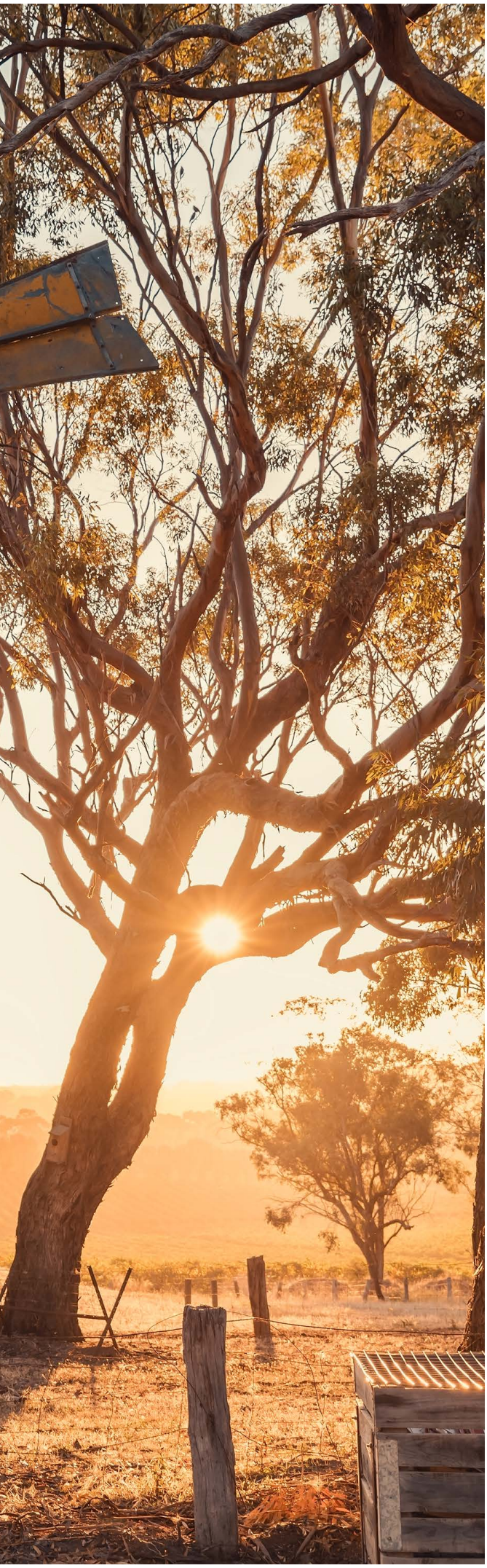
Acknowledgement of Country

The land and waters to which the McLaren Vale regional Water Security Strategy relates is Kaurna Country and Kaurna people are the traditional custodians and carers of the region. It is acknowledged that Kaurna peoples' spiritual, social, cultural, environmental, and economic practices are intrinsically linked to their lands and waters and the continuing connection to their lands and waters is recognised and respected.

Actions set out in this strategy reflect a commitment to integrating Kaurna peoples' wisdom into the management of land, water and biodiversity in the region and ensuring direct involvement and representation in regional decision-making. Ongoing meaningful engagement with Kaurna peoples will be important to continue to raise awareness and respect for Kaurna history, knowledge and wisdom and to ensuring that the contribution of Kaurna people to caring for Country is valued.



Minister's foreword

The McLaren Vale region stands as one of our State's most iconic and productive agricultural landscapes - celebrated worldwide for its breathtaking natural beauty, world-class wines and thriving tourism industry. This enduring success is built on a community foundation of shared environmental stewardship, underpinned by access to reliable, high-quality water.

However, as climate change accelerates and our population and economy continue to grow, the pressure on our precious water resources is increasing. In response, the *McLaren Vale Regional Water Security Strategy* offers a timely and forward-looking blueprint for resilience. At its core, the Strategy prioritises the protection of our land and coastal ecosystems, recognising that the health of our water, soils and marine environments is essential to the region's long-term prosperity.

The Strategy clearly demonstrates the cohesive and highly collaborative nature of the community in the McLaren Vale region. I extend my sincere gratitude to all who contributed their insights, expertise and passion. Your collective efforts have resulted in a community-driven Strategy, grounded in local knowledge and driven by a shared commitment to environmental sustainability.

Let us continue to work together to ensure that McLaren Vale remains a region of abundance, beauty and resilience for generations to come.

Hon Lucy Hood MP
Minister for Climate, Environment and Water

Introduction

The McLaren Vale region has a long history of proactively managing water resources to support industry, community and the environment. In addition to groundwater, recycled water supports a world-class wine industry and has allowed for the expansion of irrigated areas. While water resources are currently able to meet the demand for water, with a hotter and drier climate expected, planning is needed to ensure the supply of water continues to support a thriving region and viable irrigation industry.

Suburban areas in the region continue to grow, with new developments announced by the state government in 2023 and 2024. A hotter and drier climate is also likely to have an impact on the liveability of our urban areas. As the population grows, planning is needed to ensure cooler, greener suburbs. Water is a key element to achieving this. In addition to water for communities and industry, demand for water to achieve environmental and cultural outcomes is also expected to increase. With demand increasing into the future, informed investment and planning decisions will need to be made to strengthen the region's water security and allow for continued prosperity.

This strategy was developed in response to community concerns around access to, and affordability of, water and the potential impacts of climate change on water sources. Developed in partnership with regional organisations and community members, it describes a vision for a water secure future and actions needed to help achieve this vision. The actions aim to build resilience and support adaption to changes in water availability and land use.

Current and future water demand scenarios, potential water supply options to help meet this demand, and the impact of a changing climate are considered in the strategy. A high-level economic and options analysis also supports the strategy. It presents priority activities and long-term direction to inform investment decisions to be made as demand for water increases. Supporting actions are put forward for the purpose of achieving the broader regional vision. With continued collaboration and community support, the strategy will guide

both short-term and long-term decision-making around policy and infrastructure investment to safeguard the region's water security into the future.

Scope of this strategy

This is a community driven water security strategy for the McLaren Vale region (Figure 1). It covers:

- Water for industry and agriculture
- Water for suburban open spaces
- Water for the environment
- Water from natural sources – groundwater, watercourses, and surface water
- Stormwater
- Recycled water from wastewater treatment plants.

The strategy excludes urban water supply provided by SA Water. Urban water supply is considered in a long-term water security strategy for Greater Adelaide that is being developed by SA Water (Figure 2).

The McLaren Vale region includes a diverse range of land uses, including irrigated agriculture and horticulture, urban areas, and a unique coastal environment. The region closely aligns with the City of Onkaparinga local government area and is located within the Green Adelaide Landscape region and the Hills and Fleurieu Landscape region. It spans 42,800 hectares from Flagstaff Hill in the north to Sellicks Beach in the south and incorporates the McLaren Vale Geographical Indication (GI) Zone[1].

The scope of this strategy includes consideration of water for agricultural use, the environment and local greening and cooling outcomes. As mentioned above, it is important to note that it excludes potable water for households and commercial uses.

At the time of preparing this strategy, a number of other water-related projects were underway. The projects and their linkages are described at Figure 2.

1 More information about Australian wine geographic indications can be found here.

First Nations in the McLaren Vale region

The McLaren Vale region area is the traditional lands of the Kaurna people who have cared for the lands and waters in the region for thousands of generations. It is recognised that their ongoing connection to Country and obligations to care for Country remain as important as ever today.

The vision for the region reflects a future where Traditional Owners' voice, values and cultural knowledge are respected and integrated into decision-making to help effectively manage land, water and coast. Actions in this strategy recognise the deep knowledge that the Kaurna people have about land and water management and that working in partnership to care for Country will be key to achieving the vision. Actions also highlight areas that have the potential to deliver economic outcomes.

While some actions specifically highlight opportunities to work together, it is recognised that Kaurna peoples' perspectives are important to all aspects of this strategy - ongoing engagement will be important to ensure that Kaurna peoples' perspectives are incorporated into land and water management, and to ensure there are opportunities for Kaurna people to be directly involved in regional planning, governance and on-ground actions. As relationships are strengthened, initial actions can be built upon and further refined to ensure they empower Kaurna people and enable continued connection to Country.

Figure 1: McLaren Vale Geographical Indication (GI) Zone and water sources.

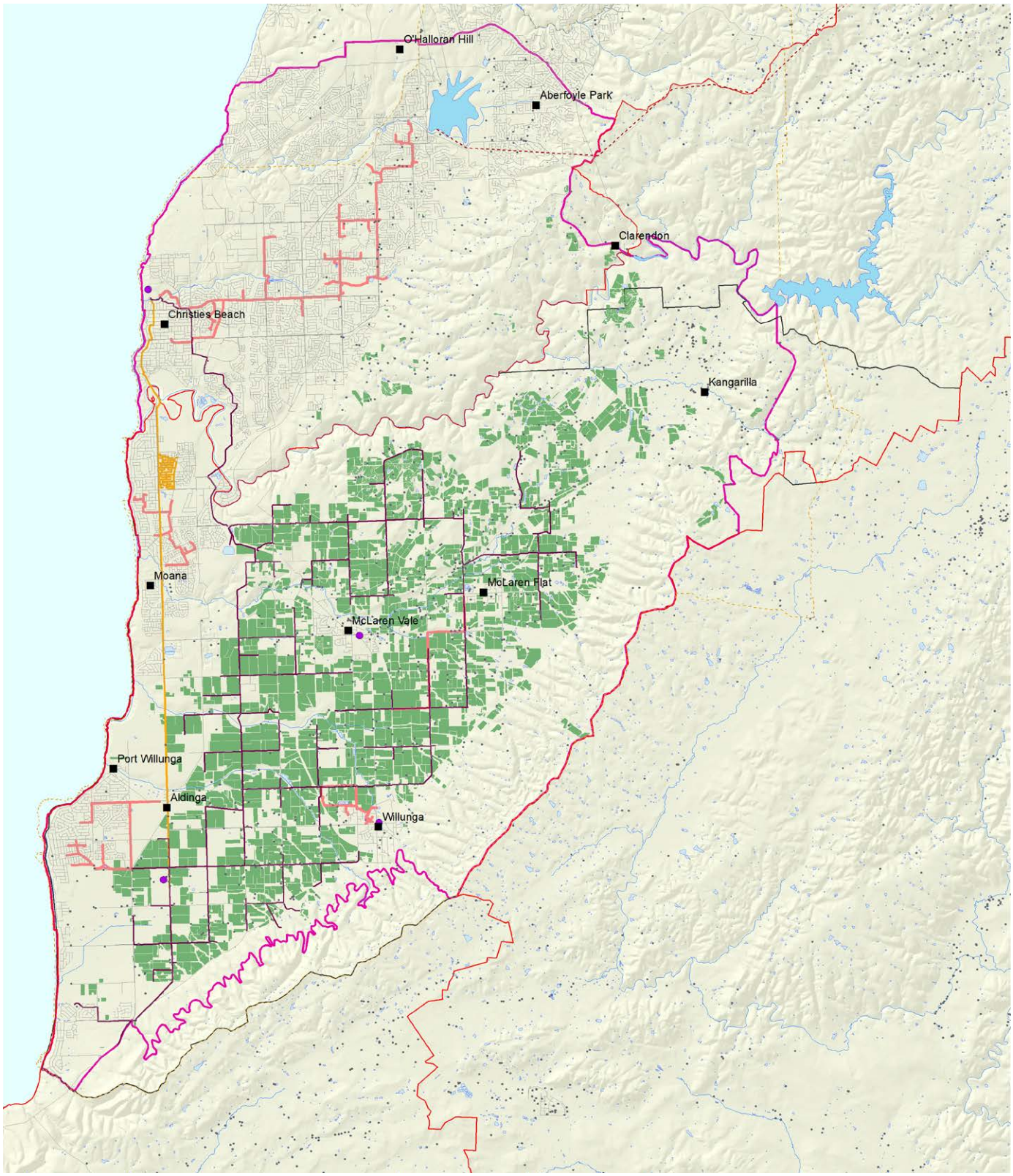
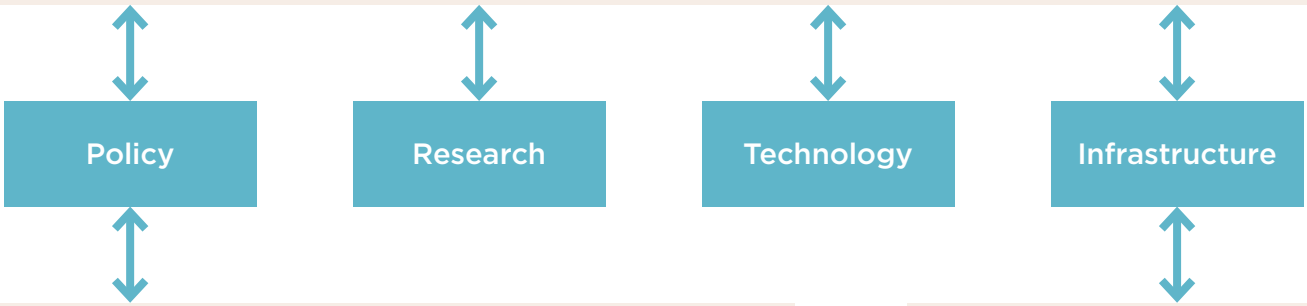


Figure 2: Water-related projects in the McLaren Vale region.

McLaren Vale Regional Water Security Strategy

The Department for Environment and Water (DEW) is supporting long-term water security planning in regions as they adapt to a changing climate and increasing demands for water. The strategy development process assesses the water needed to support the local economy, communities, amenity, cultural values, and healthy ecosystems into the future.



McLaren Vale Water Allocation Plan amendment (Hills and Fleurieu Landscape Board)

The McLaren Vale Water Allocation Plan was reviewed in 2022. The review recomendations will be progressed during the Western Mount Lofty Ranges Water Allocation Plan amendment process now underway

McLaren Vale Irrigation Water Security Project

The McLaren Vale Irrigation Water Security Project is developing a business case to increase the available storage capacity for recycled wastewater.

Salinity hotspot investigations (Hills and Fleurieu Landscape Board)

Discussions have been held with groundwater licence holders in the 'hot spot' zones to identify and implement solutions to localised rising salinity levels.

Greater Adelaide Water Strategy (SA Water)

SA Water is developing a long-term strategy to ensure water security for the Greater Adelaide region, which includes the McLaren Vale region. This considers all urban water needs for the Greater Adelaide community, including water for household and commercial use. The McLaren Vale Regional Water Security Strategy therefore excludes potable water for households and commercial uses; however, it includes sub-regional planning for agricultural use, the environment and local greening and cooling outcomes.

About the region

POPULATION

Approx. **214,682** in 2023

FIRST NATIONS

Traditional lands and waters of the Kaurna peoples

AGRICULTURE, CROPS AND LIVESTOCK

$131M in 2021

WINE GRAPES

Approx. **37,756 tonnes** crushed and **7,383 ha** planted to vineyard in 2024

Valued at approx. **$61.43M** in 2024

OTHER CROPS

523 ha irrigated horticulture

Olives, nuts, fruit trees, vegetables, cropping, and forestry.

TOURISM

estimated $300M in 2023

URBAN USES

106ha irrigated green spaces

24.8% vegetation cover

12.5% tree canopy

OTHER INDUSTRIES

Health care and social assistance, construction, retail, manufacturing, education, and training.

CLIMATE

Mediterranean climate: warmer summers, moderate winters, winter-dominated rainfall

180-200mm growing season rainfall
603mm average rainfall 2012-13 to 2021-22

GROUNDWATER

Water is accessed from three main aquifers:

- the fractured rock aquifer
- Maslin Sands aquifer
- Port Willunga Formation

RECYCLED WATER

Willunga Basin Water Company delivers water from the Christies Beach and Aldinga Wastewater Treatment Plants.

SA Water supplies water through the Southern Urban Reuse Scheme (SURS) for use in residential developments.

The **City of Onkaparinga** supplies recycled water from the Community water management schemes and via stormwater harvesting.

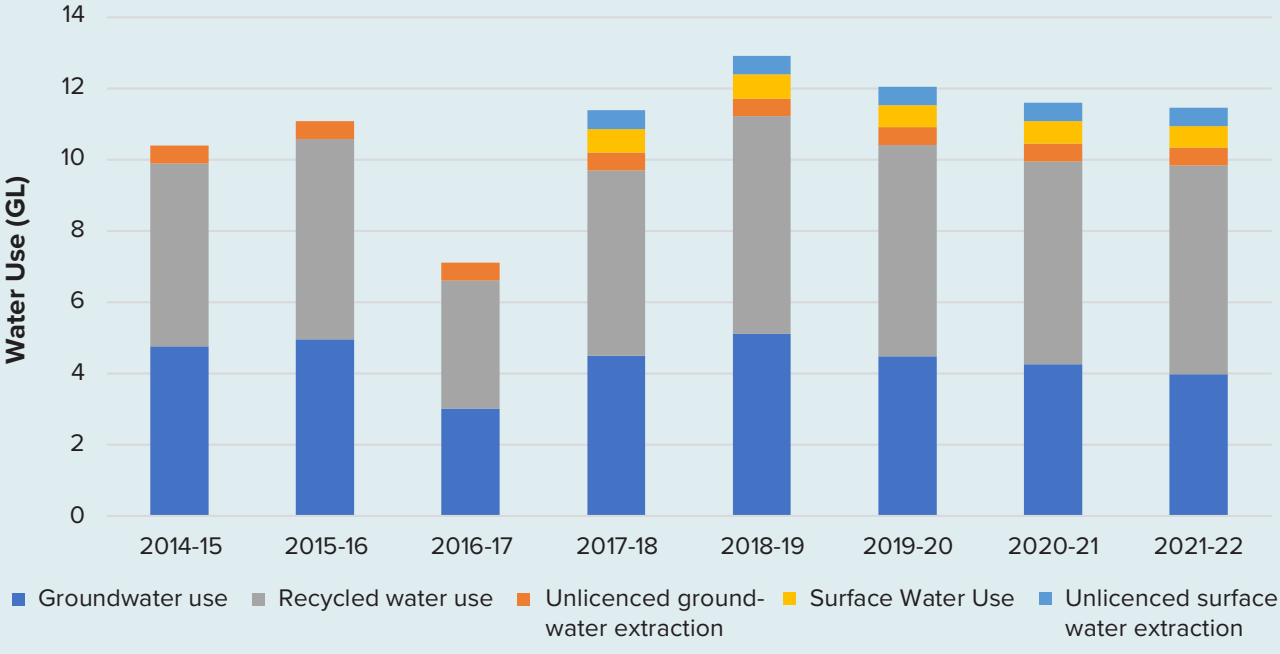
SALINITY

'Hotspots' are being experienced in areas of the Port Willunga Formation and Maslin Sands aquifers.

SURFACE WATER

Small volumes of surface water are used for irrigation and stock and domestic purposes.

Figure 3: Water use[2,3] in the McLaren Vale region over the period 2014-15 to 2021-22



2 Surface water data was not available for 2014-15 to 2016-17.
3 This does not include water supply provided by SA Water for households and commercial uses.

Challenges and opportunities

Many challenges and uncertainties face the McLaren Vale region and addressing these will be key to the future success of the region. There are also many opportunities that could be realised if sufficient fit-for-purpose water supplies are available. The strategy seeks to address challenges while proactively exploring opportunities, with particular consideration given to the potential impacts on water supply and demand. These challenges and opportunities were identified through community and industry input that was provided during the strategy development workshops.

Challenges

Cost and access to water

While recycled wastewater is a secure source of water, it comes at a cost and affordability is a concern. In addition, not all primary producers have access to the recycled water pipeline. Similarly, for those who do not already have access to groundwater, gaining access can be challenging and expensive. Some who use groundwater are experiencing salinity issues, which impacts on suitability for the irrigation of grapevines.

Competing demand for recycled water

In the future under a changing climate, as Adelaide's population grows, competition for recycled wastewater is likely to increase. As a climate-independent water source, recycled wastewater will become increasingly important to the McLaren Vale region.

Protecting local aquifers

Increasing groundwater salinity and declining water levels are already being experienced in some locations. With a hotter and drier climate expected, these issues are likely to increase if no action is taken, impacting on the sustainability of groundwater into the future. The understanding and management of the groundwater resources would benefit from the development of a regional groundwater model.

Climate change

An expected hotter and drier climate would increase the demand for water at the same time as impacting on the supply of water, particularly from native water sources (groundwater and surface water).

Population growth and urban sprawl

Population growth is expected in the region and poor planning or unmanaged development could impact on the land available for primary production, biodiversity outcomes, the special character of the region and liveability.

Market uncertainties

The Australian wine industry currently faces challenges from global oversupply, economic recessions in key markets and changing consumer preferences globally, which could impact future demand.

Opportunities

Availability of land

The soil potential of unplanted land within the McLaren Vale region indicates there is around 6,000 hectares of land suitable for grapevines or other crops.

With sufficient access to water, this provides a significant opportunity to increase irrigated plantings. This opportunity is explored further through future demand scenarios.

Availability of land may also be seen as an opportunity for other purposes, such as revegetation or carbon plantings

Crop diversification

While grapevines are currently the predominant irrigated crop, and are likely to remain so, the available land with productive capacity provides an opportunity for potential diversification.

The region is in a prime location for transport and there is potential to harness new markets.

Opportunities arise as food security becomes an issue globally. This opportunity is explored further through future demand scenarios.

Diversifying and maximising water supply

A significant portion of treated wastewater is currently discharged to the ocean. Opportunities exist to make better use of this water.

Feasibility and viability of using Managed Aquifer Recharge (MAR) could be investigated to maximise water storage capacity and increase water security in the region.

Increased wastewater from a higher population, as well as new housing developments providing an opportunity to capture and use stormwater, could then be used locally for agriculture, greening and cooling. This opportunity has been explored further through supply options analysis.

Greening and cooling

City of Onkaparinga aims to increase urban green cover (trees, shrubs, grass) and tree canopy cover (trees >3m) by 20% by 2045 (from a 2016 baseline).

The capture and use of stormwater locally could contribute to this increased demand, creating cool and liveable suburbs.

This opportunity is explored further through future demand scenarios and supply options analysis.

Developing the vision for the McLaren Vale region in 2070

How the vision was developed

The need for long-term water security planning in the McLaren Vale region was identified by community members and industry representatives concerned about the expected impacts of climate change on the availability of water in the region, and the need to maintain local industries and businesses, as well as a healthy environment. A strategic foresight and resilience-based planning approach was used, with 3 community workshops being held between February 2023 and June 2024.

Workshop Process

The community workshops were held to:

- Develop a shared vision for the McLaren Vale region, as well as water security goals (Workshop 1)
- Create plausible future scenarios based on the key global, regional and local variables that may impact the future water security of the region (Workshop 2)
- Identify options and actions to achieve the shared vision under the range of plausible future scenarios (Workshop 1 & 2)
- Share outcomes of analysis and agree on final options and actions to include in the Strategy (Workshop 3).

In addition to the workshops, analysis was undertaken to support the Strategy development, particularly around the impacts of climate change on water resources in the McLaren Vale region and analysis of future demand. An economic and options analysis of water security options identified through the workshops was undertaken to determine which ones would be most effective in contributing to water security.

One of the initial outcomes of the workshop process[4] was to develop a shared vision for the McLaren Vale region, which is outlined below.

The McLaren Vale region is a vibrant place to live, work and visit, where:

- Resilient water sources, managed in an integrated way, deliver affordable zero carbon water supply in a changing world.
- Coastal ecosystems and land biodiversity are flourishing, supported by native vegetation with healthy waterways, and wastewater and stormwater outflows are managed to maximise volumes for use while protecting the marine environment.
- Rural character has been preserved and enhanced by green streets, parks and open spaces, which keep all suburbs cool and liveable.
- All businesses are part of a clean, green, diverse and circular economy that is renowned for its food, wine and tourism.
- First Nation's voice, values and cultural knowledge are respected and integrated into decision-making to help effectively manage land, water and coast.
- Collaboration and a culture of shared responsibility persists allowing technology and opportunities for innovation to be embraced.

'A water story: the McLaren Vale region in 2070' describes the outcomes of the vision in more detail.

4 Further detail on the workshop process will be available in the *McLaren Vale System Water Security Modelling Report*, to be published alongside the Strategy.

A water story: the McLaren Vale region in 2070

The McLaren Vale region in 2070 is a vibrant place to live and work, where wine, food and tourism businesses are part of a clean, green, diverse and circular economy. Climate resilient, integrated, and affordable water sources powered by renewable energy support a thriving and sustainable region, ensuring that the region continues to flourish for generations to come.

Long-term planning in the 2020's has allowed the region to harness opportunities, and to successfully address water challenges. Access to reliable climate-independent water has allowed the region to remain water secure despite changes in climate, and this supports a diverse range of industries. An interconnected water supply system, where all use is digitally monitored, allows for real-time management of supply and demand, and supports the efficient and circular reuse of water. Wastewater and stormwater outflows are managed to maximise volumes for use

while protecting the marine environment. This has resulted in environmental benefits – coastal environments now flourish and less pressure on native water sources has increased environmental flows through local waterways, ensuring improved ecosystem health.

Collaboration and a spirit of sharing knowledge and resources persists, and the region respects the importance of Kaurna Nation's voice, values and cultural knowledge. Integrating this wisdom into decision-making helps effectively manage land, water and coastal environments.

A shared responsibility for the sustainable management of the land and waters of the region, working alongside the Kaurna Nation, ensures that the region's natural resources are protected for future generations. Conscious planning decisions have ensured that the region has maintained its rural character. Urban areas that incorporate water sensitive design and meet environmental standards sit in harmony alongside an agricultural landscape. Green streets, parks, and open spaces keep all suburbs cool and liveable.

Fertile land has been protected and the agricultural sector is diverse and thriving. The whole community benefits from investment in the region's long-term prosperity. Development occurs in harmony with the natural environment and all energy generation and water collection is sensitively integrated into the landscape.

Biodiversity in the region is supported and protected by native vegetation networks and healthy waterways. The McLaren Vale region's wineries and agricultural businesses have embraced conservation, recognizing the value of protecting the land and water that support their livelihoods. Prioritising sustainability has led to thriving local ecosystems, with diverse flora and fauna that enriches the region's natural beauty.

Businesses use water efficiently and reuse of water is optimised and affordable. The region has a reputation for being clean and green – the concept of a circular economy is embedded in all aspects of living and doing business. Access to the latest research and techniques has allowed for innovation, driving progress and creating new opportunities for the region's future.

Strong tourism businesses connect land, water and sea and Kaurna stories are widely known and celebrated. A focus on agro-ecological tourism and sustainable practices attracts visitors to the region. Nature-based accommodation and clean and green hotels are a part of the green regional brand. Visitors are attracted to the experiences that the region offers, enjoying food and wine grown and produced locally.

The McLaren Vale region in 2070 is a resilient wine and agricultural region that has successfully balanced economic growth with environmental stewardship. With a thriving local economy, a commitment to sustainability, and a dedication to preserving the region's natural beauty, the McLaren Vale region has become an exemplar that attracts interest and investment from around the world.

Water security in a changing climate

Summary of climate projections and analysis

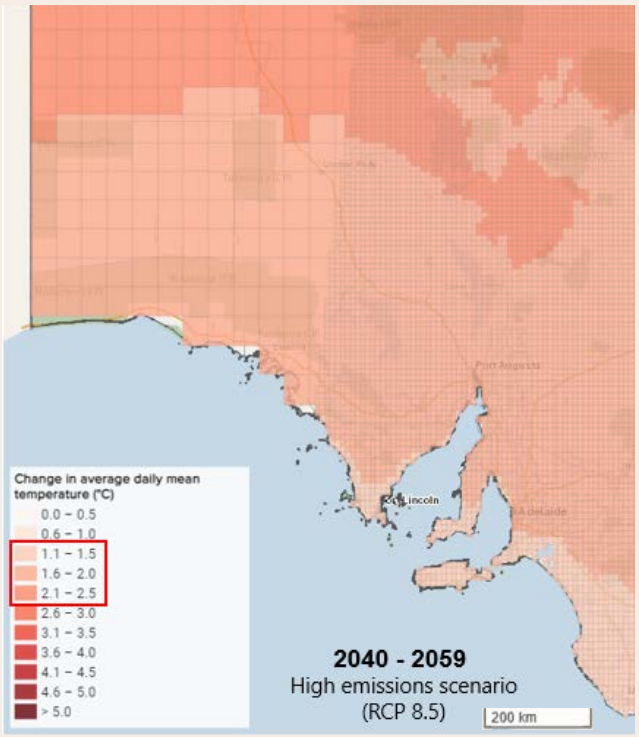
Climate change is projected to have an impact on temperatures, annual rainfall and seasonality, and potential evapotranspiration (PET), which are key drivers for water supply and demand for plant growth, animal husbandry, urban living and greenspaces. High-level climate projections for South Australia are shown below (Figure 4).

Rainfall can be a critical driver of water demand and supply in the McLaren Vale region. Changes in rainfall impact on agricultural demand and surface water availability, and over long periods impact the quantity and quality of groundwater. Rainfall is also critical for maintaining environmental health. Historically, the average annual rainfall equates to a volume of 47 GL over the McLaren Vale GI planted vineyards. Any future reduction to this volume would need to be met from other sources, or addressed through water efficiency measures.

Changes in rainfall seasonality are expected to have significant impacts on agricultural systems, including the length and timing of the growing season, yield and harvest leading to changes in crop varieties and types.

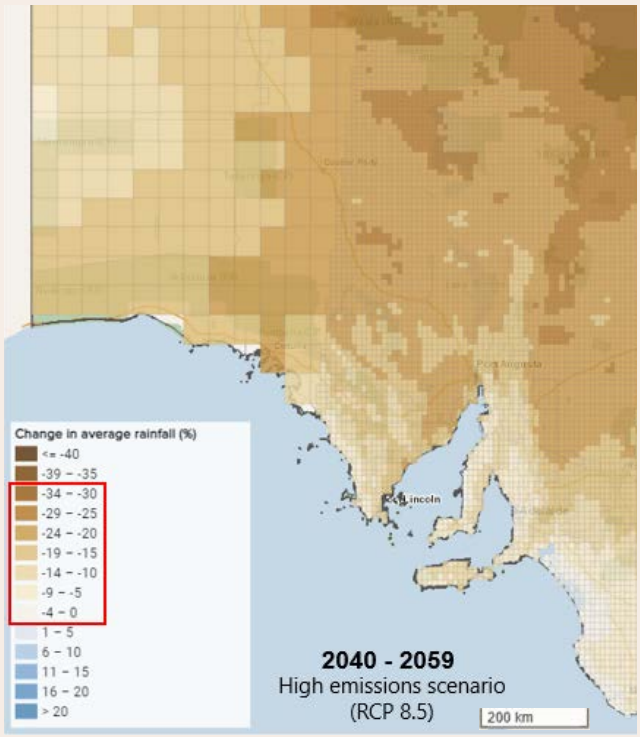
Figure 4: South Australian climate projections.

South Australian climate projections



Projected change in mean daily temperature

Change in average daily mean temperature (°C) | 2040-2059 compared with 1986-2005



Projected change in mean annual rainfall

Change in average rainfall (%) | 2040-2050 compared with 1986-2005

Annual | High emissions scenario (RCP 8.5) |
Climate projection data source NARCIM 1.5 (https://www.climatechange.environment.nsw.gov.au/about-adaptnsw/climate-projections-used-adaptnsw)

By 2070 under all climate projections, annual average minimum and maximum temperatures are likely to increase (between 0.36°C to 2.9°C and 0.5°C to 4.3°C respectively). The mean average PET is projected to increase by between 1.6% to 26%. The majority of rainfall projections predict a decrease in mean annual rainfall by up to as much as 30%.

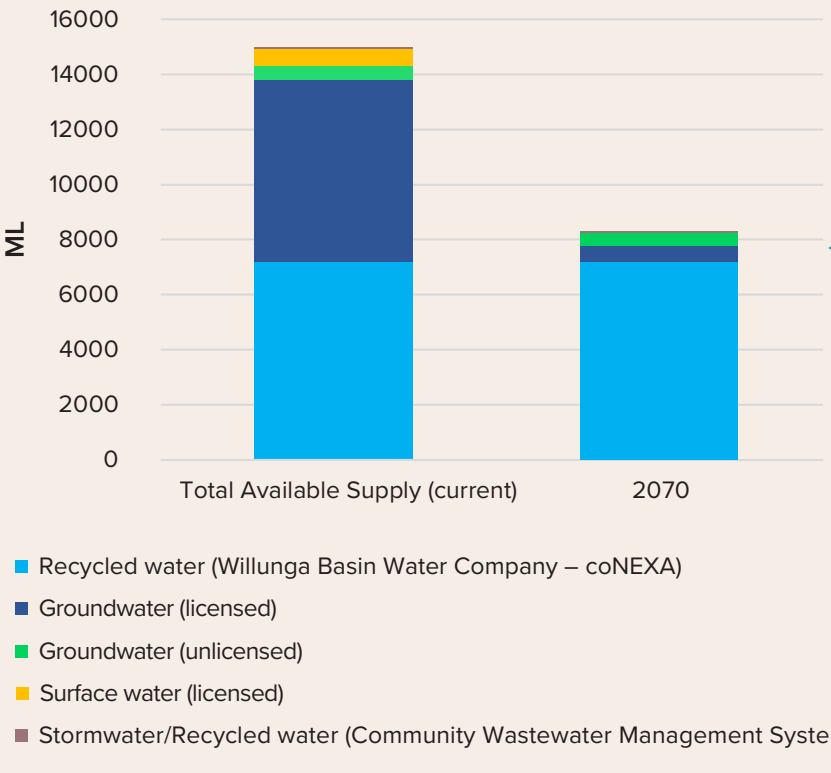
Changes are already evident, with observations over the last decade (2013-2022) showing a decrease in rainfall (2.1%) and increase in PET (4.7%) when compared to the baseline (1976-2005).

A changing climate will likely have an impact on both water supply and demand for water. The following sections take a closer look at some of these possible impacts.

Possible impacts of climate change on current water supply

The two main sources of water for agriculture, environment and open space irrigation in the McLaren Vale region are groundwater and recycled wastewater, with smaller quantities of both surface water and stormwater used (Figure 5). The following section provides a high-level overview of potential impacts a changing climate may have on these sources of water.

Figure 5: Potential impacts on current water supply in 2070 with no further investment.



Reductions in groundwater and surface water supply volumes represented here are based on potential impacts of climate change. This **does not** mean these reductions in groundwater and surface water are going to occur, but rather allows **stress-testing** of a **'worst-case scenario'.**

GROUNDWATER

While groundwater extractions are currently within the volumes allocated (a maximum use of 5,100 ML compared to an allocation of 6,600 ML), this level of use may not be sustainable in the long-term. Future change in recharge has been assessed in relation to a change in rainfall. By 2070, for the three main aquifers, recharge estimates are 2,870 ML for the least severe climate projection, and 570 ML for the most severe (hottest and driest) climate projection. There is a strong desire from stakeholders to protect groundwater aquifers in order to promote the health of groundwater dependent ecosystems and to preserve the resource for its amenity value and for future generations. To meet this desire, for the purposes of the strategy it has been assumed that groundwater take in future years be limited to recharge.

Taking a conservative approach, under worst case climate projections, the groundwater take from the three main aquifers could be limited to 570 ML by 2070. However, it is important to note that this is a conservative assumption that allows us to plan for a worst case scenario, but it does not mean it will happen. While these are only projections, and are based on high-level assumptions, any significant reduction in available groundwater will require a new supply source just to continue business as usual.

The understanding and management of the groundwater resources would benefit from the development of a regional groundwater model.

RECYCLED WATER

Recycled water in the region comes from the Christies Beach and Aldinga Wastewater Treatment Plants (WWTPs) and is provided by the Willunga Basin Water Company (coNEXA). The current supply capacity of the system is 7,200 ML/year. This volume is represented in Figure 5.

While the current supply capacity of the system is 7,200 ML/year, it is important to note that the Christies Beach and Aldinga Wastewater Treatment Plants produce approximately 12,400 ML/year. This means that approximately 6,000 ML/year is currently discharged to the gulf. The following sections of this strategy explore the possible use of this additional wastewater.

While recycled water is a climate independent source of water, its availability will be influenced by population growth. Using a conservative approach, based on a low population projection out to 2070, a volume of 14,600 ML is expected to be available from the Christies Beach and Aldinga Wastewater Treatment Plants doubling the amount currently available (7,200 ML). This estimate has been used as a minimum volume for analysing supply options for this strategy. However higher volumes may be produced if population growth occurs above the low projection. Under a high population projection out to 2070, a volume of 18,100 ML could be available[5].

SURFACE WATER

Small volumes of surface water are used in the McLaren Vale region. A maximum use of 1,202 ML was estimated in 2018-19 compared to an allowable take volume of 1,726 ML. The volumes of surface water available are expected to decline due to a reduction in annual rainfall (Figure 5).

5 See the *McLaren Vale System Water Security Modelling Report* for more information. This will be available when the Strategy is published.

Impacts of climate change on water demand

As the predominant irrigated crop in the region, viticulture demand has been used to project the impacts of climate change on future demand. If the current planted area and irrigation practices were to remain unchanged, based on an average viticulture demand of 10,400 ML (2017-18 to 2021-22), by 2070 the maximum volume of demand could increase by 29.8% to 13,500 ML a year[4].

Future demand profiles have been developed to assess different levels of water use that could occur in the future, based on available agricultural land and the desired future of the region. The demand profiles have been used to project potential demand needs to 2070, which can then be compared to supply options, to inform decision-making into the future. The profiles are set out in Table 1. Each demand profile includes an upper and lower bound to account for potential climate change impacts (see Table 1 and Figure 6). By tracking demand and investing in detailed supply investigations, decisions can be made to address any supply gaps. Figure 6 shows the 4 demand profiles and the potential future volumes needed to meet this demand.

A business-as-usual scenario has been used to project potential demand volumes in 2070 based on current water using activities in the region, if current planted area and irrigation practices remain unchanged.

Water demand is expected to increase to meet greening targets for cooling and liveability of suburban areas and address the impacts of rising temperatures. In all growth scenarios, water use for green space irrigation has been assumed to double by 2045[5].

The vision for the region is for diversification of industries, particularly to build resilience against market shocks. If other irrigated crops were to be planted, these would most likely have a higher irrigation requirement than grapevines. Even with a reduction in the area of grapevines planted, demand could significantly increase should other crops be planted in their place, or in areas of vacant agricultural land. A low diversification and high diversification demand profile have been used to project the range of potential volumes should crops diversify in the future.

The projected demand based on the 4 demand profiles ranges from a minimum of 9,100 ML for a business as usual scenario, to a maximum of 58,900 ML for a high diversification scenario (see Figure 6).

Analysis of supply vs demand

When comparing the projected volumes for the demand profiles to the supply volumes with no investment in additional water sources (see Figure 7), and taking into account reducing native water supplies, a shortfall is expected even in a 'business as usual' scenario and therefore investment in alternative water sources will be required. In the 'worst-case' supply scenario, with no action taken, the available supply volume in 2070 is approximately 8,000 ML (as demonstrated in Figure 5 and Figure 7), while the demand under business as usual is 9,100 ML to 15,400 ML (see Table 1). This illustrates a potential shortfall of between 1,100 ML and 7,400 ML just to maintain business as usual. In the high diversification demand profile, the shortfall could be as high as 50,000 ML.

Table 1: Demand scenarios under climate change for 2070.

	Scenarios ● wine grapes ● other irrigated crops ● suitable unplanted land	Business as Usual	High Viticulture	Low Diversification	High Diversification
					
Demand Components	**Viticulture**	Viticulture area and water use remains the same **(7,377ha = 10,400 ML)**	Viticulture area and water use expands until all suitable land is used **(12,161ha = 17,100 ML)**	Viticulture area expands to all suitable land, except for land for other irrigated agriculture **(10,697ha = 15,100 ML)**	Viticulture area declines to half of all available land **(6,080ha = 8,500 ML)**
	Other irrigated agriculture	Other irrigated agriculture area and water use remains the same **(523ha = 700 ML)**	Irrigated agriculture area declines until no area remains **(0ha)**	Irrigated agriculture area expands to a moderate level of growth, water used for high-value water-intensive crops **(1,464ha = 8,300 ML)**	Irrigated agriculture area expands to half of all available land, water used for high-value, water-intensive crops **(6,080ha = 35,000 ML)**
	Stock and domestic	Stock and domestic water use stays the same **(500 ML)**	Stock and domestic water use is 20% higher **(600 ML)**	Stock and domestic water use is 20% higher **(600 ML)**	Stock and domestic water use is 20% higher **(600 ML)**
	Urban greening	Urban greening water use stays the same **(500 ML)**	Urban greening use doubles by 2045 and continues increasing at same rate **(1,800 ML)**	Urban greening use doubles by 2045 and continues increasing at same rate **(1,800 ML)**	Urban greening use doubles by 2045 and continues increasing at same rate **(1,800 ML)**
	Estimated volume by 2070 (current climate)	**12,100 ML**	**19,500 ML**	**25,800 ML**	**45,900 ML**
	Estimated volume by 2070 (with climate projections)*	**9,100 ML – 15,400 ML**	**14,900 ML – 24,600 ML**	**19,600 ML – 32,900 ML**	**34,200 ML – 58,900 ML**

* The range for each demand scenario represents the upper and lower volume bounds from climate change analysis

Figure 6: Demand scenarios under climate change for 2070.

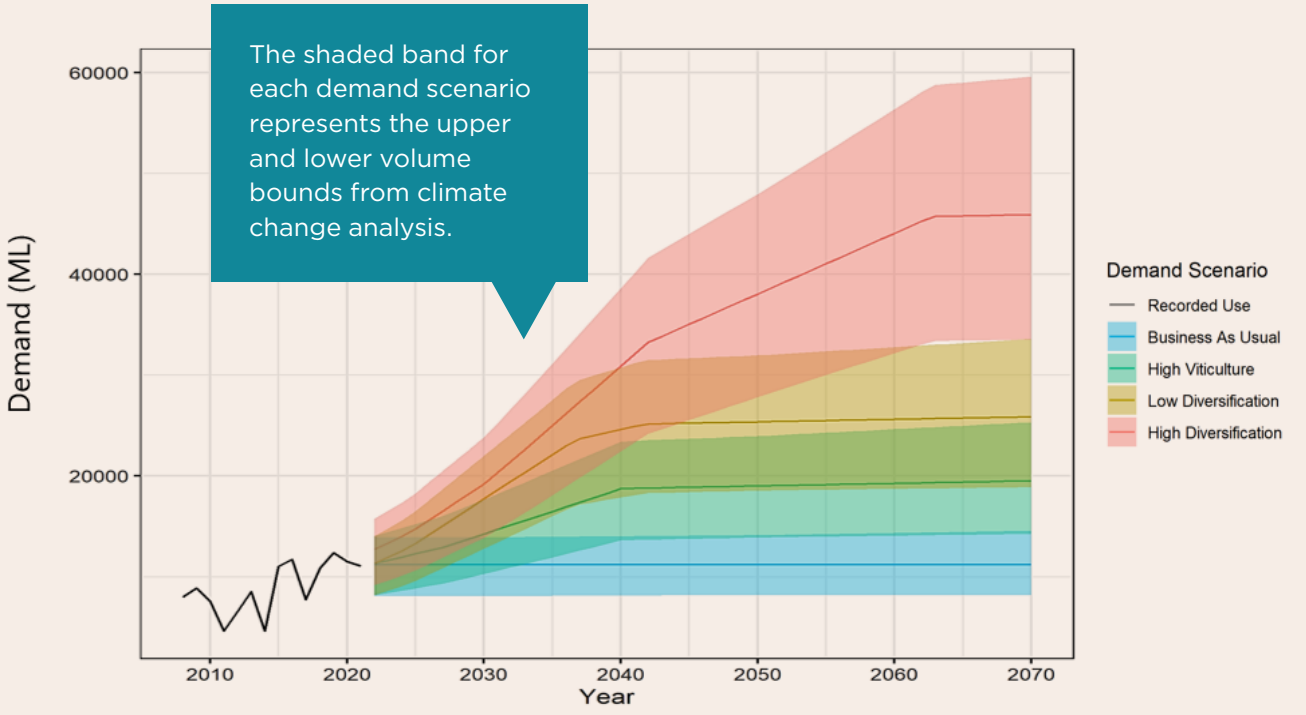
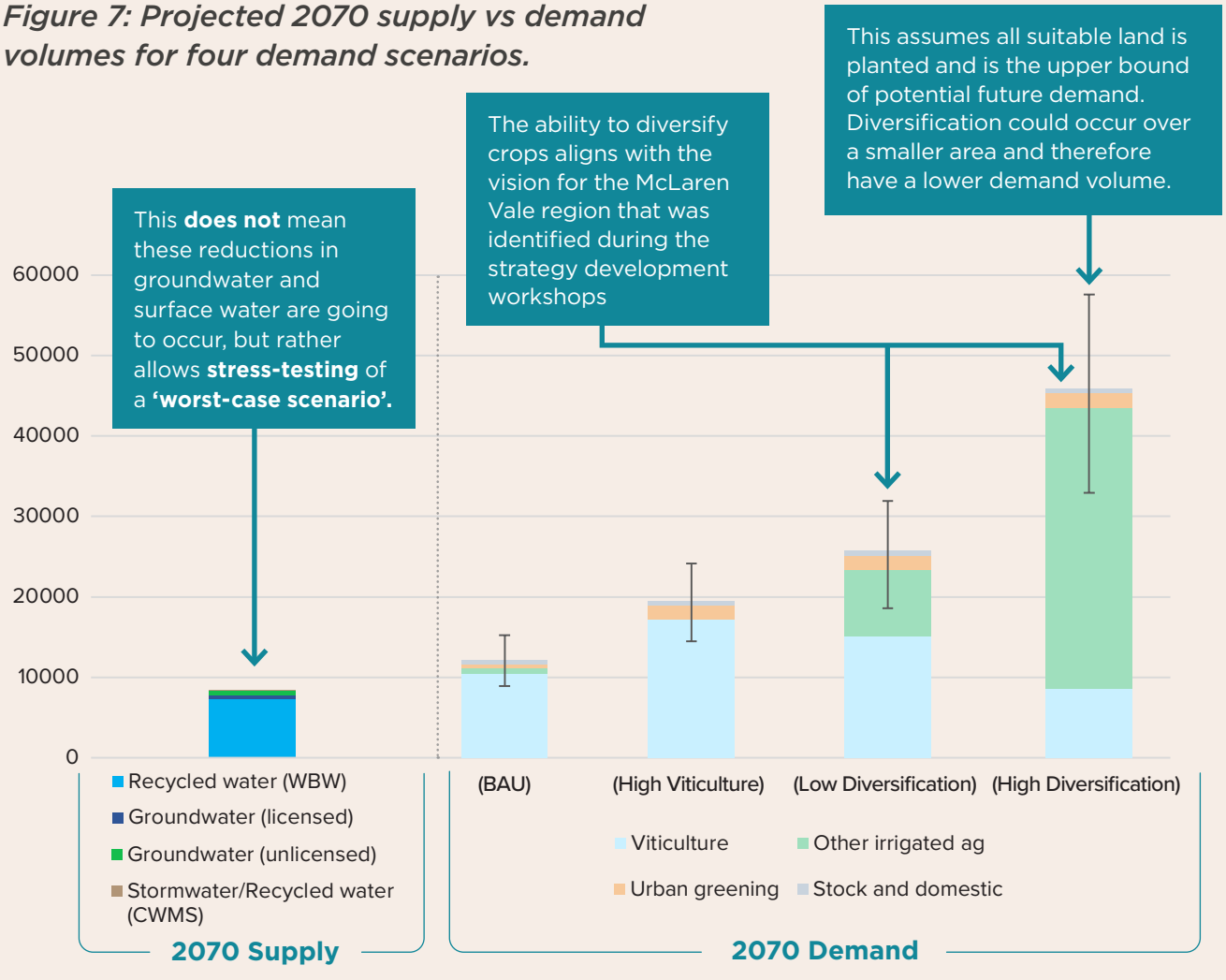


Figure 7: Projected 2070 supply vs demand volumes for four demand scenarios.



Options to deliver water security

Potential supply options have been compared to consider how best to meet the projected gap in supply and demand. In some of the high-water demand scenarios, the analysis shows significant investment in supply options is required to meet the projected demand volumes. Furthermore, if there are reductions in groundwater and surface water, due to climate change, significant investment will be needed just to enable 'business as usual' to continue.

The options considered are in addition to existing system capacity. To meet the vision for the McLaren Vale region, eight potential water supply options have been ranked[6] and include increased use of recycled wastewater from the Christies Beach and Aldinga Wastewater Treatment Plants, recycled water through the Community Wastewater Management Schemes (primarily for urban greening), stormwater harvesting (primarily for urban greening), seawater desalination and imported River Murray water (via purchase of allocations and new delivery infrastructure).

1. Recycled water – wastewater treatment
2. Recycled water - Community water management schemes
3. Stormwater capture and use
4. Seawater desalination
5. Imported River Murray Water
6. SA Water non-residential supply
7. Surface water
8. Groundwater

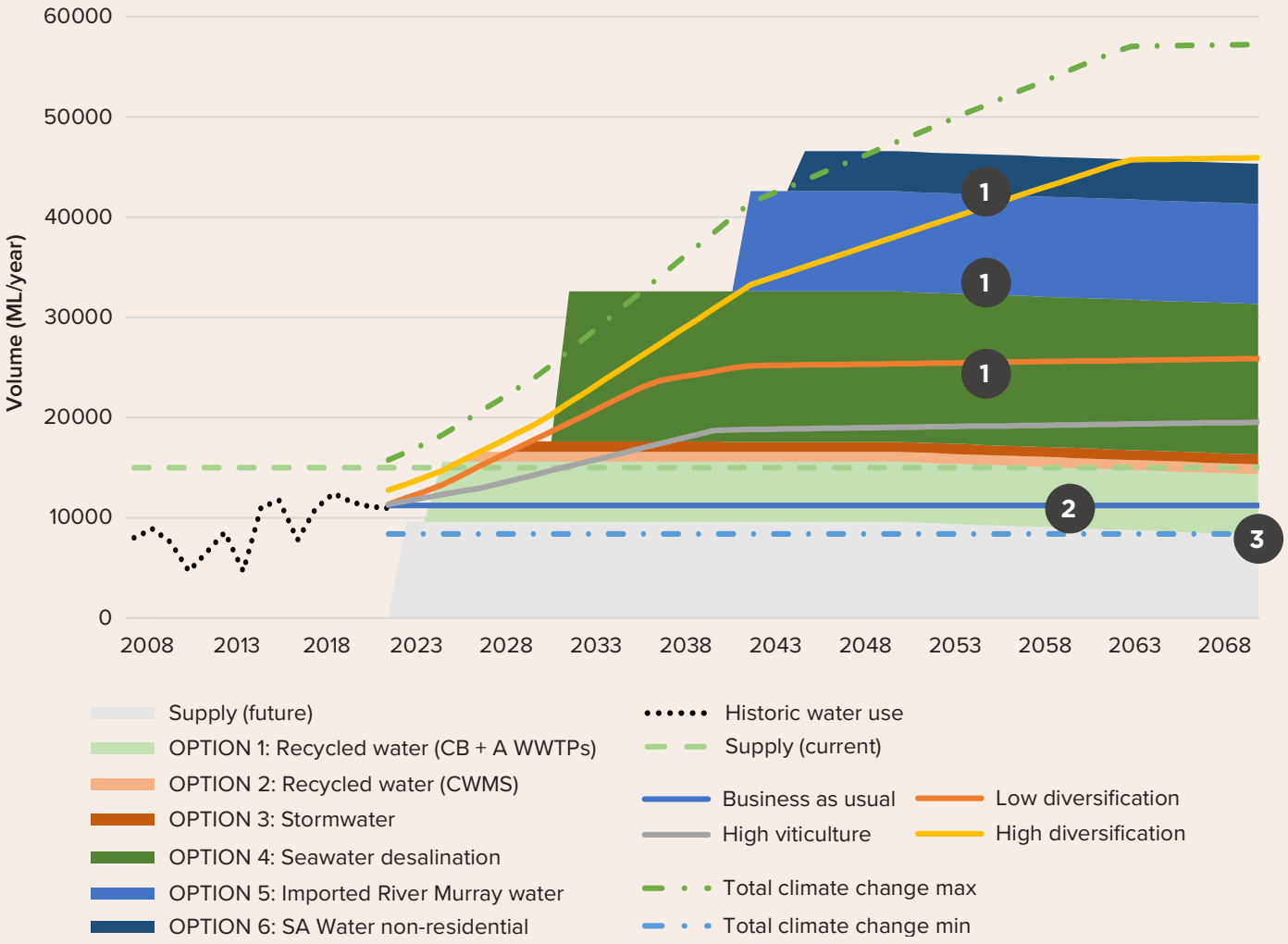
Due to the limitations on the availability of regional data for water supply options, the analysis undertaken was based on a rapid demand assessment. Further steps are recommended to enable a full economic assessment and options analysis (see Actions 1 to 5 in Strategic priority areas and outcomes).

Recommended next steps based on this analysis are included as actions in the next section – Outcomes and actions.

6 See the *McLaren Vale System Water Security Modelling Report* for ranking criteria. This will be available when the Strategy is published.

Figure 8: McLaren Vale regional vision portfolio of water source options (illustrative purposes only).

Note: Additional surface water and groundwater extraction are not included due to existing pressure on these resources and the need to reduce reliance.



1

Volumes are for illustrative purposes only. Further work is needed to assess viability and associated yields (See Actions 2-4).

2

Analysis undertaken in development of this strategy indicates the first option for increasing available water should be maximising the use of recycled water from the Christies Beach and Aldinga Wastewater Treatment Plants.

3

In a 'worst-case' scenario, future reductions in groundwater and surface water availability may not be enough to support 'business as usual'.

Outcomes and actions

Vision, themes and goals

The shared vision for the McLaren Vale region was developed through the workshop process. This vision was then broken down in four key themes:

- Integrated Water Management
- Circular Economy
- Urban and Rural Landscapes
- Healthy Land and Coastal Ecosystems.

Key goals were then developed for each theme. These goals were considered integral to realising the shared vision for the McLaren Vale region.

VISION

The McLaren Vale region is a vibrant place to live, work and visit, where:

- Resilient water sources, managed in an integrated way, deliver affordable zero carbon water supply in a changing world.
- Coastal ecosystems and land biodiversity are flourishing, supported by native vegetation, healthy waterways, and no wastewater outflow to the sea.
- Rural character has been preserved and enhanced by green streets, parks, and open spaces, which keep all suburbs cool and liveable.
- All businesses are part of a clean, green, diverse, and circular economy, that is renowned for its wine, food, and tourism.
- First Nations' voice, values and cultural knowledge are respected and integrated into decision-making to help effectively manage land, water, and coast.
- Collaboration and a culture of shared responsibility persist, allowing technology and opportunities for innovation to be embraced.

THEME	GOAL
Integrated Water Management	A. No wastewater outflow to the sea (A) B. Integrated and holistic supply network that allows all water sources to be optimised and used in a fit-for-purpose manner (B) C. A shared responsibility for water management persists (C)
Circular Economy	D. The economy is circular, diversified and industries are sustainable, including closed loop water use through an integrated water network (D) E. Water resource education and knowledge sharing has created behaviour change (E) F. Excess housing runoff is reused locally for greening and habitat (F)
Urban and Rural Landscapes	G. Preservation of the rural character of the region is prioritised in the planning of new development and population growth (G) H. Green spaces are an integral component of the region that provide cool and liveable streets (H) I. Fertile land has been protected for agriculture (I) J. The agricultural sector is diverse and thriving (J)
Healthy Land and Coastal Ecosystems	K. Networks of native vegetation corridors are increased and valued (K) L. The region values and transitions to native water-wise gardens (L) M. Flood and fire impacts are minimised (M) N. Environmental flows support healthy water-dependent ecosystems (N) O. Coastal ecosystems are protected and enhanced through no wastewater outflows to the Gulf (O)

Actions

The actions to achieve the goals and vision, developed through the workshop process, have been assigned into one of the following categories[7]:

- Priority water security actions (Table 2) – these are actions that have a direct and significant impact on supply and/or demand. These actions will need to be prioritised in the implementation phase that follows the strategy.
- Secondary water security actions (Table 3) – these actions have an indirect or less significant impact on supply and demand.
- Complementary water security actions (Table 4) – these actions may not be directly linked to supply or demand, but they are important to achieve the vision set out for the McLaren Vale region.

The first five actions identified on the following page (Table 2) arose from the economic options analysis. These actions aim to fill the technical and economic data gaps around demand and supply and feasibility of potential alternative water supply options. Undertaking these actions will be of critical importance to the water security of the region and could be utilised in any update and revision of this Strategy to guide future investment in water security projects.

7 See *the McLaren Vale System Water Security Modelling Report* for more information explaining the approach used in developing the Strategy and how actions were developed. This report willl be made available when the Strategy is published.

Priority water security actions

Priority water security actions have a direct and significant impact on supply and/or demand. These actions will need to be prioritised in the implementation phase that follows the strategy.

Table 2: Priority water security actions and links to the goals and themes.

Actions	Goal (see page 25)
1. Undertake targeted demand assessment that will underpin the economic assessment of prioritised supply options.	B D H N
2. Determine region-specific capital expenditure, operational expenditure, and yield (in ML) for additional supply options.	B D
3. Undertake economic and financial modelling for selected water infrastructure concepts to develop a prioritised list of options, particularly the exploration of options to increase the use of recycled wastewater.	A B D O
4. Develop the adaptive investment pathways for the region, including triggers and decision points.	B D
5. Develop business case(s) for the selected supply option(s).	B D
6. Establish a collaborative governance model that includes state government, local government and water businesses that supports integrated water management.	B D
7. Explore opportunities to integrate water sources for improved resilience, with consideration of equity around pricing and access.	B D

Actions	Goal (see page 25)
8. Increase storage capacity to store water outside of peak times.	
8.1. Seek funding to undertake a pilot project to investigate the feasibility of managed aquifer recharge (MAR) with a range of water sources.	A B D F O
9. Explore options to manage wastewater and stormwater discharge to protect the marine environment.	A B D O
10. Advocate for integrated water management principles and prescription of all water uses as part of the Western Mount Lofty Ranges Water Allocation Plan amendment.	B C E N
11. Investigate technology that supports digital monitoring and real-time data around the quality and quantity of water for all types of water use, with equitable access to this data.	B D
12. Explore legislative reform that improves alignment between instruments to support integrated water management.	B D
13. Meter and monitor all bores, including stock and domestic bores.	B D

Secondary water security actions

Secondary water security actions have an indirect or less significant impact on supply and demand.

Table 3: Secondary water security actions and links to the goals and themes.

Action	Goal
14. Explore the local reuse of wastewater and stormwater from new and existing developments for green spaces and habitat.	A B D F G H O
15. Explore opportunities to further improve and promote water use efficiency, including through new technology, crop selection and irrigation practices.	B D E J
16. Increase community understanding of water security and promote water efficiency across the region through education, rewards and incentives.	C E L
17. Revisit circular economy initatives and advocate that they include exploring opportunities for the circular reuse of water.	A B D F O
18. Identify and protect areas to meet greening targets, including through legislative reform.	B F G H
19. Develop an environmental watering plan that:	
19.1. is informed by a stocktake of the health of waterways and an assessment of the key areas requiring environmental flows.	N
19.2. sets out options to deliver environmental flows and flow regimes.	

Complementary water security actions

Complementary water security actions may not be directly linked to supply or demand, but they are important to achieve the vision set out for the McLaren Vale region.

Table 4: Complementary water security actions and links to the goals and themes.

Action	Goal (see page 25)
20. Enhance biodiversity of the region by: **20.1.** developing a native flora and fauna management plan, incorporating First Nations knowledge. **20.2.** encouraging landholders to protect and enhance native vegetation on their properties, including via business opportunities. **20.3.** promoting the transition to native and waterwise gardens.	C E F J K L N
21. Undertake planning that builds resilience for areas vulnerable to extreme events via: **21.1.** flood management planning, including potential restrictions on developments along floodplains. **21.2.** developing a bushfire management plan, incorporating First Nations knowledge and practices.	B M
22. Ensure that policies and planning legislation support: **22.1.** the retention of rural character. **22.2.** maintaining the Character Preservation Zone to protect agricultural land from development.	G H I J
23. Advocate for updated building standards that require climate sensitive housing developments.	B D F G H
24. Continue to partner with representative groups to ensure a coordinated and agile approach to marketing and its local produce.	D J
25. Collaborate across the region to activate enablers to innovation, circularity, and diversification and to maximise opportunities to attract investment.	D J
26. Identify pathways to diversify and value add to support a sustainable and thriving agricultural sector and increase the value of fertile land.	D I J
27. Explore opportunities for First Nations agricultural businesses.	D I J

Progressing the priority actions

As the availability of native water sources potentially declines over time, accessing new water supply options will become increasingly important. Priority Actions 1-5 outline a comprehensive body of work that would assess all possible supply options, accompanied by robust economic and financial modelling, and would ultimately result in the development of pathways to deliver water security for the region. While the development of these pathways is recommended, there are a number of indicators that suggest an initial focus and prioritisation should be given to maximising the use of recycled wastewater. These indicators include:

- analysis undertaken in the development of this strategy.
- a strong community desire to protect the native water resources.
- the emerging 'salinity hot-spots' risk.
- community desire to limit the amount of wastewater discharged to the gulf.
- the availability of significant volumes of unused recycled water.
- the work already being undertaken as part of the McLaren Vale Irrigation Water Security Project.

Key recommendation

Develop governance arrangements to progress initial priorities set out in the Strategy, particularly in relation to investigating potential pathways for the viable expansion of recycled wastewater in the McLaren Vale region. Governance membership should include representation from the City of Onkaparinga, Willunga Basin Water Company, McLaren Vale Grape, Wine & Tourism Association, the Hills & Fleurieu Landscape Board, the Department for Environment and Water, the Department of Primary Industry and Regions, and SA Water. Governance should also include community and grower representation with membership to be sought through an expression of interest (EOI) process.

Next steps

Many established groups, partnerships and activities are in motion and proposed next steps will build on these. For example, a detailed business case assessing the feasibility of increasing the available storage capacity for recycled wastewater has been submitted to the National Water Grid Authority for funding consideration. In addition, the McLaren Vale Water Allocation Plan has been reviewed and will be incorporated into the Western Mount Lofty Ranges Water Allocation Plan as part of the amendment process that is now underway. This will support the sustainable and integrated management of groundwater, surface water and imported water.

To ensure efficient and integrated delivery, it is recommended that an Implementation Plan be developed to progress the actions set out in this strategy, taking into account the activities that are underway. The implementation of actions set out in this strategy requires strong community leadership and oversight to ensure progress towards the shared future vision for the McLaren Vale region.

Acronyms

BAU	Business as Usual	**LGA**	Local Government Area	**SURS**	Southern Urban Reuse Scheme
CoO	City of Onkaparinga	**PET**	Potential Evapotranspiration	**WBWC**	Willunga Basin Water Company
CWMS	Community Wastewater Management System	**PWA**	Prescribed Wells Area	**WMLR PWRA**	Western Mount Lofty Ranges Prescribed Water Resource Area
GI zone	Graphical Indication zone	**RCP**	Representative Concentration Pathway	**WWTP**	Wastewater Treatment Plant