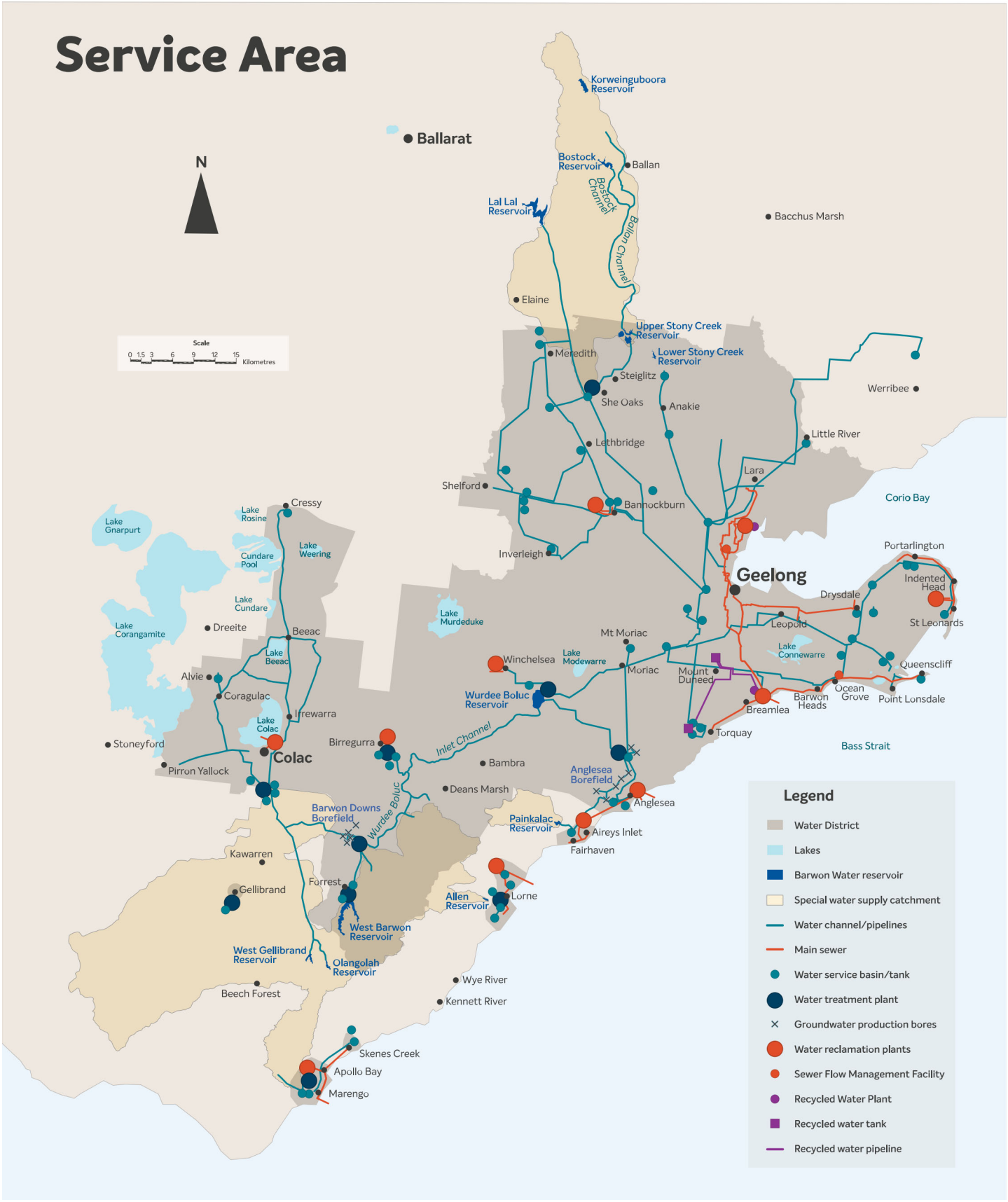
Barwon Downs borefield

Background

The Barwon Downs borefield consists of six production bores that connect to an underground aquifer, ranging from 300 to 630 metres deep. The borefield was a crucial emergency water source called on for greater Geelong when surface storages were low.

In 2007, at the height of the worst drought on record, Geelong's water storages dropped to just 14% with the borefield, at times, providing up to 70% of the city's daily drinking water.

Our licence to operate the Barwon Downs borefield was issued by Southern Rural Water in 2004 and was due to expire in June 2019.


Service Area
N
Scale
0 1.5 3 6 9 12 15
Kilometres
Ballarat
Korweinguboora Reservoir
Bostock Reservoir
Ballan
Bostock Channel
Ballan Channel
Lal Lal Reservoir
Bacchus Marsh
Elaine
Upper Stony Creek Reservoir
Meredith
Lower Stony Creek Reservoir
Steiglitz
She Oaks
Anakie
Werribee
Little River
Lethbridge
Lara
Shelford
Bannockburn
Corio Bay
Inverleigh
Portarlington
Geelong
Indented Head
Drysdale
St Leonards
Leopold
Lake Connewarre
Queenscliff
Ocean Grove
Barwon Heads
Point Lonsdale
Breamlea
Torquay
Bass Strait
Mount Duneed
Moriac
Mt Moriac
Lake Modewarre
Winchelsea
Lake Murdeduke
Wurdee Boluc Reservoir
Inlet Channel
Bambra
Deans Marsh
Anglesea Borefield
Anglesea
Aireys Inlet
Fairhaven
Painkalac Reservoir
Lorne
Allen Reservoir
Forrest
Barwon Downs Borefield
Wurdee Boluc
Kawarren
Gellibrand
West Barwon Reservoir
West Gellibrand Reservoir
Olangolah Reservoir
Beech Forest
Wye River
Kennett River
Skenes Creek
Apollo Bay
Marengo
Birregurra
Colac
Stoneyford
Pirron Yallock
Lake Colac
Irrewarra
Alvie
Coragulac
Beeac
Lake Beeac
Dreeite
Lake Corangamite
Lake Cundare
Cundare Pool
Lake Weering
Lake Rosine
Cressy
Lake Gnarpurt
Legend
Water District
Lakes
Barwon Water reservoir
Special water supply catchment
Water channel/pipelines
Main sewer
Water service basin/tank
Water treatment plant
Groundwater production bores
Water reclamation plants
Sewer Flow Management Facility
Recycled Water Plant
Recycled water tank
Recycled water pipeline

Barwon Downs borefield

Licence application submission

Barwon Water submitted its groundwater licence renewal application to Southern Rural Water in late November, 2018.

The licence application was developed over the past six years with broad community engagement as well as a comprehensive scientific monitoring program and supporting technical studies.

Barwon Water has undertaken a thorough community consultation process, which included establishment of the Barwon Downs borefield community reference group, community information sessions, briefings with regulatory agencies and Landcare groups and three independently facilitated community and stakeholder workshops.

Licence application withdrawal

Barwon Water shares the same concerns as the community about the environment and are committed to the remediation of confirmed historical impacts caused by groundwater pumping.

To this end, we announced in mid-March 2019, that the licence application for the Barwon Downs borefield would be withdrawn.

Barwon Water is also now comfortable that enough protection is in place to prevent other parties from accessing the resource at this time.

Based on this, Barwon Water is now focusing wholly on the remediation process.


Acid Sulphate Soils
Barwon Water installed four new PASS monitoring sites in 2014 and has continued to monitor them.
Objective
To have a baseline condition assessment of four PASS monitoring sites so potential changes to the sites can be monitored to understand key drivers.
Findings
Monitoring has confirmed that there is no actual acid sulphate soils outside Yeodene swamp, and conclude that:
Groundwater quality has not changed.
Groundwater levels fluctuate in line with the seasons.
Changes in surface water salinity were consistent with seasonal changes.
Barwon Water will establish a new ASS monitoring site in the Porcupine Creek catchment for ongoing monitoring as a precautionary measure.
Yeodene (Big) Swamp
What is the Yeodene peat swamp?
Boundary Creek runs through a peat swamp containing naturally occurring Acid Sulphate Soils. Over the past two decades this swamp has experienced:
very dry conditions during the Millennium drought contributing to a reduction in inflows across the catchment and increased evapo-transpiration from the swamp;
pumping from the Barwon Downs deep aquifer, together with supplementary flow releases to Boundary Creek;
Peat fires in 1997, 1998 through to 2006
The cutting of deep trenches through and around the swamp for fire control by the CFA
Why is this an issue?
Technical studies have confirmed that this swamp contains acid sulphate soils, causing water downstream of the swamp to be highly acidic.
What is Barwon Water doing about this?
Barwon Water is investigating potential remediation measures to mitigate these impacts. This study will complete a significant missing element of the Boundary Creek catchment and will be completed by late 2017.
Vegetation monitoring
Completed studies:
Tree water use study
vegetation monitoring (2016)
vegetation monitoring (2016)


Technical and community issues that need to be addressed


Previous
Next

Questions and answers

Where is Barwon Water going to source its water if we cannot access Barwon Downs?

Barwon Water changed its approach to how it would call upon the Barwon Downs borefield more than a year ago.

The Melbourne to Geelong Pipeline is now our first standby water source to supplement existing surface water supplies.

We will be accessing 1.3 billion litres (1.3 gigalitres) of water from our Melbourne Yarra-Thomson allocation to the end of June 2019 and may continue to access water from Melbourne after this depending on rainfall.

We are investing in a new pump station at Lovely Banks to ensure more water from the Melbourne to Geelong Pipeline can be transferred across our network into areas not previously supplied by the pipeline. However, the water will still not be able to be transferred to the southern areas of Geelong or the Bellarine Peninsula. The capacity of the Melbourne Geelong Pipeline is only sufficient to meet approximately half of the total Geelong region water demand.

Will Barwon Water apply for a groundwater licence for Barwon Downs once remediation has been completed?

Barwon Water will reassess the possibility of submitting another licence application post the successful completion of remediation.

Any future application would be subject to the same statutory processes for assessment of the application at that time. The community will be engaged prior to any future application to again seek their input.

What is the permissible consumptive volume (PCV)?

The PCV is the cap on the amount of groundwater that can be extracted from a groundwater system. Any groundwater licence issued must not result in this cap being exceeded.

The Department of Environment Land Water and Planning (DELWP) is currently undertaking a review of the PCV for the Gerangamete groundwater management area.

Will Barwon Water maintain the production bores and the Gerangamete Treatment Plant once the licence expires on 30 June 2019?

Yes, Barwon Water will continue to maintain all existing infrastructure in relation to the Barwon Downs borefield for the time being.

Questions and answers

Barwon Water made a number of proposed commitments in its licence application such as an investigation of the east branch of the Barwon River. What will happen to these commitments now there is no licence application?

We will be undertaking a review of how we best deliver the commitments made in our application while progressing as fast as we can with the remediation.

Has the licence been withdrawn?

Yes, Barwon Water wrote to Southern Rural Water in late March, 2019 formally requesting to withdraw its licence application.

When was the last time the borefield was operated?

The borefield has not been used since 2016.

How much water has been extracted?

To date, Barwon Water has extracted the following volumes from the aquifer:

- 3,652 ML from February to April in 1983 due to drought;
- 19,074 ML during a long term pump test in the late 1980s;
- 36,817 ML during the 1997 - 2001 drought;
- 52,684 ML during the 2006 – 2010 millennium drought, and
- 3,449 ML in 2016 to boost storages after a record dry summer.

Groundwater extraction has supplemented surface water supply by a total of 115,676 ML.

If dry conditions continue what are the next steps for ensuring water security for the region?

Barwon Water is currently operating the Melbourne to Geelong Pipeline to supplement declining surface water storage levels.

In response to our regions continuing dry climate, we will be engaging with the community over the next few years around a range of options to ensure long term water security for the region.

Barwon Water encourage customers, community and visitors across the region to continue to do their bit to conserve and preserve water including following our Permanent Water Saving Rules.

What happens if there is a natural disaster (such as a bushfire) and Barwon Water needs to access water, can they access the Barwon Downs borefield?

This would require ministerial approval.

Boundary Creek and Big Swamp remediation project

Barwon Water is committed to the remediation of Boundary Creek and Big Swamp, addressing the impacts of historic groundwater extraction.

Boundary Creek is a tributary of the Barwon River. About 18 kilometres long, it flows east through Barongarook, and joins the Barwon River at Yeodene, about 16 kilometres south-east of Colac.

Big Swamp (also known as Yeodene Swamp) is a peat swamp on Boundary Creek. The swamp is located about four kilometres upstream from the confluence of Boundary Creek and the Barwon River.

Recent technical work has confirmed that pumping from the Barwon Downs borefield – combined with the effects of a dry climate – led to a reduction in flows to Boundary Creek. Studies have also confirmed that the drying of Big Swamp due to the reduction in flows, activated acid sulfate soils in Big Swamp and subsequent releases of acidic water downstream.

Developing a remediation plan

We are committed to developing a comprehensive remediation plan for the Boundary Creek and Big Swamp environments to improve environmental outcomes for this catchment. The remediation plan is being developed in consultation with a community and stakeholder group and a panel of independent technical experts nominated by the group.

Remediation working group

Barwon Water has proactively been working with a dedicated working group comprised of community members and representatives from local agencies and environmental groups, including Traditional Owners, Boundary Creek landowners, LAWROC (Land and Water Resources Otway Catchment), PALM (People for a Living Moorabool), the Upper Barwon Landcare Network, Colac Otway Shire Council and the Corangamite Catchment Management Authority. This group has met five times since May, 2018.

Independent expert advice

The remediation working group also benefits from the advice of three independent technical experts, nominated by the group Dr Vanessa Wong (Monash University), Professor Richard Bush (Newcastle University) and Dr Darren Baldwin (independent consultant, visiting adjunct professor, Charles Sturt University.

Section 78 Ministerial Notice and scope of works

In September 2018, Barwon Water received a directive from the Minister for Water, pursuant to Section 78 of the Water Act 1989. The notice directs Barwon Water to:

- prepare and implement a remediation and environmental protection plan for Boundary Creek, Big Swamp and the surrounding area, and
- discontinue any extraction activities (other than for maintenance and emergency response purposes) while the assessment is being completed and until all remediation work dictated under the remediation plan has been completed.

Barwon Water welcomed the notice for a legally enforceable remediation plan, noting that it had already been working proactively on activities consistent with these objectives.

In accordance with the notice, we submitted a draft scope of works to prepare the remediation plan to Southern Rural Water in late 2018.

The draft scope of works outlines the area proposed to be covered by the remediation plan, the environmental values to be included and the necessary environmental assessments and methodology proposed to develop the remediation plan.

In developing the draft scope of works, we considered:

- all appropriate hydrogeological, hydrological and geochemical assessments
- community input via the Boundary Creek and Big Swamp remediation working group and nominated expert panel
- feedback from Southern Rural Water's independent technical review panel
- the State Environmental Protection Policy (Victorian Waters).

Barwon Water has received preliminary feedback on the draft scope of works from Southern Rural Water. We are still working to refine the area to be covered and the ecological values to be improved.

Environmental assessments and field program

An extensive environmental and scientific field program is due to commence in late April and is expected to take six months to complete.

The field program and environmental assessments aims to resolve information gaps raised as concerns by the working group and use the outcomes of that work to inform a remediation approach for the Boundary Creek and Big Swamp catchment.

Barwon Water will provide monthly updates to the remediation working group and meet with the group again in the coming months to provide an update on the field program and what the preliminary results are telling us.

Questions and answers

How long will it take to undertake remediation?

It is likely that remediation will take several years. The environmental assessments being undertaken over the next year will enable the timeframe to be confirmed.

Who determines if remediation is successful?

The remediation of Boundary Creek and Big Swamp is enshrined under Section 78 of the Water Act 1989 issued by Southern Rural Water on behalf of the Minister for Water.

The notice remains in effect until Barwon Water can demonstrate to the satisfaction of Southern Rural Water that the remediation plan has been implemented and the agreed measures and outcomes have been achieved.

What is involved in the remediation plan?

The remediation of Boundary Creek and Big Swamp aims to improve environmental outcomes for this catchment.

The plan is being developed in consultation with a community and stakeholder group and a panel of independent technical experts nominated by the group.

Presently, a number of environmental assessments are being undertaken to better understand what remediation options would be most successful for the affected catchment.

Following the completion of these assessments, Barwon Water in conjunction the working group and independent experts, will develop a remediation plan and submit this to Southern Rural Water.

Barwon Water will keep the working group informed of this important project with monthly updates via its Your Say at Barwon Water site.

What is the area of impact?

Right now, we're focusing on the Boundary Creek and Big Swamp catchment where we know we've had a confirmed impact.

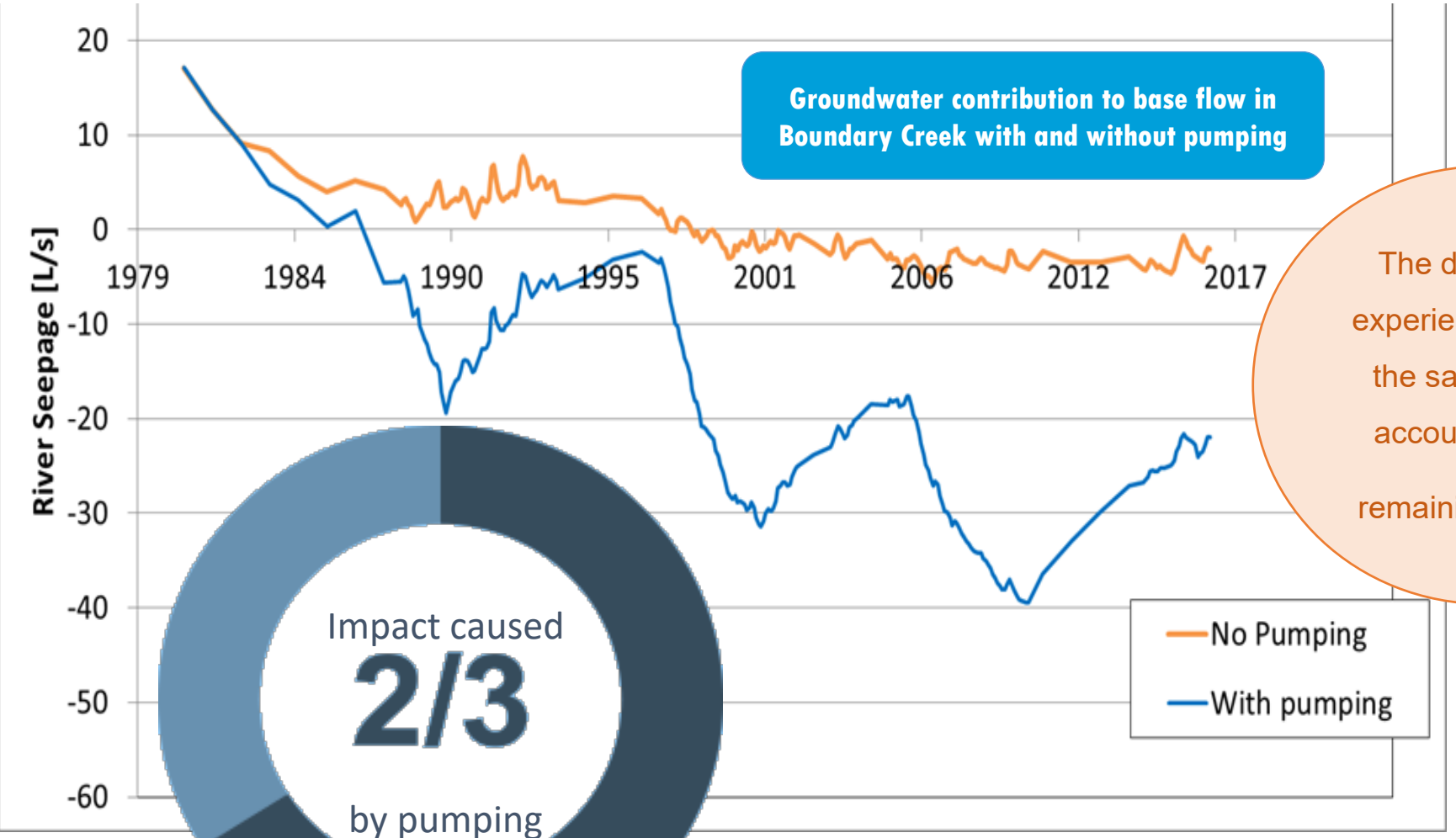
We know from our remediation working group they are concerned about other areas, such as the east branch of the Barwon River and Gellibrand River.

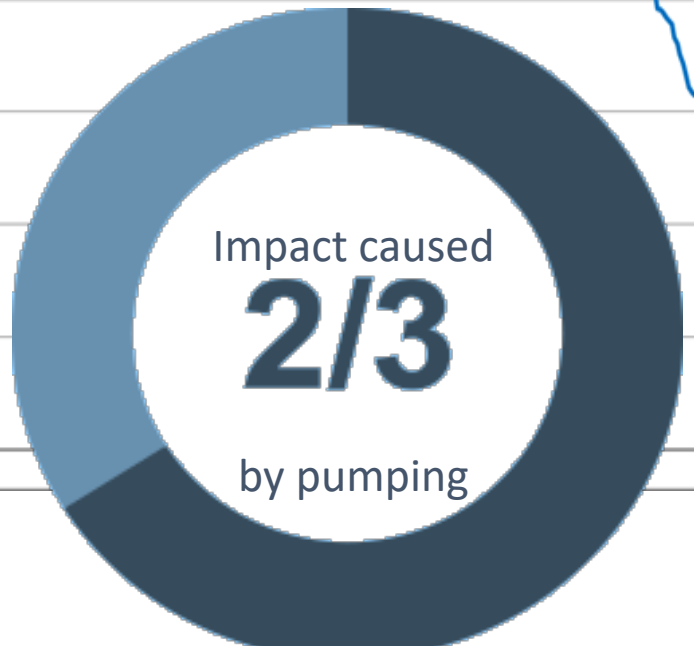
While remediation for confirmed impacts is underway, we will further investigate other areas of concern.

The remediation working group agreed with this approach at its last meeting.

We are using an adaptive management approach and as more information becomes available, we will use this to improve the remediation plan.

Historical impact to Boundary Creek from pumping



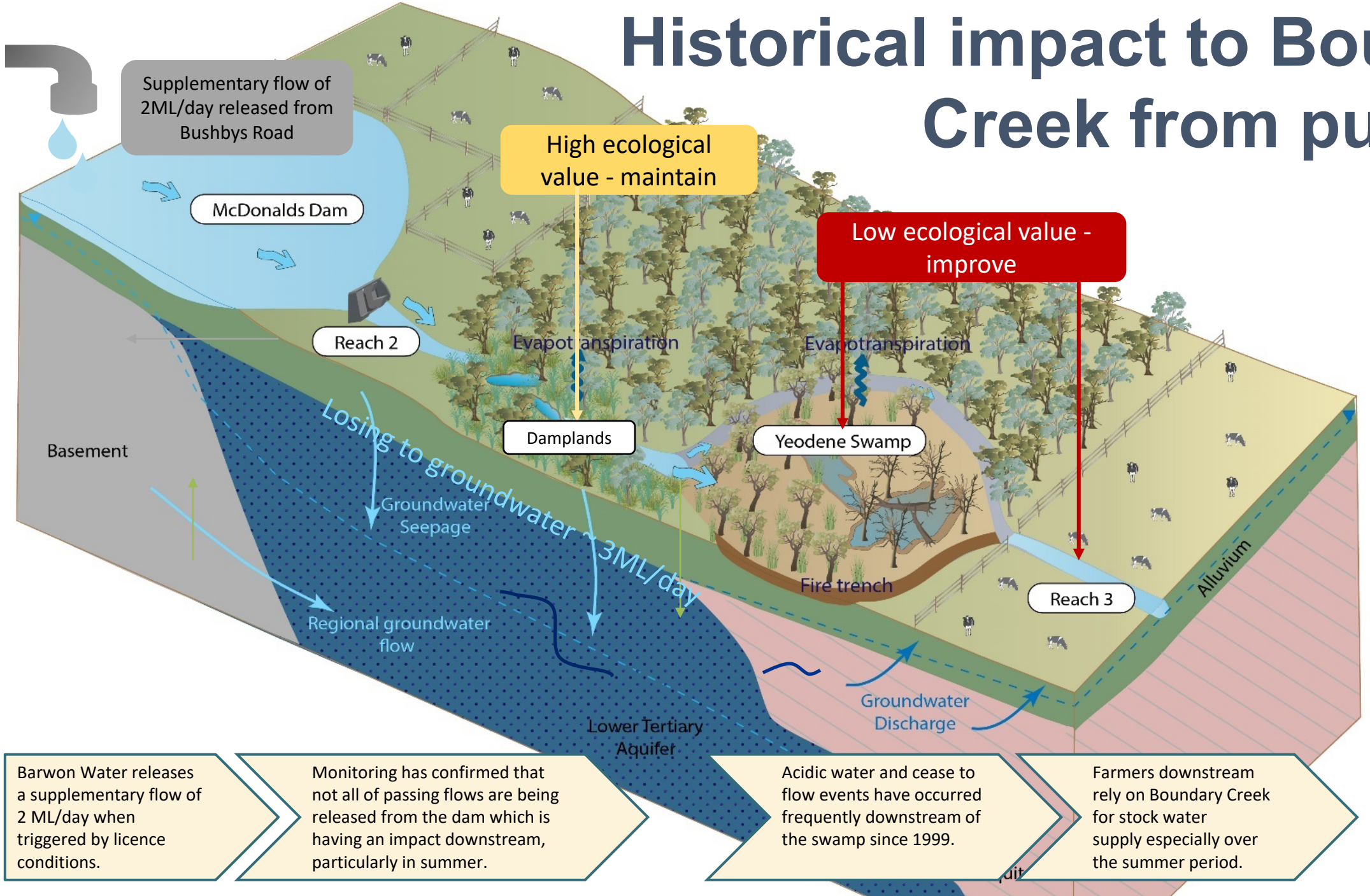


Pumping over the past 30 years has been responsible for **two thirds** of the reduction of base flow into Boundary Creek.

The dry climate experienced during the same period accounts for the remaining **third**.

Pumping has increased the **frequency and duration of no flow periods** in the lower reaches of Boundary Creek.

Historical impact to Boundary Creek from pumping



Barwon Water releases a supplementary flow of 2 ML/day when triggered by licence conditions.

Monitoring has confirmed that not all of passing flows are being released from the dam which is having an impact downstream, particularly in summer.

Acidic water and cease to flow events have occurred frequently downstream of the swamp since 1999.

Farmers downstream rely on Boundary Creek for stock water supply especially over the summer period.

Barwon River

The Barwon River is a key focus of the community and Barwon Water. It provides water for agriculture, recreation, the environment and urban supplies.

Low flows in the Barwon River

An extended dry period has reduced flows in all major rivers, including the Barwon River. January was the driest recorded at West Barwon Reservoir in over 50 years.

Inflows to West Barwon Reservoir have reduced since the millennium drought, with extended periods of low flows becoming more frequent as a result of the increased frequency of extended low rainfall periods.

In accordance with our bulk entitlement, when stream flows are low Barwon Water does not harvest water from the West Barwon Reservoir or other diversion weirs on tributaries of the Barwon River.

Environmental flows

Despite low stream flows, Barwon Water has continued to release four million litres of water each day from West Barwon Reservoir down the Barwon River over summer.

We have also been working with the Corangamite Catchment Management Authority to provide additional flows to the Barwon River from the one billion litre environmental entitlement provided by the Victorian Government.

Low pH events

Due to prolonged dry conditions and when a major rainfall event is predicted to fall in the Upper Barwon catchment, there is a heightened risk that a low pH event could occur in the Barwon River as a result of the acid generated from Big Swamp on Boundary Creek.

The development and implementation of the remediation plan will be designed to address the impacts of Boundary Creek and Big Swamp on the Barwon River.

Barwon River

Platypus

The development and implementation of the Boundary Creek remediation plan aims to improve the health of aquatic ecosystems for the Boundary Creek and Big Swamp catchment impacted by historic groundwater pumping, including for platypus.

A platypus study, led by the Upper Barwon Landcare Network and supported by funding from Barwon Water, is currently under way to investigate the current state of platypus throughout the region and inform future monitoring.

Long term water resource assessment

The Victorian Government is undertaking a long term water resource assessment for all key river systems in Victoria, including the Barwon River. This assessment looks at whether there has been a material change in the total available water in the river basin and, if so, whether the environment has been disproportionately impacted.

This will be one of the inputs to the development of a new Sustainable Water Strategy that may identify any additional environmental water recovery actions required to restore an appropriate balance between use of water for urban water supply, farm use and water for the environment. Barwon Water supports this process.

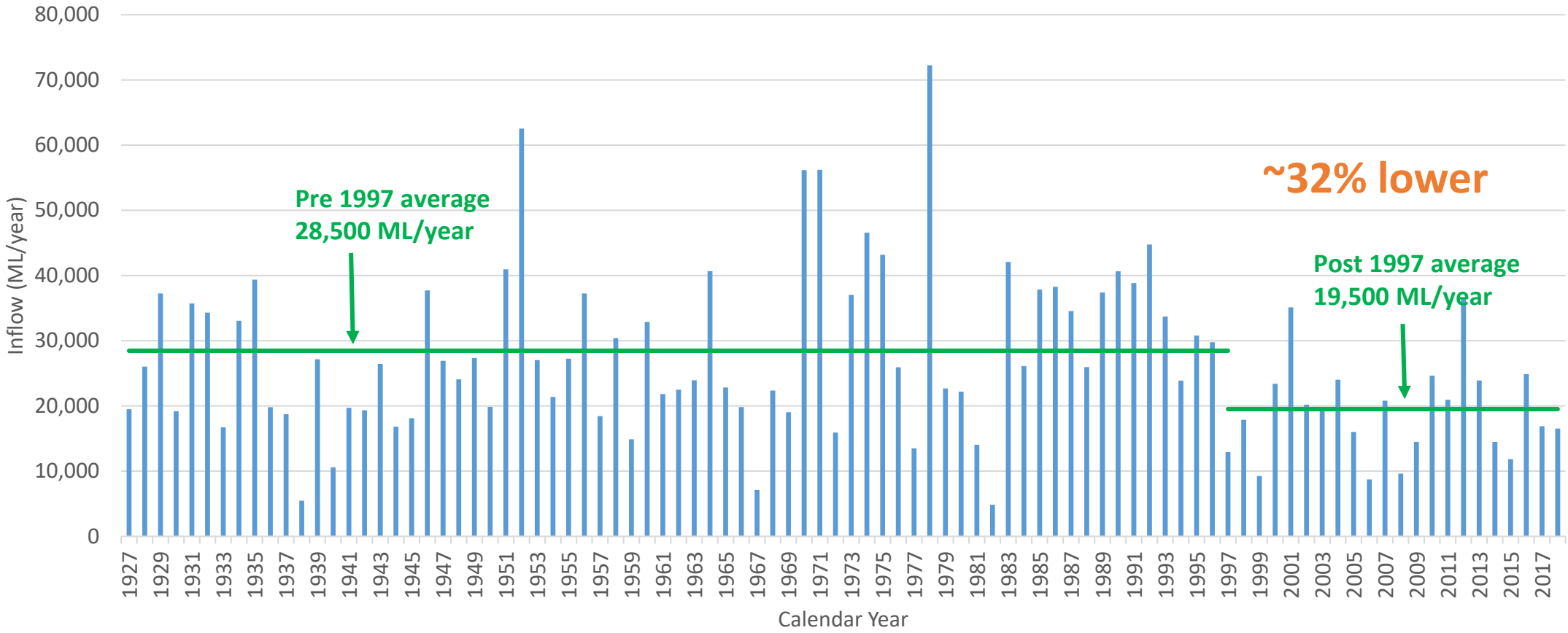
Barwon Ministerial Advisory Committee

The Victorian Government has established a Barwon River Ministerial Advisory Committee (MAC) to make recommendations to inform an Action Plan for future management and protection of the Barwon River and its tributaries.

The MAC will work in partnership with Traditional Owners, and with communities, to develop a vision and make recommendations for specific actions that support that vision.

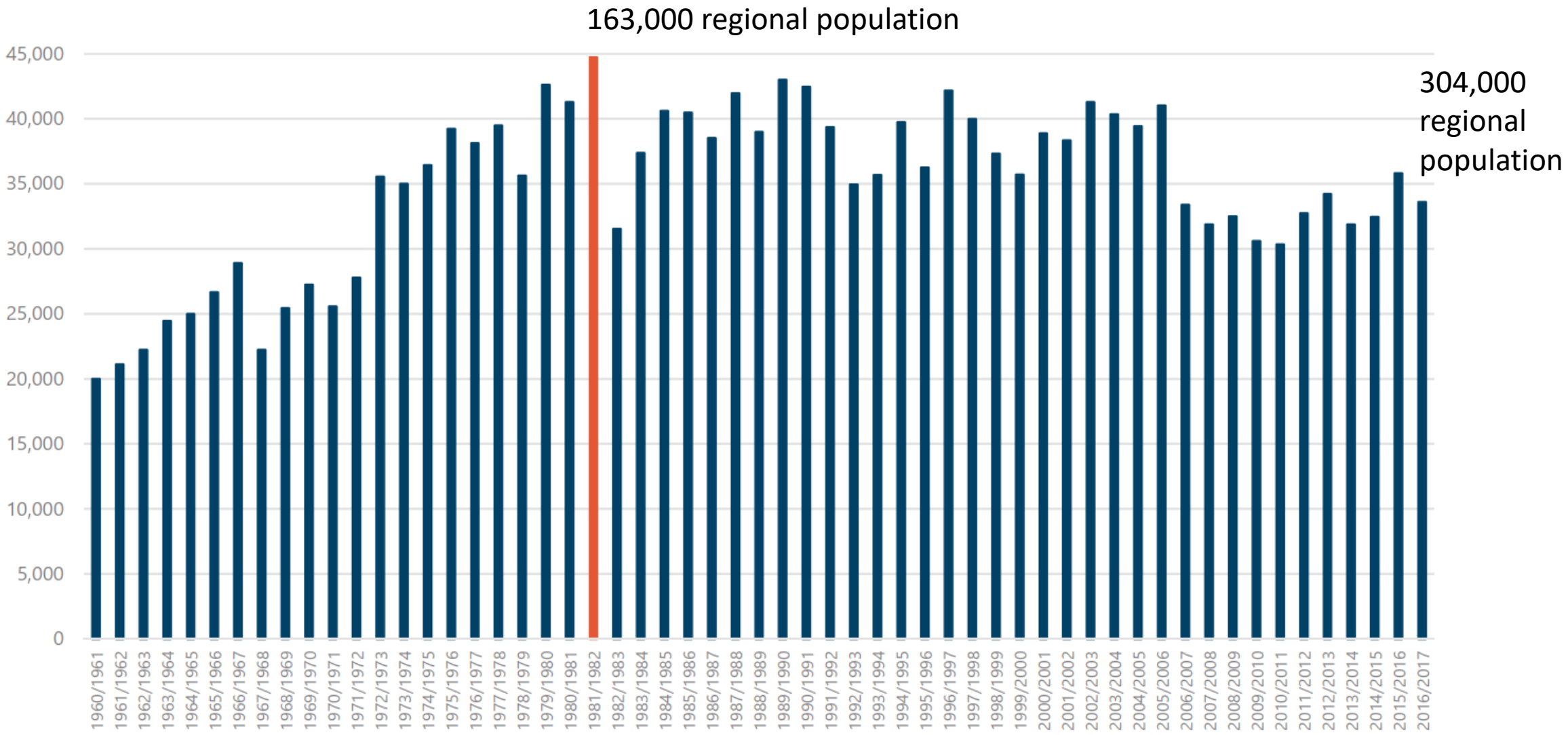
The geographic scope of the MAC's work includes the Barwon River, its catchments and tributaries, plus connected waterways including the Moorabool River and its catchment. For more information, please visit: www.water.vic.gov.au/waterways-and-catchments/barwon

West Barwon Reservoir – yearly inflow



Similar inflow reductions have been experienced in other tributaries

Historical drinking water use (ML/year)



Securing water supplies

Barwon Water has developed an Urban Water Strategy, a 50-year plan that outlines the actions required to manage demand for, and ensure sufficient supplies of, drinking water across our service region.

It considers the impacts of population growth and climate change on future water availability.

The Urban Water Strategy is revisited every five years in response to a constantly changing water outlook and the variable nature of population growth and development.

Let’s Talk Water

Our water sources have changed and diversified over time due to a drying climate. We’re getting less rain, which means less water flowing into our dams and waterways and our region is growing.

Planning for the future and ensuring we deliver water and sewerage services at affordable prices is our job.

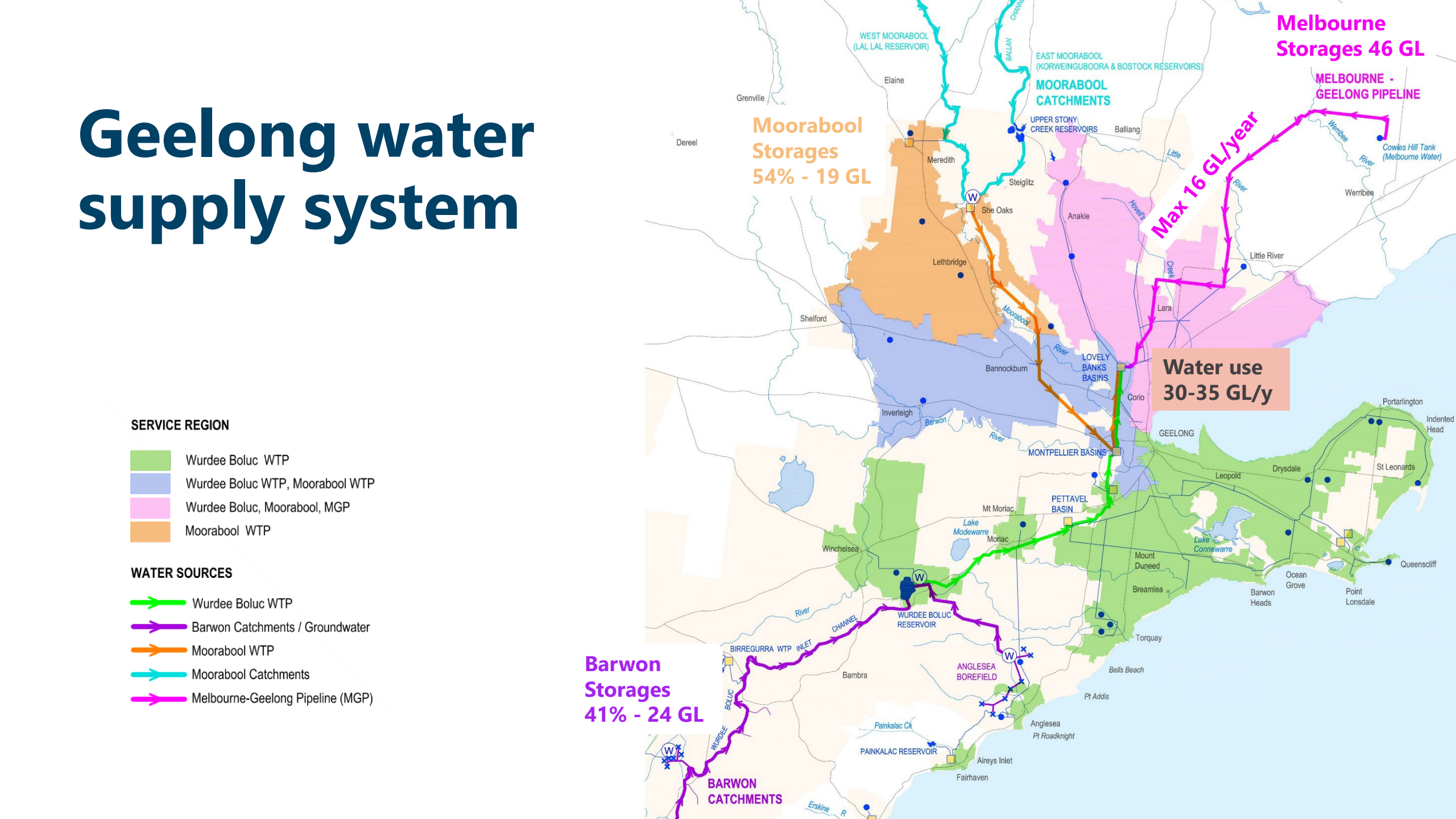
We all have a role to play in doing our bit to secure our region’s water future.

We are planning to start conversations with our community on our next Urban Water Strategy in the coming years.

Whether it is water sources, the environment, price or quality that matter to you, we will be inviting our community to get involved and help us plan for the future.

Barwon Water will provide further information to customers and the broader community on how you can be involved.

Geelong water supply system

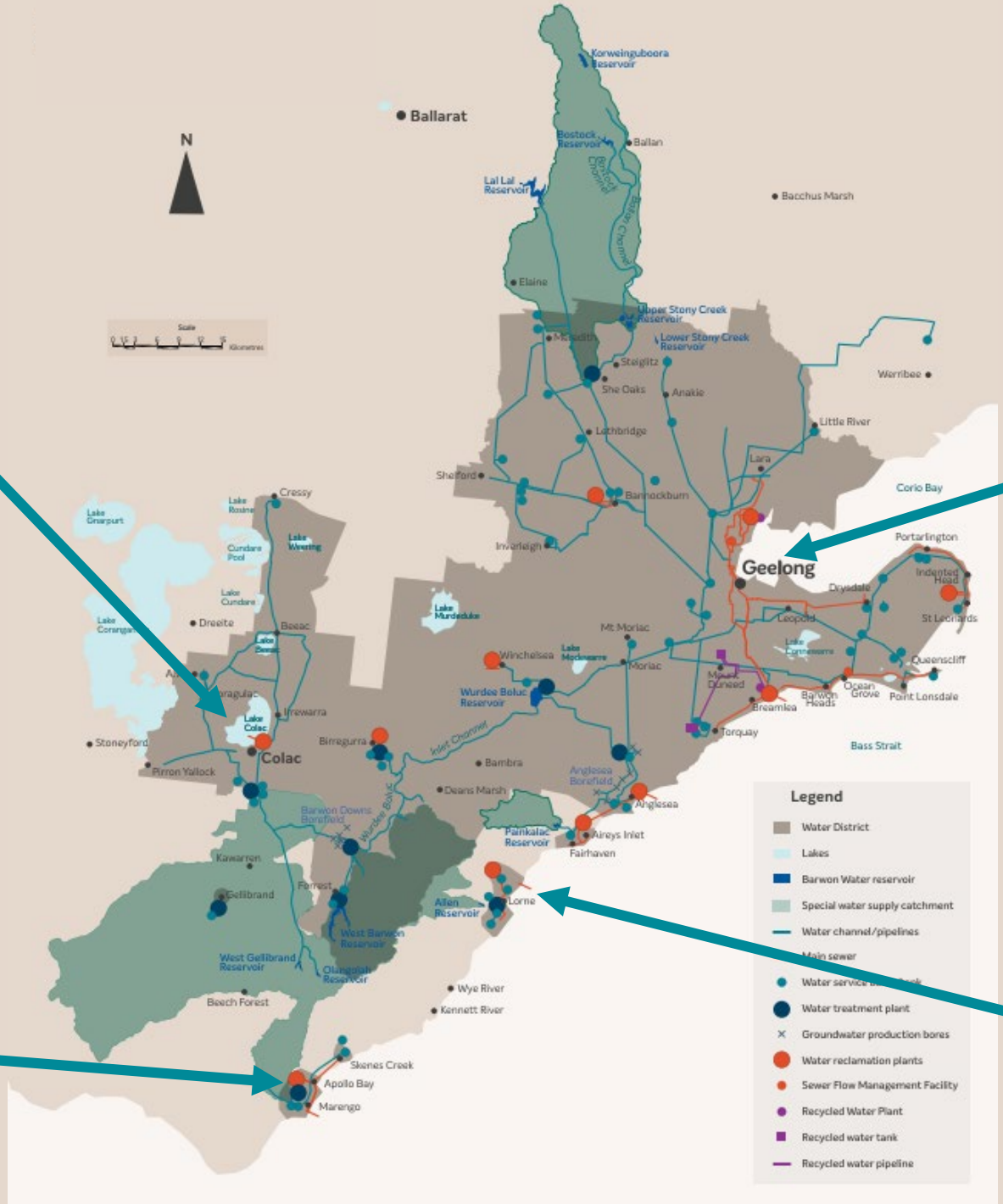


Colac storages
60.0%

Geelong storages
36.3%

Apollo Bay storages
78.4%

Lorne storages
94.0%



Next steps

The current phase of the remediation project will see our environmental assessment field program commence in April, 2019, subject to approvals and weather.

Barwon Water will continue update the community on the status of the field program.

Following the conclusion of the field program (expected to be in September, 2019), Barwon Water will share the outcomes of the program with the remediation working group and their nominated experts will assess these outcomes and reassess the remediation strategy for the Boundary Creek and Big Swamp catchment.

In the latter part of 2019, Barwon Water will continue to work with the remediation working group and their nominated experts to develop a remediation plan, which will be submitted to Southern Rural Water and its independent technical review panel for approval.

Barwon Water will continue to keep the community informed as the project progresses. For the latest information on the project, please visit www.barwonwater.vic.gov.au/about-us/major-projects/boundary-creek-and-big-swamp-remediation and www.yoursay.barwonwater.vic.gov.au/boundary-creek