

Victoria's Status Report 2024

Basin Salinity Management 2030



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We acknowledge and respect Victorian Traditional Owners as the original custodians of Victoria's land and waters, their unique ability to care for Country and deep spiritual connection to it.

We honour Elders past and present whose knowledge and wisdom has ensured the continuation of culture and traditional practices.

DEECA is committed to genuinely partnering with Victorian Traditional Owners and Victoria's Aboriginal community to progress their aspirations.



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1. Introduction

Victoria's 2023/24 Status Report presents the State's key achievements implementing the *Basin Salinity Management 2030 (BSM2030)* Strategy over the 2023/24 period. Victoria remains compliant with its obligations under Schedule B of the Murray-Darling Basin Agreement, through maintaining the State's salinity register in a net credit position and progressing accountable actions reviews.

Victoria delivered on its obligations under the BSM2030 through a collaborative approach between the Department of Energy, Environment and Climate Action (DEECA); Goulburn-Murray Water; Lower Murray Water, Agriculture Victoria; and Victoria's five northern Catchment Management Authorities (CMAs) who are all active partners in the implementation of activities to support BSM2030.

BSM2030 provides a strategic, cost-efficient and streamlined program of coordinated salinity management until 2030. It reflects the contemporary understanding of salinity risk and includes flexible, efficient and fit-for-purpose governance arrangements.

2. Key Achievements

2.1 State-Wide Achievements

In 2023/24 Victoria maintained an overall net position (-23 EC credit, based on the draft 2024 salinity register on 26 September) on the BSM2030 Salinity Registers (Table 1). Victoria has seen an 0.3 EC increase in credits arising from an 0.25 EC increase to Changed MDBC River Operations 2000 to 2002, and 0.05 EC shift in the Woolpunda and Mallee Cliffs Salt Interception Schemes (SISs). There has been no change to Victoria's debits.

In November 2023, the Murray-Darling Basin Authority (MDBA) hosted the Basin Salinity Forum in Albury NSW, where Basin States members involved in salinity and water quality management came together to share new information and research and discussed ways to continuously improve irrigation and salinity management. Victoria shared learnings from a suite of issues, such as SISs management during flood, the impact of flooding on groundwater within the Gunbower Forest, salinity management undertaken to adapt to the changing climate and market and infrastructure conditions in Northern Victoria.

The Independent Audit Group for Salinity report, released August 2024 confirmed Victoria had maintained compliance from 2021 to 2023 and specifically recognised Victoria's highly collaborative interagency framework for salinity management MDBA (2024).

Victoria has been working with Victorian Salt Disposal Working Group (VSDWG) to identify key themes as potentially important for assessment in preparation for the BSM2030 Strategic Review.

An initial assessment for the review of End of Valley Target (EoVT) sites in Victoria has been undertaken. The contextual narratives and an accompanying reporting tool have been developed to support the Victorian Government's report on salinity, salt load and flow outcomes at EoVT sites. This will support future Basin Salinity Management reporting and provide guidance for which EoVT sites require further investigation of salinity trends, predictions, and risks.

The VSDWG continued to meet quarterly and advise the DEECA Deputy Secretary of the Water and Catchments Group on the management of Victoria’s salinity debits and credits and compliance with obligations under BSM2030 (DELWP, 2021).

Victoria made substantial progress on salinity impact assessments of Victorian Mid Murray Storages project. The assessment will lead to the creation of a Victorian Mid-Murray Storages (VMMS) register entry, accounting for its impacts for the first time since VMMS infrastructure and operational rules were put in place. This will lead to a more accurate accounting of Victoria's impacts on the River Murray.

Table 1: Victoria’s Register A balance sheet summary

	Balance in September 2023		Change in 2023/24 Reporting Period		Balance in September 2024 ¹	
	Salinity Effect (EC at Morgan)	Salinity Cost Effect (\$/yr)	Salinity Effect (EC at Morgan)	Salinity Cost Effect (\$/yr)	Salinity Effect (EC at Morgan)	Salinity Cost Effect (\$/yr)
Credit	-45.3	9,879,000	-0.3	29,836	-45.6	9,908,835.9
Debit	22.6	-5,113,000	0.0	-28,000	22.6	-5,141,000.0
Total	-22.7	4,766,000	-0.3	1,836	-23.0	4,767,835.9

2.2 Regional Achievements

2.2.1 Mallee CMA

No Victorian Government allocation of salinity credits has been provided to the Mallee CMA in 2023/24 and the total has not changed since 2020/2021. Table 2 shows Mallee CMA salinity credits and debits from 2022/23 to 2023/24.

Table 2. Summary of Mallee CMA salinity credits and debits from 2022/23 to 2023/24

	Salinity (EC)		
	2022/23	Change	2023/24
Regional Debits	14.34	0.02*	14.36
Allocated State Credits	23.22	0	23.22

* Estimate of salinity impact change based on changes to annual use limit within the Nyah to South Australia Accountable Action area. Changes will be confirmed in the next accountable action review.

Mallee CMA has carried out the following key activities during 2023/24:

- Completed an Aerial Electromagnetic survey flights to assess soil salinity in the Murray River corridor and commenced data analysis
- Undertook the Psyche Bend Lagoon flushing review in 2023-24 (as the Murray River flow exceeded 35,000 ML/day during the year).
- Carried out floodplain investigations to understand the hydrological and hydrogeological processes in three areas (Hattah Lakes, Merbein Common and Lindsay Island).
- Commissioned a review to understand the application of Dendrometer technology for monitoring plant water status.
- Carried out a run of river survey for salinity from Mallee Cliffs to Boundary Bend.
- Studied impact of climate change on crop water requirements for Mallee horticulture.

¹ Based on the 2024 Salinity Registers dated 26 September 2024 and endorsed by BSMAP members for meeting number 69 on 26 September 2024

- Undertaken a desktop review to investigate the cause and identify degradation impacts of adjacent areas of irrigation development at two sites (Meridian Road and Hill Road corridors).

2.2.2 North Central CMA

Based on MDBA Register A, there has been no change in salinity debits/credits as demonstrated in Table 3.

Table 3. Summary of North Central CMA salinity credits and debits from 2022/23 to 2023/24

	Salinity (EC)		
	2022/23	Change	2023/24
Regional Debits	2.6	0	2.6
Allocated State Credits	-7.5	0	-7.5

During 2023/24, North Central CMA conducted the key activities:

- Applied the innovative 'Integrated Accountable Action Model' to the Barr Creek Catchment Strategy.
- Restructured the groundwater monitoring network to improve the spatial distribution and hydrogeological context of monitoring bores.
- Enhanced salinity risk assessment and improved understanding of the water balance in the northern Riverine plains.
- Completed a guide for 'Salinity Assessment for Proposed Wetland Management'.
- Drilled an additional 15 groundwater bores and installed electronic loggers on each to allow for improvements in salinity risk assessment and monitoring the water balance of the northern (Riverine) plains following recent flood events.
- Conducted a more detailed assessment of the forested floodplains to better understand any impacts from environmental watering on groundwater levels at Gunbower, Benwell, and Guttrum.

2.2.2 Goulburn Broken CMA

There was no change to the balance of salinity credits or debits for the Goulburn Broken CMA in 2024/23 (Table 4).

Table 4. Summary of Goulburn Broken CMA salinity credits and debits from 2022/23 to 2023/24

	Salinity (EC)		
	2022/23	Change	2023/24
Regional Debits	6.0	0	6.0
Allocated State Credits	8.90	0	8.90

During 2023/24, Goulburn Broken CMA conducted the following key activities:

- Renewed Shepparton Irrigation Region Land and Water Management Plan Completed Goulburn Murray Irrigation District Regional Irrigated Land and Water Use Mapping
- Updated groundwater levels and the Salinity Threat Map on the Goulburn Broken CMA Salinity Watch Website.
- Commenced initial stages of the SIR LWMP Register Entry Review.

2.2.3 Wimmera CMA

The Wimmera River System is not directly connected with the River Murray by surface water processes. The Wimmera River flows into a system of terminal lakes including Lake Hindmarsh.

Water quality monitoring data is collected monthly at 22 surface water sites on major rivers and creeks throughout the Wimmera catchment.

Preliminary stakeholder engagement and review has commenced which will inform the development of a new Wimmera Waterway Strategy

To support the regional salinity management capacity the Wimmera CMA's Sustainable Agriculture Facilitator program promoted sustainable agriculture in the Wimmera by:

- Coordinating and maintaining a soil moisture monitoring network on Wimmera farms.
- Building partnerships, including cross-regional partnerships and the Wimmera Partnership Group involving agriculture stakeholders.
- Disseminating information to farmers and stakeholders.

2.2.4 North East CMA

The North East CMA manage an environmental water entitlement in the Ovens River. This entitlement however is very small and has no salinity implications. There are no Basin Plan flows in the North East region that will require management in relation to salinity. Flows in the Murray system are outside the North East CMA region.

The CMA influence water quality and salinity through riparian and catchment stewardship projects as well as the sustainable irrigation program which supports the delivery of the North East Sustainable Irrigation Land and Water Management Plan.

3. Dryland Salinity

Agriculture Victoria Research (AVR) continues to oversee the monitoring of a suite of dryland salinity observation bores within the North Central CMA, Goulburn Broken CMA and North East CMA regions as part of Victoria's "watching brief" on dryland salinity and saline groundwater trends in northern Victoria.

This monitoring is part of Victoria's effort to track dryland salinity and groundwater trends, assessing their impact on key environmental and productive assets. In collaboration with DEECA's Water and Catchments division, AVR audited its bore information on the Victorian Water Measurement Information System (DEECA 2024) to identify gaps and outdated records. The audit found that the Core Salinity Monitoring Network data was complete.

Additionally, Agriculture Victoria's Climate Resilience & Recovery Program provides services addressing salinity and land management on dryland farms. AVR also engages with Landcare groups to educate them on dryland salinity management and groundwater issues.

4. Salt Interception Schemes

There are three SISs in Victoria. They are the Barr Creek Drainage Diversion Scheme, Pyramid Creek Groundwater, and Mildura-Merbein.

In 2023/24, the SISs operated in accordance with the operating rules. A summary of the operation of each of the schemes and their achievements is included below (Table 6).

During 2023/24, the Barr Creek Drainage Diversion Scheme fully complied with pumping rules (100% of the time), even after the damage from the late 2022 flood event. Pyramid Creek Groundwater still requires major refurbishment, but a small section of pumps has been operating since late January 2023 to meet the minimal requirements of the Salt Harvester.

While it was not significantly impacted in the 2022 flood event, Mildura-Merbein SIS was unable to operate at 100% capacity for a period post-flood to allow for maintenance works and due to the sustained high river flows. Mildura-Merbein SIS is now able to operate at 100% capacity as per the operational rules.

Table 6. Summary of Victorian Salt Interception Schemes

Salt Interception Scheme	Volume Pumped (ML)	Salt Load Diverted (Tonnes)	Average Salinity (EC)
Barr Creek	1584	7,297	5,722
Pyramid Creek	504	12,983	42,910
Mildura-Merbein	1,193	66,606	78,990

5. Register Entry and Model Reviews

During the period 2023/2024, the Mallee CMA completed the Nangiloc-Colignan Salinity Management Plan accountable action review. The salinity impact was estimated at 0.3 EC and was lower than salinity impact estimated under previous review carried out in 2013. While the salinity impact has decreased from 0.4 to 0.3 EC, it has been observed that flow and salt load has increased in the last two years, which may be a long-term trend anomaly due to flooding events. As a result, the review recommended no change to the register entry until further investigation is undertaken to better understand if there has been a shift in 'normal' climatic conditions.

During 2023/24, Goulburn Broken CMA updated the workplan for the Shepparton Irrigation Region (SIR) LWMP Register Entry Review. North Central CMA submitted the outcome of the review of Barr Creek Catchment Strategy and Tragowel Plains Accountable Actions to MDBA.

A summary of all of Victoria's Accountable Action and Legacy of History reviews are in Table 7.

Table 7. Status of BSM2030 Register A and Register B Victorian State Accountable Action Reviews in 2023/24

Victorian State works and measures	Last Review	Review Due	Status
Register A Entries			
Tragowel Plains Drains at 2002 level	2020	2025	Review underway as part of the Barr Creek Catchment Strategy review.
Nyah to SA Border SMP – Irrigation Development	2020	2026	The review is expected for the 2026 register.
Kerang Lakes/Swan Hill Salinity Management Plan	2010	2025	Review to be completed in conjunction with the salinity assessment of the VMMS..
Woorinen Irrigation District Excision	2010	2025	Review to be completed in conjunction with the salinity assessment of the VMMS.
RISI Victoria	2022	2027	Review completed in 2022 as part of the Sunraysia model review.
Church’s Cut decommissioning	2023	2028	Church's Cut Decommissioning is reviewed as a part of Pyramid Creek SIS as per 2023 review.
Campaspe West SMP	2017	N/A	The decommissioning of the Campaspe Irrigation District (CID) has made the original Campaspe West SMP action redundant, and BSMAP agreed to remove it during the transition to Source. Other CID impacts are covered under the Connections Provisional register entry, and Victoria will seek to integrate these into other items as needed.
Shepparton SMP	2018	2025	This review has commenced.
Psyche Bend	2023	2029	Review was completed in 2023. Victoria is working with the MDBA to merge Psyche Bend and Sunraysia Drains Drying Up register entries for efficiency and recognition of interdependent operation.
Sunraysia Drains Drying Up	2023	2029	Review was completed in 2023. Victoria is working with the MDBA to merge Psyche Bend and Sunraysia Drains Drying Up register entries for efficiency and recognition of interdependent operation.
Lamberts Swamp	2017	2029	Review completed and endorsed in 2017.
Mallee Drainage Bore Decommissioning	2019	2029	Review completed and endorsed in 2019.

Victorian State works and measures	Last Review	Review Due	Status
Nangiloc-Colignan SMP	2013	2024	Review completed in 2024.
Barr Creek Catchment Strategy	2020	2025	Review is underway.
Register B Entries			
Campaspe Catchment Legacy of History	2019	2029	Review completed in 2019.
Goulburn Catchment Legacy of History	2019	2026	Review completed in 2019.
Loddon Catchment Legacy of History	2019	2026	Review completed in 2019.
Kiewa Catchment Legacy of History	2019	2029	Review completed in 2019.
Ovens Catchment Legacy of History	2019	2029	Review completed in 2019.
Victorian Mallee – dryland	2020	2030	Review completed in 2020. New proposed date adjusted in line with the review frequency.
Victorian Mallee – Pre 88 irrigation	2020	2030	Review completed in 2020. New proposed date adjusted in line with the review frequency.

6. New Accountable Actions

In 2010, four separate storages in the Kerang Lakes system were combined to form the Victorian Mid Murray Storages (VMMS) to capture, store and release unregulated water for the environment and hold water temporarily to improve delivery to downstream users.

A preliminary assessment undertaken in 2015 showed that the operation of the VMMS had a significant salinity impact on the River Murray and must be accounted for in the Salinity Register, with a salinity impact commenced in 2022. This will review the salinity impact on the River Murray from these actions, including any changes to operational rules up to 2022/23 (and due to interactions with the VMMS includes the reviews of the Woorinen Irrigation District Excision and Kerang Lakes/ Swan Hill Salt Management Plan accountable actions).

As VMMS is not currently an action on the Register, DEECA is leading the salinity assessment of this project. In 2023/24, Victoria progressed work on the assessment of potential new actions for the VMMS Review. The assessment is expected to be completed by the end of 2024.

7. End-of-Valley Targets Summary Result

In 2023/24, each Victorian catchment valley for which an EoVT has been adopted was monitored. Table 1 in the Appendix A shows the data availability of discharge and conductivity for each site. The EoVT results for the status reporting period (2023/24) will be reported in the next comprehensive reporting period.

8. Core Salinity Monitoring Network

The Mallee, North Central and Goulburn Broken CMAs continue to monitor key surface and groundwater monitoring sites within the Basin. The information collected from these sites informs ongoing accountable action reviews and is used in the assessment of EoVTs.

During 2023/24, AVR conducted a review of the bores within the Core Salinity Monitoring Network to identify issues affecting continued monitoring. The review highlighted challenges with bore conditions, such as end-of-life infrastructure, drying bores, and difficulties accessing bores on private property. Access issues arise from a range of reasons including declining social license, farm security concerns, biosecurity risks, and land ownership changes. AVR will collaborate with the Victoria Salt Disposal Work Group to assess potential future impacts and explore mitigation options.

Goulburn Broken CMA has notified DEECA two groundwater monitoring bores (listed in Table 8) are to be removed from the core salinity monitoring network.

Table 8. Changes to Core Salinity Monitoring Network

Bore ID or Gauge Number	Region	What did it monitor?	Supporting which register entry or model?	Reason for change	Proposed action?
Bore 23447	Goulburn Broken CMA	Groundwater levels	SIR Groundwater Trends to support Shepparton SMP Register A entry	Bore decommissioned at landholder's request	No current action, but will identify replacement if required
Bore 43744	Goulburn Broken CMA	Groundwater levels	SIR Groundwater Trends to support Shepparton SMP Register A entry	Bore destroyed	No current action, but will identify replacement if required

9. References

- DELWP (2021), Manual for Victoria's Salinity Accountability in the Murray-Darling Basin.
- DEECA (2024), *Victorias Water Measurement Information System* <https://data.water.vic.gov.au/.htm>, Accessed: 12/09/2024
- MDBA (2024) Report for the Independent Audit Group for Salinity – July 2021-June 2023 <https://www.mdba.gov.au/sites/default/files/publications/report-of-the-independent-audit-group-for-salinity-2021-2023.pdf>

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10. Appendices

Appendix A – End of Valley Targets Summary of data availability

CMA Region	Valley	Reporting site	AWRC Site Number	Stream discharge	Conductivity
North East	Ovens	Ovens River @ Peechelba-East	403241	Reported	Reported
	Kiewa	Kiewa River @ Bandiana	402205	Reported	Reported
Goulburn Broken	Goulburn	Goulburn River @ Goulburn Weir	405259	Reported	Reported
	Broken	Broken Creek @ Casey's Weir	404217	Reported	Reported
North Central	Avoca	Avoca River @ Quambatook	408203	Reported	Reported
	Loddon	Loddon River @ Laanecoorie	407203	Reported	Reported
	Campaspe	Campaspe River @ Campaspe Weir	406218	Reported	Reported
Wimmera	Wimmera	Wimmera River @ Horsham Weir	415200	Reported	reported