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# 2021-22 Active Management Annual Evaluation and Review

Full report on active management in the unregulated water sources of the Barwon–Darling, Gwydir and Macquarie–Bogan

September 2023





# Acknowledgement of Country

The Department of Planning and Environment acknowledges that it stands on Aboriginal land. We acknowledge the Traditional Custodians of the land and we show our respect for Elders past, present and emerging through thoughtful and collaborative approaches to our work, seeking to demonstrate our ongoing commitment to providing places in which Aboriginal people are included socially, culturally and economically.

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Front Cover: Barwon River at Collarenebri, photo by Josh Chivers, DPE

## More information

6Water Group's Environmental Water Management Team

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## Glossary

Term or abbreviation	Definitions and descriptions
active environmental water (AEW)	<p>Water that the NSW Minister for Water identifies as requiring protection from extraction on a given day, in accordance with the active management procedures manuals for the unregulated Barwon–Darling, Gwydir and Macquarie–Bogan water sources. AEW includes:</p> <ul style="list-style-type: none"> <li>• held environmental water (HEW) flowing from an upstream water source</li> <li>• planned environment water (PEW) from upstream water sources protected from extraction under the existing water sharing plan rules</li> <li>• licensed unregulated river water where the licence holder has notified the Minister that they want the water left in the unregulated river water source and protected from extraction.</li> </ul>
active management rules	<p>Water sharing plan rules for the unregulated Barwon–Darling, Gwydir and Macquarie–Bogan water sources that enable the river operator to raise access thresholds by an amount necessary to protect active environmental water from extraction.</p>
announcements	<p>WaterNSW’s daily announcements of flow class and volumes distributed to licence holders.</p>
deviation	<p>An action by WaterNSW or Water Group that does not follow the active management procedures.</p>
The department	<p>Department of Planning and Environment</p>
Environment and Heritage Group	<p>Department of Planning and Environment–Environment and Heritage Group</p>
Water Group	<p>Department of Planning and Environment–Water Group</p>
individual daily extraction components (IDECs)	<p>A daily extraction limit for individual licence holders.</p>
mismatch	<p>The difference between the distributed volume of either available water and AEW in a management zone based on forecast flows, and volumes that could have been distributed based on observed flows.</p>
NRAR	<p>Natural Resources Access Regulator</p>
NRC	<p>Natural Resources Commission</p>

Term or abbreviation	Definitions and descriptions
'no-flow share' procedure	Procedure 19 in the current Barwon–Darling Procedures Manual which allows all licence holders access to water if available water is greater than the sum of individual daily extraction components in their management zone.
one-gauge rule	Clause 49A (5) of the <a href="#">Barwon–Darling water sharing plan</a> that allows the remaining functional gauge to be used to determine and announce access if the other gauge is not functioning.
partner agencies	Water Group, WaterNSW, Environment and Heritage Group and NRAR.
procedures	The operational procedures for active management described in the procedures manuals established under the water sharing plans for the unregulated Barwon–Darling, Gwydir and Macquarie–Bogan.
WSP	Water sharing plan

# Executive summary

Between 1 July 2021 and 30 June 2022, the active management rules provided regulatory protection to 82.6 gigalitres (GL) of active environmental water (AEW) in the unregulated Barwon-Darling and Macquarie-Bogan water sources. Protection was applied across:

- six events in the Barwon–Darling, which protected 53.5 GL
- nine events in the Macquarie–Bogan, which protected 29 GL.

The active management rules were not applied in the unregulated Gwydir because there are currently no relevant licences in those water sources.

## **The procedures were largely effective at protecting active environmental water, although some gaps exist**

The [2020-21 annual review](#) identified several gaps that require procedural improvements. Work is still underway to address many of these gaps.

No new procedural gaps were identified in this review. However, we note that active management does not protect AEW from extraction under basic landholder rights, domestic and stock or utility licences as specified in the policy<sup>1</sup> and also noted by the Natural Resources Commission during their review of the Barwon–Darling water sharing plan. This report explains why these licence types have been excluded.

NRAR did not complete any compliance monitoring of the 2021-22 events. This means that there is uncertainty around the level of water user compliance with active management rules. There are existing recommendations for enabling efficient compliance assessments in the future (R.25 and R.26) but progress on those recommendations has been delayed by inadequate access to telemetered extraction data.

## **WaterNSW followed procedures in 2021-22**

WaterNSW followed the [active management procedures](#) for each event in 2021-22. The only exception is a deviation in the Barwon-Darling where WaterNSW have been adjusting access thresholds for a schedule 2 licence (WAL 33722) to account for AEW. This same deviation was reported in 2020-21 and recommendation 18 is to resolve inconsistencies between the mandatory and discretionary conditions, the procedure and the water sharing plan.

WaterNSW have not yet published information on flow and loss forecasting methods, as required by procedure manuals. WaterNSW have drafted this information and when finalised it will be published on their WaterInsights portal.

## **Managing flow forecasting uncertainty remains a key challenge for active management**

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<sup>1</sup> except where licence conditions are subject to A class announcements.

The main residual risk to the effectiveness of active management is uncertainty in flow forecasting. In particular, upstream operators have less capacity for forecasting end of system flows during flood periods and rainfall forecasting can be difficult.

Flow forecasting uncertainty contributes to mismatches between the announced/allocated volumes and the observed or post-calculated flows in a management zone. WaterNSW manages this risk through their procedures to minimise uncertainty and through the mismatch procedures.

A review of 'mismatch' data found WaterNSW's measures to be appropriately conservative in the Barwon–Darling, as the total proportion of 'under-announced' volumes were small.

In the Macquarie the procedures have resulted in much more conservative announcements for AEW, which was under-announced by 16%, while available water was over-announced by approximately 4%. However, this outcome is largely due to event 3. The overall AEW mismatch is very small if this event is excluded (-0.84%). WaterNSW have indicated that the cause was difficulty in forecasting rainfall and inflows.

### **Some progress on 2020-21 review recommendations has been made but many issues remain unresolved**

There were 39 recommendations made in last year's annual review:

- 10 recommendations have been addressed
- 16 recommendations have been progressed

Further changes to the active management policy, procedures and water sharing plans are required to address existing recommendations. The procedures manuals require that any substantial changes to the any of these documents requires consultation with water users and key stakeholders.

### **Summary of new recommendations**

There are five additional recommendations this year.

R.40 Water Group to clarify with stakeholders how we will be consulting with them for the next annual review.

R.41 Water Group to develop better information products to communicate how active management rules protect HEW through the system and impact hydrology

R.42 Water Group to update the active management policy to further describe how proposals to expand the areas where active management rules apply will be considered.

R.43 WaterNSW to review how to better track and report on causes for mismatch.

R.44 Water Group to update procedure manuals to reflect new WSP provisions for active management of floodplain harvesting licences.

# 1 Introduction

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## 1.1 Background

On 1 December 2020, active management rules were implemented in the water sharing plans for the unregulated Barwon–Darling, Gwydir and Macquarie–Bogan water sources (see Appendix A – Where active management rules apply). The rules protect environmental flows that were previously available for extraction, replacing the need for temporary water restrictions.

The rules gave effect to the three procedures manuals for each water source which describe the operational procedures to protect active environmental water and reflect the principles and objectives outlined in the active management policy. The procedures and policy can be found on our [Active management in the Water website](#).

To clarify, the ‘active management rules’ are not directly related to the practice of ‘actively/adaptively managing’ environmental water for environmental outcomes. In NSW, this practice is the role of the NSW Environmental Water Manager, delegated responsibility of the Department of Planning and Environment–Environmental and Heritage Group (Environmental and Heritage Group), and the Commonwealth Environmental Water Holder (CEWH). From here on, ‘active management’, active environmental water (AEW) and ‘actively managed flow events’ refer only to the implementation of the active management rules.

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## 1.2 Purpose

The purpose of the evaluation and review is to support learning and provide for improvements to active management rules and procedures, in line with the adaptive management/continuous improvement approach.

The evaluation and review did not include monitoring of environmental outcomes arising from the use of environmental water, since this is a Environmental and Heritage Group and Commonwealth Environmental Water Office (CEWO) responsibility.

The purpose of this document is to present the detailed, technical findings and recommendations of the second annual evaluation and review into the implementation of active management between 1 July 2021 and 30 June 2022 – equivalent to the second ‘water year’ of implementation.

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## 1.3 Contributors

The evaluation and review was conducted by Water Group, with input from partner agencies WaterNSW, Environmental and Heritage Group, and the Natural Resources Access Regulator (NRAR). The evaluation and review compiled information mainly from the annual statements provided by the partner agencies.

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## 2 Annual evaluation and review requirements

Procedures 31, 25 and 32 of the Barwon–Darling, Gwydir and Macquarie–Bogan Procedures Manuals, respectively, outline the matters for consideration (or requirements) for the annual evaluation and review. The requirements are listed in Table 1 (below) alongside the section in the report where they are addressed. Additional requirements, relating to stakeholder consultation and mismatch procedures, are listed elsewhere in the manuals and are discussed below Table 1. Several issues were raised by agencies without accompanying recommendations.

Although issues raised by agencies are not a review requirement, they are still included in the review.

Reporting on the ‘resumption of flows’ rule will also be included in the active management review, although not required in the procedures manual for the Barwon-Darling.

Table 1. Matters for consideration and the sections of this report where they are addressed

Matters for consideration (review requirements)	Section of this report
a) Reporting on the implementation of improvements from previous reviews	Section 4.3
b) Issues relating to active management raised through consultation with stakeholders	Section 4.1 (stakeholders) Section 4.2 (agencies)
c) A summary of results and recommendations contained in reports provided by WaterNSW, NRAR and the Environmental and Heritage Group	Section 3 (results) Section 4.2 (agency recommendations)
d) Proposals for variations or new procedures brought forward by agencies or stakeholders	Section 4
e) An assessment of whether: <ul style="list-style-type: none"> <li>• procedures were followed for active management</li> <li>• any deviations from the procedures occurred and any modifications to the procedures that may be required to avoid future deviations, where possible</li> <li>• the current active management procedures and the associated operation provide for AEW to remain in the water source for environmental purposes</li> <li>• the risk management measures in place are effective in protecting AEW and ensuring that access by water users to water above the access thresholds arising from other sources has not been impacted</li> <li>• the active management procedures should be expanded, modified or remain unchanged.</li> </ul>	Section 5

Matters for consideration (review requirements)	Section of this report
f) Recommendations to change the manuals, the active management policy or [relevant] WSP rules relating to active management	Section 5.4 and 5.5

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## 2.1 Stakeholder consultation

All active management procedure manuals specify in Table 1 that Water Group is to “consult with licence holders and peak stakeholder groups when conducting each annual review”. Stakeholder consultation is reinforced in Table 6 in the manuals (for Barwon–Darling and Gwydir, and Table 2 for Macquarie–Bogan) as a minimum requirement, specifying Water Group consult with “licenced water users, environmental water holders and stakeholder representatives” on “the appropriateness, effectiveness and efficiency of the manual in meeting the objectives and principles of the active management policy, and any proposed substantive changes to the manual arising from the annual review”. While Water Group did not directly consult with licensed water users or their representative groups, the other partner agencies carried out some consultation with these stakeholders.

It has been a challenge for us to resource this consultation given the additional work created by the Claydon Review. We intend to undertake direct consultation for the 2022-23 annual review and will clarify with stakeholders how to provide this input.

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## 2.2 Mismatch

Note 5 of Procedure 18 in the Barwon–Darling Procedures Manual states that “The NSW Department of Planning, Industry and Environment – Water will consider during the annual review if criteria are required to define when a response to a mismatch between forecast and observed AEW should be taken.” Note 2 in the Gwydir Procedures Manual is similar. This note is not included in the Macquarie–Bogan.

This has not been considered in this review as the mismatch procedure will be paused, once sub-daily announcements are implemented. See section 4.3 for further information.

# 3 Actively managed events in 2021-22

Between 1 July 2021 and 30 June 2022, the active management rules provided regulatory protection to 82.6 gigalitres (GL) of active environmental water (AEW) in the unregulated Barwon-Darling and Macquarie-Bogan water sources. Protection was applied across:

- 6 events in the Barwon-Darling, which protected 53.5 GL
- 9 events in the Macquarie-Bogan, which protected 29 GL.

The active management rules were not applied in the unregulated Gwydir because there are currently no relevant licences in those water sources.

The following sections detail WaterNSW estimates. There have been some discrepancies between agencies for AEW estimates. This issue is best resolved with more timely sharing of data (see R.26).

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## 3.1 Barwon-Darling

There were 6 AEW events in the Barwon-Darling Unregulated River Water Source between 1 July 2021 and 30 June 2022 (Table 3).

Key features of the events:

- Event 1 was a continuation of the last event from the 2020-21 water year. Further environmental water protected in Gwydir and Macquarie through supplementary events also arrived during this period.
- All other events were triggered due to AEW from the Macquarie system. There was no expression of interest to protect held environmental water (HEW) in the Barwon-Darling after Event 1.

Table 2. Description of active management undertaken in the Barwon–Darling in 2021-22

Event name (if known)	Date commenced & finished	Management zone from which flow protection started	Location	Event type [HEW / PEW]	AEW Event size (Upstream HEW + protected volume within Barwon–Darling) [ML]	AEW Volume at Wilcannia (if relevant) [ML]	Volumes of AEW flowing into Lake Wetherell [ML]
Event 1	1 July – 7 Oct	Zone 2	Mogil Mogil	HEW	51,506	55,145 <sup>1</sup>	50,302
Event 2	22 Nov – 26 Dec	Zone 8	Brewarrina	HEW	1,195	952	907
Event 3	23 Feb – 16 Mar	Zone 8	Brewarrina	HEW	34	31	31
Event 4	3 Apr- 25 Apr	Zone 8	Brewarrina	HEW	108	82	77
Event 5	1 May – 24 May	Zone 8	Brewarrina	HEW	200	144	130
Event 6	21 May – 14 Jun	Zone 8	Brewarrina	HEW	501	262	258

<sup>1</sup> Event 1 is a continuation of event 3 of 2020-21. Active Environmental water from last year’s event reached Wilcannia during this event. That is why Volume arrived at Wilcannia is higher than the total protected volume of this event.

The resumption of flows (RoF) rule was not triggered in 2021-22 year (Table 2).

Table 3 History of all resumption of flows events

Resumption of flows event	Start date (any triggers activated)	End date (all triggers relaxed)	Total volume protected (ML)	Total volume that may have been extracted without RoF [ML]
#1	12 January 2021	29 January 2021	8,000 <sup>2</sup>	6,000 <sup>3</sup>

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## 3.2 Gwydir

The active management rules were not applied in the unregulated Gwydir because there are currently no relevant licences in the water source. This means that WaterNSW do not issue access announcements in the Gwydir. Any AEW originating from the Gwydir continues to be protected in the Barwon–Darling.

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## 3.3 Macquarie-Bogan

There were 9 AEW events in the Macquarie–Bogan Unregulated River Water Source between 1 July 2021 and 30 June 2022 (Table 4).

Key features of the events:

- Event 1 and 2 protected planned environmental water from the EWA2 account (PEW -Active)
- Event 3 protected a combination of EWA2 water (PEW -Active) and HEW (general security) flows
- Events 4 to 9 protected supplementary flows through one environmental licence at Marebone.

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<sup>2</sup> WaterNSW 2021. [Resumption to Flows event report February 2021](#). Accessed online 8 August 2023

<sup>3</sup> WaterNSW 2021. [Resumption to Flows event report February 2021](#). Accessed online 8 August 2023, sum of expressions of interest

Table 4. Description of active management undertaken in the Macquarie Bogon in 2021-22 (WaterNSW data)

Event name	Date commenced & finished	Event type [HEW / PEW]	AEW event size (Volume at Marebone) [ML]	Target asset/location	AEW volumes downstream of Marebone [ML]	AEW volumes at d/s of sub zone 4 (Barwon Confluence) [ML]
Event #1 FMZ Delivery - top up 1	28 Sep - 8 Oct 2021	PEW (Active)	9,244	Macquarie Marshes	Macquarie River D/S of Marebone Weir: 7,594 ML  Marebone Bk: 1,650 ML	2,856
Event #2 FMZ Delivery - top up 2	16 - 21 Oct 2021	PEW (Active)	5,322	Macquarie Marshes	Macquarie River D/S of Marebone Weir: 3,726 ML  Marebone Bk: 1,596 ML	1,396
Event #3 FMZ Delivery - top up 3	1 - 18 Nov 2021	HEW (GS) & PEW (Active)	6,705ML (3469 HEW +3,236ML PEW)	Macquarie Marshes	Macquarie River D/S of Marebone Weir: 4,962 ML  Marebone Bk: 1,743 ML	2,137
Event #4 Suppleme ntary 1	29- 30 July 2021	HEW (Supplementa ry)	750	Macquarie Marshes	Macquarie River D/S of Marebone Weir: 750 ML	63
Event #5 Suppleme ntary 2	28 Aug 2021	HEW (Supplementa ry)	500	Macquarie Marshes	Macquarie River D/S of Marebone Weir: 500 ML	62

Event name	Date commenced & finished	Event type [HEW / PEW]	AEW event size (Volume at Marebone) [ML]	Target asset/location	AEW volumes downstream of Marebone [ML]	AEW volumes at d/s of sub zone 4 (Barwon Confluence) [ML]
Event #6 Supplementary 3	3 - 4 Feb 2022	HEW (Supplementary)	1,000	Macquarie Marshes	Macquarie River D/S of Marebone Weir: 1000 ML	34
Event #7 Supplementary 4	13 - 15 Mar 2022	HEW (Supplementary)	1,500	Macquarie Marshes	1,500 ML delivered @ Marebone. Macquarie River D/S of Marebone Weir: 1,500 ML	108
Event #8 Supplementary 5	11 - 14 Apr 2022	HEW (Supplementary)	1,750	Macquarie Marshes	1,750 ML delivered @ Marebone. Macquarie River D/S of Marebone Weir: 1,750 ML	200
Event #9 Supplementary 6	1 - 5 May 2022	HEW (Supplementary)	2,250	Macquarie Marshes	2,250 ML delivered @ Marebone. Macquarie River D/S of Marebone Weir: 2,250 ML	501

# 4 Review

## 4.1 New issues and recommendations raised by stakeholders

The issues raised by stakeholders (Table 5) came from partner agency’s annual statements. ‘Stakeholders’ are licenced water users or their representatives.

If an issue is a duplicate from any issues or recommendations in the 2020-21 review report, these are not included in Table 5. See Section 4.3 for an update on previous recommendations.

Water Group responses are provided alongside the issues in Table 5.

Table 5. Issues raised by stakeholders and Water Group response

ID	Water source	Issue	Description	Water Group response
I.04	Barwon-Darling	Individual daily extraction components (IDEC) and pump capacity	WaterNSW noted that some licence holders have requested that their IDECs be increased to match their pump capacity.  There was a specific request to review for smaller licences.	IDECs were introduced in 2020 following consultation on several options with Barwon-Darling stakeholders. IDECs were distributed based on a licence holders’ access licence share component, within each licence class and across the whole water source <sup>4</sup> . The department is committed to reviewing IDECs and share components once new information becomes available through the <a href="#">metering recalibration project</a> .
I.05	Barwon-Darling	Expression of interest (EOI) reminder	Customers asked to receive an automatic reminder notification that their EOI is about to expire.	iWAS clearly shows when the current EOI is about to end.  WaterNSW has noted the request for automatic reminders and are reviewing feasibility.

<sup>4</sup>As defined in the original version of the Water Sharing Plan for the Barwon-Darling Unregulated and Alluvial Water Sources 2012, cl 52(2). Note that individual daily extraction components (IDECs) were previously referred to as individual daily extraction limits (IDELs)



ID	Water source	Issue	Description	Water Group response
I.14	Macquarie-Bogan	Input into the annual review	Stakeholders would like direct input to the review	<p>Water Group have had resourcing constraints which has meant we have been relying on partner agencies for stakeholder input. We acknowledge that direct input would be valuable and is a requirement of the procedures manuals. We will address this for the next annual review.</p> <p><b>R.40 Water Group to clarify with stakeholders how we will be consulting with them for the next annual review.</b></p>

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## 4.2 New issues and recommendations raised by partner agencies

Issues and recommendations raised by partners (WaterNSW, NRAR, Environment and Heritage Group and NRC) are presented in Table 6. In addition, an internal recommendation from DPE-Water has been included in the table.

Duplicate issues or recommendations from 2020-21 are not included in the following table. See Section 4.3 for an update on previous recommendations.

Water Group's responses are provided alongside the issues in Table 6. For issue I.13, further detail is provided below the table.

Table 6. Issues and recommendations raised by partner agencies and Water Group's response

ID	Agency	Issue	Description	Agency recommendation	Water Group response
I.01	WaterNSW	Software update required for 1 July announcement	A software update is required so that the 1 July announcement occurs after 1 July available water determinations (AWDs) have been made.	The required update has already been made by WaterNSW	Noted
I.02	WaterNSW	Barwon-Darling Negative account balances	Some licences extracted more than the available water in their account resulting in a negative account balance after a meter reading was updated in WAS.	-	Noted. Not an active management issue.

ID	Agency	Issue	Description	Agency recommendation	Water Group response
I.07	Environment and Heritage Group	Naming conventions are confusing	The “active management” term creates confusion with Environment and Heritage Group’s responsibility to ‘actively manage’ environmental water allowances and accounts.	<p>Adopt a better name for the ruleset that does not clash, with an aim to reduce the confusion, e.g.:</p> <ul style="list-style-type: none"> <li>• environmental water shepherding</li> <li>• environmental water flow protection.</li> </ul>	<p>Changing the name of the mechanism would be time consuming and costly, with no expected material benefit on protection of water for the environment.</p> <p>The “active management” name is used in various statutory documents (three water sharing plans), in both the title and throughout the Active Management Policy and the three active management procedures manuals and on various departmental and non-departmental webpages.</p> <p>As a solution to differentiate the name of the mechanism from Environment and Heritage Group’s work, Water Group agreed with Environment and Heritage Group to use the terms “active management rules” and “AEW”, as defined in the Glossary, where appropriate.</p>

ID	Agency	Issue	Description	Agency recommendation	Water Group response
I.08	Environment and Heritage Group	Lack of evidence of impact	It's difficult to tell if the active management mechanism is doing anything to the hydrology (or not). The last annual report was inconclusive.	Better access to existing data sets, analysis and reporting is required to assess impacts of the policy. For example, this could include an infographic of the AEW and system water balance. It would also be useful to assess which events would have been at risk of HEW extraction were the policy not in place and estimate the likely reduction in extractions.	<p>Existing recommendations relate to improved data sets to monitor AEW events (R.25 and R.26). For R.26, WaterNSW are reviewing how best to share data with agencies and have agreed to provide a report after each event. During longer events, WaterNSW have agreed to provide monthly update reports.</p> <p><b>R.41 - Water Group to develop better information products to communicate how active management rules protect HEW through the system and impact hydrology</b></p> <p>When scoping the above products, we will consider reporting needs of other agencies as well as information required for the policy review.</p>

ID	Agency	Issue	Description	Agency recommendation	Water Group response
I.09	Environment and Heritage Group	Lack of transparency	Further evidence required for transparency	<p>We recommend for transparency a publicly accessible system like the Namoi method to announce supplementary take: information for each access licence; volume to extract and commence and cease dates.</p> <p>There should be evidence presented about the level of compliance with the system by irrigators and any compliance actions.</p>	<p>WaterNSW already publish some information on AEW events on the <a href="#">WaterInsights</a> website (Go to the relevant water source, then select the “ACCESS ANNCMNTS” tab). The procedures manuals also specify event information that WaterNSW must publish (procedure 11 in the Barwon Darling and procedure 13 in the Macquarie).</p> <p>Other publicly accessible information is already being scoped to address R.32, however, this may not be at the individual licence level due to privacy.</p> <p>Other existing recommendations also relate to streamlining compliance assessments and reporting of issues (R.25 and R.26). A summary of compliance assessments is included in each annual review where NRAR have provided this information.</p>
I.12	Environment and Heritage Group	Discrepancy between AEW estimates	Environment and Heritage Group, WaterNSW and CEWO have all made different estimates for AEW	More timely access to event information is required to assess issues e.g. detail around the calculations of losses, travel times and final AEW estimates. Weekly updates while an event is occurring would be useful.	Discrepancies are noted and Water Group support more timely sharing of event data. This is the intent of R.26 and will be considered in design of the portal.

ID	Agency	Issue	Description	Agency recommendation	Water Group response
I.13	NRC	Protect AEW from BLR, D&S and local water utility take	Active management does not protect from all forms of take  Noted in the review of the Barwon-Darling Unregulated River Water Source 2012	Evaluate whether active management needs to incorporate consideration of basic landholder rights, domestic and stock, and utility take to ensure protection of held environmental water for the 2023 Plan remake.	This was previously considered as an option but was not pursued. Reasons for this are provided in section 4.2 below this table.1.
I.15	Water Science Group	Active management required for Boomi	There is no active management in the Boomi. Recent science indicates that it is a significant movement corridor used by native fish and hence active management of HEW would have significant ecological benefits.	Propose that active management is developed for the Boomi	<p>The department will review the feasibility, on consultation with WaterNSW. There may be other more suitable mechanisms for protecting HEW in this area.</p> <p>The policy already describes some decision-making criteria for determining where active management will be applied (see <i>Areas where active management applies</i> in the policy). This could be expanded to help guide proposals and decision making.</p> <p><b>R.42 Water Group to update the active management policy to further detail how new areas will be prioritised for active management.</b></p>

## 4.2.1 Protection of AEW from basic landholder right, domestic and stock and local water utility extraction

As described at issue I.13 in Table 6, the Natural Resources Commission have recommended that DPE-Water evaluate whether active management in the Barwon–Darling needs to consider protection from basic landholder rights (BLR), domestic and stock (D&S), and local water utility extraction.

Active management rules do not incorporate protection from all forms of extraction. During development of the active management rules, DPE considered whether further protections are required. Protection from BLR, D&S and local water utility extraction was not accounted for in the rules for the following reasons:

- Our ability to restrict BLR is limited.
- There are relatively low risks of HEW extraction from BLR, D&S and local water utility users in the Barwon-Darling and very high practicality constraints:
  - The estimated extraction from domestic and stock rights and water access licences are small. For example, in the Barwon-Darling Unregulated River Water Source these are both estimated to be less 1,000 ML per year. Large extractions on any one day are unlikely due to BLR users having small storages. This means that daily extractions might be around 3 ML/day.
  - BLR use does not require metering. Some BLR extraction cannot be practically metered and the remainder would result in many meters on a many small pumps for a relatively small amount of water use. As a result, enforcing BLR protection is practically difficult.
- The impacts from local water utility use is potentially more significant, however there are still practical constraints which prevented their inclusion when developing the active management rules:
  - The most significant impact is likely to be from weir pools. Town weirs tend to be fixed crest structures. This means that if there is airspace in the weir, there is no way to avoid protected environmental water from filling up the weir.
  - This could mean that town water use has a material impact on AEW during dry periods, e.g., from replenishment flows to maintain refuge pools during a severe drought. This water could then subsequently be used by towns.
  - If town weirs became operable with infrastructure changes, Water Group would consider including a requirement in the active management procedures to maintain the weir level during protected events, to ensure the AEW is passed downstream.
  - We also considered that town weir pools might also be considered refuge pools, so there are complexities between environmental and water supply objectives.
- If other forms of take were found to be more significant in future, then we would consider feasible ways to protect environmental water.

## 4.3 Update on previous recommendations

There were 39 recommendations made in the first active management annual review. Some recommendations have been completed but many are still in underway or not started (Table 7).

Table 7 Status of previous (2020-21) review recommendations

REF	2020-21 review recommendation	Agency	Status	Comments
R.1	Water Group to enable sub-daily (corrective) announcements in the unregulated Barwon-Darling water source, through water sharing plan (WSP), procedures manual and operational changes, and consider the implications for compliance monitoring.	Water Group & WaterNSW	Underway	The Barwon-Darling WSP has been amended to allow for sub-daily announcements, however the procedures manual has not been updated and WaterNSW have not yet completed the necessary information and communication technology (ICT) system updates to enable implementation of sub daily announcements.
R.2	Water Group and WaterNSW to make the required changes to the Barwon-Darling WSP and procedures manual and develop systems to enable temporary trade of IDECs.	Water Group	Underway	The Barwon-Darling WSP has been amended but the procedures manual and ICT systems have not.
R.3	Water Group to consider revising wording for access thresholds in the Barwon-Darling WSP (49A, Table B) from "more than" to "equal to or more than".	Water Group	Not started	Will be considered in 2024 as part of the next Barwon-Darling WSP remake.
R.4	Water Group and WaterNSW to revise trading rules between management zones in the Macquarie-Bogan to manage the impact of trading in/out entitlements with different access thresholds.	Water Group & WaterNSW	Not started	All trading rules will be reviewed during the Macquarie-Bogan WSP remake.



REF	2020-21 review recommendation	Agency	Status	Comments
R.5	Water Group to remove the requirement to ignore the flow class threshold at a non-functioning flow reference point gauge when making flow class announcements in the Barwon-Darling for management zones that rely on two flow reference points (i.e., WSP sub-clause 49A (5), referred to as the "one-gauge rule"), to allow the use of forecast flows at both flow reference points to determine flow class access.	Water Group	Complete	The Barwon-Darling WSP has been amended
R.6	Water Group to change the 'no flow share' procedure (Procedure 19 in the Barwon-Darling Procedures Manual) to prevent licence holders who did not submit an EOI from extracting water.	Water Group & WaterNSW	Underway	Water Group to undertake stakeholder consultation on the proposed change.
R.7	Water Group and WaterNSW to complete investigations into travel times greater than one day within a management zone and their impact on licence holders in the Macquarie-Bogan.	Water Group & WaterNSW	Underway	The Macquarie-Bogan WSP remake will consider how a change of reference gauge will work with active management.
R.8	Water Group to advise licence holders in the unregulated Barwon-Darling, Gwydir and Macquarie-Bogan water sources on the maximum period that can be entered for an EOI.	Water Group	Not started	Water Group to work with WaterNSW to revise the maximum EOI period, educate stakeholders and link changes to WaterNSW forecast modelling
R.9	Water Group to include wording (based on any relevant WSP clauses) in the three procedures manuals relating to the period an announcement applies in the case of a system outage and should clarify that the announcement covers both the flow class and flow share.	Water Group	Underway	Water Group have made changes to the draft (unpublished) versions of the manuals. The changes will be implemented when the revised manuals are published.
R.10	Water Group to amend the three procedures manuals to require WaterNSW to provide a basic summary of active management events in the previous 12 months to 30 June to agencies by 31 August each year.	Water Group	Underway	Water Group arranged to provide data to partner agencies early in 2022 but are still to make changes to the procedures manuals. Water Group are working with WaterNSW to gather active management information after each event. See R.26.

REF	2020-21 review recommendation	Agency	Status	Comments
R.11	Water Group to reinforce the requirement that IDECs shall not be exceeded under any circumstances by stating this in the Barwon-Darling Procedures Manual.	Water Group	Complete	Not necessary. The procedures manuals are for WaterNSW and it was Water Group that allowed the exceedance
R.12	Water Group to revise the Barwon-Darling Procedures Manual to clarify that multiple flow share announcements and flow class announcements (each of 24-hour duration) during times of "high flow" may be announced on one day ("high flow" to be defined) so long as WaterNSW's operational practice of daily accounting is followed.	Water Group	Underway	Water Group have made changes to the draft (unpublished) versions of the manuals. The changes will be implemented when the revised manuals are published.
R.13	Water Group to change reporting templates so that feedback, issues and their recommendations are tracked using a table format.	Water Group	Complete	Templates sent to partner agencies. WaterNSW have provided further suggestions on template formats.
R.14	Water Group and WaterNSW to review operational feasibility of the mismatch procedures.	Water Group & WaterNSW	Complete	WaterNSW have completed a review and support pausing mismatch once sub-daily announcements are implemented.
R.15	Water Group to further investigate measures to protect AEW in Barwon-Darling backflows from extraction in the Macquarie, and then implement these measures.	Water Group	Underway	<p>Further investigation required.</p> <p>As an interim solution to best protect AEW in Barwon-Darling backflows, WaterNSW has been issuing 'no access' or 'limited access' notifications to these licence holders when they could potentially access the AEW. However, this only occurs when there is also an AEW event in the Macquarie.</p> <p>If possible, will be resolved through active management procedures. If required may also be considered during the Macquarie Unregulated WSP remake.</p>
R.16	Water Group to resolve the issue with sleeper/irrigator licences in the unregulated Macquarie-Bogan being able to protect water instream.	Water Group	Underway	Being tracked through Macquarie issues list (Issue 3). Resolution of this issue may require an update to the active management policy.

REF	2020-21 review recommendation	Agency	Status	Comments
R.17	Water Group to consider changes to the WSP clause relating to use of the remaining functional gauge, when data from one gauge is not available [49A (5) Barwon-Darling WSP], to allow forecast flows instead of ignoring the non-functional gauge.	Water Group	Complete	The Barwon-Darling WSP has been amended
R.18	Water Group and WaterNSW to first explore the rationale behind the inclusion of Procedure 15.3 and Note 5 and then revise the procedure, the Barwon-Darling WSP, and the mandatory and discretionary conditions for Schedule 2 and 2A licences in the WSP to ensure consistency between all three instruments.	Water Group & WaterNSW	Not started	Following advice from Water Group, WaterNSW adjusted WAL 33722's access thresholds to account for AEW.
R.19	WaterNSW to review the customer request to change the cut-off time for EOI submission (currently 9:00am on previous day).	WaterNSW	Complete	WaterNSW will not be changing the cut-off time
R.20	WaterNSW to consider including a graphical representation of AEW on the WaterInsights portal and implement where practical.	WaterNSW	Underway	Complete for the Barwon-Darling. See next section for a user guide.
R.21	WaterNSW to pursue opportunities to improve flow forecasting in the Barwon-Darling (in line with Claydon Review Recommendation 2 and 3).	WaterNSW	Underway	WaterNSW continue to revise the forecast procedure however no significant improvements have been possible. Key issues which make forecasting difficult include limited resources for forecasting end of system flows during flood periods and variability in event behaviour in the Barwon-Darling.
R.22	Water Group and WaterNSW to make changes to the Gwydir Procedures Manual to reflect the practices of not announcing access when normal conditions apply in the Gwydir and only announcing on days when active management rules apply.	Water Group & WaterNSW	Not started	There are currently no announcements in the Gwydir, as there are no relevant WALs. But Gwydir AEW is protected as it flows into the Barwon-Darling.
R.23	Water Group to conduct an analysis on the likelihood of an issue (issue 12 in Table 5 of the full report on equitable sharing) between two licence holders in the Macquarie-Bogan.	Water Group	Underway	This needs to be resolved through an update to active management procedures and does not require an update to the WSP.

REF	2020-21 review recommendation	Agency	Status	Comments
R.24	WaterNSW to consider development of a system/process to facilitate Aboriginal supplementary access licences in the Barwon-Darling.	WaterNSW	Complete	Decided this issue is beyond the scope of the active management policy.
R.25	WaterNSW and NRAR to explore options for dynamic (near real-time) comparison of extraction data and daily access announcements.	WaterNSW & NRAR	Not started	Waiting on telemetry data.
R.26	Water Group to investigate development and implementation of an active management event reporting portal so agencies can report events, track compliance, report issues and put forward recommendations throughout the year	Water Group	Not started	WaterNSW are reviewing how best to share data with agencies and can provide a report after each event. During long events they will provide monthly updates.
R.27	WaterNSW to change operational systems to prevent full IDEC announcement for licences that did not submit an EOI when the rules allow this.	WaterNSW	Not started	Not started as procedure change is not finalised (see R.6)
R.28	Water Group to review interim measures used by WaterNSW to address issues with Tara gauge and either endorse the measures or propose new measures.	Water Group	Underway	
R.29	WaterNSW to identify extraction points along management zones in the Barwon-Darling and incorporate into the forecasting model to improve flow forecasts in the downstream zone.	WaterNSW	Not started	Waiting on telemetry data.
R.30	Water Group to change procedures to require environmental water licence holders to (a) nominate the end of the upstream regulated system as the delivery location when the water is then to be actively managed in the Barwon-Darling (b) place such orders via iWAS.	Water Group	Not started	Not all end of system locations are currently listed in iWAS. Also, Environment and Heritage Group are not placing orders via iWAS. WaterNSW plan to review whether an update of iWAS is required.

REF	2020-21 review recommendation	Agency	Status	Comments
R.31	Water Group to progress installation of a new gauge at Marthaguy Creek near upstream of the confluence with Terrigal Creek (prioritised in the Hydrometric Improvement Plan).	Water Group	Underway	<p>Work is progressing to establish a new gauging station on Marthaguy Creek at Sandy Camp Road near Quambone - the location of an historic monitoring site (421062). Progress to date includes:</p> <ul style="list-style-type: none"> <li>• It is design complete,</li> <li>• some equipment purchased,</li> <li>• benchmark established</li> </ul> <p>Data from the historic sites will be used to establish a rating for the new site when constructed. Construction will occur once stakeholders have approved the design.</p>
R.32	WaterNSW to make access announcements from all prior water years publicly available through their WaterInsights portal.	WaterNSW	Underway	WaterNSW have scoped archiving announcements on WaterInsights but have not yet implemented.
R.33	WaterNSW and NRAR to establish an advanced notification protocol to facilitate timely active management compliance monitoring.	WaterNSW & NRAR	Not started	WaterNSW have not sent notifications to NRAR. Water Group will establish the most appropriate method for notification of all agencies. This may be via a mailbox.
R.34	WaterNSW to replace/relocate Tara gauge and Water Group to update references to the gauge in the Barwon-Darling WSP and procedures manual.	WaterNSW	Underway	<p>A new gauge upstream of Tara has been installed in the Barwon River at Caloola gauge (422035). It has provided data since April 2022. Tara is now just a level gauge.</p> <p>Before the new gauge at Caloola completely replaces the Tara gauge, the following issues and changes need to be considered:</p> <ul style="list-style-type: none"> <li>• changes to the WSP – the reference to the gauge and the impacted management zone</li> <li>• changes to licences – need to determine how many licences are “between” Tara and Caloola and notify them of the changes required to their licence. Need to also look at special licences that may reference Tara</li> <li>• changes to the licencing systems, data bases, operational models.</li> </ul>
R.35	WaterNSW to revise the announcement system to minimise opportunity for human error.	WaterNSW	Complete	The missed event was in the early days of active management and the procedures have now had time to mature.
R.36	WaterNSW to review and improve systems to ensure all active environmental watering events are reported and protected.	WaterNSW	Complete	The missed event was in the early days of active management and the procedures have now had time to mature.

REF	2020-21 review recommendation	Agency	Status	Comments
R.37	WaterNSW to ensure impacts on AEW volumes are avoided when manually changing travel time.	WaterNSW	Complete	Changes to travel time are infrequent and only during high flow periods.
R.38	Water Group and WaterNSW to address stakeholder concerns around the resumption of flows rule through external communications.	Water Group & WaterNSW	Not started	Water Group and WaterNSW are communicating with stakeholders through the Barwon-Darling CAG and plan to conduct further engagements to address Claydon Review recommendations.
R.39	Water Group to notify licence holders of current trading rules between zones with different access thresholds.	Water Group	Not started	To be discussed as part of Macquarie-Bogan WSP remake

### 4.3.1 How to find the graphical representation of AEW on the WaterNSW website

The WaterNSW WaterInsights website now includes a graphical view for the Barwon–Darling so that total flow and AEW can be seen at each gauge (Figure 2).

To access this data, following the 3 steps:

1. Go to: <https://waterinsights.waternsw.com.au/>
2. Navigate to the Barwon–Darling Unregulated River water source, select Gauges and then select Graphical View. Alternatively use this link: <https://waterinsights.waternsw.com.au/16001-barwon-darling-unregulated-river/river-data#volumetric-view>
3. Choose a timeframe e.g., latest daily, last 30 days or last 365 days.

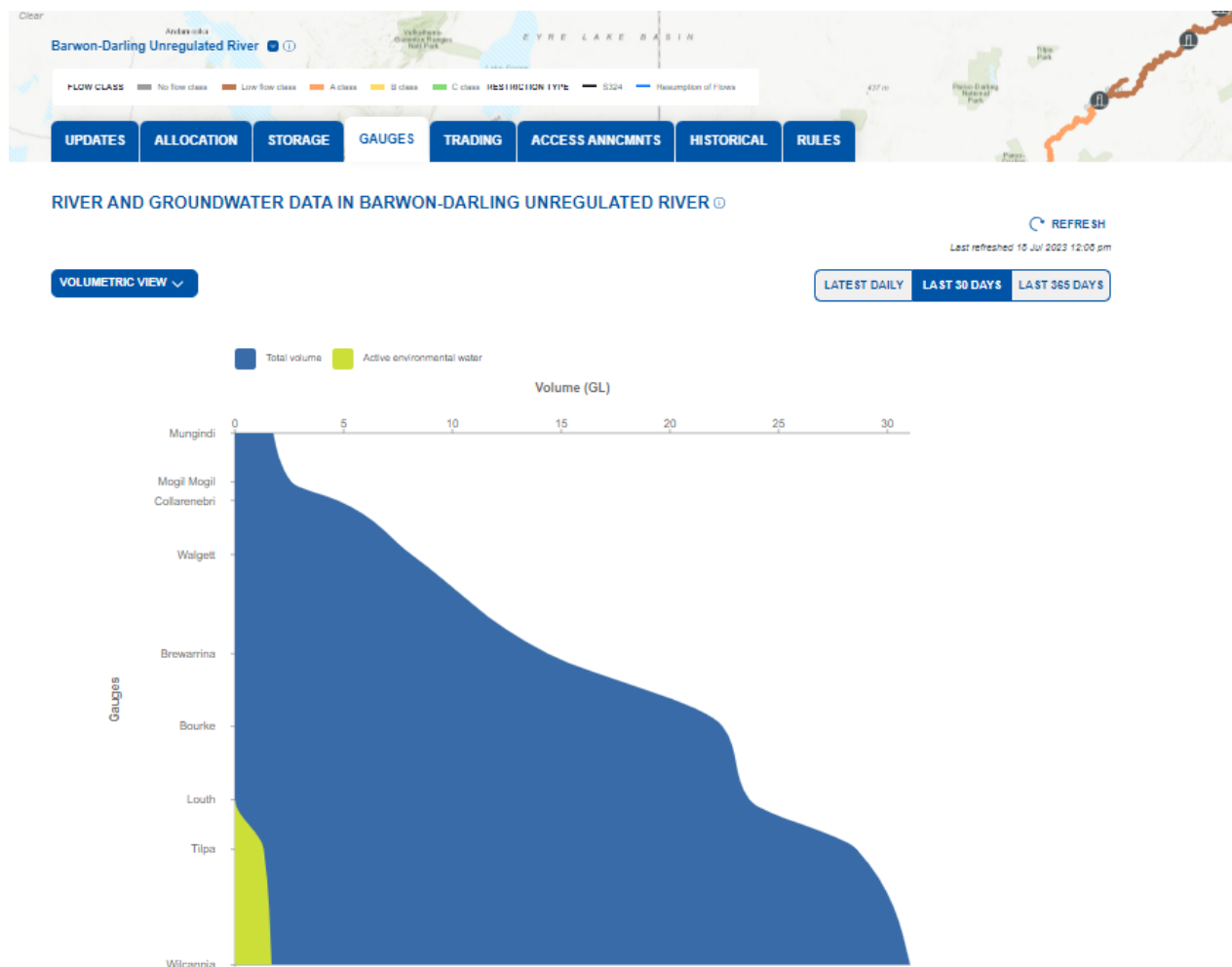


Figure 1. WaterInsights graphical view for AEW and Total Flow in the Barwon-Darling

# 5 Evaluation

Item 3 (e) of Procedures 31, 25 and 32 of the Gwydir, Barwon–Darling and Macquarie–Bogan manuals, respectively, require the report to include an assessment of whether:

- procedures were followed for active management
- any deviations from the procedures occurred and any modifications to the procedures that may be required to avoid future deviations, where possible
- the current active management procedures and the associated operation provide for AEW to remain in the water source for environmental purposes
- the risk management measures in place are effective in protecting AEW and ensuring that access by water users to water above the access thresholds arising from other sources has not been impacted
- the active management procedures should be expanded, modified or remain unchanged.

## 5.1 Procedures and deviations

Procedures were followed with the exception of one deviation in the Barwon-Darling. This deviation protected AEW from one access licence when not required by the procedure.

An assessment of deviations (i.e., which procedures were not followed) is provided in Table 7. The findings in Table 7 are based on information provided in the annual statements and consultation with WaterNSW.

No announcements are required at present in the Gwydir (see Section 3.2).

While procedures were followed for each event, WaterNSW have not yet published some information on methods as required by procedures. This includes flow and loss forecasting methods. This information has been prepared and when finalised will be published on the WaterInsights portal.

Table 8 Assessment of deviations from procedures (value in brackets corresponds to deviation no.)

Procedure category	Any deviations?	
	Barwon–Darling	Macquarie–Bogan
Forecasting flows and river transmission losses	N	N
Identifying, determining and monitoring active environmental water	N	N



Procedure category	Any deviations?	
	Barwon-Darling	Macquarie-Bogan
Monitoring and managing the intended sharing of river flows	N	N
Issuing flow advice	N	N
Expressions of interest	N	N
Adjusting access thresholds	Y (1)	N/A
Determining the water available and maximum volume permitted to be taken	N	N/A
Determining the flow class	N	N
Daily management approach	N/A	N/A
Access announcements	N	N
Debiting water allocations accounts	N	N
Monitoring, evaluation, reporting and improvement	N	N
Deviating from procedures outlined in this procedures manual	N	N

## Deviation 1 - Adjusting schedule 2 licences to account for AEW

WaterNSW have been adjusting access thresholds for a Schedule 2 licence (WAL 33722) to account for AEW. This action represents a deviation from Procedure 15 (3) and Note 5 of the Barwon-Darling Procedures Manual. This deviation was also reported in the 2020-21 annual review and further detail can be found in that report. There are conflicting conditions on this licence and WaterNSW sought advice from Water Group as to whether WAL 33722's access thresholds should be adjusted or not. Following the advice from Water Group, WaterNSW adjusted WAL 33722's access thresholds to account for AEW. Recommendation 18 is to resolve the inconsistencies between the mandatory and discretionary conditions, the procedure and the water sharing plan.

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## 5.2 Were the procedures and their associated operations effective?

This section seeks to determine whether the current active management procedures and the associated operation provide for AEW to remain in the water source for environmental purposes. This section does not describe environmental benefits or outcomes from the implementation of the active management rules. The active management policy specifies that reporting of outcomes is outside the scope of the annual review and is the responsibility of environmental water holders.

### 5.2.1 Procedures and associated operation

There were no unprotected events in 2021-22.

In their current form, the procedures manuals largely provide for AEW to remain in the water source for environmental purposes. However, there are two gaps in the procedures and overarching water sharing plans that need to be filled to better protect AEW. These gaps are (1) protection of AEW in Barwon–Darling backflows into the lower Macquarie and (2) protection of AEW from specific Schedule 2 and 2A licences. These gaps have been detailed in Section 5.2 the 2020-21 report. Measures to resolve these issues are:

- WaterNSW has implemented an interim solution as described in last year’s report. WaterNSW has been issuing ‘no access’ or ‘limited access’ notifications to these licence holders when they could potentially access the AEW from the Barwon-Darling. However they only issue this when there is also an AEW event in the Macquarie. R.15 is for a longer-term solution, and this is being progressed through the Macquarie Issues List (Issue 7).
- WaterNSW have applied an interim deviation to procedure to also adjust access thresholds for these licences. R.18 is for DPE to clarify and if necessary, update procedures.

Other operational recommendations made in the 2020-21 review are still applicable and being progressed. In particular:

- R.25 and R.26 both relate to better systems to enable compliance assessments and for agencies to access compliance and extraction information.

#### NRC review notes gap in protection

When reviewing the Barwon-Darling Unregulated River Water Source 2012 Water Sharing Plan, the Natural Resource Commission (NRC) noted that active management does not protect AEW from extraction under basic landholder rights (BLR), domestic and stock (D&S), and local water utility (LWU) access. The NRC recommended that DPE Water evaluate whether protection from extraction under these access rights/licence categories is required. See section 4.2.1 for explanations on DPE Water’s decision not to extend protection to BLR, D&S and LWU.

### 5.2.2 Compliance monitoring

NRAR has a broad capability and experience in monitoring environmental flow events for compliance with license obligations - both in real time and historically. However, NRAR did not specifically monitor the Active Management events that occurred in 2021/22.

NRAR are progressing development of a system to provide timely identification of possible breaches of active management rules (R.25).

NRAR did complete a review of the resumption of flows event in January 2021. No compliance action was taken following the review, and as a result, NRAR have not published any details of the review.

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## 5.3 Were the risk management measures effective?

The procedures manuals require an assessment of whether the risk management measures in place for active management are effective in:

- protecting AEW
- ensuring that access by water users to water above the access thresholds arising from other sources (i.e., available water) has not been impacted.

The procedures manuals identify ‘uncertainty in forecasting flows’ as the principal residual risk to both protection of AEW and access to available water. The uncertainty is a result of the inherent variability in natural river systems and the limitations in measuring and estimating flow parameters. This uncertainty leads to differences between announced (based on the forecast) flows and actual (measured or post-calculated) flows.

### 5.3.1 Risk management measures

There are eight risk management measures listed in the procedures manuals, employed mostly by WaterNSW, with the aim of striking a balance between over-estimating and underestimating available water and AEW, while remaining operationally feasible. The eight risk management measures for WaterNSW are:

1. consider the best information available on daily extraction
2. make the forecast/prohibition to access/volumetric limit announcements as close to the period of access as possible
3. share river transmission losses proportionally
4. base initial and ongoing loss estimates on historic loss
5. adjust the ongoing loss forecast to prevent mismatches compounding
6. adjust access to address cumulative mismatches
7. increasing the frequency of announcements
8. continuous improvement (better information and metering, conduct reviews and evaluations).

### 5.3.2 Assessment

As part of risk management measure 8, WaterNSW provide information on flow events in their annual reports, summarising differences between forecast and actual available volumes, losses and

AEW. The mismatch totals for available water, losses and AEW, across all events in the Barwon–Darling and Macquarie–Bogan, are shown in Table 9.

Table 9 Forecast minus post-calculated totals

Unregulated water source	AEW mismatch Forecast minus post-calculated AEW (ML)	Available water mismatch Announced available water minus post-calculated available water (ML)	Losses mismatch Forecast minus actual river losses (ML)
Barwon–Darling	-953	-65,612	194,351
Macquarie–Bogan	-4,559	8035	-4,401
<b>TOTAL</b>	<b>-5,512</b>	<b>-57,577</b>	<b>189,950</b>

Table 10 Total volumes of AEW and available water announced and mismatch %

Unregulated water source	AEW	Available water
Barwon–Darling (ML)	53,544	115,258,747
Macquarie–Bogan (ML)	29,021	184,221
<b>Total (ML)</b>	<b>82,565</b>	<b>115,442,968</b>
<b>WMismatch %</b>	<b>-7%</b>	<b>-0.05%</b>

### Effectiveness in protecting AEW

Table 9 and Table 10 show:

- In the Barwon–Darling, 953 ML of AEW was not protected under the active management rules that would have been protected based of the post-calculated flows. This represents -2% of the AEW in the Barwon–Darling.
- In the Macquarie–Bogan, 4,559 ML was not protected under the active management rules that would have been protected based on post-calculated flows. This represents -16% of the AEW in the Macquarie. This outcome is largely due to event 3. The overall mismatch for the other events is -0.84%.
- Across these AEW events, the total volume of AEW protected in the Barwon–Darling was 53,544 ML and Macquarie–Bogan was 29,021 ML, totalling 82,565 ML.

Therefore, across the two water sources where active management events occurred in 2021-22, forecasting uncertainty led to 5,512ML of AEW not being protected under the active management rules, that would have been protected if forecasting was 100% accurate. This underestimate represents 7% of the total volume of AEW in 2021-22.

### **Effectiveness in not impacting available water**

Table 9 and Table 10 show:

- In the Barwon–Darling, 65,612 ML was not made available to licence holders that would have been made available based on post-calculated flows. This represents -0.1% of the available water in the Barwon-Darling.
- In the Macquarie–Bogan, 8,035 ML was announced that would not have been announced based on post-calculated flows. This represents +4.4% of the available water in the Macquarie.
- Across these AEW events, the total volume of available water in the Barwon–Darling was 115,258,747 ML and Macquarie–Bogan was 184,221 ML, totalling 115,442,968 ML.

Therefore, across the two water sources where active management events occurred in 2021-22, 57,577 ML was not made available to licence holders as a result of forecasting uncertainty. This underestimate represents 0.05% of the total volume of available water in the two water sources in the 2021-22 period when the active management rules applied.

### **Sources of uncertainty**

In regard to the source of uncertainty, Table 9 shows that losses are a major source of forecasting uncertainty. In the Barwon–Darling, losses were over-estimated by around 194,000 ML. In the Macquarie losses were under-estimated by around 4,400 ML.

WaterNSW have indicated that the key sources of uncertainty in the Barwon–Darling are the same as reported last year, including unexpected rainfall, difficulty in making forecasts during flood periods and high variability between events. In addition, when available volume is close to the sum of IDECs this can result in large apparent mismatch volumes which are not a realistic representation of foregone opportunity. See Table 5 in the 2020-21 report for further information (No. 23).

In the Macquarie, flooding has impacted on gauging and forecast accuracy. The largest loss errors were in the downstream subzone 3. WaterNSW attributed these higher losses to backwater effects at the Brewarrina gauge. WaterNSW have also attributed the large mismatch for AEW in event 3 to difficulties forecasting rainfall and inflows.

### **Discussion and recommendations**

In the Barwon–Darling, forecasting uncertainty has led to conservative announcements with underestimation for both AEW and available water. The results for Barwon–Darling are relatively small in percentage terms which indicates an acceptable level of systematic conservatism.

Three recommendations were made last year to address mismatches in the Barwon–Darling (R.1, R.14 and R.6). These recommendations have not been fully implemented (see Section 4.3).

In the Macquarie there has been a much larger underestimate of AEW which indicates that there has not been an acceptable balance in the assessments:

- The mismatch is largely due to Event 3.

- Both AEW and available water were under-estimated in event 3 but the percentage mismatch was much greater for AEW and has been attributed to difficulty in forecasting rainfall and inflows. Better tracking and analysis of causes would be useful.

R.43 WaterNSW to review how to better track and report on causes for mismatch.

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## 5.4 Are changes to the procedures required?

Active management procedures need to be updated to reflect new water sharing plan provisions for active management of floodplain harvesting licences. These provisions were added to the Gwydir and Macquarie regulated water sharing plans in 2022/23. However, these new provisions do not commence until 1 December 2023.

R.44 DPE to update procedure manuals to reflect new WSP provisions for active management of floodplain harvesting licences.

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## 5.5 Policy recommendations

There is only one new recommendation relating to either policy or legislation:

R.42 DPE to update the active management policy to further detail how new areas will be prioritised for active management.

Note that a review of the policy is due by February 2026.

# 6 Next steps

The next steps in the continuous improvement of active management will be:

- (1) determine which recommendations to progress
- (2) consult with stakeholders on the proposed changes to the active management rules and procedures
- (3) plan implementation, track and report on status.

DPE-Water, with partner agencies, will determine which recommendations to progress.

Licence holders and peak stakeholder groups will be consulted on the changes to vary water sharing plans, the Active Management in Unregulated Rivers Policy or the three active management procedures manuals and their associated operations.

DPE-Water will continue to report on progress in each annual review. In carrying out the workplan, DPE-Water will collaborate with partner agencies, and managers of relevant projects and programs.

# 7 References

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DPE (NSW Department of Planning and Environment) 2020. Active Management Procedures Manual for the Gwydir Unregulated Rivers Water Source (INT20/57481), December 2020

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WaterNSW 2021. How to guide – Lodge an expression of interest (EOI) for active management. Accessed online 12 June 2022

WaterNSW 2021. [Resumption to Flows event report February 2021](#). Accessed online 8 August 2023



# Appendix A – Where active management rules apply

Table 11 Where active management rules apply in NSW

Unregulated water source	Unregulated water sharing plan management zone	Figure
Barwon–Darling	All management zones	Figure A1
Gwydir	Upper Gingham Watercourse Management Zone Lower Gingham Watercourse Management Zones Mallow Creek Water Source	Figure A2
Macquarie–Bogan	Lower Macquarie River Upstream Management Zone Lower Macquarie Downstream Management Zones Gum Cowal Management Zone Lower Marthaguy Creek Management Zone	Figure A3

Figure A2. Active management rules apply across all fourteen management zones in the Barwon–Darling Unregulated River Water Source

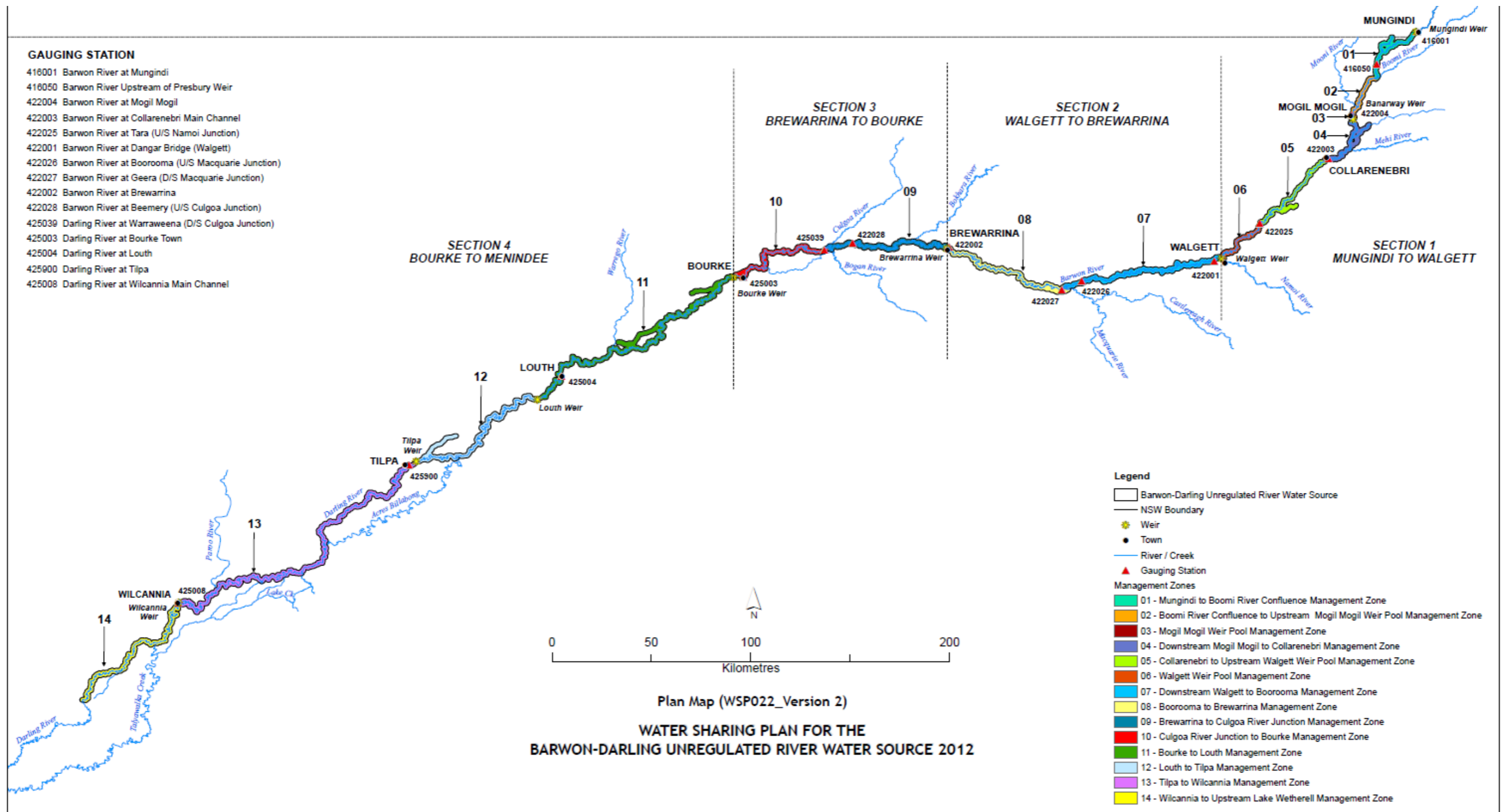


Figure A3. The three management zones where active management rules apply in the Gwydir Unregulated River Water Sources

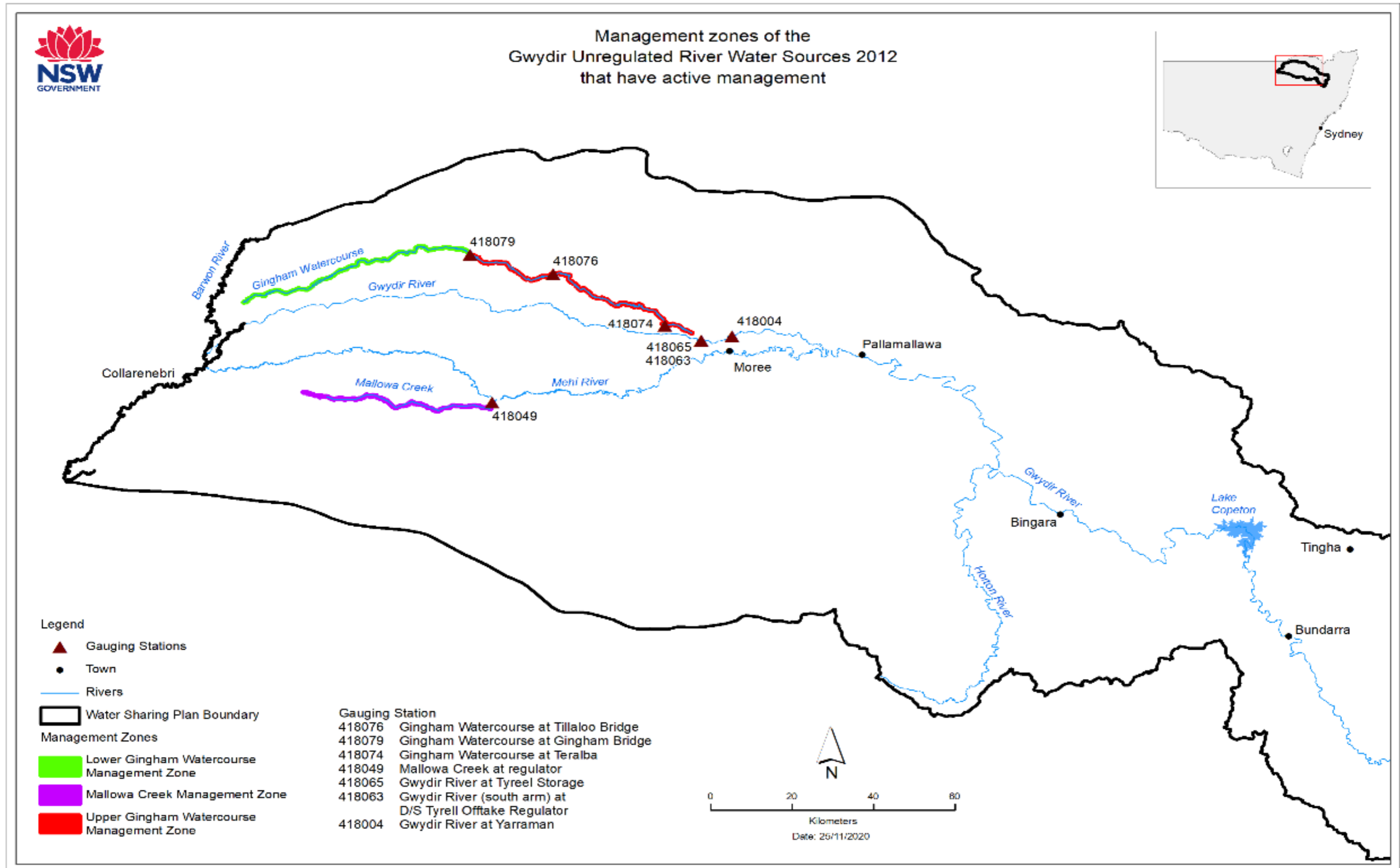


Figure A4. The four management zones where active management rules apply in the Macquarie–Bogan Unregulated River Water Source

