

LTAAEL compliance assessment for Barwon Darling River Water Source

Executive Summary

This report describes the methods used to assess if extractions in the Barwon Darling Unregulated River Water Source are compliant with the limit described in the water sharing plan (WSP) in the 2024-2025 water year. The assessment found that long-term average annual extractions (LTAAE) were compliant in 2024-2025.

Background and Purpose

The water sharing plan (WSP) for the Barwon Darling unregulated River Water Source requires an assessment of compliance with a Long-term Average Annual Extraction Limit (LTAAEL). The LTAAEL is often referred to as the 'plan limit'.

The assessment is to be carried out annually by the Department¹ on behalf of the Minister following the end of each water year. LTAAEL compliance assessment requires two scenario models; one to represent the LTAAEL and one to represent current conditions. The long-term results from both scenario models are compared to assess compliance.

Each water sharing plan (WSP) defines the LTAAEL, how the compliance assessment is to be completed, triggers for non-compliance and subsequent compliance action. The LTAAEL includes multiple types of water use. However, the compliance assessment is based on the total.

This report summarises a compliance assessment for the Barwon Darling Unregulated River Water Source for the 2024-2025 water year. The assessment was based on best available models, using fully refreshed climate data from 1895 to 2025.

Scenarios and agreed model version

Model scenarios for Cap, WSP and current conditions were selected based on evaluation against multiple scenario model selection criteria, including whether these had been documented and independently reviewed, how appropriate the management and levels of development are, and the consistency of the hydrology. For the Barwon Darling Unregulated River Water Source, the selected

¹ Refers to the current Department of Climate Change, Energy, the Environment and Water (DEECCW), as well as its predecessor(s) and likely successor(s) over the lifecycle of each Water Sharing Plan.

model scenarios reported in Table 1 are the most appropriate for the 2024-2025 LTAAEL compliance purposes.

The scenarios are based on the model scenario used for both the Cap and the water sharing plan (WSP) to set the LTAAEL, and the annual permitted take model used for sustainable diversion limit compliance assessment as part of the Murray Darling Basin Plan.

Table 1 Scenario models selected for Barwon Darling River Water Source for LTAAEL assessment purposes

Scenario model	System file
Cap and water sharing plan (WSP) conditions	LTAAEL_02_2025.sqq
Current conditions	DarLAPT08_curr.sqq

Note: The Cap version of the model scenarios reflect a multistage iteration process required between the equivalent Barwon-Darling and Gwydir River system model scenarios.

LTAAEL compliance results

LTAAEL assessment

The LTAAEL is the modelled long-term average annual extractions over the modelling period 1895-2025 using the Cap/WSP scenario model. The results of this analysis are reported in Table 2. The LTAAEL for 2024-2025 water year for Barwon Darling Unregulated River Water Source is 207.5 GL. There are also unmodelled extractions estimated at 5.8 GL/y. These unmodelled estimates have not changed and are not included in LTAAEL compliance assessment.

Table 2 Modelled long term average annual extractions (1895-2025) for Cap and WSP scenario models (GL/y)

Extraction category	Cap/WSP Scenario
A Class	1.1
B Class	137.7
C Class	51.5
Floodplain harvesting ²	17.2
Total modelled extractions	207.5

² Floodplain harvesting estimated by the model and is estimated by the addition of overbank flow and non-exempt rainfall runoff harvesting.

Extraction category	Cap/WSP Scenario
Basic Rights	0.8
Town Water Supply	2.3
Stock and Domestic	2.7

Compliance assessment

The modelled long-term average annual extractions (LTAAE) from the current conditions model scenario are compared to the LTAAEL results in Table 3. The current water sharing plan defines non-compliance if extractions under current conditions exceeds LTAAEL by 3% or more.

Note that plan limit compliance is assessed on total extractions and not by individual forms of take. The results in Table 3 show current levels of diversions less than LTAAEL, and therefore the Barwon Darling Unregulated River Water Source is compliant with the LTAAEL. The key reasons for differences between current and LTAAEL scenario results are:

- The previous annual volumetric licences were converted to individual shares of the long-term valley Cap as part of establishing the 2012 water sharing plan. This reduced licences to roughly 1/3 of the previous size.
- Some Cap shares were assigned to inactive water users which creates systemic underuse.
- Some irrigation businesses (generally smaller farms) ceased operations during the millennium drought.

Table 3 Modelled long term average annual extractions (1895-2025) for LTAAEL and Current Conditions' scenario models (GL/y)

Extraction category	LTAAEL scenario	Current conditions scenario
A Class	1.1	6.8
B Class	137.7	109.2
C Class	51.5	23.2
Deemed HEW usage	n/a	30.4
Floodplain harvesting	17.2	28.1
Total modelled extractions	207.5	197.7

Held environmental water (HEW) entitlements were used extensively in the Barwon-Darling for the first time during the 2020/2021 water year. Environmental uses are not yet included in the model. However, it is apparent based on recorded usage data in this year that environmental water

managers can fully utilise their entitlements. Based on this, full utilisation has been adopted for LTAAEL compliance purposes as discussed later in this report.

Results and comparison with 2023-2024 assessment results

The 2024-2025 LTAAEL showed noticeable increases of up to 4% in total diversion when compared to the previous 2023-2024 assessment.

The increase in diversion was largely due to adopting the plan limit for each valley tributary which in 2024-2025 was the BDL model scenario. Traditionally, as Barwon Darling Plan limit is the Cap scenario, the principle that had been applied was that a true understanding of Cap conditions in the Barwon-Darling could only occur in circumstances where the relevant upstream contributions were also operating at Cap levels of extraction. In reviewing this adopted approach, a decision was made whereby more weight was placed on the purpose of the run, and that when determining the plan limit for the Barwon-Darling, which just happens to also be Cap, that the tributary valleys should be also operating at their respective plan limits.

This means that when we are doing plan limit, then we have the Cap model in the Barwon-Darling and plan limit in the tributaries. Noting that plan limit in each of the tributaries is the lesser of either the BDL model or the Cap model as a rule.

Based on the compliance assessment results, the long-term average annual extractions in the Barwon- Darling Unregulated River Water Source were found to be compliant in 2024–2025.

No compliance action is required.

Supporting information

Results over Basin Plan assessment period

The results over the Basin Plan assessment period of 1895-2009 reported in Table 4 is included for reference only. These results will be used to track the degree to which future model updates change these long-term averages.

Table 4 Modelled long term average annual extractions (1895-2009) for LTAAEL scenario model and Current with floodplain harvesting licences scenario model (GL/y)

Extraction category	LTAAEL Scenario	Current Scenario
A Class	1.2	6.7
B Class	137.6	108.2
C Class	51.3	23.1
Deemed HEW usage	n/a	30.4
Floodplain harvesting ¹	17.1	28.1
Total modelled extractions	207.2	196.5

¹This includes Overbank Flow (OBF) and non-exempt Rainfall Runoff Harvesting (RRH)

Usage by Held Environmental Water Entitlements

Tables 3 and 4 reported estimates for held environmental water (HEW) usage in the current conditions model scenario. These were used for LTAAEL compliance purposes. The Basin Plan intends to recover entitlements for this purpose equivalent to 32 GL/year of long-term usage. Current recovery is 1.6 GL/year short of this target. We expect that held environmental water entitlements will be actively used over the longer term to meet environmental objectives.

No environmental water use was recorded prior to 2021-2022, and our current conditions scenario model has represented environmental water use by making the model nodes with these entitlements inactive. This representation still protects the long-term value of the entitlements from extraction by other entitlement holders because the entitlements were issued as a long-term share of Cap.

Environmental water managers used 217% of their entitlements over the 2024-2025 year. Their actual usage is detailed in Table 5.

This demonstrates the active use of the held environmental water (HEW) portfolio by the dedicated environmental water manager for the Barwon-Darling Unregulated River.

For the 2024-2025 LTAAEL compliance assessment we are still assuming long-term utilisation of these licences will equal 30 GL/year on average based on 2024-2025 usage data. The utilisation of these licences was 212% in the 2023-2024 year and 55% the year prior. This demonstrates the fluctuating nature of use by environmental water managers and their ability to utilise the full environment water entitlements.

Table 5 2024-2025 Environmental water share and usage by Water Access Licence (ML)

Water Access Licence	Category	Share	Usage
33752	A	111	0
33701	A	51	153
33704	A	95	227
33784	B	1,566	4,698
33762	A	41	0
33743	B	51	0
33619	B	9,252	21,432
33798	C	6,963	15,712
33621	A	39	0
35943	C	5,535	16,605
35944	B	1,188	3,367
36273	Unregulated river	1,488	73
37353	B	0	0
37461	B	323	323
37810	B	3,731	3,731
Total		30,434	66,061
Usage / share (ML/share)			2.17

Appendix A

The models used for the compliance assessment runs for the old and new Barwon-Darling models are described in Table 6.

Table 6 Model scenarios selected for compliance assessment

Scenario	Model		Difference between old and new models
	Old	New	
Cap and water sharing plan (WSP) conditions	LTADEL_2024.sqq	LTADEL_02_2025.sqq	Tributary inflows were updated to use the Plan Limit models for all inflow valleys, which in each case correspond to the BDL rather than the Cap scenario. The IQQM sub-models were configured into the main model for the following tributaries: • Castlereagh sub-model • Marra Creek • Bellinger Creek, Gunningbar and Peak Hill (ingested to represent the Bogan sub-model) • Little Weir River inflow (updated due to using inflows from BRIV IQQM in Source) The model timestep was changed from 6-hour to 24-hour. While the updated models developed to incorporate WSP ROF rules and IDELS had already shifted from a 6-hour to a 24-hour timestep, this change was not carried over to the previous models used for LTADEL compliance.
Current conditions	DarLAPT07_curr.sqq	DarLAPT08_curr.sqq	Errors in the pump IDT related to embargoes were identified in the latest Current Conditions model version <i>DarLAPT07.sqq</i> (nodes 58, 62, 102, 110). The model timestep was changed from 6-hour to 24-hour. While the updated models developed to incorporate WSP ROF rules and IDELS had already shifted from a 6-hour to a 24-hour timestep, this change was not carried over to the previous models used for LTADEL compliance. The effect of this timestep change resulted in a 1% decrease in total diversion. The Barwon–Darling WSP rule for floodplain harvesting access has also been incorporated. However, only one of the two access conditions has been modelled to date. Each floodplain harvesting irrigator has been restricted when Menindee Lakes storage is at or below 195 GL. The second access condition, where the restriction ceases when flow at Wilcannia (425008) exceeds 7,900 ML/day, has not yet been included in this model version.