

5 October 2023

# Lachlan Regulated River Water Source

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## Evaporation Reduction

The *Water Sharing Plan for the Lachlan Regulated River Water Source 2016* was amended in December 2022. A fact sheet is available ([link to the fact sheet](#)) outlining the changes. One amendment, at Clause 45, introduced an evaporation reduction to be applied to relevant general security licence accounts. This change aims to assign the additional evaporative losses from storage caused by carryover water to those with carryover, rather than socialising the loss across all users. It is considered a fair and reasonable initiative proposed by water users, consistent with the widely supported principle of 'user pays'. This information sheet explains the implementation of this rule.

### Key concepts

The evaporation reduction is to reflect additional net evaporation caused by extra surface area generated by the carried over water - water that was not used in the previous year.

The reduction will be debited from general security water accounts at the end of each quarter and, in accordance with the water sharing plan, it will focus on Wyangala Dam until it falls sufficiently to then include Lakes Cargelligo and Brewster.

The notion of tracking carryover water and its usage in accounts over time and calculating a reduction due to evaporation on the remaining carryover balance each quarter, such that those using their carryover water (or moving it to an unaffected account) could reduce their carryover reduction compared with those using allocation water, was initially found by system developers to be excessively complicated and costly to implement.

To expedite the matter and comply with the water sharing plan, a simplified approach was found that would reduce the costs to water users and deliver the 'user pays' principle while meeting the quarterly reduction required by the plan.

The simplifications required to cost-effectively implement this new requirement of the water sharing plan provide equity and transparency however remove the opportunity for some to limit or avoid their carryover liability. The proposed simplification is modest compared with the Victorian situation where a 5% reduction is unilaterally applied to all carryover water in accounts across the state on 1 July.

By choosing an appropriate design evaporation rate, the complication and uncertainty of measuring the highly variable actual net evaporation rate over days and months is removed. And, to the extent that the 'design' rate is greater than the actual evaporation, the extra water deducted from accounts will be returned to water users through the available water determination process.

The annual evaporation reduction liability is based on the total volume carried forward on 1 July and is applied quarterly to the Hold account until empty, then the Take account.

The annual liability will remain with the license, regardless of water usage or trade, and will be deducted from the account in instalments at the end of each quarter. Any remaining liability will lapse if the accounts are empty when the debit falls due for deduction.

New water allocations (AWDs) in a water year are not subject to the evaporation reduction.

## The simplified approach

The initial discussions in the planning phase of tracking daily evaporation and the balance of carryover water in accounts to establish a quarterly reduction for individual accounts was found difficult and time-consuming to implement. The additional costs were considered unwarranted given the relatively small volumes involved, typically less than 1% of carryover balance per quarter. Instead, a simplified, cost-effective approach was developed to satisfy the water sharing plan and deliver the basic principles of equity and 'user pays' by attributing the extra 'cost' of carryover to the beneficiaries of the carryover provision.

In time, it is proposed to assess the implementation of the Lachlan evaporation reduction and in consultation with water users determine if it should continue unchanged or if further investment in changes or sophistication are warranted.

## Assumptions

The extra volume in storage at the end of the year caused by unused water (carryover) creates additional surface area and increases evaporative losses. The difference in surface area (therefore evaporation) between the storage with carryover and without carryover reflects the quantum of extra evaporation loss caused by carryover.

Annual net evaporation (annual evaporation minus annual rainfall; minimum zero) will be determined by the operator, consistent with routine operational planning calculations. For transparency and certainty the value will be a suitable long-term 'design' figure, not an attempt to track the actual highly variable daily or monthly net evaporation.

The total liability (volume of extra loss), which is the additional surface area multiplied by the evaporation rate, will be attributed to each license in proportion to the volume of carryover held. The liability for each license is then divided by four to determine the instalment (megalitres) to be deducted from each account at the end of each quarter.

The quantum of annual evaporation reduction liability will be small and the annual calculation can occur in June or July without material impact to individual accounts.

## Implementation

1. Identify the ownership and total volume of carryover water in all Take and Hold accounts on 1 July.
2. Determine extra surface area caused by the carried over volume, first at Wyangala Dam (C145(1)(a)), and if needed (C145(1)(b)) at Lakes Cargelligo and Brewster. That is the actual surface (with carryover) minus the surface area that would be without carryover.
3. Select the design net evaporation rate (commensurate with other operational planning).

4. Identify the total annual evaporation reduction volume (megalitres) being the extra surface area (ha) (2) multiplied by evaporation rate (mm) (3) divided by 100.
5. Determine the annual percentage (%) reduction factor, which is 100 times the total evaporation reduction volume (4) divided by total carryover volume on 1 July (1).
6. The annual evaporation liability applying to each licence will be the total carryover in the Take and Hold accounts, multiplied by the annual percentage reduction factor (5).
7. This liability will be deducted at the end of each quarter, in four instalments at the end of September, December, March, June.
8. The Hold sub-account to be debited first then the Take sub-account until empty. If the accounts are empty, no liability will be carried forward.

## Worked Example

The following values are similar to 2023/24

Item	Quantum	Comment
1. Total GS carryover on 1 July in all current Take and Hold accounts	715,797 (ML)	Sum of all individual Take (585,218 ML) and Hold (130,588 ML) sub-accounts.
2. Extra surface area due to carryover	2,259 (ha)	Actual surface at time of calculation (5,196 ha) minus surface area without carryover volume in storage (2,937 ha).
3. Identified net evaporation (design) value	997 (mm)	Based on value used for operational planning purposes (@Cowra)
4. Extra evaporation loss due to carryover	22,522 (ML)	(2) times (3) divided by 100
5. Annual reduction factor	3.1464 %	100 times Extra loss (4) divided by total GS carryover in accounts (1)
6. Quarterly account reduction	Individual account carryover times 0.7866%	Total carryover on 1 July for individual licence multiplied by annual reduction factor (5) divided by four.

<p>Assume WAL 1234 has a total carryover in Hold and Take accounts of 5,000 (ML)</p>		<p>Hold carryover 3,500 ML Take carryover 1,500 ML</p>
<p>7. Annual evaporation liability for WAL 1234</p>	<p>157.32 ML</p>	<p>Total carryover on 1 July for individual licence multiplied by annual reduction factor (5)</p>
<p>8. Quarterly deduction for WAL1234, first from Hold sub-account</p>	<p>39.33 (ML)</p>	<p>Deduction from Hold sub-account first (end Sept, Dec 2023, Mar, Jun 2024) until empty, then Take sub-account.</p>