

The Menindee Lakes system

The Menindee Lakes are a naturally occurring series of shallow wetlands located along the Lower Darling River, approximately 200 kilometres upstream of the junction with the Murray River at Wentworth. Naturally ephemeral, that is, typically dry but filling with water for brief periods following rainfall, the Menindee Lakes were modified during the 1950s and 1960s to provide water storage to Broken Hill and other users in the Murray–Darling system, and to supply towns¹ and irrigators along the Lower Darling and Murray rivers.

The regulated storage system at Menindee consists of four main interconnected lakes. Of these, three are modified natural depressions (Lakes Pamamaroo, Menindee and Cawndilla), while the fourth (Lake Wetherell) is an artificial lake along the main river channel formed by the construction of the Main Weir. A channel was also built to connect Lakes Pamamaroo and Menindee (via Copi Hollow), while the other interconnections are modified natural channels. There are seven main regulating structures in the Menindee Lakes system, shown in Figure 1.

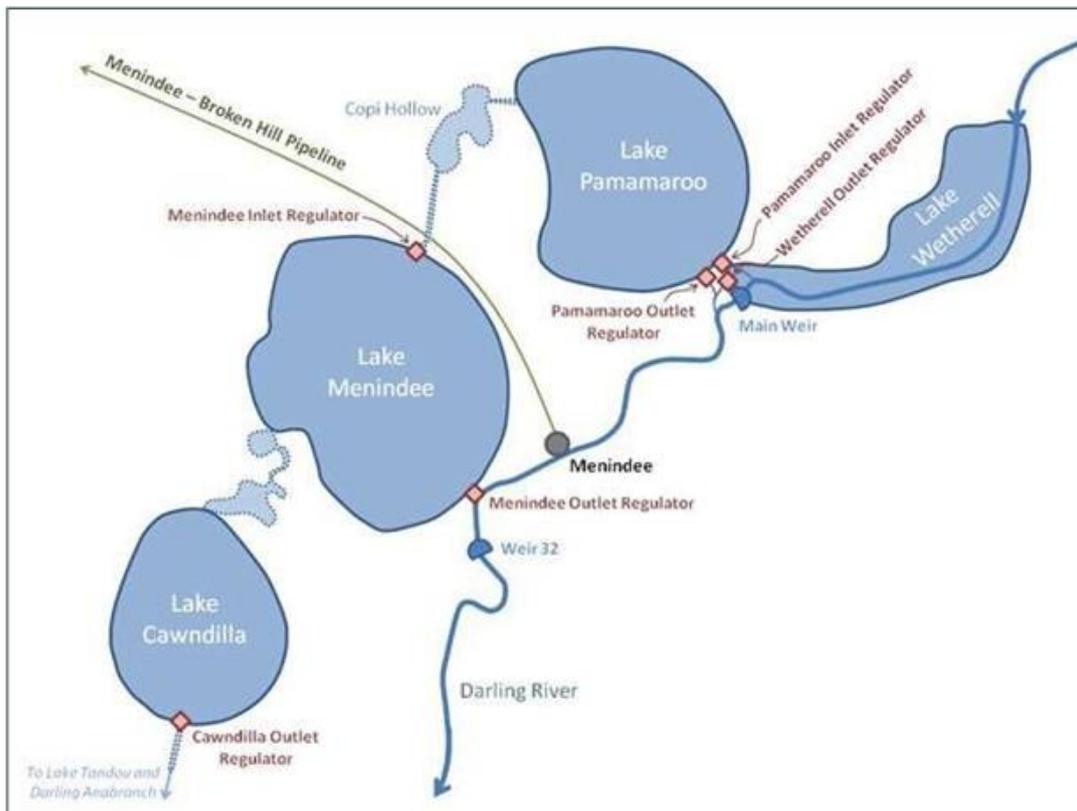


Figure 1 - Schematic diagram showing regulating structures in the Menindee Lakes system

As well as being a significant source of water for local towns and users, the lakes are also located in an area of environmental, social and cultural significance and provide recreational, tourism and economic opportunities for the towns and surrounding region. The Menindee Lakes system contains a broad diversity of both terrestrial and aquatic flora and fauna including threatened species and nationally important wetlands.

Current management and operation of the lakes system

Since their modification, the Menindee Lakes have generally been operated to maximise the storage volumes, water quality, and ability to supply users, and to minimise evaporation and mitigate floods where possible.

¹ Menindee, Broken Hill, Silverton and Pooncarie

Since the 1990s, operations have also focused on providing ecological benefits, managing flood mitigation for the Lower Darling to provide environmental benefits, controlling foreshore erosion, and minimising erosion of cultural heritage sites.

The Menindee Lakes storage is owned and operated by New South Wales with a long standing arrangement under the Murray Darling Basin Agreement. This Agreement requires the Murray Darling Basin Authority (the MDBA) to include the water held within the lakes as part of the shared resource of the River Murray System, and use the water in the lakes when the volume is above 640 GL until it next falls below 480 GL.

Once the total volume of the lakes falls below 480GL, the held water is no longer considered a shared resource of the River Murray System and the water is managed by New South Wales to meet local demands. Some of the water within the Menindee Lakes system is considered dead storage and cannot be accessed for release. The dead storage volume within the system is 125 gigalitres.

To ensure critical water supply needs can be met during periods of low inflows as well as to minimise evaporative water losses, Lakes Wetherell and Pamamaroo are preferentially used to store water ahead of Lakes Menindee and Cawndilla. In most instances, water released to meet immediate consumptive demands comes initially from Lake Menindee, then Lake Cawndilla and Lake Wetherell.

As in other catchments, water is supplied according to the order of priority of licences, particularly during periods where water availability is limited and use may need to be restricted to protect water for critical needs. This protection of stored water can become particularly crucial as water volumes drop, and as evaporative losses become more significant and water salinity increases.

In an extended period of low inflows, the salinity can become sufficient to make the water in the lakes unsuitable for irrigation or town water supply regardless of availability. It does, however, remain an important refuge habitat for aquatic and terrestrial fauna until the next major inflow.

During periods of flood, the lakes are operated to maintain the structural integrity of existing infrastructure, to maintain the security of existing water entitlements, and to minimise damage to downstream properties where possible.

Inflows are managed based on a series of considerations including water quality, levee bank stability and pre-releases to mimic a more natural flow pattern. Water can also be transferred from Lake Menindee to Lake Victoria in the Lower Murray under a 'harmony operation' if flows in the Lower Murray are not meeting consumptive and environmental demands for water. Water for additional dilution flow procedures can also be called from the lakes during periods of storage excess.

Future potential for the Menindee Lakes system

Prior to the modification of the lakes to provide a storage system, the lakes would naturally fill during high river flows and subsequently recede, forming a series of pools that would periodically evaporate entirely. The alteration of the lakes through the addition of weirs, regulators, levees, and channels to allow the storage and release of water has substantially changed this natural regime, while storage of water within the lakes incurs losses of an average 426 gigalitres per year through evaporation.

The NSW Government is now considering options to reduce the substantial loss of stored water to evaporation. The NSW Government has undertaken a series of investigations since 1995 to identify potential structural works and management changes to improve the efficiency of the Menindee Lakes and reduce evaporation.

© State of New South Wales through Department of Industry 2018. The information contained in this publication is based on knowledge and understanding at the time of writing (October 2018). However, because of advances in knowledge, users are reminded of the need to ensure that the information upon which they rely is up to date and to check the currency of the information with the appropriate officer of the Department of Industry or the user's independent adviser.