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2018-19 water delivery shortfall assessment as at February 2019

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Acknowledgement of the Traditional Owners of the Murray–Darling Basin

The Murray–Darling Basin Authority pays respect to the Traditional Owners and their Nations of the Murray–Darling Basin. We acknowledge their deep cultural, social, environmental, spiritual and economic connection to their lands and waters.

The guidance and support received from the Murray Lower Darling Rivers Indigenous Nations, the Northern Basin Aboriginal Nations and our many Traditional Owner friends and colleagues is very much valued and appreciated.

Aboriginal people should be aware that this publication may contain images, names or quotations of deceased persons.

Key findings of 2018-19 water delivery shortfall assessment

Despite hot, record-breaking summer weather with repeated and sustained heatwave conditions, the risk of delivery shortfall has remained low in early 2019 and all consumptive demands have been met. The risk of a water delivery shortfall event on the River Murray for the remainder of February and March is expected to remain low as the season progresses. However, if conditions turn even drier and hotter the risk could increase slightly.

What is a delivery shortfall?

Delivery shortfalls are rare but occur when available water cannot be delivered to users when they want it. For example, it could happen because demand exceeds the physical capacity of rivers and channels to carry sufficient water, or when demands for water unexpectedly increase and there is not enough time to release additional water from dams to meet the demand.

Water holders along the River Murray, especially downstream of the Barmah Choke, need to understand the risk of water delivery shortfall and take it into account in their business planning and investment decisions.

What is the chance of a delivery shortfall occurring?

A delivery shortfall could occur in any year. The risk of a shortfall is influenced by a range of factors including water use patterns, river capacity to convey water and climate variability.

There has only been one delivery shortfall on the River Murray that was shared between states. That was in 2002. Since 2002 the risk of shortfall has been mitigated through a range of operational actions undertaken by the Murray-Darling Basin Authority and state agencies of the River Murray System, including improved business practices, limiting large orders and using additional state based infrastructure.

What does the Murray–Darling Basin Authority do to reduce the risk of a delivery shortfall?

In operating the river the Murray-Darling Basin Authority is required to deliver state water entitlements whilst also maximising water availability. That requires moving the right amount of water at the right time to where it is needed in the river system. This can be challenging given the River Murray system is 2500 km long. The majority of the water storages are located in the upper part of the River Murray system and significant demand is located in the middle to lower parts of the system. It can take four weeks or more for water released from storages to reach the point of extraction downstream so decisions to release water need to be made well in advance of the time it is required for use by entitlement holders.

Forecasting demand, system inflows, and weather are key to ensuring the right volume of water is in the river at any given time. Computer simulation models that draw on a range of data including gauges that measure rainfall, river and storage levels, and water quality are used. The latest Bureau of Meteorology forecasts are also used and overlaid with considerations about the physical constraints of the river system to inform daily water release decisions. These forecasts are revised on a daily basis.

To guide river management, long-term strategies and plans are prepared, including an **annual operating plan** that considers the future possible operational activities under a wide range of climate and demand scenarios. An important aspect of this work is to understand where the delivery risks are for the coming year and what operational actions will assist in reducing these risks. The annual operating plan is reviewed regularly throughout the year. It can be accessed at <https://www.mdba.gov.au/publications/mdba-reports/river-murray-system-annual-operating-plan>.

In addition to routine operations, there are a number of actions that the Murray–Darling Basin Authority and states can employ to reduce the chance of a delivery shortfall occurring.

What mitigation measures can be used?

River operators have a range of measures available to reduce the risk of shortfall, key ones include:

- bulk water transfers in spring to ensure water is stored below the Barmah Choke (mainly in Lake Victoria) before high summer demands emerge;
- sustained (in channel) releases from Hume through summer to meet demands and support Lake Victoria. Having higher flows provides flexibility in meeting spikes in demand (unused water can be recaptured in Lake Victoria);
- call on Inter Valley Trade water (from the Goulburn, Murrumbidgee and Darling Rivers when available) to increase flows and supply peaks in demand;
- transferring additional volumes of water around the Barmah Choke via the Edward-Wakool system and Murray Irrigation Limited infrastructure;
- surcharging weir pools in the mid-Murray, such as the Euston Weir pool to provide an additional supply that can be quickly drawn on if a sudden spike in demand occurs; and
- calling on other water sources in the mid-Murray such as Lake Boga.

The need to implement these measures is regularly reviewed and system operations adjusted accordingly.

What are the main influencing factors for a delivery shortfall?

Whilst there is a chance of delivery shortfall in all years, there are a number of factors that increase the risk in some years. The main factors that increase the risk of a shortfall include:

- higher demands for water downstream of the Barmah Choke;
- limited water stored in Lake Victoria to supplement flows from upstream storages; and
- the possibility of a quick transition from cooler conditions to heatwave conditions causing a sudden spike in demand.

There has been an increase in the total annual demand as well as peak demand for water in the River Murray downstream of the Barmah Choke. Some of this is due to sustained growth in new irrigation developments along the mid-Murray with record volumes of water traded from the Goulburn River. The increase in both peak and total demands means more water needs to be delivered through the system, adding pressure to channel capacity in the lower Goulburn and the Barmah Choke.

Lack of water in Lake Victoria during periods of high demand increases reliance on flows originating from Hume Dam or upstream tributaries. As Lake Victoria drops to low levels the ability to release water and supplement flows from upstream diminishes. If this coincides with a peak in demand then a shortfall could result.

What is the chance of a delivery shortfall for the remainder of 2018-19?

Despite hot, record-breaking summer weather with repeated and sustained heatwave conditions, the risk of delivery shortfall has remained low and all consumptive demands have been met. This has been possible in particular due to the water that was transferred and stored below the Barmah Choke before summer, sustained releases from Hume Dam through summer, heavy calls on Inter Valley Trade and utilisation of Murray Irrigation Limited channel network to bypass the Barmah Choke. The Murray–Darling Basin Authority, with support from the states, has also kept the Euston Weir pool raised, providing additional buffer capacity as a temporary mid-Murray storage.

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Looking ahead to the next few weeks, the chance of a delivery shortfall remains very low. This is due to the current high regulated flows along the River Murray provided to meet entitlement holder demands and also support sufficient Lake Victoria storage levels. Of note is that flows this summer are on average 4000 ML/day more than compared with the same time last year.

On the basis of these relatively high regulated river flows, Euston Weir pool will now be lowered from 20cm above full supply level back to full supply level. Having Euston Weir pool surcharged is an important mitigation measure against shortfall that was heavily called upon in 2018 when flows over Euston Weir were low. However, this surcharging onto the floodplain increases system losses and so is only undertaken when shortfall risks are elevated. With Euston flows forecast to remain at or above 8000 ML/day until early March, this buffer is no longer required and the surcharge volume will be transferred to be stored more efficiently in Lake Victoria.

March and April 2019

For the rest of the water year the chance of shortfall remains similar to most years and is low.

Managing the volume in Lake Victoria is critical to balancing the risk of shortfall while maximising water available to entitlement holders. Under normal operations, Lake Victoria is filled during winter and spring and drawn down over summer and autumn as water is released to meet demands. Having the lake low at the end of the irrigation season maximises the capture of winter and spring tributary inflows. However, as the lake level drops, outlet capacity decreases reducing the extent to which upstream flows can be supplemented to meet demand. If a high demand emerges late in the season when Lake Victoria is low then the risk of shortfall can increase.

To offset this risk, a large volume of water was transferred from Hume Dam to Lake Victoria in the spring of 2018. While Lake Victoria did not fill the storage peaked at 85 per cent capacity. Murray–Darling Basin Authority modelling of later season system operations showed this volume would be

sufficient to supply demands under an ongoing very dry outlook similar to the conditions experienced so far this season. However, should extreme hot and dry conditions emerge and combine with high demands in the coming weeks, there is a chance that Lake Victoria could fall lower than planned. In this unlikely situation it is possible that a shortfall could occur.

The current operational outlook for the system indicates there will be sufficient volumes in the river and in Lake Victoria to meet all demands through March and April.

The Murray–Darling Basin Authority together with the states continues to monitor storage levels in Lake Victoria along with climate and demand forecasts and will adjust operations should the risk of shortfall increase.

Regular updates on the risk of a shortfall this season is provided in the River Murray Weekly Report available for subscription and online at <https://www.mdba.gov.au/river-information/weekly-reports>.

What happens if a delivery shortfall occurs?

The Murray–Darling Basin Authority continues to work with Basin governments and state agencies to prepare to manage any delivery shortfall event that may occur. If a delivery shortfall occurs temporary water restrictions may need to be placed on water users. Should this be necessary then state agencies are responsible for implementing and enforcing any water restrictions.

More information on delivery shortfall management is available on the [Murray–Darling Basin Authority website](#).

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