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BASIN AUTHORITY

# Assessment of the salt export objective and salinity targets for flow management 2017-18

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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

# Basin salinity management

Salinity management across the Murray–Darling Basin is a significant challenge. If not managed well, salinity poses an ongoing risk to the Basin’s land and water resources. While salt occurs naturally in the Basin’s landscape, activities such as irrigation development and land clearing can cause salts to concentrate in certain places. Water flowing through the River Murray system and out to the Southern Ocean through the Murray Mouth is the only natural means by which salt can leave the Basin.

## Salt export objective

The Basin Plan includes a salt export objective to ensure salt is flushed at a sufficient rate into the Southern Ocean from the River Murray system. The Murray–Darling Basin Authority assesses achievement of the salt export objective by estimating the number of tonnes of salt exported per year averaged over the preceding three years. This is then compared with the Basin Plan indicative figure of 2 million tonnes per year.

The estimated annualised rate of salt export over the barrages was 0.86 million tonnes (Figure 1) during the three year assessment period (July 2015–June 2018). This is less than the Basin Plan’s indicative figure of 2 million tonnes per year.

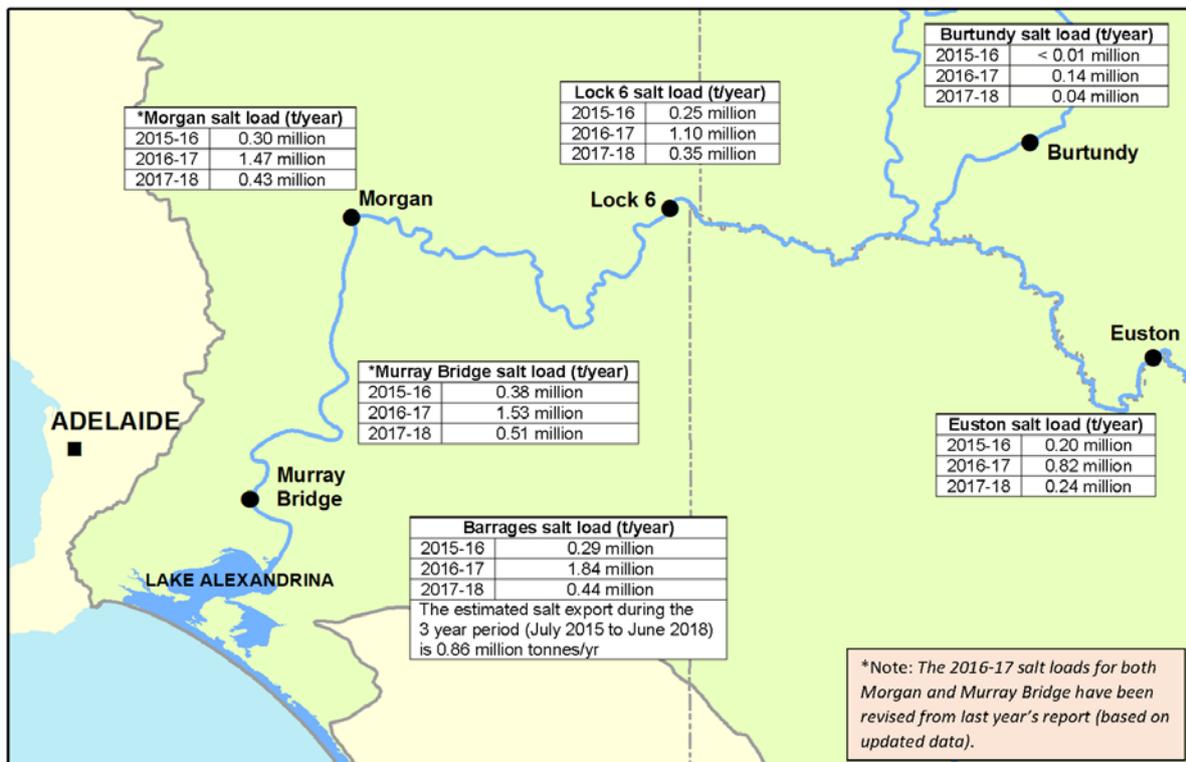


Figure 1: Salt loads at key locations in the Murray-Darling Basin

It has not been possible to consistently export large quantities of salt over the barrages as two of the three years over which the assessment was run were low flow years in the Basin (2015–16 and 2017–18). However, in 2016–17, the estimated salt exported over the barrages increased significantly to 1.84 million tonnes as a result of the 2016 flood event.

A range of factors influence how much salt is exported each year. These factors include river regulation, changed land management practices, complex groundwater systems and the highly variable nature of the hydrological conditions in the Basin. It may not be possible to flush 2 million tonnes of salt consistently while maintaining salt concentration or salinity levels in the river at acceptable levels.

During periods of low flow, preventing salt entering the river is more important than exporting salt to the ocean. Salt interception schemes (SIS), built over the past three decades to protect the shared water resources in the river, play an important role during these periods by diverting salt away from the River Murray system. During periods of higher flow, such as those experienced during late 2016, SIS play less of a role in reducing river salinity, as there is greater dilution and more salt is exported. (Table 1).

Table 1 Estimated salt export over the barrages and salt diverted away from the river system by salt interception schemes

Variable	2015-16 reporting year	2016-17 reporting year	2017-18 reporting year
Salt diverted away from the river and adjacent landscapes through operations of SIS (tonnes/year)	525,000	395,000	485,000
Estimated salt export over the lower lake barrages (annualised average over the three preceding years – tonnes/year)	0.56 million	0.87 million	0.86 million

The achievement of the salt export objective should therefore be viewed in the wider context of overall salinity management, including all the measures implemented in the Basin over the last three decades. It is anticipated that the increased flows resulting from the Basin Plan will assist to flush salts from the Basin and particularly the River Murray system over time.

## Salinity targets for flow management

The Basin Plan also includes salinity targets for flow management (operational targets) at five reporting sites. These targets seek to ensure River Murray water is suitable for drinking, agriculture, recreation and the environment.

Salinity has been continuously monitored over the five-year reporting period (2013–18) at the five reporting sites—Murray Bridge, Morgan, Lock 6, Burtundy and Milang. The targets are deemed to have been met if the percentage of days above the target is less than 5%, or the salinity has been below the target value for 95% of the time.

Results for July 2013 to June 2018 (Table 2) show that the salinity target values were achieved at four of the five reporting sites—Murray Bridge, Morgan, Lock 6 and Milang.

Over the reporting period, the salinity at Burtundy was above the target value for 36% of days. A dry period in the Darling River system between mid-2014 and mid-2016 led to low flows in the lower Darling, downstream of Menindee Lakes, resulting in salinity levels of over 1,500 EC at Burtundy from

early March to mid-August 2016. Drought conditions in the northern basin (as currently being experienced) continue to challenge effective salinity management in the lower Darling River. Governments are continuing to explore both operational and longer-term solutions for this part of the basin.

Table 2 Salinity levels at the reporting sites over the five-year period from 1 July 2013 to 30 June 2018, compared to the target values in Basin Plan (section 9.14)

Reporting site	Target value (EC in $\mu\text{S/cm}$ )	Non-exceedance salinity at 95% of the time ( $\mu\text{S/cm}$ )*	% of days above the target value
River Murray at Murray Bridge	830	568	0
River Murray at Morgan	800	511	0
River Murray at Lock 6	580	299	0
Darling River downstream of Menindee Lakes at Burtundy	830	1,620	36
Lower Lakes at Milang	1,000	878	0

\*Salinity values compiled from best available data (daily mean values derived from continuously logged data).

EC is an electrical conductivity unit commonly used to indicate salt concentration or the salinity of water.