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Assessment of the salt export objective and salinity targets for flow management 2015–16

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Acknowledgement of the Traditional Owners of the Murray–Darling Basin

The Murray–Darling Basin Authority acknowledges and pays respect to the Traditional Owners, and their Nations, of the Murray–Darling Basin, who have a deep cultural, social, environmental, spiritual and economic connection to their lands and waters. The MDBA understands the need for recognition of Traditional Owner knowledge and cultural values in natural resource management associated with the Basin.

The approach of Traditional Owners to caring for the natural landscape, including water, can be expressed in the words of the Northern Basin Aboriginal Nations Board:

> …As the First Nations peoples (Traditional Owners) we are the knowledge holders, connected to Country and with the cultural authority to share our knowledge. We offer perspectives to balance and challenge other voices and viewpoints. We aspire to owning and managing water to protect our totemic obligations, to carry out our way of life, and to teach our younger generations to maintain our connections and heritage through our law and customs. When Country is happy, our spirits are happy.

The use of terms 'Aboriginal' and 'Indigenous' reflects usage in different communities within the Murray–Darling Basin.

Cover image: Salt appearing on the surface at the Pike Floodplain (photo by Philip Cole).

Salinity management across the Murray–Darling Basin is a significant challenge. If not managed well, salinity poses an on-going risk to the land and water resources in the Basin. While salt occurs naturally in the Basin's landscape, activities such as irrigation development and land clearing can cause it to concentrate in certain parts of the landscape. 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.

The Basin Plan includes a salt export objective to ensure that salt is flushed at a sufficient rate into the Southern Ocean from the River Murray system. Each year the Murray–Darling Basin Authority must assess achievement of the salt export objective by estimating the number of tonnes of salt exported per year averaged over the preceding 3 years. This is then compared with the Basin Plan indicative figure of 2 million tonnes per year.

Due to the low inflows into the River Murray system over the last three years, it has not been possible to export that much salt over the barrages. Estimated annualised rate of salt export over the barrages was about 0.56 million tonnes (Figure 1) during the three year assessment period (July 2013–June 2016). This is less than the Basin Plan's indicative figure of two million tonnes per year.

A range of factors like river regulation, changed land management practices and the highly variable nature of the hydrological conditions in the Basin, influence how much salt is exported each year, along with complex groundwater systems. It may not be possible to flush 2 million tonnes of salt consistently while maintaining salt concentration or the salinity levels in the river at acceptable levels. However, flushing of salt from the river Murray System would have been less without the increased flows resulting from the Basin Plan. Therefore, achievement of the salt export objective should be viewed in the wider context of overall salinity management in the Basin.

During periods of low flows, the prevention of salt entering the river is more important than exporting salt out to the ocean. Salt interception schemes (SIS), built over the past three decades to protect the shared water resources in the river, have an important role to play during these times in diverting salt away from the River Murray. In 2015–16, the operation of SIS helped protect the river from salinity by preventing about 525,000 tonnes of salt reaching the river and riverine landscape (Table 1). During periods of higher flow, SIS play less of a role in reducing river salinity as there is greater dilution due to the higher flows.

Table 1: Estimated salt export over the barrages and salt diverted away from the river system by Salt Interception Schemes

Variable	2013–14 reporting year	2014–15 reporting year	2015–16 reporting year
Salt diverted away from the river and adjacent landscapes through operations of SIS (tonnes/year)	398,000	432,000	525,000
Estimated salt export over the lower lake barrages (annualised average over the 3 proceeding years – tonnes/year)	1.5 million	0.9 million	0.56 million

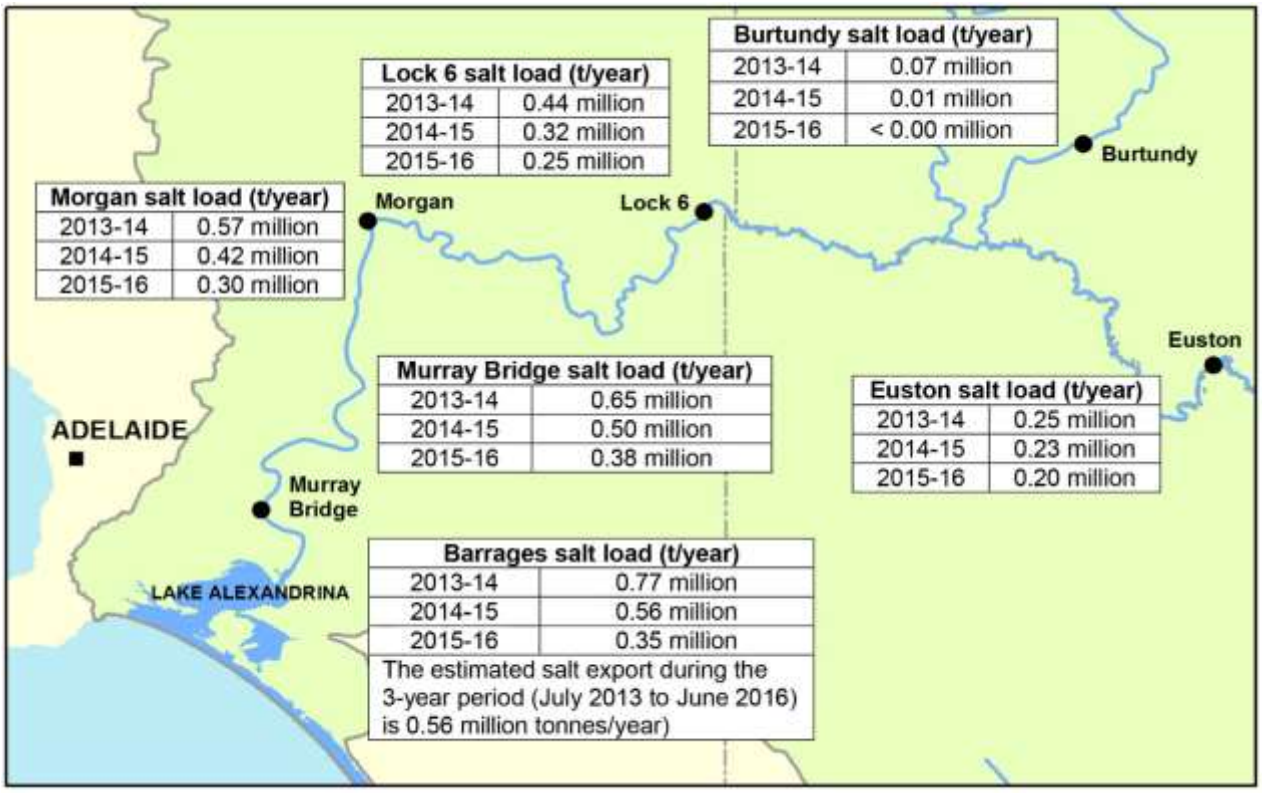

Figure 1: Salt loads at key locations in the Murray–Darling Basin

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

The salinity at the five reporting sites (Lock 6, Morgan, Murray Bridge, Milang and Burtundy) is monitored continuously over the five year reporting period (2011–2016). 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 2011–June 2016 (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 32% of days. This was due to low flows in the Lower Darling River, downstream of Menindee Lakes for the

third year in a row, resulting in a peak salinity of 1,764 EC in May 2016. The lack of water available from Menindee Lakes made it difficult to manage salinity in the lower Darling River.

Table 2: Salinity levels at the reporting sites over the 5 year period from 1 July 2011 to 30 June 2016, compared to the target values in Basin Plan (section 9.14)

Reporting site	Target value (EC in µS/cm)	Non-exceedance salinity at 95% of the time (µS/cm)*	% of days above the target value
River Murray at Murray Bridge	830	520	0
River Murray at Morgan	800	494	0
River Murray at Lock 6	580	362	0
Darling River downstream of Menindee Lakes at Burtundy	830	1602	32
Lower Lakes at Milang	1,000	853	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.