

Musgrave Prescribed Wells Area Bramfield

2018 Groundwater level and salinity status
report



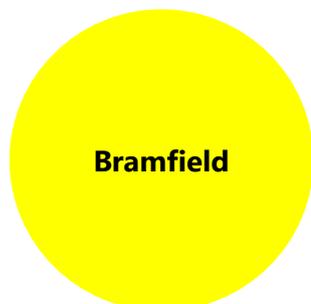
**Government
of South Australia**

Department for
Environment and Water

2018 Status summary

Musgrave PWA

Bramfield



The Bramfield lens of the Musgrave Prescribed Wells Area (PWA) has been assigned a **yellow** status for 2018 because minor adverse trends have been observed over the past five years.

The status is based on five-year trends: over the period 2014–18, 72% of wells show declining groundwater levels.

The status is based on five-year trends. To view the *Musgrave PWA groundwater level and salinity status report 2011*, which includes long-term trends in rainfall, groundwater levels and salinity, please visit the [Water Resource Assessments](#) page on WaterConnect. To download the full record of groundwater level and salinity data for the Musgrave PWA, please visit the *Groundwater Data* page on [WaterConnect](#).

This status report does not seek to evaluate the sustainable limits of the resource, nor does it make any recommendations on management or monitoring of the resource. These actions are important, but occur through separate processes such as prescription and water allocation planning.

Rainfall

See Figures 1 and 2

Rainfall station	Elliston Bureau of Meteorology (BoM) rainfall station, number 18069, is located in the township of Elliston.
Annual total ¹	422 mm 17 mm (4%) greater than the five-year average of 405 mm 8 mm (2%) less than the long-term (1900–2018) average of 430 mm

Groundwater extraction

See Figure 3

Allocated volume ^{1,2}	222.2 ML
Licensed groundwater extractions ^{1,3}	85.4 ML
Extraction volume comparison	Negligible change compared with the previous year 15% greater than the five-year average

¹ For the water-use year 1 July 2017 to 30 June 2018

² Allocated volume does not include rollover, carry over or recharge allocations

³ Total licensed extractions are subject to change as extraction data have not yet been verified in full – see [More information](#)

Groundwater level

See Figure 4

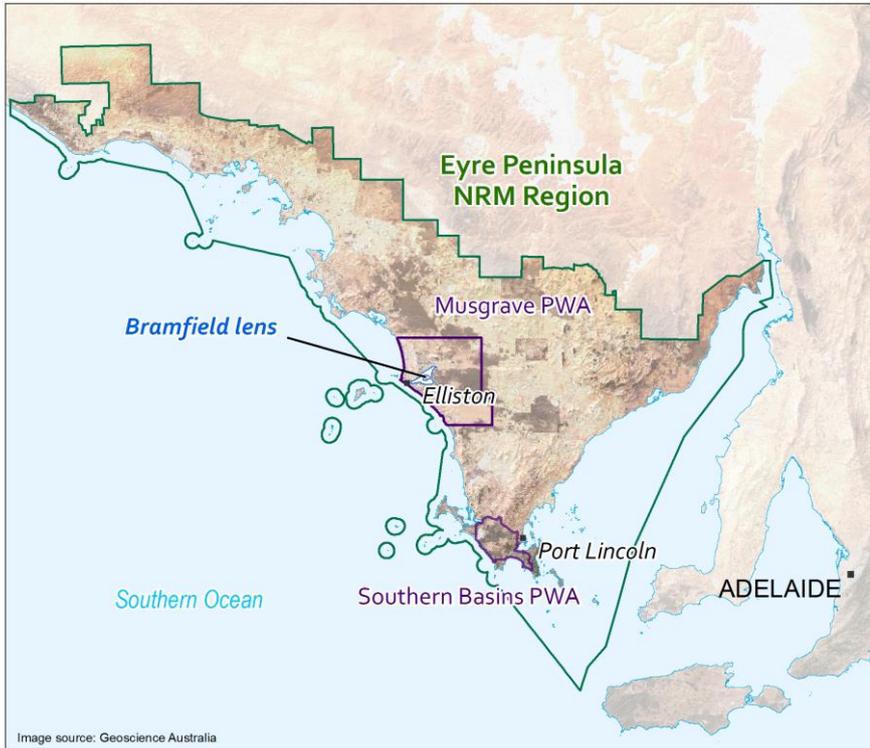
Five-year trend: 2014–18	5 out of 7 wells (72%) show a declining trend at rates of 0.01–0.11 m/y (median of 0.06m/y)
	1 well (14%) is stable
	1 well (14%) shows a rising trend, at a rate of 0.14 m/y

Groundwater salinity

See Figures 5 and 6

2018 salinity	482–1016 mg/L (5 wells; median of 664 mg/L)
Five-year trend: 2014–18	All 2 wells (100%) are stable

Regional setting



The Musgrave PWA is located within the Eyre Peninsula Natural Resources Management Region, on the west coast of the Eyre Peninsula, approximately 120 km north-west of Port Lincoln. The groundwater resources are prescribed under South Australia's *Natural Resources Management Act 2004*, and a water allocation plan provides for their sustainable use. The Bramfield lens is situated in the north-west of the Musgrave PWA.

Within the Musgrave PWA, there are three main sedimentary sequences containing groundwater that overlie basement rocks: the Quaternary limestone aquifer, the underlying Tertiary sands aquifer and deeper Jurassic sediments that occur only within the Polda Trough. The Quaternary limestone aquifer, which is the focus of this report, comprises a generally thin veneer of aeolianite sediments of the Bridgewater Formation. The Bridgewater Formation sediments are continuous across the PWA, however aquifers occur in discrete lenses such as the Bramfield lens, separated by areas where the sediments are thin or dry. The main source of recharge to the Quaternary limestone aquifer is the direct infiltration of rainfall, and groundwater flow is predominantly in a westerly to south-westerly direction toward the Southern Ocean.

Groundwater levels and salinities in the Musgrave PWA are highly responsive to recharge from rainfall, and trends in groundwater level or salinity are primarily climate driven: below-average rainfall results in a reduction in recharge to the aquifers. Below-average summer rainfall can also result in increasing extractions, and both elements can cause the groundwater levels to decline and salinities to increase. Conversely, above-average rainfall can result in increases in recharge, decreases in extractions and groundwater levels may rise and salinities may stabilise or decrease. Historical rainfall data indicate that trends of above or below-average rainfall can last for up to 25 years, and that high-intensity rainfall events can result in rapid groundwater level responses (i.e. recharge).

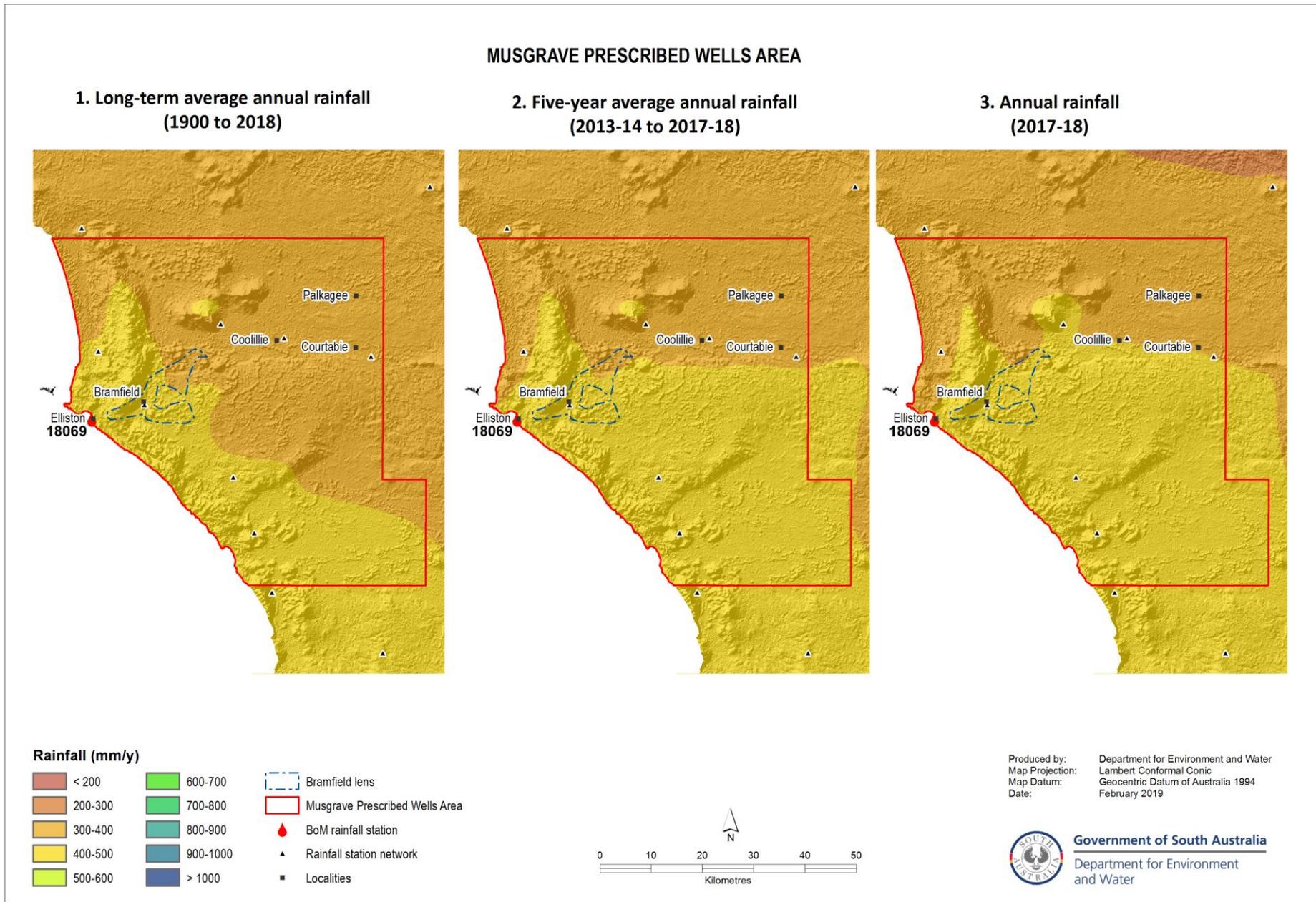


Figure 1. Spatial distribution of (1) long-term and (2) five-year average annual rainfall, and (3) annual rainfall⁴

⁴ Data source: SILO Patched Point Dataset, available <https://legacy.longpaddock.qld.gov.au/silo/> – see [More information](#)

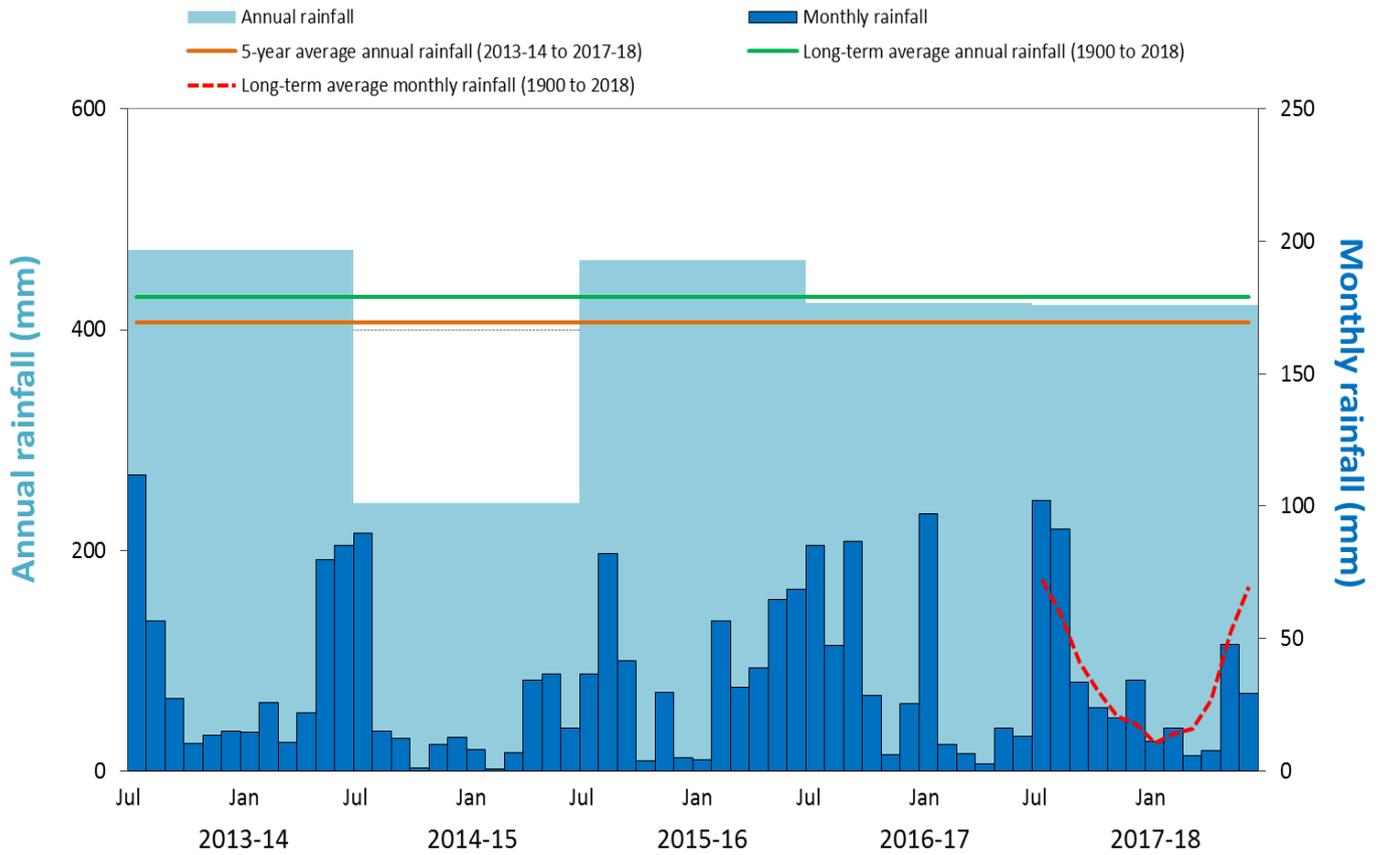


Figure 2. Annual and monthly rainfall for the past five water-use years recorded at Elliston (BoM Station 18069)⁵

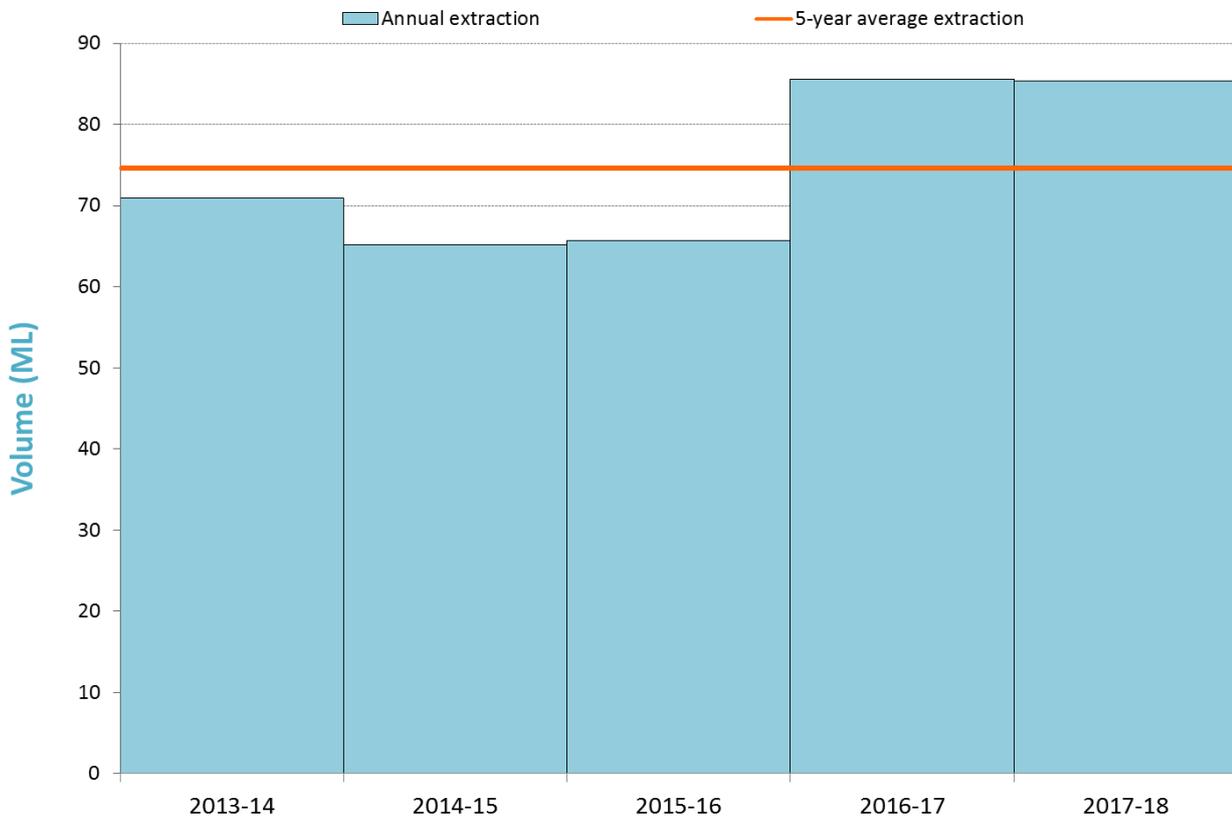


Figure 3. Licensed groundwater extraction volumes⁶ for the past five water-use years

⁵ Data source: SILO Patched Point Dataset, available <https://silo.longpaddock.qld.gov.au/> – see [More information](#)

⁶ Total licensed extractions are subject to change as extraction data have not yet been verified in full – see [More information](#)

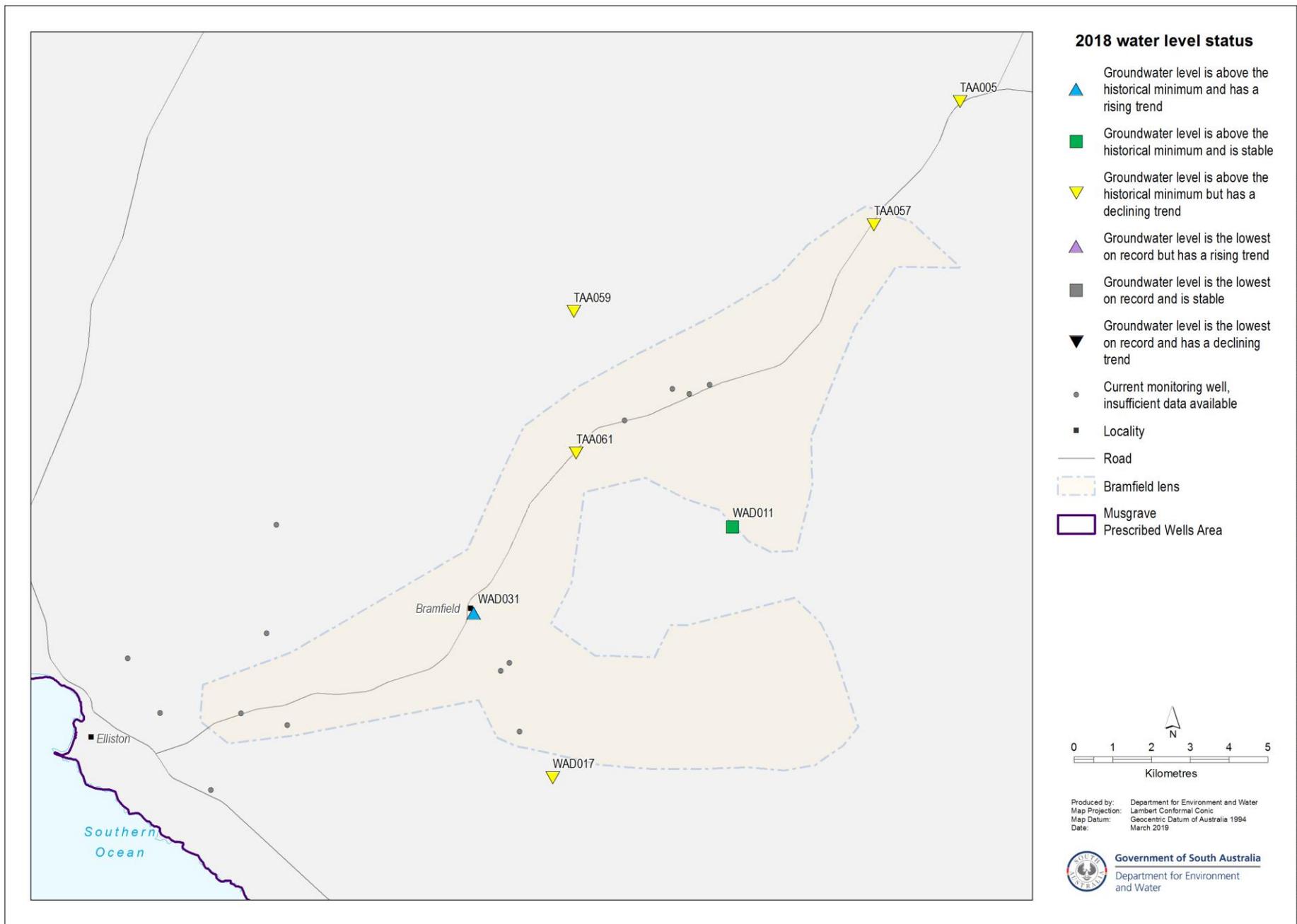


Figure 4. Five-year trends (2014–18) in groundwater levels: Bramfield lens

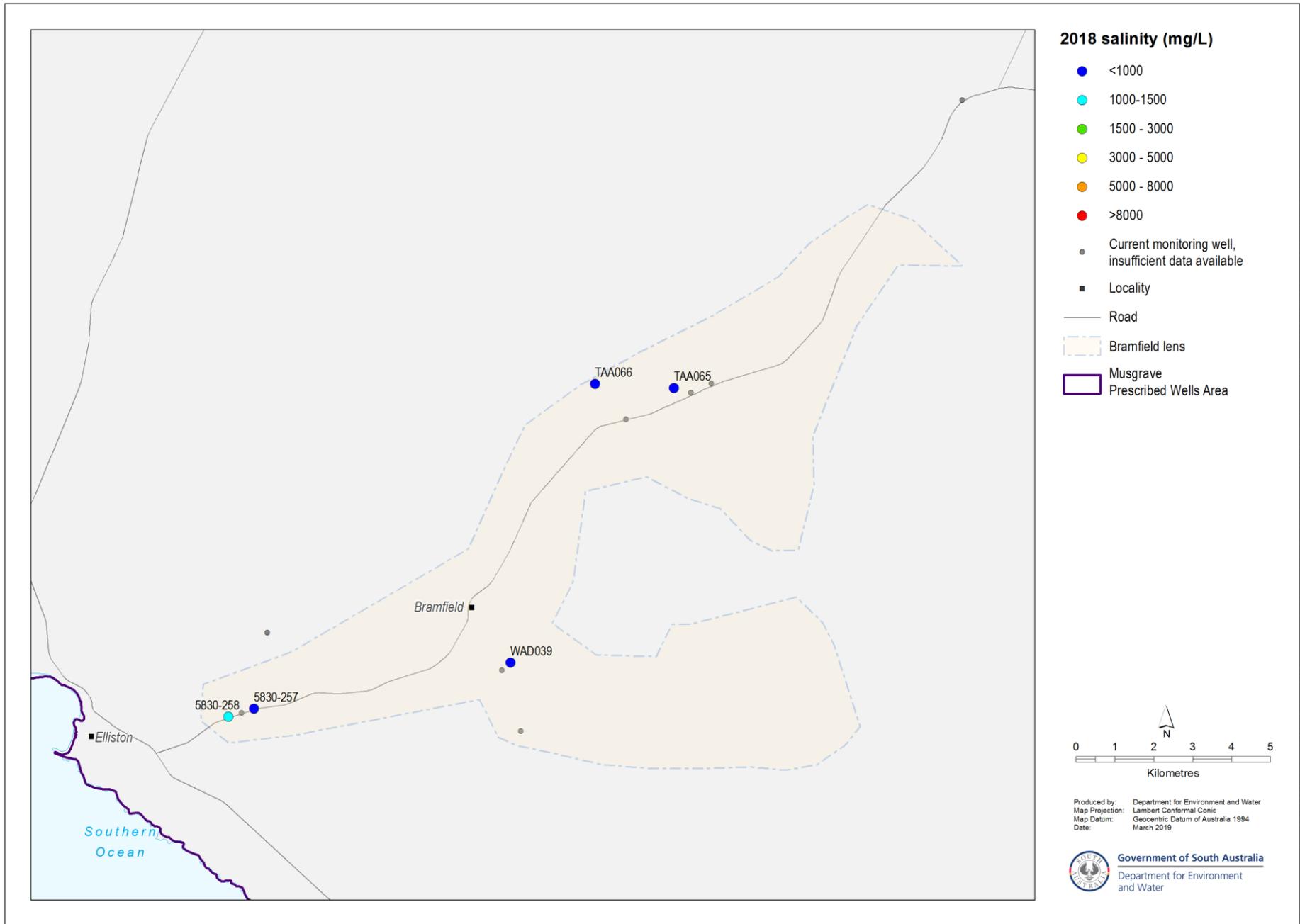


Figure 5. 2018 groundwater salinities: Bramfield lens

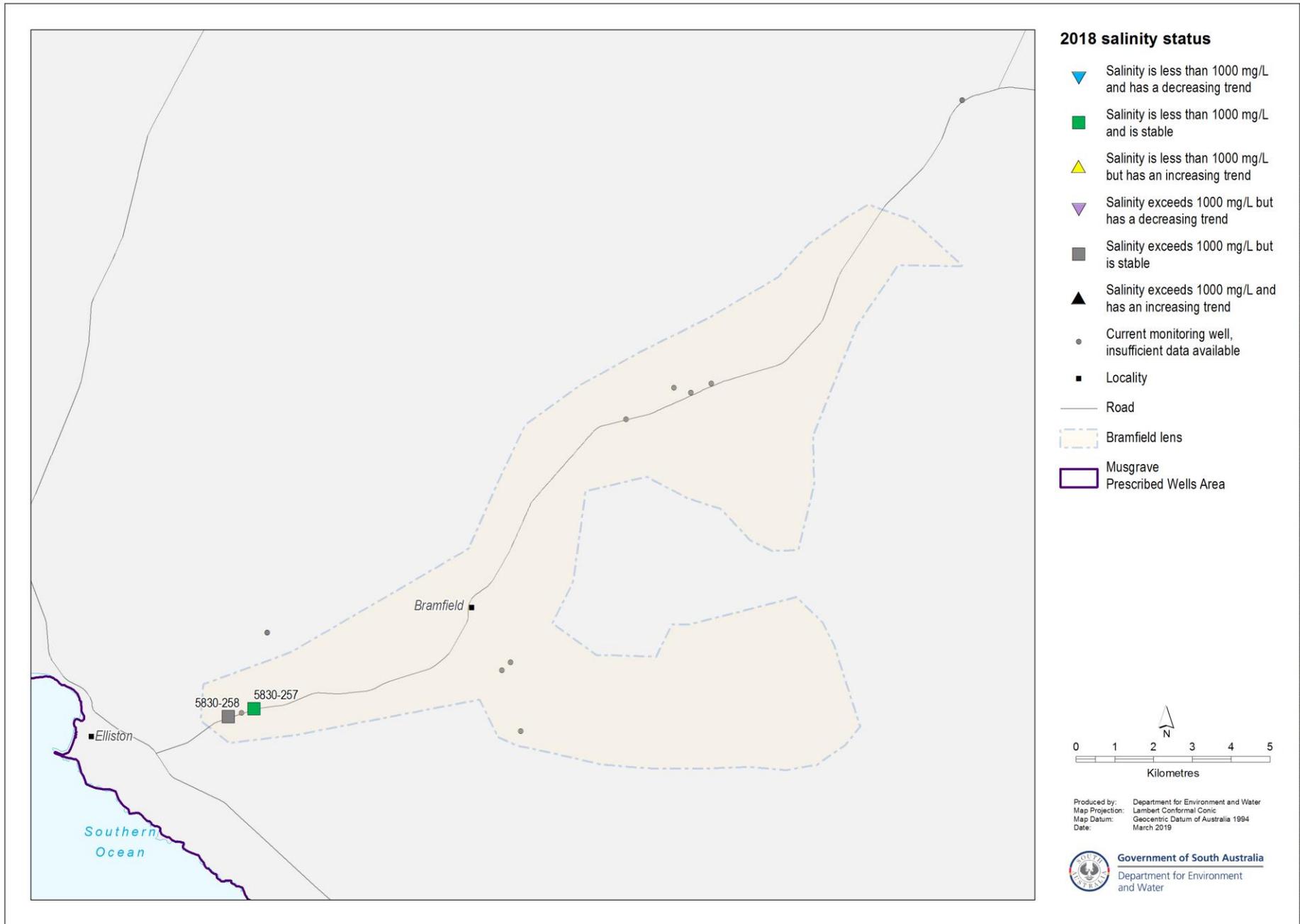


Figure 6. Five-year trends (2014–18) in groundwater salinities: Bramfield lens

More information

To determine the status of the Bramfield lens for 2018, the trends in groundwater levels and salinities over the past five years (2014 to 2018, inclusive) were analysed, in contrast to the year-to-year assessments that have been used in *Groundwater level and salinity status reports* published prior to 2015. Please visit the [Frequently Asked Questions](#) on the *Water Resource Assessments* page on WaterConnect for more detail on the current method of evaluating the status of groundwater resources.

To view descriptions for all status symbols, please visit the *Water Resource Assessments* page on [WaterConnect](#).

For additional information related to monitoring wells nomenclature, please refer to the *Well Details* page on [WaterConnect](#).

The licensed groundwater extraction for the 2017–18 water-use year is based on the best data available as of February 2019 which could be subject to change, as some extraction volumes may be in the process of being verified.

For information completeness and consistency across all the groundwater level and salinity status reports, the legend on each map herein shows the full range of water level and salinity status that could possibly be reported. However, the measured data that appear on each map may not span this full range.

Rainfall data used in this report are sourced from the SILO interpolated point and gridded datasets, which are calculated from BoM daily and monthly rainfall measurements and are available online at <https://legacy.longpaddock.qld.gov.au/silo/>.

To view the *Musgrave PWA groundwater level and salinity status report 2011*, which includes background information on hydrogeology, rainfall and relevant groundwater-dependent ecosystems, please visit [WaterConnect](#). To view all past published *Groundwater level and salinity status reports*, please visit the [Water Resource Assessments](#) page on WaterConnect.

To download groundwater level and salinity data from monitoring wells within the Musgrave PWA, please visit the *Groundwater Data* page under the Data Systems tab on [WaterConnect](#).

For further details about the Musgrave PWA, please see the Water Allocation Plan for the Southern Basins and Musgrave Prescribed Wells Areas on the Natural Resources Eyre Peninsula [website](#).

Units of Measurement

mm	millimetre
ML	megalitre
m/y	metres per year
mg/L	milligrams per litre
mg/L/y	milligrams per litre per year
mm/y	millimetres per year

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