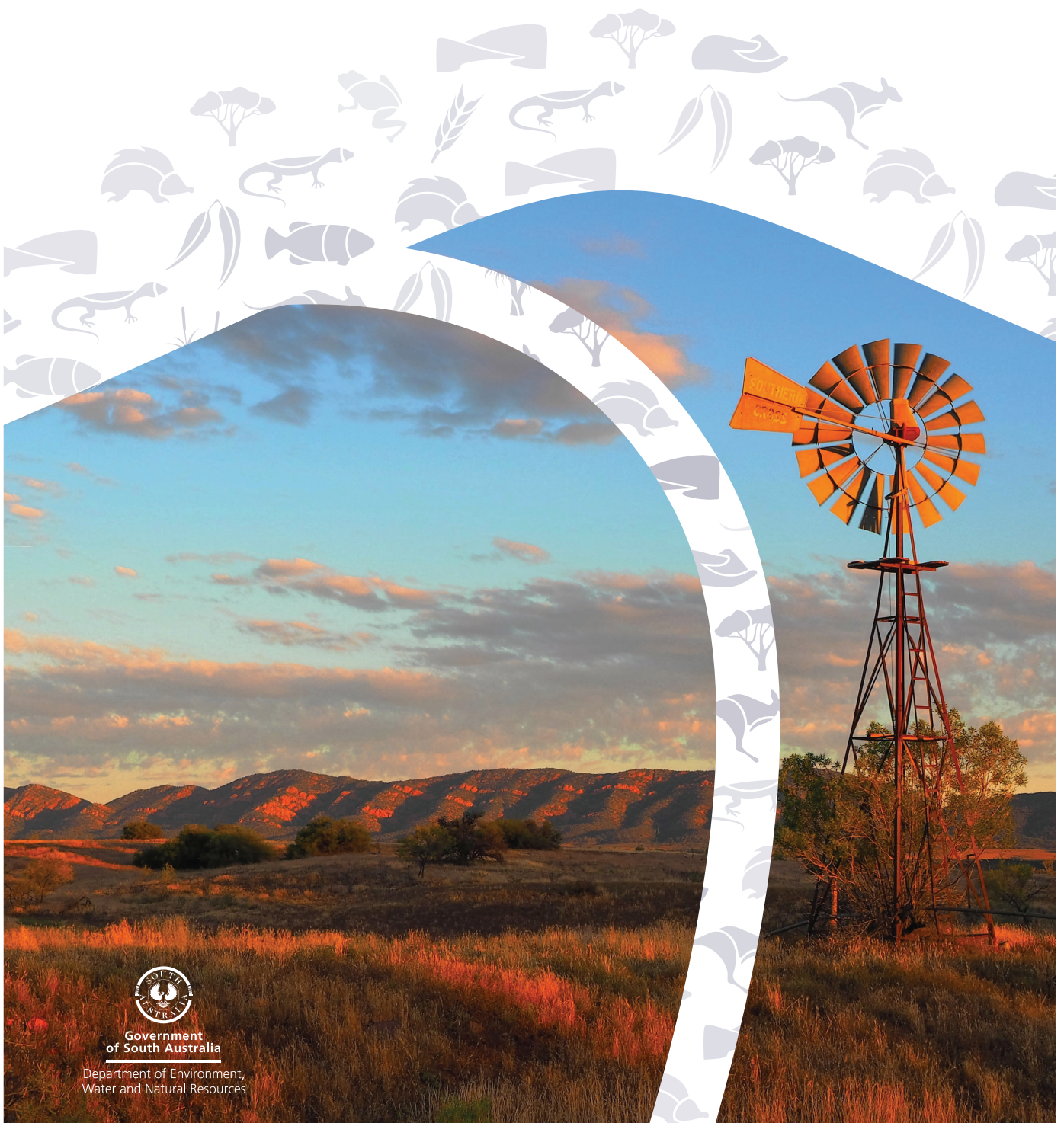


Eastern Mount Lofty Ranges PWRA Murray Group Limestone aquifer

2016 Groundwater level and salinity status report



Government
of South Australia

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Water and Natural Resources

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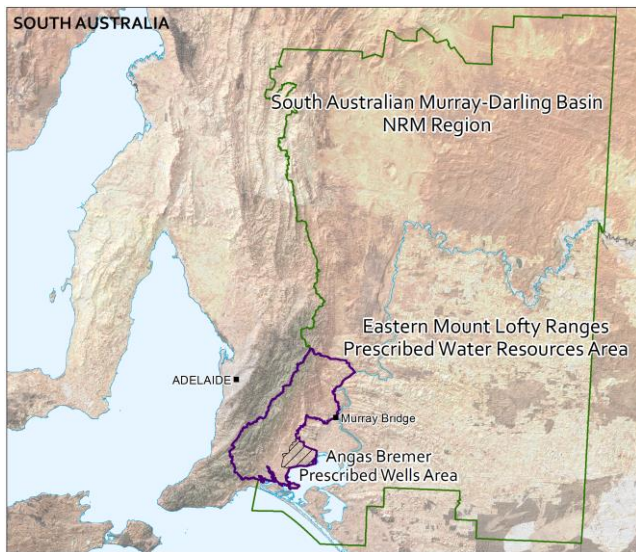
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Regional setting



The Eastern Mount Lofty Ranges (EMLR) Prescribed Water Resources Area (PWRA) lies within the South Australian Murray-Darling Basin Natural Resources Management Region and is located about 50 km east of Adelaide. It is a regional-scale resource for which groundwater, surface water and watercourse water are prescribed under the *Natural Resources Management Act 2004* (SA) and a water allocation plan provides for the sustainable use of the region's water resources. The Angas Bremer Prescribed Wells Area (PWA) is located within the boundaries of the EMLR PWRA and a stand-alone groundwater level and salinity status report has been prepared for this PWA (please visit the [Water Resource Assessments](#) page on [WaterConnect](#)).

There are three sedimentary aquifers in the EMLR PWRA, namely the Permian Sand, Murray Group Limestone (MGL) and Quaternary. This report focuses on the MGL aquifer, in particular within the Currency

Limestone Underground Water Management Zone (Fig. 1), which is defined in the WAP. The MGL aquifer consists predominantly of a shallow marine fossiliferous limestone that was deposited approximately 50 million years ago. The aquifer is up to 100 m thickness and overlies the Kanmantoo Group fractured rock aquifer and the Permian Sand aquifer in some areas. It is confined by overlying Quaternary clay sediments to the south-west of Murray Bridge, but it is unconfined to the north. The primary recharge mechanisms are lateral throughflow mainly from the Permian Sand aquifer, and downward leakage from the overlying Quaternary aquifer.

Despite the confined nature of the MGL in the Currency Limestone Underground Water Management Zone, which does not receive direct recharge from incident rainfall, the intensity and timing of rainfall and subsequent extraction practices can have an effect on groundwater pressure levels and salinities. For example, if the PWRA experiences above-average rainfall during typically dry summer months, this could result in decreases in irrigation extraction. This may cause groundwater pressure levels to rise and salinities to stabilise or decline.

2016 Status

The MGL aquifer in the Currency Limestone Underground Water Management Zone of the Eastern Mount Lofty Ranges Prescribed Water Resources Area has been assigned a green status for 2016:

2016 Status



Positive trends have been observed over the past five years

The 2016 status for the Currency Limestone Underground Water Management Zone is based on:

- all monitoring wells show a five-year trend of rising groundwater pressure levels.

Rainfall

The Finnis rainfall station (BoM Station 23714) was chosen for analysis as it is the closest station to the Currency Limestone Underground Water Management Zone (Fig. 1). Finnis station recorded 399 mm of rainfall in the 2015–16 water-use year, 19% less than the long-term average (1900 to 2016) of 495 mm, and 22% less than the five-year average annual rainfall of 512 mm (2012–16) (Figs 1 and 2). Across the area, long-term and five-year trends of declining rainfall are evident (Fig. 1). In 2015–16, eight months show below long-term monthly average rainfall – October, December and April rainfall recorded markedly below their respective long-term monthly average. However, January, February and June recorded rainfall which is considerably greater than their respective long-term monthly average (Fig. 2).

Water use

The Eastern Mount Lofty Ranges PWRA has a total extraction limit of 36 323 ML across all aquifers, of which 31 207 ML has been allocated. In previous years, water use was estimated based on land-use surveys of irrigated properties and the theoretical irrigation requirements for various crops. Due to uncertainties in these estimates, a time-series analysis of water use has been omitted from this report. More recently, changes in the way water is managed across the region have required licensed water users to measure their water use. By 2015–16, 60% of water licensees had installed water meters and submitted water usage data. Metered extractions from Currency Limestone Underground Water Management Zone totalled 1286 ML¹, which is 302 ML (31%) greater than the extraction limit of 984 ML for this management zone.

Groundwater pressure levels

In the five years to 2016, all monitoring wells show a rise in groundwater pressure levels, at rates which range between 0.06 and 0.5 m/y, with a median of 0.21 m/y (Fig. 3).

Groundwater salinity

Each year since 2015, irrigators in the EMLR PWRA have submitted groundwater samples from their irrigation wells to the Department of Environment, Water and Natural Resources for salinity testing. The increasing coverage of salinity measurements in the area will greatly assist in assessing long-term changes in groundwater salinity and its spatial distribution. To ensure these salinity data meet Quality Assurance standards, annual measurements over four to five years will be required from each well. Once validated, salinity data will be reported in groundwater level and salinity status reports².

In 2016, salinity in the Currency Limestone Underground Water Management Zone varies between 806 and 5181 mg/L, with eight of 14 wells (57%) showing salinities less than 1500 mg/L (Fig. 4), which is the salinity threshold for most crop types. In the five years to 2016, and of the two salinity monitoring wells that have sufficient data for analysis, one well shows an increase in salinity (at a rate of 38 mg/L/y) while the other shows stable salinity (Fig. 5).

¹ The licensed groundwater extraction volume for the 2015–16 water-use year is based on the best data available as of March 2017 and may be subject to change, as some extraction volumes are in the process of being verified; installation of water meters by licensed users is still in progress across the EMLR PWRA.

² The salinity data collected from irrigation wells can be viewed at [Groundwater Data](#) or via [WaterConnect](#).

More information

To determine the status of the Murray Group Limestone aquifer in the Currency Limestone Underground Water Management Zone for 2016, the trend in groundwater pressure levels and salinities over the past five years (2012 to 2016, inclusive) were analysed, in contrast to the year-to-year assessments that have been used in past *Groundwater level and salinity status reports*. 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](#).

To view the *Eastern Mount Lofty Ranges PWRA Groundwater Level and Salinity Status Report 2011*, which includes background information on hydrogeology, rainfall and relevant groundwater-dependent ecosystems, please visit the *Water Resource Assessments* page on [WaterConnect](#).

To view or download groundwater level and salinity data from observation wells within the Eastern Mount Lofty Ranges PWRA, please visit [Groundwater Data](#) on WaterConnect.

For further details about the Eastern Mount Lofty Ranges PWRA, please see the *Water Allocation Plan for the Eastern Mount Lofty Ranges* on the Natural Resources SA Murray-Darling Basin [website](#).

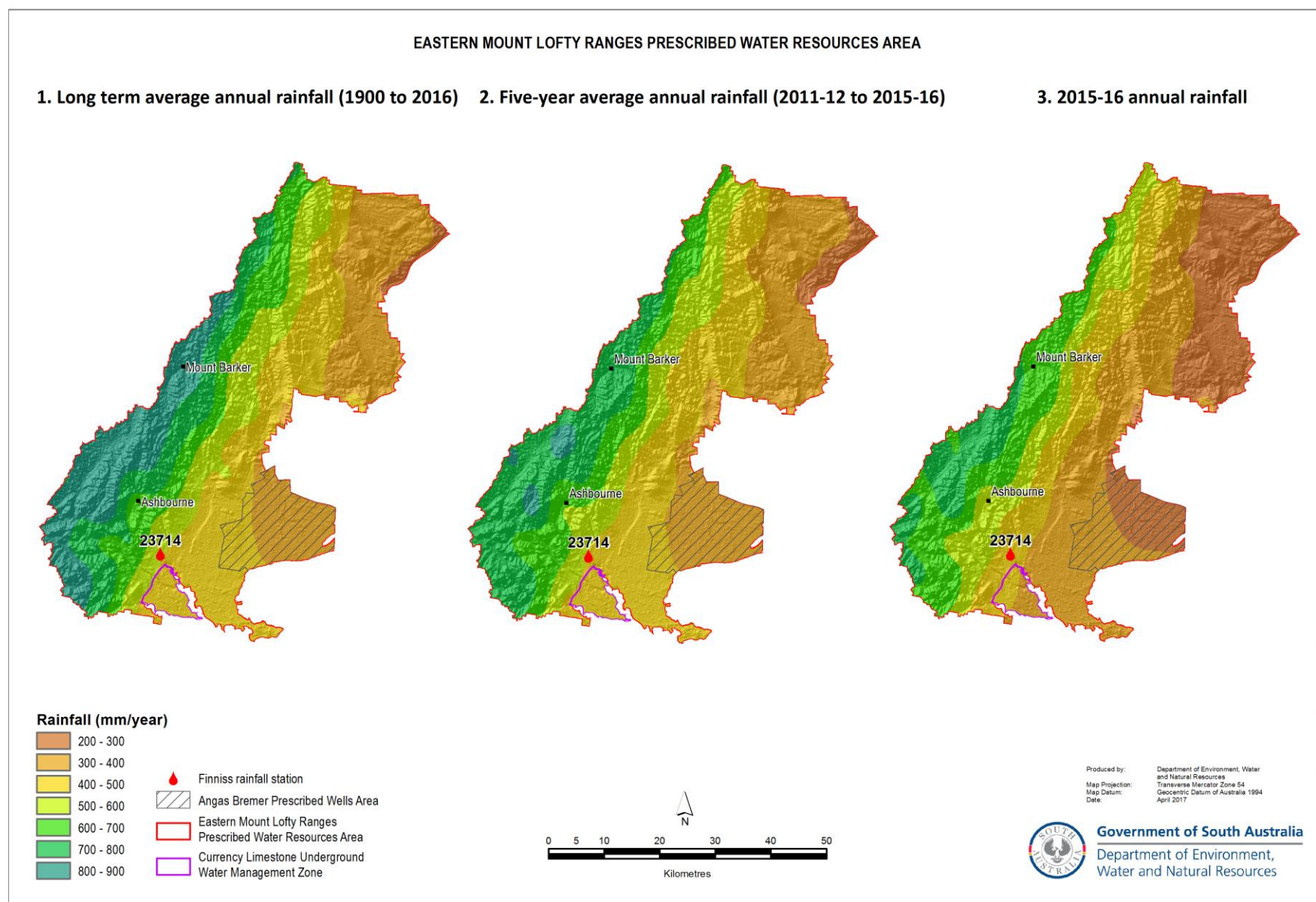


Figure 1. (1) Long-term and (2) five-year average annual rainfall and (3) annual rainfall for the 2015–16 water-use year in the Eastern Mount Lofty Ranges PWRA³

³ Rainfall data used in this report is sourced from the SILO Patched Point Dataset, which uses original Bureau of Meteorology daily rainfall measurements and is available online at www.longpaddock.qld.gov.au/silo.

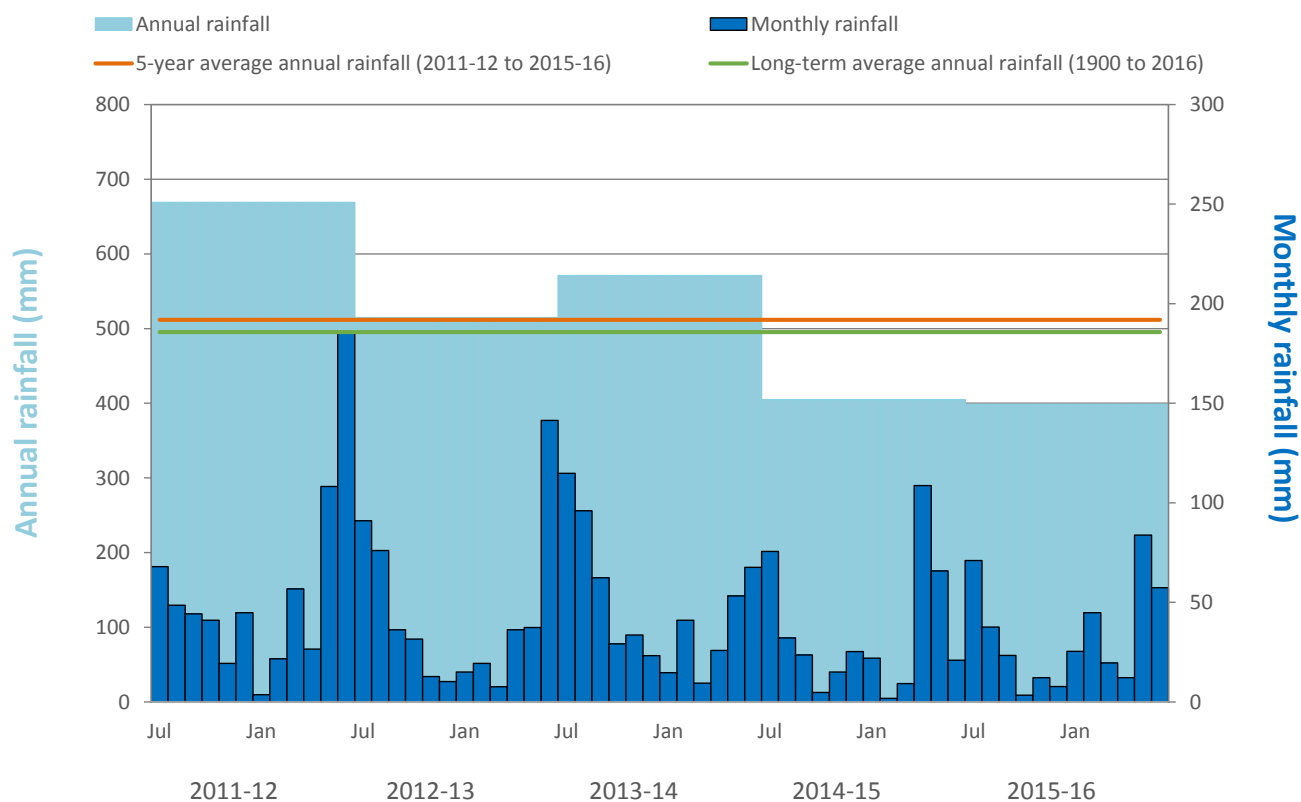


Figure 2. Annual (July–June) and monthly rainfall for the past five water-use years, and the five-year and long-term average annual rainfall recorded at Finniss (BoM Station 23714)⁴

⁴ Rainfall data used in this report is sourced from the SILO Patched Point Dataset, which uses original Bureau of Meteorology daily rainfall measurements and is available online at www.longpaddock.qld.gov.au/silo.

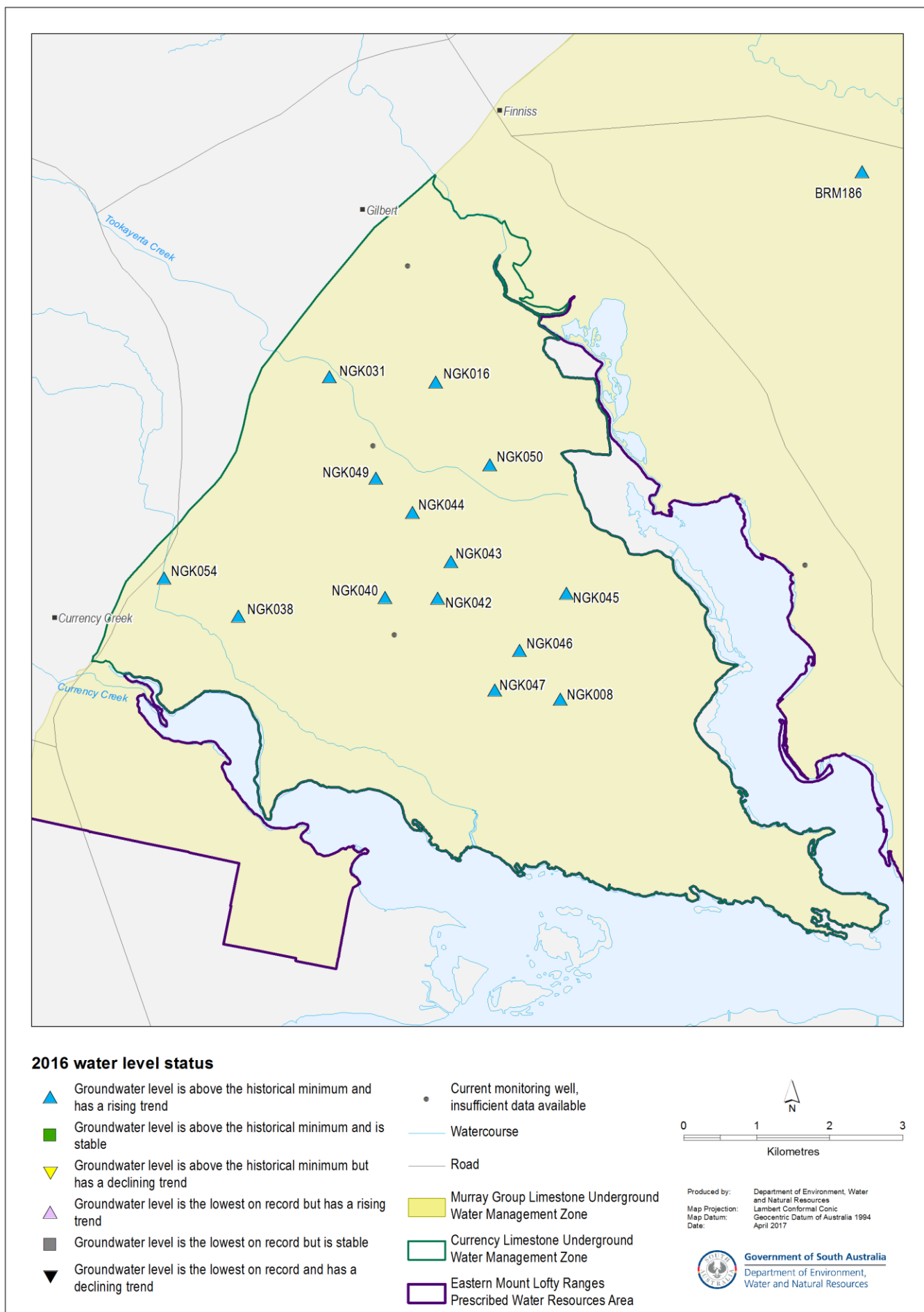


Figure 3. 2016 status of groundwater pressure levels for the MGL aquifer in the Currency Limestone Underground Water Management Zone (Eastern Mount Lofty Ranges PWRA) based on the five-year trends from 2012 to 2016

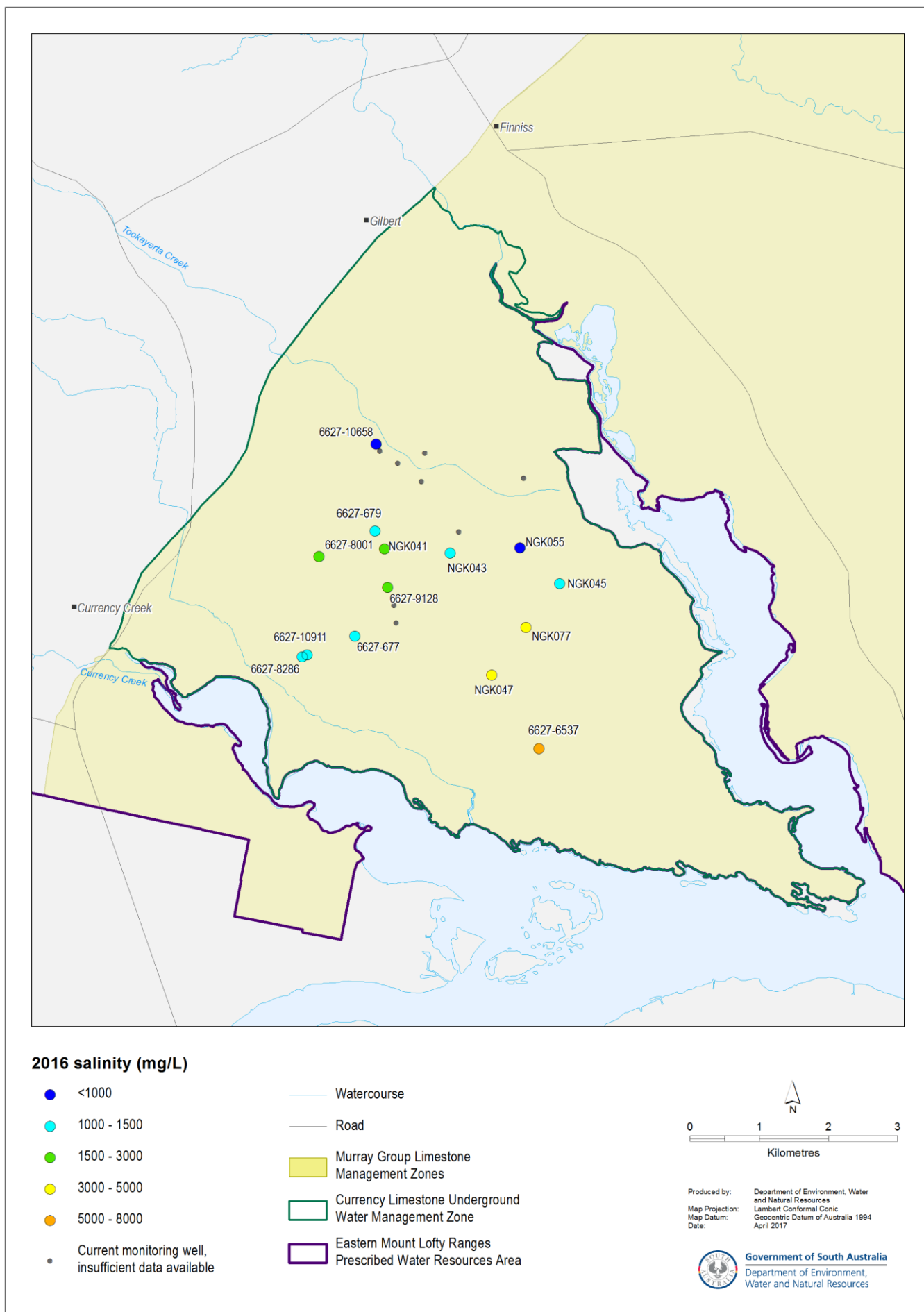


Figure 4. 2016 groundwater salinity of the MGL aquifer in the Currency Limestone Underground Water Management Zone (Eastern Mount Lofty Ranges PWRA)

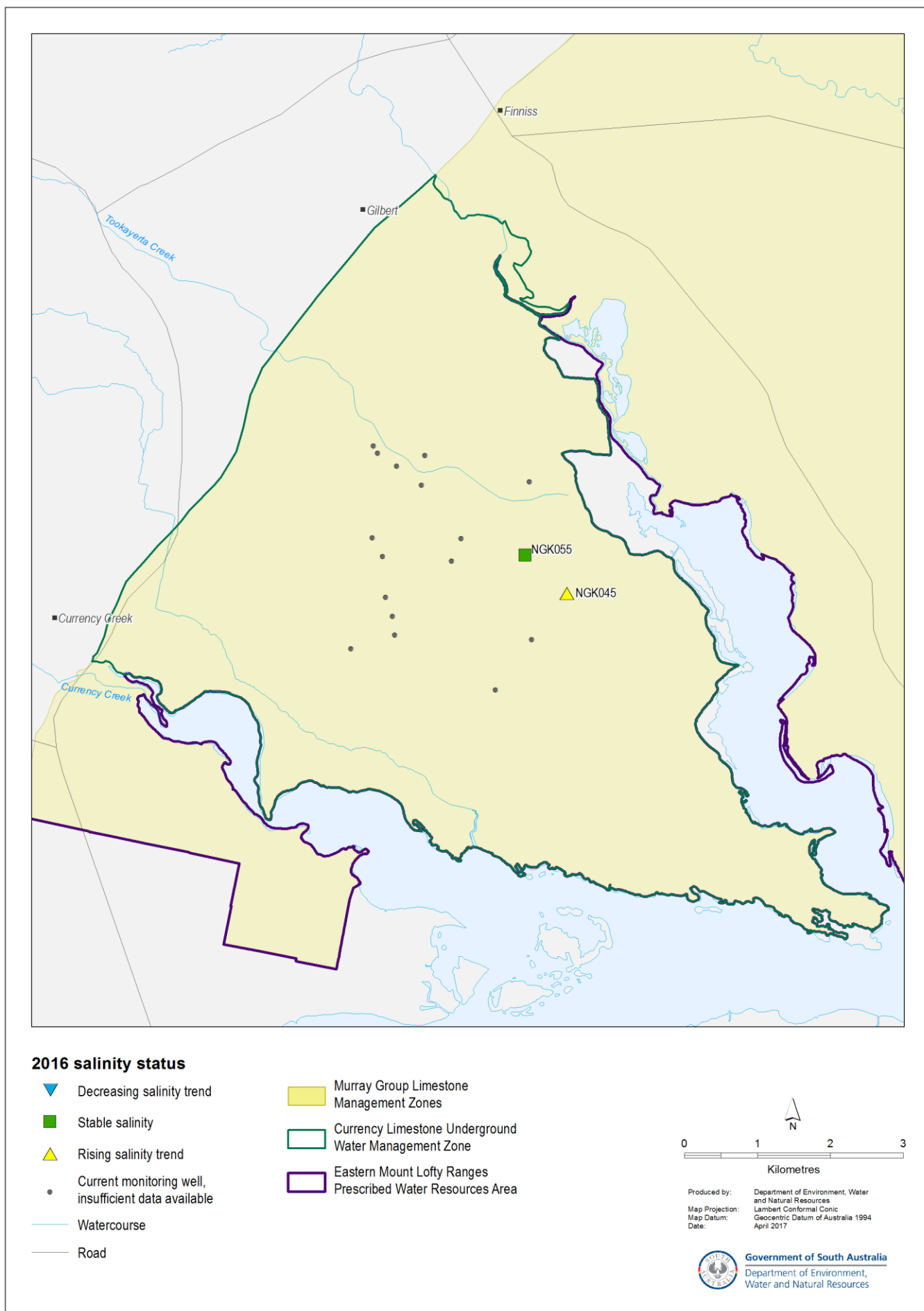


Figure 5. 2016 status of groundwater salinity for the MGL aquifer in the Currency Limestone Underground Water Management Zone (Eastern Mount Lofty Ranges PWRA) based on the five-year trend from 2012 to 2016



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