Western Mount Lofty Ranges PWRA

Permian Sand aquifer

2015 Groundwater level and salinity status report

Government of South Australia
Department of Environment, Water and Natural Resources

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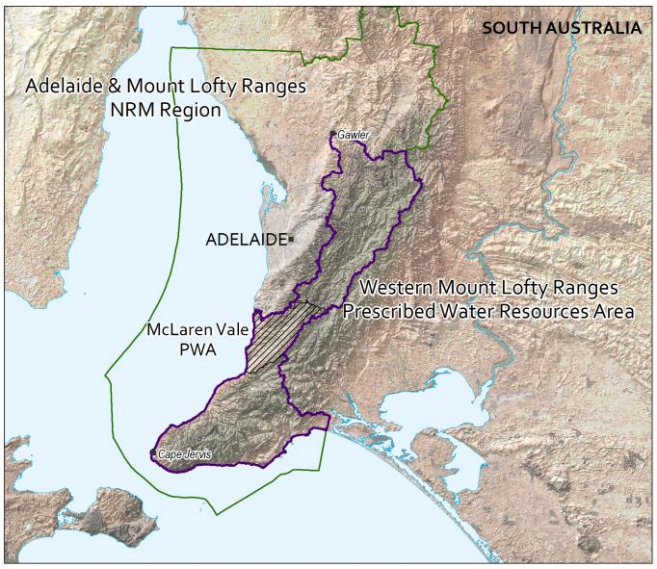
2015 Summary



The Western Mount Lofty Ranges (WMLR) Prescribed Water Resources Area (PWRA) covers an area of approximately 2750 km^2, stretching from Cape Jervis on the south coast to Gawler in the north, and lies within the Adelaide and Mount Lofty Ranges NRM Region. It is a regional-scale resource for which groundwater, surface water and watercourse water are prescribed under South Australia's *Natural Resources Management Act 2004*. A water allocation plan provides for the sustainable use of the water resources. The McLaren Vale Prescribed Wells Area (PWA) is located within the boundary of the WMLR PWRA and a separate groundwater level and salinity status report for this PWA can be accessed via the WaterConnect website.

There are three main sedimentary groundwater systems within the WMLR PWRA: the Permian Sand, Tertiary limestone and Quaternary aquifers. This report focuses on the Permian Sand aquifer, which is found only on the Fleurieu Peninsula, toward the south of the PWRA in the Myponga and Hindmarsh Tiers Basins (Fig. 1). Also known as the Cape Jervis Formation, it consists of unconsolidated sands, silts and clays with occasional gravel beds. This aquifer is generally low-yielding, except in the northern Myponga Basin where the Tertiary limestone aquifer, which otherwise overlies the Permian Sand aquifer, is absent. Here, the aquifer shows generally good yields and low salinity; however, high clay content in some areas can lead to lower yields and higher salinities.

Rainfall and groundwater extractions are important factors that govern changes in groundwater level and salinity of the Permian Sand aquifer. Below-average rainfall results in a reduction in recharge to the aquifer. Below-average summer rainfall can also result in increased irrigation extraction, which may cause the groundwater level to fall and salinity to increase. Conversely, increased rainfall may result in increased recharge and decreased irrigation extraction. This may cause groundwater levels to rise, and salinity to stabilise or decrease.

The Hindmarsh Valley rainfall station (BoM Station 23823) was used for rainfall analysis due to its central location within the Hindmarsh Tiers Basin (Fig. 1); 704 mm of rain fell in the 2014–15 water-use year, over 200 mm less than the long-term average of 938 mm (1900–2015), and nearly 150 mm less than the five-year average of 850 mm (Figs. 1 and 2). A general trend of declining rainfall in the region over the past five years is evident (Fig. 2).

Long term monitoring of groundwater levels since 1975 indicate general stability within the Myponga Basin as well as the Hindmarsh Tiers Basin. For the Myponga Basin, six of eight monitoring wells with available data from 2011 to 2015 recorded a trend of stable or increasing water levels. The remaining two wells recorded a declining trend in groundwater levels, with one of these recording its lowest groundwater level on record in 2015 (MYP007). The two monitoring wells in the Hindmarsh Tiers Basin recorded increasing groundwater level trends.

Groundwater salinity of the Permian Sand aquifer is not regularly measured and as such, there is insufficient data available to conduct any trend analyses. However, the salinity of the Permian Sand aquifer within the Myponga and Hindmarsh Tiers Basins typically measures less than 1000 mg/L.

To determine the status of the Permian Sand aquifer for 2015, the trend in groundwater levels over the past five years (2011 to 2015, inclusive) was analysed. This is a new approach, 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 a detailed explanation of the new method of status assessment.

The Permian Sand aquifer of the Western Mount Lofty Ranges PWRA has been assigned a green status for 2015:

2015 Status  Positive trends have been observed over the past five years

The 2015 status of the Permian Sand aquifer is based on:

- most monitoring wells (80%) show a five-year trend of stable or rising groundwater levels.

To view descriptions for all status symbols, please visit the *Water Resource Assessments* page on WaterConnect.

To view the *Western 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 monitoring wells within the Western Mount Lofty Ranges PWRA, please visit Groundwater Data on WaterConnect.

For further details about the Western Mount Lofty Ranges PWRA, please see the *Water Allocation Plan for the Western Mount Lofty Ranges* on the Natural Resources Adelaide and Mount Lofty Ranges website.

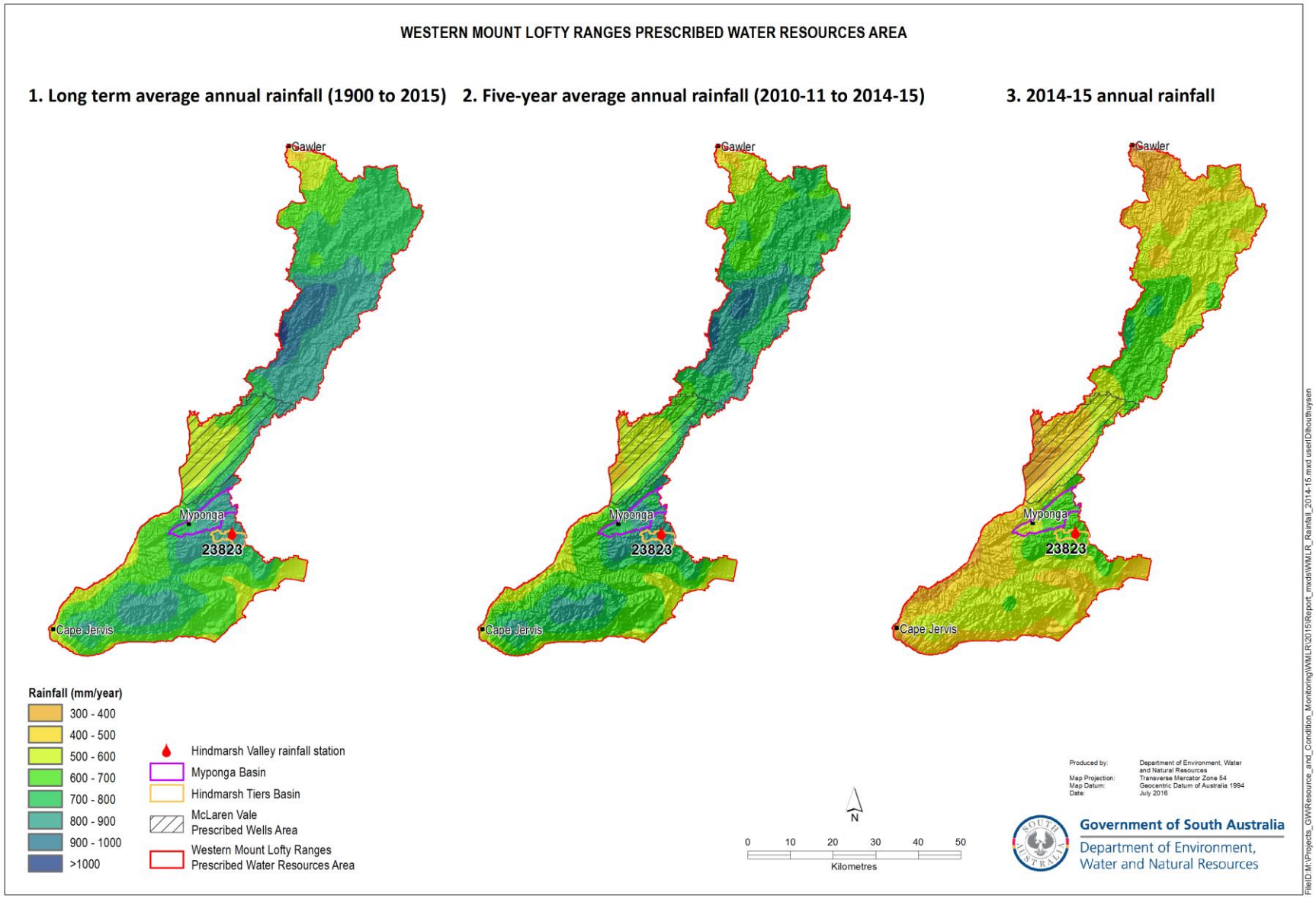


Figure 1. (1) Long-term and (2) five-year average annual rainfall and (3) annual rainfall for the 2014–15 water-use year in the Western Mount Lofty Ranges Prescribed Water Resources Area[1]

[1] 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.

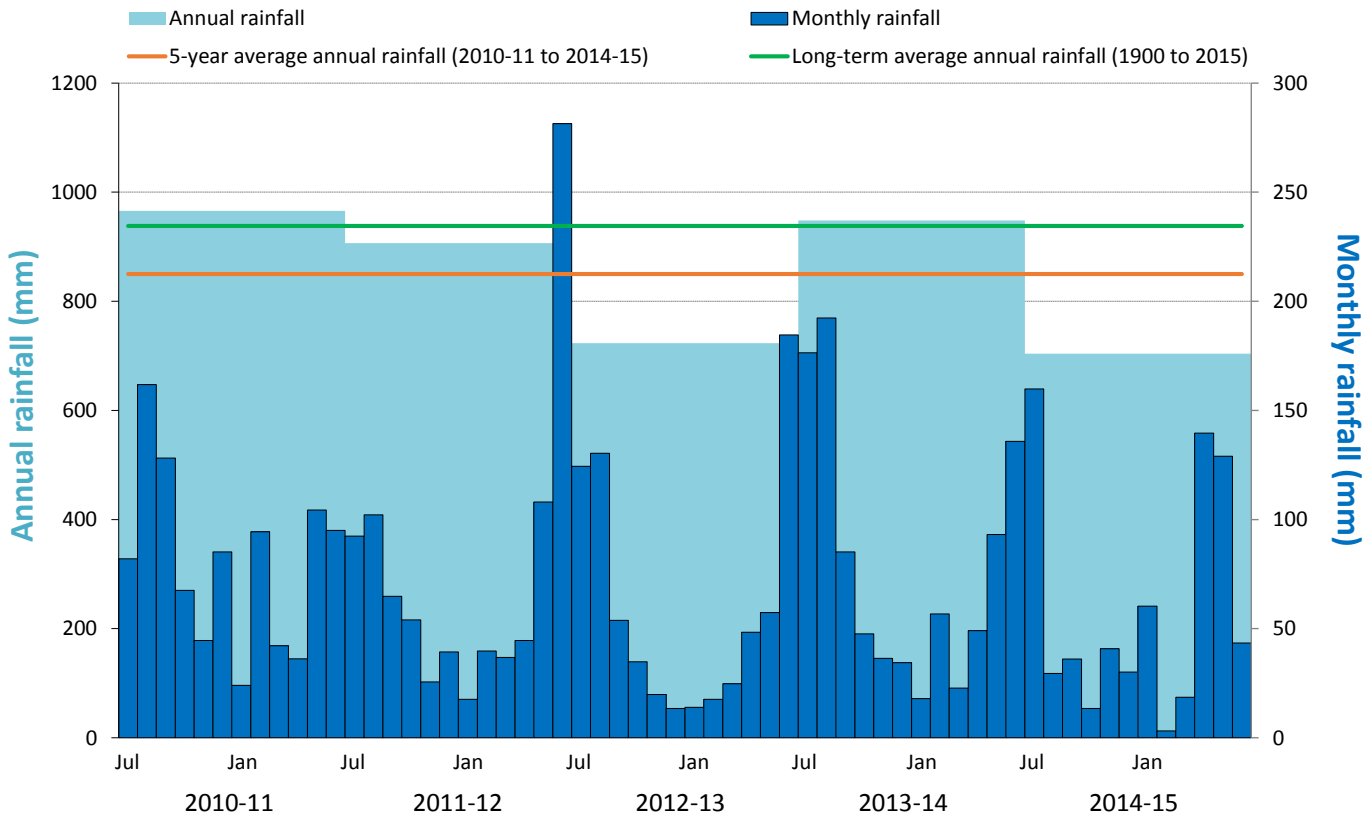


Figure 2. Annual (July–June) and monthly rainfall for the past five water-use years, and the five-year and long-term average annual rainfall recorded at Hindmarsh Valley (BoM Station 23823)[2]

[2] 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.

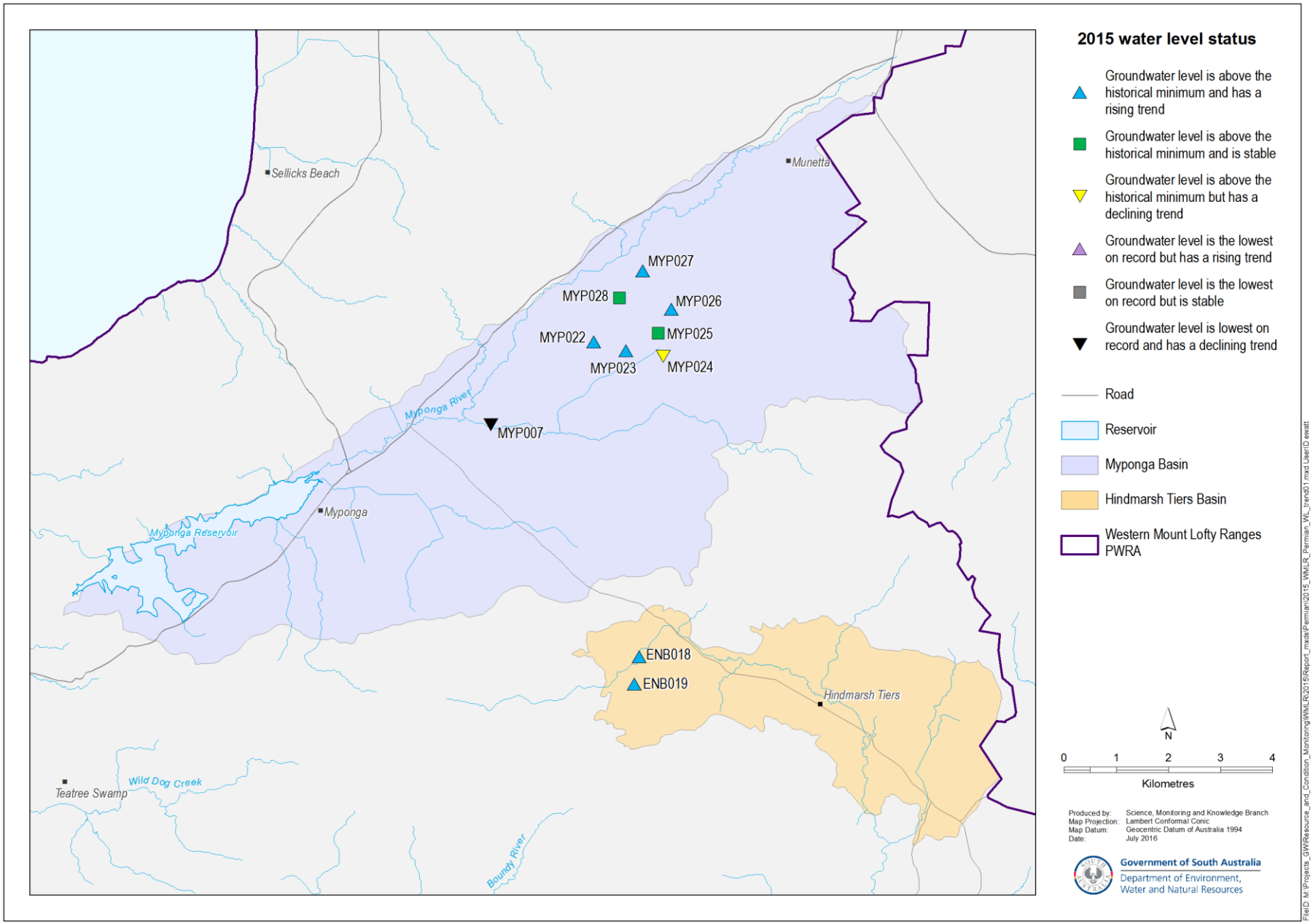


Figure 3. 2015 status of groundwater levels in the Permian Sand aquifer (Western Mount Lofty Ranges Prescribed Water Resources Area) based on the five-year trend from 2011 to 2015

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