
WESTERN MOUNT LOFTY RANGES PWRA PERMIAN SAND AQUIFER

Groundwater Level and Salinity Status Report

2013



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2013 SUMMARY



The Western Mount Lofty Ranges Prescribed Water Resources Area (PWRA) covers an area of approximately 2750 km² stretching from Cape Jervis on the south coast, to Gawler in the north. It is a regional-scale prescribed 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.

There are three types of sedimentary aquifers in the Western Mount Lofty Ranges PWRA: Permian Sand, Tertiary Limestone and Quaternary sediments. Recharge to these aquifers occurs directly from the portion of rainfall that percolates down to the watertable through the soil profile or indirectly from throughflow from adjacent aquifers.

Although extensive meter data is not yet available for groundwater extractions, an estimated 50 250 ML/y is extracted for licensed purposes across the whole Western Mount Lofty Ranges PWRA. This estimate is based on a land-use survey of irrigated properties and the theoretical irrigation requirements for various crops. This volume is below the sustainable yield of 70 324 ML/y calculated for the Western Mount Lofty Ranges PWRA. The majority of groundwater is used for the irrigation of pasture (35%) and various fruits (33%). The remaining is used in the irrigation of wine grapes (14%), vegetables (6%), lucerne (3%) and other uses (9%).

The Western Mount Lofty Ranges PWRA has a Mediterranean climate, with hot, dry summers and mild, wet winters. In Figure 1, the long-term average monthly rainfall is graphed in orange with the actual monthly rainfall for 2013 graphed in blue. In 2013, the total annual rainfall recorded at Hindmarsh Valley rainfall station (23823) was 925 mm, slightly below the long-term (1889–2013) annual average of 948 mm. The monthly rainfall data indicates that while June, July and August recorded rainfall above their long-term monthly average, all other months, with the exception of December, recorded rainfall below their average (Fig.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.

The Permian sediments consist of unconsolidated sands, silts and clays with occasional gravel beds that are known as the Cape Jervis Formation. The Permian Sand aquifers are found only in the Myponga and Hindmarsh Tiers Basins, in the south of the PWRA on the Fleurieu Peninsula. The Permian sand aquifer is generally not highly productive, except in the northern Myponga Basin where the overlying Tertiary limestone is absent. Although yields are generally low, the water quality is very good, with most salinities observed to be below 500 mg/L. Groundwater levels of the Permian sand aquifer in the Myponga Basin were relatively stable between 1975 and 1995. Since 2001, groundwater levels have declined by up to two metres, which correlates well with a dominant below-average rainfall trend recorded over this period. In the Hindmarsh Tiers Basin, groundwater levels of the Permian Sand aquifer were relatively stable between 1999 and 2004, after which they declined by nearly one metre, with a small recovery from 2009 to 2011.

In 2013, the majority of observation wells (90%) recorded a slight increase (up to 0.43 m) in the maximum recovered groundwater level when compared to the maximum recorded in 2012 (Fig. 2). This may reflect the above-average rainfall recorded in June, July and August or a reduction in extractions from the aquifer.

Because groundwater salinities in the Permian Sand aquifer are generally quite low, salinity monitoring is not a high priority. Two salinity observation wells are located in the Permian Sand aquifer and just one well was sampled in 2013 with salinity value of 245 mg/L.

The Permian sand aquifer of the Myponga and Hindmarsh Tiers Basins in the Western Mount Lofty Ranges PWRA has been assigned a green status for the 2013 reporting period:

2013 STATUS



“No adverse trends, indicating negligible risk to the resource”

This means that Groundwater status was observed to be stable, i.e. no significant change, or improving over the reporting period. Continuation of these trends favours a very low likelihood of negative impacts on beneficial use. The 2013 status of the Permian sand aquifer is supported by:

- The overall increase in the maximum recovered groundwater level when compared to that recorded in 2012.

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, and descriptions of all status symbols, please visit the Water Resources page on the [WaterConnect website](#).

For further details on the Western Mount Lofty Ranges PWRA, please see the *Western Mount Lofty Ranges Water Allocation Plan* on the [Adelaide & Mt Lofty Ranges Natural Resources Management website](#).

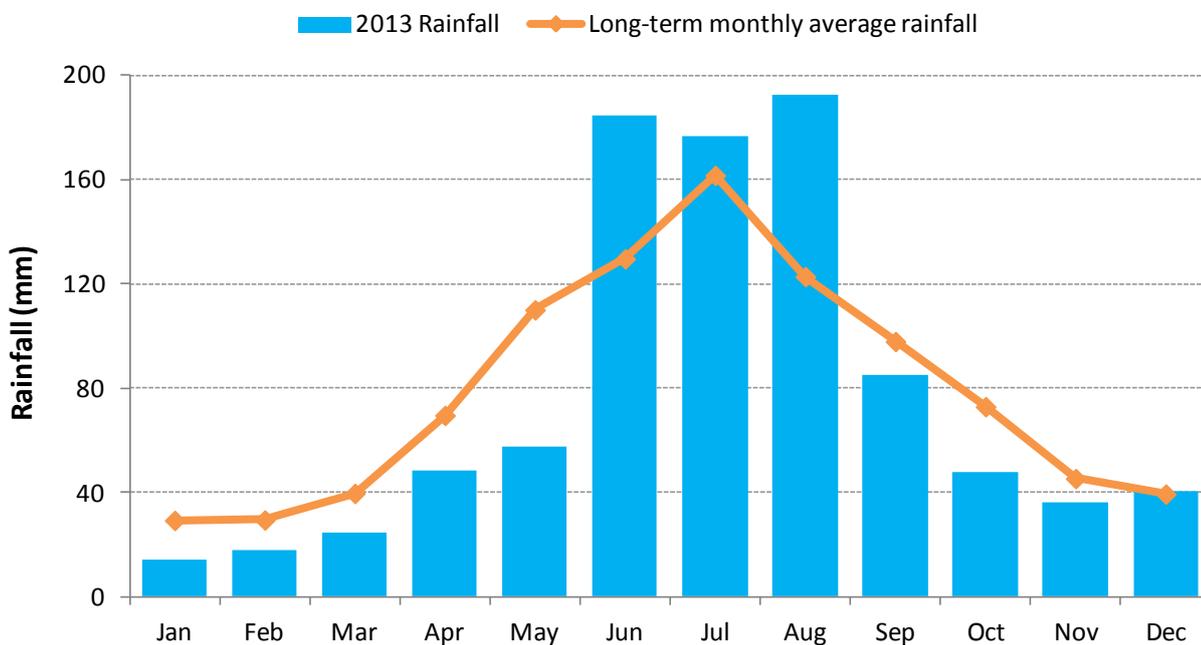


Figure 1. Monthly rainfall (mm) for 2013 and the long-term average monthly rainfall (mm) at the Hindmarsh Valley rainfall station (number 23823) in the Western Mount Lofty Ranges PWRA

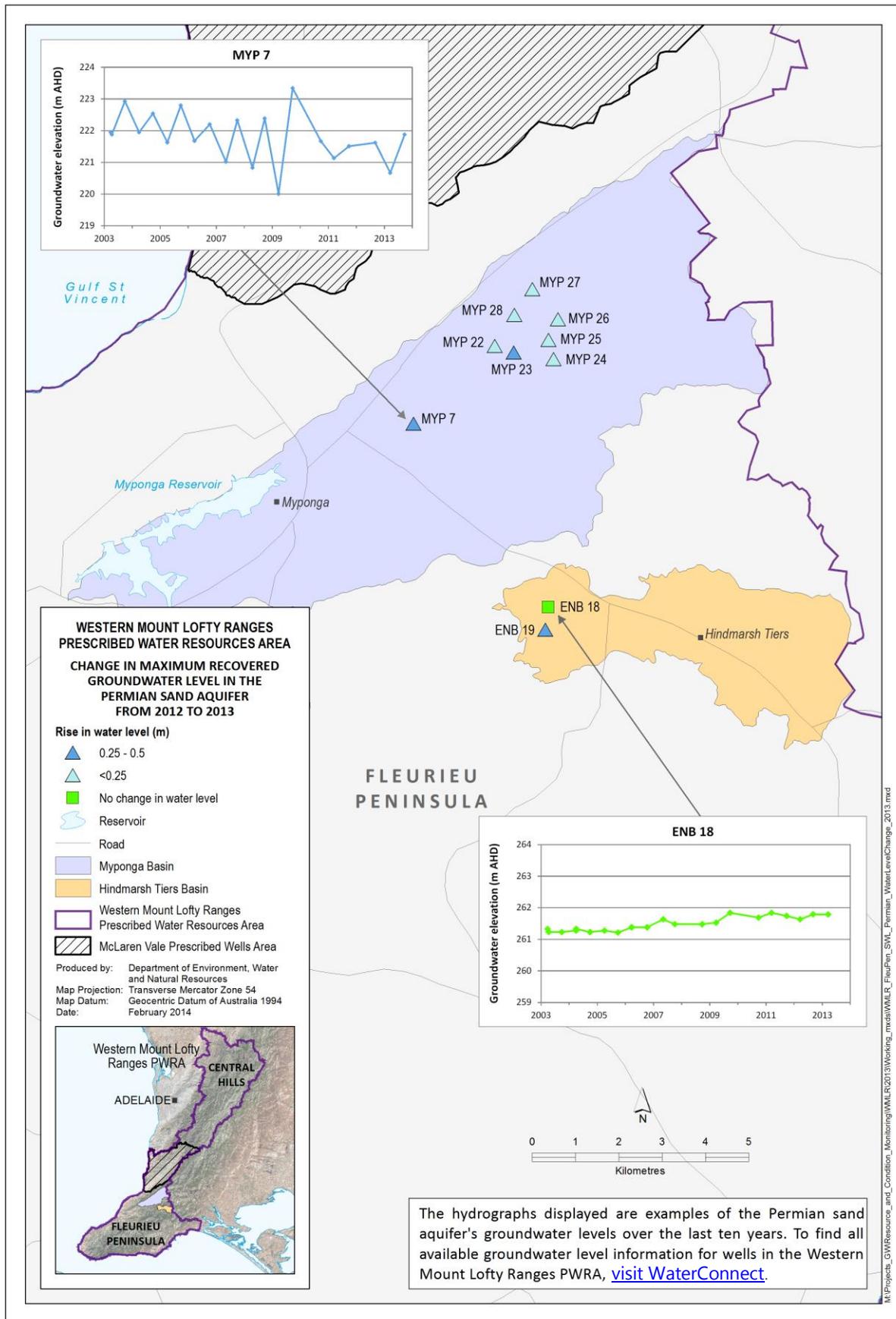


Figure 2. Overall changes in maximum groundwater levels in the Permian sand aquifer of the Western Mount Lofty Ranges PWRA from 2012 to 2013

Western Mount Lofty Ranges PWRA

Permian Sand Aquifer Groundwater Status Report 2013

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