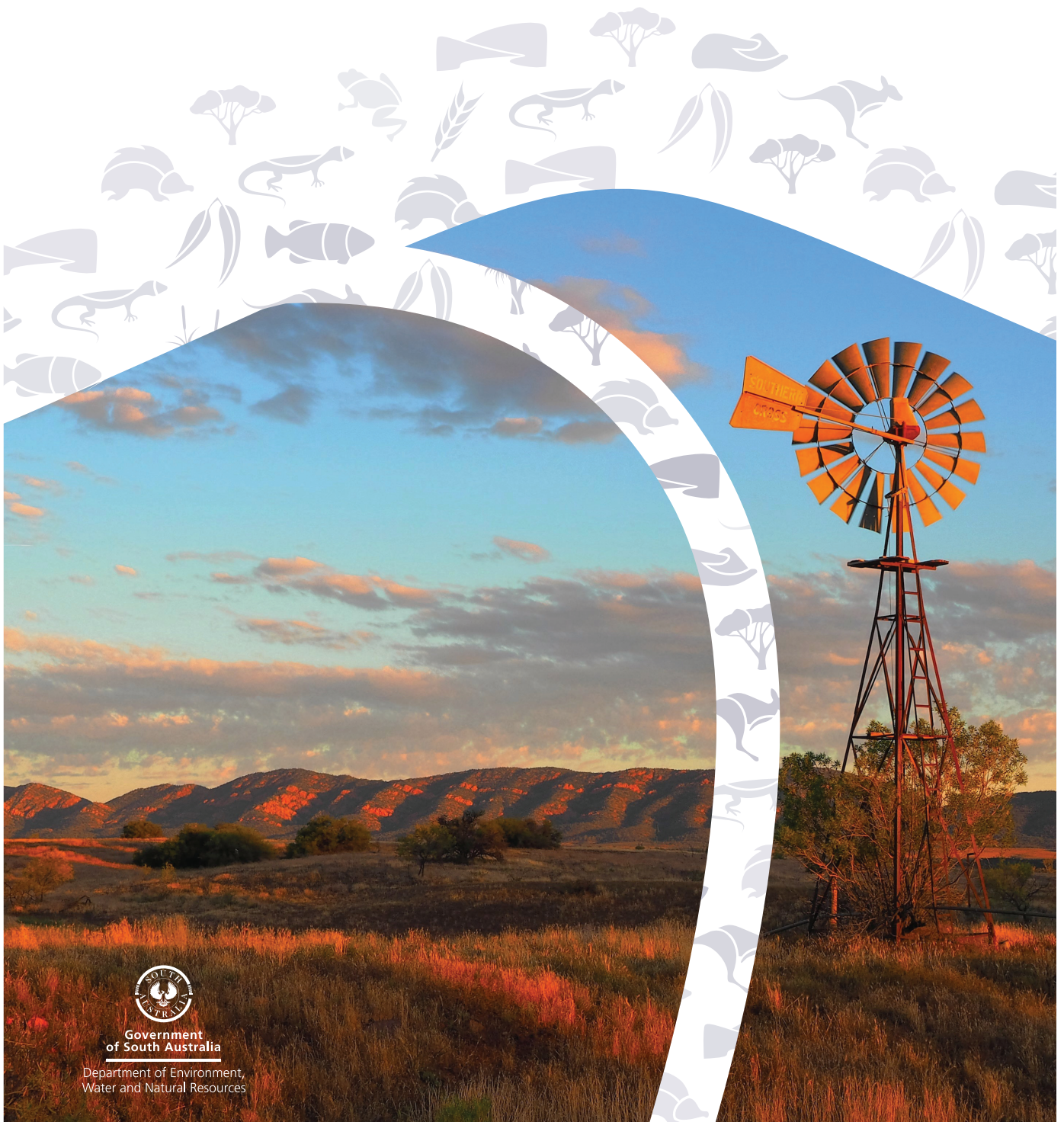


# McLaren Vale PWA

## Port Willunga Formation aquifer

**2016 Groundwater level and salinity status report**



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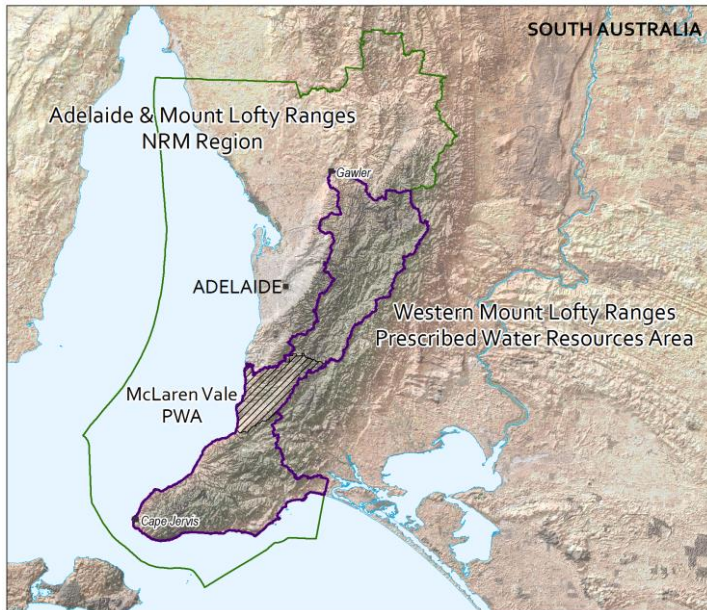
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# Regional setting



The McLaren Vale Prescribed Wells Area (PWA) is located approximately 35 km south of Adelaide. It lies within the Adelaide and Mount Lofty Ranges Natural Resources Management Region (location map left). For those groundwater resources located within the adjacent Western Mount Lofty Ranges (WMLR) Prescribed Water Resources Area (PWRA), but outside the McLaren Vale PWA, a separate groundwater level and salinity status report has been prepared and it can be found on the *Water Resource Assessments* page of [WaterConnect](#). Both the McLaren Vale PWA and WMLR PWRA comprise regional-scale groundwater resources, for which groundwater has been prescribed under South Australia's *Natural Resources Management Act 2004*, and in each of these two areas a water allocation plan provides for the sustainable management of the water resources.

Underlying the McLaren Vale PWA is the Willunga Embayment, a structurally controlled trough containing sedimentary groundwater systems of Quaternary and Tertiary age that is bounded in the south-east by the Willunga Fault and to the north by basement outcrop. There are four aquifers described within the Willunga Embayment: the Quaternary aquifer; the Port Willunga Formation aquifer; the Maslin Sands aquifer; and the fractured rock aquifer (FRA).

This report focuses on the Tertiary-aged Port Willunga Formation aquifer, which is a coarse-grained sandy limestone overlain by younger Quaternary aquifers and underlain by the Tertiary Maslin Sands aquifer and the older fractured rock aquifers. Groundwater within the Port Willunga Formation aquifer typically flows from the higher elevations in the north-east in a south-westerly direction toward the coast. Recharge to the aquifer occurs from direct recharge from local rainfall where it is unconfined in its northern extent near McLaren Vale and McLaren Flat, and from streamflow recharge in drainage lines at or near the Willunga Fault. Lateral throughflow from the fractured rock aquifer, across the Willunga Fault, may also provide recharge to the aquifer.

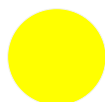
Groundwater level and salinity trends within the Port Willunga Formation are primarily climate driven: below-average rainfall results in reduced recharge to the aquifer. Below-average rainfall can also lead to increased extractions for irrigation, which can cause groundwater level to fall and salinities to increase. Conversely, higher rainfall may result in increased recharge and decreased irrigation extraction. This may cause the groundwater level to rise and salinities may stabilise or decline.



# 2016 Status

The Port Willunga Formation aquifer of the McLaren Vale PWA has been assigned a yellow status for 2016:

## 2016 Status



Minor adverse trends have been observed over the past five years

The 2016 status for the Port Willunga Formation aquifer is based on:

- most monitoring wells (67%) showing a five-year trend of declining groundwater levels.

### Rainfall

The Willunga rainfall station (BoM Station 23753) recorded 535 mm in the 2015–16 water-use year, nearly 110 mm less than the long-term average annual rainfall (1900–2016) of 643 mm and nearly 40 mm less than the five-yearly average of 571 mm (Figs 1 and 2). Although there have been sporadic instances of above average rainfall over the past five years (2012–16), there is a general declining trend in rainfall for this time period (Fig. 2), which is also evident when compared with the long-term average in the PWA (Fig. 1). Monthly rainfall data for 2015–16 show above-average recordings for January and February, but the remaining monthly totals were below their long-term averages.

### Water use

Licensed groundwater extractions (excluding stock and domestic use) from the Port Willunga Formation aquifer totalled 3174 ML<sup>1</sup> in 2015–16, an increase of 14% on the previous water-use year and 18% higher than the recent five-year average (Fig. 3). Groundwater extraction has increased on average by 199 ML/y over the recent five-year period (2011–12 to 2015–16). These increased extraction volumes are likely to be in response to the general decline in rainfall (Figs 2 and 3). The Port Willunga Formation aquifer accounted for 64% of the groundwater extracted from the McLaren Vale PWA in 2015–16.

### Groundwater levels

Long-term monitoring records show groundwater levels in the Port Willunga Formation aquifer have declined by up to 5 m since 1993. In the five years to 2016, 67% of monitoring wells show a trend of declining groundwater levels (Fig. 4), at rates ranging between 0.03 and 0.28 m/y with a median of 0.17 m/y. Two thirds of these monitoring wells recorded their lowest groundwater level in 2016, and are located in the eastern half of the aquifer extent where it is unconfined and the most irrigation occurs (Fig. 4).

### Groundwater salinity

Due to the paucity of salinity data available for the Port Willunga Formation aquifer in 2015 and 2016, salinity has not been used in the assessment of the status of the resource for this report.

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<sup>1</sup> The licenced groundwater use for the 2015–16 water-use year is based on the best data available as of January 2017 and could be subject to change, as some extraction volumes may be in the process of being verified.

# More information

To determine the status of the Port Willunga Formation aquifer for 2016, the trends in groundwater level 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 *McLaren Vale PWA Groundwater Level and Salinity Status Report 2009–10*, 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 McLaren Vale PWA, please visit [Groundwater Data](#) on WaterConnect.

For further details about the McLaren Vale PWA, please see the *Water Allocation Plan for the McLaren Vale Prescribed Wells Area* on the Adelaide and Natural Resources Mount Lofty Ranges [website](#).

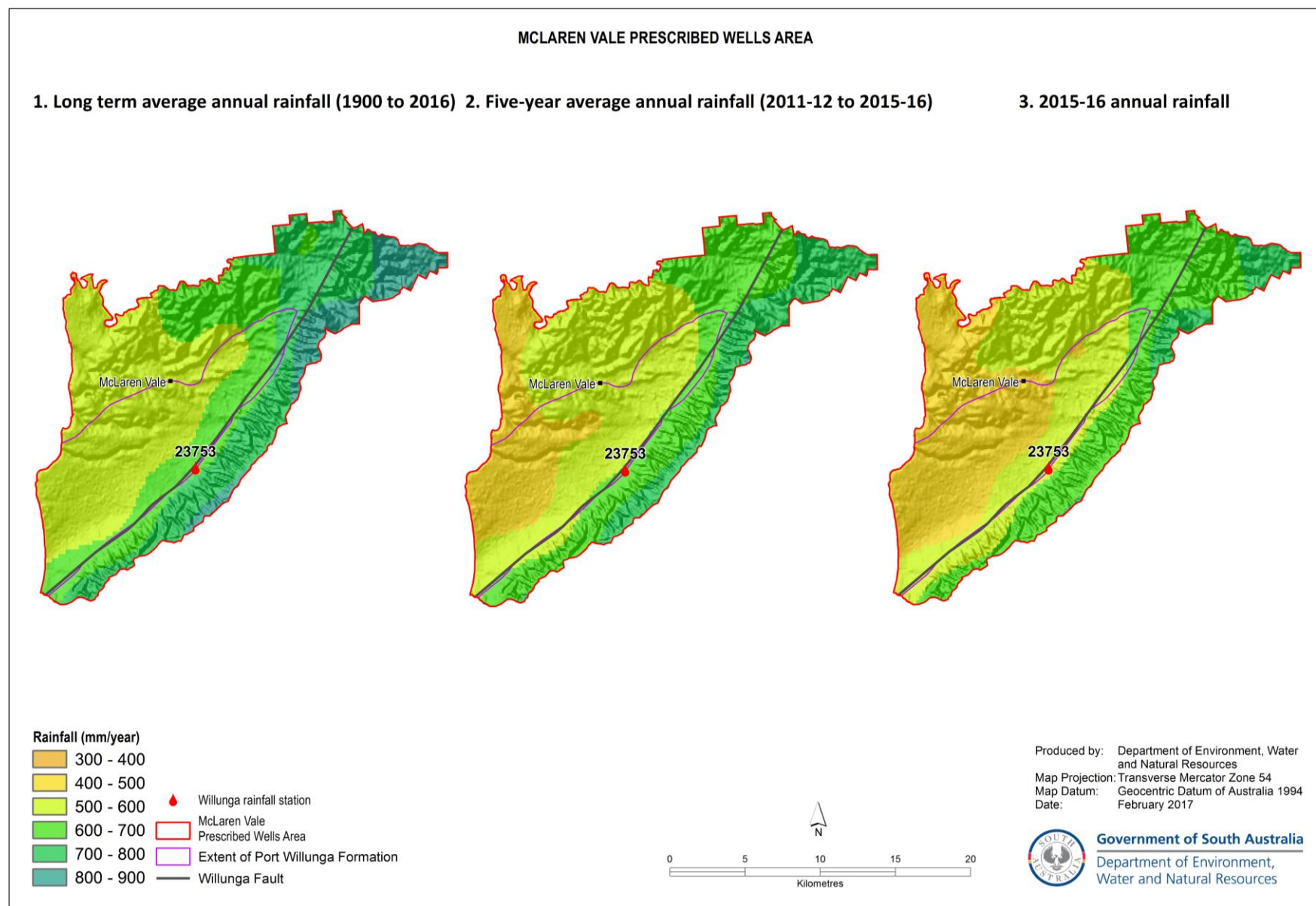


Figure 1. (1) Long-term and (2) five-year average annual rainfall, and (3) annual rainfall for the 2015–16 water-use year in the McLaren Vale PWA<sup>2</sup>

<sup>2</sup> 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](http://www.longpaddock.qld.gov.au/silo).

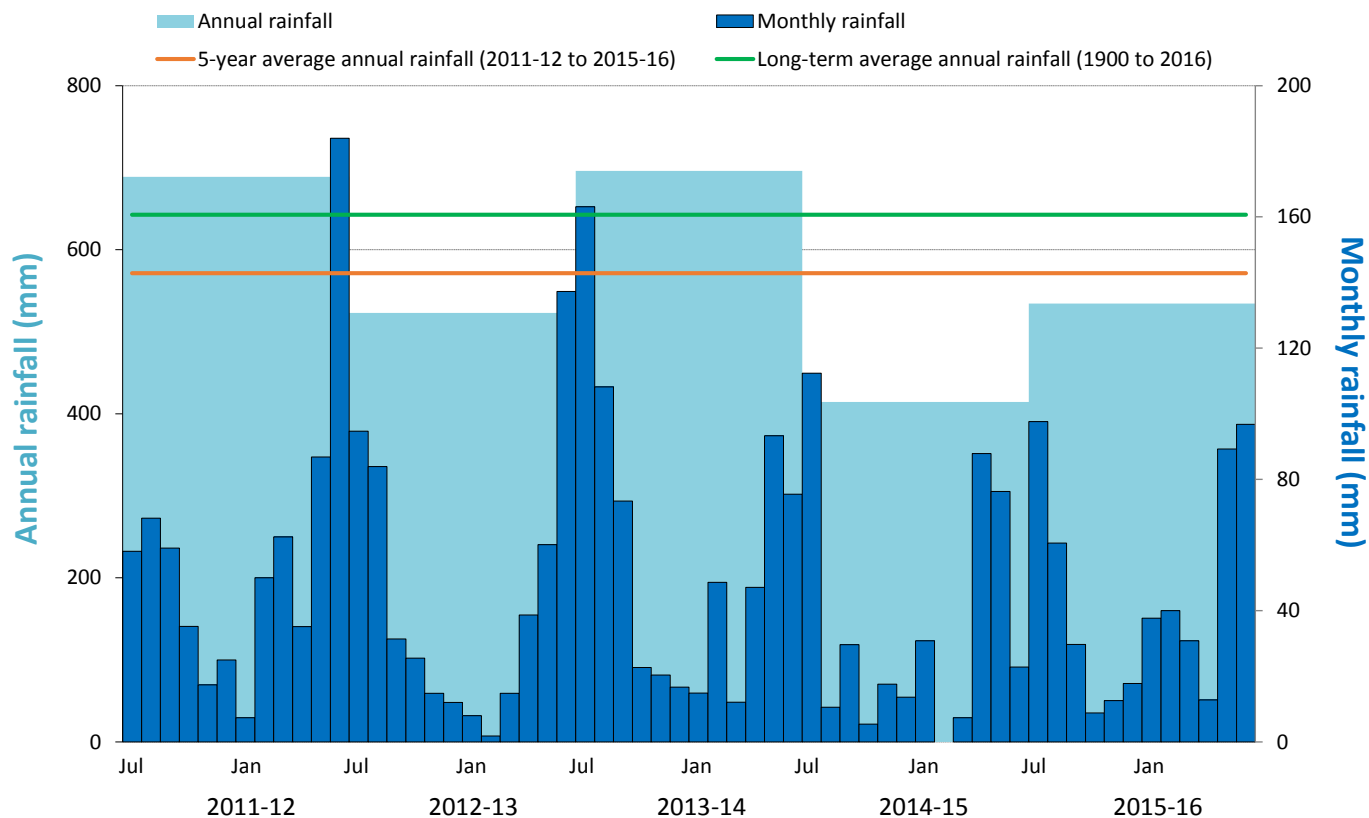


Figure 2. Annual (July–June) and monthly rainfall for the past five water-use years, and the five-yearly and long-term average annual rainfall recorded at Willunga (BoM Station 23753)<sup>3</sup>

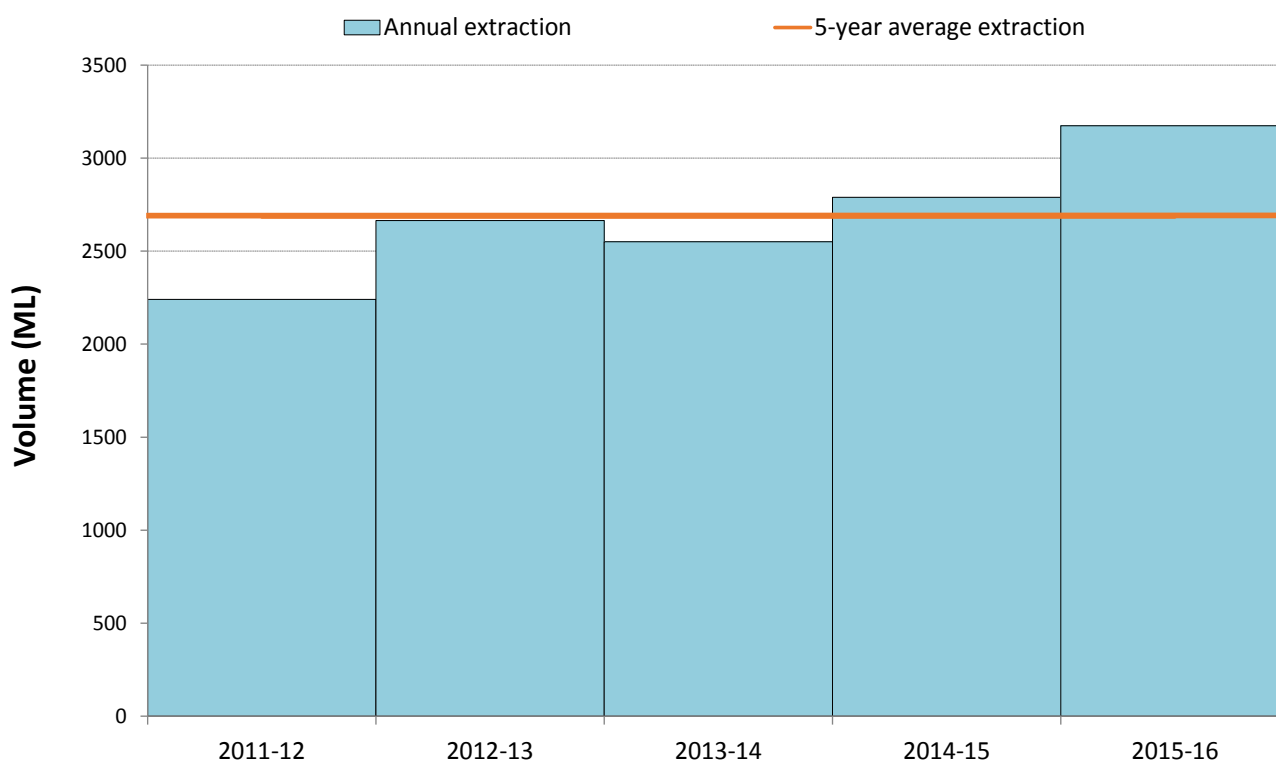


Figure 3. Licensed groundwater extraction volumes<sup>4</sup> from the Port Willunga Formation aquifer for the past five water-use years

<sup>3</sup> 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](http://www.longpaddock.qld.gov.au/silo).

<sup>4</sup> The licenced groundwater use for the 2015–16 water-use year is based on the best data available as of January 2017 and could be subject to change, as some extraction volumes may be in the process of being verified.

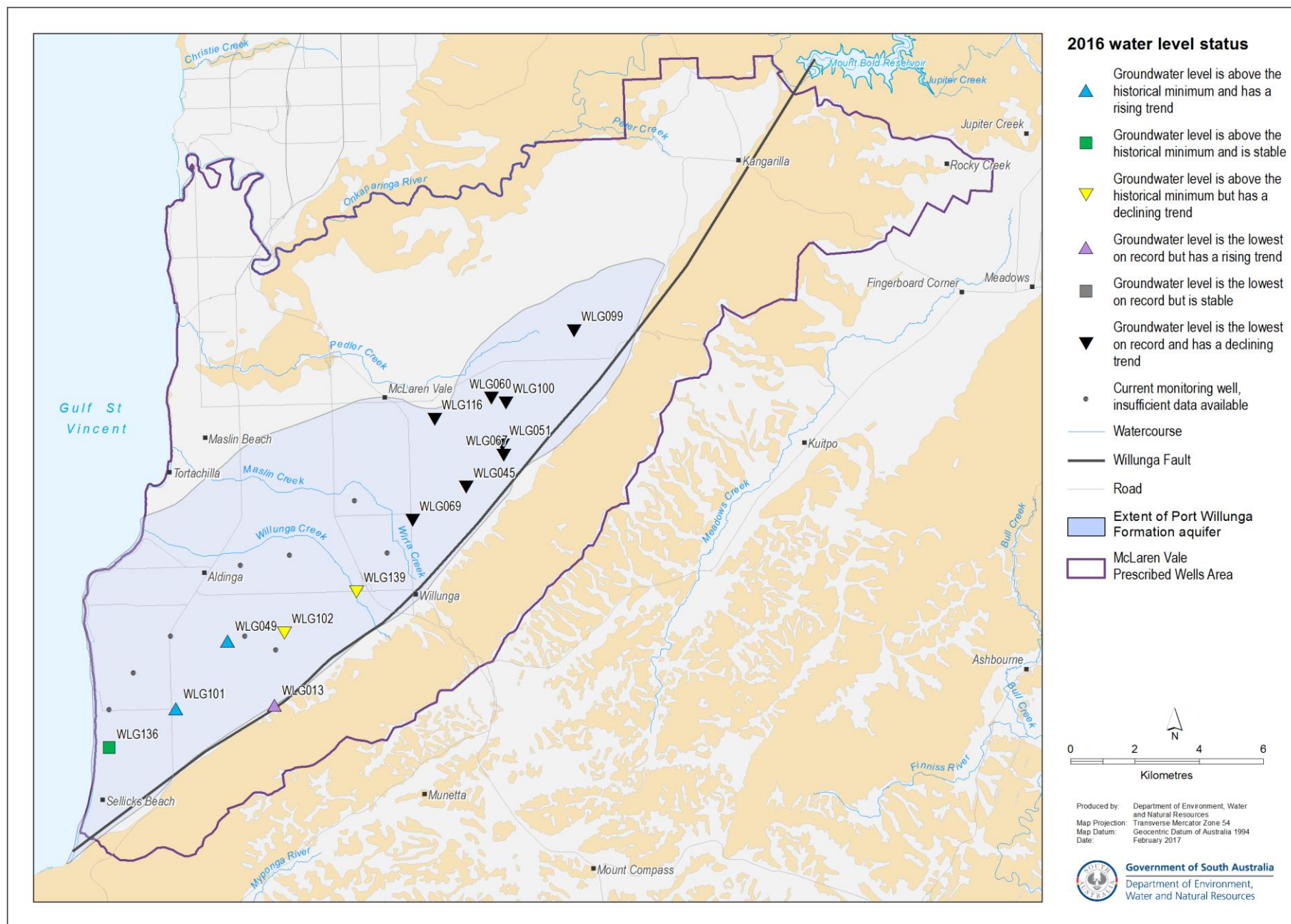


Figure 4. 2016 status of the water level in the Port Willunga Formation aquifer (McLaren Vale PWA) based on the five-year groundwater level trend from 2012 to 2016





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