McLaren Vale Prescribed Wells Area Port Willunga Formation aquifer

2018 Groundwater level and salinity status report

Government of South Australia
Department for Environment and Water

2018 Status summary
McLaren Vale PWA
Port Willunga Formation aquifer

Port Willunga Formation aquifer

The Port Willunga Formation aquifer of the McLaren Vale 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, 55% of wells show declining groundwater levels.

The status is based on five-year trends. To view the *McLaren Vale PWA groundwater level and salinity status report 2009-10*, 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 McLaren Vale 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	The Willunga Bureau of Meteorology (BoM) rainfall station, number 23753, is located near the township of Willunga in the south-eastern part of the McLaren Vale PWA.
Annual total[1]	622 mm 12 mm (2%) greater than the five-year average of 610 mm 14 mm (2%) less than the long-term (1900-2018) average of 636 mm

Groundwater extraction

See Figure 3

Allocated volume[1,2]	~3600 ML
Licensed groundwater extractions[1,3]	2797 ML
Extraction volume comparison	891 ML (47%) greater than the previous year 154 ML (6%) 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 allocation and extractions are subject to change as data have not yet been verified in full – see More information

Groundwater level

See Figure 4

Five-year trend: 2014–18	12 out of 22 wells (55%) show declining trends, at rates of 0.06–0.22 m/y (median of 0.12 m/y); 11 of these wells show their lowest level on record 1 well (4%) is stable 9 wells (41%) show rising trends, at rates of 0.04–2.90 m/y (median of 0.08 m/y)

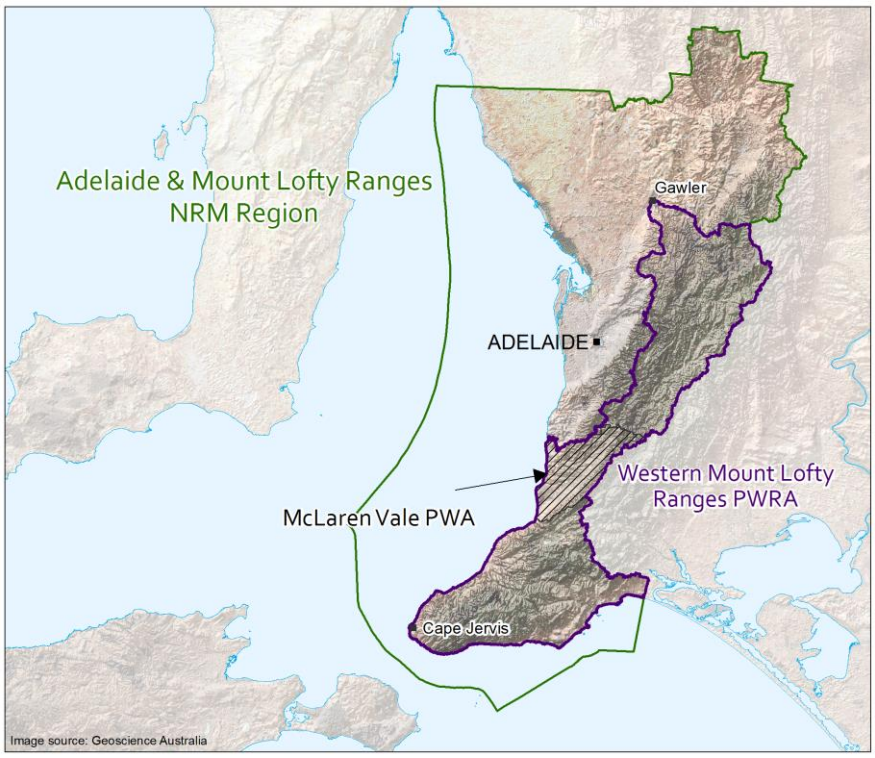
Groundwater salinity

See Figure 5

2018 salinity	471–1850 mg/L (86 wells; median of 1103 mg/L)
Citizen science	Since 2017, irrigators in the McLaren Vale PWA have submitted groundwater samples that DEW have tested for salinity concentration. Data that have been validated are augmenting the existing DEW monitoring network.[4]

[4] The salinity data collected from irrigation wells can be viewed at Groundwater Data or via WaterConnect

Regional setting



The McLaren Vale PWA is located approximately 35 km south of Adelaide within the Adelaide and Mount Lofty Ranges Natural Resources Management Region. It is a regional-scale resource for which groundwater has been prescribed under South Australia's *Natural Resources Management Act 2004* and a water allocation plan provides for their sustainable management.

The McLaren Vale PWA is located within the boundary of the Western Mount Lofty Ranges (WMLR) Prescribed Water Resources Area (PWRA). For those groundwater resources located within the WMLR PWRA, but outside the McLaren Vale PWA, separate groundwater level and salinity status reports have been prepared. These reports can be found on the *Water Resource Assessments* page of WaterConnect.

Underlying the McLaren Vale PWA is the Willunga Embayment, a structurally-controlled trough containing sedimentary groundwater systems of Quaternary and Tertiary age, which is bounded in the south-east by the Willunga Fault (Fig. 1), and to the north by basement outcrop. This report focuses on the 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 toward the coast in a south-westerly direction. Recharge to the aquifer occurs through direct recharge from local rainfall where it is unconfined in its northern extent near McLaren Vale (Fig.1) 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.

Trends in groundwater level and salinity within the Port Willunga Formation are primarily climate driven: below-average rainfall results in reduced recharge to the aquifer. Below-average rainfall can also result in increased extractions for irrigation, which can cause groundwater levels to decline and salinities to increase. Conversely, above-average rainfall may result in increased recharge and decreases in irrigation extractions, which can cause groundwater levels to rise and salinities to stabilise or decrease.

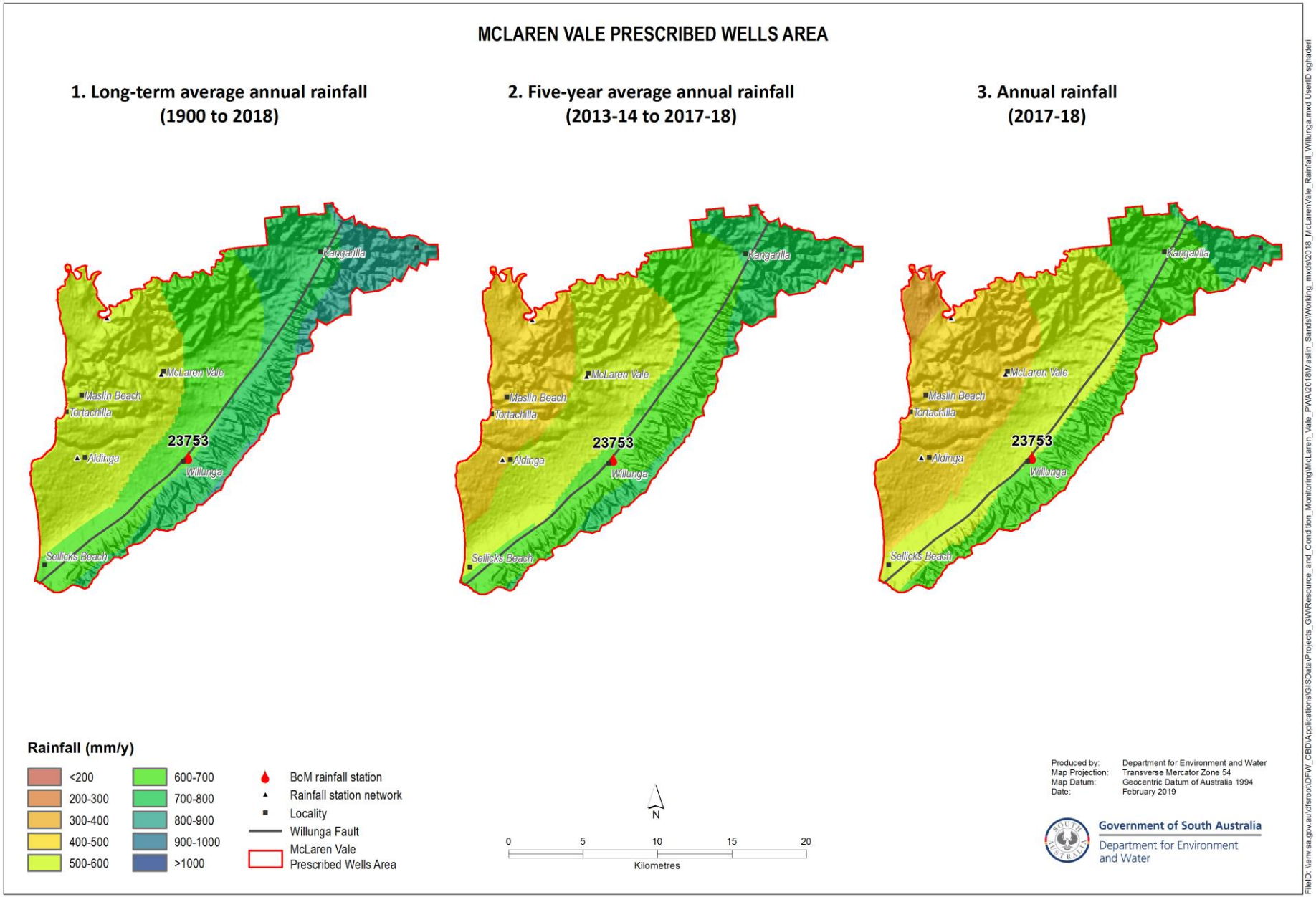


Figure 1. Spatial distribution of (1) long-term and (2) five-year average annual rainfall, and (3) annual rainfall[5]

[5] Data sources: SILO interpolated point and gridded datasets available at https://legacy.longpaddock.qld.gov.au/silo/ – see More information

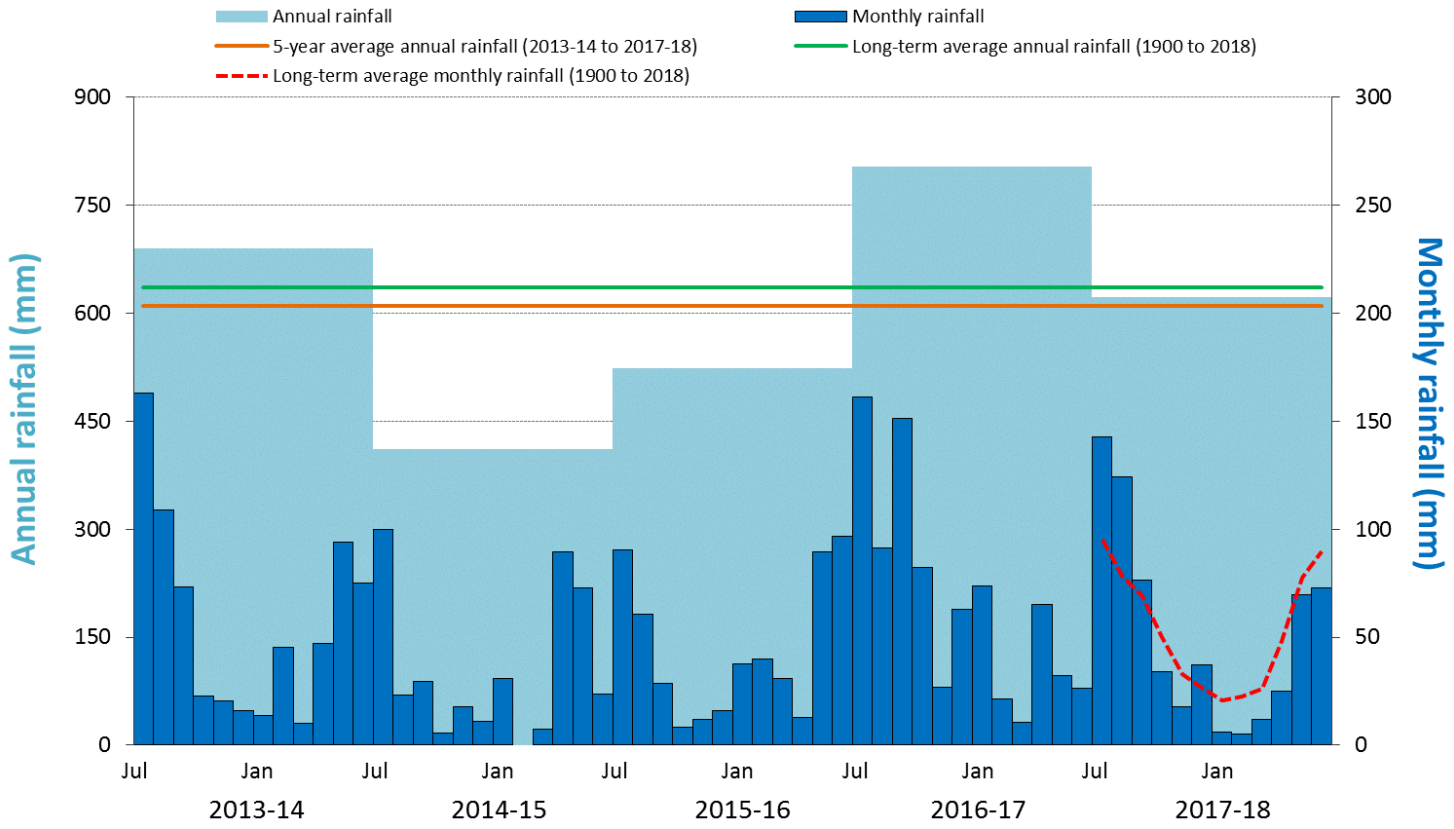


Figure 2. Annual and monthly rainfall for the past five water-use years recorded at Willunga (BoM Station 23753)[6]

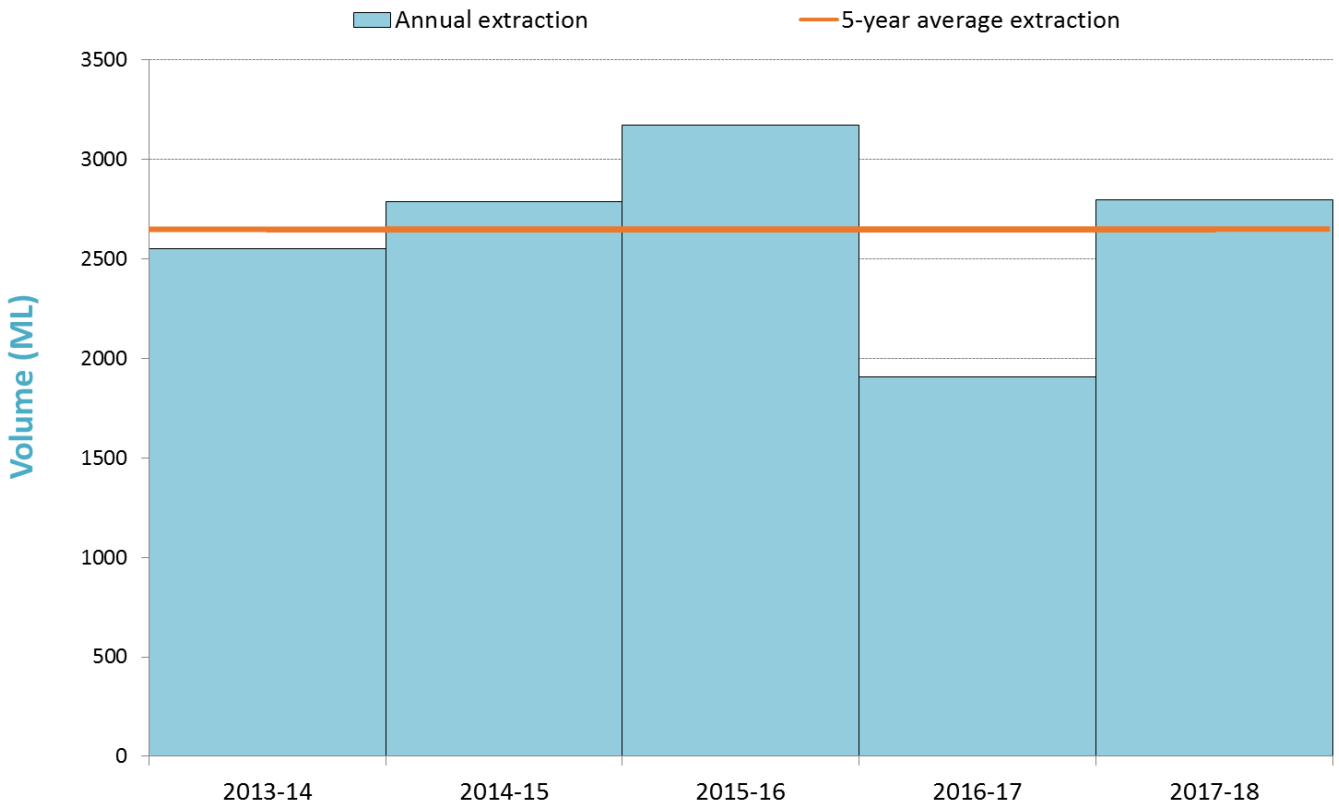


Figure 3. Licensed groundwater extraction volumes[7] for the past five water-use years

[6] Data source: SILO Patched Point Dataset, available https://legacy.longpaddock.qld.gov.au/silo/ – see More information
[7] Total licensed extractions are subject to change as extraction data have not yet been verified in full – see More information

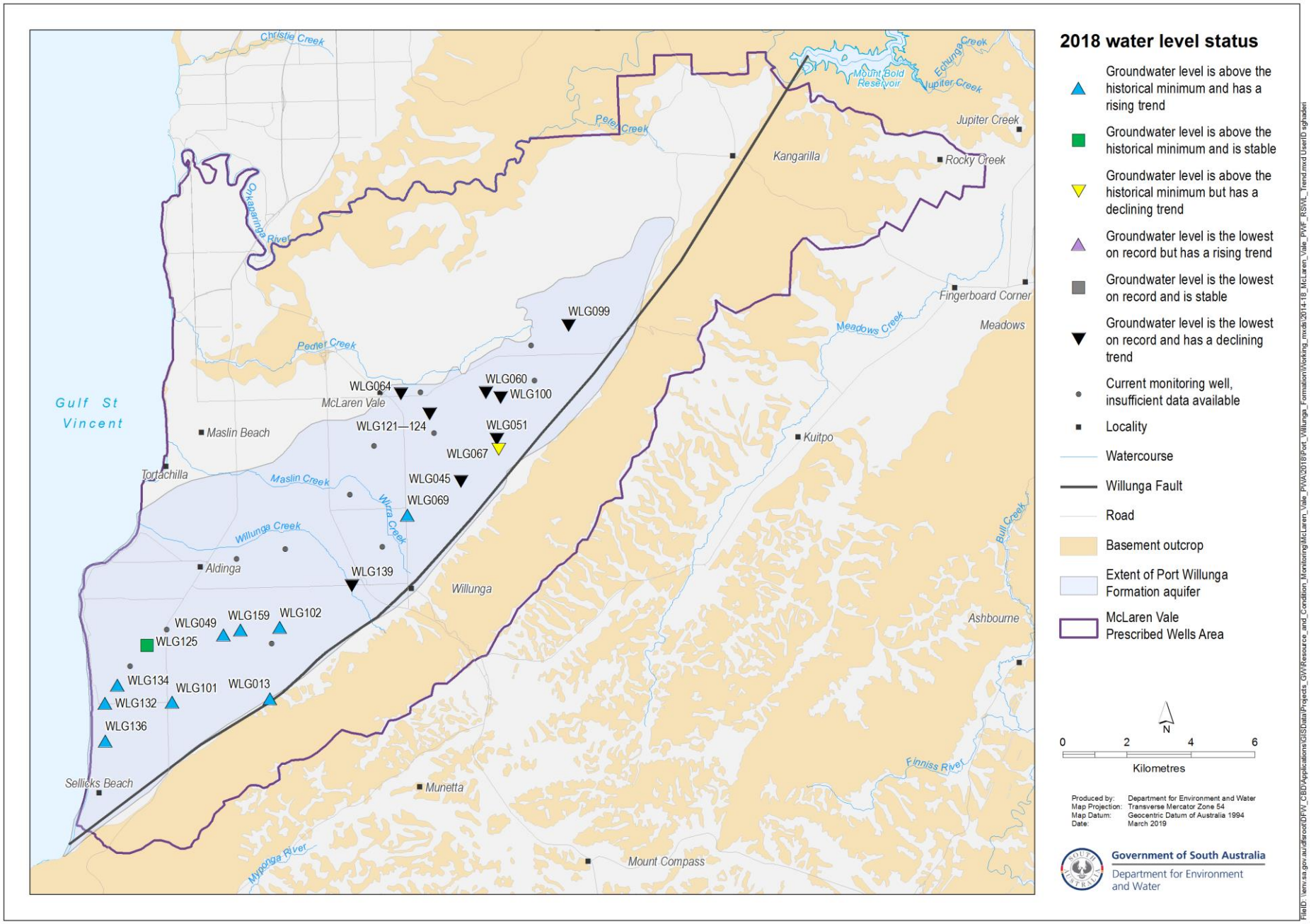


Figure 4. Five-year trends (2014–18) in groundwater levels: Port Willunga Formation aquifer

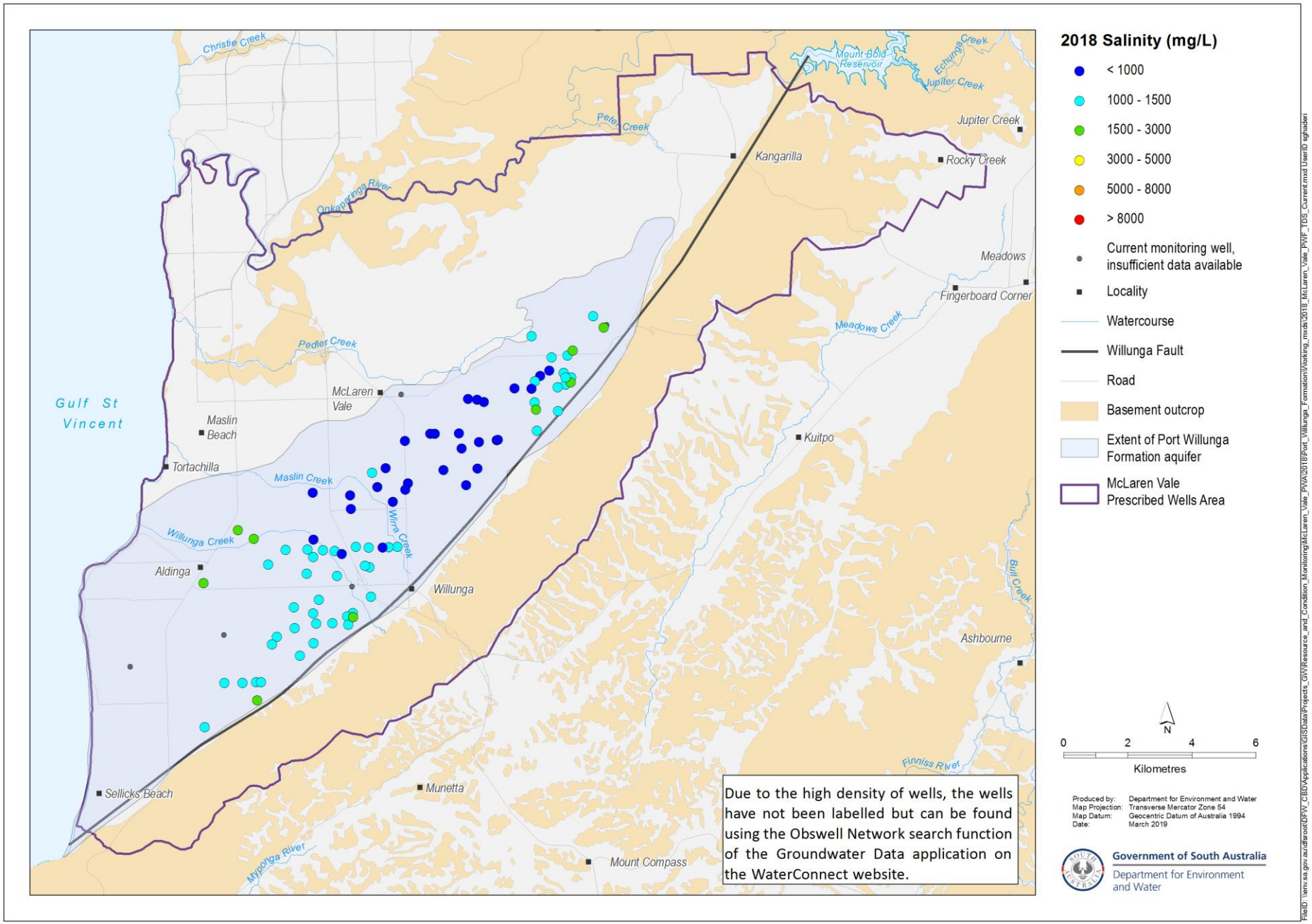


Figure 5. 2018 groundwater salinities: Port Willunga Formation aquifer

More information

To determine the status of the Port Willunga Formation aquifer 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 allocation and extraction for the 2017–18 water-use year is based on the best data available as of February 2019 and 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 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 *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 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 McLaren Vale PWA, please visit the *Groundwater Data* page under the Data Systems tab 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 Natural Resources Adelaide and Mount Lofty Ranges 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

Published by the Department for Environment and Water.
Government of South Australia
16 July 2019

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ABN 36702093234
ISBN 978-1-925805-84-0

Report prepared by:
Department for Environment and Water
Water Science and Monitoring Branch
Strategy, Science and Corporate Services Directorate

www.environment.sa.gov.au

Preferred way to cite this publication

DEW 2019. *McLaren Vale PWA Port Willunga Formation aquifer 2018 groundwater level and salinity status report*, Government of South Australia, Department for Environment and Water, Adelaide

Download this document at www.waterconnect.sa.gov.au

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