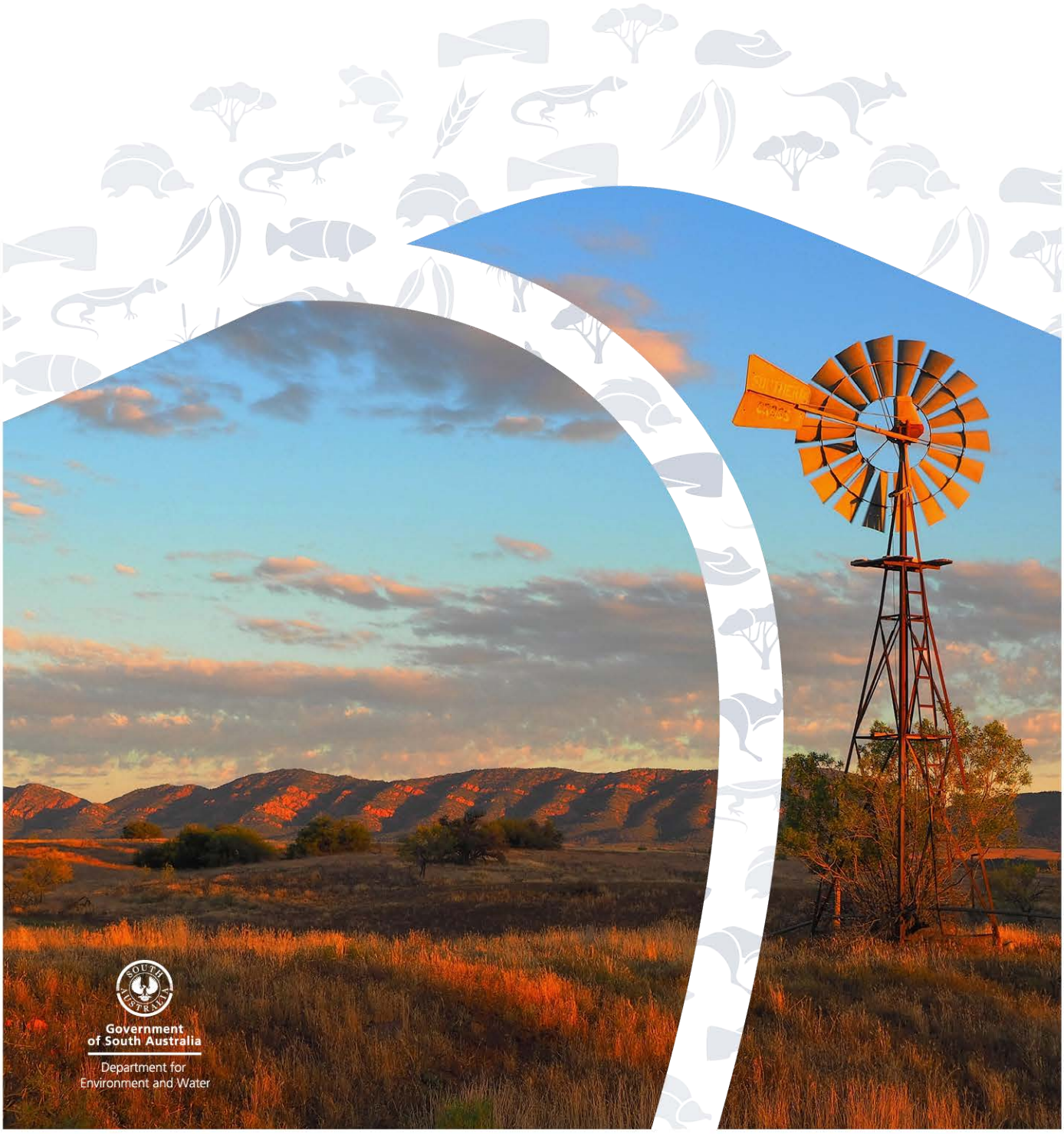
Peake, Roby and Sherlock PWA Confined aquifer

2017 Groundwater level and salinity status report



Department for Environment and Water
GPO Box 1047, Adelaide SA 5001

Telephone	National	(08) 8463 6946
	International	+61 8 8463 6946
Fax	National	(08) 8463 6999
	International	+61 8 8463 6999
Website	www.environment.sa.gov.au	

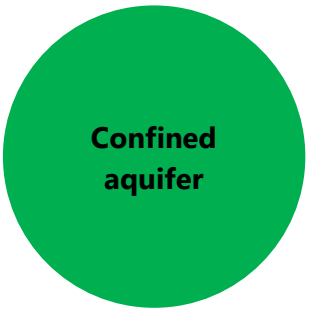
ISBN 978-1-925805-15-4

Preferred way to cite this publication

DEW (2018). *Peake, Roby and Sherlock PWA confined aquifer 2017 Groundwater level and salinity status report,* Government of South Australia, Department of Environment, Water and Natural Resources, Adelaide.

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

2017 Status summary
Peake, Roby and Sherlock PWA
Confined aquifer



The confined aquifer of the Peake, Roby and Sherlock Prescribed Wells Area (PWA) has been assigned a ***green*** status for 2017 because positive trends have been observed over the past five years.

The status is based on five-year trends: over the period 2013–17, all wells show rising groundwater pressure levels and stable salinities.

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	Peake Bureau of Meteorology (BoM) rainfall station 25513, located in the western part of the PWA
Annual total[1]	459 mm 128 mm (39%) greater than the five-year average of 331 mm 70 mm (18%) greater than the long-term average of 389 mm
Monthly summary	Well-above average rainfall in September, December, January and February Well-below average rainfall recorded in March and June
Spatial distribution	Rainfall in 2016–17 was well above average across the entire PWA

Water use

See Figure 3

Total allocated volume: 2016–17	2168 ML
Licensed groundwater extractions*	572 ML[2] (26% of total allocation)
Extraction volume comparison	565% greater than the previous year 3% less than the five-year average

*Stock and domestic use is not included in licensed extractions

[1] For the water-use year 1 July 2016 to 30 June 2017
[2] Total licensed extractions are subject to change as extraction data have not yet been verified in full – see More information

Groundwater pressure level

See Figure 4

Five-year trend: 2013–17	All 13 wells show a rising trend, at rates of 0.04–2.02 m/y (median of 0.63 m/y)

Groundwater salinity

See Figures 5 and 6

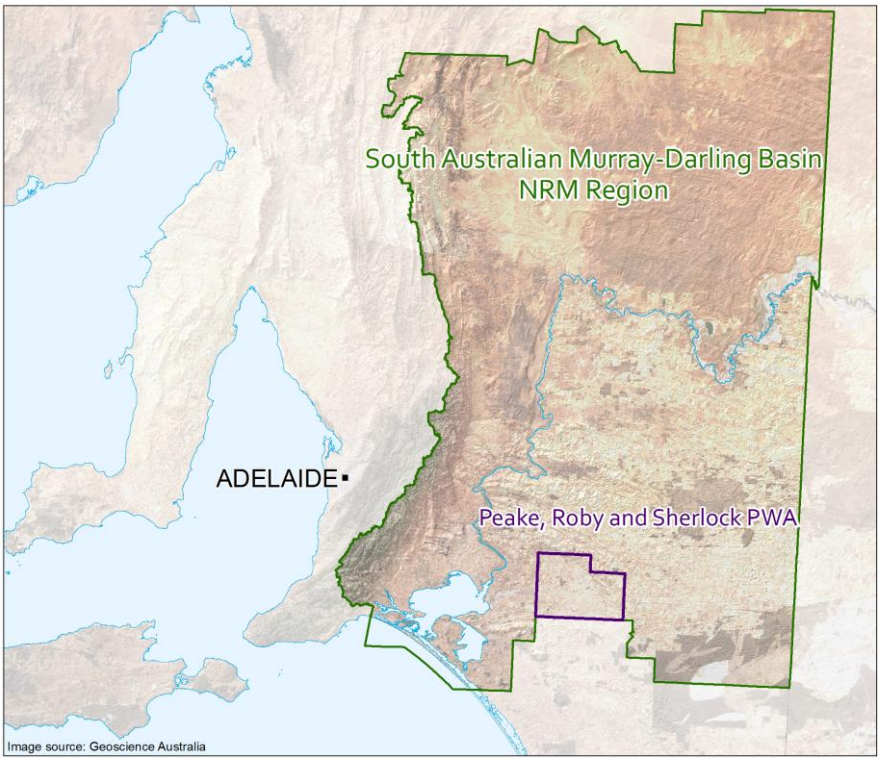
2017 salinity	1580–5186 mg/L
Five-year trend: 2013–17	All 10 wells are stable

Groundwater condition limits

See Figures 7, 8 and 9

Definition	The water allocation plan (WAP) for the Mallee PWA has identified resource condition limits based on water level and salinity thresholds – these are designed to give early warning of adverse trends that may impact users of the resource
Water level thresholds definition	The rolling three-year average of the annual maximum drawdown and recovery levels, measured in at least 50% of designated wells, should not fall below the maximum drawdown or recovery thresholds
Water level in 2016–17	Thresholds have not been reached or exceeded
Salinity thresholds definition	The rolling three-year average of the maximum groundwater salinity, measured in at least 50% of the designated wells, should not rise more than 5% from the baseline salinity
Salinity in 2016–17	Threshold have not been reached or exceeded

Regional setting



The Peake, Roby and Sherlock PWA is located around 120 km south-east of Adelaide in the South Australian Murray-Darling Basin Natural Resources Management Region. It is underlain by sedimentary aquifers of the Murray Basin and is a local-scale groundwater resource used by mainly a small number of irrigators, feedlots and for public water supply. Groundwater is prescribed under the *Natural Resources Management Act 2004* and a WAP provides for the sustainable management of the groundwater resources.

The Peake, Roby and Sherlock PWA has two distinct aquifers—an unconfined aquifer and a confined aquifer. Almost all licensed groundwater extractions are taken from the confined aquifer and as such, it is the focus of this report.

The confined aquifer comprises the Buccleuch Group and Renmark Group Formations. The Buccleuch Group consists of a consolidated bryozoal limestone or 'coral' that lies at a depth of 90–100 m below the ground and varies in thickness from 5 to 25 m. This coral layer begins to merge laterally with the Renmark Group in the eastern area of the PWA. The Renmark Group comprises interbedded sands and clays and there are very few wells that extract from this aquifer. As the Buccleuch and Renmark Group aquifers are confined, they are not recharged by local rainfall. The primary source of recharge is the lateral inflow of groundwater from aquifers located in south-western Victoria.

Despite being a confined aquifer that does not receive direct recharge from incident rainfall, the intensity and timing of local rainfall and subsequent extraction practices can have an effect on groundwater levels. For example, if the region experiences above-average rainfall during typically dry summer months, this could result in less groundwater being extracted for irrigation and consequently there may be a rise in groundwater levels. Conversely, below-average rainfall might result in increases in irrigation extraction and groundwater levels may decline.

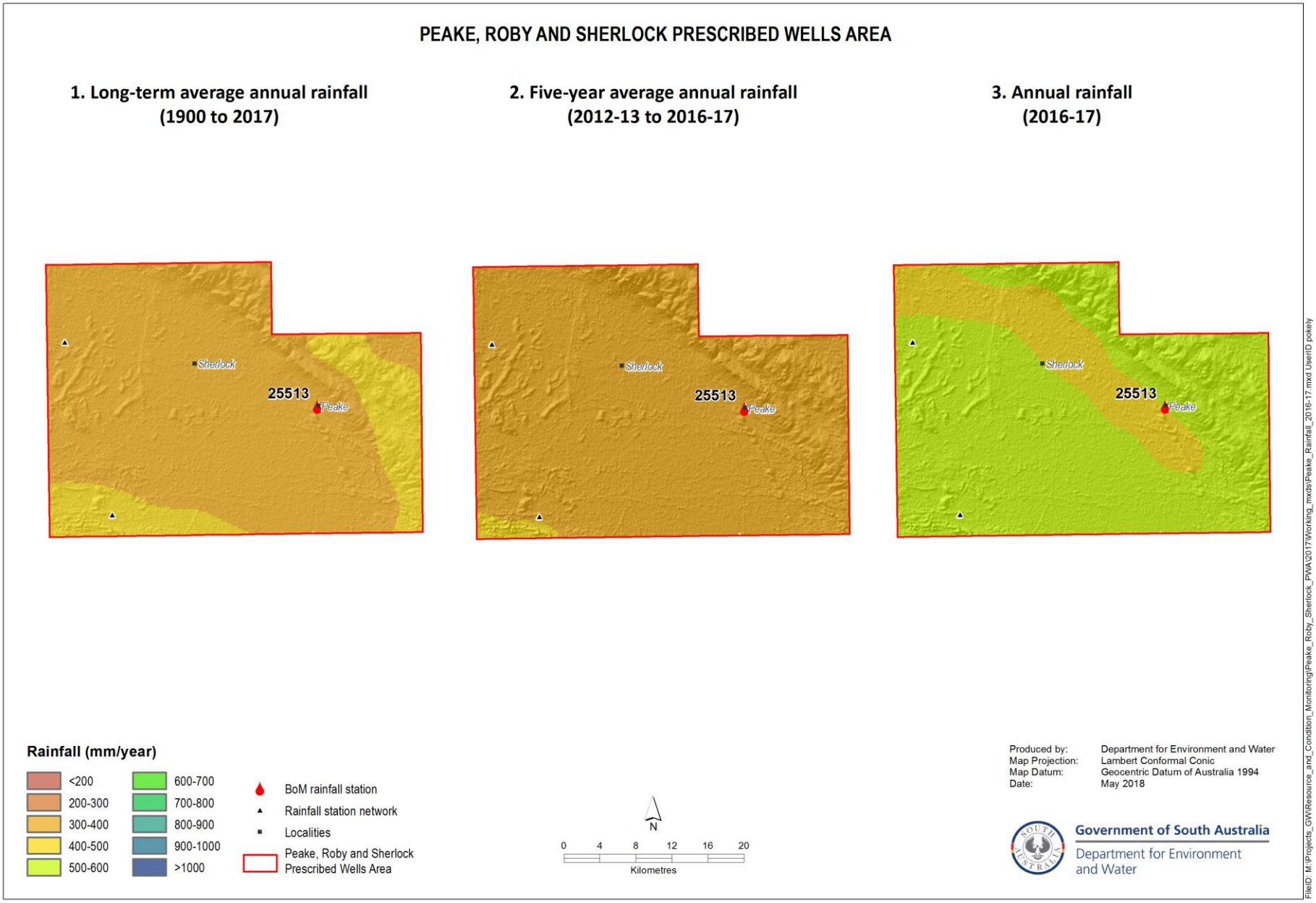


Figure 1. Spatial distribution of (1) Long-term and (2) five-year average annual rainfall, and (3) annual rainfall[3]

[3] Data sources: SILO Patched Point Dataset https://silo.longpaddock.qld.gov.au/ and BoM Australian Water Availability Project (http://www.bom.gov.au/jsp/awap/) – see More information

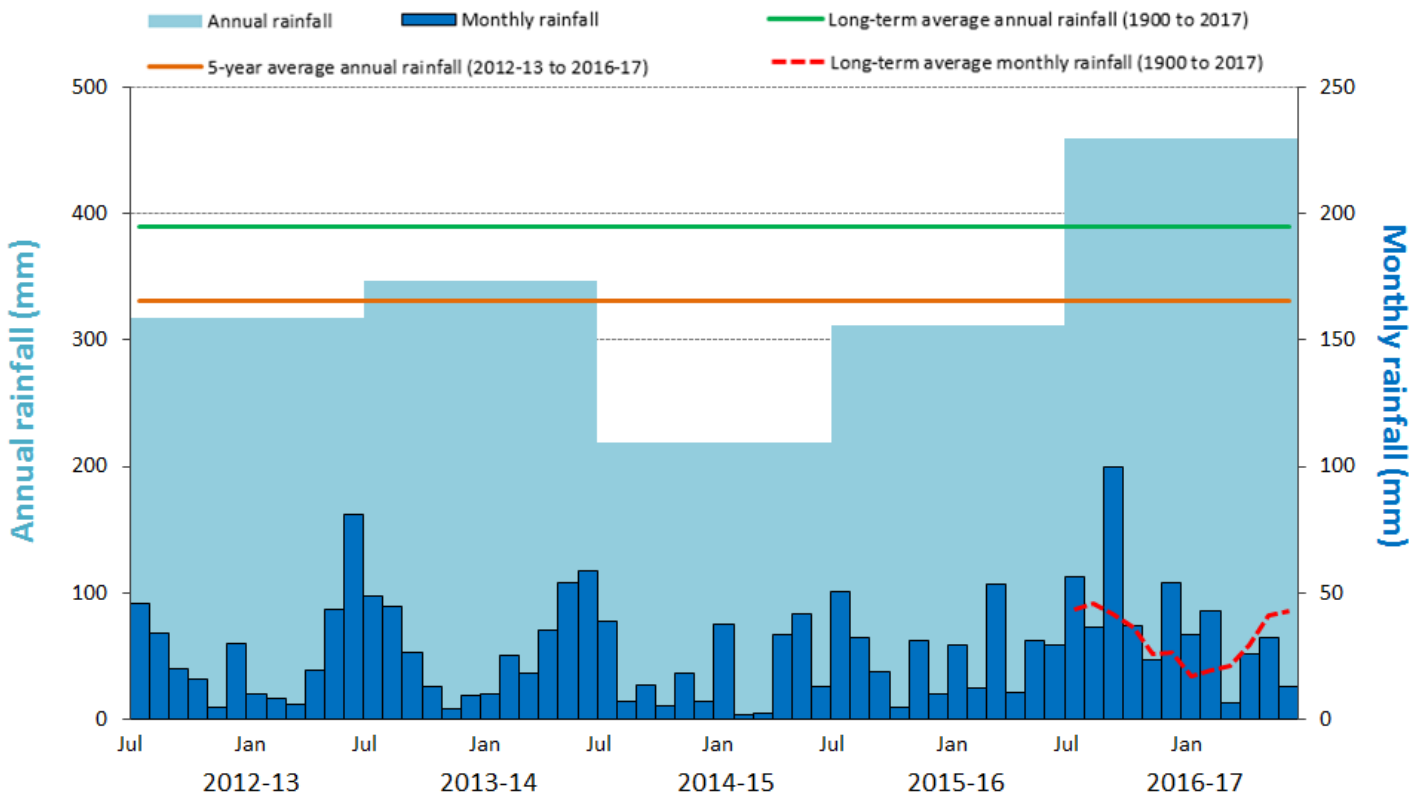


Figure 2. Annual and monthly rainfall for the past five water-use years recorded at Peake (BoM Station 25513)[4]

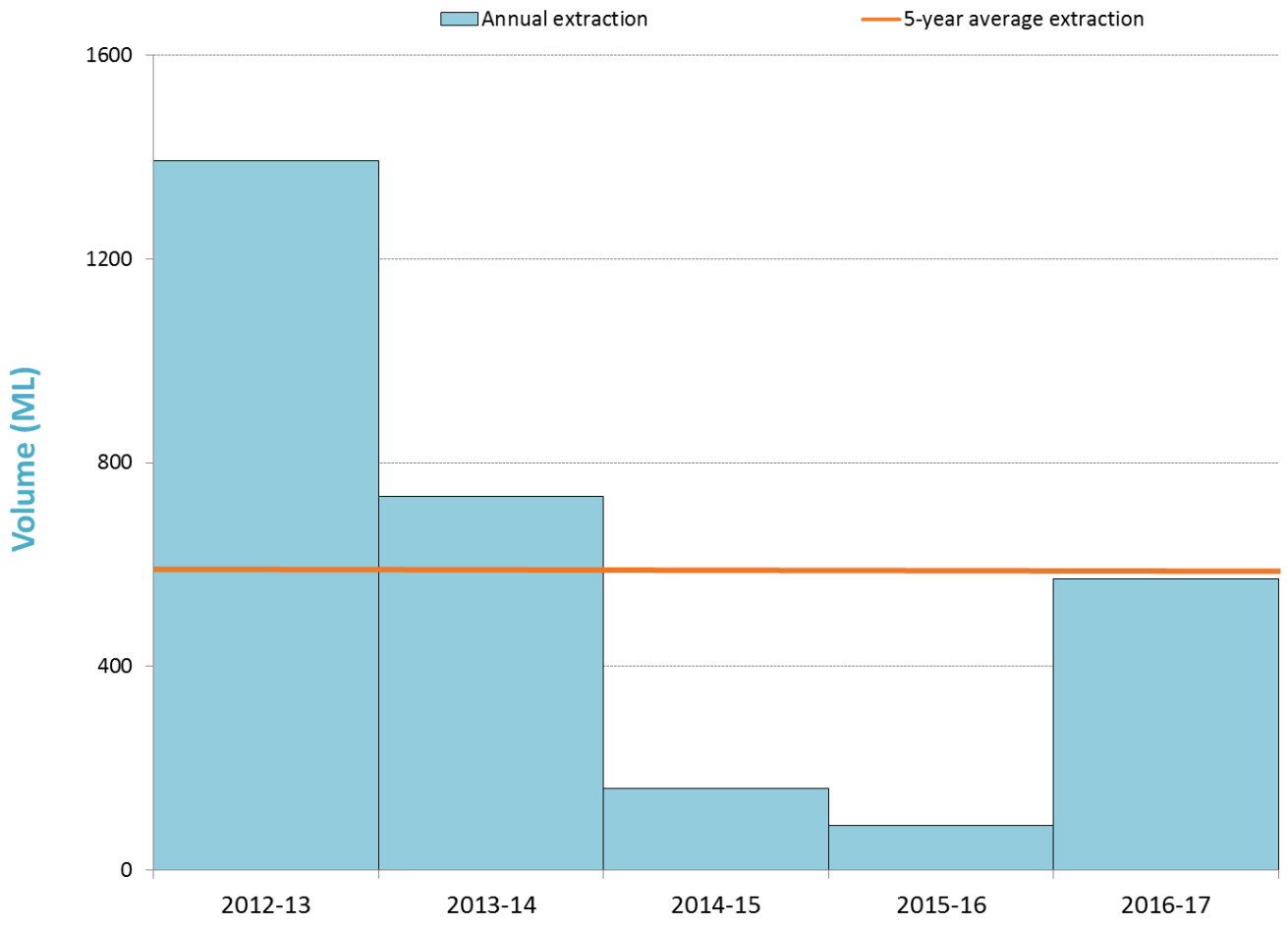


Figure 3. Licensed groundwater extraction volumes[5] for the past five water-use years

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

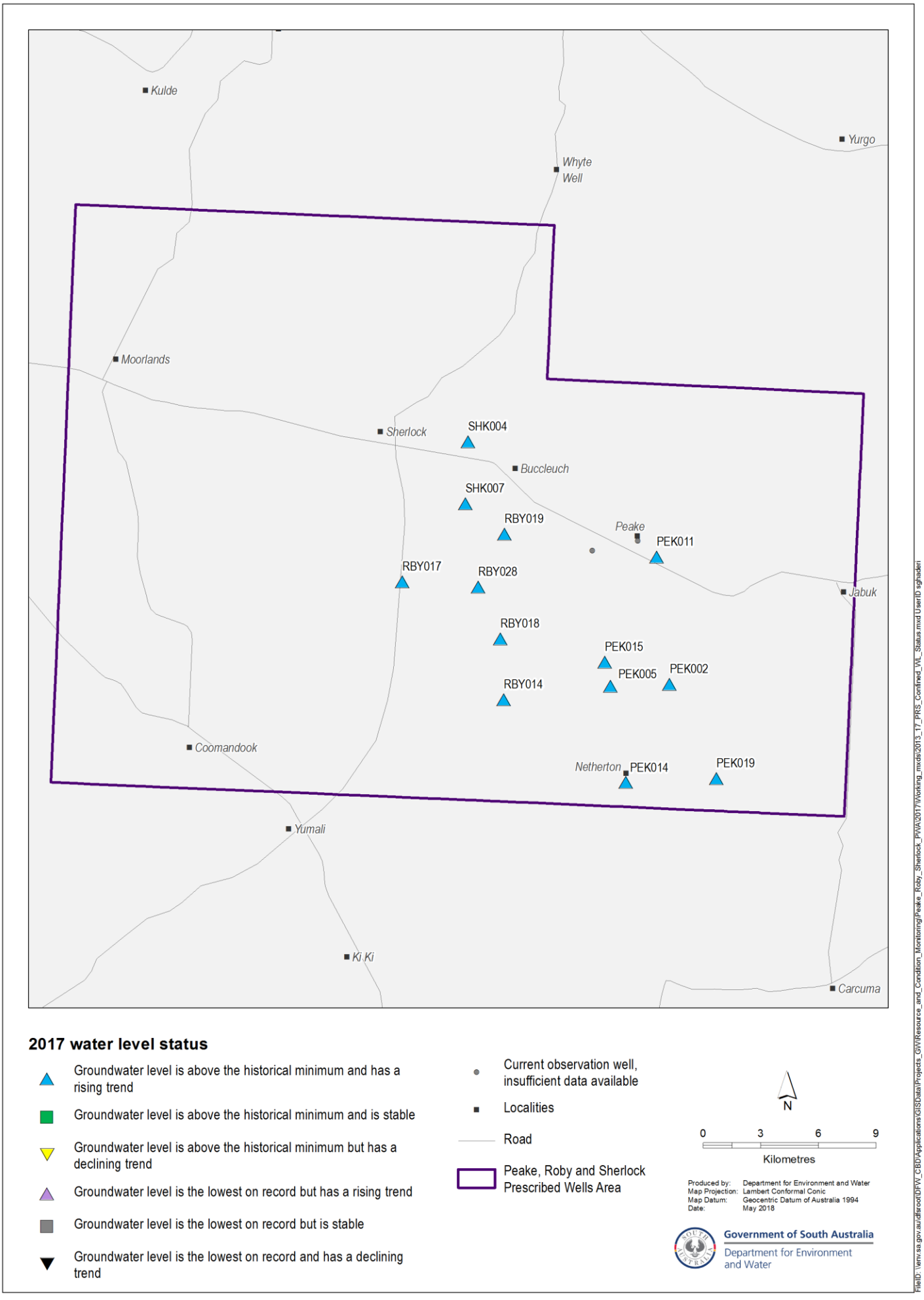


Figure 4. Five-year trends (2013–17) in groundwater pressure levels: confined aquifer

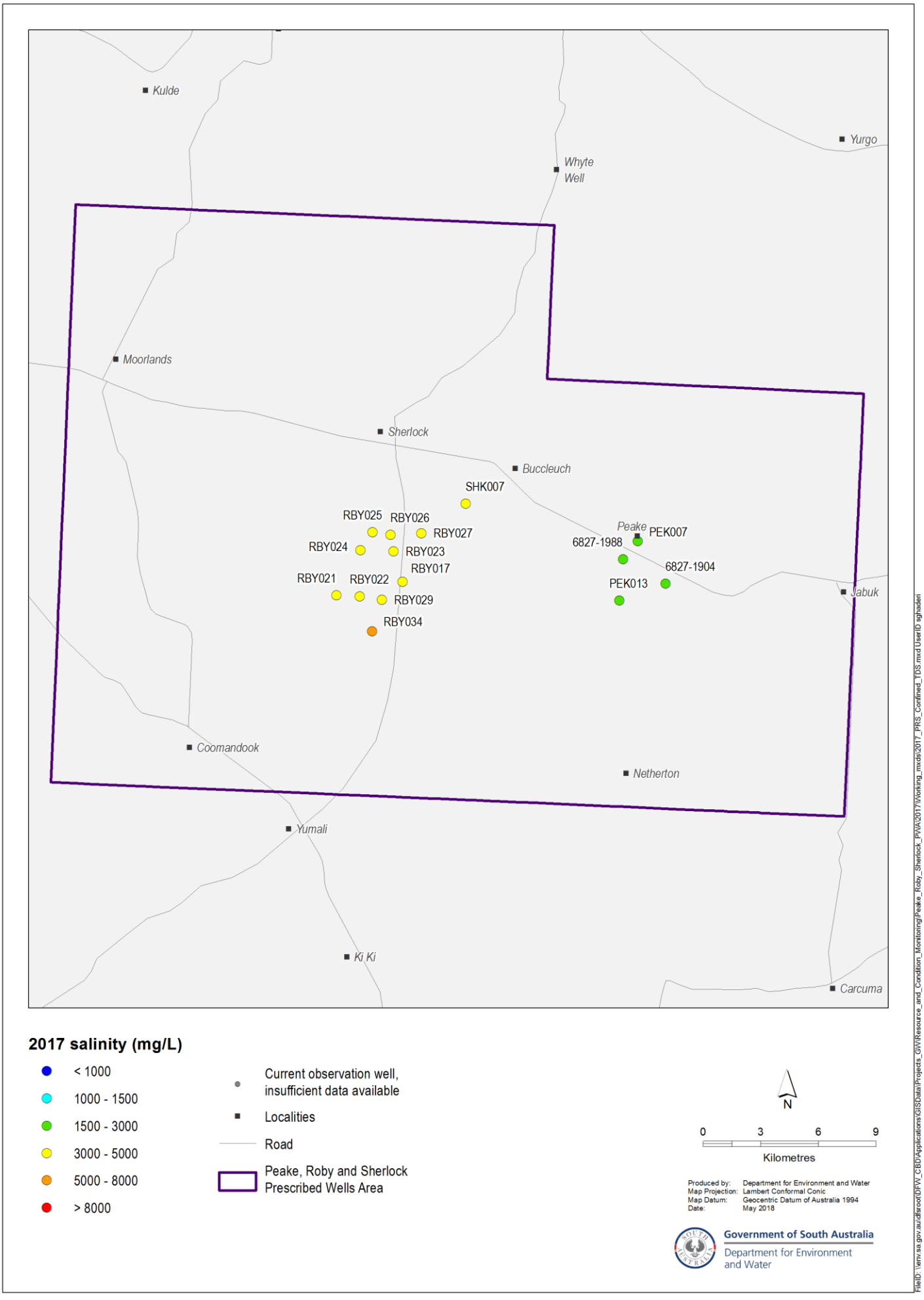


Figure 5. 2017 groundwater salinities: confined aquifer

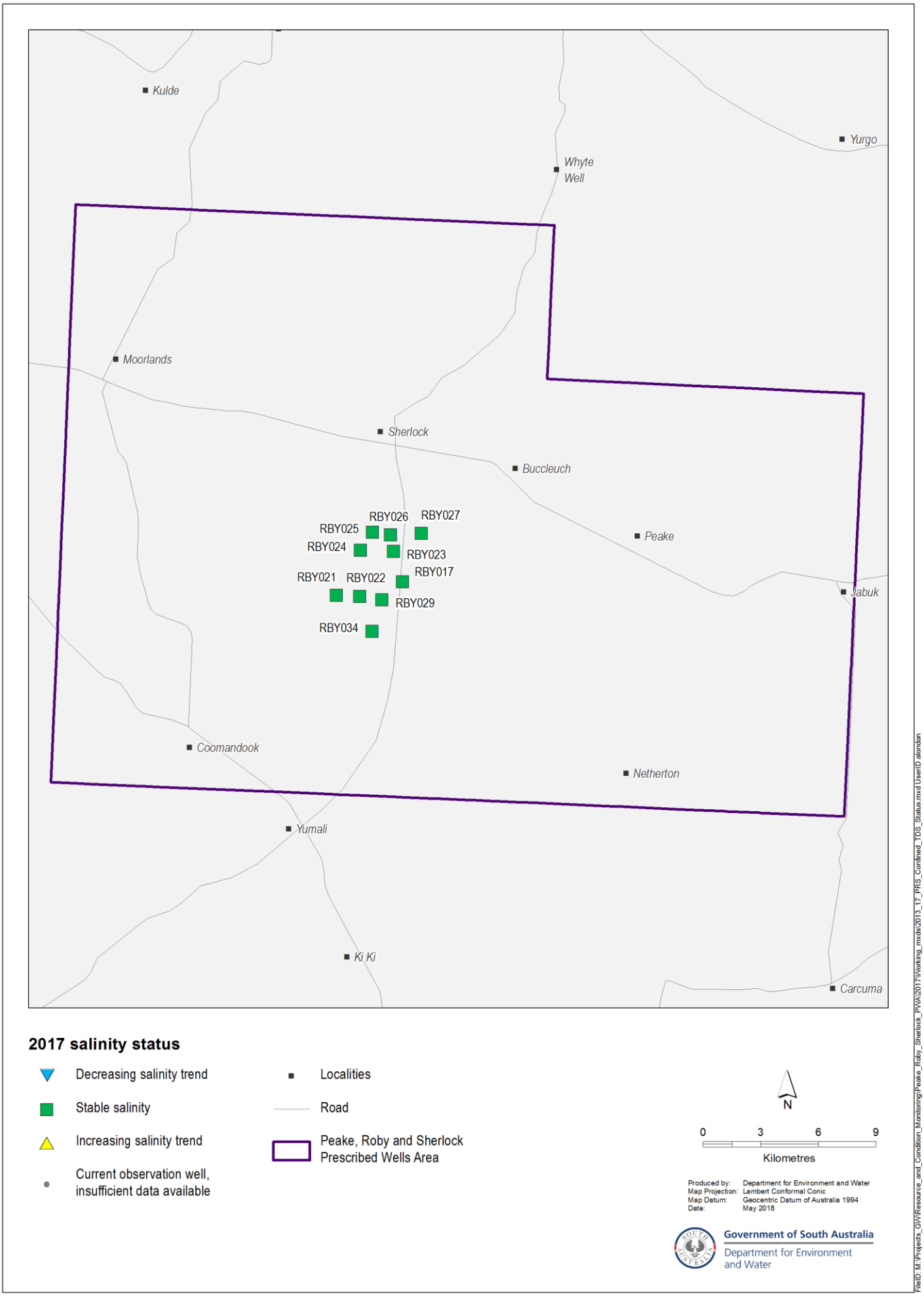


Figure 6. Five-year trends (2013–17) in groundwater salinities: confined aquifer

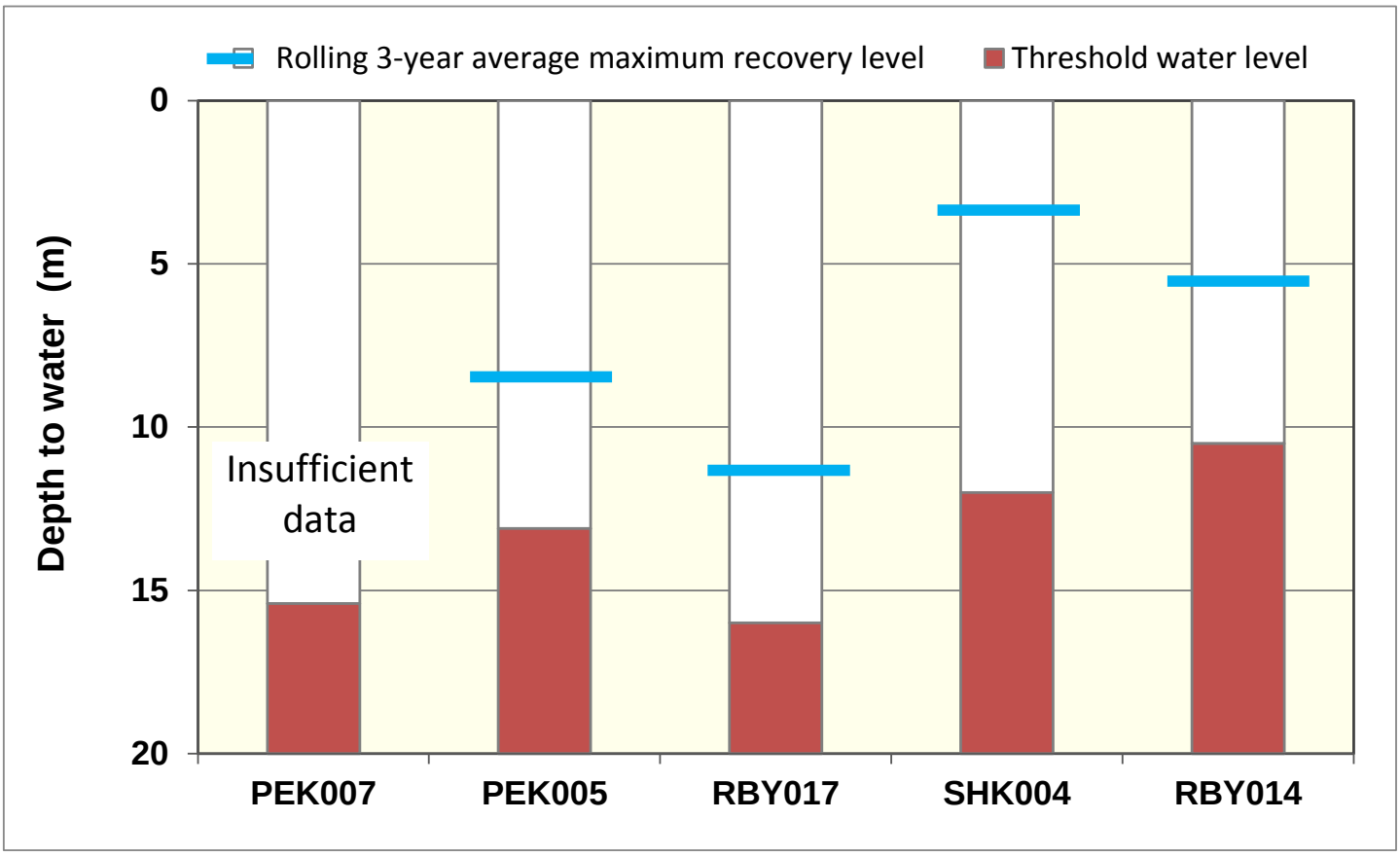


Figure 7. Maximum recovery level condition indicator thresholds of the Peake, Roby and Sherlock PWA as defined in the WAP and rolling three-year average maximum recovery level (from 2015 to 2017)

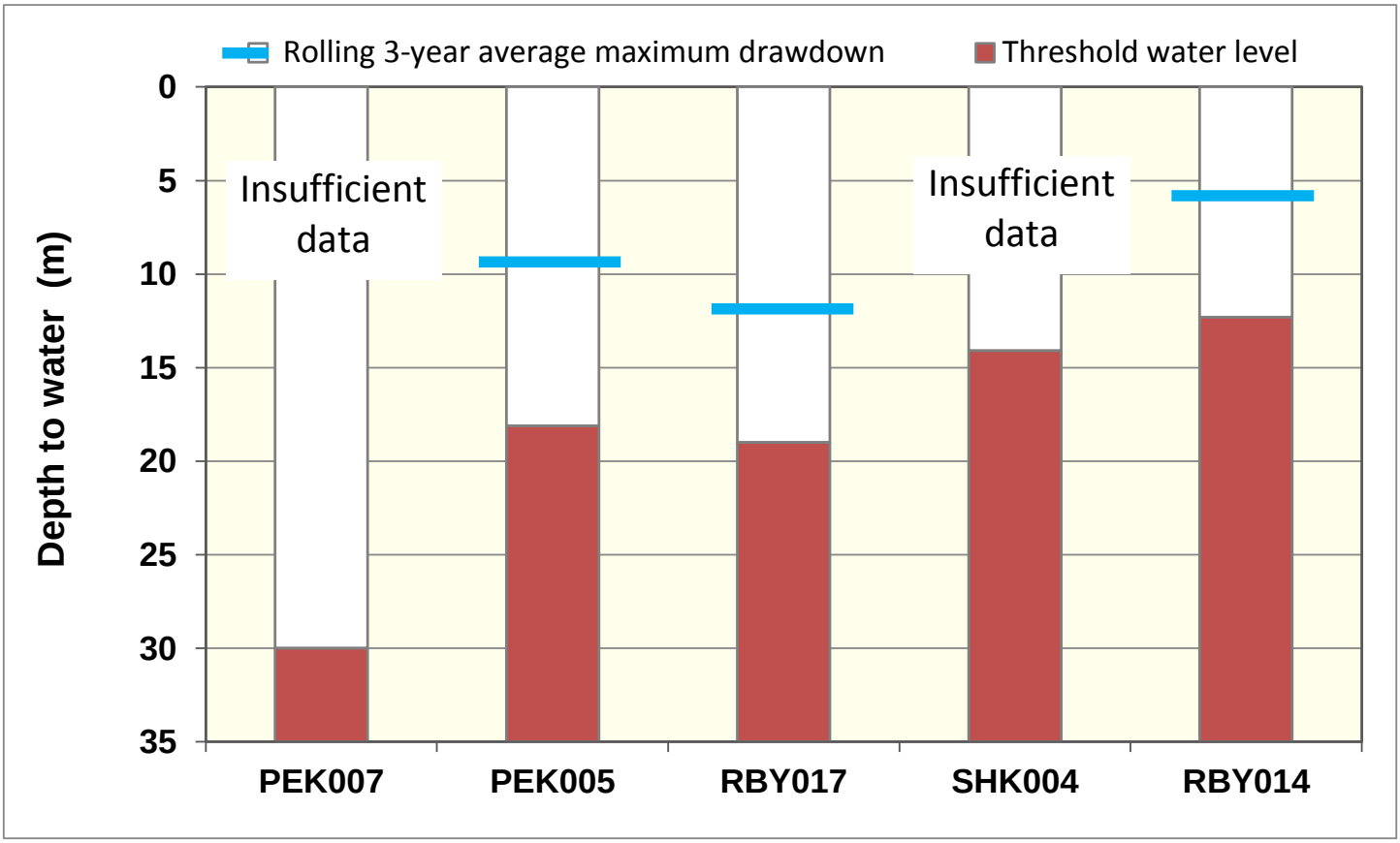


Figure 8. Maximum drawdown condition indicator thresholds of the Peake, Roby and Sherlock PWA as defined in the WAP and rolling three-year average maximum drawdown (from 2015 to 2017)

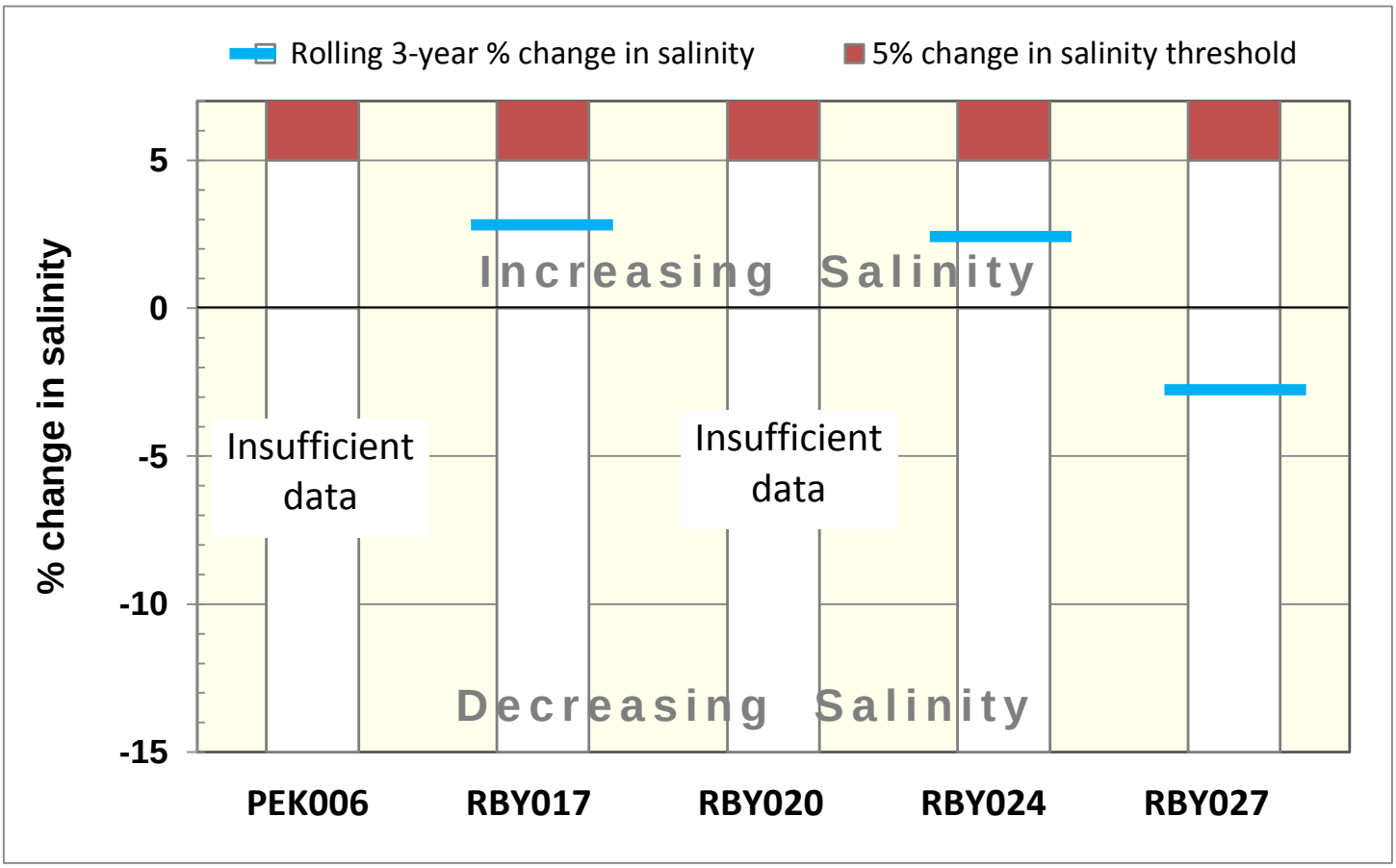


Figure 9. Salinity condition indicator thresholds of the Peake, Roby and Sherlock PWA as defined in the WAP and rolling three-year change in salinity (from 2015 to 2017)

More information

To determine the status of the confined aquifer for 2017, the trends in groundwater levels and salinities over the past five years (2013 to 2017, 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, and to review the full historical record of the monitoring wells, 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 use for the 2016–17 water-use year is based on the best data available as of January 2018 and may 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 is sourced from the SILO Patched Point Dataset, which uses original BoM daily rainfall measurements and is available online at https://silo.longpaddock.qld.gov.au/. Rainfall maps have been compiled using daily gridded data produced by the BoM Australian Water Availability Project (www.bom.gov.au/jsp/awap/).

To view the *Peake, Roby and Sherlock PWA Groundwater Level and Salinity Status Report 2011*, 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 Peake, Roby and Sherlock PWA, please visit the *Groundwater Data* page under the *Data Systems* tab on WaterConnect.

For further information about the Peake, Roby and Sherlock PWA, please see the *Water Allocation Plan for the Peake, Roby and Sherlock Prescribed Wells Area* on the Natural Resources SA Murray-Darling Basin 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

Government of South Australia

Department for Environment and Water

Published 2018

www.environment.sa.gov.au