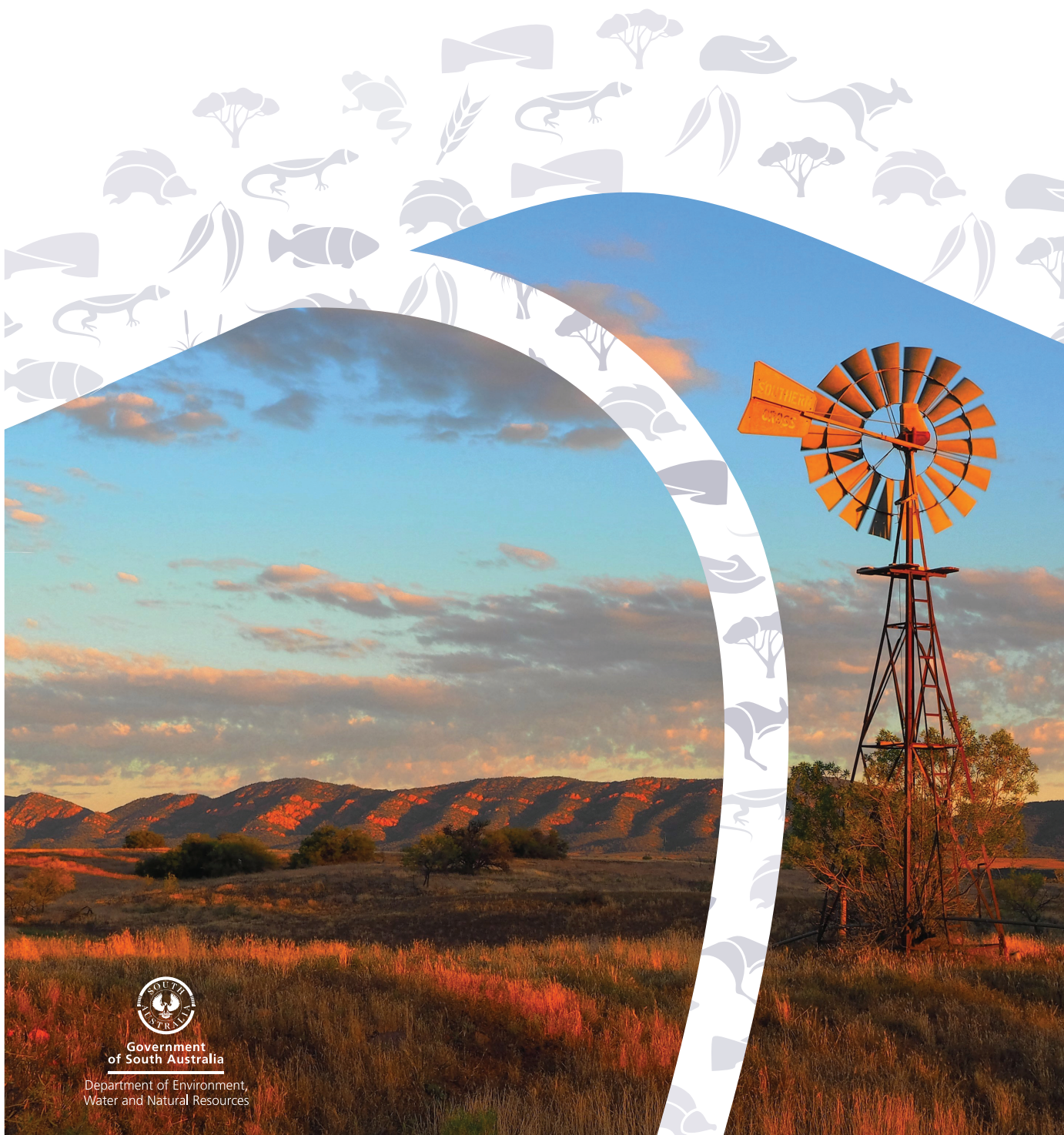


Barossa PWRA

Fractured rock aquifer

2016 Groundwater level and salinity status report



Department of Environment, Water and Natural Resources
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	

Disclaimer

The Department of Environment, Water and Natural Resources and its employees do not warrant or make any representation regarding the use, or results of the use, of the information contained herein as regards to its correctness, accuracy, reliability, currency or otherwise. The Department of Environment, Water and Natural Resources and its employees expressly disclaims all liability or responsibility to any person using the information or advice. Information contained in this document is correct at the time of writing.



This work is licensed under the Creative Commons Attribution 4.0 International License.

To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/>

© Crown in right of the State of South Australia, through the Department of Environment, Water and Natural Resources 2017

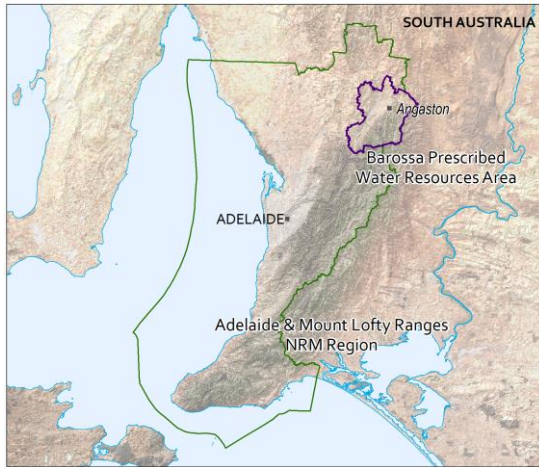
ISBN 978-1-925510-75-1

Preferred way to cite this publication

DEWNR (2017). *Barossa PWRA fractured rock aquifer 2016 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

Regional setting



The Barossa Prescribed Water Resources Area (PWRA) encompasses both the highland areas of the Mount Lofty Ranges (MLR) and the Barossa Valley. It is located approximately 60 km north-east of Adelaide and lies within the Adelaide and Mount Lofty Ranges Natural Resources Management Region.

Barossa PWRA 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 management of these regional-scale water resources.

The Barossa PWRA consists of three major groundwater systems: two sedimentary aquifers (Upper and Lower) that are located within the region's largest valley; and a fractured rock aquifer that underlies the sedimentary aquifers and crops out in the MLR towards the eastern and western margins of the valley. This report focuses on the fractured rock aquifer (FRA) of the

Barossa PWRA.

Groundwater flow within the FRA generally follows the topography and flows from the higher elevations of the MLR to lower areas within the valley, with some groundwater discharge occurring to streams and the sedimentary aquifers.

Trends in groundwater levels and salinity in the FRA of the Barossa PWRA are primarily climate driven: below-average rainfall results in a reduction in recharge to the aquifer. Below-average summer rainfall can also result in increasing irrigation extractions, and these two elements can cause the groundwater levels to fall and salinity to increase. Conversely, increases in rainfall may result in increases in recharge, decreases in irrigation extractions and groundwater levels may rise and salinities may stabilise or decline.

2016 Status

The fractured rock aquifer of the Barossa PWRA 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 fractured rock aquifer is based on:

- most monitoring wells (85%) showing a five-year trend of declining groundwater levels.

Rainfall

In 2015–16, the Angaston rainfall station (BoM Station 23300) recorded 390 mm, which is 145 mm below the long-term average of 535 mm (1900–2016) and 77 mm below the five-year average of 467 mm (Figs 1 and 2). A trend of declining rainfall is evident over the long term (1900–2016) (Fig. 1) and three of the past five years show rainfall below the long-term average (Fig. 2). Monthly rainfall data show January, March, May and June recording above-average monthly rainfall, with the remaining months below their long-term average at a median reduction of 26 mm/month.

Water use

Licensed groundwater extractions are primarily used for the irrigation of vineyards and in 2015–16, extractions totalled 2215 ML¹. This is a 40% increase from the previous water-use year of 1583 ML and 27% greater than the five-year average annual extraction of 1740 ML (Fig. 3). The FRA is the main source of groundwater in the Barossa PWRA, accounting 59% of the total volume extracted. This increase in groundwater extraction for the 2015–16 water-use year is most likely due to below-average rainfall recorded in the summer months of December and February.

Groundwater levels

In the five years to 2016, most monitoring wells (85%) show a declining trend in groundwater levels. In 2016, 41% of these wells show their lowest levels on record (Fig. 4). The rate of decline in groundwater levels ranges between 0.06 and 2.61 m/y with a median of 0.35 m/y. The largest declines are mainly located in the north-eastern part of the PWRA around Angaston, with a cluster close to the eastern boundary of the PWRA. Fifteen percent of wells show a rising trend in groundwater levels with rates between 0.04 and 0.51 m/y and a median of 0.14 m/y. These wells are mainly located in the south-western half of the area around Rowland Flat and Lyndoch where rainfall is higher (Fig. 4).

Groundwater salinity

Long-term salinity trends in the FRA are highly variable due to the complex system of preferential flow paths that influence recharge and the movement of water through the aquifer. Due to the limited salinity data available for the fractured rock aquifer in recent years, salinity has not been used when assessing the status of the resource in this report.

¹ The licenced groundwater use for the 2015–16 water-use year is based on the best data available as of February 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 FRA 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 a detailed explanation of the new method of status assessment.

To view descriptions for all status symbols, please visit the *Water Resource Assessments* page on [WaterConnect](#).

To view the *Barossa 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 Barossa PWRA, please visit [Groundwater Data](#) on WaterConnect.

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

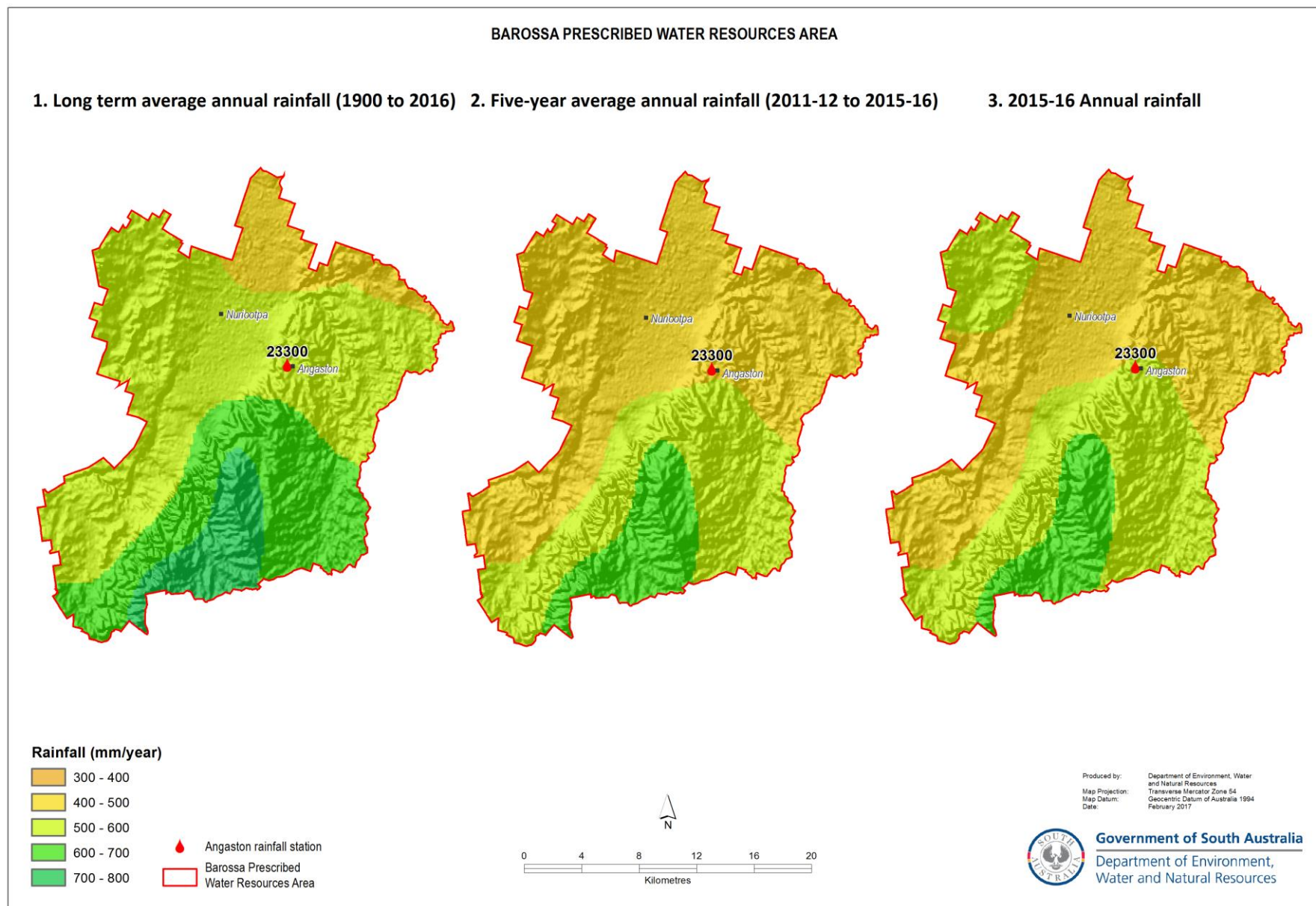


Figure 1. (1) Long-term and (2) five-year average annual rainfall, and (3) annual rainfall for the 2015–16 water-use year in the Barossa PWRA²

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.

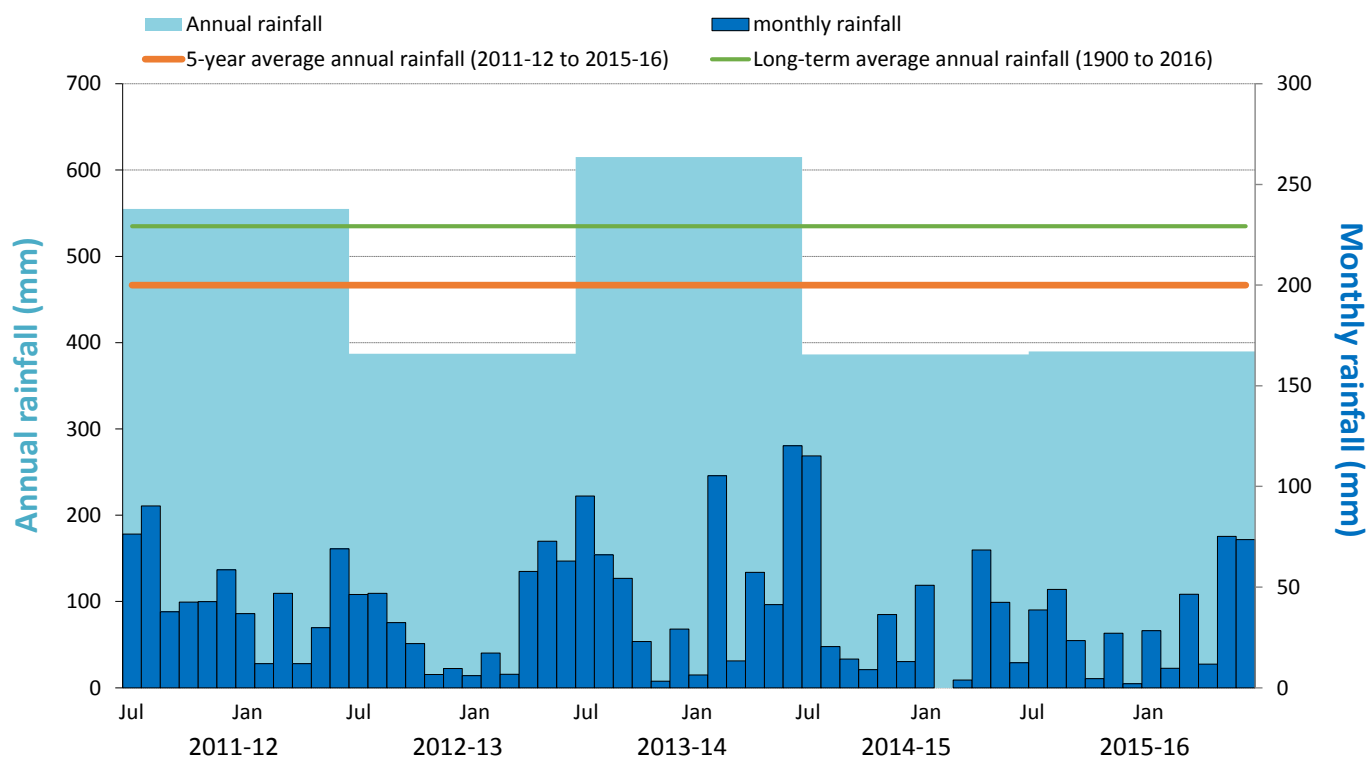


Figure 2. Annual (July–June) and monthly rainfall for the past five water-use years, and the five-year and long-term average annual rainfall recorded at Angaston (BoM Station 23300)³

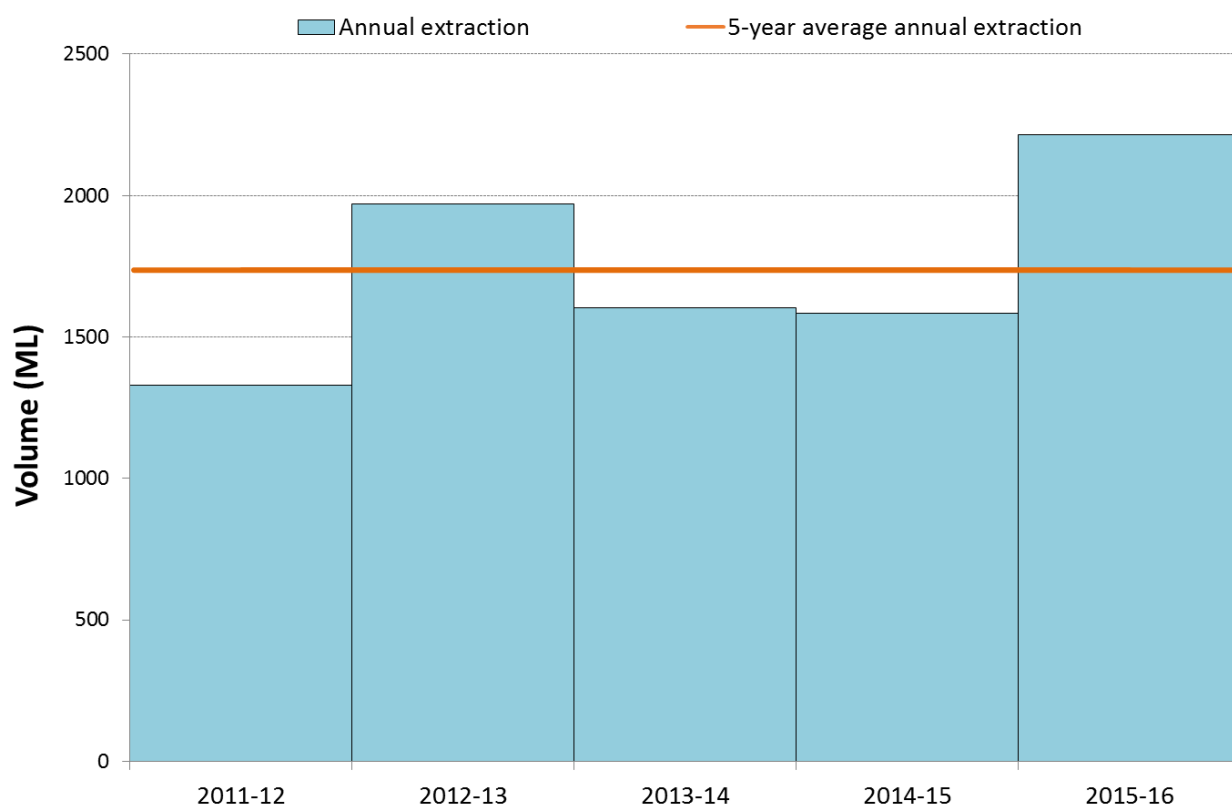


Figure 3. Licensed groundwater extraction volumes⁴ for the past five water-use years, from the fractured rock aquifer

³ 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

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

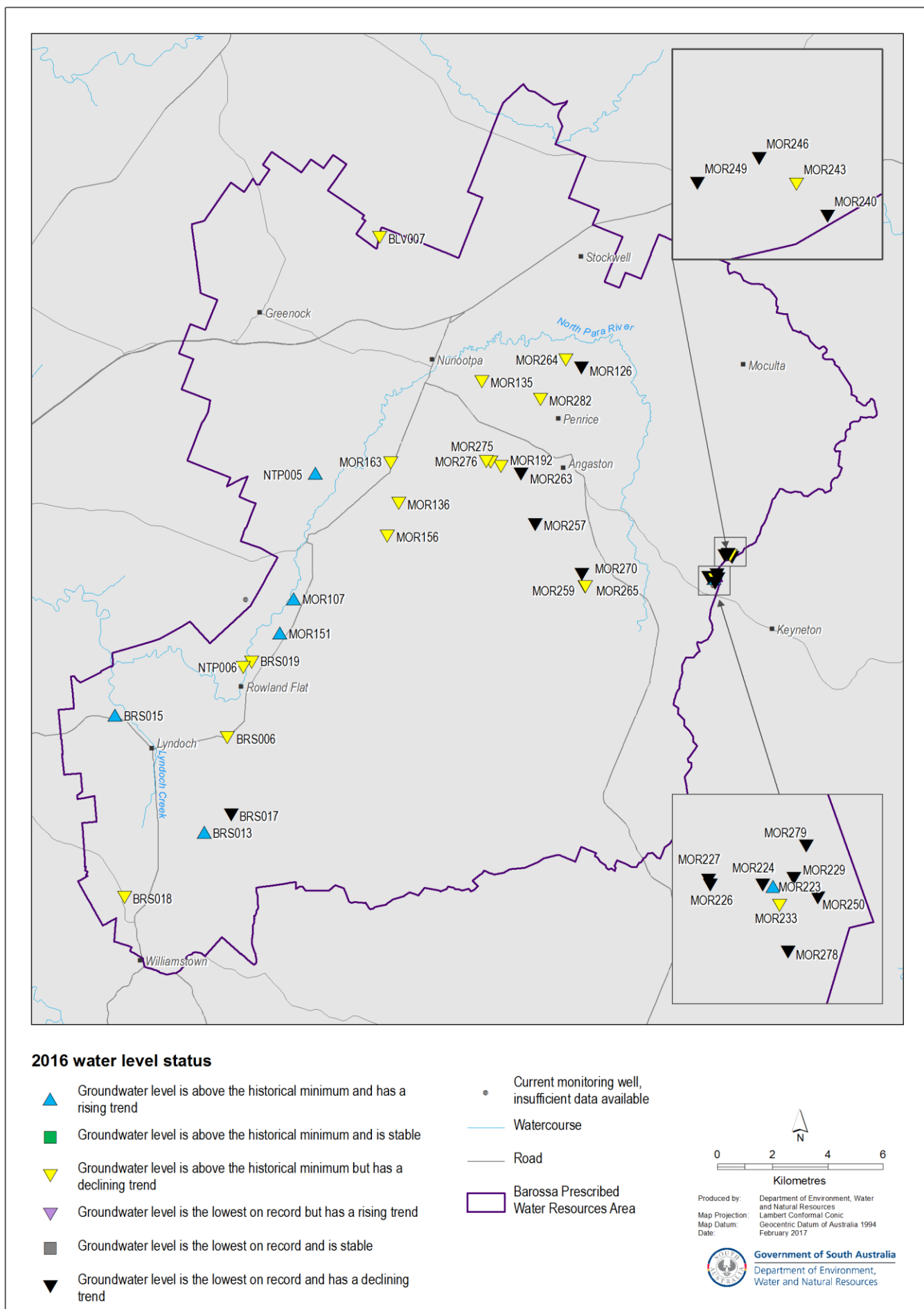


Figure 4. 2016 status of groundwater levels in the fractured rock aquifer (Barossa PWRA), based on five-year trends from 2012 to 2016



**Government
of South Australia**

Department of Environment,
Water and Natural Resources

Front Cover © Graham Green, Principal Hydrogeologist, DEWNR

2017 © Department of Environment, Water and Natural Resources

Published 2017 | FIS 94502

www.environment.sa.gov.au