

Barossa PWRA Fractured Rock Aquifer

2017 Groundwater level and salinity status report



Government
of South Australia

Department for
Environment and Water

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2017 Status summary

Barossa PWRA

Fractured Rock Aquifer



The Fractured Rock Aquifer (FRA) of the Barossa Prescribed Water Resources Area (PWRA) has been assigned a **yellow** status for 2017 because minor adverse trends have been observed over the past five years.

The status is based on five-year trends: over the period 2013–17, 58% of wells show declining groundwater levels.

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 | Tanunda Bureau of Meteorology (BoM) rainfall station 23318, located in the central-west of the Barossa PWRA |
| Annual total ¹ | 650 mm 130 mm (25%) greater than the five-year average of 520 mm 102 mm (19%) greater than the long-term average of 548 mm |
| Monthly summary | Well-above average rainfall recorded in September, December, January and February Well-below average rainfall recorded in March, May and June |
| Spatial distribution | Rainfall in 2016–17 was well above average across the entire PWRA |

Water use

See Figure 3

| | |
|-----------------------------------|------------------------------------------------------------------------|
| Total allocated volume: 2016–17 | 7867 ML across all aquifers (Upper, Lower and Fractured Rock) |
| Licensed groundwater extractions* | 1286 ML ² from Fractured Rock (16% of total allocations) |
| Extraction volume comparison | 42% less than the previous year 26% 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 level

See Figure 4

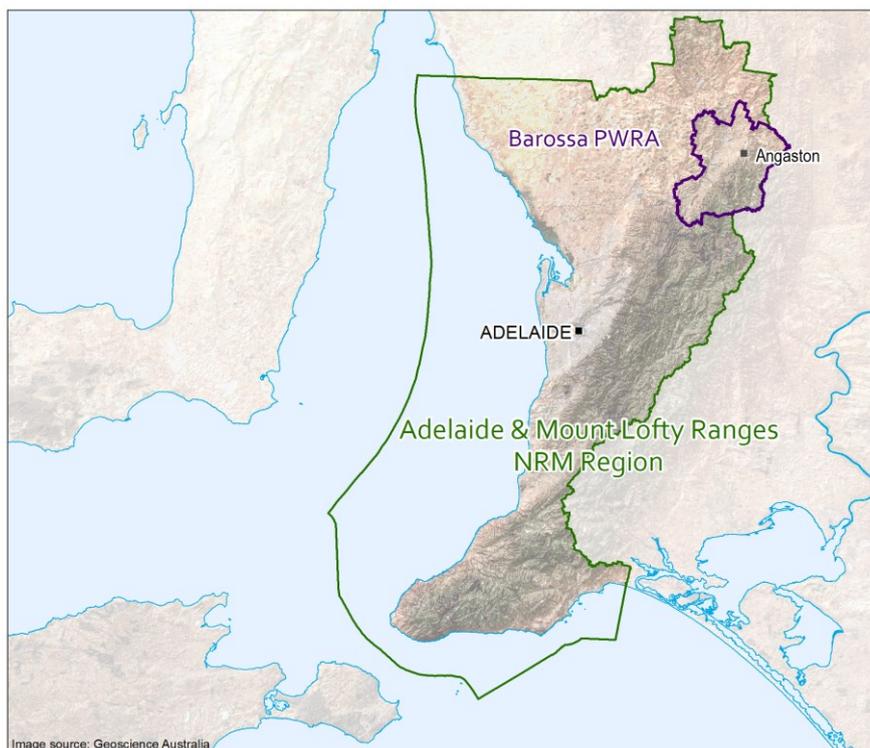
| | |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Five year trend: 2013–17 | 21 out of 36 wells (58%) show declining trends, at rates of 0.04–1.29 m/y (median of 0.18 m/y); one of these shows its lowest level on record 15 wells (42%) show rising trends, at rates of 0.02–0.99 m/y (median of 0.3 m/y) |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Groundwater salinity

| | |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2017 salinity | Data not available |
| Citizen science | Since 2018, irrigators in the Barossa PWRA have submitted salinity samples and once validated, these will augment the existing DEW monitoring network ³ |

³ The salinity data collected from irrigation wells can be viewed at [Groundwater Data](#) or via [WaterConnect](#)

Regional setting



The Barossa 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. It 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 (WAP) 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 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 salinities in the FRA of the Barossa PWRA are primarily climate driven: below-average rainfall results in reduced recharge to the aquifer. Below-average summer rainfall can also result in increased irrigation extractions, and both elements can cause the groundwater levels to decline and salinities to increase. Conversely, increases in rainfall may result in increased recharge, decreases in irrigation extractions and groundwater levels may rise and salinities may stabilise or decrease.

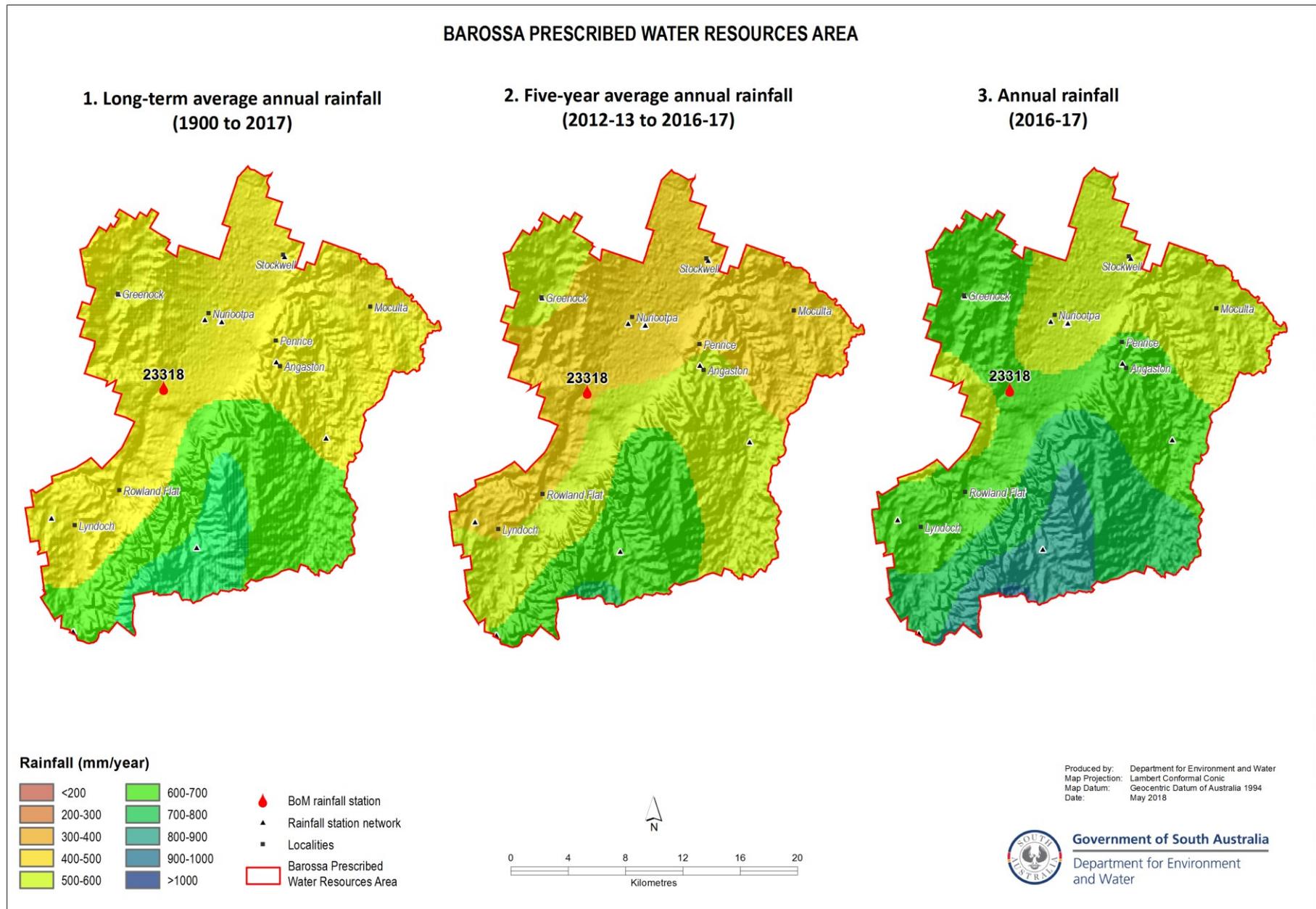


Figure 1. Spatial distribution of (1) Long-term and (2) five-year average annual rainfall, and (3) annual rainfall⁴

⁴ 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](#)

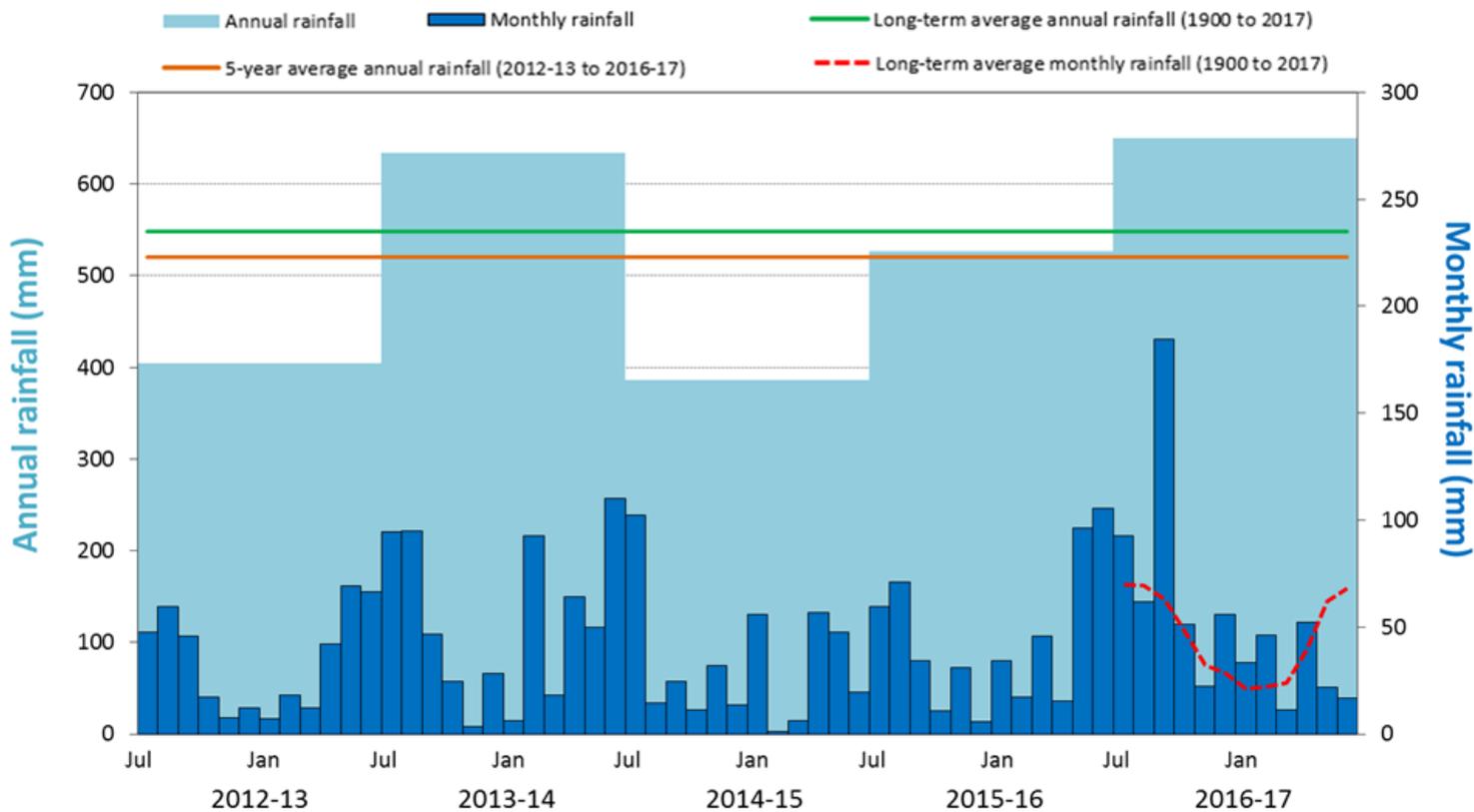


Figure 2. Annual and monthly rainfall for the past five water-use years recorded at Tanunda (BoM Station 23318)⁵

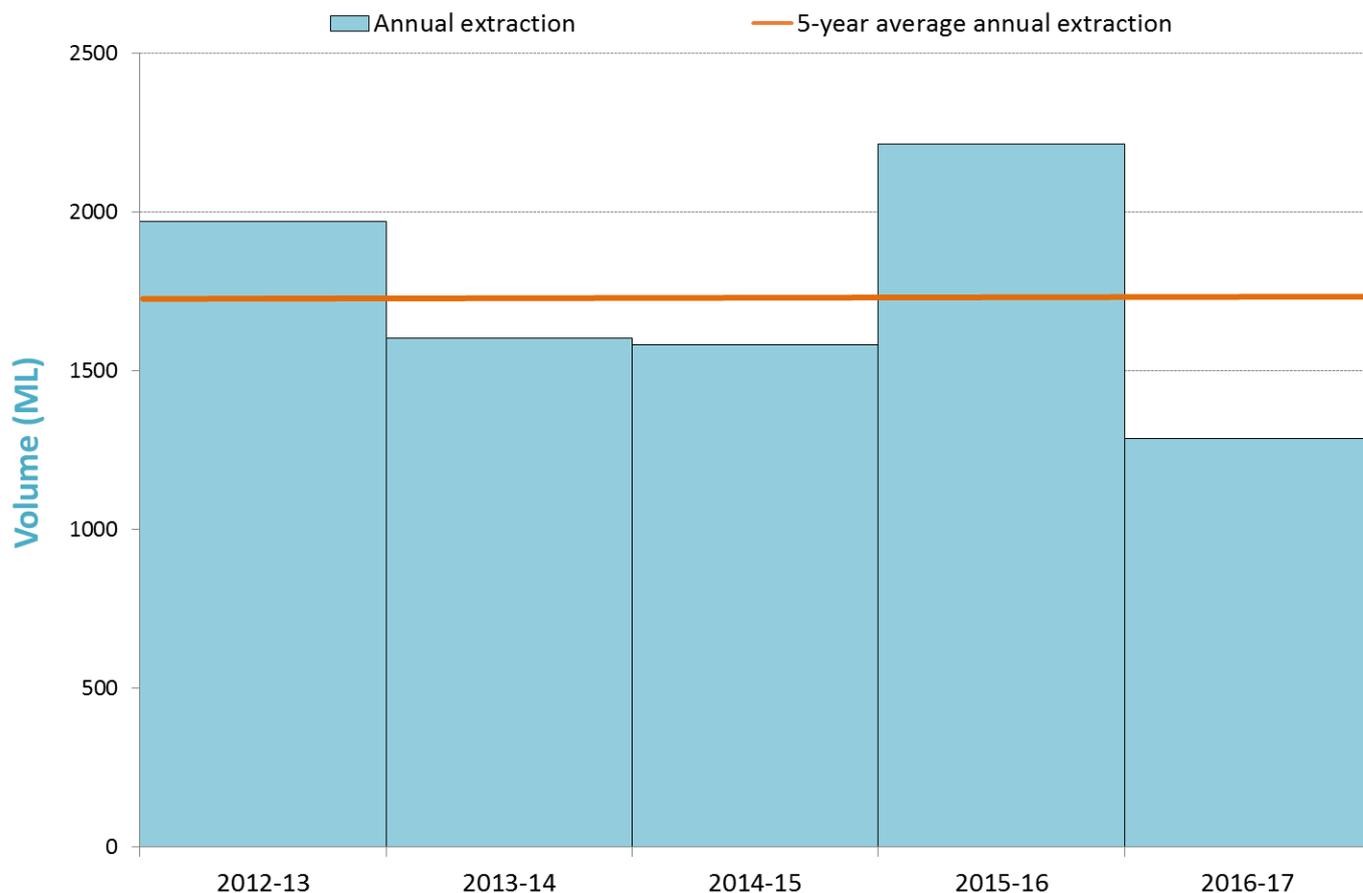
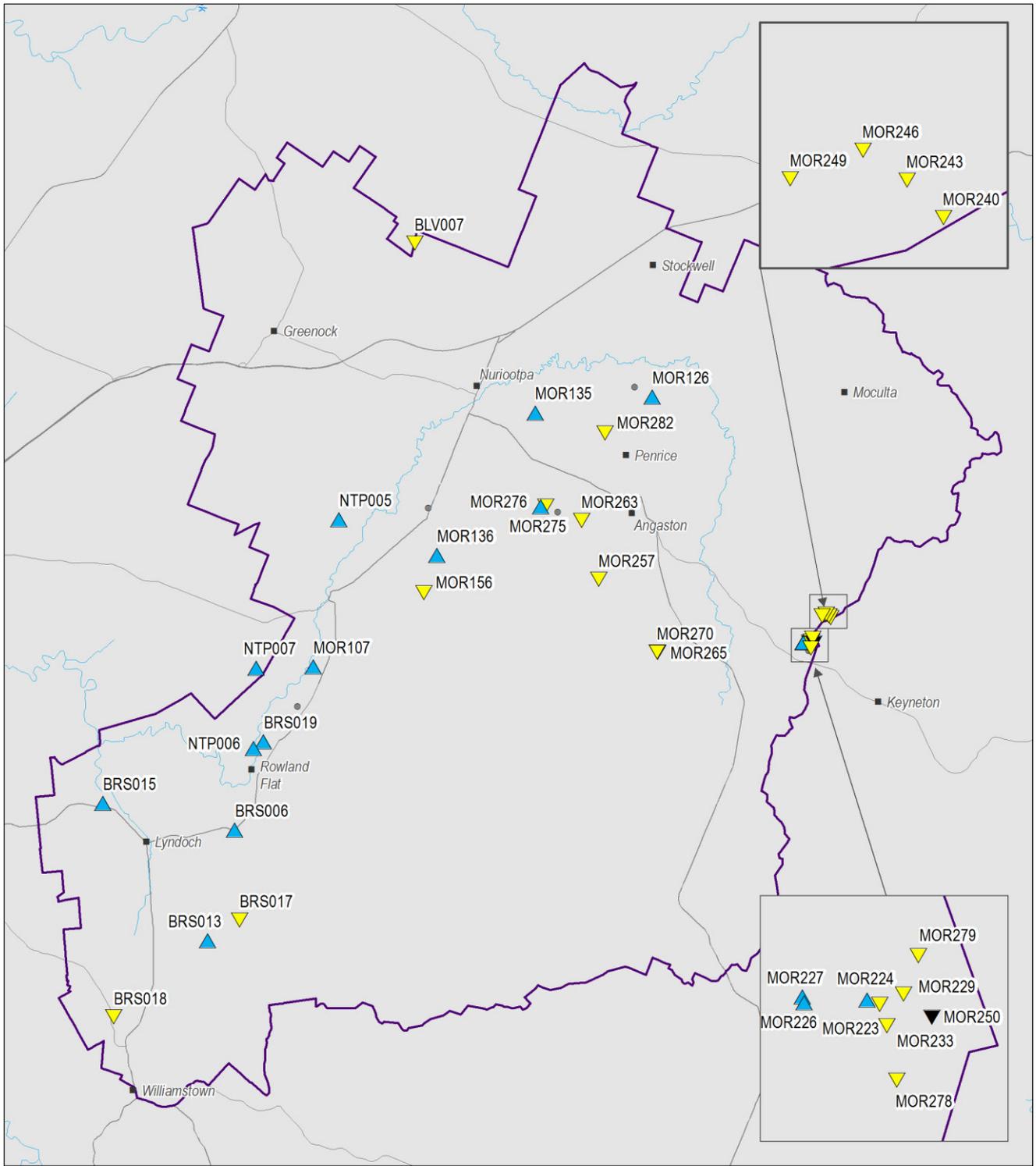


Figure 3. Licensed groundwater extraction volumes⁶ for the past five water-use years

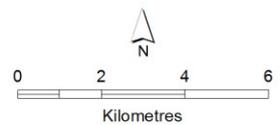
⁵ Data source: SILO Patched Point Dataset, available <https://silo.longpaddock.qld.gov.au/> – see [More information](#)

⁶ Total licensed extractions are subject to change as extraction data have not yet been verified in full – see [More information](#)



2017 water level status

- ▲ Groundwater level is above the historical minimum and has a rising trend
- Groundwater level is above the historical minimum and is stable
- ▼ Groundwater level is above the historical minimum but has a declining trend
- ▲ Groundwater level is the lowest on record but has a rising trend
- Groundwater level is the lowest on record and is stable
- ▼ Groundwater level is the lowest on record and has a declining trend
- Current monitoring well, insufficient data available
- Localities
- Watercourse
- Road
- ▭ Barossa Prescribed Water Resources Area



Produced by: Department for Environment and Water
 Map Projection: Lambert Conformal Conic
 Map Datum: Geocentric Datum of Australia 1994
 Date: February 2018



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Figure 4. Five-year trends (2013–17) in groundwater pressure levels: Fractured Rock Aquifer

More information

To determine the status of the FRA 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 *Barossa PWRA 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 Barossa PWRA, please visit the *Groundwater Data* page under the Data Systems tab 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](#).

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 |



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