

Barossa Prescribed Water Resources Area Upper Aquifer

2018 Groundwater level and salinity status
report



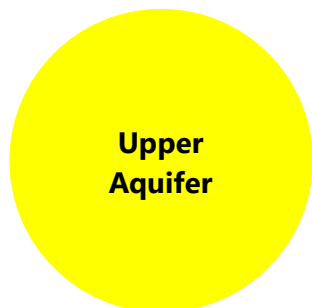
**Government
of South Australia**

Department for
Environment and Water

2018 Status summary

Barossa PWRA

Upper Aquifer



The Upper Aquifer of the Barossa Prescribed Water Resources Area (PWRA) 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, 57% of wells show declining groundwater levels.

The status is based on five-year trends. To view the *Barossa PWRA groundwater level and salinity status report 2011*, 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 Barossa PWRA, 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	Tanunda Bureau of Meteorology (BoM) rainfall station, number 23318, is located near the township of Tanunda which is in the western part of the Barossa PWRA.
Annual total ¹	475 mm 62 mm (12%) less than the five-year average of 537 mm 70 mm (13%) less than the long-term (1900-2018) average of 545 mm

Groundwater extraction

See Figure 3

Allocated volume ^{1,2}	7862 ML across all aquifers (Upper, Lower and fractured rock)
Licensed groundwater extractions ^{1,3}	350 ML from the Upper Aquifer
Extraction volume comparison ⁴	109 ML (45%) greater than the previous year 3 ML (1%) less 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 extractions are subject to change as extraction data have not yet been verified in full – see [More information](#)

⁴ Extraction volumes for Upper Aquifer only

Groundwater level

See Figure 4

Five year trend: 2014–18	16 out of 28 wells (57%) show declining trends, at rates of 0.02–0.31 m/y (median of 0.06 m/y); 2 of these wells show their lowest level on record
	4 wells (14%) are stable
	8 wells (29%) show rising trends, at rates of 0.02–0.14 m/y (median of 0.06 m/y)

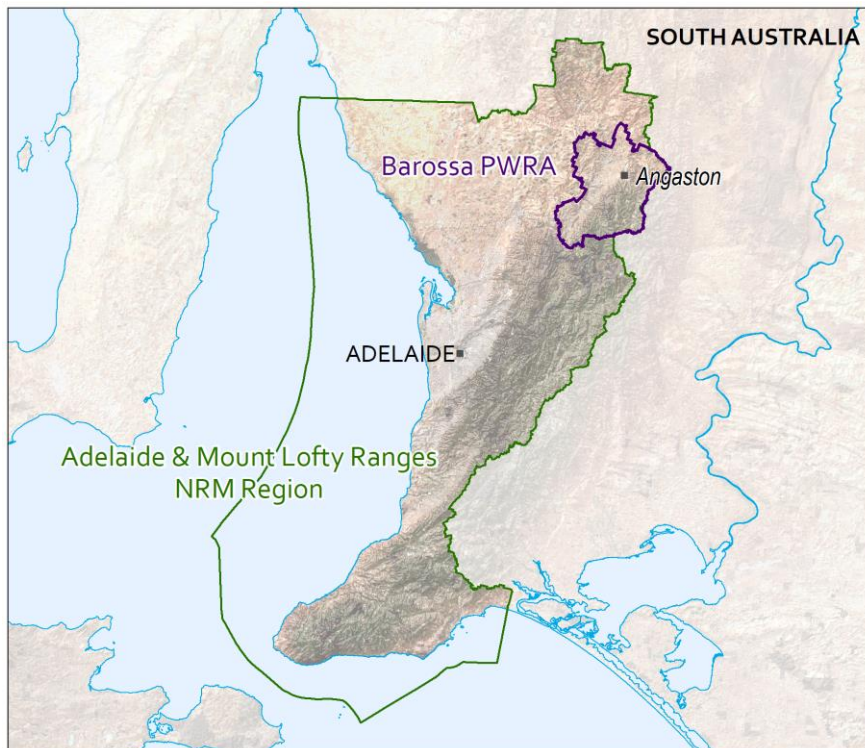
Groundwater salinity

See Figure 5

2018 salinity	878–2773 mg/L (23 wells; median of 1407 mg/L)
Citizen science	Since 2018, irrigators in the Barossa PWRA have submitted groundwater samples that DEW have tested for salinity concentration. Data that have been validated are augmenting the existing DEW monitoring network. ⁵

⁵ The salinity data collected from irrigation wells can be viewed at [WaterConnect](#)

Regional setting



The Barossa PWRA encompasses both the highland areas of the Mount Lofty Ranges 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* and a water allocation plan provides for their sustainable management.

The Barossa PWRA consists of three major groundwater systems: two sedimentary aquifers (Upper and Lower) and the fractured rock aquifers that underlie the sedimentary aquifers and crop out in the ranges to the east and west of the valley. The sedimentary Upper Aquifer of the Barossa PWRA is the focus of this report.

Groundwater flow within the Upper Aquifer is in a south-westerly direction in the northern part of the valley, and in a northerly direction near Lyndoch (Fig. 1). Recharge to the Upper Aquifer is from local rainfall, with contribution from streamflow in some areas.

Trends in groundwater levels and salinity in the Upper Aquifer of the Barossa PWRA are primarily climate-driven: below-average rainfall results in reduced recharge to the aquifers. Below-average summer rainfall can also result in increased irrigation extractions, and both elements 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. Seasonal responses to recharge are common, except where there is overlying Quaternary clay.

BAROSSA PRESCRIBED WATER RESOURCES AREA

**1. Long-term average annual rainfall
(1900 to 2018)**

**2. Five-year average annual rainfall
(2013-14 to 2017-18)**

**3. Annual rainfall
(2017-18)**

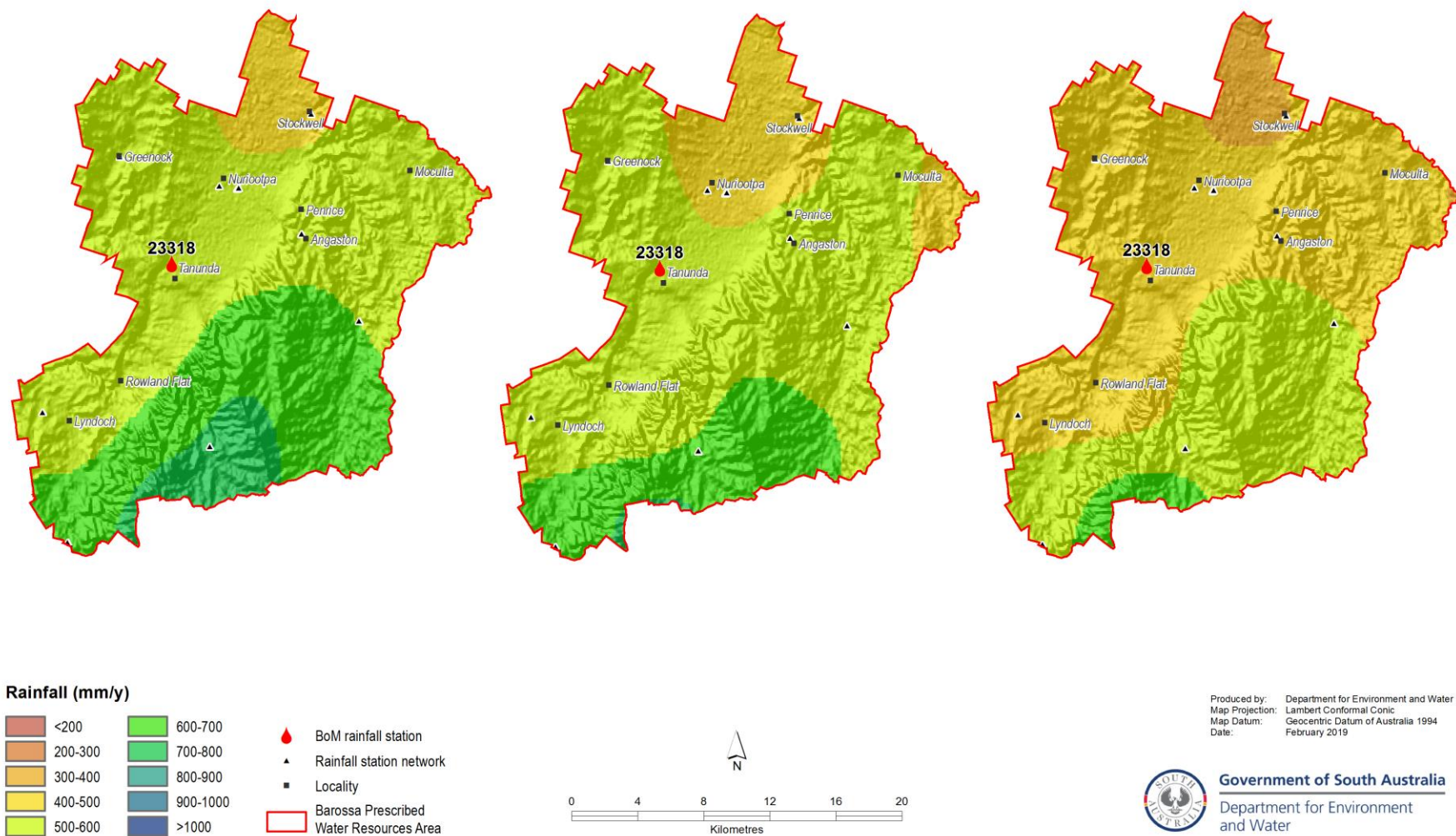


Figure 1. Spatial distribution of (1) long-term and (2) five-year average annual rainfall, and (3) annual rainfall⁶

⁶ Data sources: SILO interpolated point and gridded datasets available at <https://legacy.longpaddock.qld.gov.au/silo/> – see [More information](#)

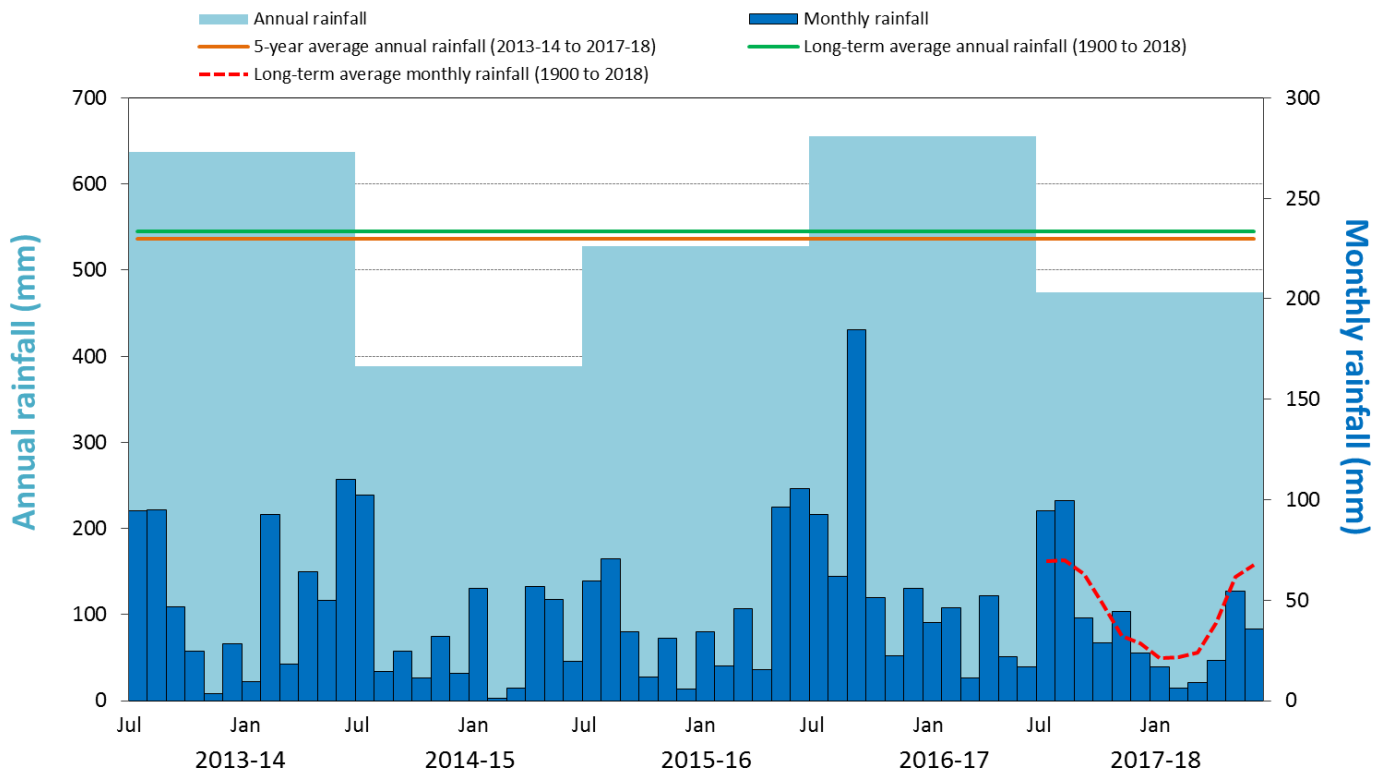


Figure 2. Annual and monthly rainfall for the past five water-use years recorded at Tanunda (BoM Station 23318)⁷

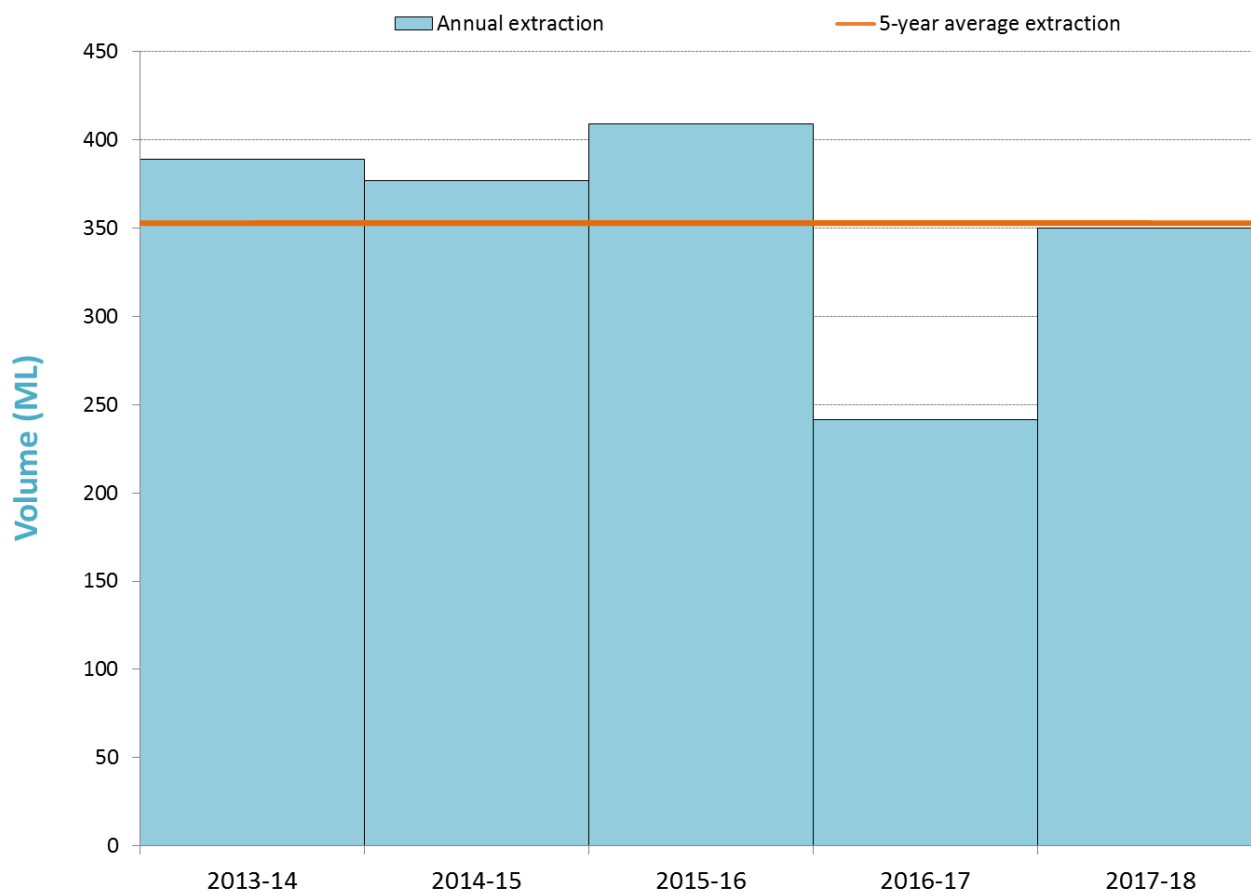
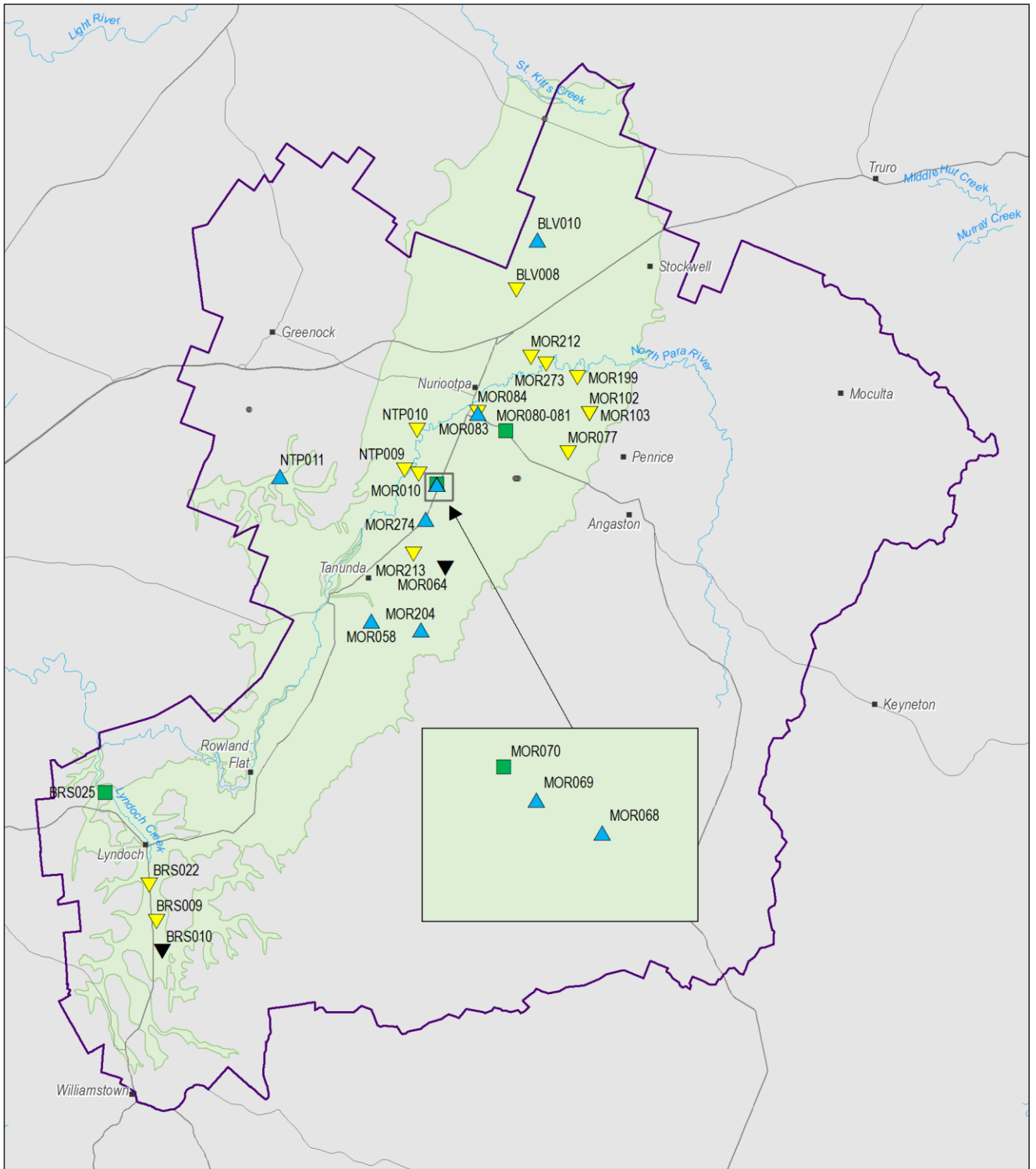


Figure 3. Licensed groundwater extraction volumes⁸ for the past five water-use years

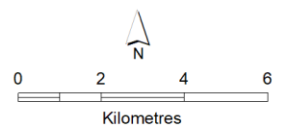
⁷ Data source: SILO Patched Point Dataset, available <https://legacy.longpaddock.qld.gov.au/silo/> – see [More information](#)

⁸ Total licensed extractions are subject to change as extraction data have not yet been verified in full – see [More information](#)



2018 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 well available
- Locality
- Watercourse
- Road
- Extent of Upper Aquifer
- Barossa Prescribed Water Resources Area

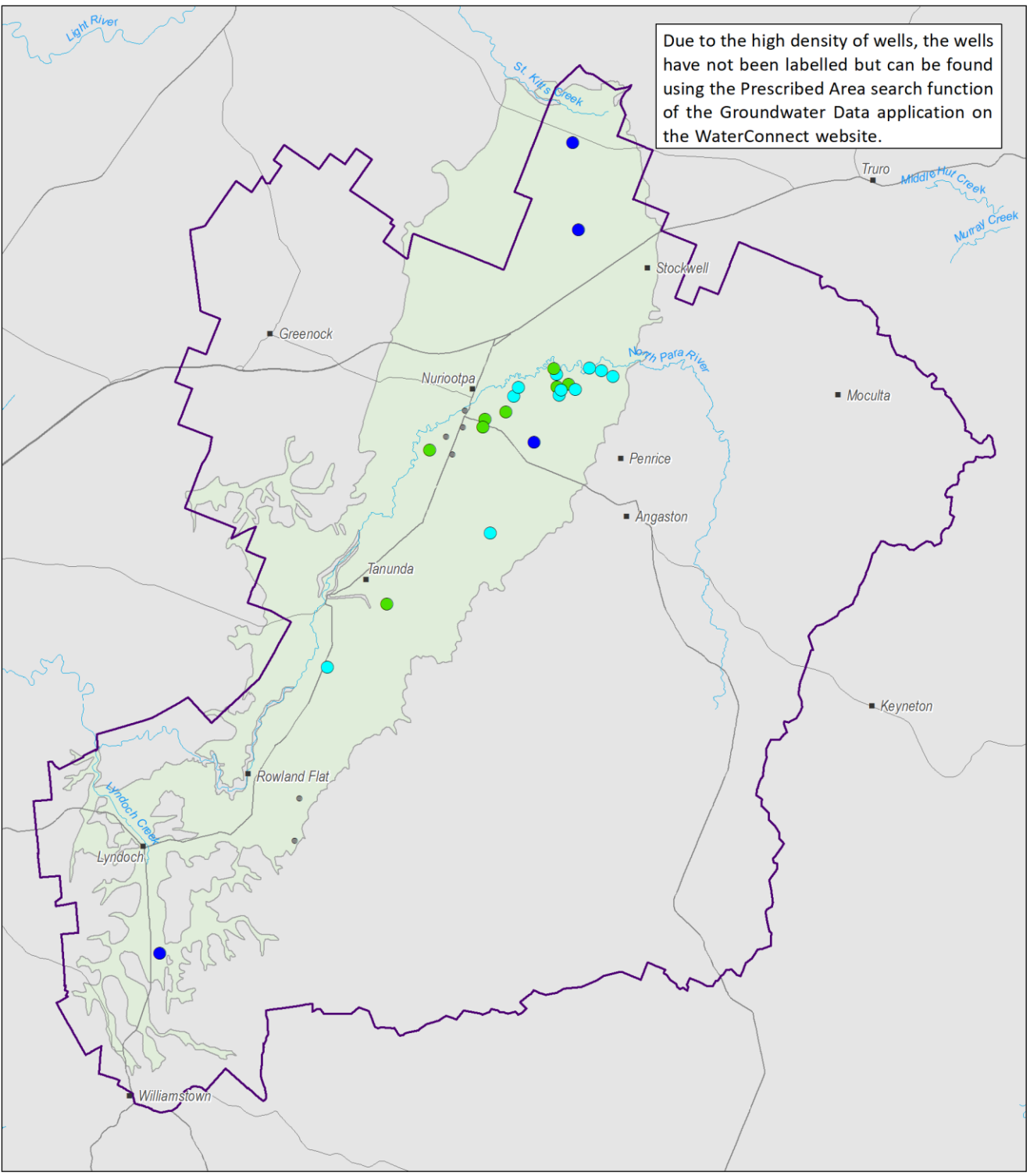


Produced by: Department for Environment and Water
 Map Projection: Lambert Conformal Conic
 Map Datum: Geocentric Datum of Australia 1994
 Date: March 2019

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Figure 4. Five-year trends (2014–18) in groundwater levels: Upper Aquifer

Due to the high density of wells, the wells have not been labelled but can be found using the Prescribed Area search function of the Groundwater Data application on the WaterConnect website.



2018 salinity (mg/L)

- < 1000
- 1000 - 1500
- 1500 - 3000
- 3000 - 5000
- 5000 - 8000
- > 8000

- Current monitoring well, insufficient data available
- Locality
- Watercourse
- Road
- Extent of Upper Aquifer
- Barossa Prescribed Water Resources Area

0 2 4 6
Kilometres

Produced by: Department for Environment and Water
 Map Projection: Lambert Conformal Conic
 Map Datum: Geocentric Datum of Australia 1994
 Date: February 2019

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Figure 5. 2018 groundwater salinities: Upper Aquifer

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More information

To determine the status of the Upper 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 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 *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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