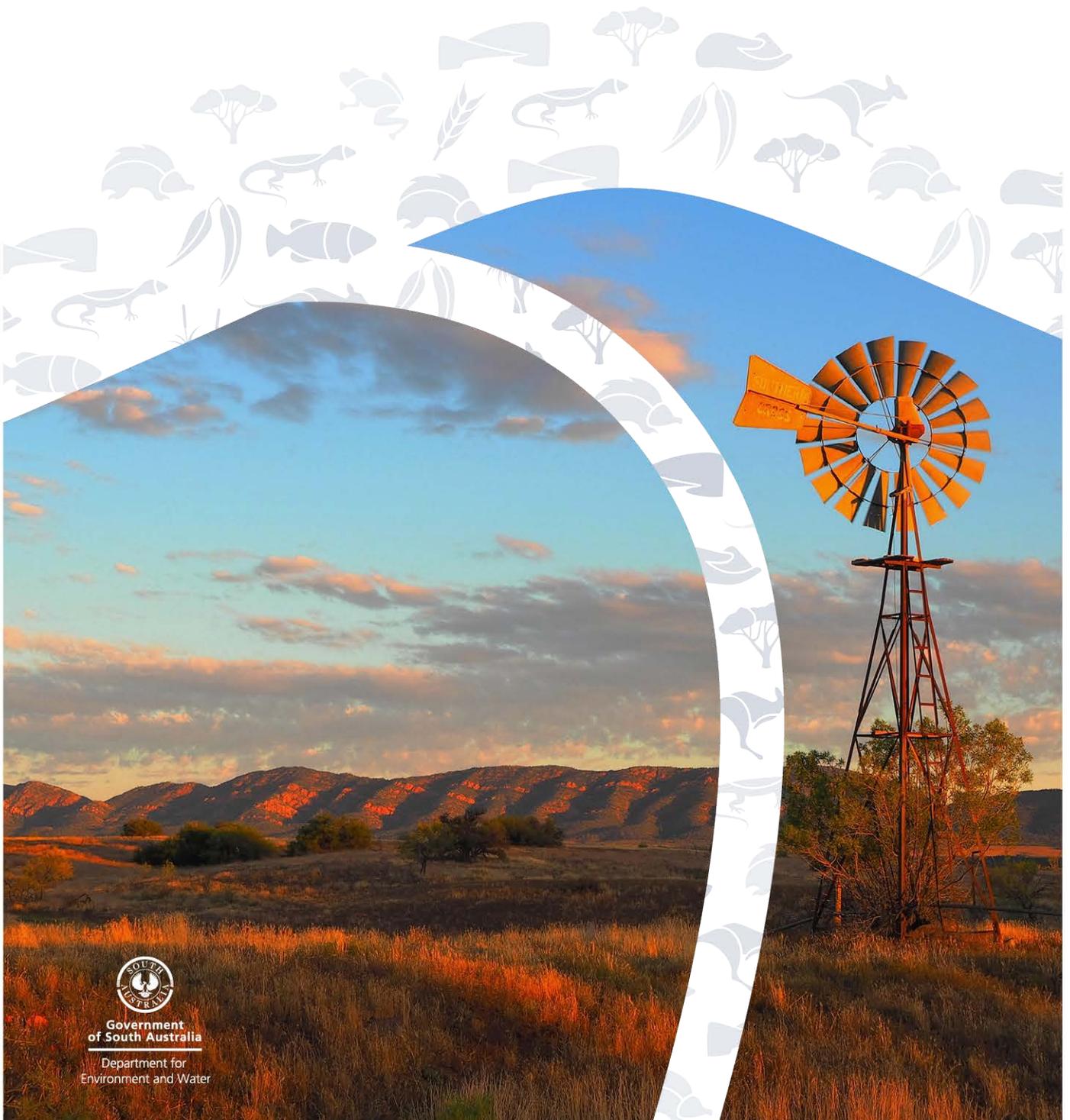


# Northern Adelaide Plains PWA T2 aquifer

**2017 Groundwater level and salinity status report**



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of South Australia

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Environment and Water

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# 2017 Status summary

## Northern Adelaide Plains PWA

### T2 aquifer



The T2 aquifer of the Northern Adelaide Plains (NAP) 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, 100% of wells show rising groundwater pressure levels and 86% show 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	Smithfield Bureau of Meteorology (BoM) rainfall station 23025 was selected as a representative for the PWA
Annual total <sup>1</sup>	571 mm 134 mm (31%) greater than the five-year average of 437 mm 95 mm (20%) greater than the long-term average of 476 mm
Monthly summary	Well-above average rainfall recorded in July, September, December and January Well-below average rainfall recorded in March, May and June
Spatial distribution	Rainfall in 2016–17 was above average across the entire PWA

#### Water use

See Figure 3

Total allocated volume: 2016–17	18 000 ML
Licensed groundwater extractions*	7226 ML <sup>2</sup> (40% of total allocation)
Extraction volume comparison	24% less than the previous year 17% less than the five-year average

\*Stock and domestic use is not included in licensed extractions

<sup>1</sup> For the water-use year 1 July 2016 to 30 June 2017

<sup>2</sup> Total licensed extractions are subject to change as extraction data have not yet been verified in full – see [More information](#)

## Groundwater pressure level

See Figures 4 and 5

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Five-year trend: 2013–17	All 32 wells (100%) show rising trends, at rates of 0.04–2.68 m/y (median of 0.70 m/y)
Potentiometric surfaces: March 2017	Extractions from the T2 aquifer have created a long-standing cone of depression centred on Virginia, where intensive irrigation occurs

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## Groundwater salinity

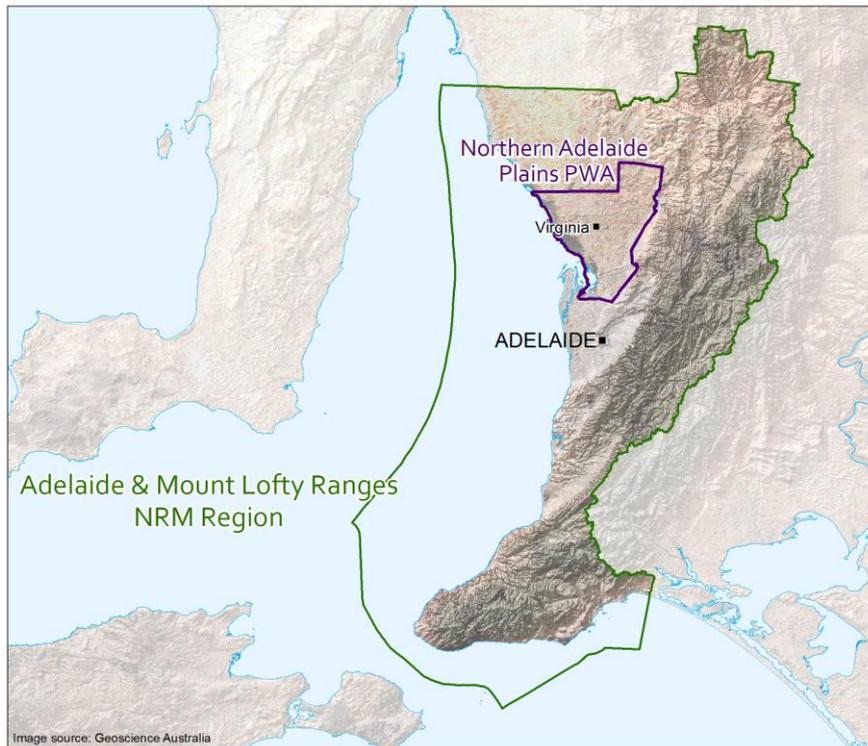
See Figures 6 and 7

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2017 salinity	581–3511 mg/L 148 out of 188 wells (79%) show salinities less than 1500 mg/L
Five-year trend: 2013–17	63 out of 73 wells (86%) are stable 10 wells (14%) show increasing trends, at rates of 17–99 mg/L/y (median of 33 mg/L/y)

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# Regional setting

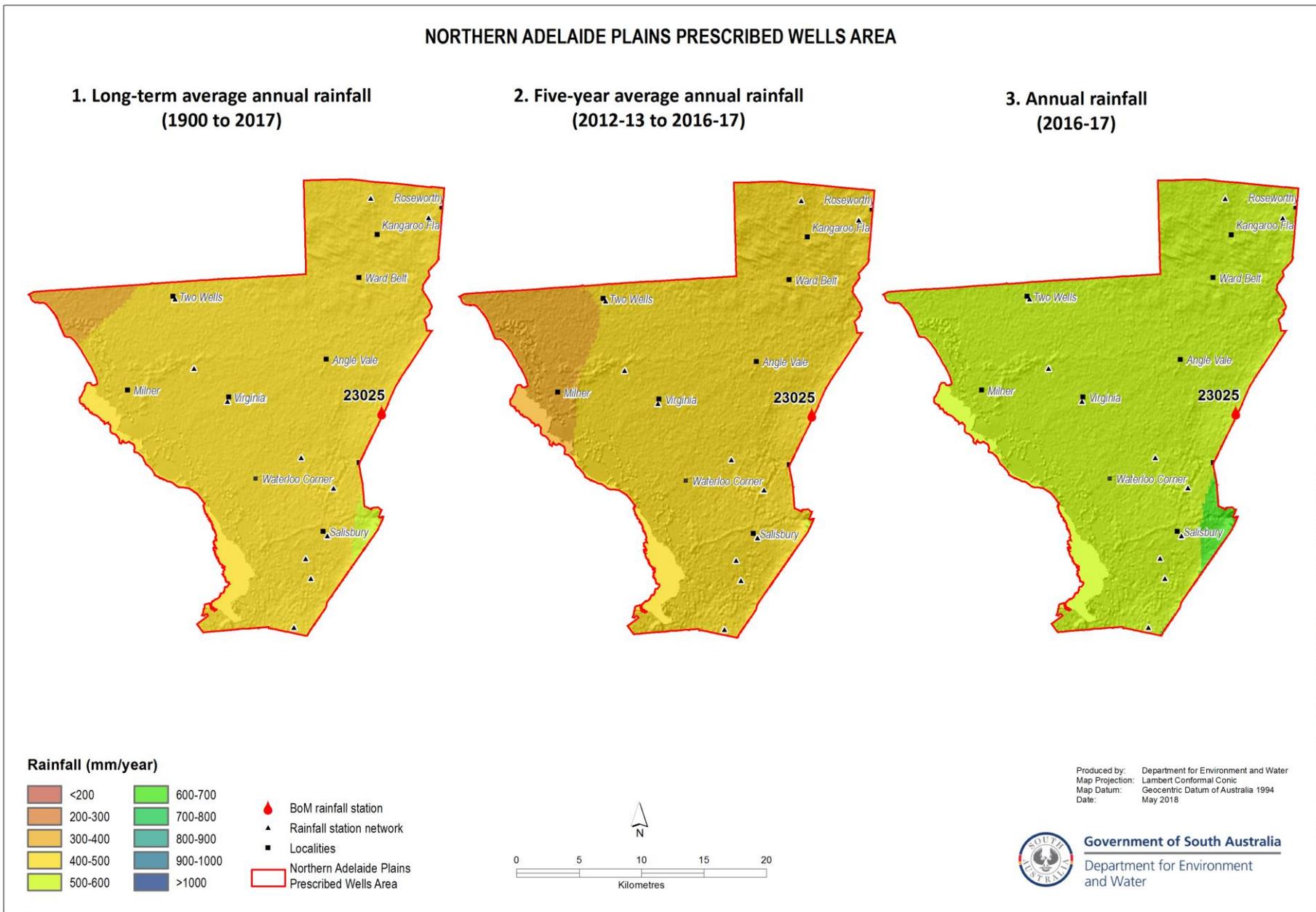


The NAP PWA is located immediately north of the Adelaide metropolitan area, in the Adelaide and Mount Lofty Ranges Natural Resource Management Region. It is prescribed under South Australia's *Natural Resources Management Act 2004*, and a water allocation plan (WAP) provides for the sustainable use of the groundwater resources.

Within the NAP PWA, the T1 and T2 aquifers are the shallowest Tertiary aquifers and the main source of groundwater, which is used mostly by the horticulture industry. The deeper T2 aquifer, which is separated from the T1 aquifer by the Munno Para Clay aquitard (i.e. confining layer), is the focus of this report. It occurs extensively across the NAP PWA and consists of well-cemented limestones of the lower Port Willunga Formation.

The main source of recharge to the aquifer was previously thought to be lateral throughflow from the Mount Lofty Ranges, which lie to the east of the NAP PWA. However, recent research suggests that recharge to the aquifer primarily occurs from infiltration of surface water from streams that flow onto the plains from the ranges.

Although there is no direct recharge from incident rainfall to the confined T2 aquifer, there may be an indirect correlation between groundwater pressure levels and rainfall, as periods of below-average rainfall will likely result in increased rates of groundwater extraction, which may lead to declines in groundwater pressure levels. Conversely, groundwater pressure levels may rise after periods of above-average rainfall due to reduced rates of groundwater extraction.



**Figure 1. Spatial distribution of (1) Long-term and (2) five-year average annual rainfall, and (3) annual rainfall<sup>3</sup>**

<sup>3</sup> 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](#)

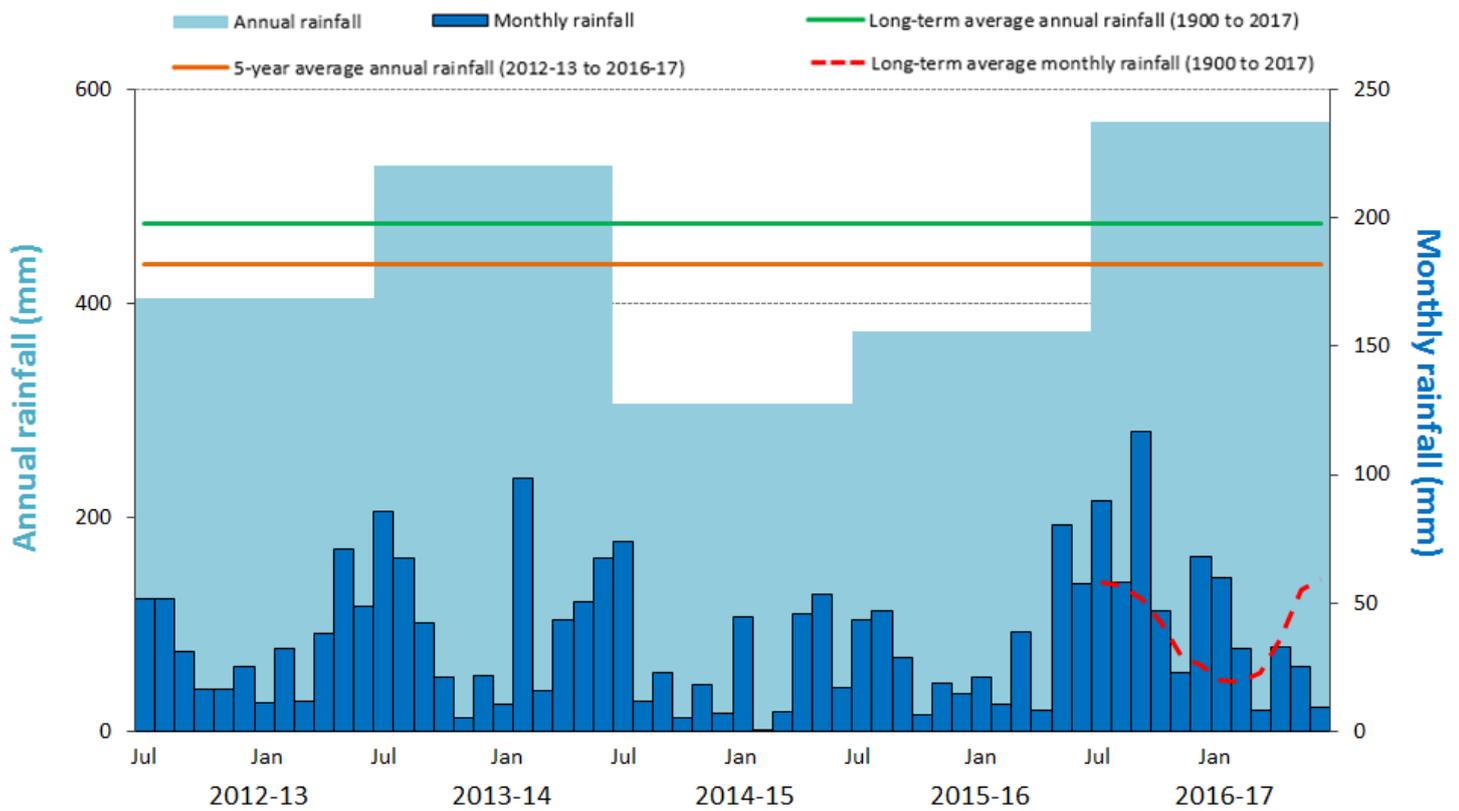


Figure 2. Annual and monthly rainfall for the past five water-use years recorded at Smithfield (BoM Station 23025)<sup>4</sup>

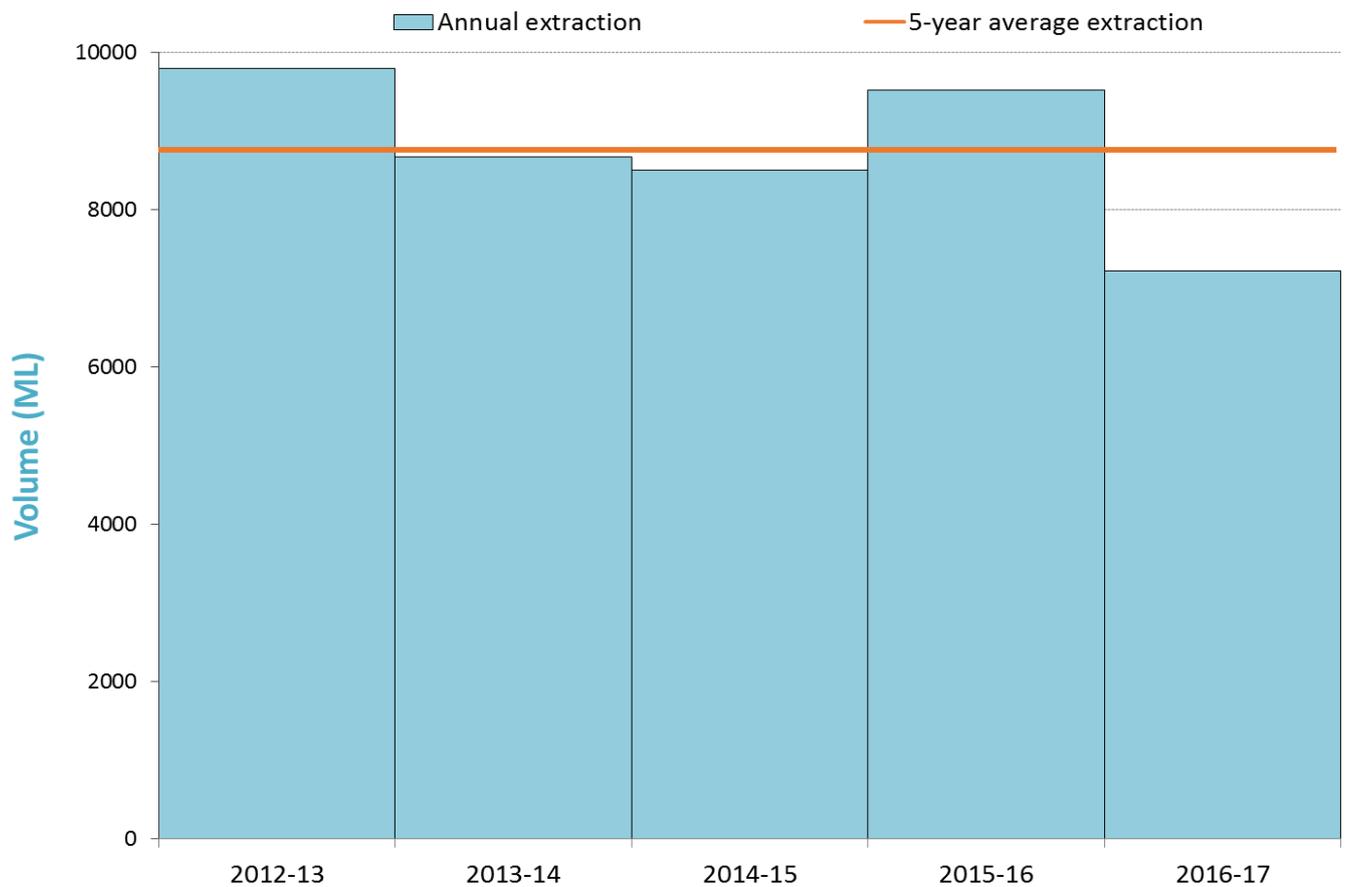
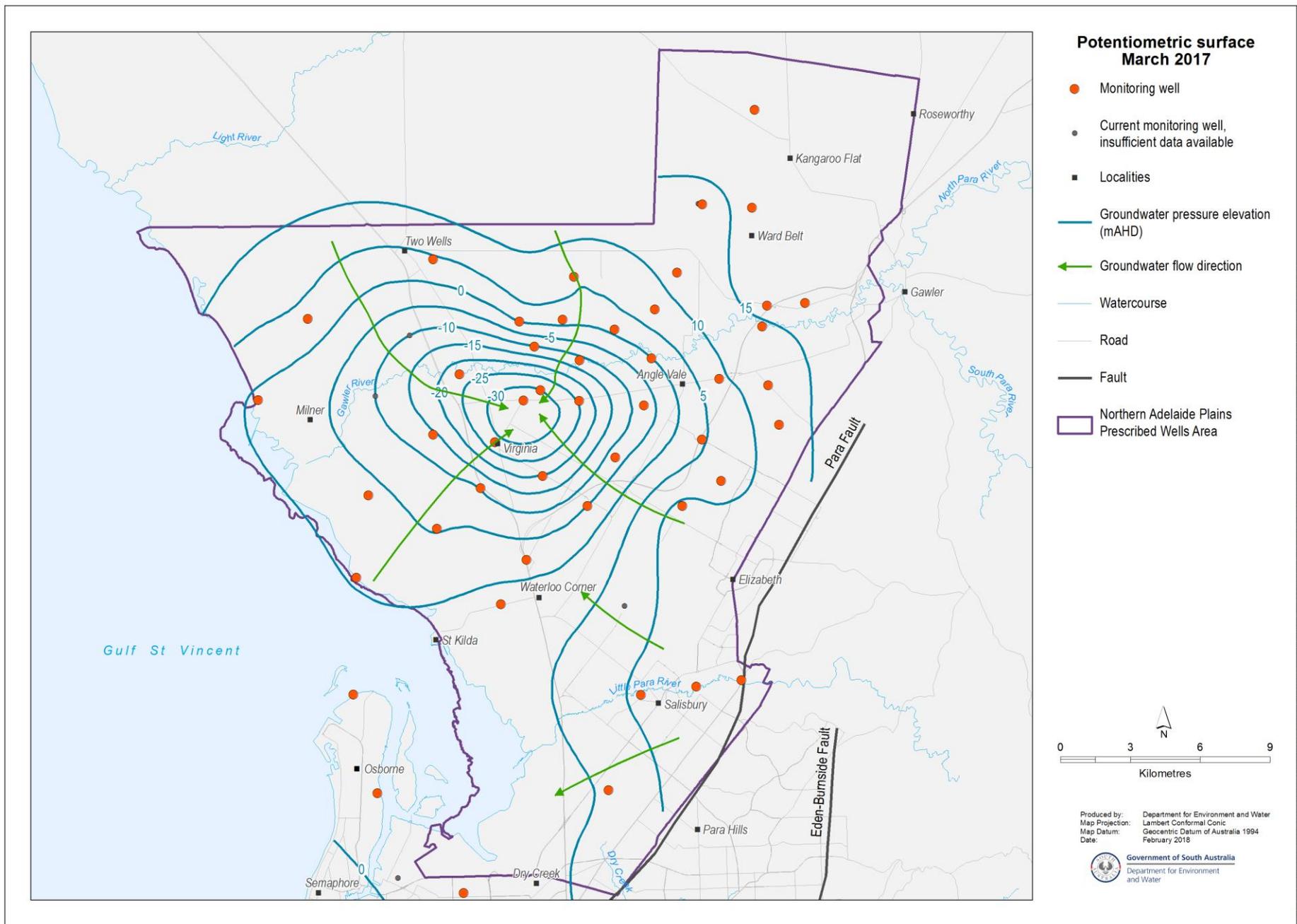


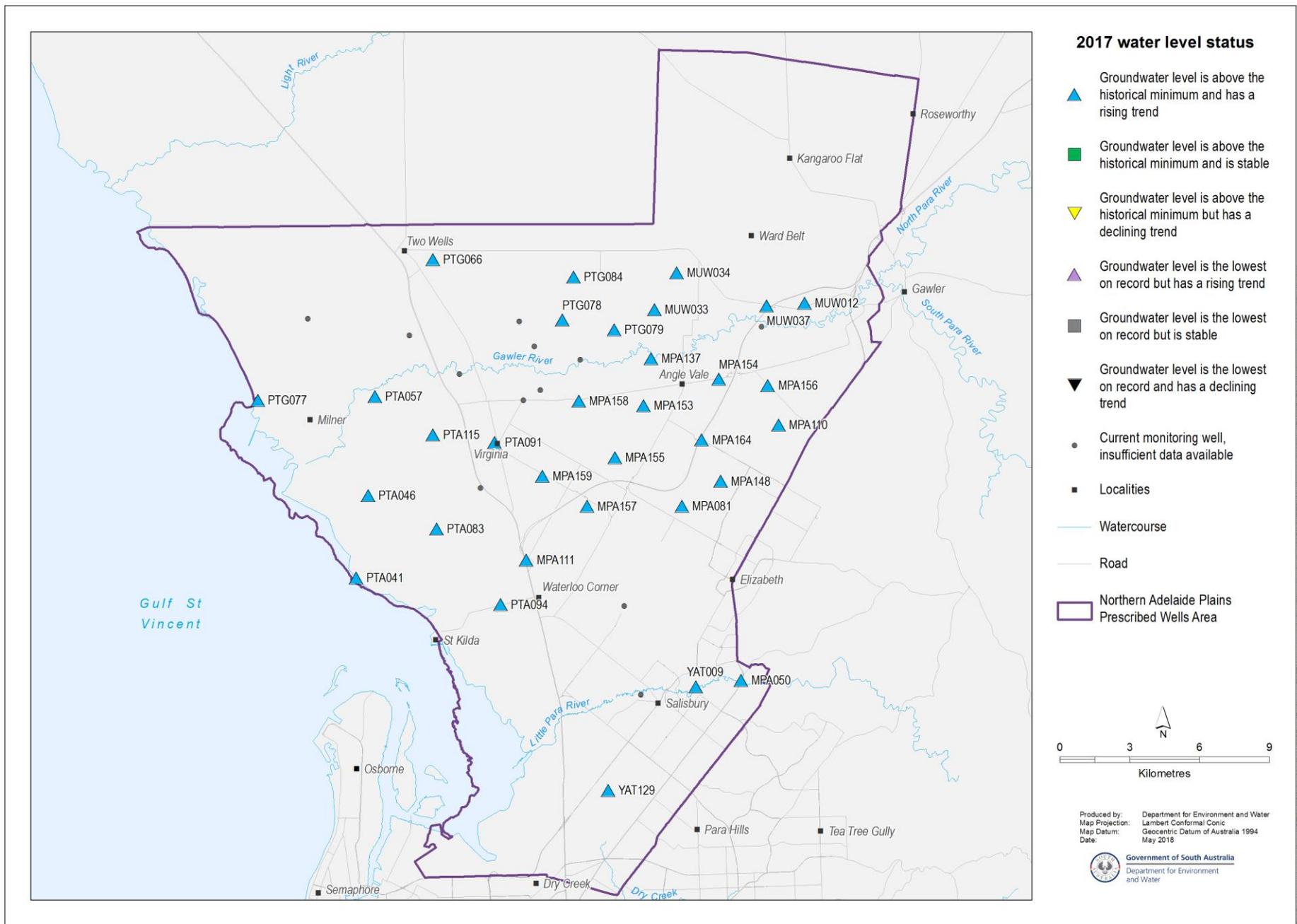
Figure 3. Licensed groundwater extraction volumes<sup>5</sup> for the past five water-use years

<sup>4</sup> Data source: SILO Patched Point Dataset, available <https://silo.longpaddock.qld.gov.au/> – see [More information](#)

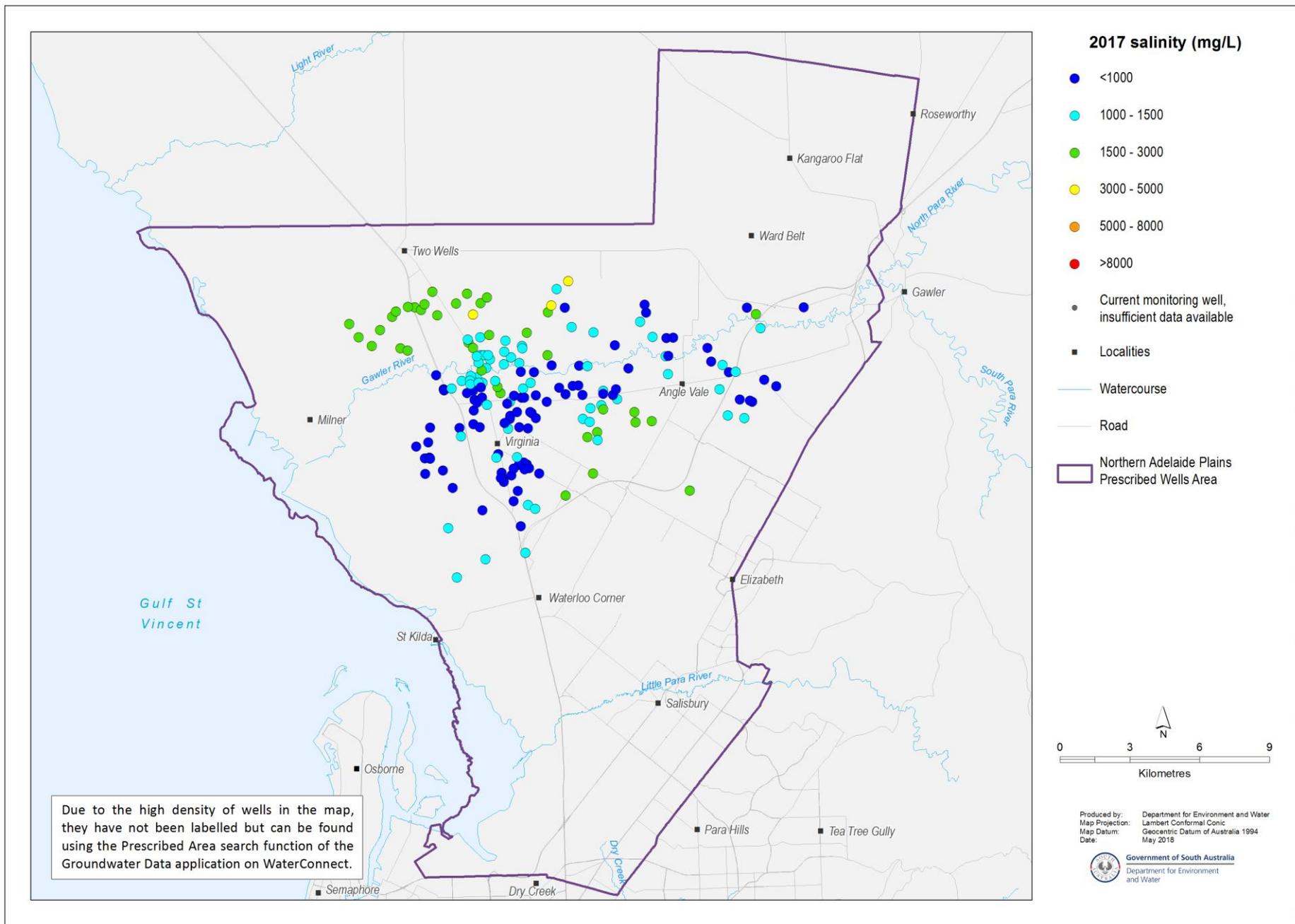
<sup>5</sup> Total licensed extractions are subject to change as extraction data have not yet been verified in full – see [More information](#)



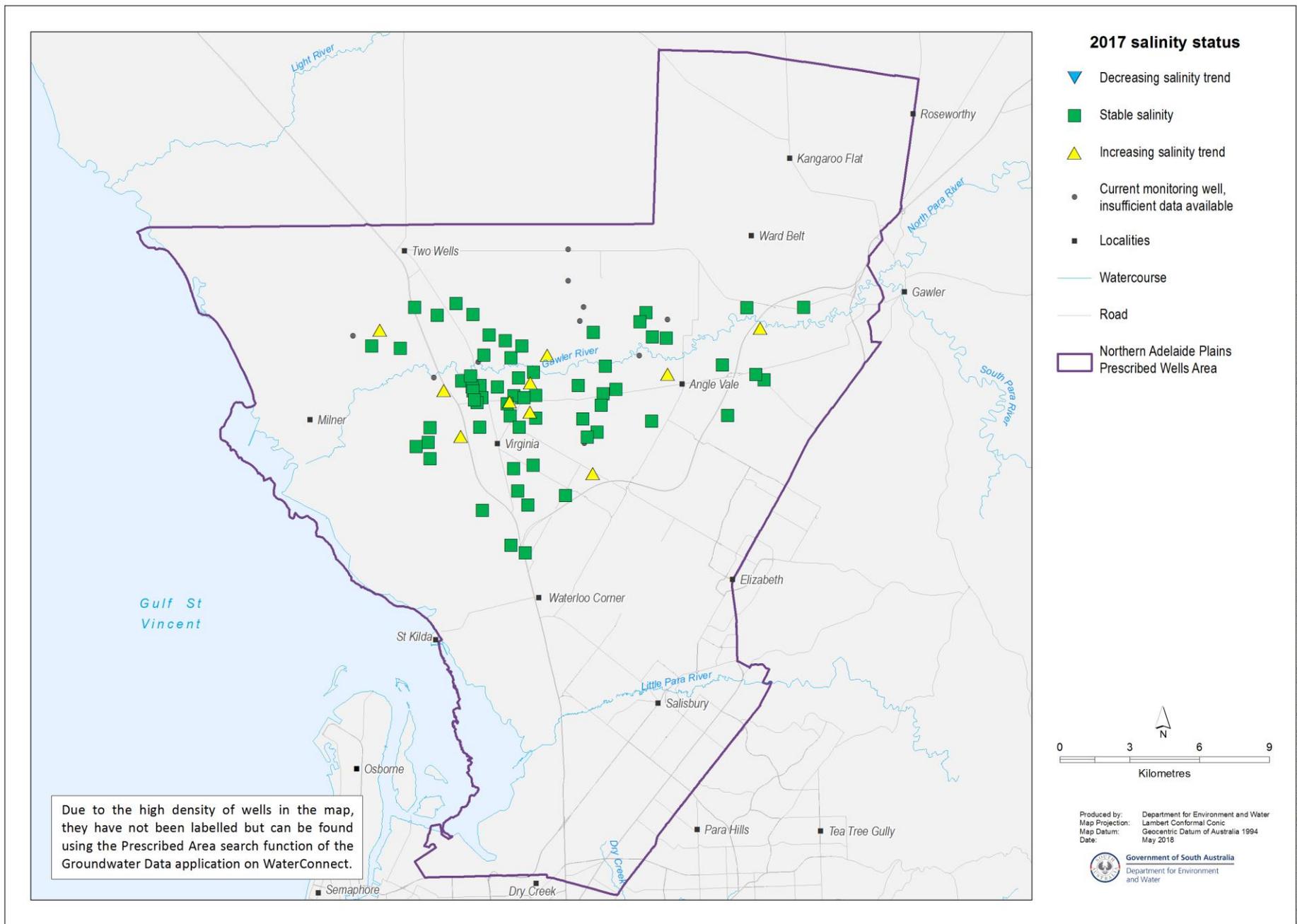
**Figure 4. Potentiometric surface and direction of groundwater flow: T2 aquifer**



**Figure 5. Five-year trends (2013–17) in groundwater levels: T2 aquifer**



**Figure 6. 2017 groundwater salinities: T2 aquifer**



**Figure 7. Five-year trends (2013–17) in groundwater salinities: T2 aquifer**

# More information

To determine the status of the T2 aquifer for 2017, the trends in groundwater pressure 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/](http://www.bom.gov.au/jsp/awap/)).

To view the *Northern Adelaide Plains 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 NAP PWA, please visit the *Groundwater Data* page under the *Data Systems* tab on [WaterConnect](#).

For further details about the NAP PWA, please see *Adelaide Plains Water Allocation Plan* on the Natural Resources Adelaide and Mt 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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