

Musgrave PWA

Polda

2017 Groundwater level and salinity status report



Government
of South Australia

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Environment and Water

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2017 Status summary

Musgrave PWA

Polda



The Polda lens of the Musgrave 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, 97% of wells show rising or stable groundwater levels and 78% of wells show decreasing or 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	The Lock (Terrah Winds) Bureau of Meteorology (BoM) rainfall station 18165, located to the south-east of Polda
Annual total ¹	378 mm 10 mm (3%) less than the five-year average of 388 mm 6 mm (2%) greater than the long-term average of 372 mm
Monthly summary	Well-above average rainfall recorded in September, December and January Well-below average rainfall recorded in November and March through to June
Spatial distribution	Rainfall in 2016–17 was consistent with past years over the entire PWA

Water use

See Figure 3

Total allocated volume	10 ML ²
Licensed groundwater extractions*	3.43 ML ³ (33% of total allocations)
Extraction volume comparison	471% greater than the previous year 193% greater 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² In 2017, the Ministerial Notice of Prohibition, which restricted the taking of water in Polda since 2008, has been revoked to allow for the water allocation plan to be implemented which explains the large jump in extraction in 2016–17

³ 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

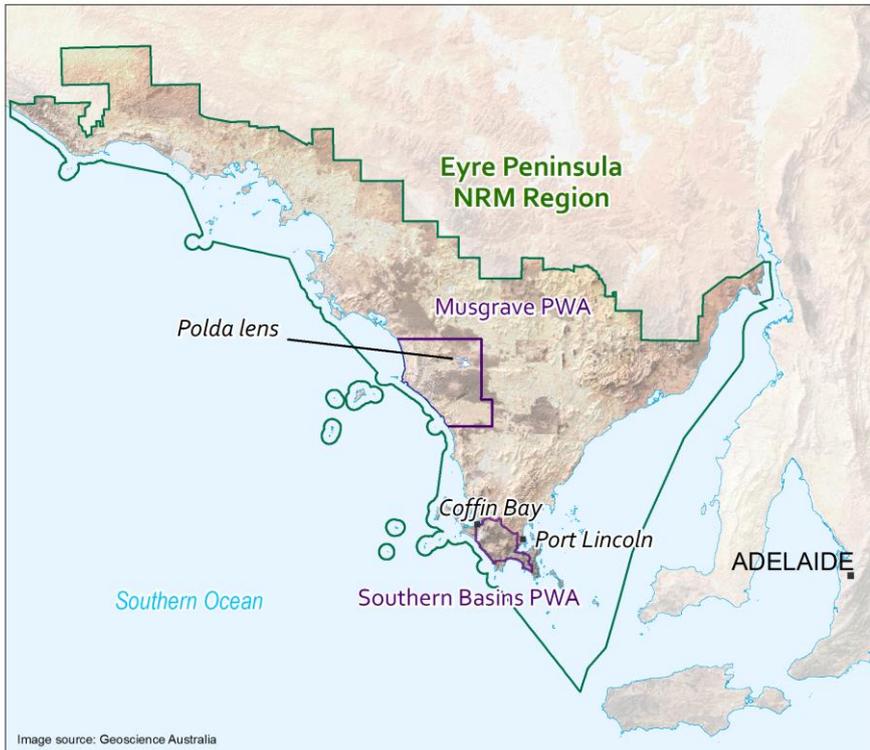
Five-year trend: 2013–17	31 out of 33 wells (94%) show rising trends, at rates of 0.01–0.12 m/y (median of 0.05 m/y) 1 well (3%) is stable 1 well (3%) shows a declining trend, at a rate of 0.01 m/y
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Groundwater salinity

See Figures 5 and 6

2017 salinity	338–3371 mg/L 18 out of 30 wells (60%) show salinities less than 1000 mg/L
Five-year trend: 2013–17	5 out of 27 wells (19%) show decreasing trends, at rates of 18–178 mg/L/y (median of 27 mg/L/y) 16 wells (59%) are stable 6 wells (22%) show increasing trends, at rates of 16–85 mg/L/y (median of 59 mg/L/y)

Regional setting



The Musgrave PWA is located at the west coast of the Eyre Peninsula, approximately 120 km north-west of Port Lincoln and within the Eyre Peninsula Natural Resources 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. The Polda lens is situated in the north-east of the Musgrave PWA.

Within the Musgrave PWA, there are three main sedimentary sequences containing groundwater that overlie basement rocks: the Quaternary limestone aquifer; the underlying Tertiary sands aquifer; and deeper Jurassic sediments that occur only within the Polda Trough. The Quaternary limestone aquifer, which is the focus of this report, comprises a generally thin veneer of aeolianite sediments of the Bridgewater Formation and is continuous across the PWA. The main source of recharge to the Quaternary limestone aquifer is the direct infiltration of rainfall, and groundwater flow is predominantly in a westerly to south-westerly direction toward the Southern Ocean.

Groundwater levels and salinities in the Musgrave PWA are highly responsive to recharge from rainfall, and trends in groundwater level or salinity are primarily climate driven: below-average rainfall results in a reduction in recharge to the aquifers. Below-average summer rainfall can also result in increasing extractions, and both elements can cause the groundwater levels to decline and salinities to increase. Conversely, above-average rainfall can result in increases in recharge, decreases in extractions and groundwater levels may rise and salinities may stabilise or decrease. Historical rainfall data indicate that trends of above or below-average rainfall can last for up to 25 years, and that high-intensity rainfall events can result in rapid groundwater level responses (i.e. recharge).

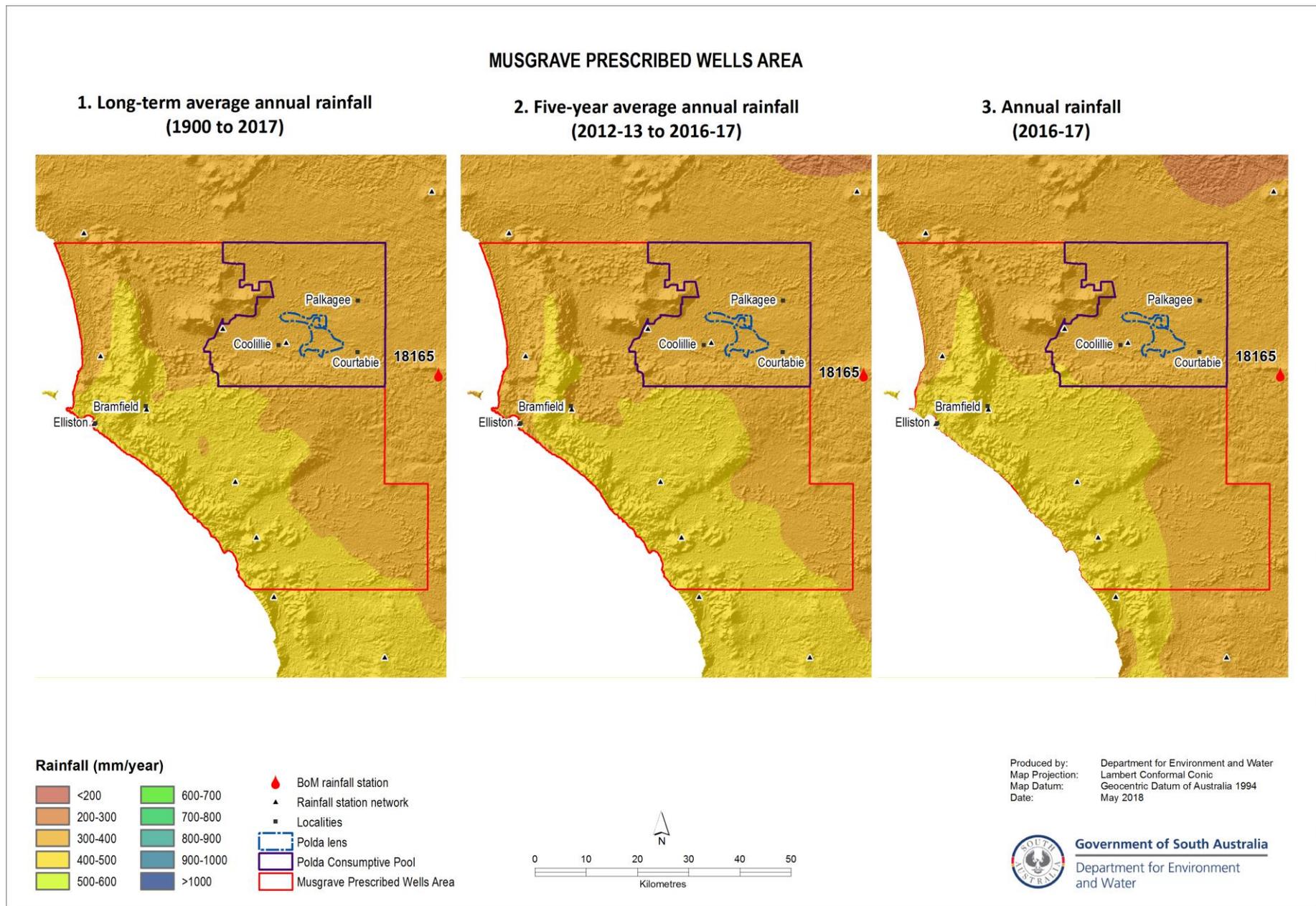


Figure 1. Spatial distribution of (1) Long-term and (2) five-year average annual rainfall, and (3) annual rainfall⁴

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](#)

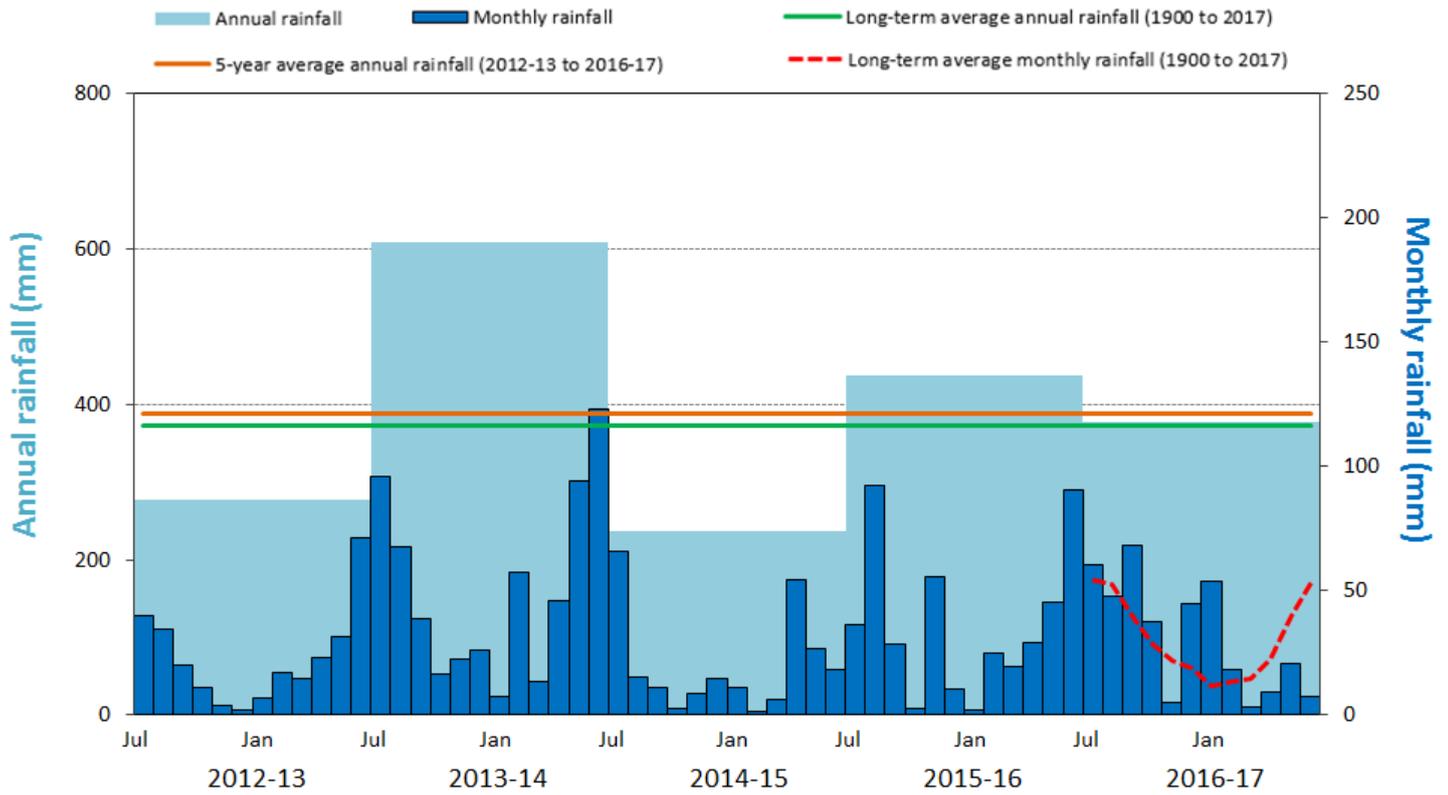


Figure 2. Annual and monthly rainfall for the past five water-use years recorded at The Lock (Terrah Winds) (BoM Station 18165)⁵

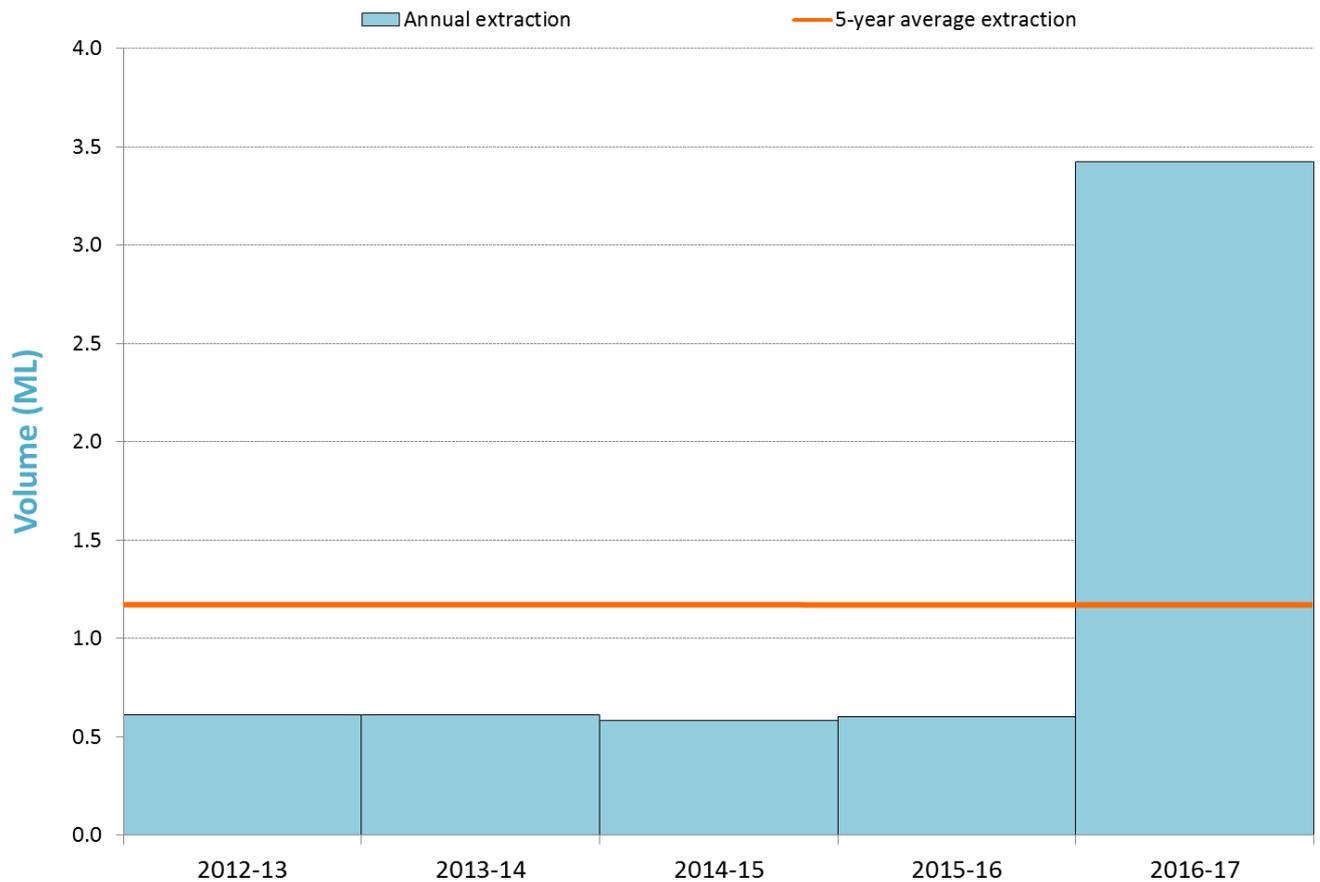


Figure 3. Licensed groundwater extraction volumes⁶ for the past five water-use years

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](#)

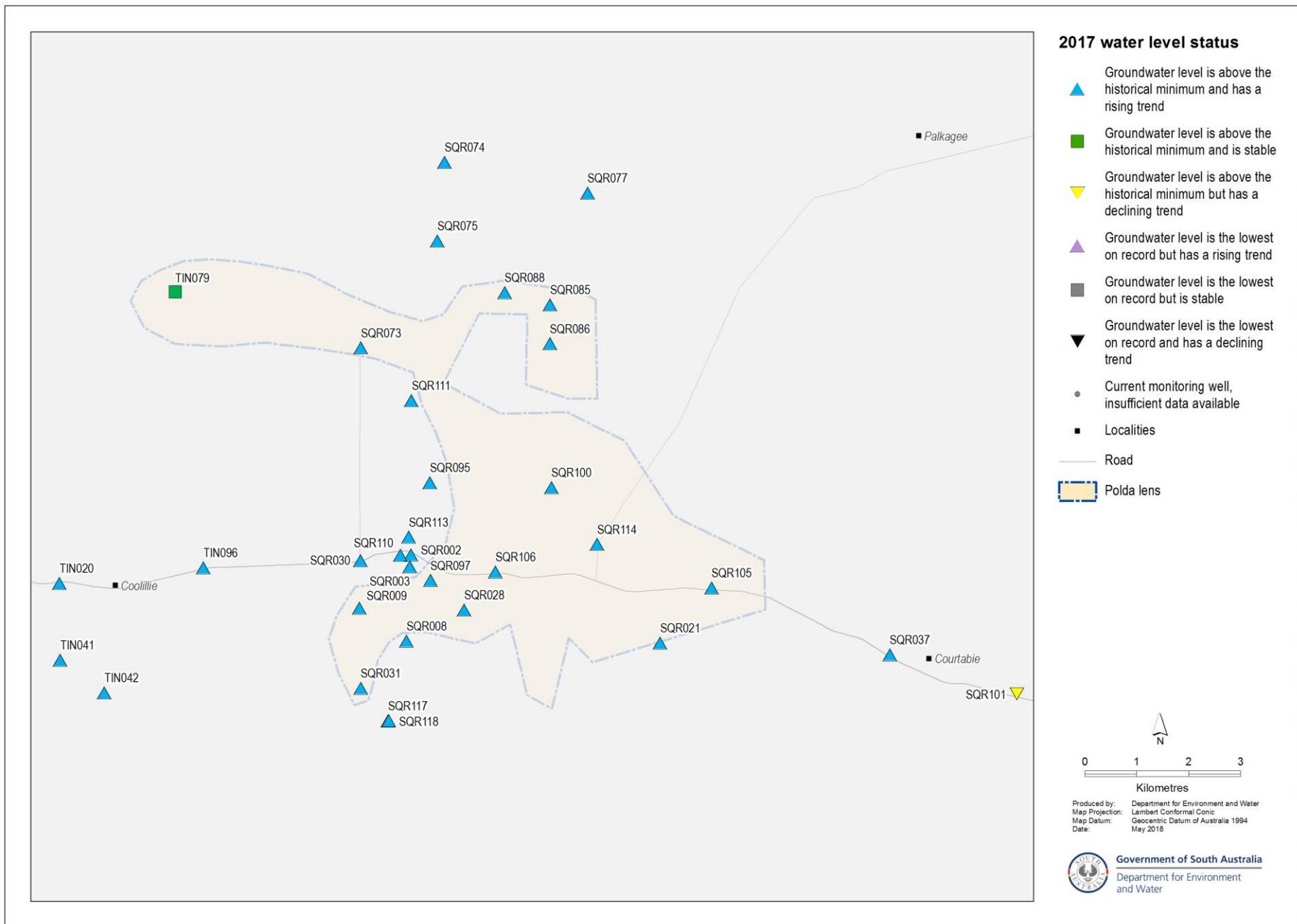


Figure 4. Five-year trends (2013–17) in groundwater levels: Polda lens

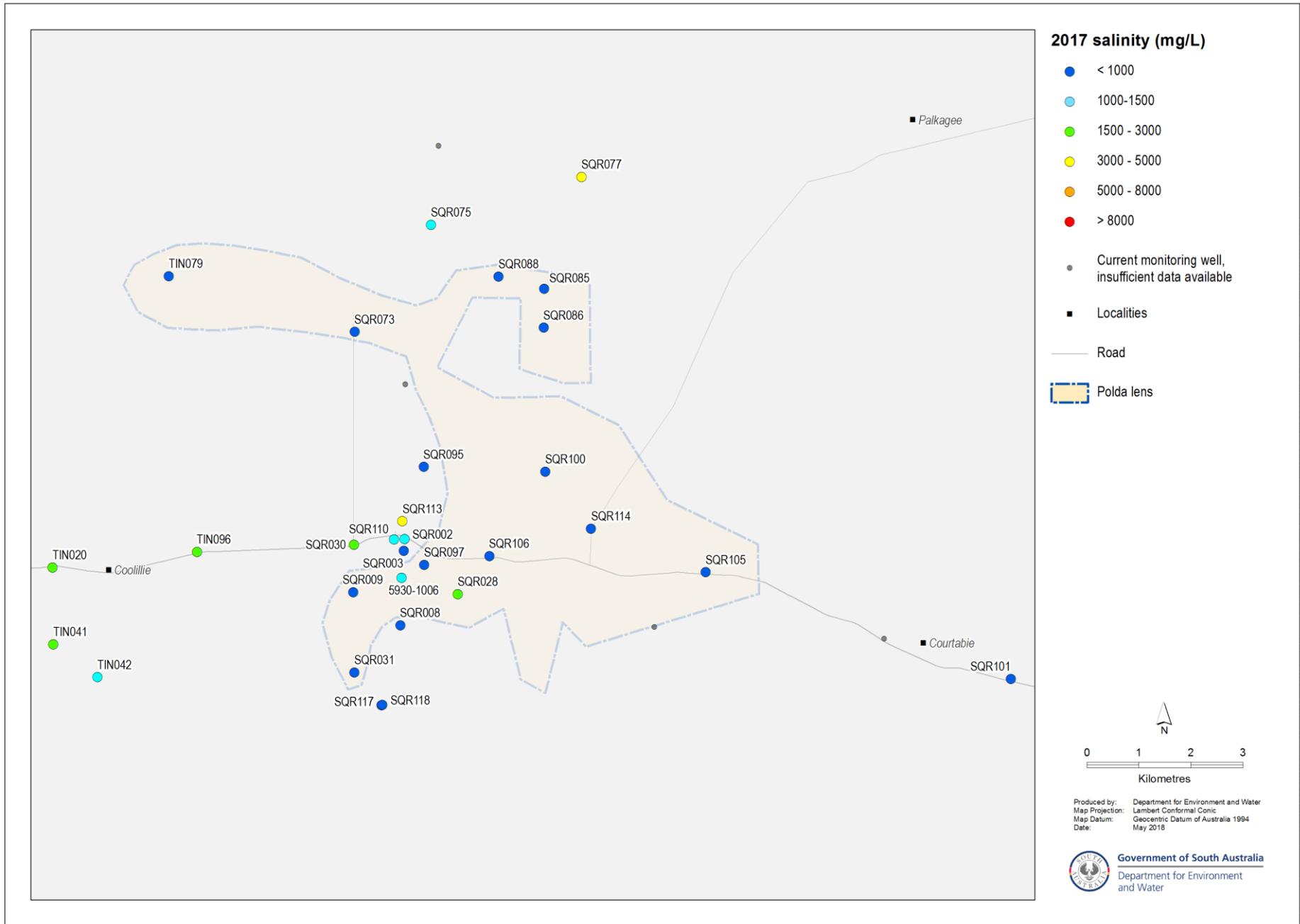


Figure 5. 2017 groundwater salinities: Polda lens

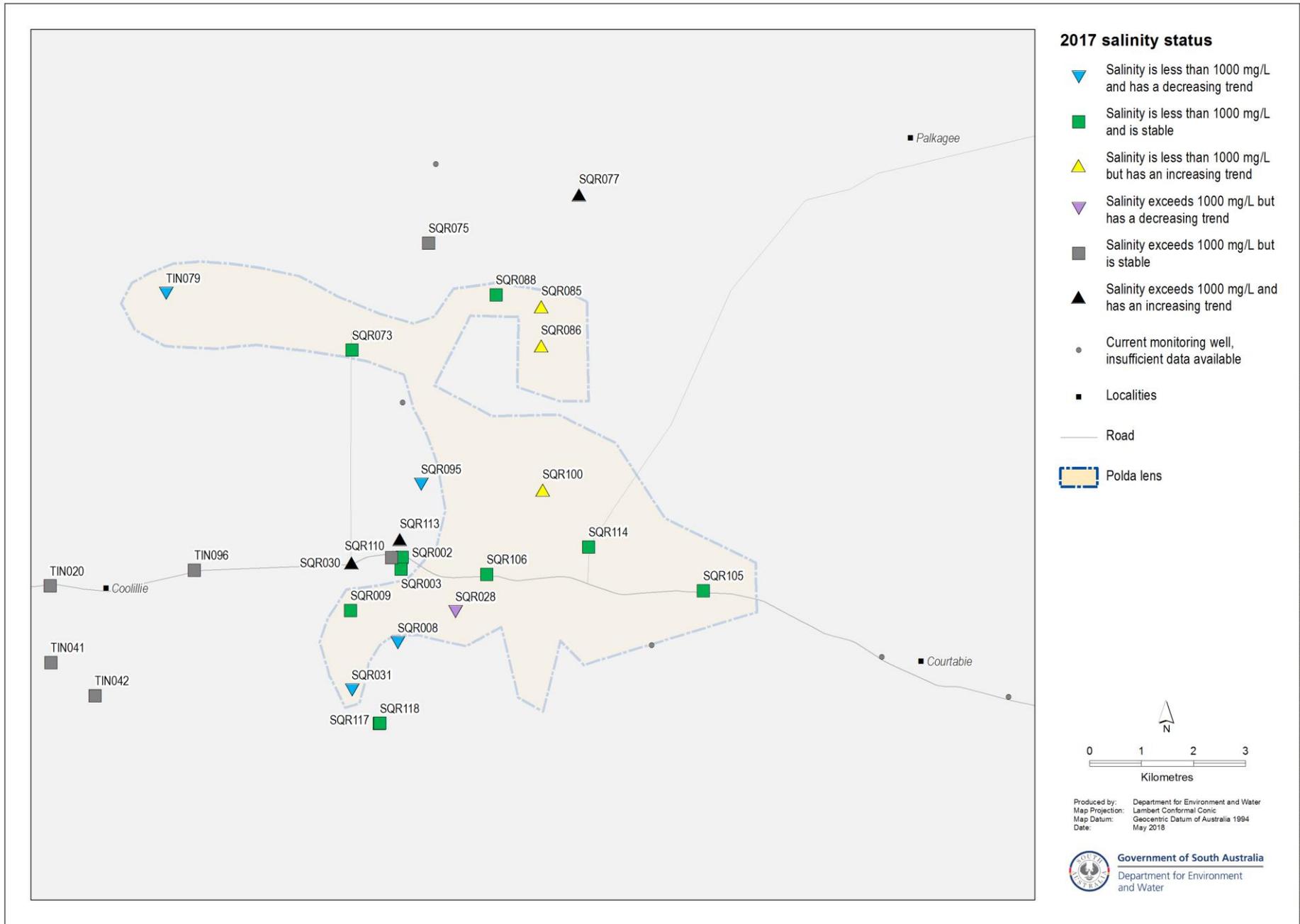


Figure 6. Five-year trends (2013–17) in groundwater salinities: Polda lens

More information

To determine the status of the Polda lens 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](#).

Consumptive pool is defined as the water that will, from time to time, be taken to constitute the resource within a particular part of a prescribed water resource. For further information please see the *Water Allocation Plan for the Southern Basins and Musgrave Prescribed Wells Areas* on the Natural Resources Eyre Peninsula [website](#).

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 level 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 *Musgrave 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 Musgrave PWA, please visit the *Groundwater Data* page under the Data Systems tab on [WaterConnect](#).

For further details about the Musgrave PWA, please see the *Water Allocation Plan for the Southern Basins and Musgrave Prescribed Wells Areas* on the Natural Resources Eyre Peninsula [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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