

Eastern Mount Lofty Ranges Prescribed Water Resources Area Murray Group Limestone aquifer

2018 Groundwater level and salinity status
report



**Government
of South Australia**

Department for
Environment and Water

2018 Status summary

Eastern Mount Lofty Ranges PWRA

Murray Group Limestone aquifer



The Murray Group Limestone (MGL) aquifer in the Currency Limestone Underground Water Management Zone of the Eastern Mount Lofty Ranges (EMLR) Prescribed Water Resources Area (PWRA) has been assigned a **green** status for 2018 because positive trends have been observed in the past five years.

The status is based on four and five-year trends: over the period 2015–18, 93% of wells show rising groundwater levels and over the period 2014–18, 50% of wells show stable salinities.

Water level trends were calculated over the period 2015–18 because of a lack of groundwater level measurements in 2014.

The status is based on five-year trends. To view the *Eastern Mount Lofty Ranges 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 Eastern Mount Lofty Ranges 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	Finniss Bureau of Meteorology (BoM) rainfall station, number 23714, is located to the north of the Currency Limestone Underground Water Management Zone.
Annual total ¹	496 mm 18 mm (4%) less than the five-year average of 514 mm 2 mm less than the long-term (1900–2018) average of 498 mm

Groundwater extraction

Allocated volume ^{1,2}	31 835 ML (all aquifers of the EMLR PWRA)
Licensed groundwater extractions ^{1,3}	1086 ML (Currency Limestone Underground Water Management Zone)

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; installation of water meters by licensed users is still in progress across the EMLR PWRA – see [More information](#)

Groundwater level

See Figure 3

Five-year trend: 2015–18	14 out of 15 wells (93%) show a rising trend, at rates of 0.15–0.62 m/y (median of 0.35 m/y) 1 well (7%) shows a declining trend, at a rate of 0.06 m/y
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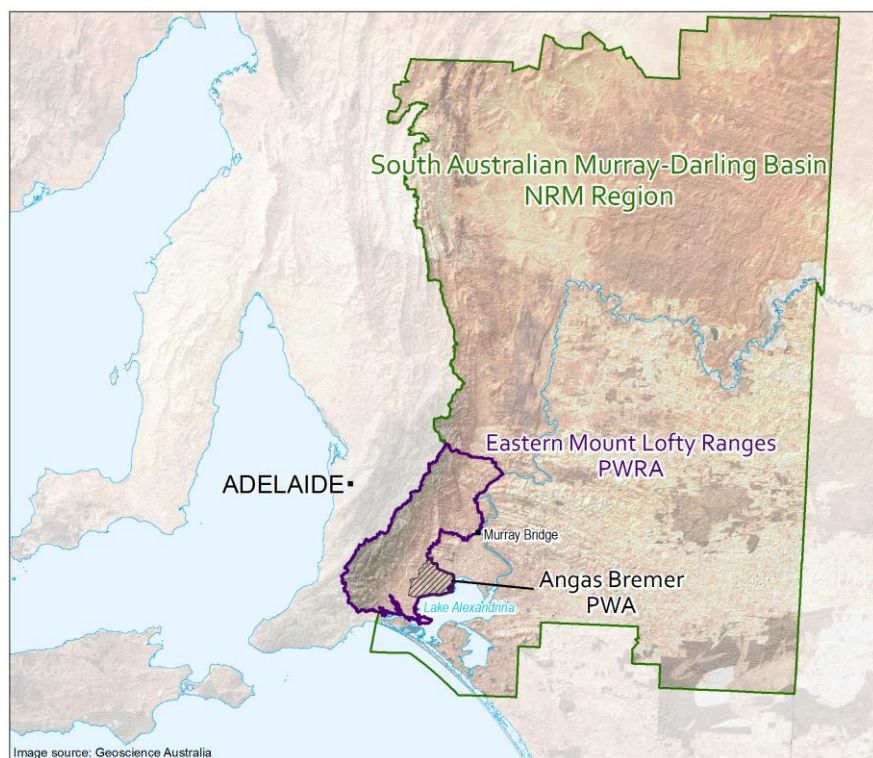
Groundwater salinity

See Figures 4 and 5

2018 salinity	685–3575 mg/L (15 wells; median of 1220 mg/L)
Five-year trend: 2014–18	4 out of 8 wells (50%) show stable salinities 4 wells (50%) show an increasing trend, at rates of 22–163 mg/L/y (median of 92 mg/L/y)
Citizen science	Since 2014, irrigators in the EMLR PWRA have submitted groundwater samples that DEW have tested for salinity concentration. Data that has been validated are augmenting the existing DEW monitoring network. ⁴

⁴ The salinity data collected from irrigation wells can be viewed at [Groundwater Data](#) or via [WaterConnect](#)

Regional setting



The EMLR PWRA lies within the South Australian Murray-Darling Basin Natural Resources Management Region and is located about 50 km east of Adelaide. 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 Angas Bremer Prescribed Wells Area is located within the boundaries of the EMLR PWRA and a stand-alone groundwater level and salinity status report has been prepared for this area (please visit the *Water Resource Assessments* page on [WaterConnect](#)).

There are three sedimentary aquifers in the EMLR PWRA: the Permian sand, MGL and Quaternary aquifers. Separate groundwater level and salinity status reports have been prepared on the Permian sand and fractured rock aquifers (FRAs) of the EMLR PWRA. These reports can be found on the *Water Resource Assessments* page of [WaterConnect](#).

This report focuses on the MGL aquifer, in particular the Currency Limestone Underground Water Management Zone (Fig. 1), which is defined in the water allocation plan. The MGL aquifer consists predominantly of a shallow marine fossiliferous limestone that was deposited approximately 50 million years ago. The aquifer is up to 100 m thick and overlies the Kanmantoo Group fractured rock aquifer and the Permian sand aquifer in some areas. It is confined by overlying Quaternary clay sediments to the south-west of Murray Bridge, but it is unconfined to the north. The primary recharge mechanisms are lateral throughflow mainly from the Permian sand aquifer, and downward leakage from the overlying Quaternary aquifer.

Despite the confined nature of the MGL aquifer within the Currency Limestone Underground Water Management Zone, which does not receive direct recharge from incident rainfall, the intensity and timing of rainfall (and related variations in groundwater extraction rates) can have an effect on groundwater levels and salinities. For example, if the area experiences above-average rainfall, this could result in less groundwater being extracted from the MGL aquifer for irrigation, which can cause groundwater levels to rise and salinities to stabilise or decrease. Conversely, below-average rainfall may result in increased rates of groundwater extraction, and groundwater levels may decline and salinities increase.

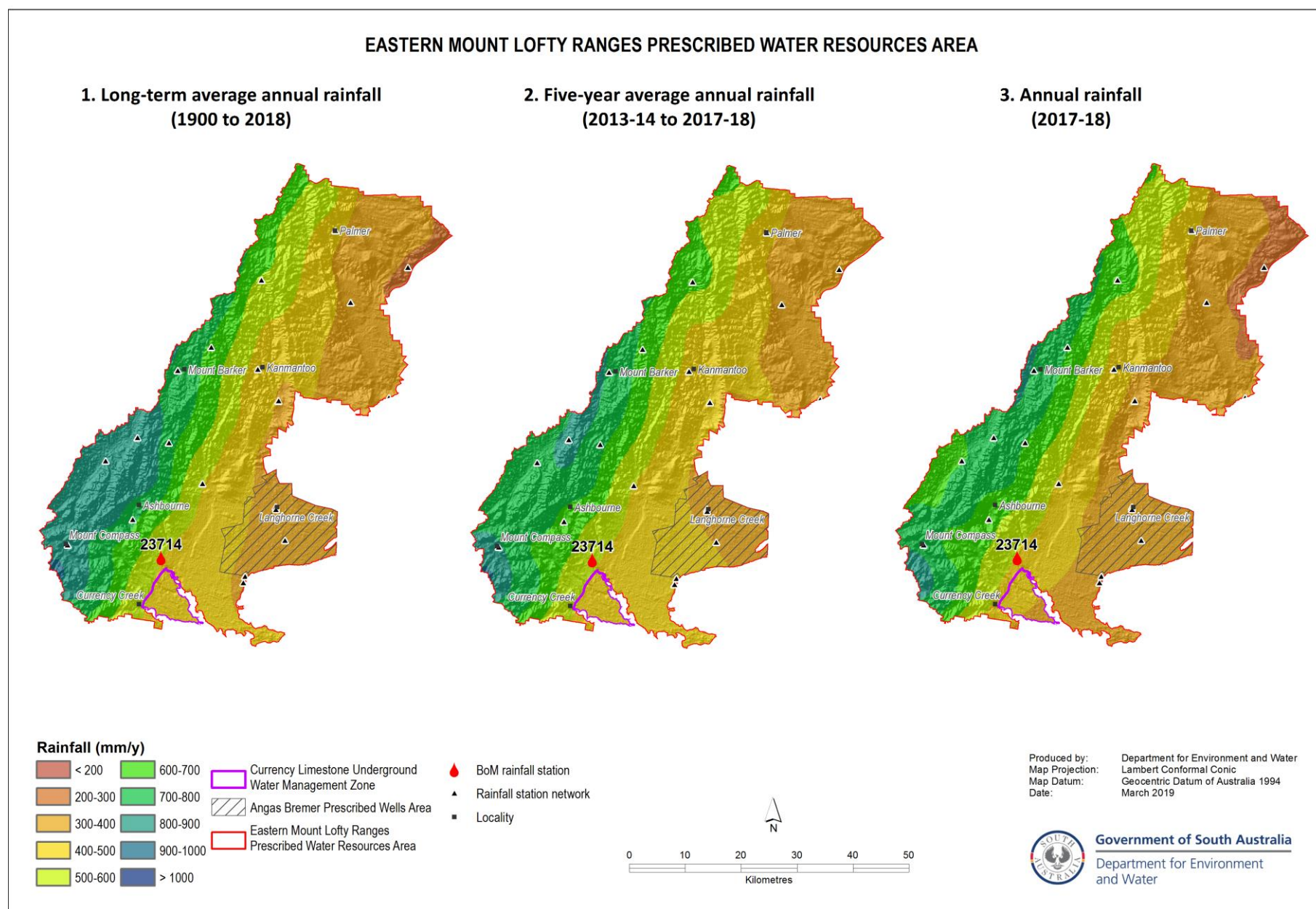


Figure 1. Spatial distribution of (1) long-term and (2) five-year average annual rainfall, and (3) annual rainfall⁵

⁵ Data sources: SILO interpolated point and gridded datasets available at <https://legacy.longpaddock.qld.gov.au/silo/> – see [More information](#)

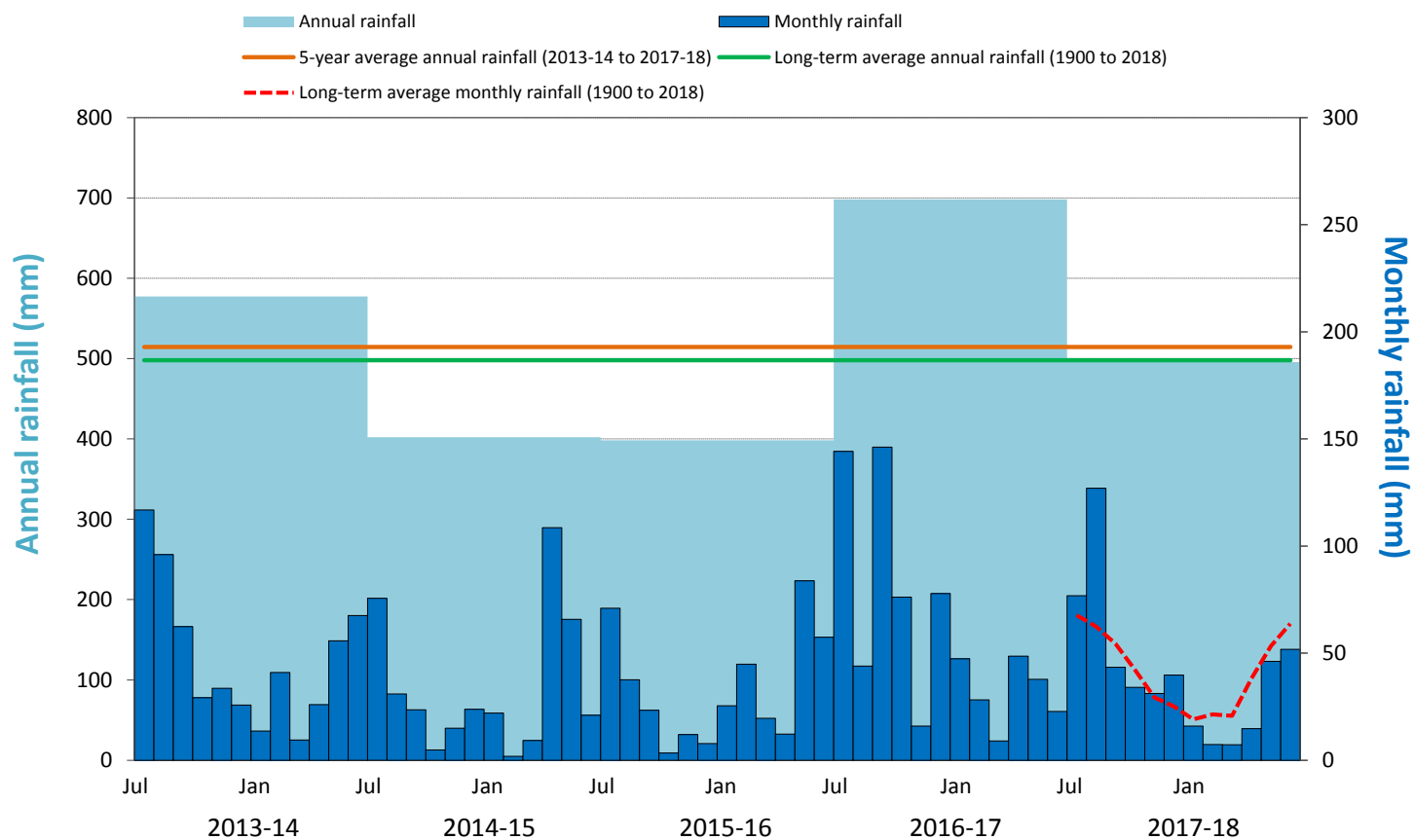
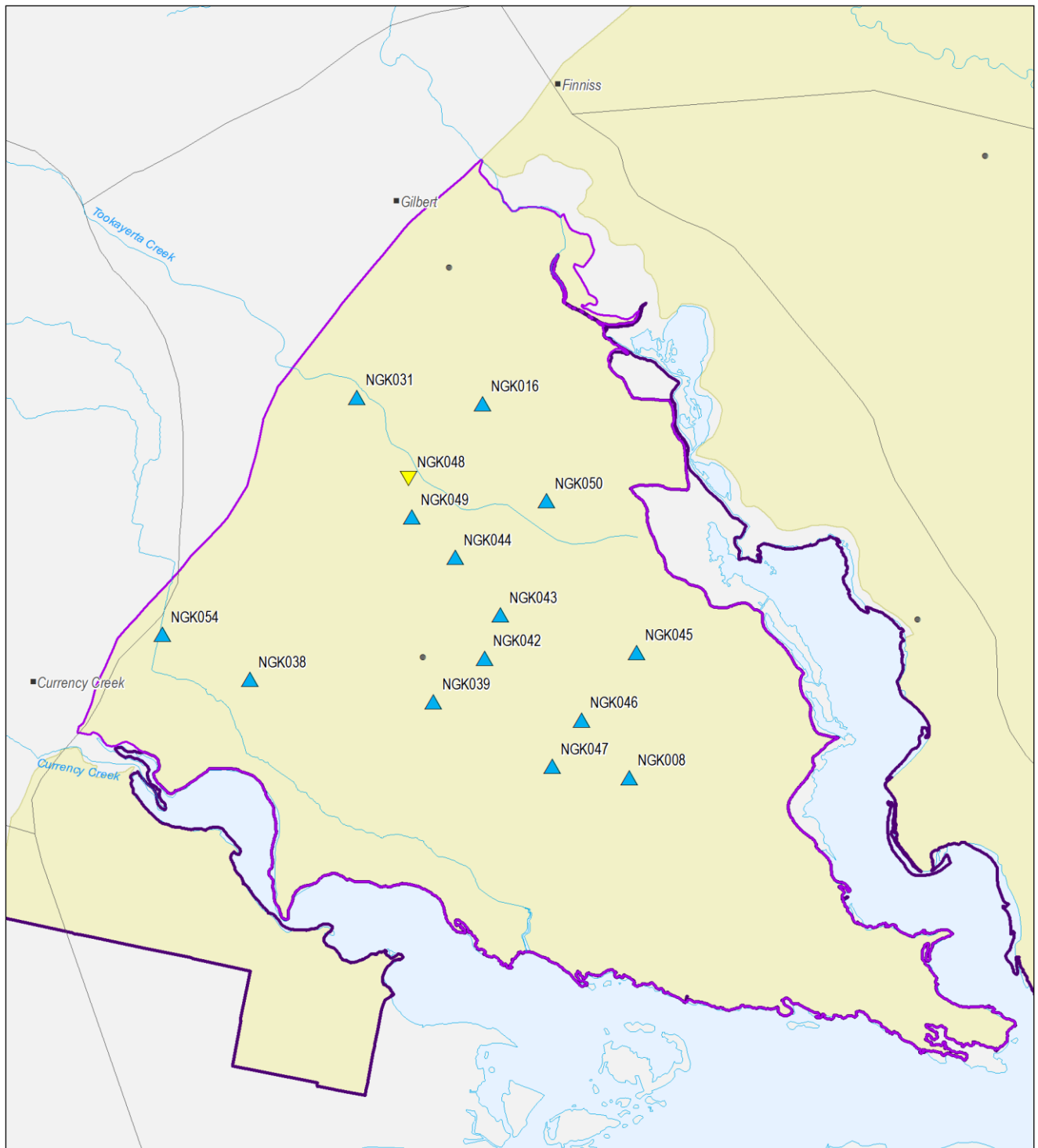


Figure 2. Annual and monthly rainfall for the past five water-use years recorded at Finniss (BoM Station 23714)⁶

⁶ Data source: SILO Patched Point Dataset, available <https://legacy.longpaddock.qld.gov.au/silo/> – see [More information](#)



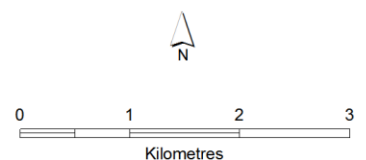
2018 water level status

- ▲ 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 but is stable
- ▼ Groundwater level is the lowest on record and has a declining trend

- Current monitoring well, insufficient data available
- Locality

- Watercourse
- Road

- Murray Group Limestone Management Zones
- Currency Limestone Underground Water Management Zone
- Eastern Mount Lofty Ranges Prescribed Water Resources Area

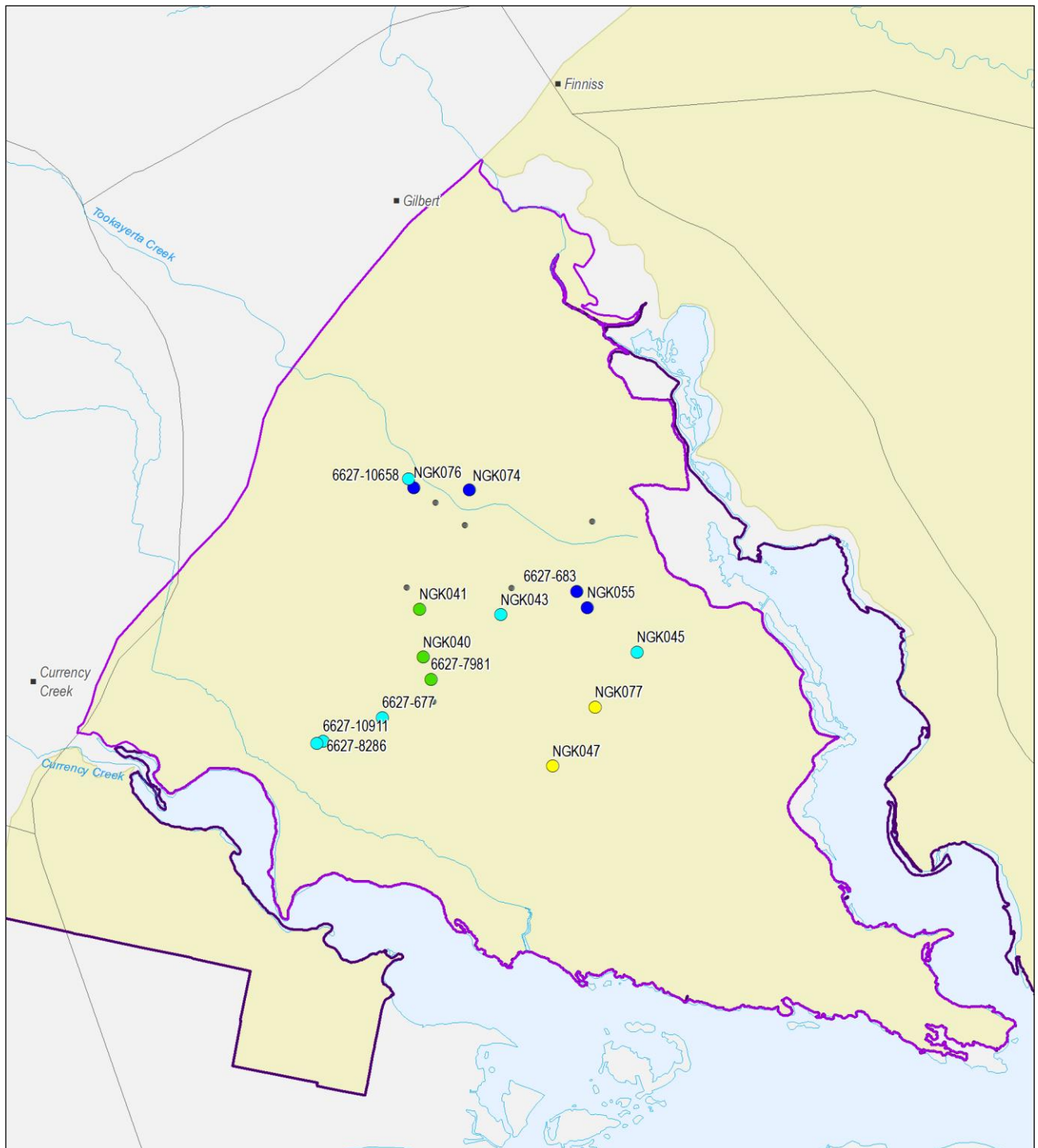


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Map Datum: Geocentric Datum of Australia 1994
Date: March 2019



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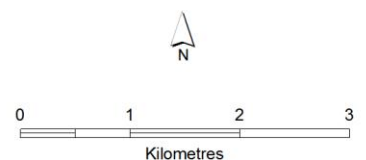
Figure 3. Four-year trends (2015–18) in groundwater levels: Murray Group Limestone aquifer



2018 salinity (mg/L)

- < 1000
- 1000 - 1500
- 1500 - 3000
- 3000 - 5000
- 5000 - 8000
- > 8000
- Current monitoring well, insufficient data available

- Locality
- Watercourse
- Road
- Murray Group Limestone Management Zones
- Currency Limestone Underground Water Management Zone
- Eastern Mount Lofty Ranges Prescribed Water Resources Area

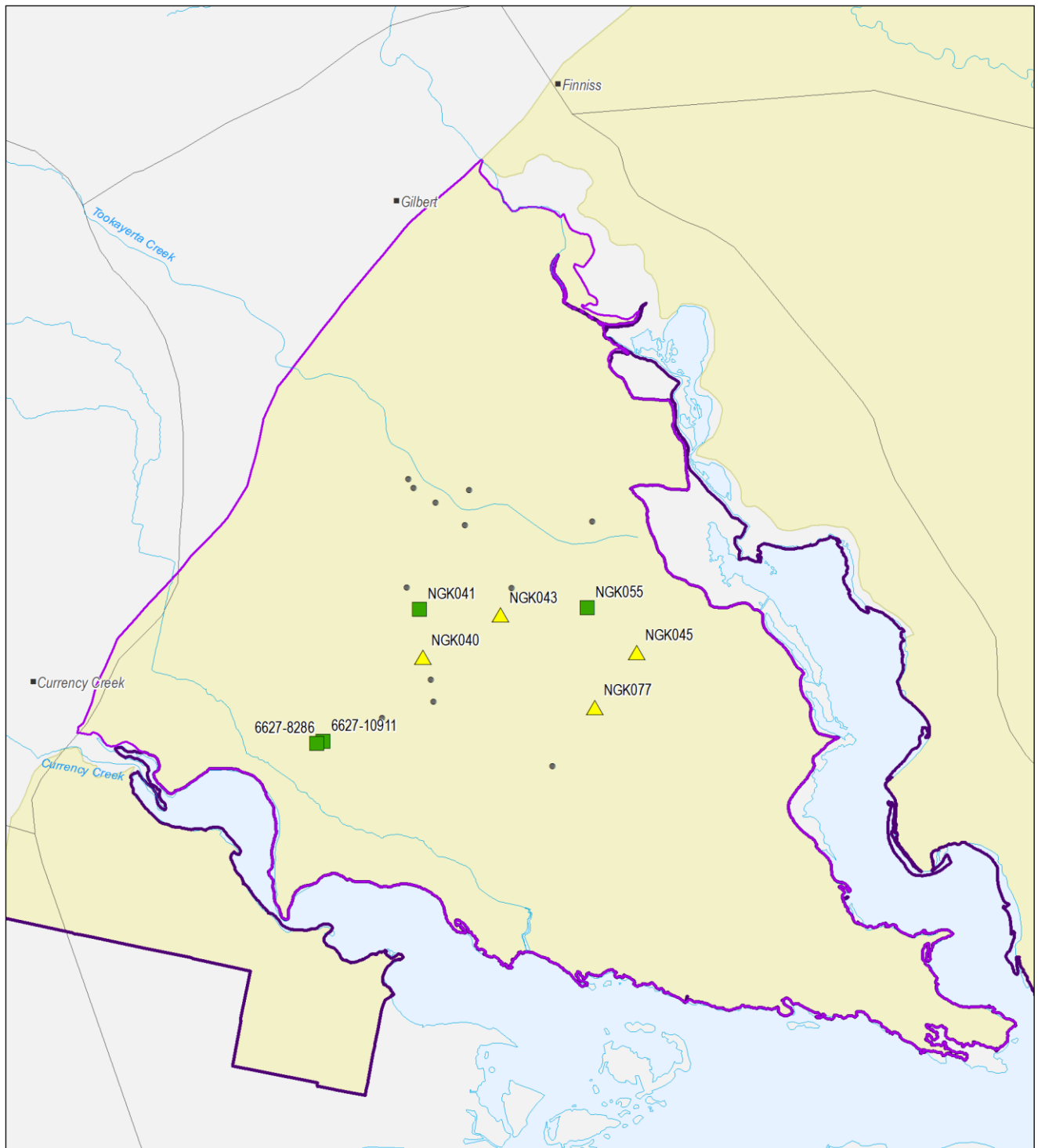


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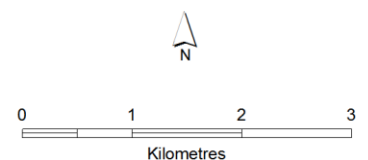
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Figure 4. 2018 groundwater salinities: Murray Group Limestone aquifer



2018 salinity status

- ▼ Decreasing salinity trend
- Stable salinity
- ▲ Increasing salinity trend
- Current monitoring well, insufficient data available
- Locality
- Watercourse
- Road
- Murray Group Limestone Management Zones
- Currency Limestone Underground Water Management Zone
- Eastern Mount Lofty Ranges Prescribed Water Resources Area



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Figure 5. Five-year trends (2014–18) in groundwater salinities: Murray Group Limestone aquifer

More information

To determine the status of the MGL 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 *Wells 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; installation of water meters is still in progress across the EMLR PWRA.

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 *Eastern Mount Lofty Ranges 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 Eastern Mount Lofty Ranges PWRA, please visit the *Groundwater Data* page under the Data Systems tab on [WaterConnect](#).

For further details about the Eastern Mount Lofty Ranges PWRA, please see the *Water Allocation Plan for the Eastern Mount Lofty Ranges* on the Natural Resources South Australian Murray-Darling Basin [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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