

# Polda

Eyre Peninsula Groundwater Dependent Ecosystems monitoring site

## 2022 Report Card

### Summary

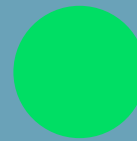
**Type of site:** Licensed extraction monitoring site.

**Status:** **Green**, improving trends in the short term (2016 to 2022). Stable condition (2021-2022) likely due to ongoing good winter rainfall, and stable groundwater levels.



**Climate:** Below average maximum summer temperatures and above average winter rainfall, with good groundwater recharge events.

This Report Card should be read in conjunction with the *Overview and Red Gum GDE Condition Summary* which provides information about Groundwater Dependent Ecosystem (GDE) monitoring and summary information for all monitored Red Gum GDE sites.



Adult Red Gum at Polda assessed as in 'very good' condition in Oct 2022.

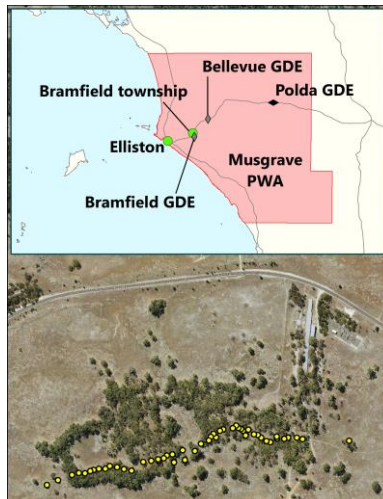
The **Polda** Groundwater Dependent Ecosystem (GDE) monitoring site is situated 33 kilometres east of Bramfield, on the Birdseye Highway. The site includes a remnant patch (approximately 65 ha) of Red Gum (*Eucalyptus camaldulensis*) Woodland. The understorey is dominated by native and introduced grasses.

The Polda GDE site is monitored to assess the impacts of licensed water extraction from the Polda groundwater lens in the Musgrave Prescribed Wells Area. There are a number of users who hold licenses to extract a limited amount of water for private commercial purposes. There was, however, zero extraction from the Polda Consumptive Pool in 2020-2021 and 2021-2022, and less than 1 ML extraction in 2018-2019.

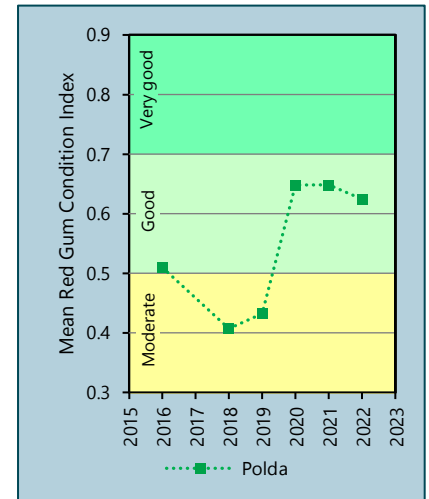
There is also extraction of water for stock and domestic purposes for which a license is not necessary. This extraction is assumed to be low compared to extraction for licensed consumptive purposes, and there is a low likelihood of it having any impact on the GDE.

### Red Gum condition

Tree condition monitoring is carried out in late October to early November. In 2016, when the monitoring commenced, the Red Gum condition was good, with an average Red Gum Condition Index (RCI) score of 0.51. In 2018 and 2019 the condition declined to moderate, before improving to good again in 2020, (average RCI score of 0.65). There was negligible change in Red Gum condition between 2020 and 2022 (-2%), with condition remaining good. The small reduction in RCI was caused by lower tip growth and/or reproduction (fruit and flower) scores, an indication of less vigour in the trees. The dataset is too short to enable determination of any long term trends.



Polda site map (yellow dots represent 50 surveyed trees)



Graph 1 Change in Red Gum Condition Index at Polda from 2016 to 2022

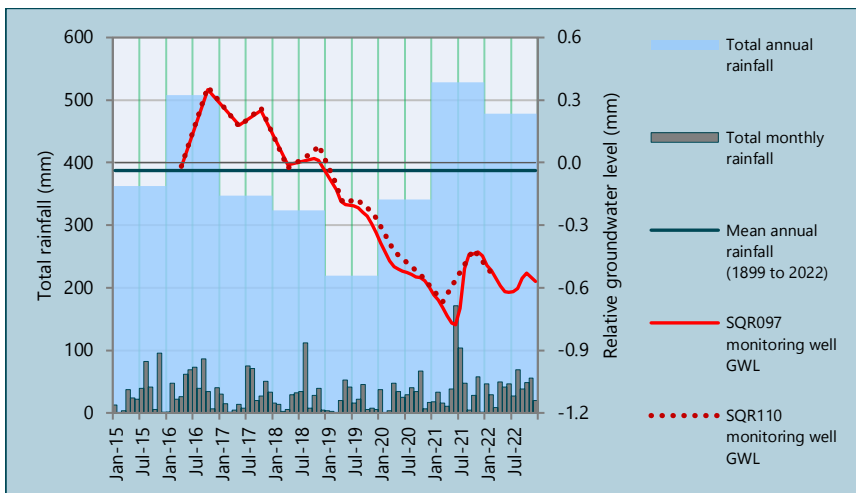
## Groundwater and climate assessment

Red Gum condition remained good through 2022, with trees supported by stable groundwater levels, higher than average rainfall total annual rainfall, and cooler than average maximum daily temperatures.

As detailed below, graphs on the right show climatic factors contributing to groundwater recovery, and associated stable Red Gum condition:

- Total annual rainfall decreased from 529 mm in 2021 to 478 mm in 2022, 91 mm above the long term<sup>1</sup> mean annual rainfall (387 mm) (Graph 2).
- Through the summer months of 2022, levels in monitoring well SQR097 continued to decline. This decline was, however, followed by a small amount of recharge of groundwater during winter, from June to October, and then further decline at the start of the new summer.
- Temperatures were cooler than usual, with the monthly average of daily maximum temperature for the summer months (November to March) 0.8°C below the long term<sup>1</sup> mean (Graph 3). These cooler temperatures could result in improved groundwater recharge, with less evaporation occurring after rainfall events. The impact of cooler temperatures on Red Gum condition is possibly mixed. Cooler temperatures can contribute to improved Red Gum condition, with the trees being impacted less by heat stress. Cooler temperatures could, however, also result in less vigour in the trees and might be the cause of the small decline in Red Gum RCI during 2022.

Although located on a different groundwater lens, similar changes in groundwater levels, and small declines in Red Gum condition, were observed at Bramfield and the control site Bellevue. This indicates changes can be attributed to factors that are relatively consistent across

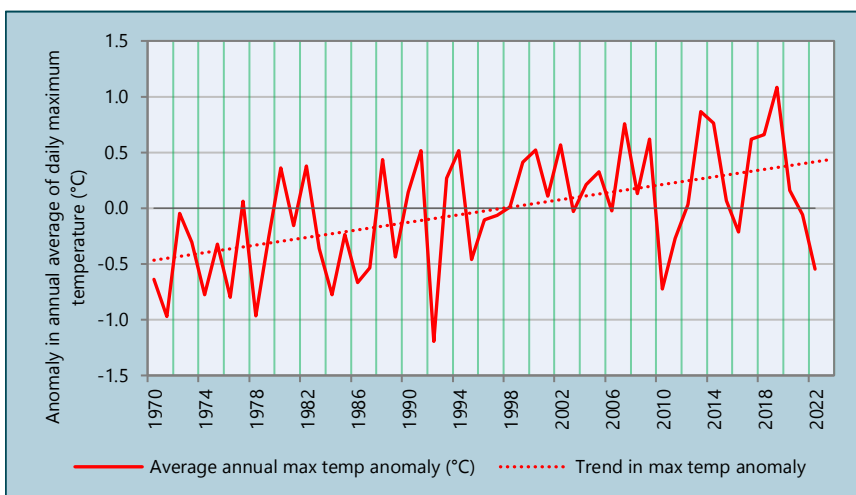


**Graph 2** Total annual and total monthly rainfall<sup>^^</sup>, and change in groundwater levels<sup>\*\*</sup> at two monitoring well, SQR097 and SQR110

Notes:

<sup>^^</sup>Rainfall data for 2016 to 2018 is patched [SILO](#) data for the Bureau of Meteorology station, Mount Wedge (number 18056). Rainfall data for 2019 to 2022 is site specific data obtained from a rainfall gauge installed at the Poldia GDE site.

<sup>\*\*</sup>The groundwater levels shown for monitoring wells SQR097 (5930-1050) and SQR110 (5930-1062) are relative to the groundwater levels in June 2018, which are shown as zero.



**Graph 3** Anomaly in annual average of daily maximum temperature <sup>^</sup> from 1970 to 2022

Note:

<sup>^</sup>This is the difference between the annual average of the daily maximum temperature for any one year and the long term<sup>1</sup> mean of the annual average of the daily maximum temperature. Maximum daily temperature is measured at the Bureau of Meteorology station, Mount Wedge (number 18056).

the three sites, specifically good winter rains, and cooler summer temperatures.

## Monitoring into the future

Tree condition monitoring will continue on a yearly basis. As time goes on, more data will allow for the identification of any long term trends in the GDE condition.

<sup>1</sup>All long term averages are for the period 1 Jan 1899 to 31 Dec 2022.

### For more information

Access the full report on assessment of Red Gum condition in 2018 [here](#):

Muller K. L., N.J. Souter and Australian Water Technology (2019). *Eyre Peninsula Groundwater Dependent Ecosystem Data Analysis: Red Gum tree condition data (five sites)*. A report for Natural Resources Eyre Peninsula, Department for Environment and Water (DEW), Port Lincoln, South Australia.

Access the 2022 *Overview and Red Gum GDE Condition Summary* and other specific site (Bramfield, Bellevue, Wanilla and Coultia) report cards [here](#)

For groundwater status and long term water extraction information

DEW (2021). [Musgrave and Southern Basins Prescribed Wells Areas. 2019-20 water resources assessment](#). DEW Technical Note 2021/15.

DEW (2021). [Musgrave Prescribed Wells Area. 2019-20 groundwater status overview](#).

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