

Musgrave Prescribed Wells Area

2020–21 Groundwater status overview



Musgrave PWA	Bramfield	●
	Polda	●

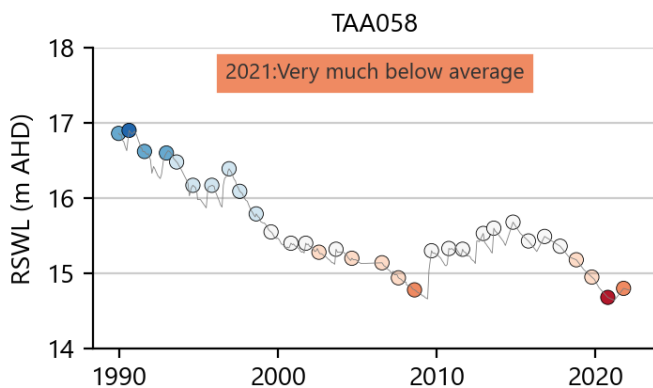
LEGEND

- Highest on record
- Very much above average
- Above average
- Average
- Below average
- Very much below average
- Lowest on record
- Long-term trend

Groundwater levels

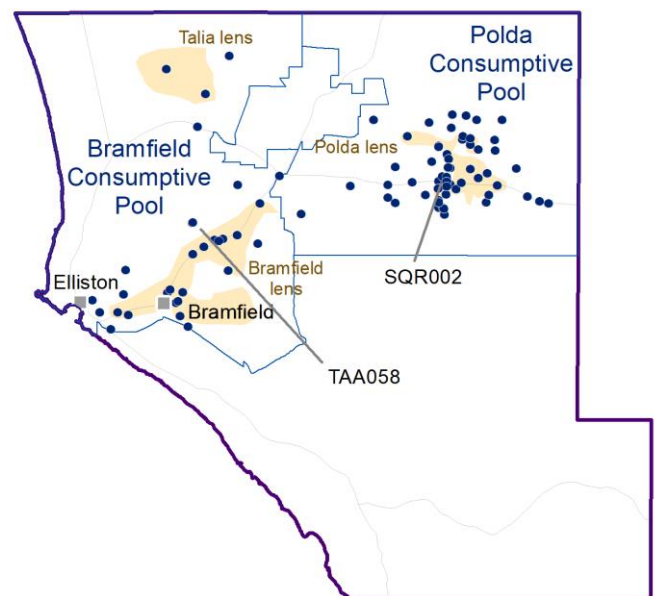
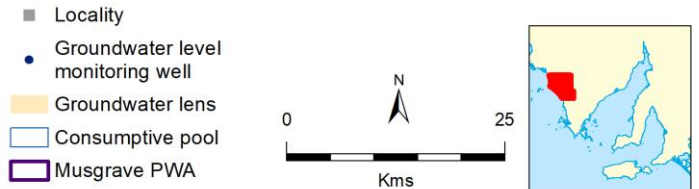
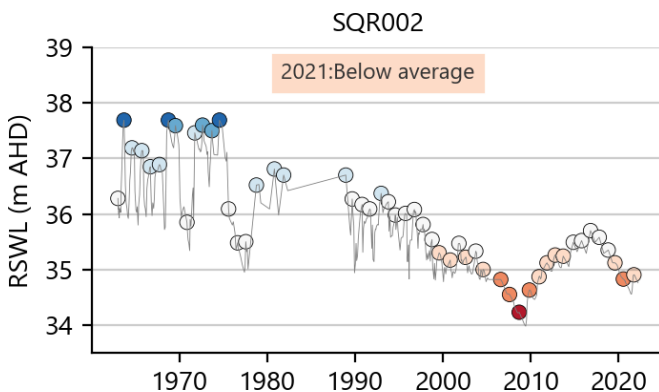
Water levels in Quaternary Limestone aquifer wells within the Bramfield consumptive pool are classified 'Very much below average'.

- The majority of wells (6 out of 7) are classified as 'Below average' or lower.
- Five-year trends (2017 to 2021) show water levels are declining in 85% of wells.
- The figure below shows the long-term water level record for an observation well located within the Bramfield consumptive pool.



Water levels in 97% of Quaternary Limestone aquifer wells within the Polda consumptive pool are classified 'Below average' or lower.

- Water levels in 30% of wells are classified 'Very much below average', or lower.
- Five-year trends (2017 to 2021) show water levels are declining in 97% of wells (see example hydrograph below).



Regional context

The Musgrave Prescribed Wells Area (PWA) is located within the Eyre Peninsula Landscape region. Groundwater is the main source of water resource across the PWA and is mainly used for town water supply and stock and domestic purposes.

There are four main groundwater systems located in the region: the uppermost unconfined Quaternary Limestone aquifer, a confined aquifer in underlying Tertiary sediments, a high-salinity aquifer in Jurassic sediments and a fractured rock aquifer that occurs in basement rocks. The only supplies of potable groundwater are found in the Quaternary Limestone aquifer, and these are known as fresh groundwater lenses.

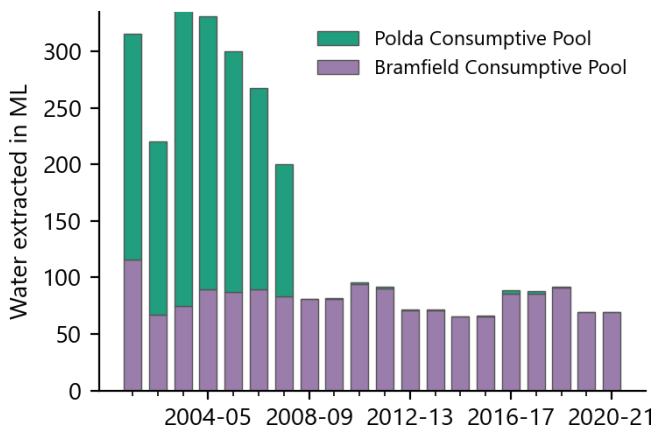
The resources are divided into management zones – the zone with the highest licensed use is the Bramfield consumptive pool. However, most of the use is for stock and domestic supply and is mainly sourced from brackish groundwater that resides within the Quaternary Limestone aquifer between the fresh lenses.



Water use

Licensed extractions from the Musgrave Prescribed Wells Area total 69 ML.

- Groundwater is used for a variety of purposes, but mainly for town water supply and stock and domestic use.
- The licensed groundwater extractions from the Bramfield consumptive pool of 69 ML shows a slight decrease from the 70 ML in 2019–20.
- Licensed extractions from the Polda consumptive pool are nil, due to very low groundwater storages.
- The figure below shows the past 18 years of extraction.



Salinity

Groundwater samples from 8 Quaternary Limestone aquifer wells within the Bramfield consumptive pool show a median salinity of 550 mg/L.

- Salinity ranges between 478 and 1,001 mg/L.
- Ten-year trends in three of four wells show gradually increasing salinity, at rates of 0.33 to 0.51% per year.

Groundwater samples collected from 18 Quaternary Limestone aquifer wells within the Polda consumptive pool show a median salinity of 860 mg/L.

- Salinity ranged between 512 and 3,364 mg/L.
- Ten-year trends show salinity is increasing in the majority of wells (65%), with rates ranging from a decrease of 3.0% per year to an increase of 1.5 % per year (median rate of 0.3% increase per year).

More Information

This fact sheet is a high level summary of information provided in the 2020–21 Water Resources Assessment for the Musgrave and Southern Basins PWAs. Full details of the assessment can be found at: <https://www.waterconnect.sa.gov.au>

Climate

In general, below-average rainfall results in a reduction in groundwater recharge. Furthermore, below-average rainfall can result in increasing extractions and together, both elements can cause 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.

In the Musgrave PWA, climate is the main driver of changes in groundwater levels and salinity. In particular, water levels are highly responsive to recharge from incident rainfall, due to the nature of the PWA's surface and subsurface geology.

Historical rainfall data indicate that trends of above or below-average rainfall can last for up to 25 years and suggest that, when matched with groundwater level data, high-intensity rainfall events can result in rapid groundwater level responses (i.e., groundwater recharge).

Rainfall

In 2021, annual rainfall is above average at Elliston and Terrah Winds.

- In 2021, total annual rainfall at Elliston (BoM Station 18169) is 517 mm, which is 22% above the long-term average (1971 to 2021).
- In 2021, total annual rainfall at Terrah Winds (BoM Station 18165) is 419 mm, which is 13% above the long-term average (1971 to 2021).
- At both rainfall stations, monthly rainfall was below average in April, September and December.
- Considerably above-average rainfall occurred at both stations in June, July and November.
- The long-term trend in annual rainfall (1971 to 2021) is declining at Elliston, but relatively stable at Terrah Winds station.
- The figure below shows monthly rainfall (blue) for 2021 at Elliston compared to monthly averages (grey).

