Annual Report 2017/18

Murrayville Local Management Plan (Groundwater)

July 2017 - June 2018

Executive summary

GWMWater presents the annual report for the Murrayville Groundwater Management Area Local Management Plan (LMP) for the 2017/18 season. While groundwater in the Murrayville area has been managed under a defined management arrangement for more than 20 years, the 2017/18 irrigation season was the first year post implementation of the Murrayville Groundwater Management Area Local Management Plan, which came into effect in July 2017.

This report provides an overview of groundwater use and management activities in the Murrayville Groundwater Management Area (GMA) during 2017/18.

The monitoring conducted indicates that groundwater levels are recovering steadily across much of the GMA, following a 2017/18 seasonal drawdown of up to 10 metres measured in some observation bores.

Metered use in the Murrayville GMA was 85 per cent (8,331 ML) of licence entitlement in 2017/18. This is a 30 per cent increase on use from previous years due to the extremely dry conditions experienced. Three licensees overused their license allocation. All instances of non-compliance are investigated by GWMWater as per its compliance policies and procedures.

There were 10 temporary trades in the 2017/18 season. This is an increase on previous years which suggests groundwater licence holders generally have sufficient entitlement to meet their water needs in most years, except when it's exceptionally dry and there are increased production demands.

GWMWater looks forward to maintaining its relationship with stakeholders in the Murrayville Groundwater Management Area as we continue to support the implementation of the LMP into the future through monitoring, metering, compliance programs and community interaction.

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1. Introduction

1.1 Purpose

This report has been prepared as required by the Murrayville Groundwater Management Area Local Management Plan, 2017. It provides an overview of groundwater management activities undertaken in the accordance with the LMP for the 2017/18 season.

1.2 Groundwater Management Area

The Murrayville GMA is located in the Wimmera-Mallee Groundwater Catchment in northwest Victoria and is part of the Murray Darling Basin. The GMA covers 1,916km^2 and is centred on the town of Murrayville and abuts the South Australian border. Groundwater from the Upper Mid-Tertiary Limestone Aquifer (Murray Group Limestone) is the sole source of water for domestic and stock, town supplies and irrigation in the region.

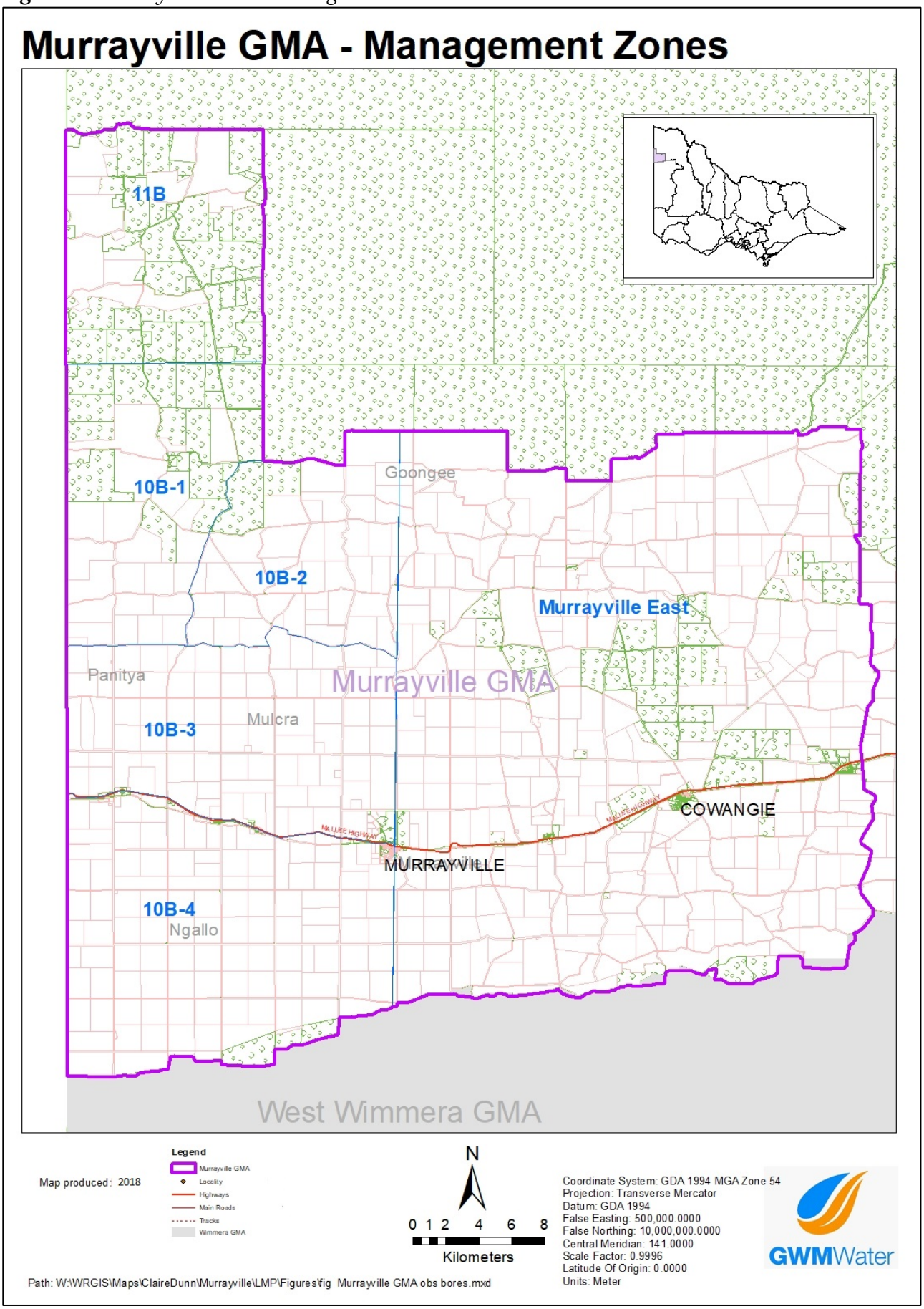
There are six management zones in the Murrayville GMA (Figure 1). Zones 10B-1, 10B-2, 10B-3 and 10B-4 of the Murrayville GMA combine to form Border Zone 10B. Zone 11B is within Border Zone 11B and Murrayville East zone is outside the Border Designated Area.

1.3 Local Management Plan

The Murrayville GMA Local Management Plan (LMP) describes the framework to manage groundwater resources in the Murrayville GMA. The LMP provides the rules and information for GWMWater's customers relating to the take and use of groundwater. The LMP can be accessed via the GWMWater website https://www.gwmwater.org.au/ .

The key objective of the Murrayville LMP is to ensure the equitable sharing of available water between licensed users, while protecting the environment and acknowledging its non-renewable nature, ensuring as much as practicable, the long-term sustainability of the water resource.

***Figure 1**: Murrayville GMA Management Zones.*



2. Groundwater Management

2.1 Licence entitlement

In July 2017, the Minister for Water declared the Permissible Consumptive Volume for the Murrayville GMA at 11,005 ML/year. The current total licence entitlement volume in the GMA is 9,754.8 ML. The licence information is summarised in Table 1.

***Table 1**: Licence entitlement in the Murrayville GMA*

Zone	Number of Licences	Volume licenced ML	Zone limit ML
11B	3	1,600	1,720
10B-1	3	2,265	2,265
10B-2	2	1,120	1,370
10B-3	12	2,020	2,140
10B-4	6	1,312.8	2,830
Murrayville East	13	1,437	2,412
Total	**39**	**9,754.8**	

2.2 Groundwater use

Each irrigation bore and active commercial bore is fitted with an approved meter to measure use. Meters are read mid-season (January) and at the end of season (June). Annual usage by licence is uploaded to the Victorian Water Register on 30 June each year.

The total metered groundwater use in the Murrayville GMA in 2017/18 was 8,331 ML or 85 percent of licence entitlement. This extraction volume is the highest recorded since 2001 due mostly to the extremely dry conditions from January to May. Figure 2 illustrates the total use compared to previous years, while Figure 3 illustrates rainfall recorded at the Bureau of Meteorology site in Murrayville (76038) during the period July 2017 to June 2018. Table 2 provides a summary of use by zone.

Figure 2 *Groundwater usage over time in the Murrayville GMA*

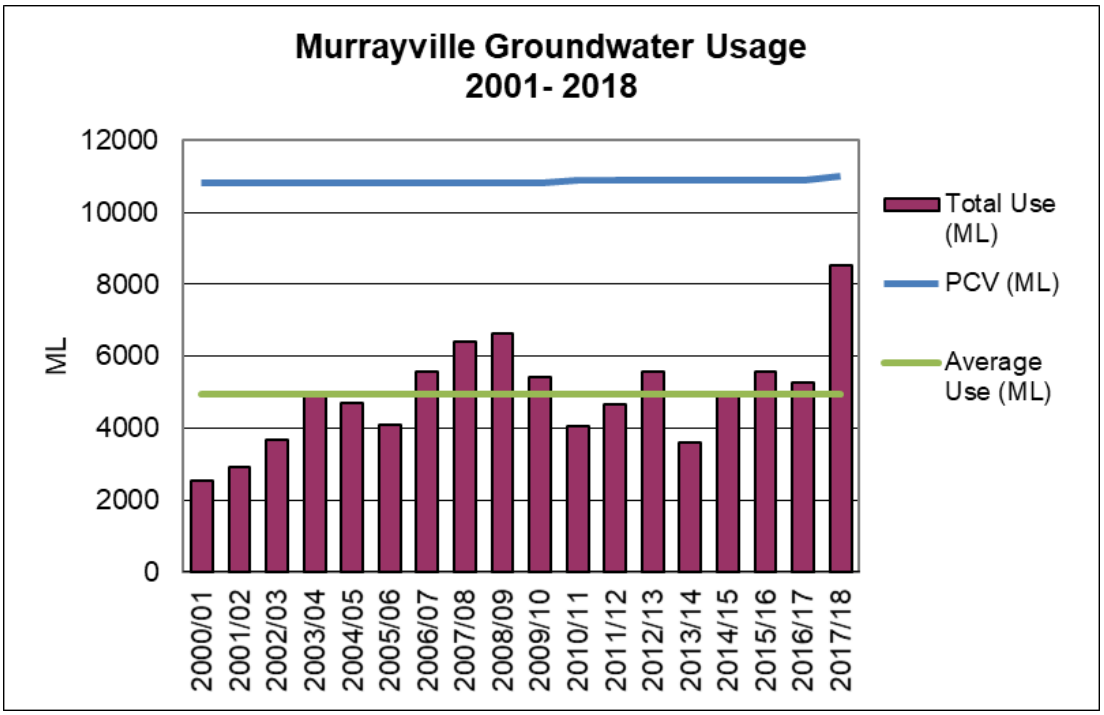


Figure 3 *Actual and average monthly rainfall for Murrayville*

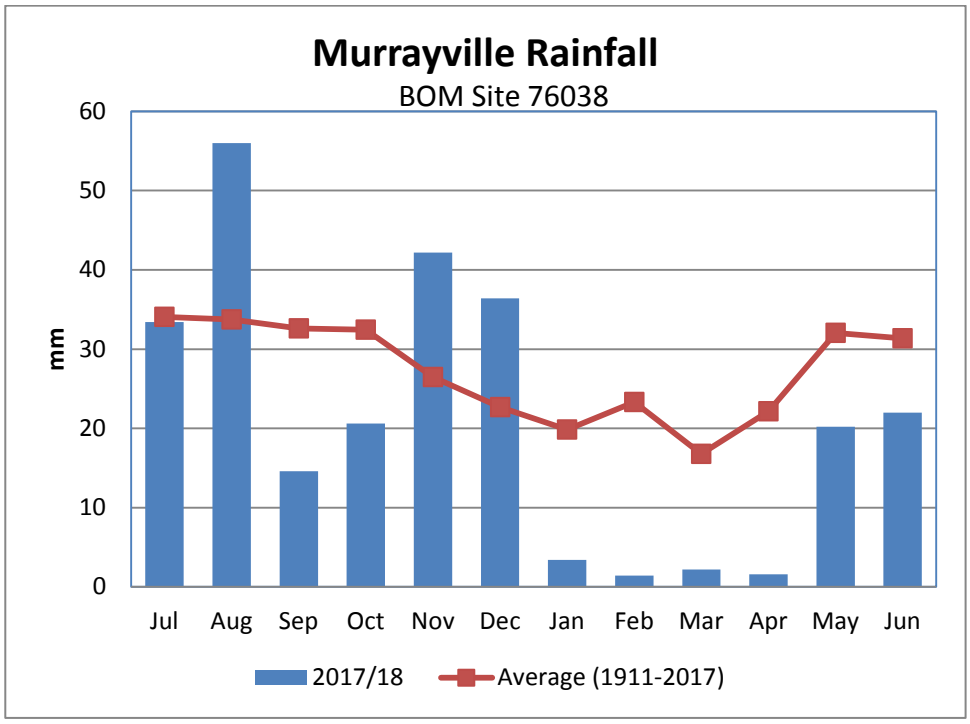


Table 2: *2017/18 Groundwater use by zone*

Zone	Use 2017/18 ML	Zone limit ML
11B	1,062	1,720
10B-1	2,206	2,265
10B-2	1,952*	1,370
10B-3	1,952	2,140
10B-4	510	2,830
Murrayville East	649	2,412
Total	**8,331**	

*Total use was in excess of zone limit. Overuse by more than one licensee was identified in 10B-3

2.3 Accessing additional water - Transfer of entitlement

The particularly dry conditions from January to May had a direct impact on groundwater use. The increased water requirements resulted in a number of licensees obtaining additional water by way of temporary trade from other licensees. Ten temporary trades of licence entitlement occurred in 2017/18.

2.4 Licence Compliance

Through meter reading and compliance checks conducted by GWMWater, a number of potential instances of failure to comply with licence conditions were detected, some of which were resolved prior to the end of the 2017/18 season. Those licensees (three instances) who have been non-compliant with licence conditions (particularly overuse) have been issued with a Notice of Contravention under Section 151 of the *Water Act* by GWMWater. A Notice of Contravention specifies corrective action a licence holder must take, and any applicable timeframes for that action.

2.5 Domestic and stock bores

Landholders can apply for licenses to construct domestic and stock bores via the Victorian Water Register. There were three bore construction licences issued for the construction of new bores in the Murrayville GMA in 2017/18.

2.5.1. Reimbursement for works to D&S bores

There were no instances of landholders seeking reimbursement for the lowering or deepening of domestic and stock pumps, mills or bores in 2017/18.

3. Monitoring Program

3.1 Groundwater quality monitoring

Annual water quality sampling of more than 40 domestic and stock bores located throughout the GMA has been undertaken since 2008. A map illustrating the spot sampling data is illustrated in Appendix 1. Graphs of bores grouped by Parish are also illustrated. The salinity data is loaded into the Victorian Water Measurement Information System (WMIS) and is accessible to the public.

The data indicates that no discernible increase in the salinity level of water in the bores tested.

3.2 Groundwater use monitoring

As discussed in Section 2.2, each commercial and irrigation bore is metered and seasonal use is determined by GWMWater annually in June. In 2017/18 the volume of water extracted in the Murrayville GMA was the greatest recorded since 2001. Zone 10B-4 and Murrayville East were the least active zones.

3.3 Groundwater level monitoring

Water level monitoring is undertaken by contractor Ventia on behalf of the Department of Environment, Land, Water and Planning (DELWP) and GWMWater. Data is transferred to WMIS which can be accessed at http://data.water.vic.gov.au/monitoring.htm. Observation bores are monitored on a quarterly basis. There are also a number of bores that have data loggers installed which can transmit data daily.

A map illustrating the locations of currently monitored observation bores is provided in Appendix 2. This illustrates the geographic extent of monitoring in the GMA, with particular concentration in areas where extraction is more intense.

3.4 Impact of use on observed groundwater levels

In examining the use and the impact on groundwater levels we can only reflect on use in Victoria as use information for over the border in South Australia was unavailable at the time of this report.

Despite the increased drawdown observed in some bores there was no reported impact on domestic and stock bores in 2017/18.

The greatest use was recorded in the Panitya North area (southern area of Zone 10B-1) where 2,015 ML has been extracted (in Victoria) within a 3km radius. There are four key observation bores in the vicinity, with bore 134950 recording the greatest seasonal drawdown of 8.5m, as illustrated in the hydrograph (**10B-3 Border to Mulcra**), this is the largest drawdown level recorded at this site. The hydrograph **10B-1 Panitya North** bores illustrates the groundwater response in the other observation bores in the vicinity of the concentrated area of use, with each bore recording a similar drawdown, although not as great as previously experienced.

Substantial use was recorded north of bore 8003582 where the seasonal drawdown was 6.4m, this level has not been recorded for five years.

Groundwater use in zone 10B-2 has increased this season as compared to previous years with the activation of two additional irrigation bores. The increased use is reflected in the increased seasonal drawdown observed of up to 7.2m in the **10B-2 Goongee** observation bores. If the large seasonal drawdown is sustained in 2018/19 there may be potential for greater drawdown than previously observed.

The impact of extraction over the border in South Australia may be observed in bores in the in the **Manya North** area. In this localised area use was relatively low and irrigation has ceased however, the groundwater levels indicated in the hydrographs for the Manya North observation bores continue to fall. This may be a function of the impact of continuing extraction in South Australia.

3.5 Resource condition threshold

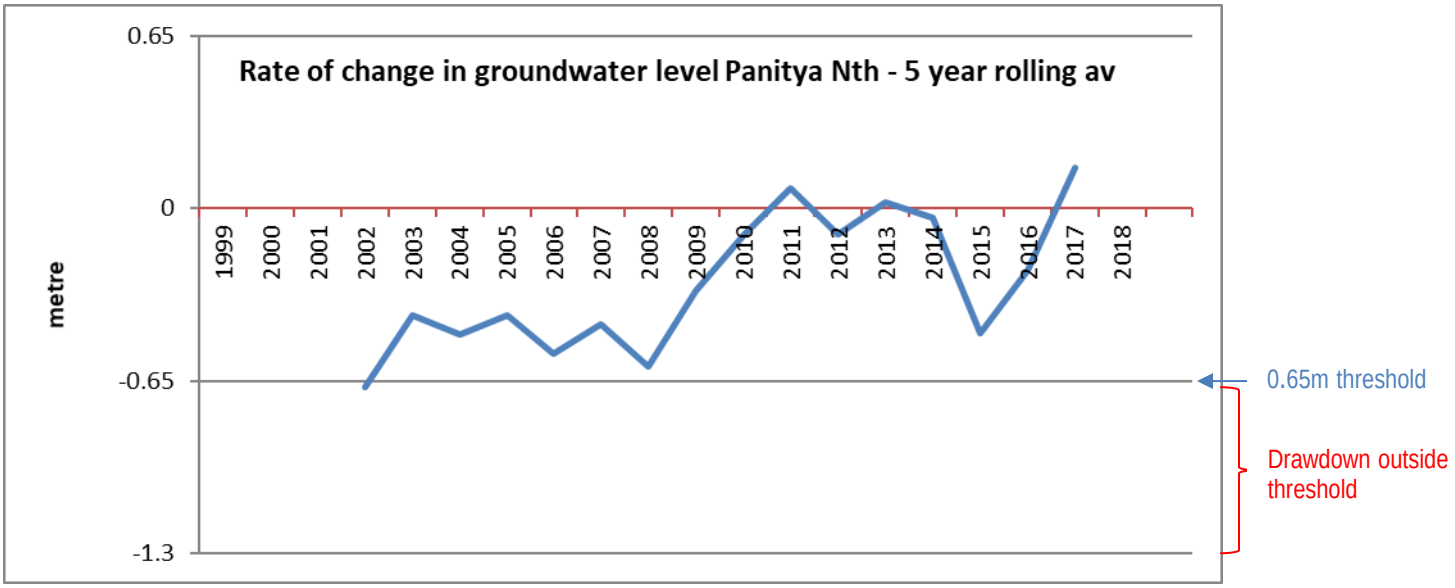
A resource condition threshold of 0.65m per year exists in the Murrayville GMA. This threshold has been established to manage the rate of decline in groundwater level and is calculated using average graphs to represent the average rate of change in groundwater level based on the annual recovery level in a management zone or local area in the four areas:

1. Border to Mulcra (Zone 10B-3)
2. Panitya North (Zone 10B-1)
3. Manya North (Zone 11B)
4. Goongee (Zone 10B-2)

The trigger for management intervention is two successive years of drawdown outside the threshold (based on the five year rolling average). The threshold was not exceeded in any of the bore groups based on the residual groundwater level measured in 2017/18.

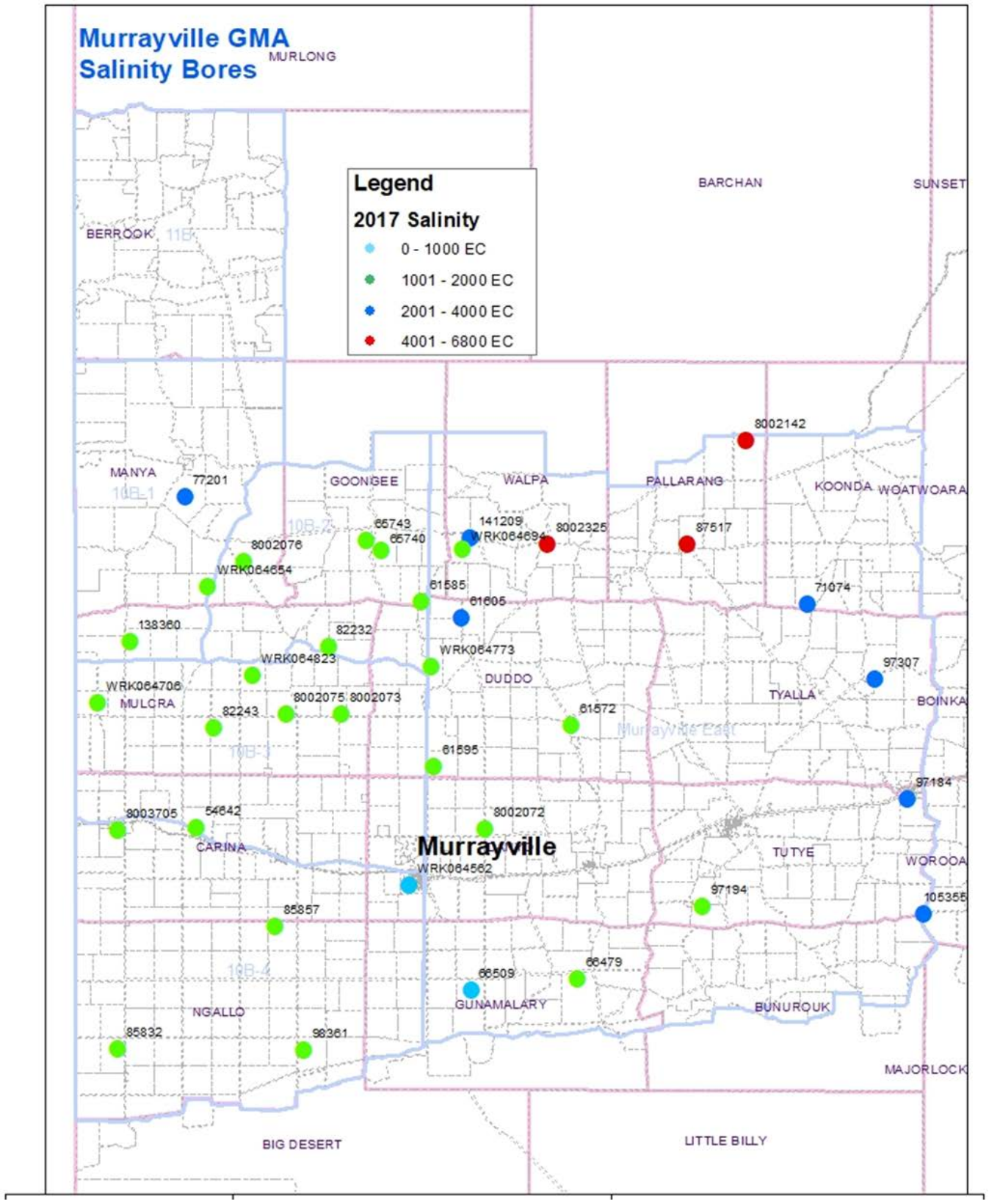
The average graph for Panitya North is illustrated below in Figure 4 as an example, the suite of average graphs is included in Appendix 3.

Figure 4 *Average rate of change in groundwater level Panitya North (Zone 10B-1) Bores*

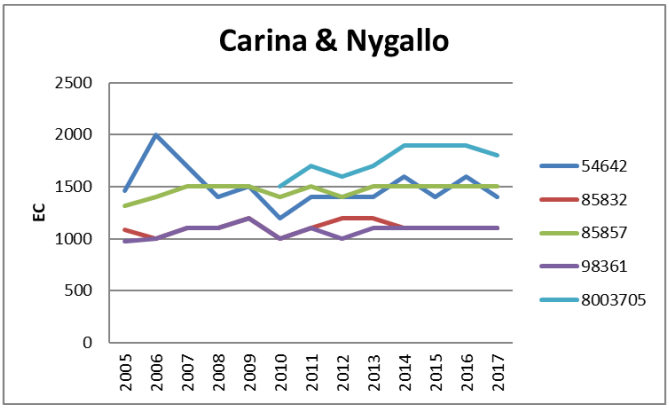


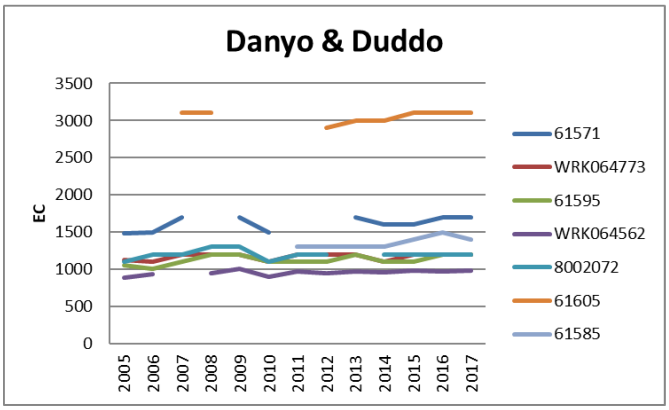
Appendix 1 – Water Quality Monitoring

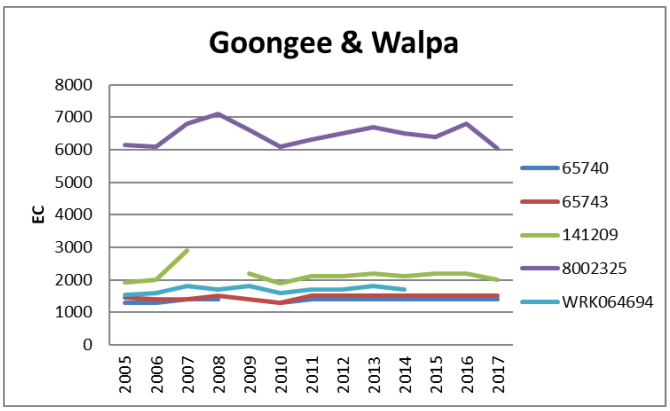
Annual water quality sampling of D&S bores - November 2017

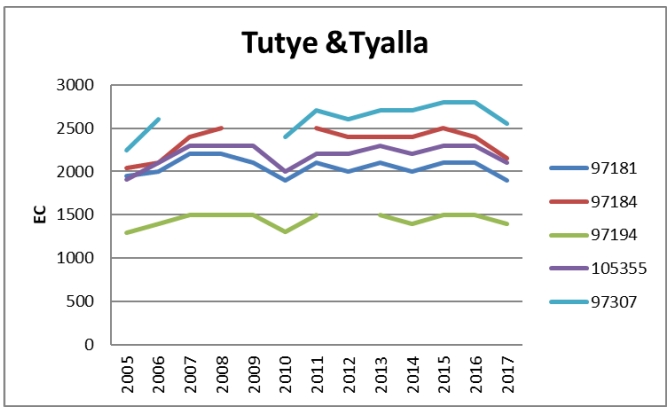


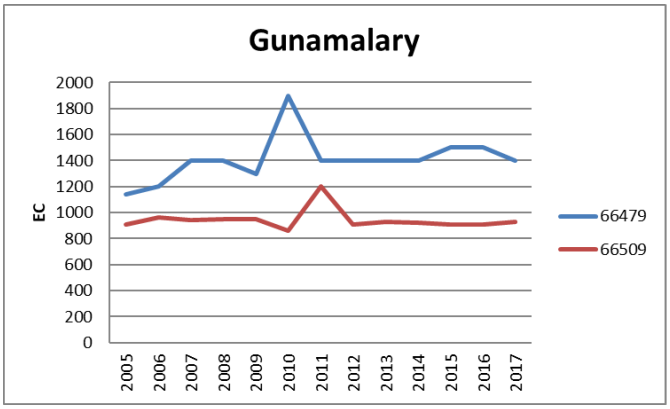
D&S annual sampling salinity data (graphed by parish)

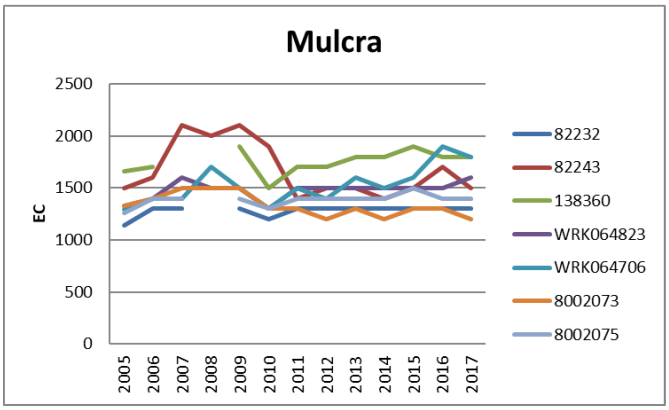


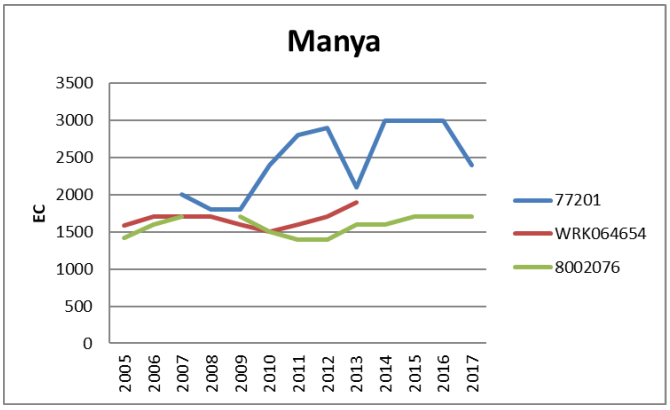


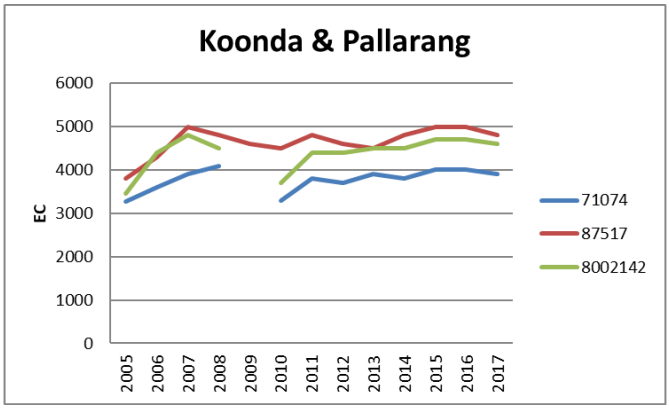




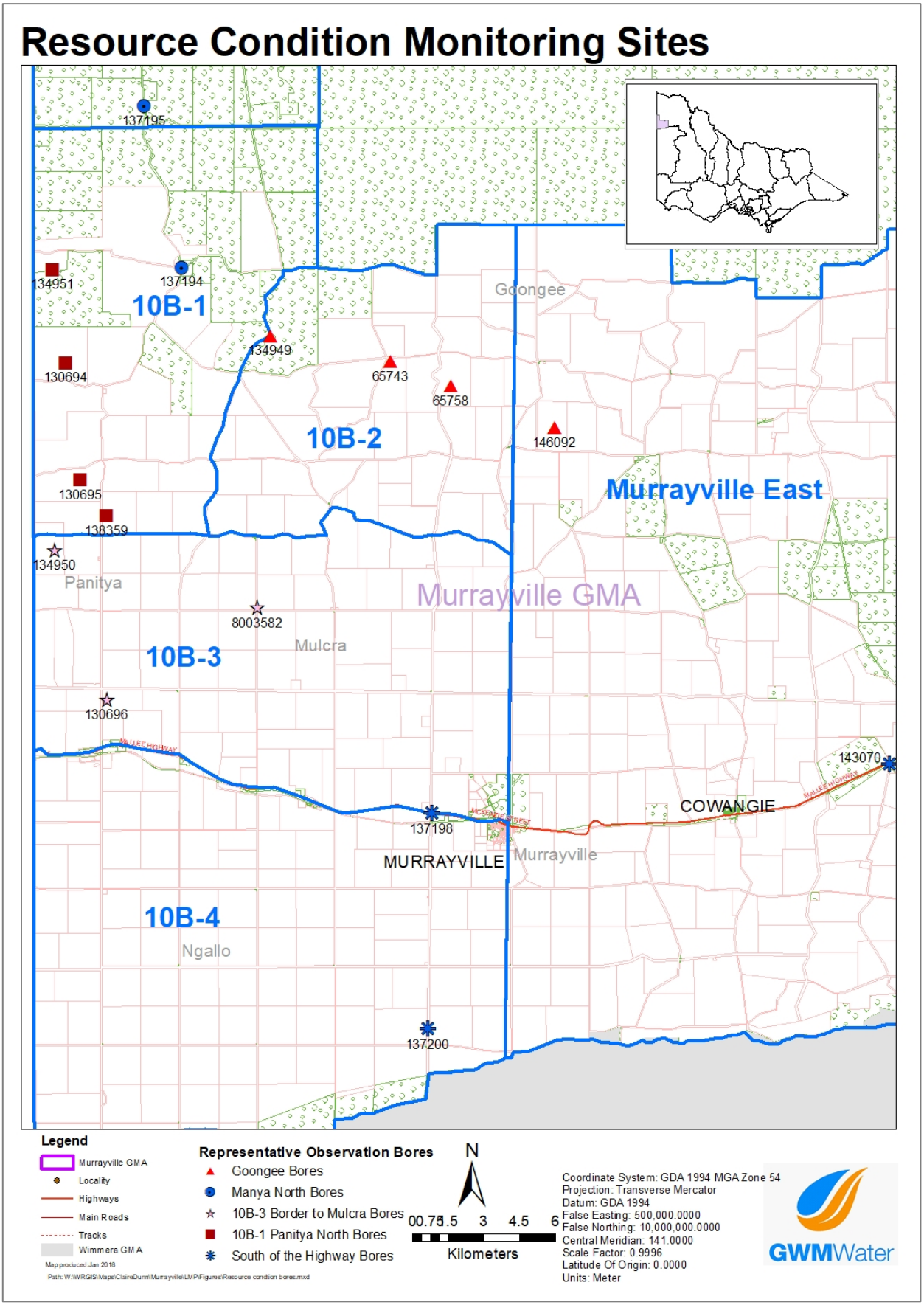




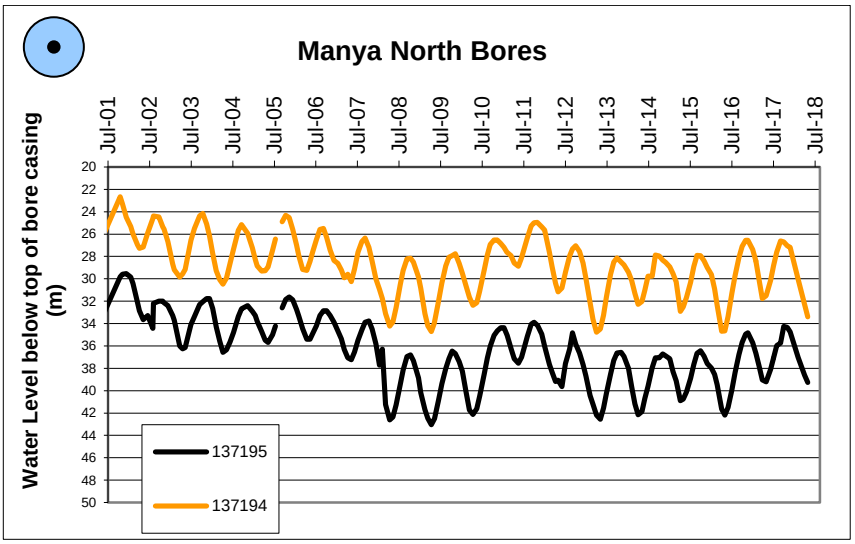


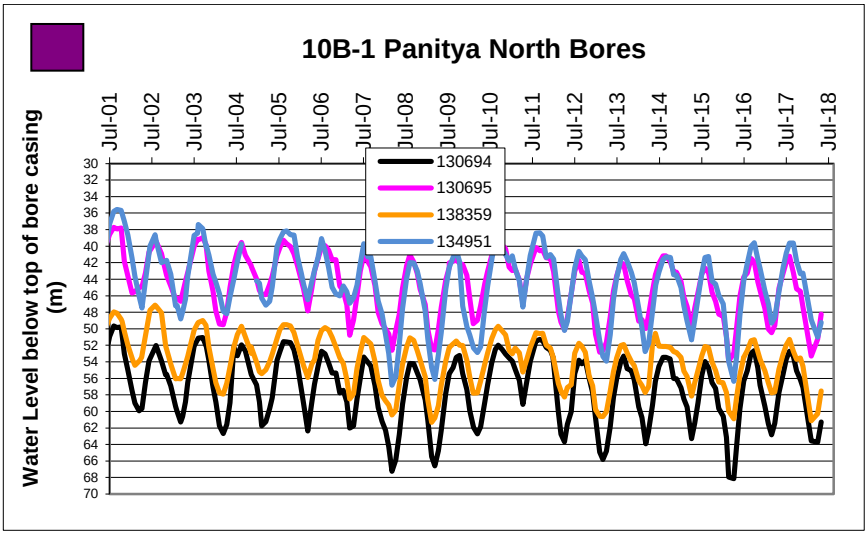


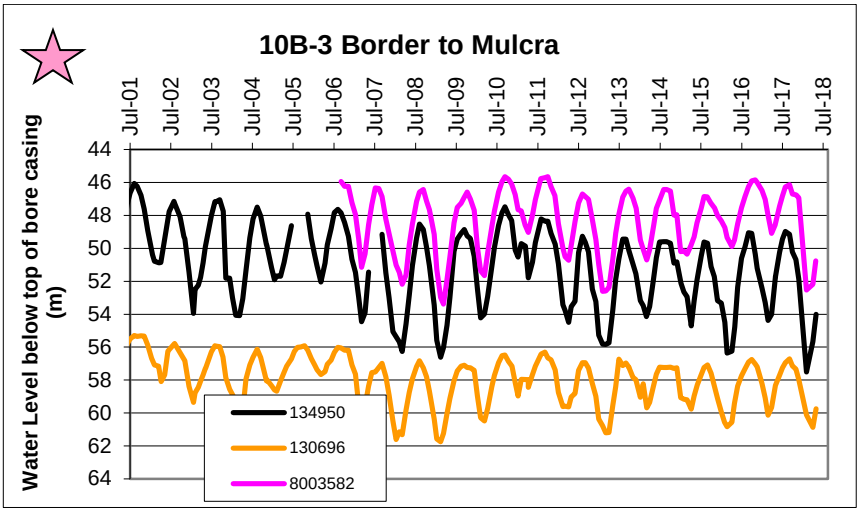
Appendix 2 – Water level monitoring

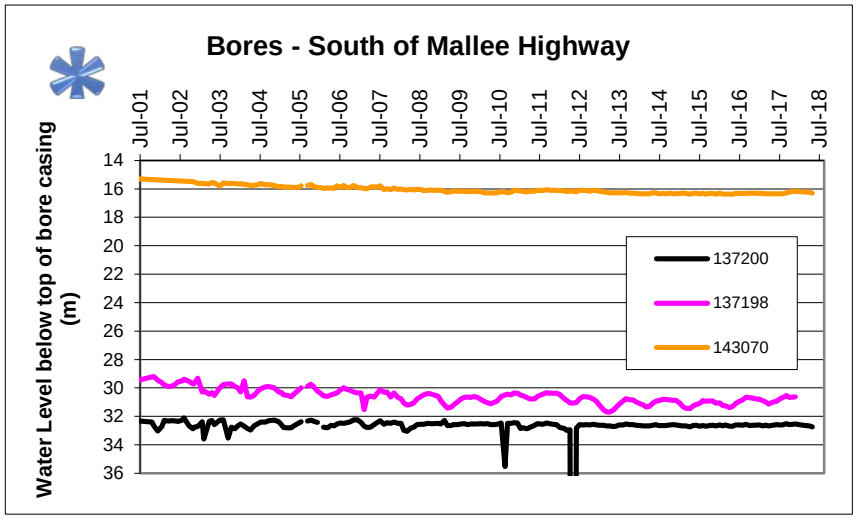


Hydrographs illustrating individual depth to water readings as measured at each observation bore.








Bores - South of Mallee Highway
Water Level below top of bore casing (m)
Jul-01
Jul-02
Jul-03
Jul-04
Jul-05
Jul-06
Jul-07
Jul-08
Jul-09
Jul-10
Jul-11
Jul-12
Jul-13
Jul-14
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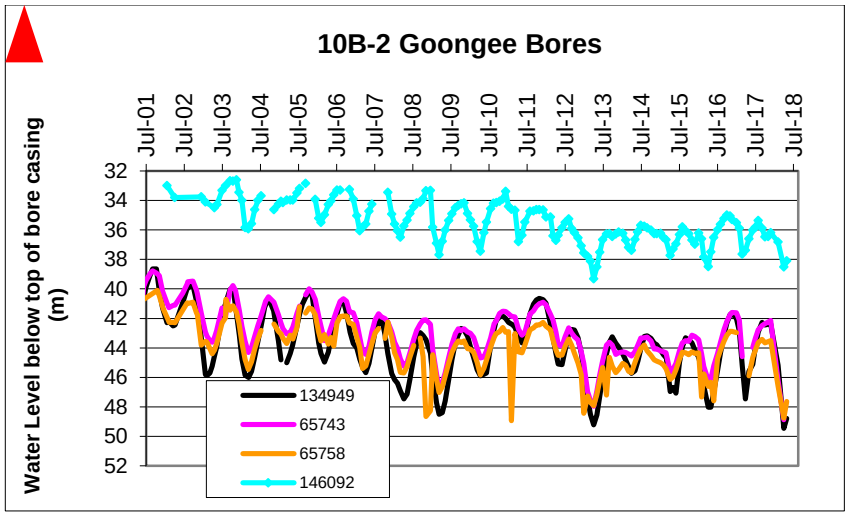
10B-2 Goongee Bores
Water Level below top of bore casing (m)
Jul-01
Jul-02
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Jul-05
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Jul-08
Jul-09
Jul-10
Jul-11
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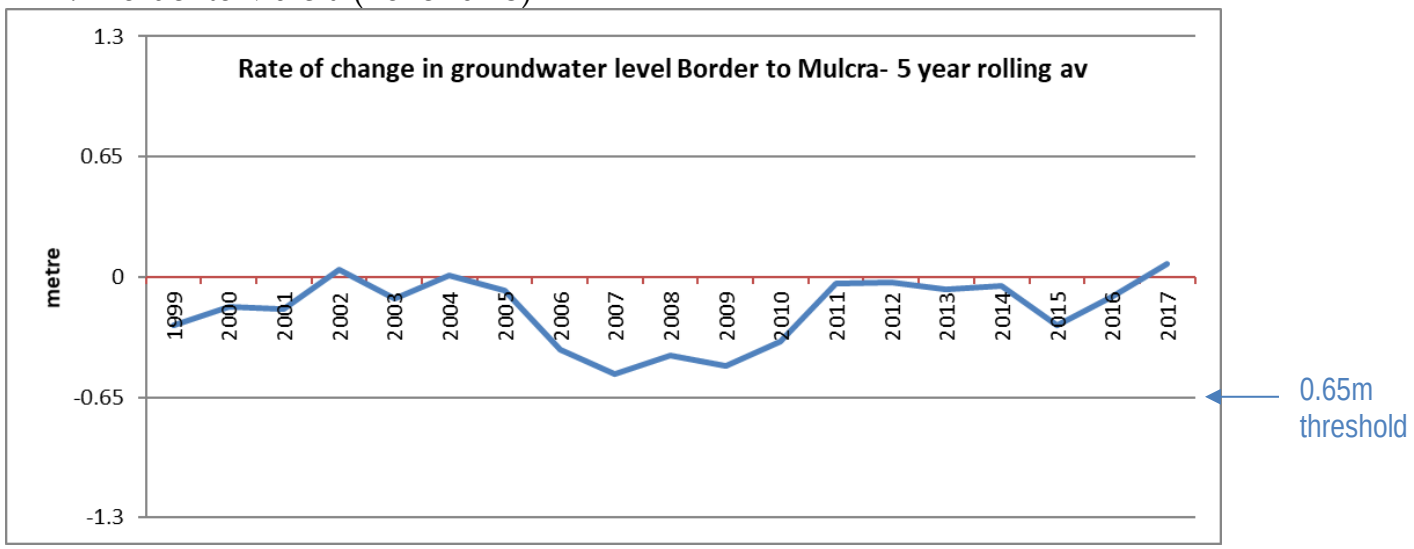
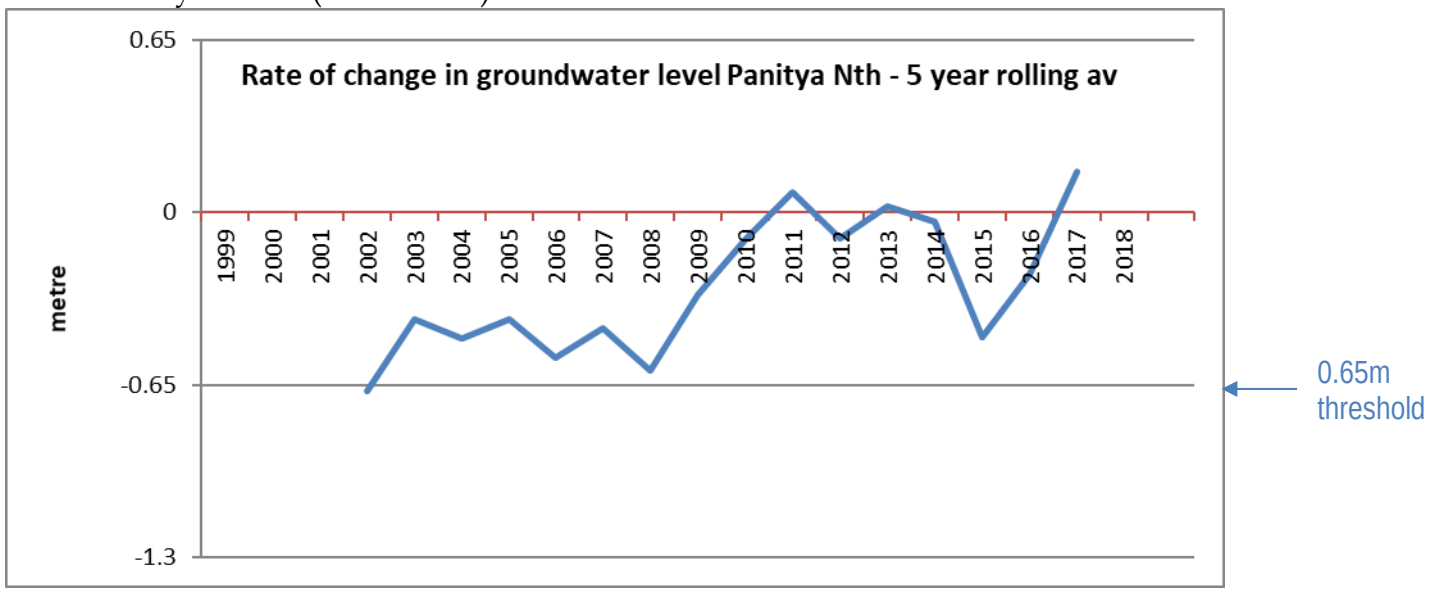
146092

Appendix 3 – Resource condition threshold assessment

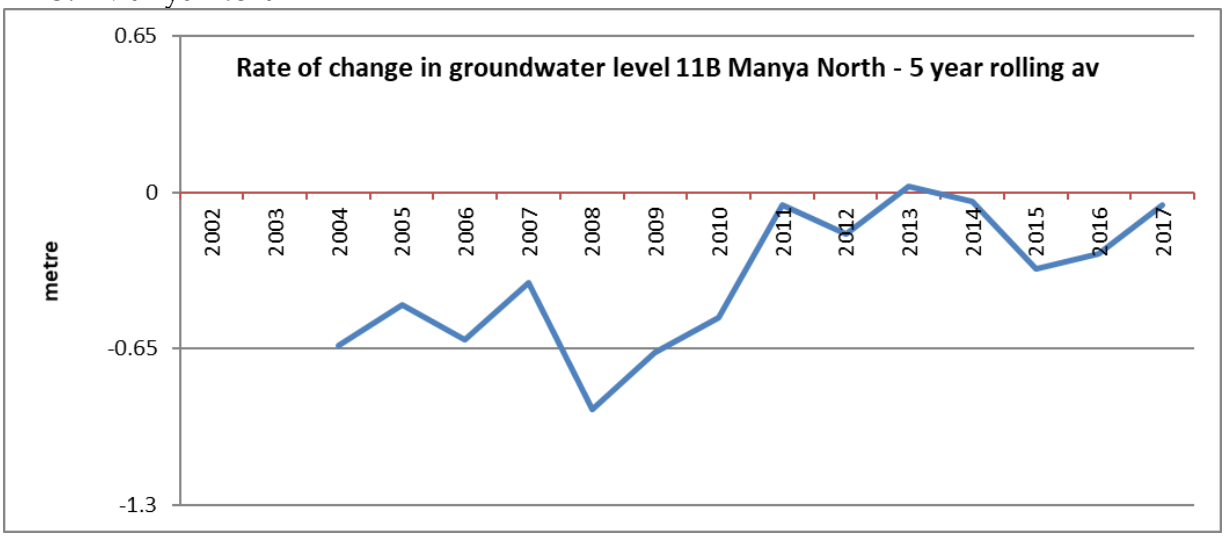
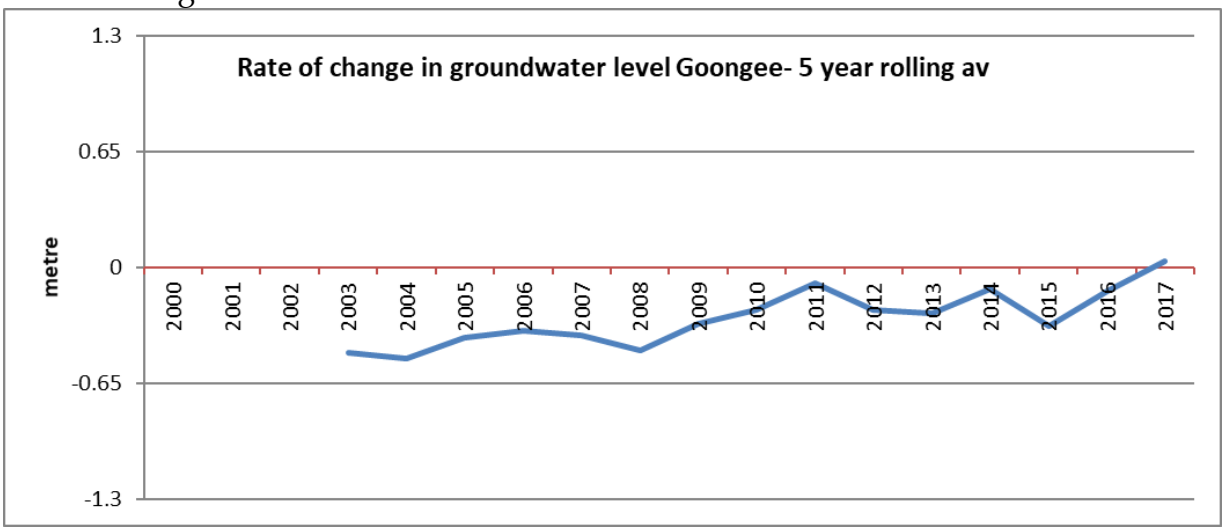
1. Border to Mulcra (Zone 10B-3)



2. Panitya North (Zone 10B-1)



3. Manya North



4. Goongee