Katunga
Water Supply Protection Area
Groundwater Management Plan

Annual Report

For year ending 30 June 2018

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Foreword

Goulburn-Murray Water (GMW) is pleased to present the annual report for the Katunga Water Supply Protection Area Groundwater Management Plan (the Plan) for the 2017/18 water year.

GMW is responsible for implementation and administration of the Plan which was approved by the Minister administering the *Water Act 1989* (the Minister) on 24 July 2006.

This report has been prepared in accordance with section 32C of the *Water Act 1989* (the Act).

The report provides an overview of the groundwater management activities administered under the Plan during the 2017/18 water year.

A copy of this report is available for inspection at the Tatura office of GMW, or for download from the GMW website.

Pat Lennon

MANAGING DIRECTOR

Date 18/09/2018

Executive summary

The Katunga Water Supply Protection Area Groundwater Management Plan (the Plan) was approved on 24 July 2006 by the Minister for Water.

In 2017, a Consultative Committee appointed by the Minister in accordance with section 32G of the *Water Act 1989* (the Act) recommended amendments to the Plan. The Minister approved the amendments on 22 August 2017, including a new method for determining restrictions, simplification of trading rules, salinity monitoring requirements and the establishment of a groundwater reference group.

For the first time since the Plan was implemented in 2006, licence holders had access to 100 per cent of their licensed volume in the 2017/18 water year. This is a result of the implementation of the new restriction method in the amended Plan.

Groundwater use in the 2017/18 water year was 53 per cent (31,973 ML) of the total licensed volume in the Katunga Water Supply Protection Area (WSPA). This is a 16 per cent increase on the 2016/17 water year and is consistent with below-average rainfall during the year.

Groundwater monitoring and metering programmes continue to support the implementation of the Plan.

Groundwater monitoring shows that aquifer recovery levels rose several metres following the end of the extended dry period in 2009. However, the levels are on a declining trend. If groundwater levels continue to decline a reduced allocation may be triggered in future water seasons.

Contents

1 Introduction

1.1 Purpose

This annual report provides an overview of groundwater resource status and use in the Katunga Water Supply Protection Area (WSPA) throughout the 2017/18 water year (1 July 2017 to 30 June 2018).

1.2 Water Supply Protection Area

The Katunga WSPA is located in the Murray and Goulburn valleys, extending from Yarrawonga in the east to Barmah in the west, and from the River Murray in the north down to Wungnhu in the south. The Katunga WSPA includes the townships of Numurkah, Cobram, Nathalia, Katunga and Katamatite.

The Katunga WSPA boundary has been set to manage groundwater resources at a depth of greater than 25 metres (m) below the ground surface. The overlying groundwater resources are managed in accordance with the Shepparton Irrigation Region Groundwater Management Area Local Management Plan.

There are three management zones within the Katunga WSPA: North Western Dryland Zone (1061), Numurkah-Nathalia Zone (1062) and Cobram Zone (1063), as shown in Figure 1.

1.3 Groundwater Management Plan

The Katunga WSPA Groundwater Management Plan (the Plan) was approved on 24 July 2006 by the Minister for Water in accordance with section 32A(6) of the *Water Act 1989* (the Act).

In 2017, a Consultative Committee appointed by the Minister in accordance with section 32G of the Act recommended amendments to the Plan. The Minister approved the amendments on 22 August 2017, including a new method for determining restrictions, simplification of trading rules, salinity monitoring requirements and the establishment of a groundwater reference group.

The objective of the Plan is to make sure that the groundwater resources within the WSPA are managed in an equitable and sustainable manner. Equitable means that everyone is treated fairly. When allocations are made under the Plan, all Katunga WSPA licence holders are treated in the same manner.

The Plan enables annual allocations to be set to manage groundwater extraction. The intent of the annual allocation process is to maintain groundwater access for groundwater users. Goulburn-Murray Water (GMW) has not received any reports of loss of access to groundwater from licensed groundwater users in the Katunga WSPA.

GMW is responsible for the implementation, administration and enforcement of the Plan. An assessment summary of GMW's activities in accordance with Plan prescriptions is presented in Appendix A.

A copy of the Plan can be downloaded from the GMW website: www.gmwater.com.au

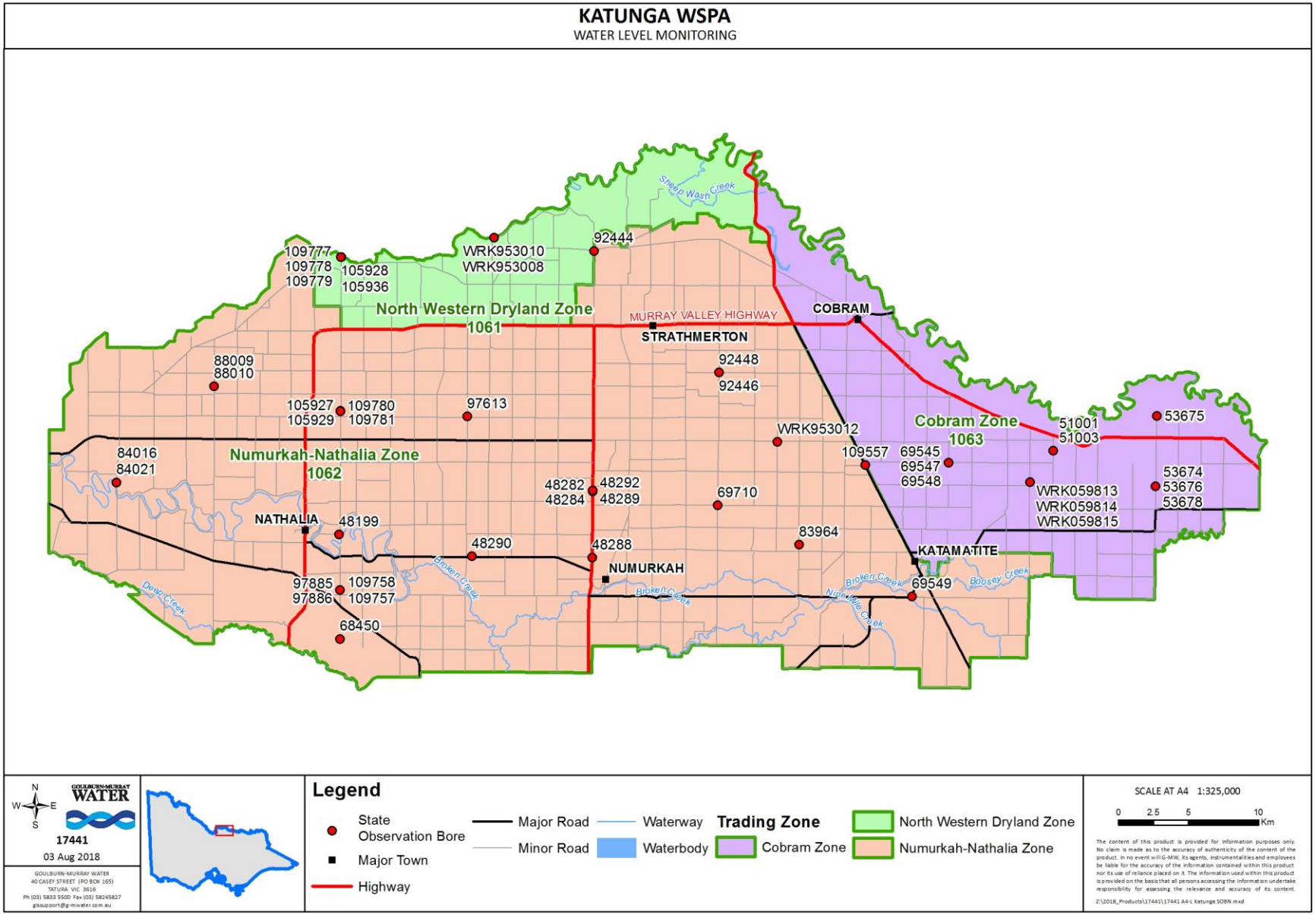


Figure 1 Katunga Water Supply Protection Area

2 Groundwater Management

2.1 Licensed volume

A limit on groundwater licensed volume (known as a Permissible Consumptive Volume) for the Katunga WSPA has been set by the Minister at 60,577 megalitres per year (ML/year).

The total groundwater licensed volume in the Katunga WSPA was 60,218.9 ML/year at 30 June 2018. The number of licences in each management zone is summarised in Table 1 along with the total number of licensed bores and total licensed volume.

Table 1 Groundwater licensed volume in the Katunga WSPA in 2017/18

Management zone	Licences	Licensed bores	Licensed volume (ML/year)
Northwest Dryland Zone – 1061	20	21	4,937.2
Numurkah-Nathalia Zone – 1062	165	188	34,590.7
Cobram Zone – 1063	64	80	20,691.0
Total	**249**	**289**	**60,218.9**

Note: Data extracted from the Victorian Water Register 2 July 2018.

2.2 Groundwater allocations

Allocations were assessed in accordance with the original Plan and announced on 14 July 2017. If the five year rolling average use in Katunga WSPA was less than 30,000 ML/year, allocations would be 70 per cent; if it was more than 30,000 ML/year the allocation would be 50 per cent. The five year rolling average use to 2016/17 was 26,219 ML (Figure 2), leading to an allocation of 70 per cent for 2017/18.

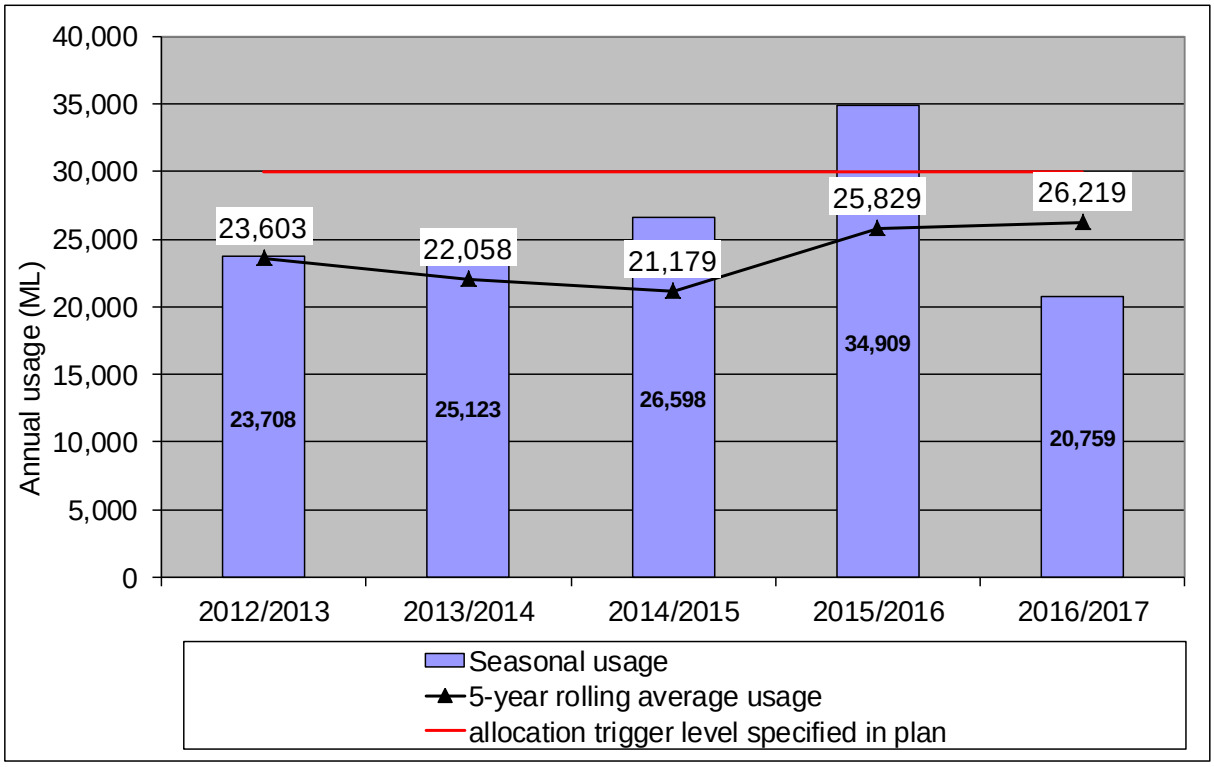


Figure 2 Annual use and five year rolling average use – used for allocations in the Katunga WSPA

All licence holders were informed of the initial allocation by mail posted on 14 July 2017. Public notices announcing the allocation were published in the *Shepparton News* on 18 July 2017; *Numurkah Leader*, *Cobram Courier* and *Yarrawonga Chronicle* on 19 July and the *Country News* on 25 July 2017.

Following the approval of the amended Plan by the Minister on 22 August 2017, allocations were reassessed using the amended allocation method.

Revised allocations were assessed by determining the rolling average of the maximum groundwater recovery levels from the previous five irrigation seasons for bores listed in Schedule 1 of the Plan (Prescription 2). The allocation announced was based on the trigger levels in Table 2.

Table 2 Trigger levels for allocations in the Katunga WSPA

Trigger level depth below natural surface (m)	Allocation
21.0 and above	100%
21.1 to 24.0	70%
Below 24.1	70% and review undertaken by GMW in consultation with Katunga Groundwater Reference Group

The rolling average recovery level for the previous five seasons was above 21.0 m (Figure 3) and the Katunga WSPA allocation was revised to 100 per cent for the 2017/18 season on 29 August 2017.

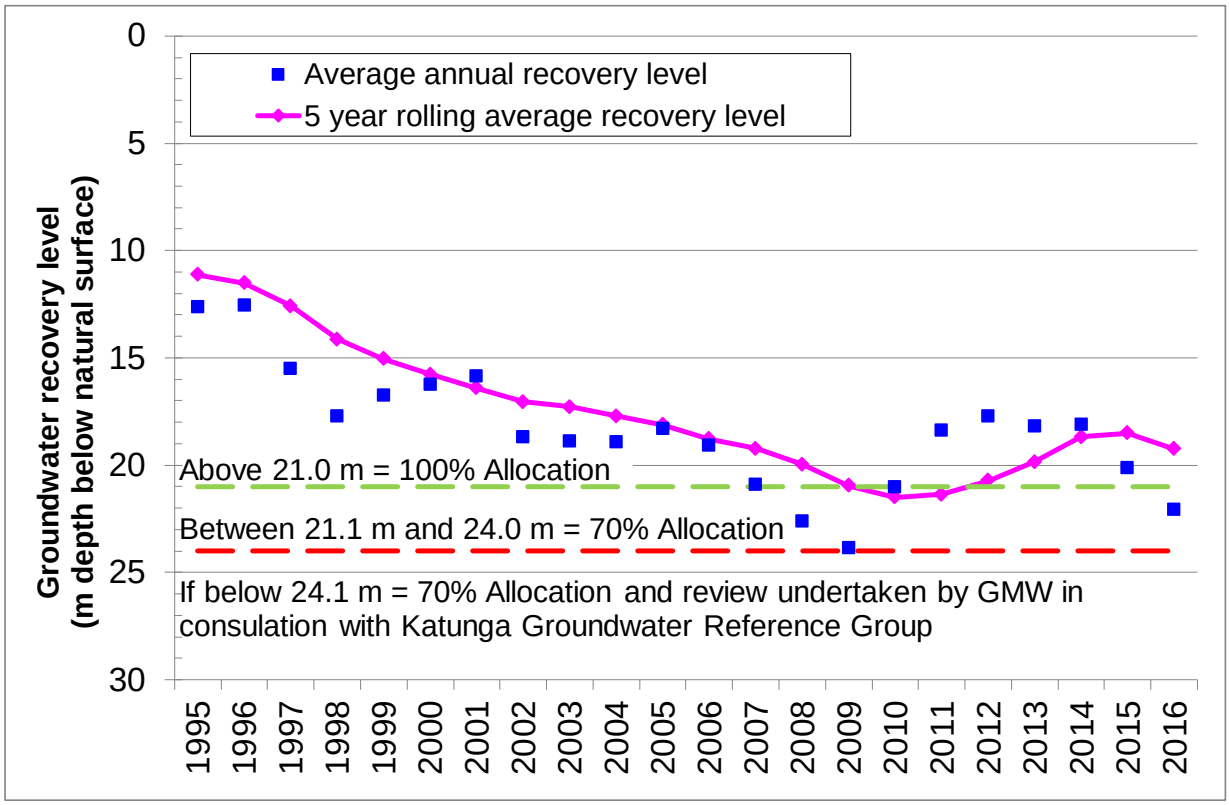


Figure 3 Trigger levels for groundwater allocations in the Katunga WSPA

Public notices announcing the revised 2017/18 allocation were printed in the *Shepparton News* and *Country News* on 29 August 2017. All licence holders were informed by mail posted on 31 August 2017. The revised allocation was also published on the GMW website.

The total licence volumes allocated in each management zone in 2017/18 are provided in Table 3.

Table 3 Total allocated licenced volumes in 2017/18 by management zone in the Katunga WSPA

Management zone	Licensed volume (ML/year)[1]	Total allocation (ML)[2]
Northwest Dryland Zone – 1061	4,937.2	4,922.2
Numurkah-Nathalia Zone – 1062	34,590.7	34,606.7
Cobram Zone – 1063	20,691.0	20,690.0
Total	**60,218.9**	**60,218.9**

Note: Data extracted from the Victorian Water Register on 7 August 2018.
[1]Licensed volume in zones differs from licensed volumes in total allocation column due to trading activity
[2]Allocation at the start of the 2016/17 water year

2.3 Groundwater use

Total recorded use in 2017/18 was 31,973.2 ML; 53 per cent of total licensed volume (Figure 4). This is a 16 per cent increase on the volume used in 2016/17. This increased use is likely due to the below-average rainfall conditions experienced in 2017/18.

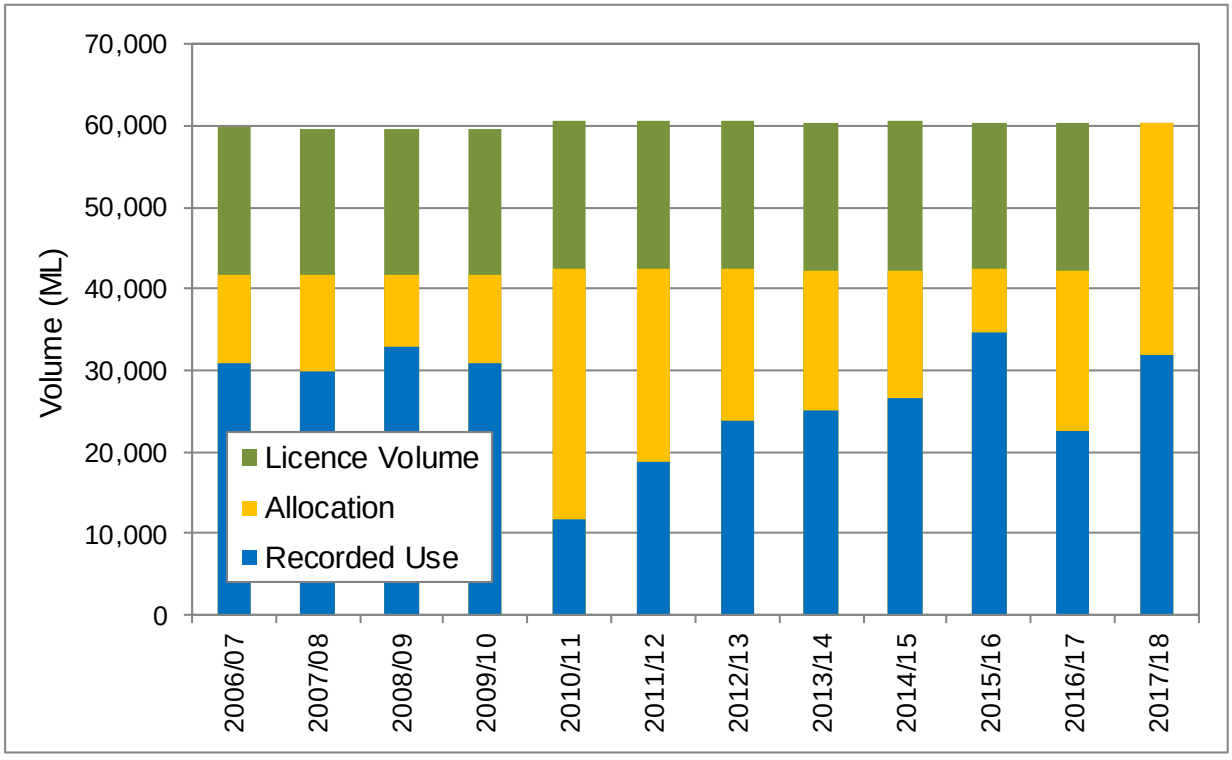


Figure 4 Total licensed volume, allocation and recorded use in the Katunga WSPA

Recorded use by management zone is provided in Table 4. Recorded use as a percentage of total licensed volume was greatest in the Northwest Dryland Zone, 69 per cent; and lowest in the Numurkah-Nathalia Zone, 47 per cent.

Table 4 Recorded use by Katunga WSPA management zone in 2017/18

Management zone	Licensed volume (ML/year)[1]	Recorded use (ML)	Proportion of total licensed volume used
Northwest Dryland Zone – 1061	4,937.2	3,397.8	69%
Numurkah-Nathalia Zone – 1062	34,590.7	16,294.0	47%
Cobram Zone – 1063	20,691.0	12,281.4	59%
Total	**60,218.9**	**31,973.2**	**53%**

Note: Data extracted from the Victorian Water Register on 7 August 2018.

Groundwater use in the Katunga WSPA is heavily influenced by climate and the availability of surface water for irrigation. Groundwater use increases during extended periods of dry weather and when surface water allocations are reduced.

2.4 Rainfall

Historical rainfall data sourced from the Bureau of Meteorology (BoM) weather station at Cobram is presented in Figure 5 as an indicator of trends across the Katunga WSPA.

The data show that annual rainfall in 2017/18 in the Katunga WSPA was less than average. This may explain the increase in use compared to 2016/17, which was wetter than average.

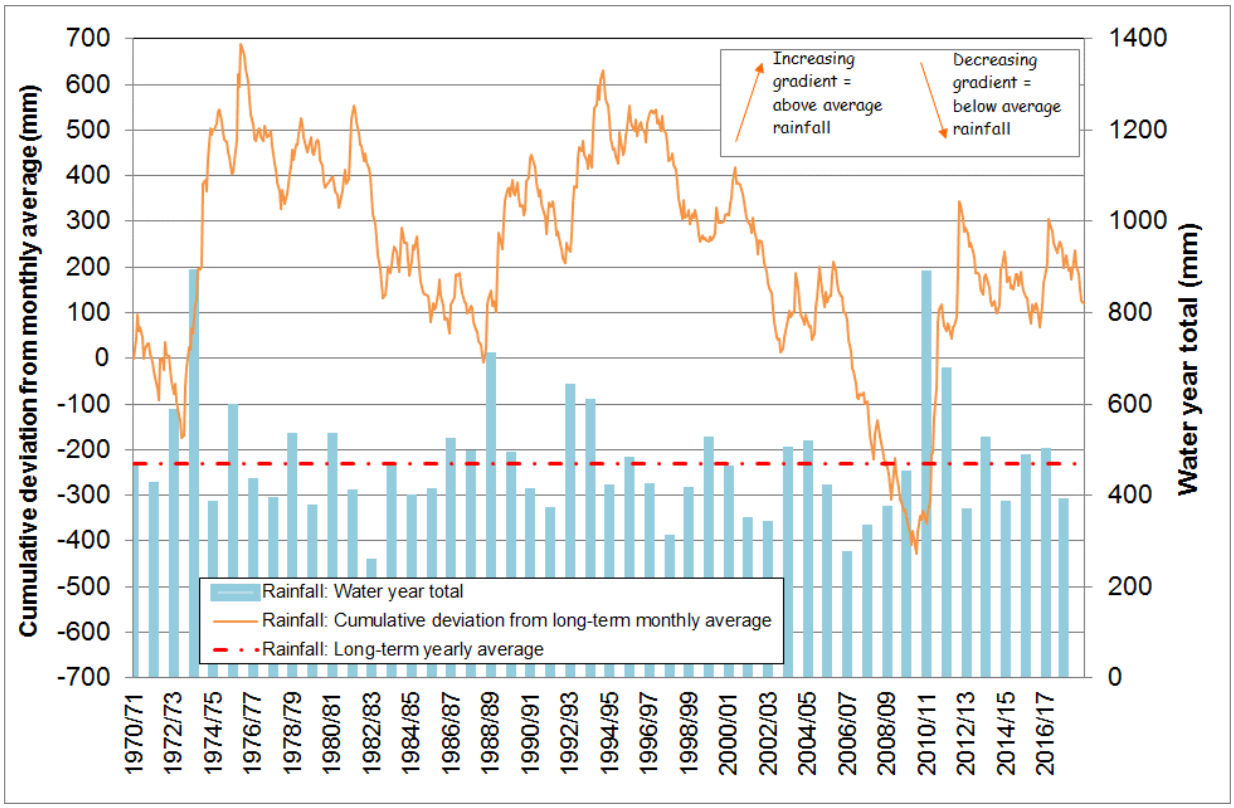


Figure 5 Rainfall recorded at Cobram (BoM station 080109) in the Katunga WSPA

2.5 Licence transfers

The Plan allows groundwater licence holders to temporarily or permanently transfer licensed volume. Groundwater licence transfer activity during 2017/18 is summarised in Table 5.

Whilst more trades occurred than the previous season, the total volume traded and number of trades undertaken is low compared to previous seasons since the Plan was implemented in 2006 (Figure). For example, in 2015/16 there were 25 trades undertaken and a total volume of more than 3,500 ML was traded

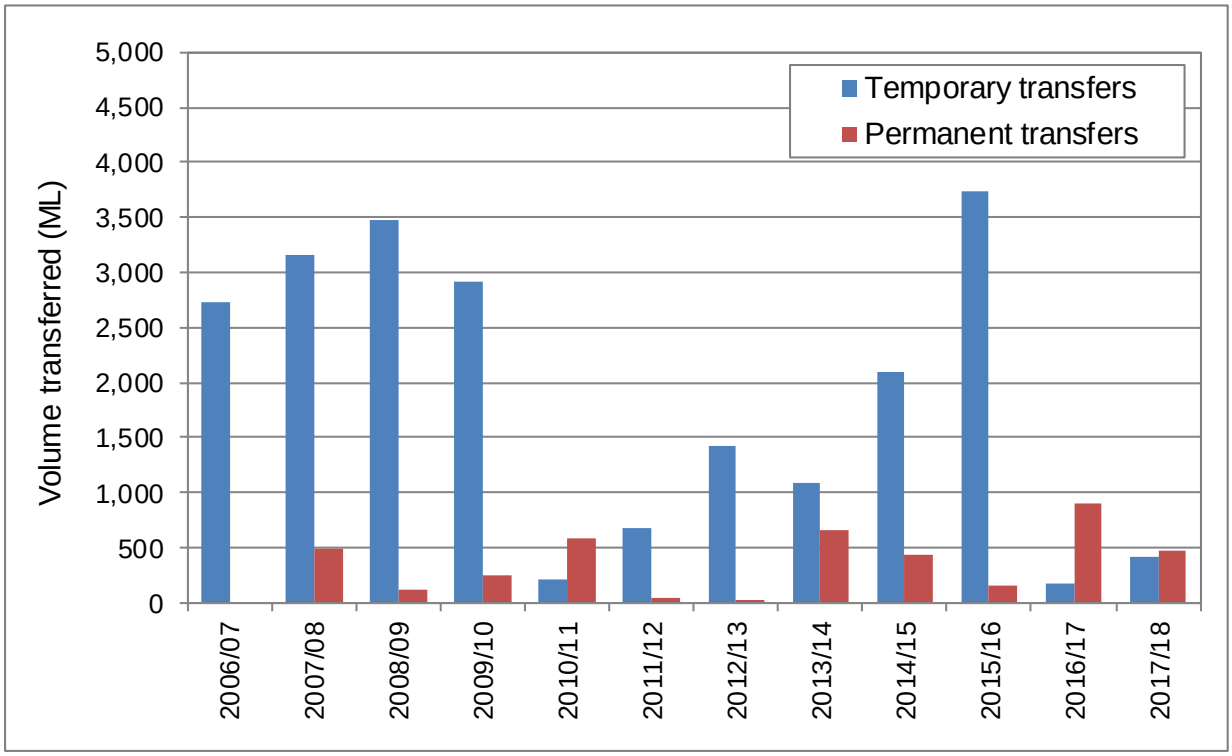


Figure Total licensed volumes transferred in the Katunga WSPA

The 2017 amendments to the Plan relaxed trading rules by allowing new development through temporary trade and removing the 20 per cent loss for permanent trades.

Table 5 Licence transfers in the Katunga WSPA in 2017/18

Management zone	Temporary transfers				Permanent transfers			
	Transfer from		Transfer to		Transfer from		Transfer to	
	No. of transfers	Volume (ML)	No. of transfers	Volume (ML)	No. of transfers	Volume (ML)	No. of transfers	Volume (ML)
Northwest Dryland Zone – 1061	0	0.0	0	0.0	0	0.0	1	15.0
Numurkah-Nathalia Zone – 1062	3	98.0	3	98.0	5	465.0	3	449.0
Cobram Zone – 1063	2	319	2	319.0	1	1.0	2	2.0
Total	**5**	**417.0**	**5**	**417.0**	**6**	**466.0**	**6**	**466.0**

During 2017/18, five more trades occurred than in 2016/17. However, the total volume transferred decreased from 1,075.0 ML to 883 ML. All transfers occurred within the Katunga WSPA and no licences were transferred into or out of the Katunga WSPA.

During 2017/18 there were six permanent transfers totalling 466.0 ML, around half the volume permanently transferred in 2016/17 (down from 910.0 ML).

Five temporary transfers totalling 417.0 ML occurred in 2017/18, an increase in volume compared to 2016/17 when 165.0 ML was transferred temporarily.

2.6 Metering

There were 179 active metered service points in in the Katunga WSPA as of 30 June 2018. All meters were read twice during 2017/18. Of these meters, 104 were inspected during 2017/18, 75 underwent maintenance and two were replaced (Table 6).

Table 6 Metering activity in the Katunga WSPA in 2017/18

Metering activity	Year ending 30 June 2018
Total number of meters	179
Total number of meter reads	358
Meters installed or replaced	2
Meters inspection events	104
Meter maintenance events	75

2.7 Licence compliance

There were no prosecutions or convictions relating to groundwater matters in the Katunga WSPA during the 2017/18 water year.

There were five instances of unauthorised take and use of groundwater above licensed volume identified in 2017/18. These incidents have been investigated and GMW has taken action in accordance with the National Framework for Compliance and Enforcement of Systems for Water Resource Management (DSEWPC, 2012).

2.8 Domestic and stock bore licences

Domestic and stock use is not required to be licensed, as it is a private right under section 8 of the Act.

The installation of a bore for domestic and stock use requires a bore construction licence. Upon completion of a bore, a bore completion report (BCR) is required to be submitted to GMW; details from this report are documented in the Water Measurement Information System at http://data.water.vic.gov.au/monitoring.htm

During the 2017/18 water year in the Katunga WSPA, 44 licences to construct a bore for domestic and stock use were issued by GMW and the Victorian Water Register (combined).

3 Monitoring Program

3.1 Groundwater levels

The Plan requires that groundwater levels are monitored in seven State Observation Bores Network bores, specified in Schedule 1 of the Plan.

State observation bores routinely monitored during the 2017/18 water year located in the Katunga WSPA are shown in Figure 1.

Groundwater level monitoring indicates that Deep Lead (comprising Calivil Formation and lower Shepparton Formation) groundwater levels have steadily declined as groundwater development increased from 1990 onwards, as represented by historical water levels in three nested bores on Langan Road in Katamatite (Figure 6).

This hydrograph also shows strong seasonal variation in response to pumping. Following above-average rainfall in 2010/11 and 2011/12, aquifer recovery levels increased by 6.1 m over two years and have slightly declined again since then (0.5 m over five years).

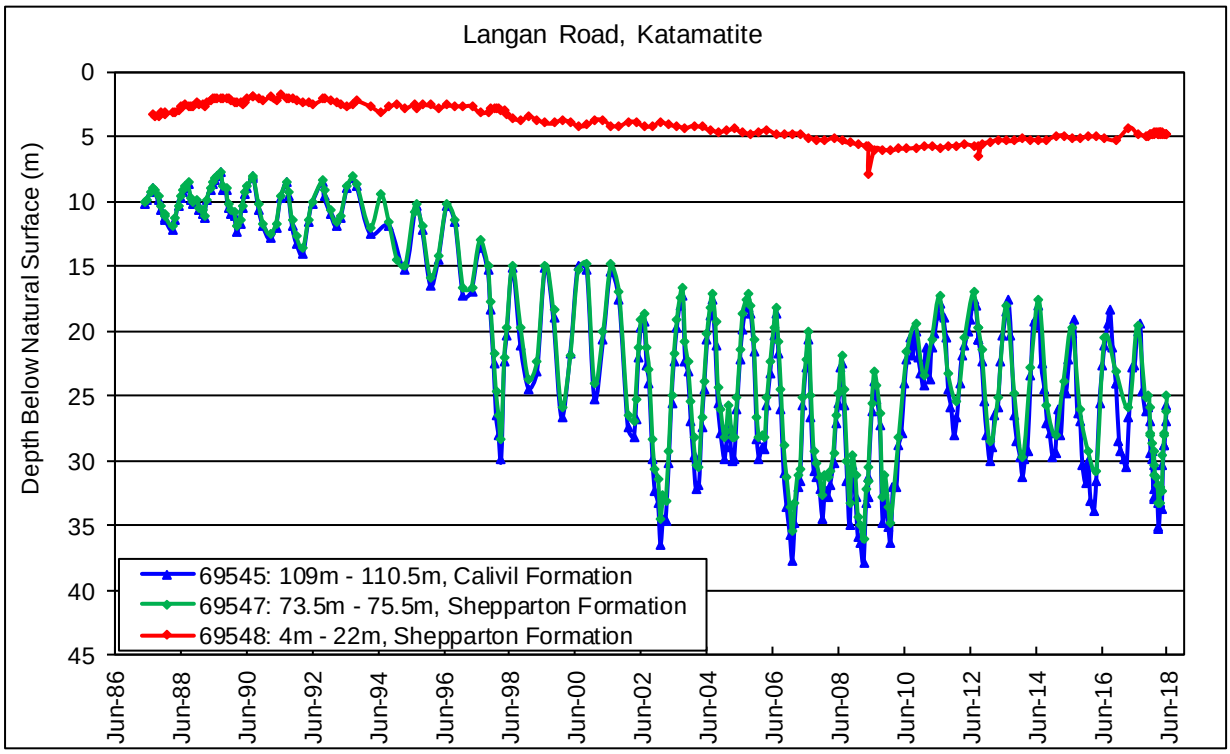


Figure 6 Groundwater monitoring in the Cobram zone in the Katunga WSPA

3.2 Groundwater quality

The amended Plan requires GMW to sample bores specified in Schedule 1 of the Plan and have samples analysed for salinity once a year (Prescription 5). Locations of bores sampled are shown in Figure 1. Salinity measured in these bores is uploaded to the State groundwater database, the Water Management Information System. Sampling results are provided in Table 7.

Table 7 Results from groundwater quality sampling in March 2018 in the Katunga WSPA

Management Zone	Location	Bore ID	Screened interval (m below natural surface)	Aquifer screened	Electrical Conductivity (µS/cm)
North Western Dryland Zone - 1061	River Road, Barmah National Park	WRK953007	84.0 – 90.0	Calivil Formation	600
		WRK953008	36.0 – 39.0	Shepparton Formation	620
Numurkah-Nathalia Zone - 1062	Goulburn Valley Highway, Numurkah	48281	108.8 – 116.1	Calivil Formation	2,900
		48288	10.0 – 16.0	Shepparton Formation	3,200
	James Bridge Road, Picola	84016	129.0 – 146.0	Calivil Formation	8,600
		84021	4.5m – 14.5	Shepparton Formation	28,000
Cobram Zone - 1063	Langan Road, Katamatite	69545	109.0 – 110.5	Calivil Formation	970
		69547	73.5 – 75.5	Lower Shepparton Formation	290
		69548	4m – 22m	Shepparton Formation	720

Additionally, the amended Plan requires GMW to provide a sample bottle to any groundwater user in Katunga WSPA who requests one and to test the salinity level of returned samples. In 2017/18 one licence holder requested a sample to be tested in the Katunga WSPA. A sample bottle was provided to this licence holder and the sample was analysed by GMW for salinity.

Domestic and stock groundwater users are also encouraged to submit a salinity sample from their groundwater bore. In accordance with the Plan, a user must contact GMW to register interest to be supplied with a sample bottle.

4 Future Management Considerations

4.1 Groundwater Reference Group

One of the amendments to the Plan approved by the Minister for Water required the appointment of a Groundwater Reference Group to:

- Consult on groundwater allocations if the rolling average of the maximum annual groundwater recovery levels from the previous five irrigation seasons for bores listed in Schedule 1 fall below 24.1 m depth below natural surface (Prescription 2).
- Present annual report findings each year and discuss any need to review the Plan.

GMW has recently appointed a Groundwater Reference Group comprising landholders and representatives from GMW, Goulburn Valley Water and the Goulburn Broken Catchment Management Authority. GMW will meet with the Groundwater Reference Group at least annually for the next five years.

4.2 Management Plan review

The Plan was reviewed in 2011/12. The Plan will be due for review in 2022.

5 References

Australian Government Department of Sustainability, Environment, Water, Population and Communities, 2012. National Framework for Compliance and Enforcement of Systems for Water Resource Management. [WWW document] http://www.environment.gov.au/system/files/resources/d4367a3b-28a9-430d-a869-2effbda8a447/files/ris-water-compliance-enforcement.pdf

Department of Environment, Land, Water and Planning, 2006. *Groundwater Management Plan for the Katunga Water Supply Protection Area.* Department of Environment, Land, Water and Planning, 2006.

Appendix A – Assessment of activities against Plan prescriptions

<table>
<tr><th>Prescription</th><th>Activity</th><th>Compliant</th></tr>
<tr><td colspan="3">PRESCRIPTION 1 Limit on groundwater licences</td></tr>
<tr><td>GMW must not approve an application for a groundwater licence if the approval of the application would cause:
a) the total licensed volume within a 2 km radius of the proposed extraction site exceeding 3,700 ML/year; or
b) the following zone limits to be exceeded.
<table>
<tr><th>Management zone</th><th>Zone limit (ML/year)</th></tr>
<tr><td>North Western Dryland Zone (1061)</td><td>6,500</td></tr>
<tr><td>Numurkah-Nathalia Zone (1062)</td><td>No limit</td></tr>
<tr><td>Cobram Zone (1063)</td><td>25,000</td></tr>
</table>
</td><td></td><td>Yes</td></tr>
<tr><td colspan="3">PRESCRIPTION 2: Restrictions on taking groundwater</td></tr>
<tr><td>By 15 September 2017, and by 1 July each year thereafter GMW will:
a) determine the rolling average of the maximum annual groundwater recovery levels from the preceding five irrigation seasons for bores listed in Schedule 1 and announce a corresponding allocation for the subsequent irrigation season as detailed below:
<table>
<tr><th>Trigger level depth below natural surface (m)</th><th>Allocation</th></tr>
<tr><td>21.0 and above</td><td>100%</td></tr>
<tr><td>21.1 to 24.0</td><td>70%</td></tr>
<tr><td>Below 24.1</td><td>70% and review undertaken by GMW in consultation with Katunga Groundwater Reference Group</td></tr>
</table>
b) Announce allocations by listing them on its website, sending letters to all licence holders and placing public notices in local newspapers</td><td>a) Allocations were initially determined in accordance with the original Plan and a 70 per cent allocation was announced on 14 July 2017.
Following approval of Plan amendments, the allocation was reassessed in accordance with the amended methodology. The revised allocation of 100 per cent was announced for the 2017/18 season on 29 August 2017.
b) Public notices announcing the revised 2017/18 allocation were printed in the Shepparton News and Country News on 29 August 2017. All licence holders were informed by mail posted on 31 August 2017. Allocation information was also published on the GMW website.</td><td>Yes</td></tr>
</table>

PRESCRIPTION 3 Transfer of a groundwater licence		
3.1 GMW may approve a permanent transfer of a groundwater licence provided relevant matters have been considered and: a) zone limits in Prescription 1 will not be exceeded; and b) the total licensed volume within 2 km of an applicant's bore will be less than 3,700 ML/year; or c) where the total licensed volume within 2 km of an applicant's bore is equal to or greater than 3,700 ML/year, the permanent transfer is from other licence holders within a 2 km radius of the applicant's bore.	All applications were assessed with regard to this prescription.	Yes
3.2 GMW may approve a temporary transfer of a groundwater licence provided relevant matters have been considered and: a) zone limits in Prescription 1 will not be exceeded; and b) the total licensed volume within 2 km of an applicant's bore will be less than 3,700 ML/year; or c) where the total licensed volume within 2 km of an applicant's bore is equal to or greater than 3,700 ML/year – i. the applicant's licensed volume in one water season will not exceed 125% of their permanent licensed volume prior to any temporary trade occurring; or ii. the temporary transfer is from other licence holders within a 2 km radius of the applicant's bore	All applications were assessed with regard to this prescription.	Yes
PRESCRIPTION 4 Metering of licensed take		
GMW will: a) ensure that a meter is fitted to new licensed bores; b) read each meter at least once a year and record take in appropriate database(s); and c) if GMW is unable to measure the volume of water taken through a meter it may: i. make an estimate of take; or ii. request the licence holder to provide a meter reading	All new bores metered. Meter readings recorded annually.	Yes

PRESCRIPTION 5 Groundwater level monitoring		
5.1 GMW will: a) obtain groundwater levels from bores used for allocation assessments (listed in Schedule 1) on a monthly basis. If a bore used for allocation assessments becomes defective an alternative bore may be monitored and the defective bore should be decommissioned. The alternative bore will be selected by consensus between DELWP and GMW. b) undertake water level monitoring at appropriate locations throughout the Katunga WSPA to: i. assess annual and long-term impact on water levels from groundwater pumping; ii. monitor regional and local seasonal drawdown; and iii. monitor the impacts of groundwater pumping generally across the Katunga WSPA and in areas of high intensity groundwater pumping.	a) Groundwater levels for allocation assessments are being obtained on a monthly basis. b) Water level monitoring is undertaken at appropriate locations in Katunga Water Supply Protection Area.	Yes
5.2 DELWP will manage the State observation bore network so that: a) continuous regional baseline monitoring is maintained to provide sufficient information to identify changes in groundwater resource availability and condition; b) State observation bores are properly maintained; and c) data collected from the bores is entered into the groundwater database, within 30 days after it has been collected.	a) Baseline monitoring is being supported by DELWP. b) State observation bores are maintained by DELWP. There are three blocked bores in schedule 1 – 48288, 84021 and 69547 – that may need maintenance. c) Data collected from the bores is entered into the groundwater database by DELWP.	Yes
PRESCRIPTION 6 Groundwater salinity monitoring		
GMW must: a) sample bores specified in Schedule 1 and have the samples analysed at an accredited laboratory for salinity once a year; b) enter salinity measured in bores referred to in Schedule 1 to the State groundwater database; and c) provide a sample bottle to any groundwater user in the Katunga WSPA who requests one, test the salinity level of returned samples and provide the results to the groundwater user.	a) Bores specified in Schedule 1 were sampled and analysed for salinity in March 2018. b) Salinity results were entered into the State groundwater database. c) One groundwater user in the Katunga WSPA requested a sample bottle in 2017/18. This was provided and the returned sample was tested and results provided to the groundwater user.	Yes

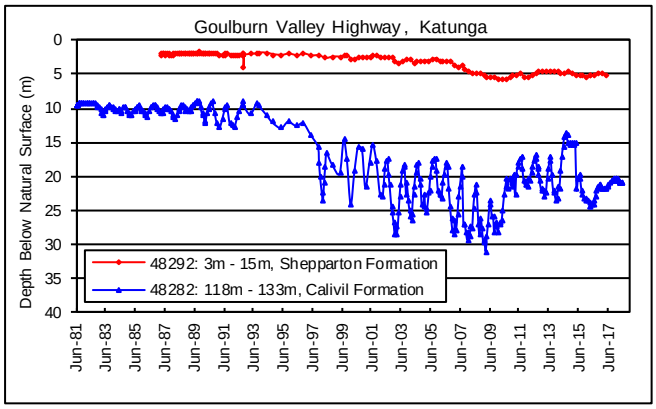
PRESCRIPTION 7 Annual reporting		
By 30 September each year GMW will prepare an annual report on the enforcement and administration of the Plan. The report will be provided to the Minister and the Goulburn Broken Catchment Management Authority and made publicly available on GMW's website.	An annual report was prepared by GMW and provided to the Minister and the Goulburn Broken Catchment Management Authority on 27 September 2017. The annual report was also published on GMW's website.	Yes

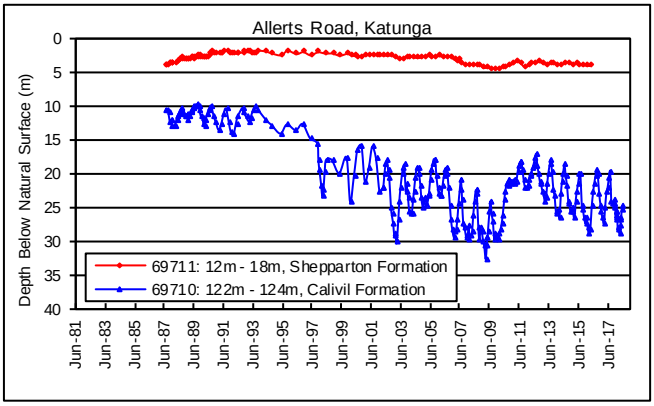
Appendix B – Hydrographs for key monitoring bores

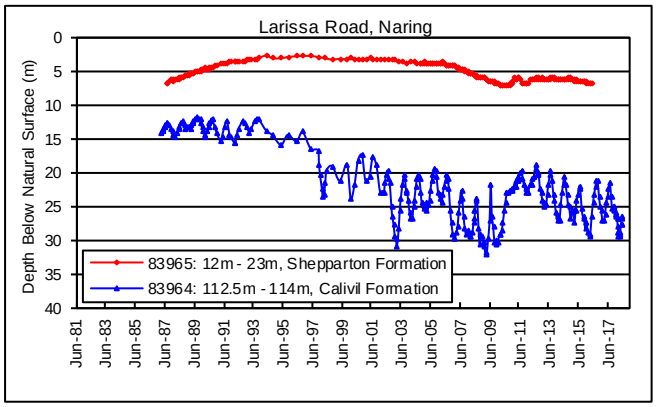
Hydrographs are provided for key monitoring bores listed in Schedule 1 of the Plan.

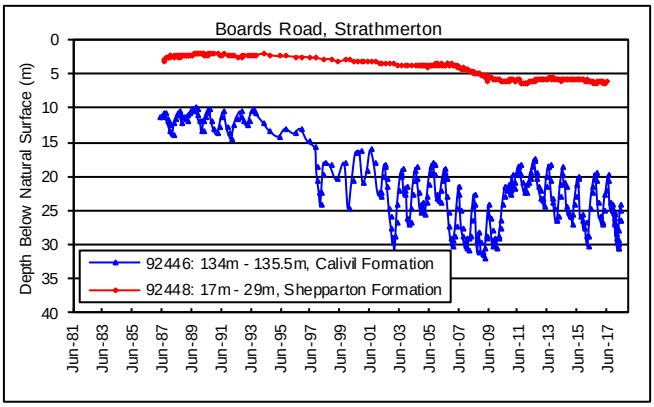
Further groundwater level information from other State observation bores is available on the Water Measurement Information System at http://data.water.vic.gov.au/monitoring.htm

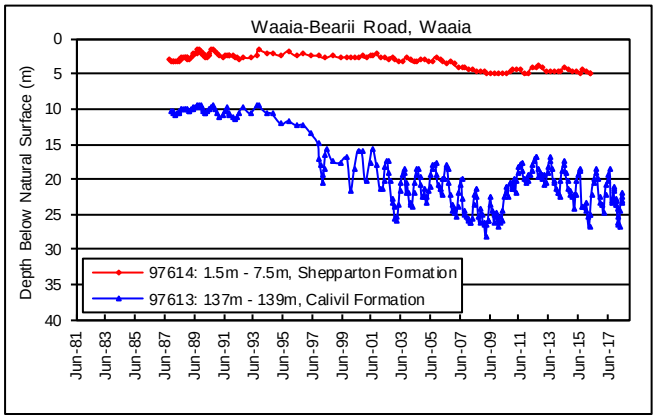
Numurkah-Nathalia Zone – 1062











Cobram Zone – 1063