



Warrion Groundwater Management Plan

**Annual Report
2016-17**

Foreword

This report is submitted to the Minister for Water and the Corangamite Catchment Management Authority in accordance with s32C *Water Act 1989*. A copy of this report is available for inspection at the offices of the Authority, and notice of report availability of the report will be published as required by s32D of the *Water Act 1989*.

The purpose of this report is to detail Authority activities administering and enforcing the management plan, and provide information that is required to be reported under the Plan.

Area Summary

Area	Warrion Water Supply Protection Area
Segment	Groundwater
Area Declared	August 2000
Plan Approved	30 August 2010
Allocation Limit (Permissible Annual Volume)	13,836 ML
Scheduled Plan Review	A review is being undertaken in 2017
Implementation Authority	Southern Rural Water
Relevant CMA	Corangamite Catchment Management Authority
Report Period	1 July 2016 – 30 June 2017

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1 Executive Summary

The Warrion Groundwater Management Plan (GMP) was prepared under Division 3 Part 3 of the *Water Act 1989* for the Warrion Water Supply Protection Area (WSPA) and relates to the groundwater resources of the protection area. The Warrion GMP was approved by the Minister for Water in August 2010.

The objective of the management plan is to make sure that the water resources of the area are managed in an equitable manner so as to ensure the long-term sustainability of those resources.

Southern Rural Water (SRW) is the authority responsible for managing and administering the plan, which includes the preparation of an annual report to demonstrate compliance. The annual report summarises licence information, metered usage and monitoring data collected for the reporting period in accordance with the recommendations given in the Warrion GMP.

The Warrion GMP Annual Report for 2016-17 demonstrates that SRW has complied with the requirements of the plan.

Monitoring and metering indicate no significant changes in the condition of the resource or water usage patterns that require review of the plan. Therefore, it is considered that the groundwater resources of the Warrion WSPA are being managed sustainably.

SRW is currently reviewing the Warrion GMP to determine whether a groundwater management plan is still necessary or whether a local management plan would be more suitable. This is due for completion by the end of 2017.



CHRIS HUGHES
Manager Groundwater & Rivers

2 Introduction

This report summarises the licence information, metered usage and monitoring data collected for the period 1 July 2016 and 30 June 2017 in accordance with the Warrion GMP.

The groundwater located in the Warrion WSPA encompasses all aquifers. The principal aquifer in the Warrion WSPA is unconfined and is predominantly composed of fractured basalt and scoria material surrounding the eruption centres of Warrion Hill, the Red Rock Complex and Robertsons Hill. The basalts are relatively thin and generally less than 30 metres thick. The Hanson Plains Sand aquifer underlies the volcanic material, and although it is limited in extent, it may be hydraulically connected.

Groundwater in the Warrion WSPA is used for irrigation, commercial and domestic & stock purposes. The dairy industry is the dominant water dependant farming enterprise within the Warrion WSPA.

The objective of the management plan as set out in the *Water Act 1989* is to make sure that “*the water resources of the area are managed in an equitable manner so as to ensure the long-term sustainability of those resources.*”

The plan requires SRW to:

- Coordinate groundwater level monitoring and metering programs;
- Review monitoring and metering data;
- Administer groundwater licensing within the prescriptions of the plan;
- Review and report annually to the Minister administering the Water Act 1989 on the implementation of the plan;
- Seek review of the plan and if, in its opinion, amendments are necessary or desirable, make recommendations to the Minister accordingly.

The success of the Warrion GMP is measured through a number of licensing, metering and monitoring objectives and outcomes.

- All consumptive use to be metered and recorded in line with both State Government and Corporation metering policies;
- Groundwater usage is to be maintained within licence volumes;
- Water levels and water quality (salinity) is to be monitored to maintain acceptable levels and to ensure the long term sustainable use of the aquifer(s);
- Trading of existing consumptive use allocations occurs in accordance with all relevant provisions of the Water Act 1989 and/or any supplementary rules adopted for the Warrion WSPA;
- No new groundwater licences will be issued if the total of all groundwater licence entitlements equals or exceeds the PCV declared for the Warrion WSPA, unless in accordance with prescriptions 5 & 6.

Further information can be obtained from the Warrion WSPA Groundwater Management Plan. A copy can be found on Southern Rural Water’s website: www.srw.com.au.

3 Key Observations

3.1 Rainfall

Rainfall during the reporting period was 736.6mm (measured at Colac airport). Rainfall in this reporting period was above the long term average, which is 594.6mm.

3.2 Water Levels

Groundwater levels are measured in nine (9) bores, monitoring the Shallow Alluvial, Newer Volcanics and Dilwyn aquifers.

Groundwater levels in many bores have returned to normal seasonal variation over the past few years, with many bores showing a seasonal variance of about 1 meter. Significant recharge can be seen last spring, with most bores having risen between 1m to 2m during the year.

In July 2016, DELWP reduced the number of active observation bores in Warrion from 30 to 9. This reduction was part of a project that looked into “Improving management of Victoria’s groundwater resources”. This project reduced the number of active observation bores all across Victoria.

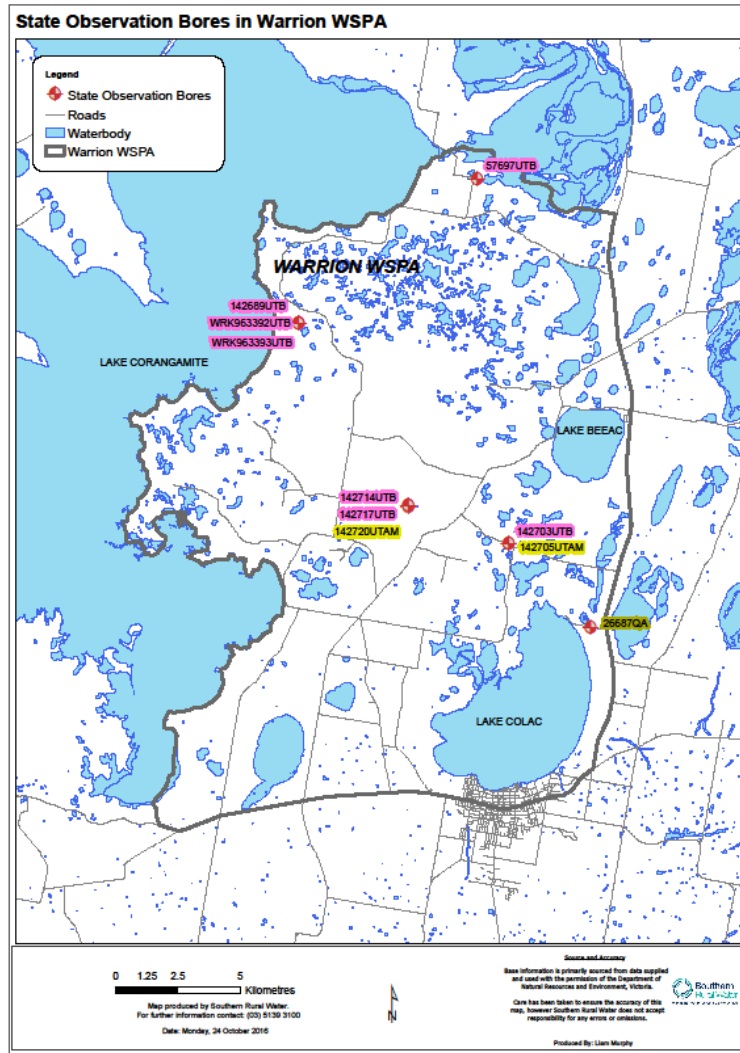


Figure 1: Location map of Warrion WSPA showing State Observation Bores

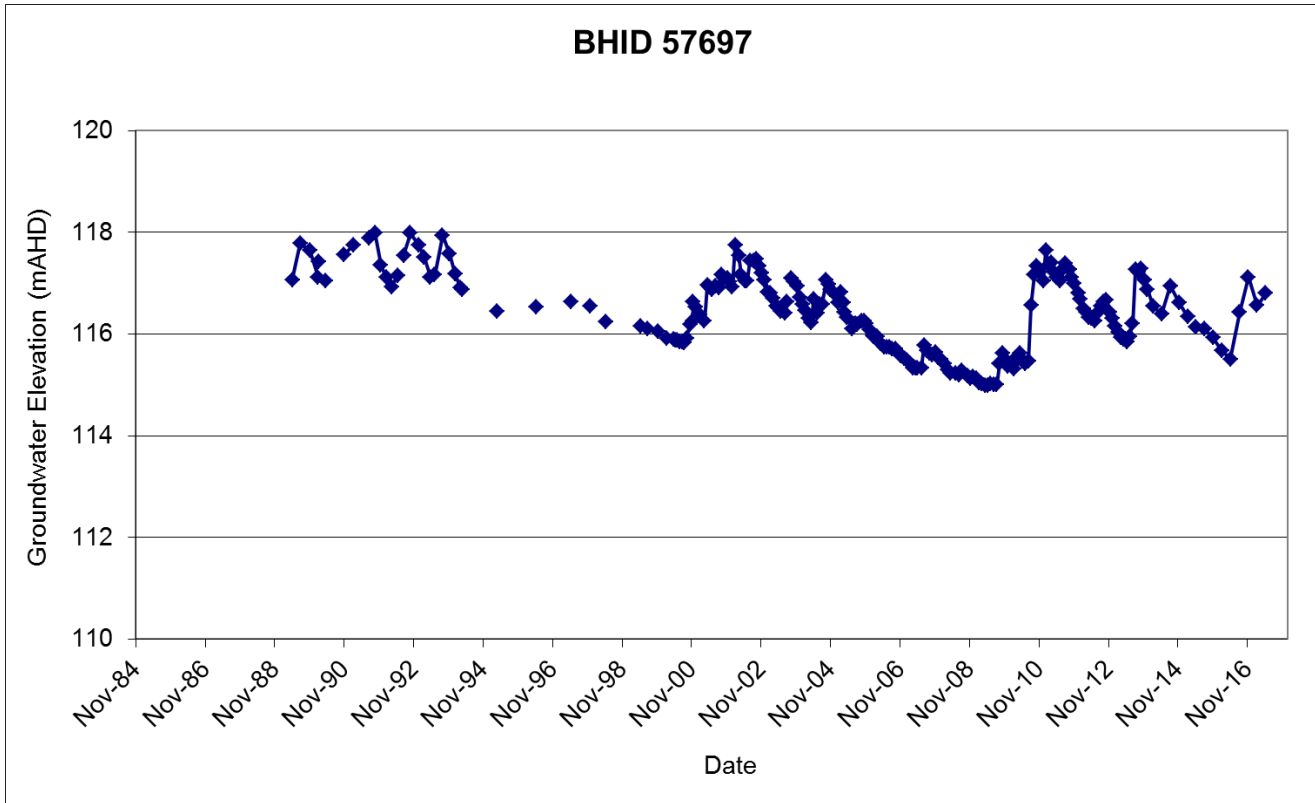


Figure 2: Example hydrograph

All hydrographs are presented in appendix 6.2.

The groundwater elevation data indicates that:

- Water levels in numerous bores have increased between 0.3m and 2.3m over the past year. This was mainly due to above average rainfall during the year and reduced usage. Warrion has seen above average rainfall over the past year;
- Groundwater levels show a slight increase over the past 10 years, and have generally only varied 3m or less over the past 25 years.

3.3 Salinity / Water Quality

Salinity is regularly measured in 5 of the State observation Bores in Warrion, and the results from two of these bores can be seen in the graph below. Salinity has been measured intermittently in the area since 1988, but it has only been regularly measured since September 2008.

Salinity has remained stable over the past 12 months and measurements are within historical ranges.

The number of bores used to collect salinity measurements has been reduced from 15 to 5 due to DELWP reducing the number of actively monitored state observation bores. All salinity graphs are in appendix 6.3.

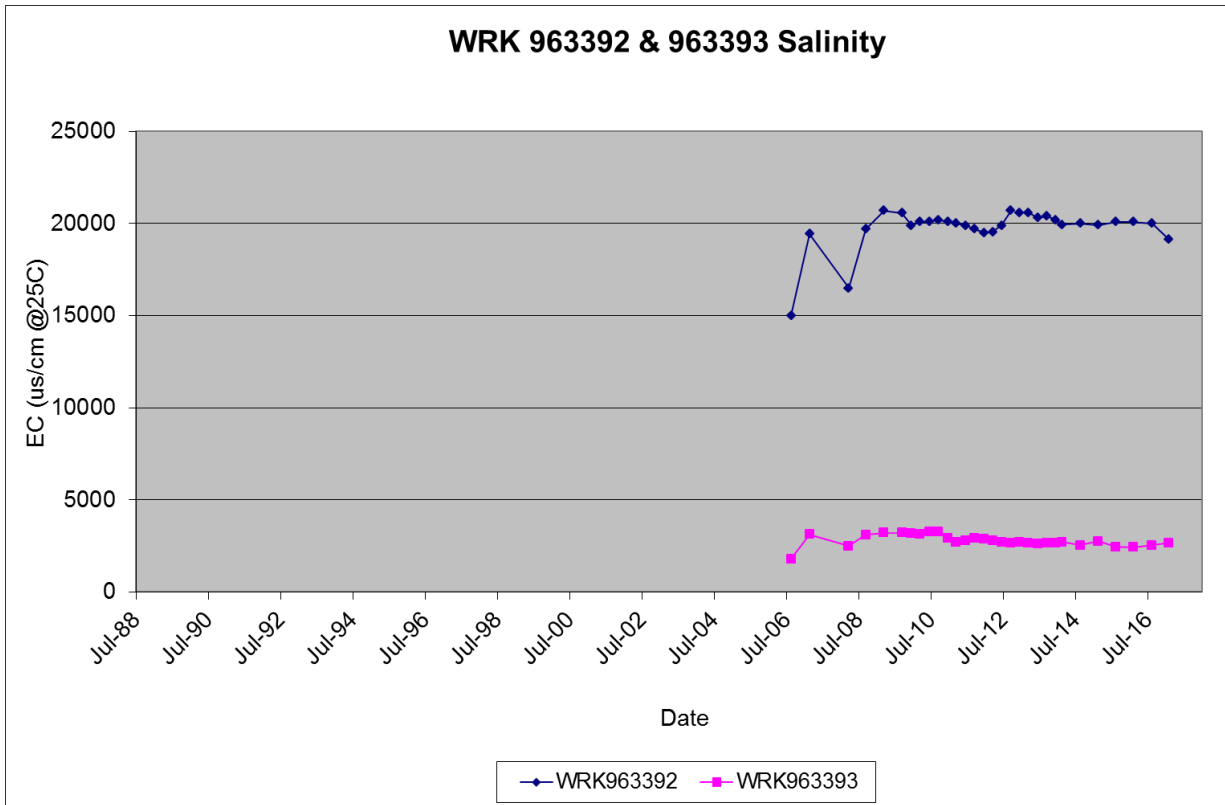


Figure 3: Example salinity graph from Warrion WSPA.

EC (electrical conductivity) units are microSiemens per centimeter (uS/cm)

3.4 Water Use

The following table provides detail on water use in the 201-17 year as compared to four previous years.

At 30 June	2013	2014	2015	2016	2017
No. of licences	143	137	136	136	132
Total allocated volume (ML)	14,081	14,081	14,081	14,081	14,078
No. of metered licences	96	95	95	94	86
Total volume metered (ML)	12,812.7	12,862.7	12,872.3	12,778	12,097
Metered volume used (ML)	4,530.4	3,425.6	5,261	5,348	3,702
Use of allocation (%)	32%	24%	37%	38%	26%
No. of licences with use greater than allocation	5	0	1	1	0
Permissible Consumptive Volume (PCV)	13,836	13,836	14,086	14,086	14,086
Use as a % of PCV	33%	25%	37%	38%	26%
No. of D&S bores ¹	352	304	286	286	265
D & S bores estimated use ¹	528	456.0	429.0	429	398
Estimated D & S use from licensed bores ²	214.5	205.5	204	204	198

¹Taken from the Victorian State Water Accounts

²Estimated 1.5ML per licence 2013 onwards

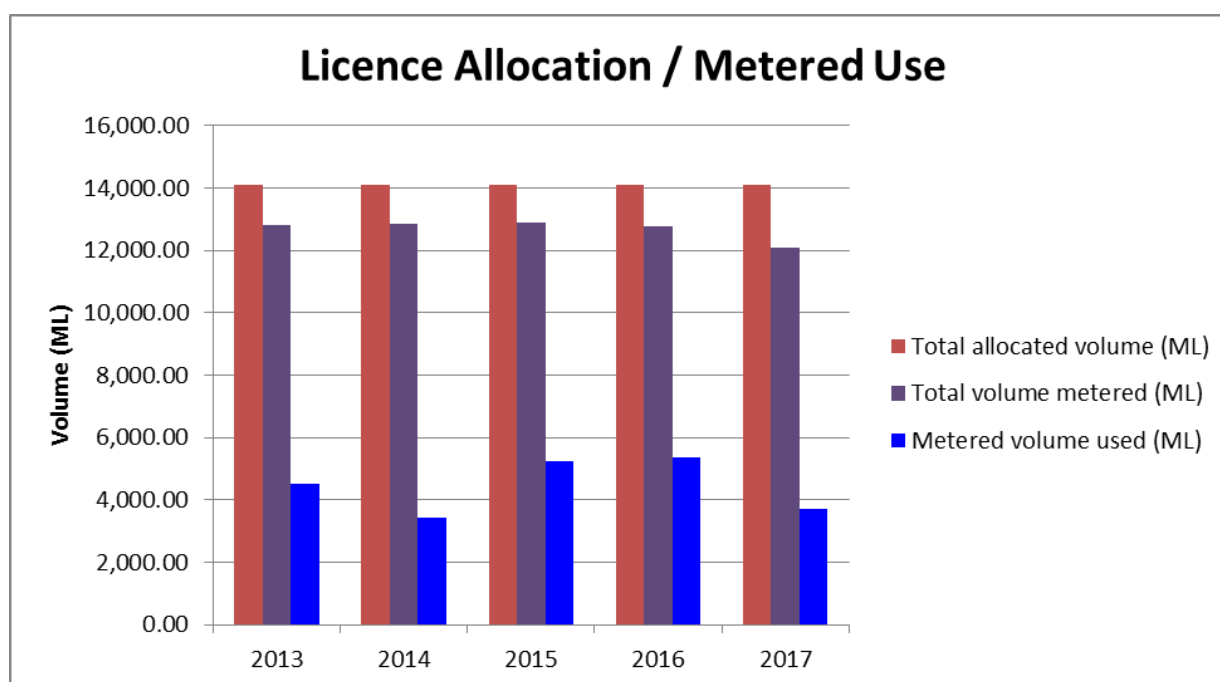


Figure 4: Licence allocation compared to metered volume and usage.

3.5 Non compliance

The following table lists the licences where water use was recorded in excess of licensed entitlement.

Licence Number	Licence Volume	Amount taken	Amount overused	Comments
Nil	N/A	N/A	N/A	Nil over-use recorded.

3.6 Groundwater dependent ecosystems

Several lakes in the area have been identified as having some likely connection to groundwater (see GMP for further details). No additional information to report.

4 Plan Implementation

4.1 Monitoring

4.1.1 Prescriptions

The following table details the requirements of the management plan in relation to monitoring.

Plan Requirement:	Activity / Reference	Complies
11. The Department must ensure that monitoring bores are properly maintained and replaced if necessary; and	The monitoring bores are owned and managed by the Department of Environment, Land, Water and Planning (DELWP).	Yes
12. The Department and the Corporation must ensure that data collected from monitoring bores are entered into the groundwater management system, within 60 days of them being received.	All bores have minor maintenance carried out annually which includes site clearance, rust removal, painting, and ensuring the bore is secure and safe.	Yes
13. The Department and the Corporation must ensure that water level monitoring is carried out at appropriate locations throughout the Protection Area to: a) assess annual and long term impact on water levels from groundwater pumping; b) monitor regional and local seasonal drawdown; and c) provide information for future resource assessments.	The DELWP carries out maintenance on bores that have been identified by the field service provider through the Extra Works Advice. This is bore specific. SRW works closely with the DELWP to ensure that the monitoring program meets the requirements of the Plan. SRW regularly reviews the groundwater level monitoring program and data. All 9 bores are currently monitored monthly. If SRW identifies bores of greater interest, monitoring may be undertaken	Yes

	in addition to the DELWP's monitoring program.	
14. The Corporation must ensure that water quality monitoring is carried out at appropriate locations throughout the Protection Area to provide information that allows the necessary assessment of any changes in the salinity of the groundwater.	Salinity measurements are currently been taken in 5 of the 9 observation bores on a biannual basis. The program and data are regularly reviewed.	Yes

4.2 Metering

4.2.1 Prescriptions

The following table details the requirements of the management plan in relation to metering.

Prescription	Activity	Complies
8. All meters will comply with the national standards as adopted in State Government and Corporation metering policy.	SRW has completed a Metering Action Plan that outlines how our metering fleet will comply with the required metering standards. Meters comply with the current requirements.	Yes
9. The Corporation must: a) ensure all meters within the Protection Area are read twice per year, in or around January and June; b) determine the volume of water extracted from the bore since the meter was last read; and c) within 30 days after the meter is read, record the amount of water used on a database.	All meters were manually read twice however a project was completed installing Automated Meter Reading (AMR) technology on all metered bores. We can now access daily meter readings. Meter readings and usage data were recorded and stored in SRW's metering system. Usage is also recorded in the State Water Register.	Yes
10. The Corporation may request the Licensee to read a meter and to provide Corporation with the meter reading: a) the Licensee must comply with the request; and b) For the purposes of this clause the Corporation must provide a phone number, email address, pre-paid mail or similar method for the licensee to lodge the meter read.	SRW did not request any licensee's to read their meter and provide the meter reading.	Yes

4.2.2 Metering activities

	Year to 30 June 2017	Total for WSPA at 30 June 2017
Number of licences issued	0	
Number of meters installed	3	130
Meters requiring maintenance	5	
Meters replaced	8 replaced 15 removed	
Meters read (1 – date)	Jan 2017	
Meters read (2 – date)	May/Jun 2017	
Number of estimated readings	0	

4.3 Restrictions on Licensing and Licence Transfers

4.3.1 Prescriptions

The following table details the requirements of the management plan in relation to licensing

Plan Requirement:	Activity/Reference	Complies
1. All groundwater licences in the Protection Area will be migrated to the State Water Register within 6 months of ministerial approval of the Management Plan.	All licences are located in the Water Register.	Yes
2. No new groundwater licences will be issued except as described in Prescriptions 4, 5 and 6.	No New licences were issued	Yes
3. The total licence entitlement in the Protection Area must not exceed 14,086ML (PCV Increased. Ref Gazette G32 8 Aug 2013) or any volume adjusted in accordance with Prescriptions 4 to 6 inclusive.	Licence entitlements total 14,081ML.	Yes
4. If a groundwater licence is surrendered, revoked or not renewed the total entitlement in Prescription 3 will be reduced by that licence volume and capped until such time as a review of the management plan and sustainable yield is undertaken. After which, the PCV will be reduced accordingly, or the volume will be available through a public process.	2 entitlements have been surrendered or revoked in the period.	Yes
5. The Corporation may issue a licence which may lead to the total groundwater licence entitlement in Prescription 3 being exceeded to overcome an administrative oversight or other anomaly, provided it does not exceed the PCV (Increased to 14,086ML Ref Gazette G32 8 Aug 2013)	No entitlements issued under this clause for the period.	Yes

6. The Corporation may issue or amend a groundwater licence in accordance with any state-wide policy. The volume described in Prescription 3 and the PCV (by application to the Minister) will be adjusted accordingly.	No new licences. All amendments have been in line with policy and no additional entitlement allocated.	Yes
7. The Corporation must report the details of any licence referred to in Prescriptions 4 to 6 in the annual report.	Refer to appendices for licence details.	Yes

4.3.2 Compliance and Exceptions

Activities under taken during the reporting period comply with the requirements of the Plan.

4.3.3 Issues Affecting Implementation

No issues to report.

4.4 Licensing Activities

The following table provides details of licensing activities.

Year to 30 June 2014	No.	Volume ML
New licences issued	0	0
Additional volumes on existing licences	0	0
Licences revoked	0	0
Permanent transfers	1	19.6
Temporary transfers	2	117.3
D&S Bores notifying use	0	0

4.4.1 Issues Affecting Implementation

No issues to report.

5 Conclusions

The objective of the management plan as set out in the Water Act 1989 is to make sure that *“the water resources of the area are managed in an equitable manner so as to ensure the long-term sustainability of those resources.”*

Overall, it is considered that the groundwater resources of the WSPA are being managed sustainably.

SRW is currently reviewing the Warrion GMP to determine whether a groundwater management plan is still necessary or whether a local management plan would be more suitable. This is due for completion by the end of 2017.

6 Appendices

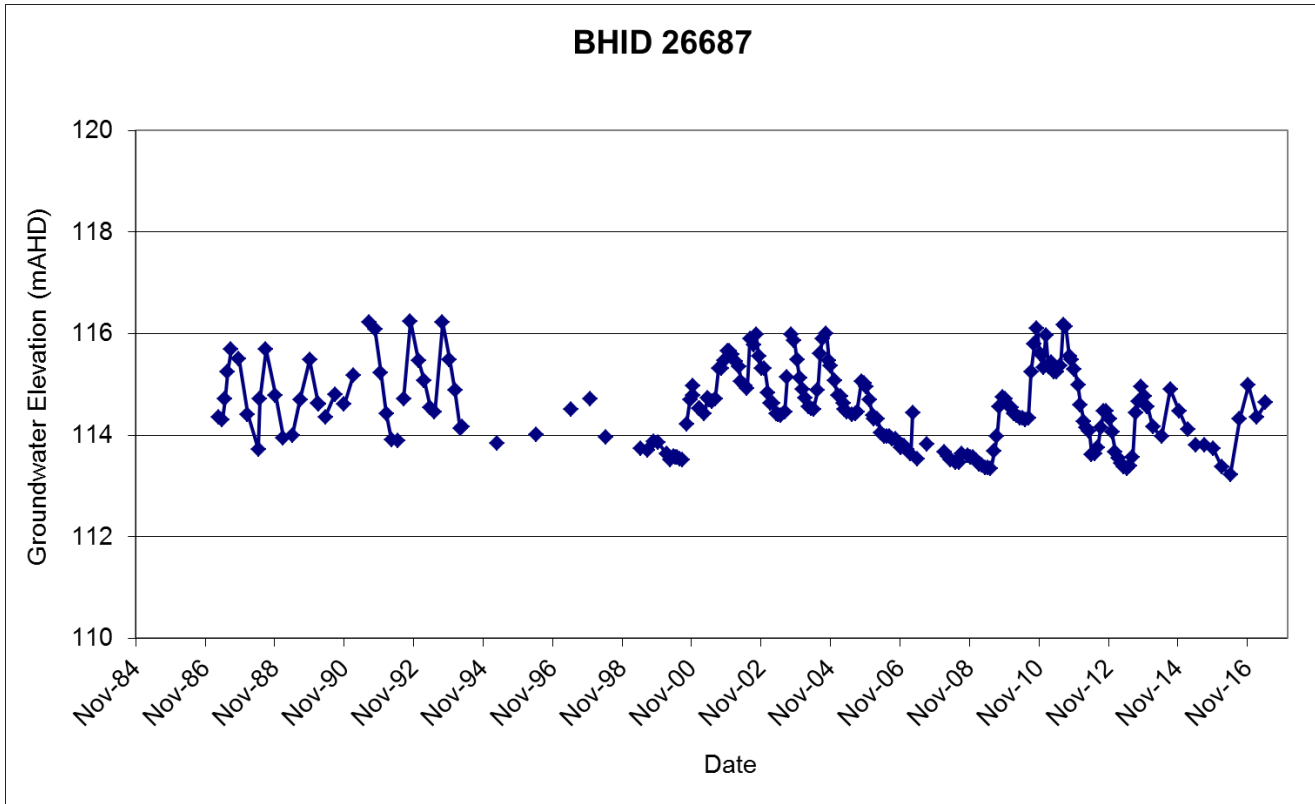
6.1 Licence Details

Entitlement Number	Application Type	Purpose	Previous Volume	Approved Volume
BEE072874	Surrender	Dairy	2.4	0
BEE072874	Surrender	Irrigation	0	0

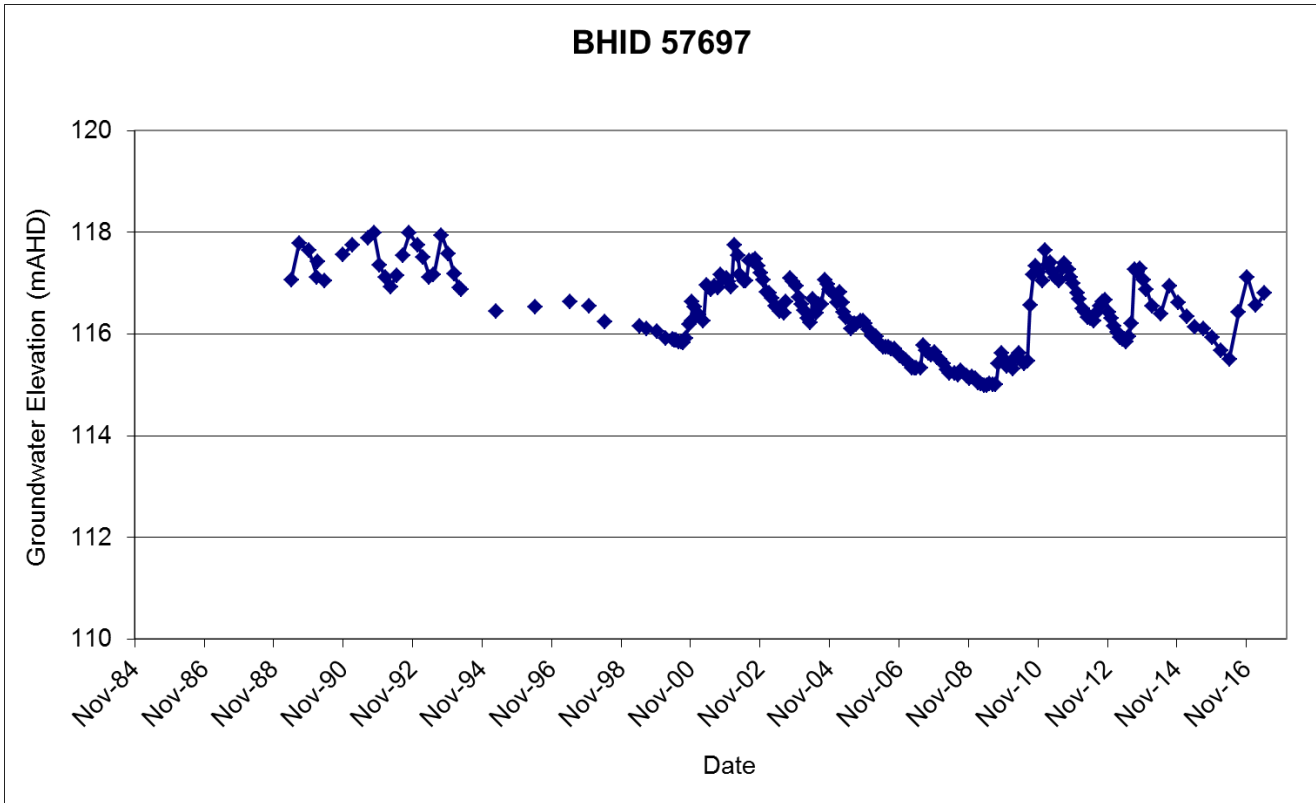
Water Trade details for the 2016-17 season can be found at:

<http://waterregister.vic.gov.au/water-trading/take-and-use-licence-trading>

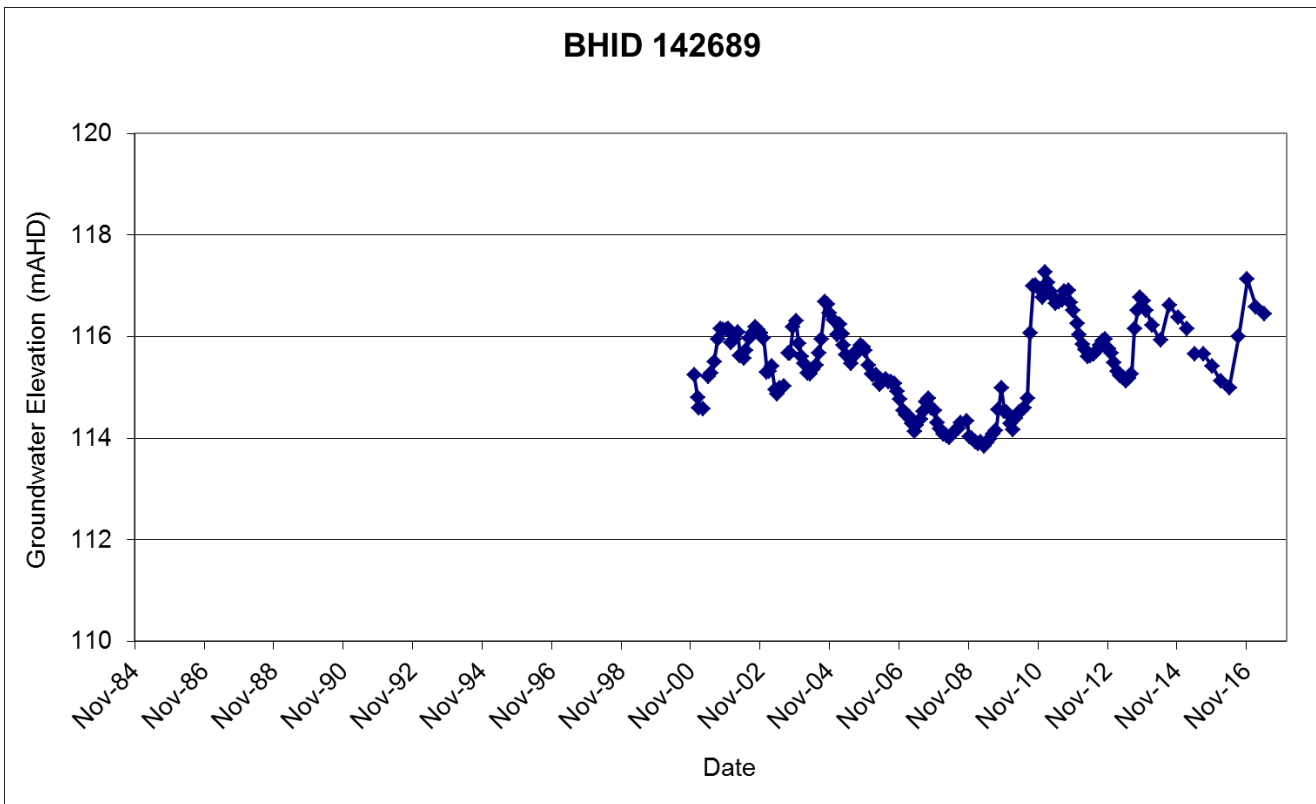
6.2 Hydrographs



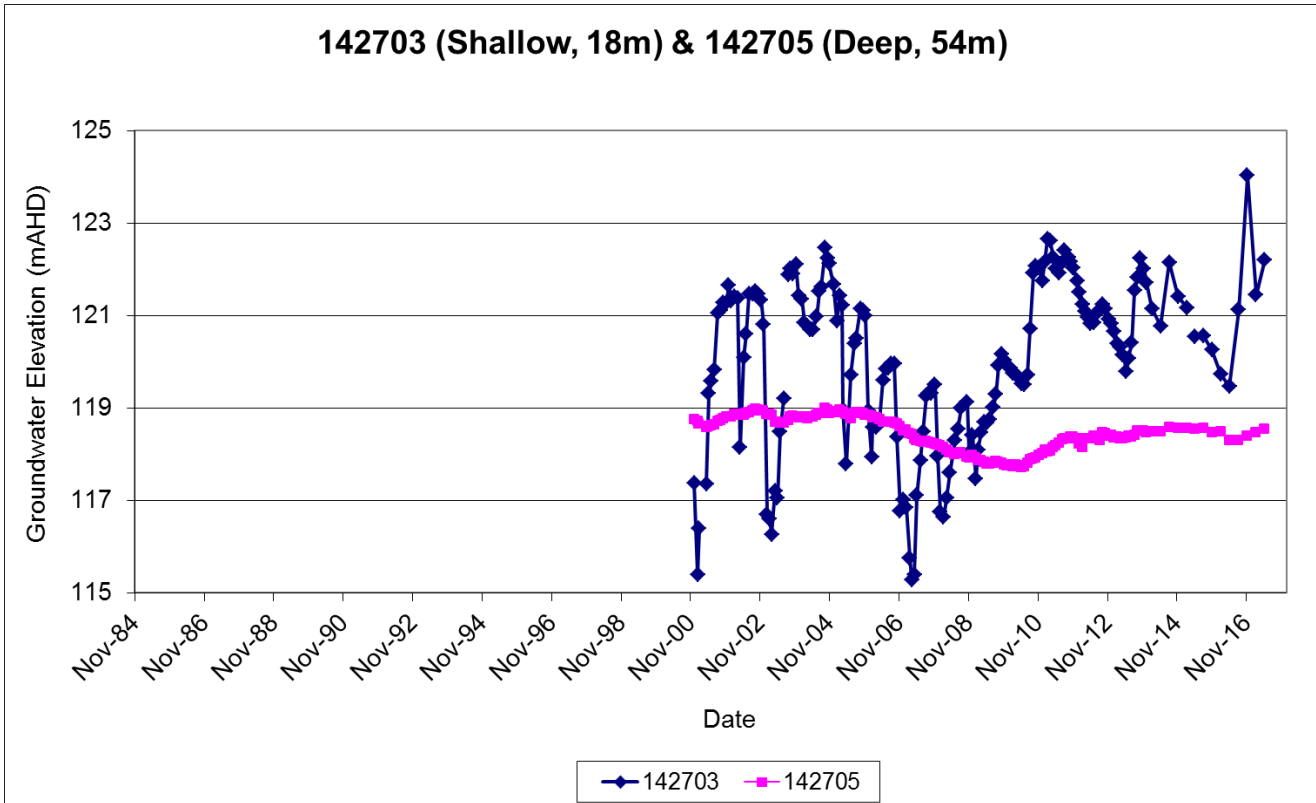
This bore monitors the alluvium



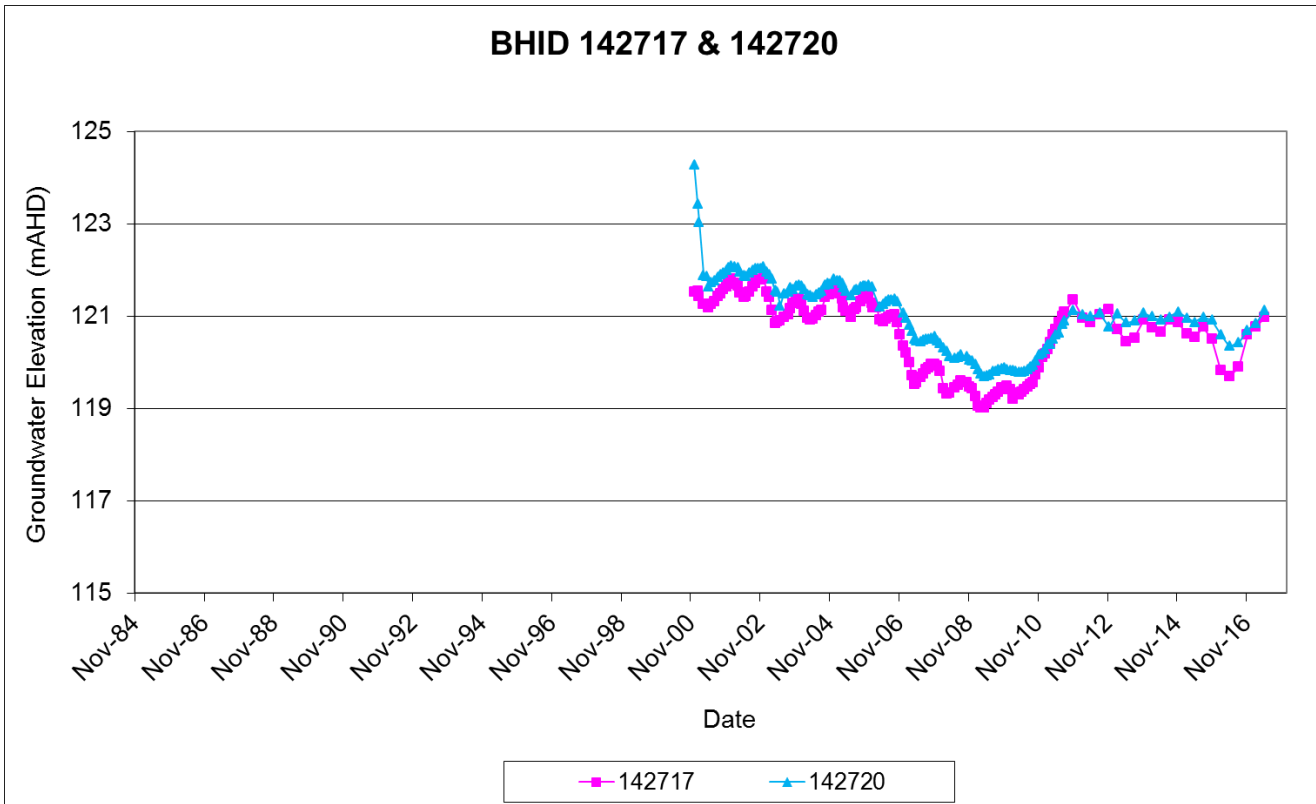
This bore monitors the Newer Volcanics



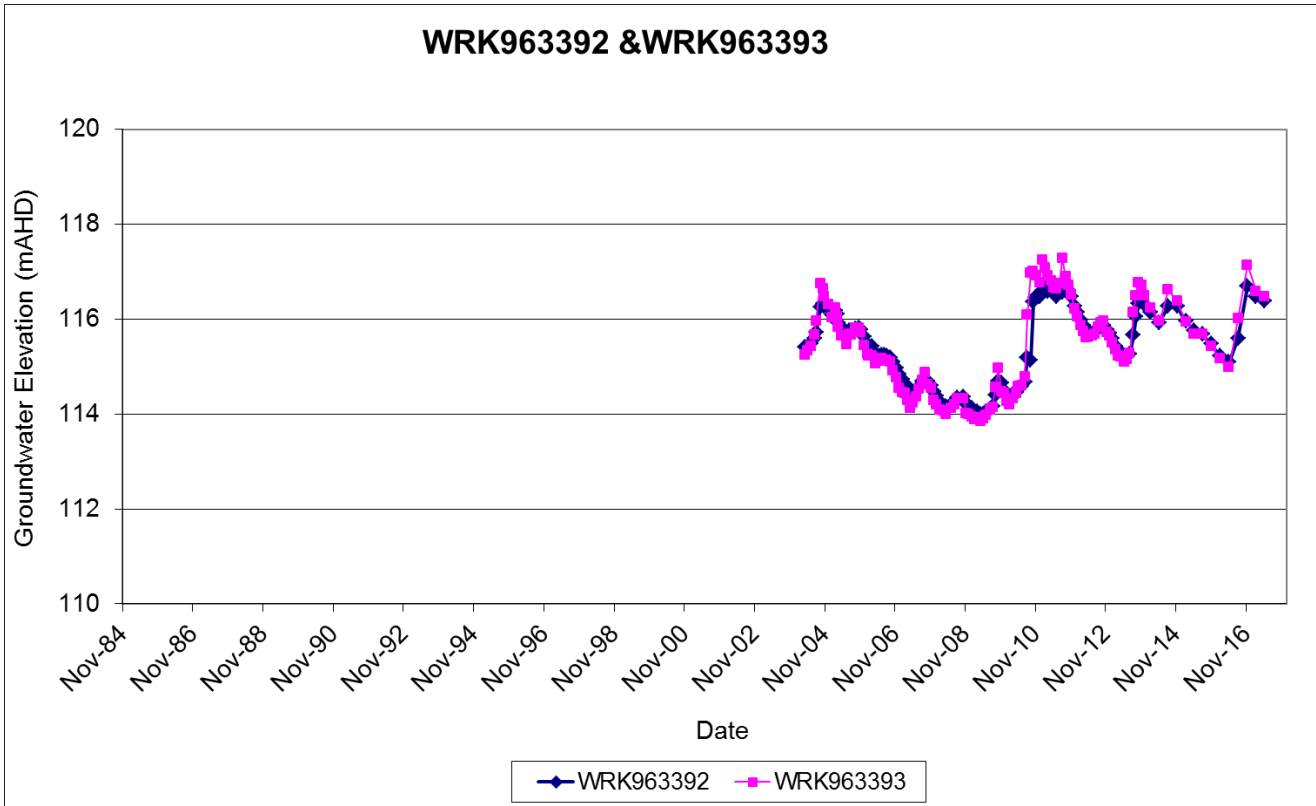
This bore monitors the Newer Volcanics



These bores monitor the Newer Volcanics



142717 monitors the Newer Volcanics; 142720 monitors the Dilwyn formation



These bores monitor the Newer Volcanics

6.3 Salinity

