

# **Koo Wee Rup WSPA Groundwater Management Plan**

## **Annual Report 2020-21**

## Foreword

This report is submitted to the Minister for Water, Port Phillip & Westernport Catchment Management Authority and Melbourne Water in accordance with s32C *Water Act 1989*. A copy of this report is available by contacting Southern Rural Water at [srw@srw.com.au](mailto:srw@srw.com.au) or by calling 1300 139 510. A notice of report availability will be published as required by s32D of the *Water Act 1989*.

The purpose of this report is to detail Southern Rural Water activities implementing the groundwater management plan along with documenting information that is required to be reported under the Plan.

## Area Summary

<b>Area</b>	Koo Wee Rup Water Supply Protection Area
<b>Segment</b>	Groundwater
<b>Area Declared</b>	January 2002
<b>Plan Approved</b>	4 August 2010
<b>Allocation Limit (Permissible Consumptive Volume)</b>	12,915 ML
<b>Scheduled Plan Review</b>	A review of the Plan was completed in 2019.
<b>Responsible Authority</b>	Southern Rural Water
<b>Relevant CMA</b>	Port Phillip & Westernport Catchment Management Authority
<b>Report Period</b>	1 July 2020 – 30 June 2021

<b>1</b>	<b>Executive Summary.....</b>	<b>3</b>
<b>2</b>	<b>Introduction.....</b>	<b>4</b>
<b>3</b>	<b>Key Observations .....</b>	<b>5</b>
3.1	Rainfall.....	5
3.2	Water levels.....	5
3.3	Groundwater salinity.....	6
3.4	Water Use.....	8
3.5	Non-compliance .....	9
<b>4</b>	<b>Plan Implementation.....</b>	<b>10</b>
4.1	Monitoring .....	10
4.1.1	Prescriptions.....	10
4.2	Metering .....	11
4.2.1	Prescriptions.....	11
4.2.2	Metering activities.....	12
4.3	Restrictions on Licensing and Licence Transfers .....	13
4.3.1	Prescriptions.....	13
4.4	Licensing Activities .....	14
4.4.1	Compliance and exceptions .....	14
4.4.2	Issues affecting implementation.....	14
<b>5</b>	<b>Conclusions .....</b>	<b>15</b>
	<b>Appendices .....</b>	<b>16</b>
5.1.1	Licence Details.....	16
5.1.2	Monitoring program details .....	17
5.1.3	Hydrographs.....	18
5.1.4	Salinity .....	32
5.1.5	Links for Compliance.....	33

## 1 Executive Summary

The Koo Wee Rup Groundwater Management Plan (GMP) was prepared under Division 3 Part 3 of the *Water Act 1989* for the Koo Wee Rup Water Supply Protection Area (WSPA) and relates to the groundwater resources of the protection area. The Koo Wee Rup 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 and 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 with requirements of the plan. The annual report summarises licence information, metered usage and monitoring data collected for the reporting period in accordance with the recommendations given in the Koo Wee Rup GMP.

The Koo Wee Rup GMP Annual Report for 2020-21 demonstrates that SRW has complied with the requirements of the plan.

Groundwater monitoring and water use metering indicate no significant changes in the condition of the resource or water usage patterns; therefore it is considered that the groundwater resources of the Koo Wee Rup WSPA are being managed sustainably. In the absence of material changes in use patterns, and the long-term data available for monitoring sites, no changes are proposed to monitoring for the 2021-22 period.

A survey of groundwater licence holders was completed in 2019 as part of a review of the GMP. The review confirmed that the plan was working well, however some customers believe that there should be greater flexibility in the trade rules. Further technical work is continuing in order to improve our understanding of the groundwater resources of the WSPA and to assess the impacts of a range of future management opportunities.



Bryce Morden  
Manager Groundwater & Rivers  
Southern Rural Water

## 2 Introduction

This report summarises licence information, metered usage and monitoring data collected for the period between 1 July 2020 and 30 June 2021 in accordance with the requirements of the Koo Wee Rup GMP.

The Koo Wee Rup WSPA is separated into 8 zones, with groundwater resources consisting mainly of the Westernport sequence (Baxter, Sherwood and Yallock geological formations). The Westernport sequence is generally considered a single aquifer system, as there are hydraulic connections between each formation. The basaltic clay of the Older Volcanics acts as a semi-confining layer between the Westernport sequence and the underlying Older Volcanics/Childers formations.

Groundwater within the Koo Wee Rup WSPA is used for irrigation, dairy, industrial, and stock and domestic purposes.

The Koo Wee Rup GMP identifies SRW as the authority responsible for managing and administering the plan.

The management plan objective, 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 and to ensure the long-term sustainability of those resources.

The GMP requires SRW to:

- Coordinate groundwater level monitoring and metering programs;
- Review monitoring and metering data to understand resource status;
- 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; and
- Periodically review the plan and if, in its opinion, amendments are necessary or desirable, make recommendations to the Minister accordingly.

The success of the Koo Wee Rup GMP is measured through a number of licensing, metering and monitoring objectives. These include:

- 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 salinity is to be monitored to maintain target levels and to ensure the long-term sustainable use of the aquifer(s);
- Transfers of existing licences occurs in accordance with all relevant provisions of the *Water Act 1989* and/or any supplementary rules adopted for the Koo Wee Rup WSPA; and
- No new groundwater licences will be issued if the total of all groundwater licence entitlements would exceed the PCV declared for the Koo Wee Rup WSPA, unless allowed for by prescriptions 7 & 8 of the GMP.

Further information can be obtained from the Koo Wee Rup WSPA Groundwater Management Plan. A copy can be found on Southern Rural Water's website: [www.srw.com.au](http://www.srw.com.au).

### 3 Key Observations

#### 3.1 Rainfall

Rainfall during the reporting period was 731mm measured at Lang Lang. This is below the long-term average rainfall for Lang Lang of 859mm per year.

#### 3.2 Water levels

Groundwater levels are measured monthly at twenty eight (28) observation bores, targeting the Quaternary Sands, Westernport Group, Older Volcanics and Childers aquifers.

The location of observation bores in the area are shown in Figure 1. The hydrograph for bore 71219 is shown in Figure 2, with all hydrographs are presented in appendix 2.

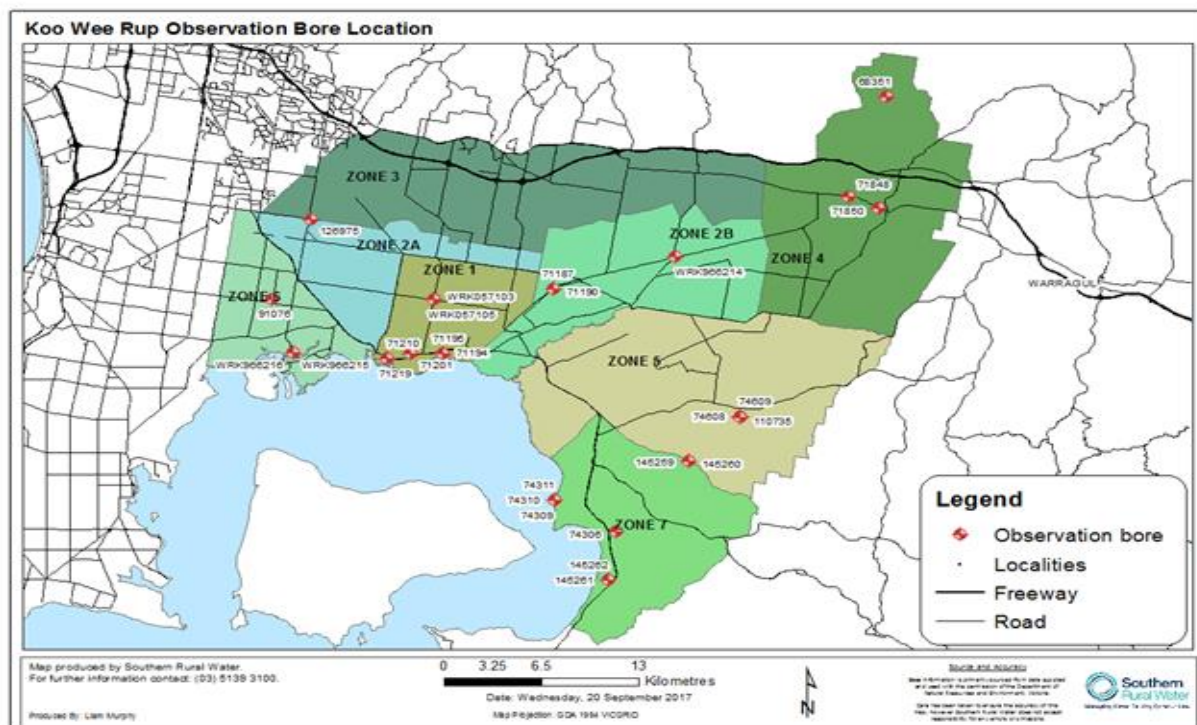
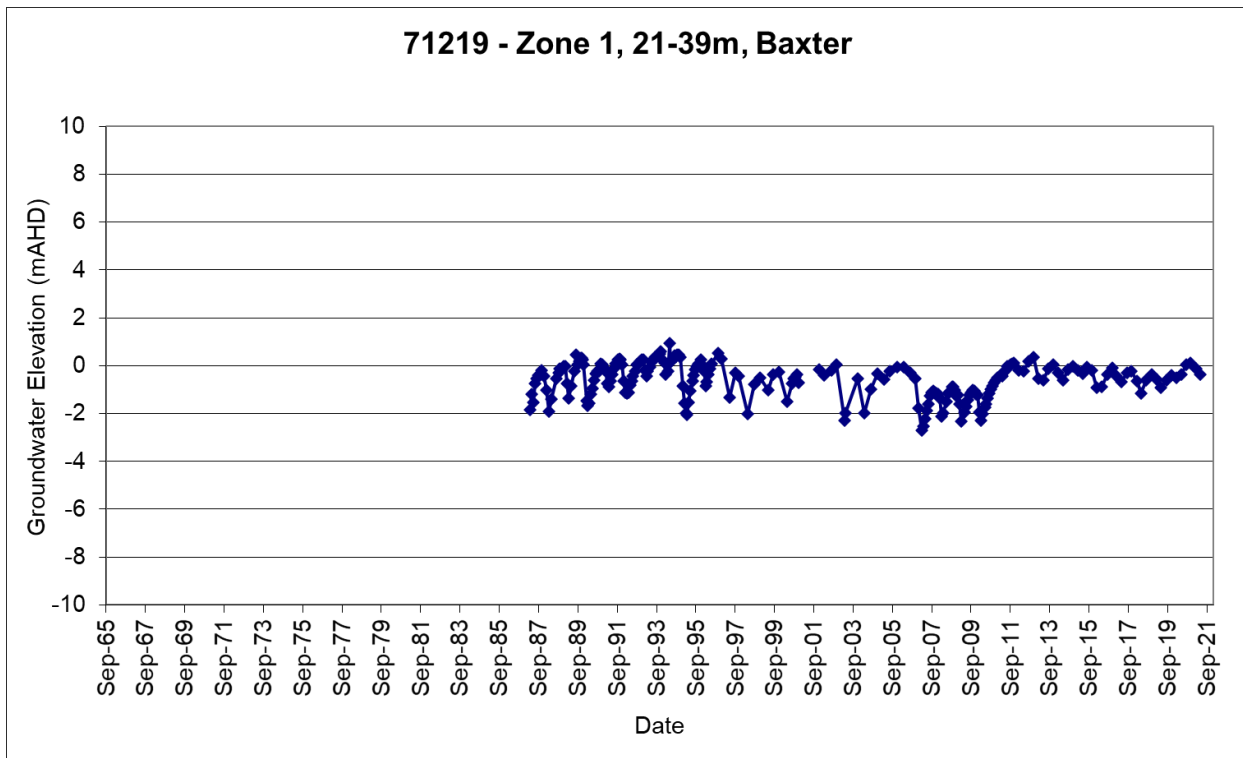


Figure 1: SOBN locations in Koo Wee Rup WSPA.



**Figure 2: Example hydrograph from Zone 1.**

The groundwater level data from all observation bores indicate that:

- Groundwater level trends over the last 30 years in all aquifers are broadly stable across the majority of the WSPA, including the coastal zone;
- Current water levels in many bores are similar to levels seen in the 1990s;
- There are isolated locations where hydrographs show a modest longer-term declining trend, in Zone 7 (SOBN bores 74306 and 145259) and in Zone 1 (WRK057103/5). These declines are likely to represent the impact of local pumping; and
- Bore 145262 has been replaced by bore WRK116126 during 2020-21. Due to the redrill, the correct water level is now being recorded which is around 2m higher than previously thought.

### 3.3 Groundwater salinity

One of the key drivers for monitoring salinity in the plan was the potential of marine intrusion into the aquifer near the coast, as well as broader resource management issues.

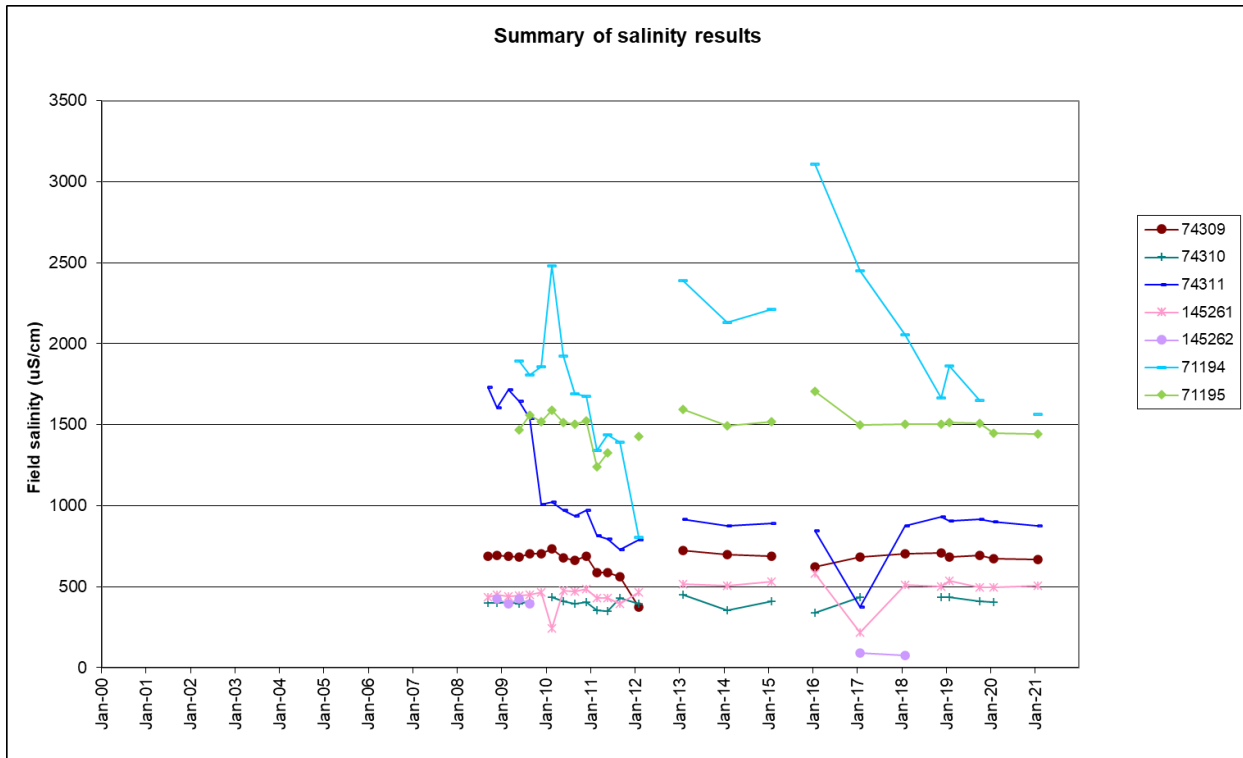
Monitoring has shown that salinity has been relatively stable over the period since 2009 and most bores remain within historic ranges. Figure 3 provides a summary of results.

The exceptions to this are:

- Salinity in Bore 71194, which is on the coast in zone 1, has varied considerably over the period of record.
- Salinity in Bore 74311, which is on the coast in zone 7, has decreased since monitoring began in 2008 and has remained stable over the past 12 months.
- Bore 71219 (appendix 3) has much higher levels of salinity than the other monitored bores, although these levels are stable. This is potentially due to a remnant pocket of saline water

in the aquifer, or because the impermeable clays and mudstones that separate the aquifer from the sea are thinner in this area. Salinity in this bore is within historic ranges.

Salinity will continue to be monitored and reviewed on an annual basis. All salinity graphs are presented in appendix 3.



**Figure 3: Graph showing salinity in key Koo Wee Rup WSPA observation bores.**

EC (electrical conductivity) units are microSiemens per centimeter ( $\mu\text{S/cm}$ )



### 3.4 Water Use

Details of water use in the 2020-21 year with comparison to the four previous years are provided in Table 1 and figure 4. The total number of licences has decreased over the 5 years predominantly due to customers amalgamating multiple licences held into one licence, as well as historic surrendering of licences (no licences were surrendered in 2020-21). The total number of metered licences has decreased due to changes in licence use from irrigation back to stock and domestic use only, or licences becoming inactive.

*Table 1: Changes in water use, licences numbers and entitlement volumes over the past five years*

At 30 June	2017	2018	2019	2020	2021
No. of licences	344	346	340	335	332
Total entitlement volume (ML)	12,577.2	12,575.0	12,575.0	12,462	12,283
No. of metered licences	173	162	156	155	153
Total entitlement volume metered (ML)	9,561.1	9,412.7	9,547.4	9,041.6	8,618.6
Metered volume used (ML)	3,503.3	3,451.1	3,963.5	2,912.1	3,123.2
Metered use (% of allocation)	28%	28%	32%	23%	25%
No. of licences with unauthorised take <sup>1</sup> at 30 June 2021 (refer to section 3.5)	1	2	0	0	0
Permissible Consumptive Volume (PCV)	12,915	12,915	12,915	12,915	12,915
Metered use (% of PCV)	27%	27%	31%	23%	24%
No. of D&S bores <sup>2</sup>	1,061	996	996	911	450
D & S bores estimated use <sup>2</sup>	2,402	1,494	1,494	1,367	675
Estimated D & S use from licensed bores <sup>3</sup>	516	519	510	503	498

<sup>1</sup> Unauthorised Take of Non-Urban Water

<sup>2</sup> Taken from the Victorian State Water Accounts

<sup>3</sup> Estimated 1.5ML per licence 2013 onwards

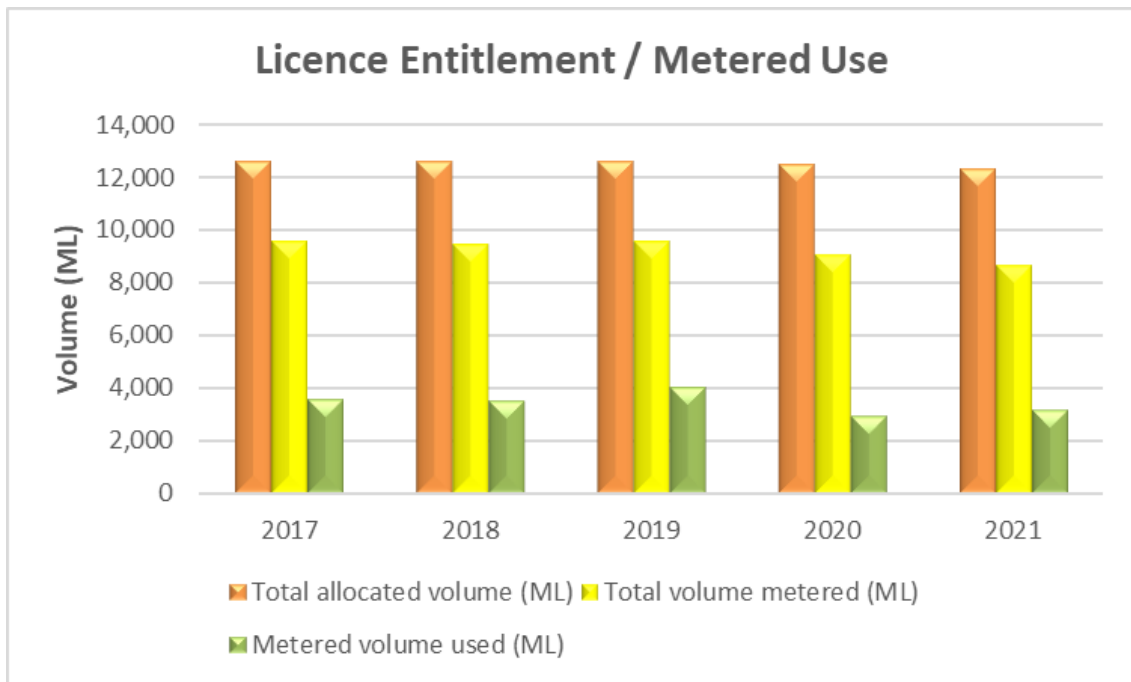


Figure 4: Licence entitlement compared to metered volume and usage. Data based on table 1.

### 3.5 Non-compliance

The Victorian Government and SRW have a zero-tolerance approach to unauthorised take of non-urban water. SRW is responsible for ensuring water users in southern Victoria comply with their licence conditions.

Further information regarding Southern Rural Water and State Governments approach to compliance is provided in appendix 5.1.5

SRW investigates all compliance issues and considers several factors such as the seriousness of the breach and impact on the resource and other users, prior to deciding on the most appropriate action. The action taken by SRW can include the use of direction notices, warning letters and prosecution.

No compliance issues were identified in the Koo Wee Rup GMP during the 2020-21 season.

## 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
13. 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
14. The Department and the Corporation must ensure that data collected from monitoring bores are entered into the State's groundwater management system (or equivalent), within 30 days of 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.  DELWP undertakes additional maintenance on bores that have been identified as requiring attention under the annual program.	Yes
15. The Department and the Corporation must ensure that water level monitoring and investigations are carried out at appropriate locations throughout the Water Supply Protection Area to:  i. assess annual and long term impact on water levels from groundwater pumping; ii. monitor regional and local seasonal drawdown; iii. examine interaction between groundwater and surface water; iv. provide information for future resource assessments; and v. monitor the impacts of groundwater pumping generally across the Water Supply Protection Area and in areas of high intensity groundwater pumping.	SRW works closely with the DELWP to ensure that the monitoring program meets the requirements of the Plan.  If SRW identifies bores of greater interest, monitoring may be undertaken in addition to the DELWP's monitoring program.  SRW regularly reviews the groundwater level monitoring program and data.	Yes
16. The Corporation shall review the groundwater level monitoring program as the established trigger level is approached (the trigger level at the time of writing is specified in Schedule 1 but may be reviewed and amended by the Corporation, as necessary).	SRW regularly reviews the groundwater level monitoring program. Monitoring program is presented in the Appendices.	Yes
17. The Corporation must ensure that water quality monitoring is carried out at appropriate locations throughout the Water Supply Protection Area to provide information that allows assessment of changes in groundwater salinity.	SRW regularly reviews the salinity monitoring program and data. Salinity monitoring program is presented in the Appendices.	Yes
18. The Corporation shall review the groundwater quality monitoring program as the established trigger level is approached (the trigger level at the time of writing is specified in Schedule 1 of the Plan).	SRW regularly reviews the salinity monitoring program.	Yes

## 4.2 Metering

### 4.2.1 Prescriptions

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

<b>Prescription</b>	<b>Activity</b>	<b>Complies</b>
10. All meters will comply with State metering policy and the Corporation's metering policy	Meters comply with the current requirements.	Yes
11. The Corporation must: i. ensure all meters within the Protection Area are read twice per year – in or around January and June; ii. determine the volume of water extracted from the bore since the flow meter was last read; and iii. within 30 days after a meter is read, record the amount of water used on a database.	All meters were manually read twice each year, with ongoing works to install Automated Meter Reading (AMR) technology on all metered bores. This will provide access to near-real time meter readings exceeding the minimum requirement.  Meter readings and usage data were recorded and stored in SRW's metering system. Usage is also recorded in the Victorian Water Register.	Yes
12. The Corporation may request the Licensee to read a meter and to provide the Corporation with the meter reading: i. the Licensee must comply with the request; and ii. 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 use these powers to request any licensees to read their meter and provide the meter reading.	Yes

#### 4.2.2 Metering activities

Meters are installed on bores with active licences greater than 10ML with few exceptions. Some licences may require multiple meters to properly account for water usage. The continued rollout of automated meter read technology adds to the ability of SRW and its customers to actively manage the resource throughout the year.

As highlighted in section 3.4 the total number of metered licences has decreased in the area due to changes in licence use from irrigation to stock and domestic use only, licence consolidation or licences becoming inactive. Summary statistics relating to metering activities are provided in Table 2.

**Table 2 Licence, meter and reading statistics for season 2020-21 and overall**

	<b>Year to 30 June 2021</b>	<b>Total for WSPA at 30 June 2021</b>
Number of licences issued (see section 4.4 for details)	0	332
Number of meters installed	0	193
Meters requiring maintenance	0	0
Meters replaced	2 removed 0 replaced	
Meters read (1 – date)	Jan/Feb 2021	
Meters read (2 – date)	Jun 2021	
Number of estimated readings	0	
Meters fitted with Taggle		157

## 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

*Table 3 Prescriptions from GMP*

Plan Requirement:	Activity/Reference	Complies
1. Temporary trade of water entitlement is allowed within a zone or coastal sub-zone and from one zone to another zone provided that: (i) Where usage has exceeded 80% of allocation over the previous 2 years, water levels have recovered appropriately; (ii) Transfer does not occur into coastal sub-zones; (iii) Transfer does not occur into zones 1, 2B, 4 and 5; and (iv) A temporary trade shall expire no later than 30th June in the financial year in which it is approved (ie 1 July to 30 June). (v) At the request of both trading parties, the temporary transfer may commence on 1 July if it is approved prior to 30 June (ie transfer entitlements can start in the new irrigation season rather than having to commence in the middle of an irrigation season).	11 temporary transfers were processed during the reporting period in accordance with this prescription.	Yes
2. Permanent trade of Water Entitlement shall be allowed within zones and from one zone to another zone provided that: (i) Where usage has exceeded 80% of allocation over the previous 2 years, water levels have recovered appropriately*; (ii) Review of groundwater monitoring data indicates that the transfer is unlikely to have significant adverse impacts and seasonal water level recovery in the target zone is acceptable. (iii) Transfer does not occur into zones 1, 2B, 4 & 5; and (iv) Transfer does not occur into coastal sub-zones.	7 permanent transfers were processed during the reporting period.	Yes
3. All groundwater licenses in the WSPA will be migrated to the State Water Register within six months of Ministerial approval of this Management Plan.	All licences are recorded in the Water Register.	Yes
4. No new groundwater licenses shall be issued, except as described in Prescriptions 7 and 8.	0 licences were issued.	Yes
5. The total licence entitlement/allocation shall not exceed 12,915 ML (PCV Gazette G28 11 July 2011), or any volume adjusted in accordance with Prescriptions 6 to 8.	Total entitlement volume is less than PCV.	Yes
6. If a groundwater licence is surrendered, revoked or not renewed the total entitlement in Prescription 5 will be reduced by that licence volume.	0 licences were surrendered.	Yes
7. The Corporation may issue a licence which may lead to the total groundwater licence entitlement in Prescription 5 being exceeded to overcome an administrative oversight or other anomaly, provided it does not exceed the PCV (12,915ML at time of writing).	Not applicable	Yes
8. The Corporation may issue or amend a groundwater licence in accordance with any State-wide policy. The volume in Prescription 5 and the PCV (by application to the Minister) will be adjusted.	Not applicable	Yes
9. The Corporation must report the details of any licence referred to in Prescriptions 6 to 8 in the annual report.	Refer to appendices for details	Yes

#### **4.4 Licensing Activities**

Table 4 provides details of licensing activities. As highlighted in section 3.4 there has been a reduction in the number of licences over the past 5 years predominantly due to customers amalgamating multiple licences held into one licence.

*Table 4 Licensing activities 2020-21*

<b>Year to 30 June 2021</b>	<b>No.</b>	<b>Volume ML</b>
New licences issued*	0	0
New licences issued#	5	0
Additional volumes on existing licences	0	0
Licences revoked	0	0
Permanent transfer	7	415.4
Temporary transfers	11	481
D&S Bores notifying use	0	0

\*Issued as a result of a split licence

# Issued with zero entitlement to enable trade to occur

##### **4.4.1 Compliance and exceptions**

Activities undertaken during the reporting period comply with the requirements of the GMP.

##### **4.4.2 Issues affecting implementation**

No issues were experienced or identified.

## 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 and to ensure the long-term sustainability of those resources.*

Monitoring results demonstrate that the groundwater resources of the Koo Wee Rup WSPA are being managed sustainably.

An internal review of the GMP was completed in 2019. The review identified that the Plan was working well, however that there may be some opportunities to simplify trading rules to provide for improved trade and equitable access to the resource. Further technical work is underway to assess the potential for improvements to the Plan. The first stage of this work includes a review of the hydrogeology and groundwater resources of the Westernport catchment. This report is scheduled for completion in September 2021.

The Koo Wee Rup GMP Annual Report for 2020-21 demonstrates that SRW has complied with the requirements of the plan.



## **Appendices**

### **5.1.1 Licence Details**

Water Trade details for the 2020-21 season can be found at:

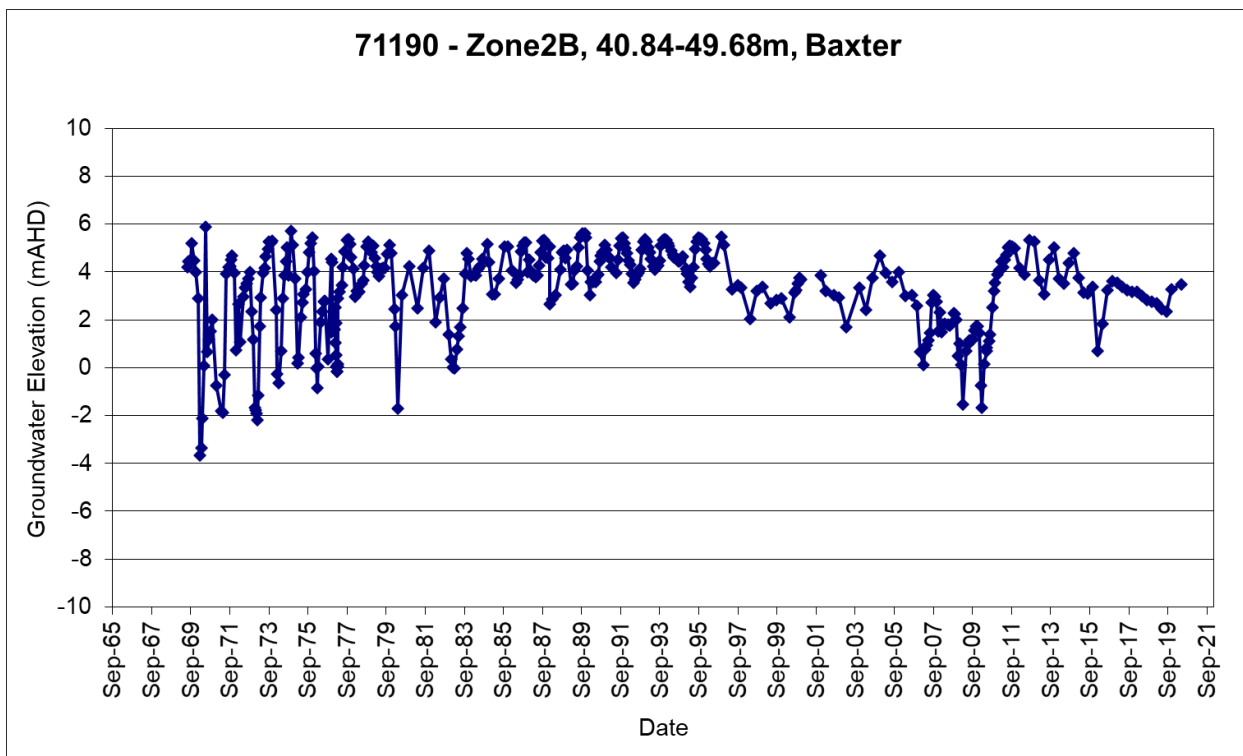
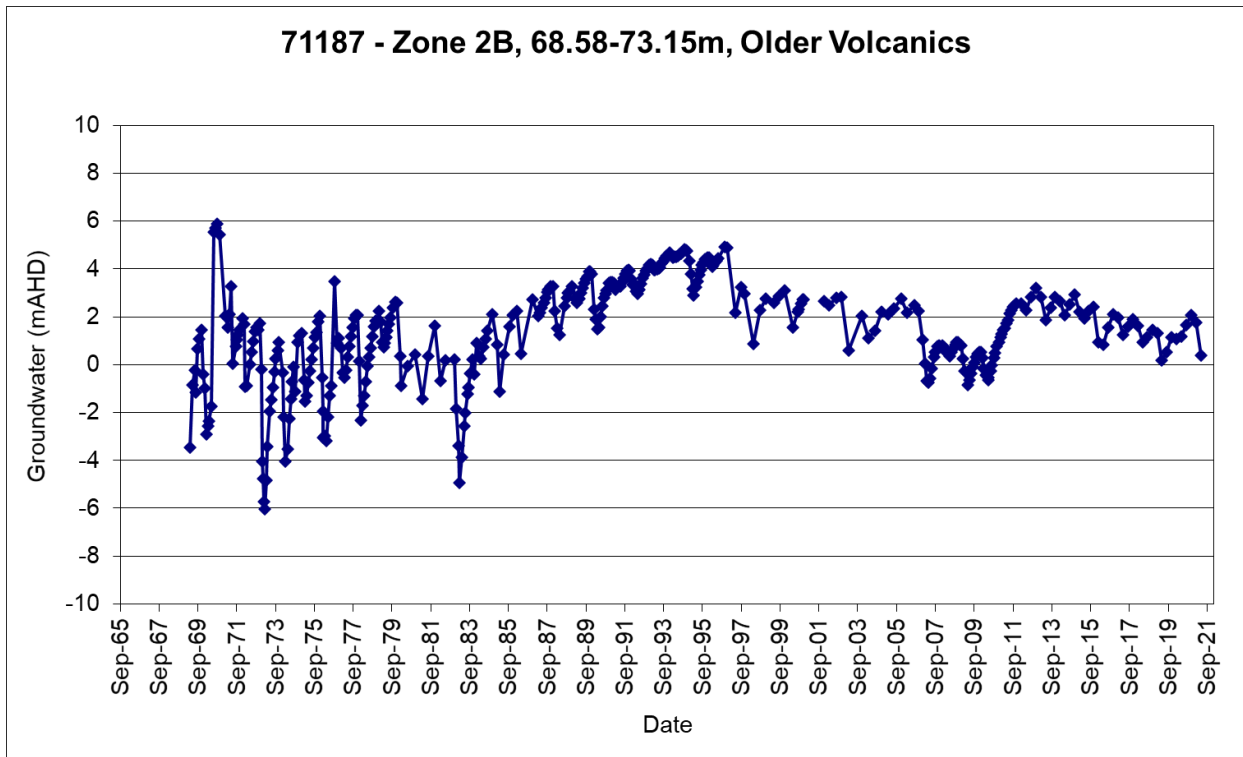
<http://waterregister.vic.gov.au/water-trading/take-and-use-licence-trading>

## 5.1.2 Monitoring program details

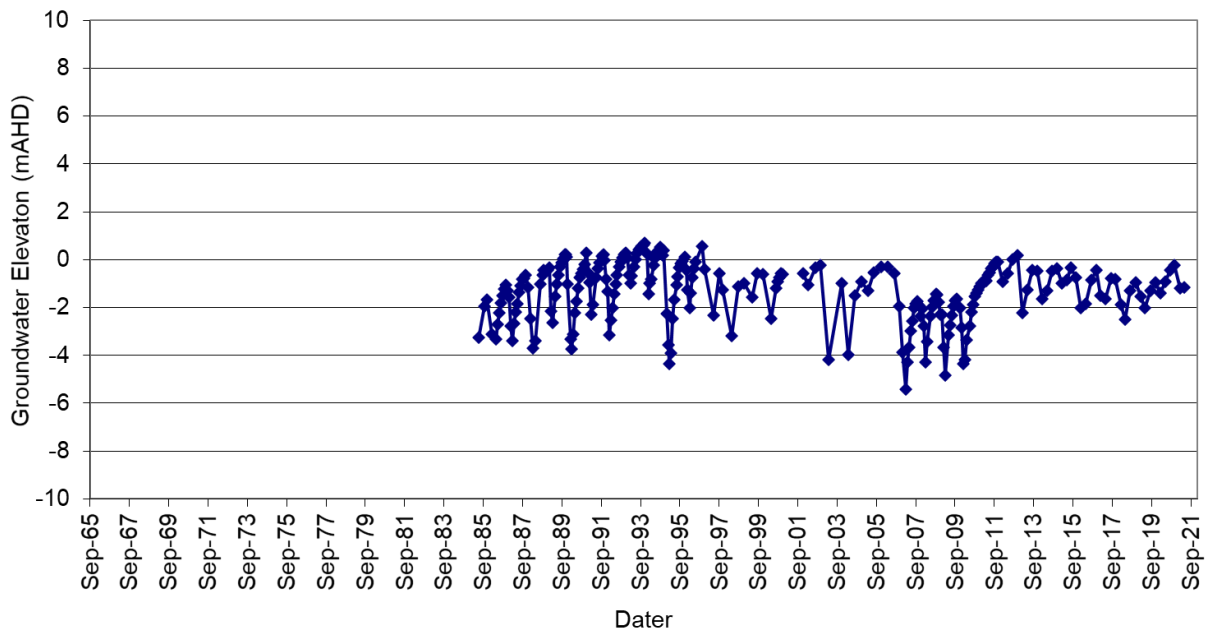
### Groundwater monitoring program summary

BHID	Zone	Formation	GW Level	Salinity
71194	1	Baxter, Sherwood	Quarterly	Annual
71195	1	Sherwood	Quarterly	Annual
71201	1	Sherwood	Quarterly	
71210	1	Sherwood	Quarterly	
71219	1	Baxter	Quarterly	Annual
WRK057103	1	Older Volcanics	Quarterly	
WRK057105	1	Sherwood	Quarterly	
68351	4	Quaternary Sands	Quarterly	
71848	4	Yallock	Quarterly	
71850	4	Yallock	Quarterly	
74608	5	Older Volcanics	Quarterly	
74609	5	Yallock	Quarterly	
110735	5	Quaternary Sands	Quarterly	
91076	6	Silurian Bedrock	Quarterly	
74306	7	Childers	Quarterly	
74309	7	Older Volcanics	Quarterly	Annual
74310	7	Sherwood	Quarterly	Annual
74311	7	Baxter	Quarterly	Annual
145259	7	Westernport	Quarterly	
145260	7	Childers	Quarterly	
145261	7	Westernport	Quarterly	Annual
145262	7	Childers	Quarterly	Annual
126975	2A	Older Volcanics	Quarterly	
71187	2B	Older Volcanics	Quarterly	
71190	2B	Baxter	Quarterly	
WRK966214	2B	Yallock	Quarterly	
WRK966215	6	Sherwood	Quarterly	
WRK966216	6	Older Volcanics	Quarterly	

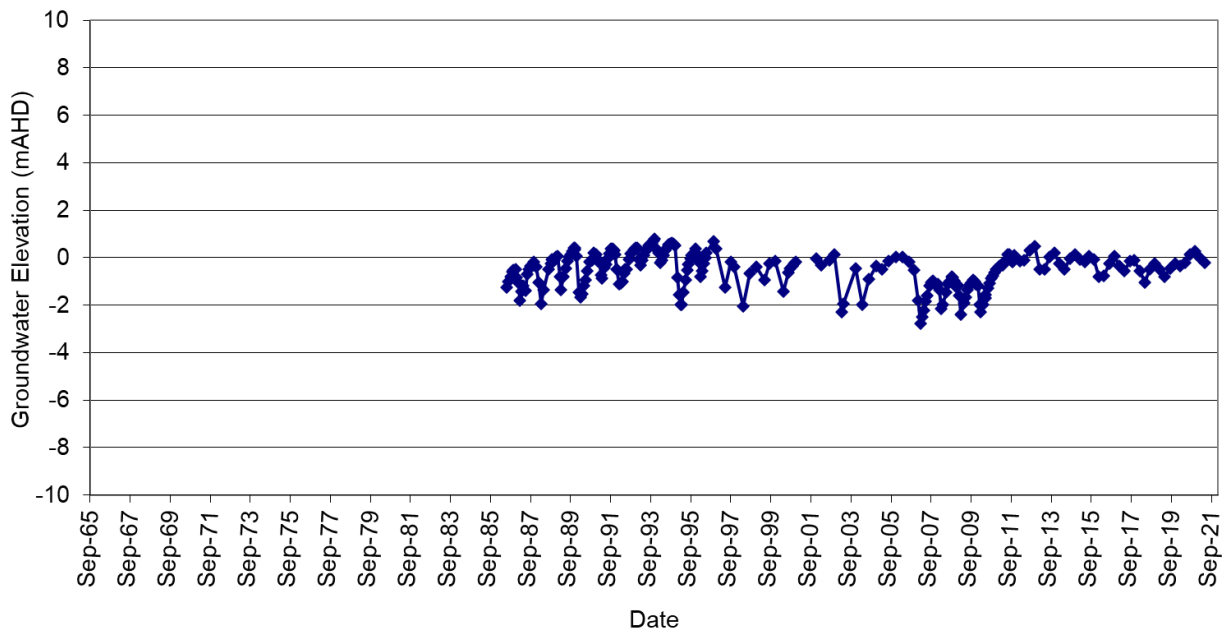
### 5.1.3 Hydrographs

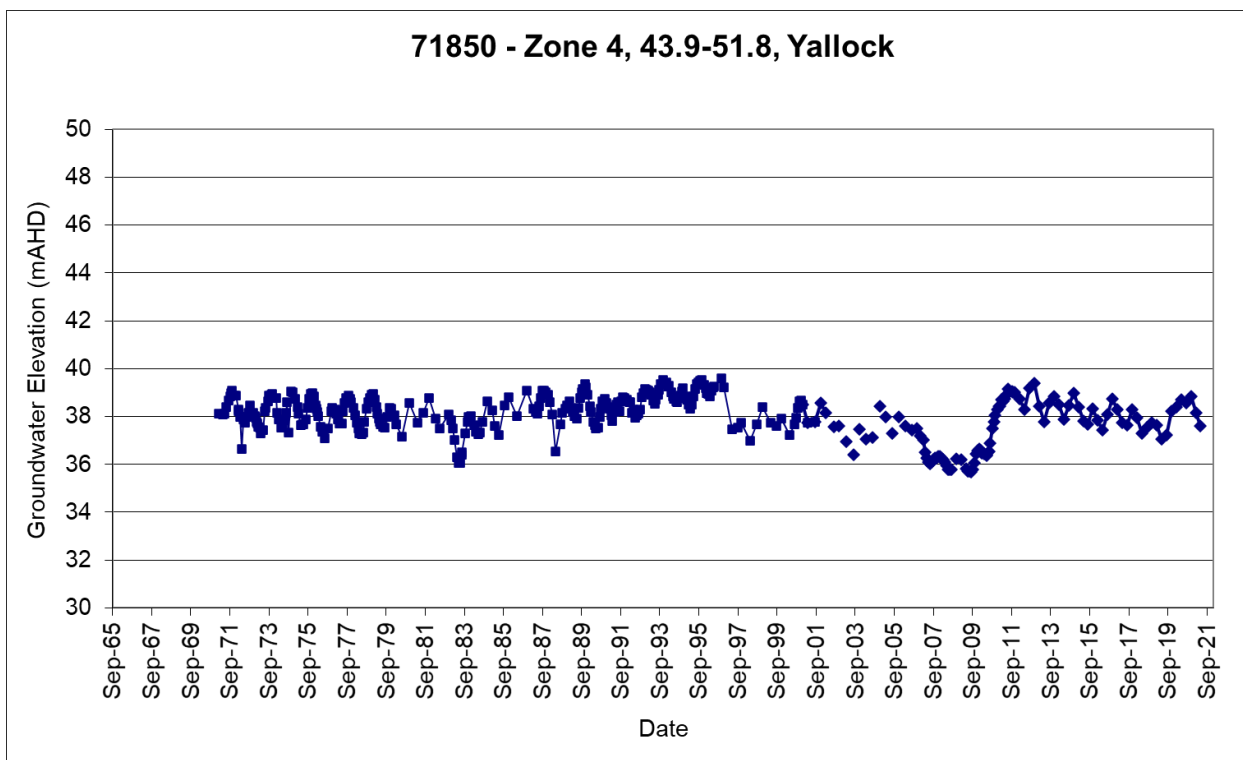
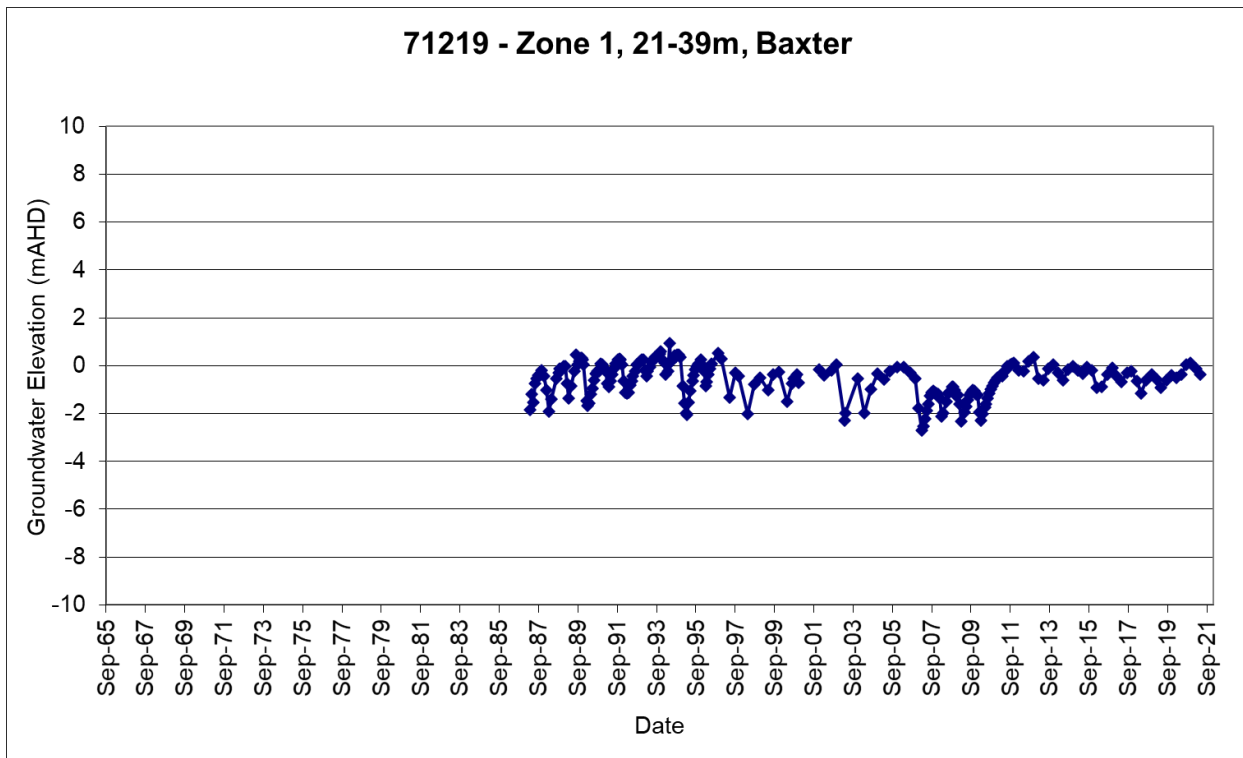


**71201 - Zone 1, 84-96m, Sherwood**

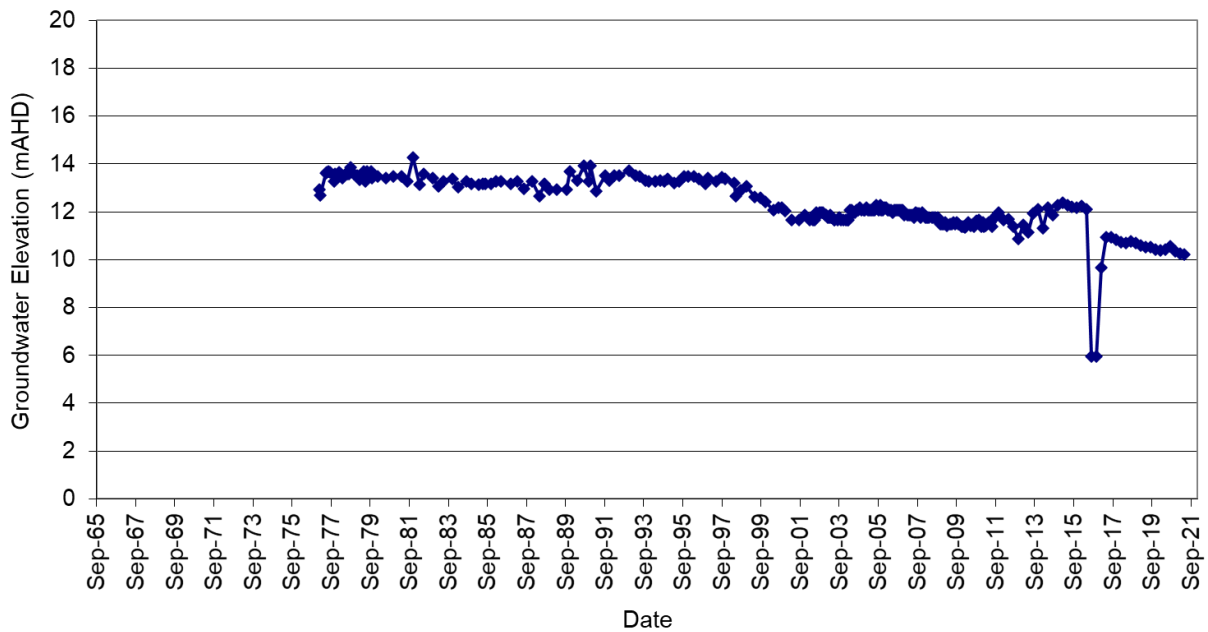


**71210 - Zone 1, 52.5-61.5m, Sherwood**

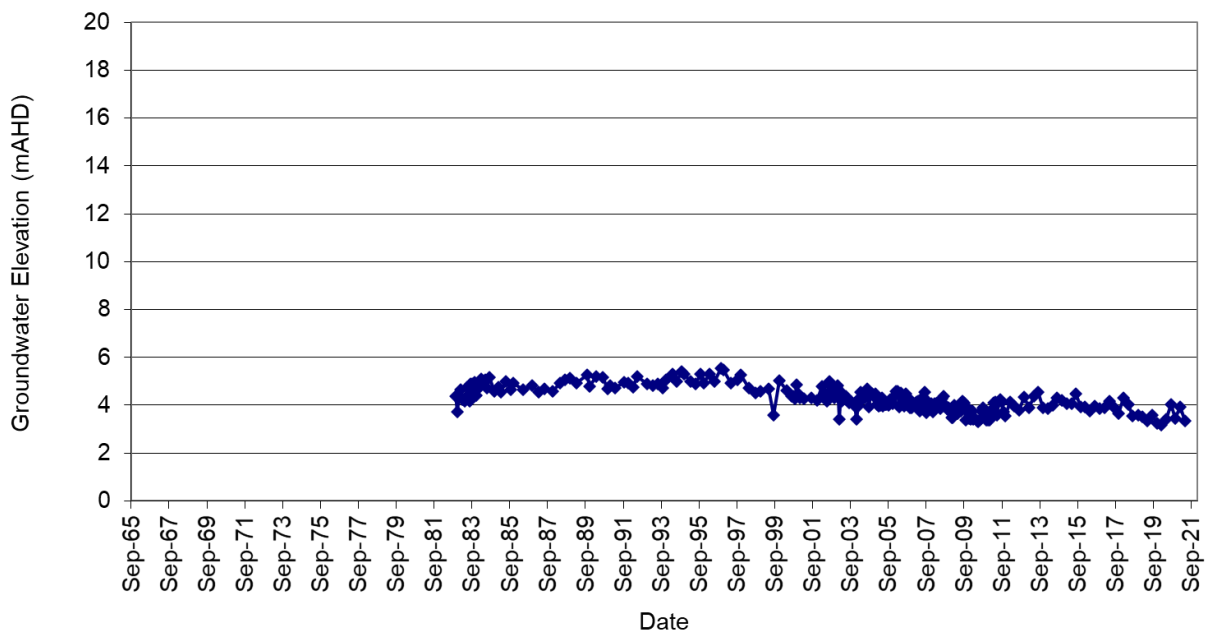




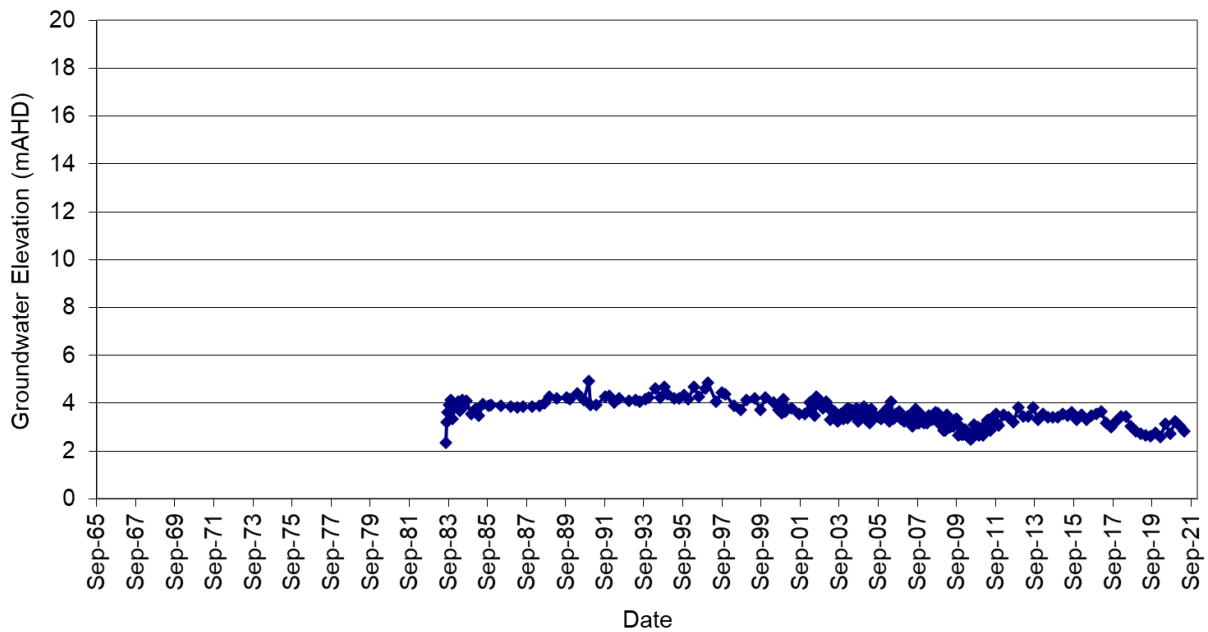
**74306 - Zone 7, 242-244m, Childers**



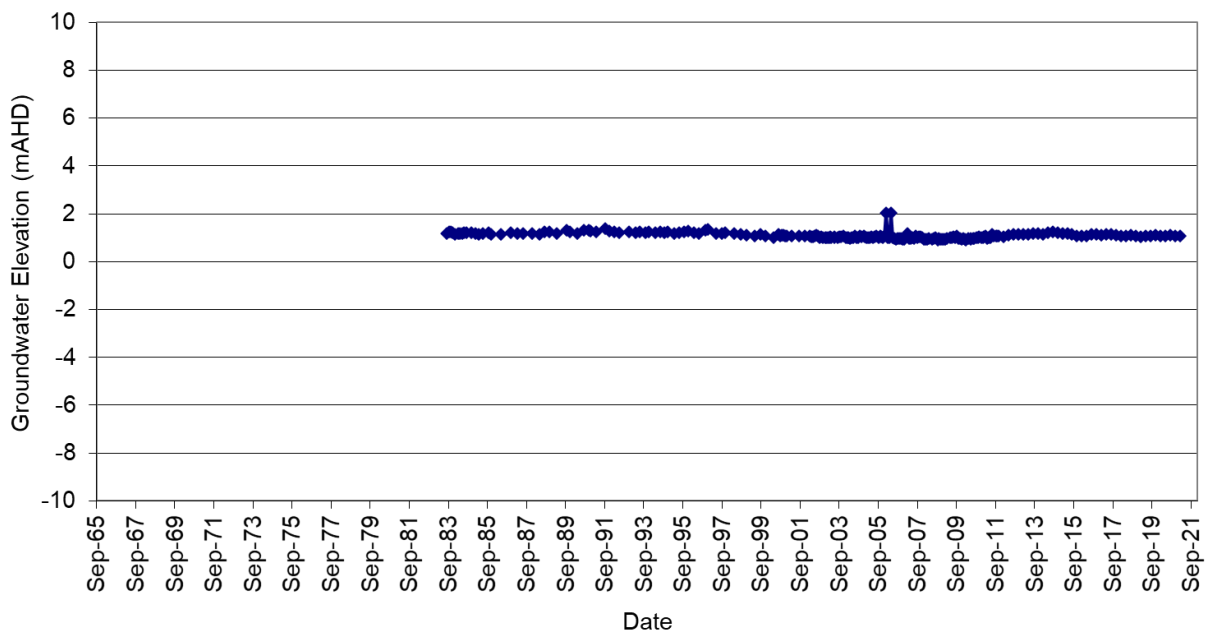
**74309 - Zone 7 coastal, 97.5-118.5m, Older Volcanics**

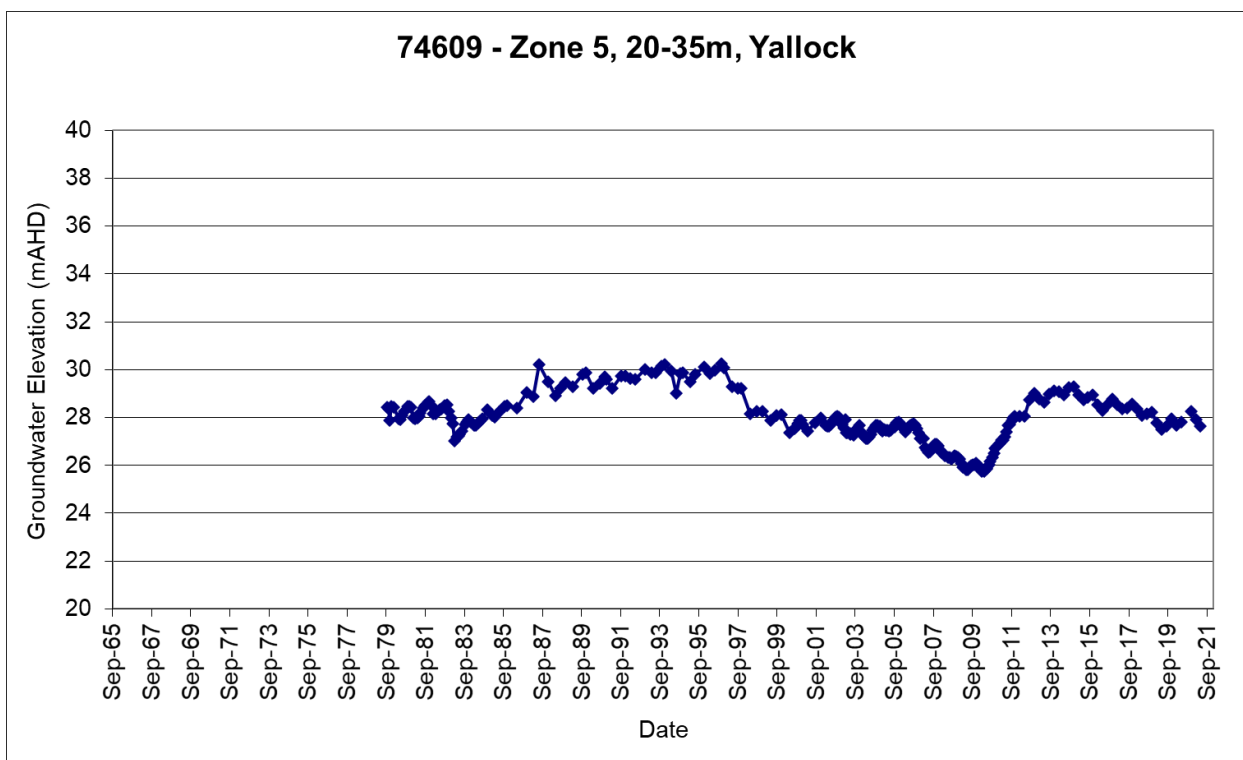
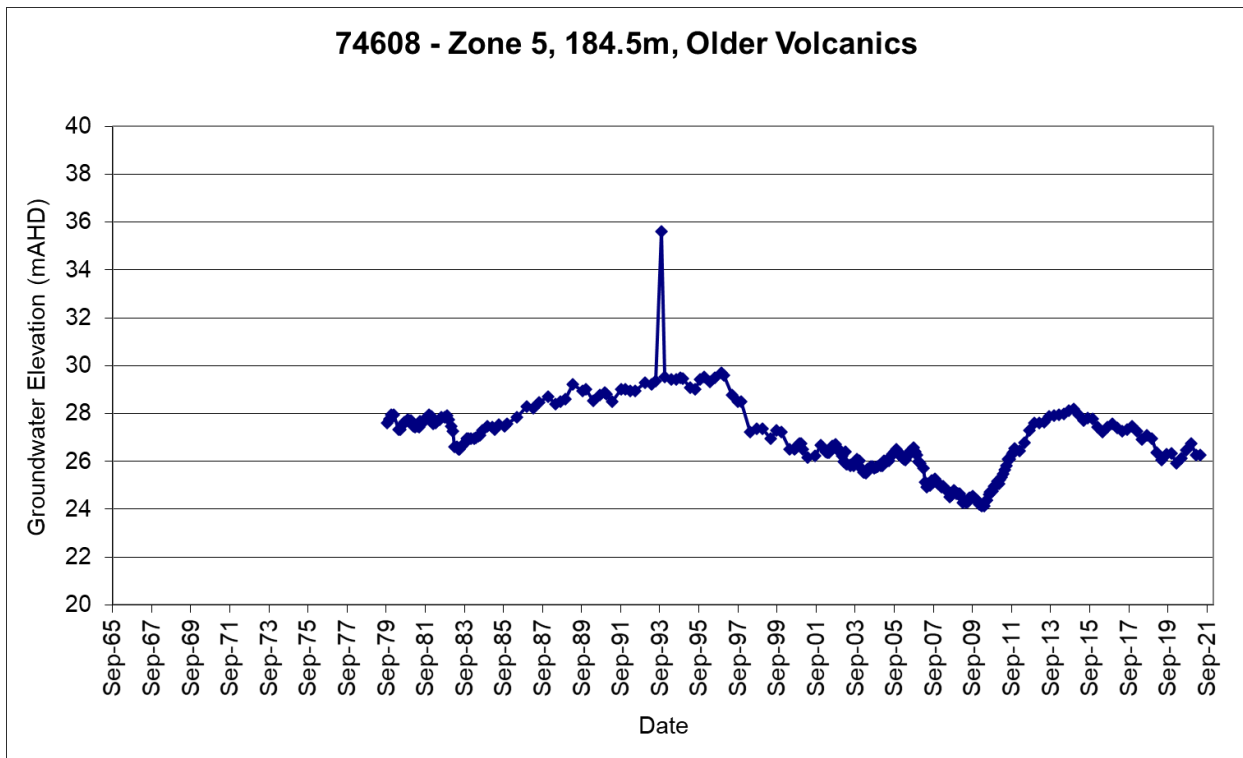


**74310 - Zone 7 coastal, 84.1-87.5m, Sherwood**

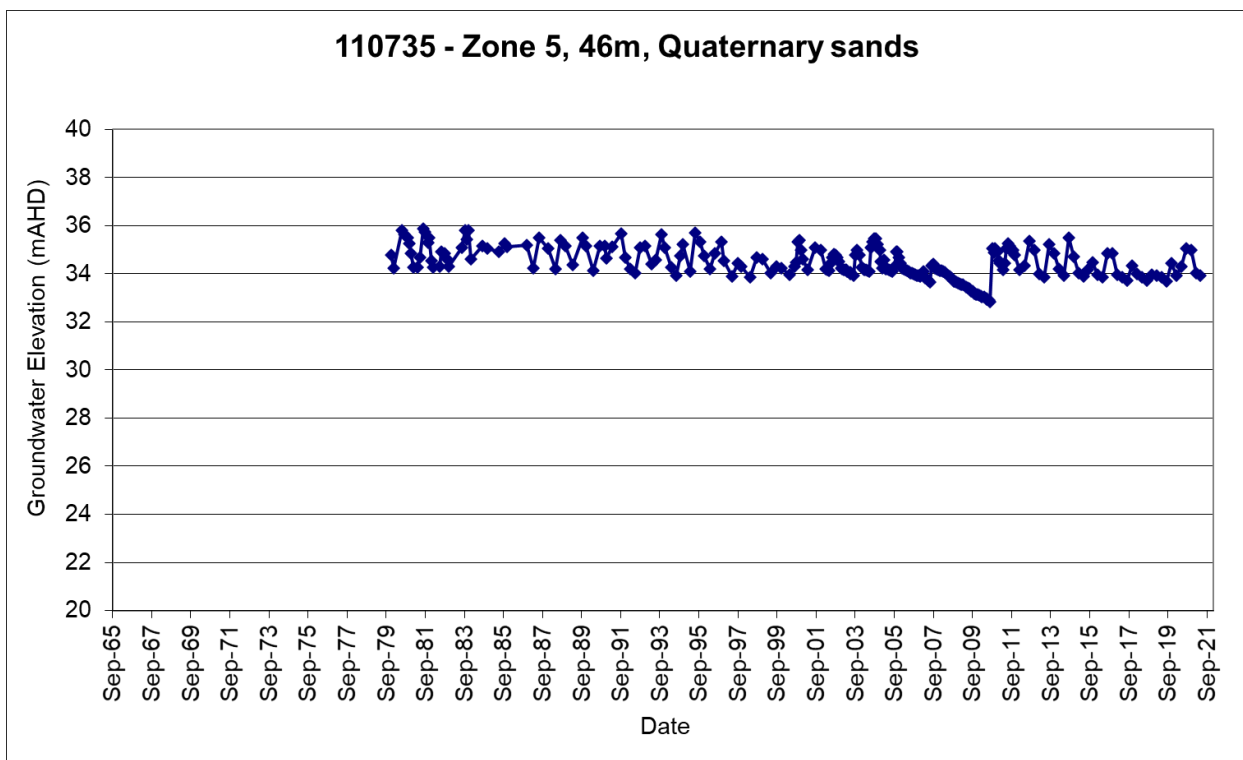
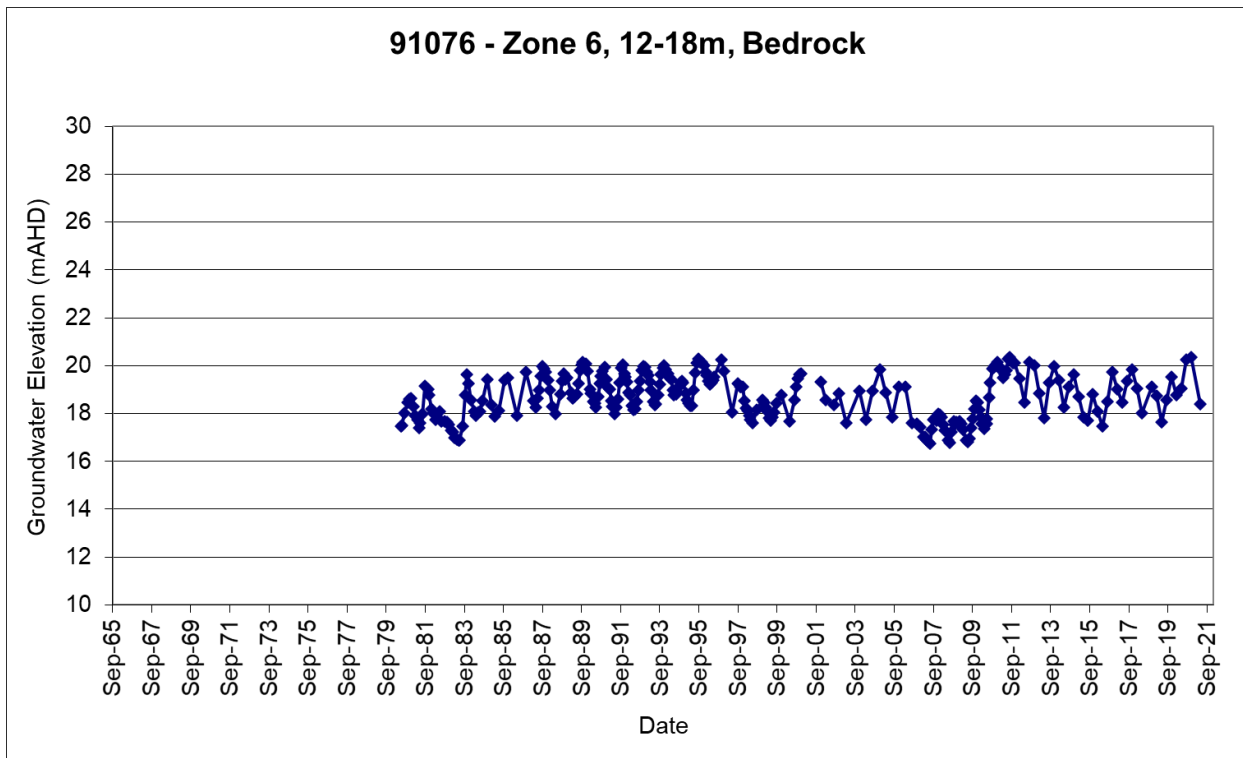


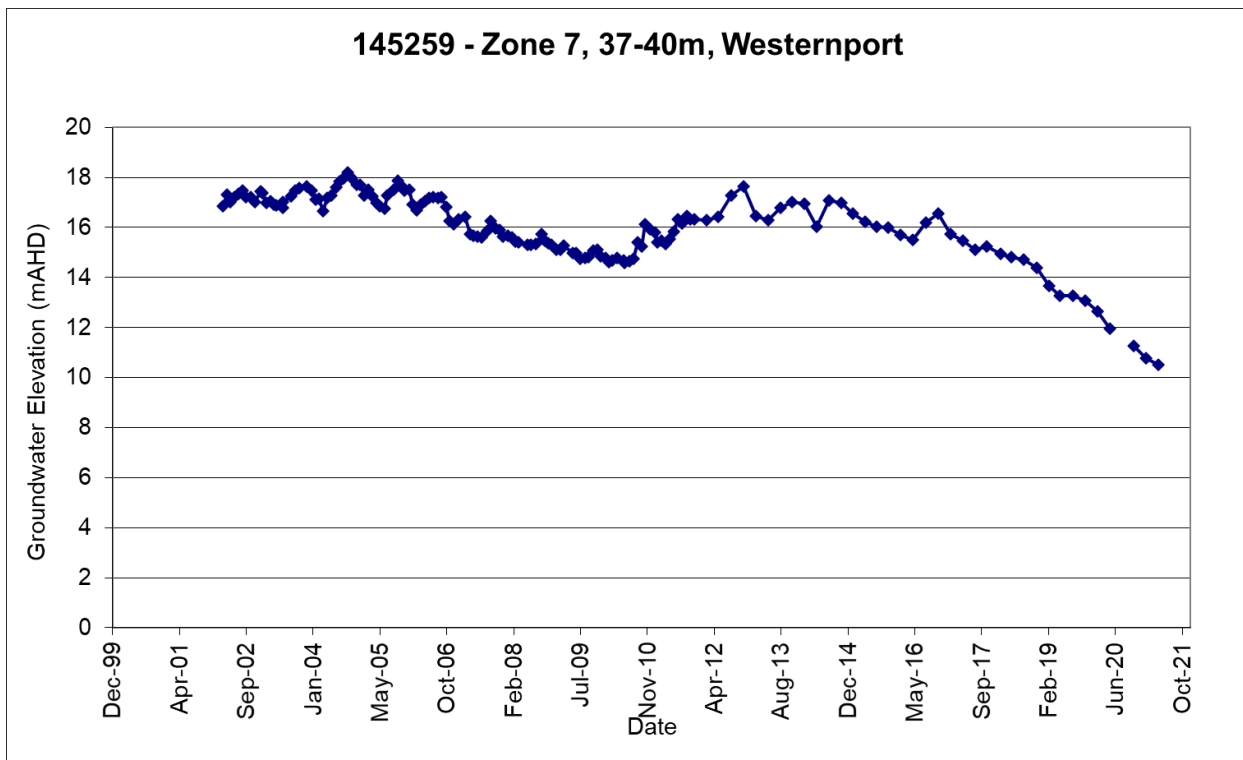
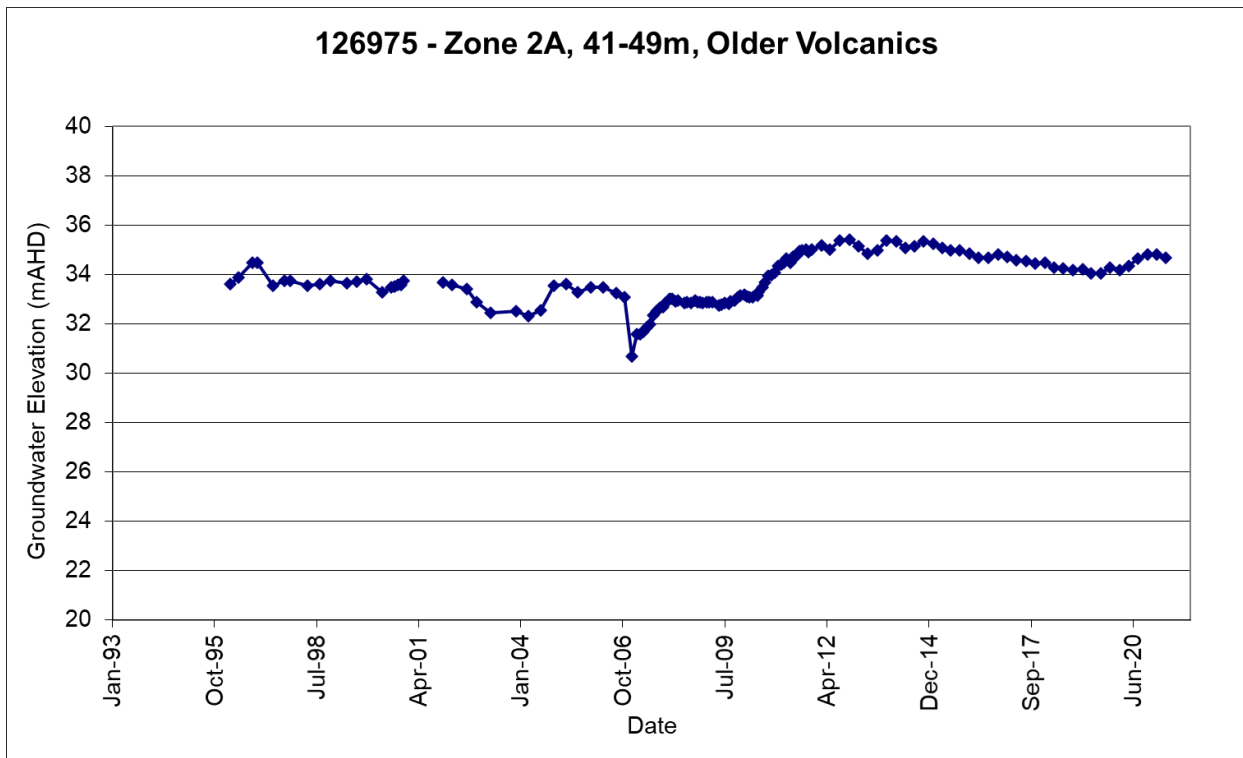
**74311 - Zone 7 coastal, 17-25m, Baxter**

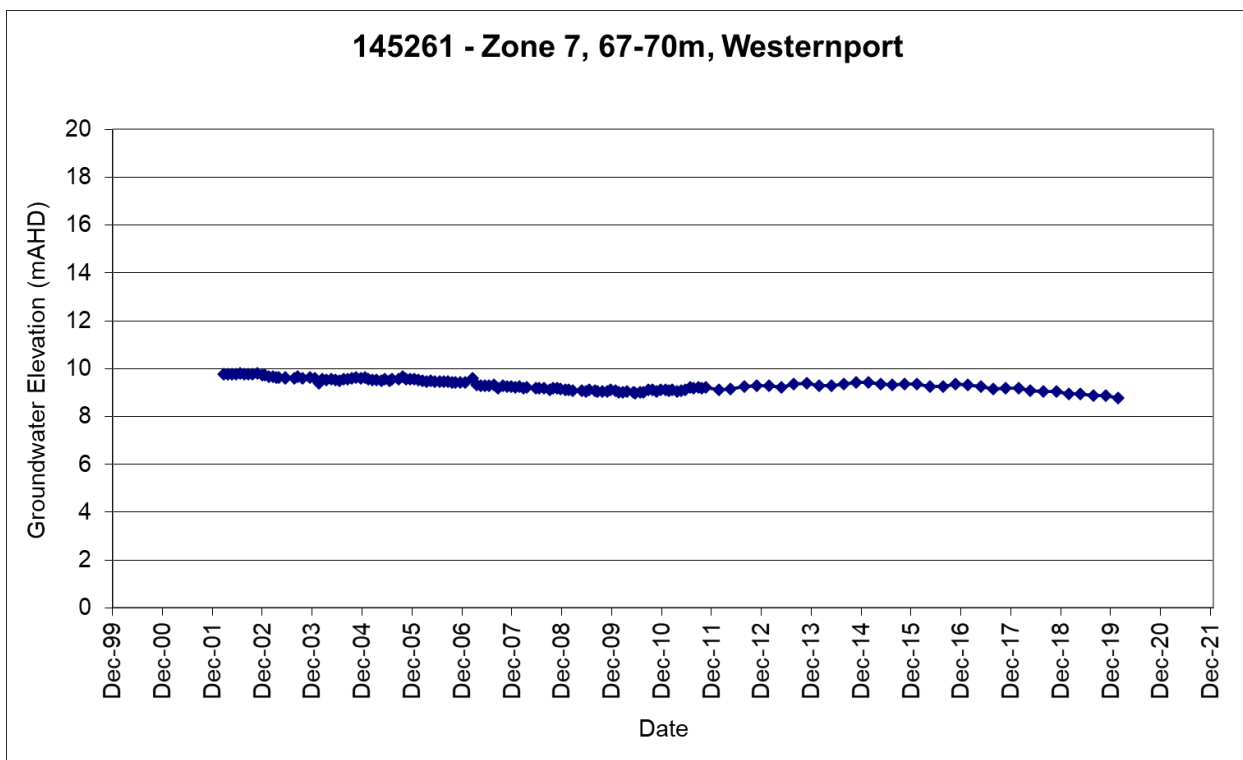
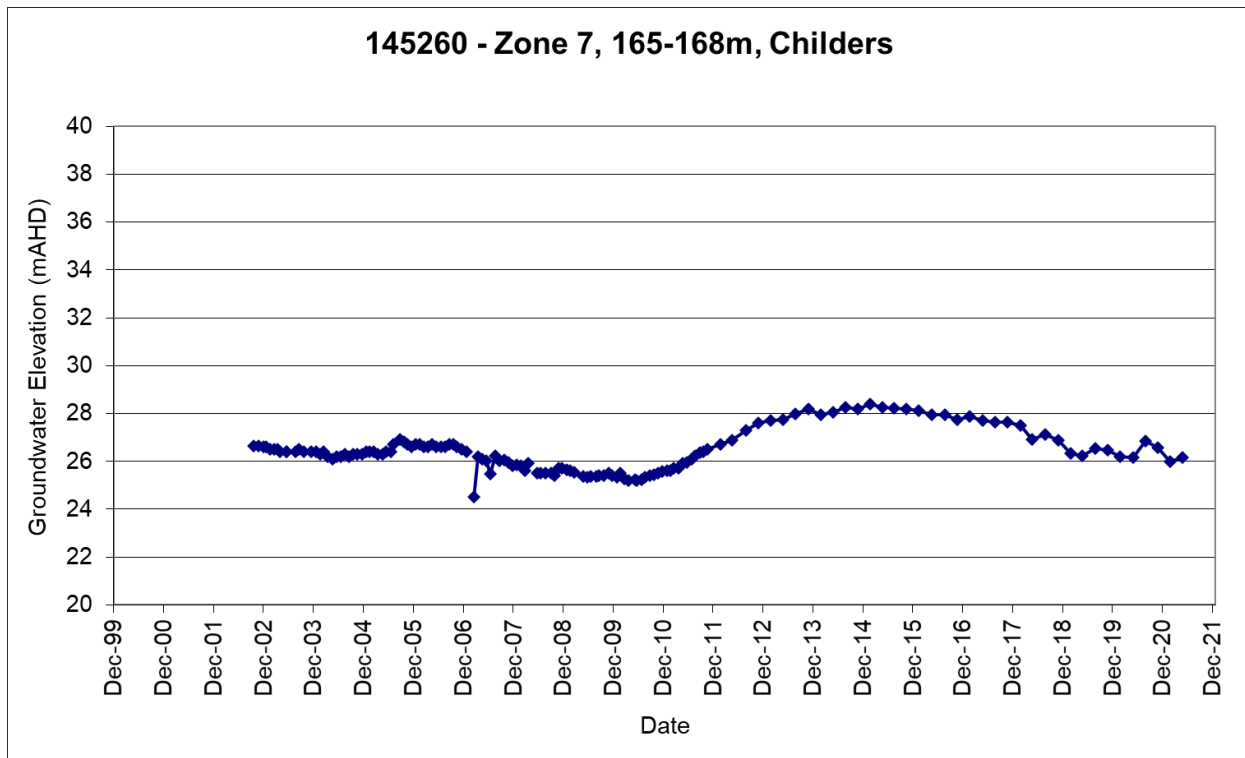




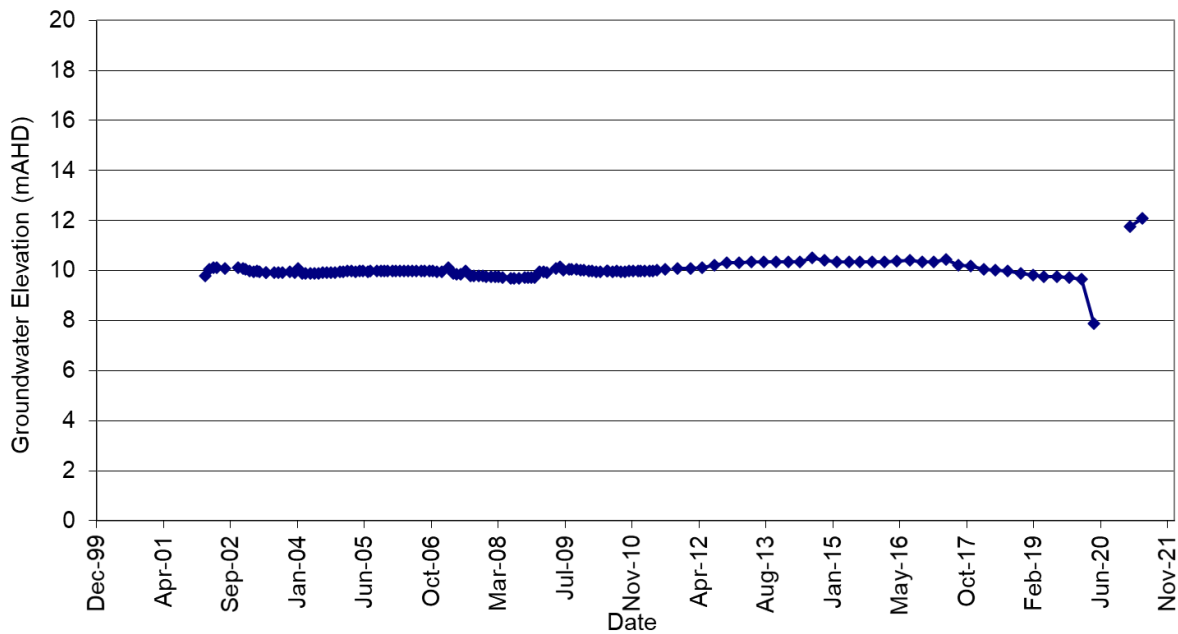




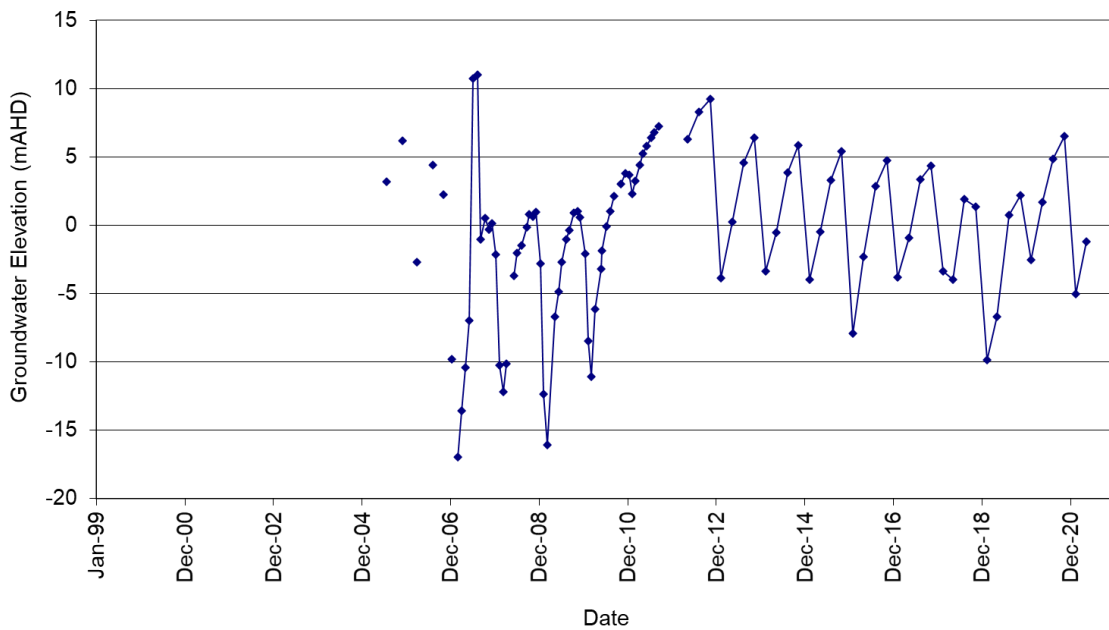




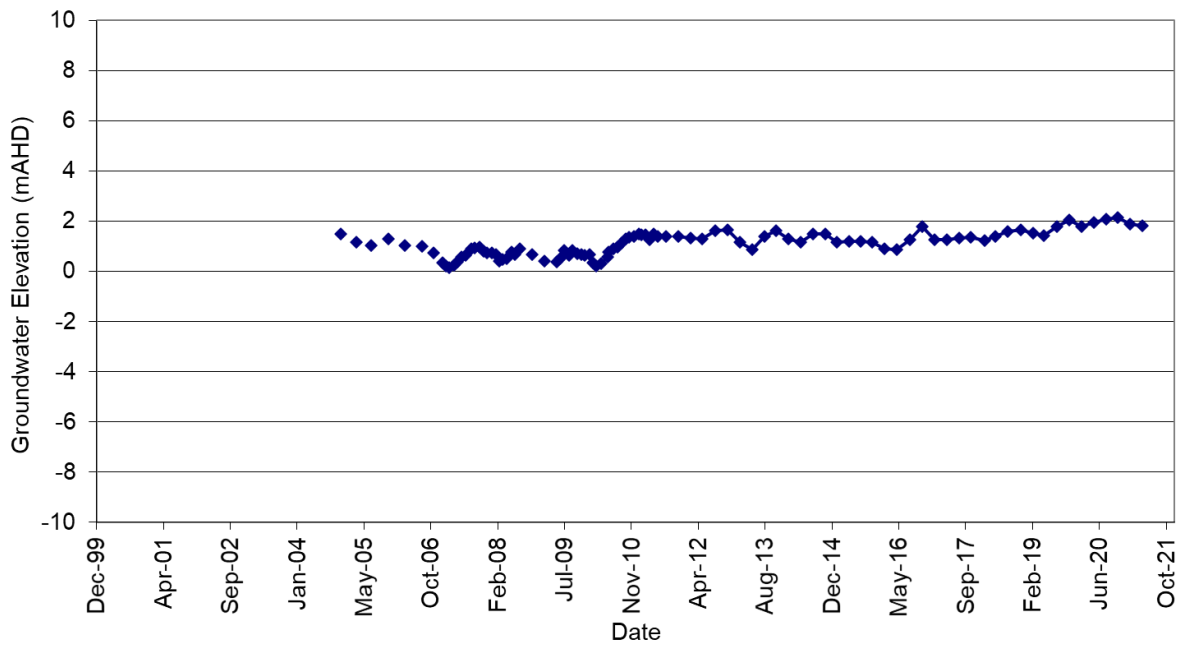
145262/WRK116126 - Zone 7, 205-208m, Childers



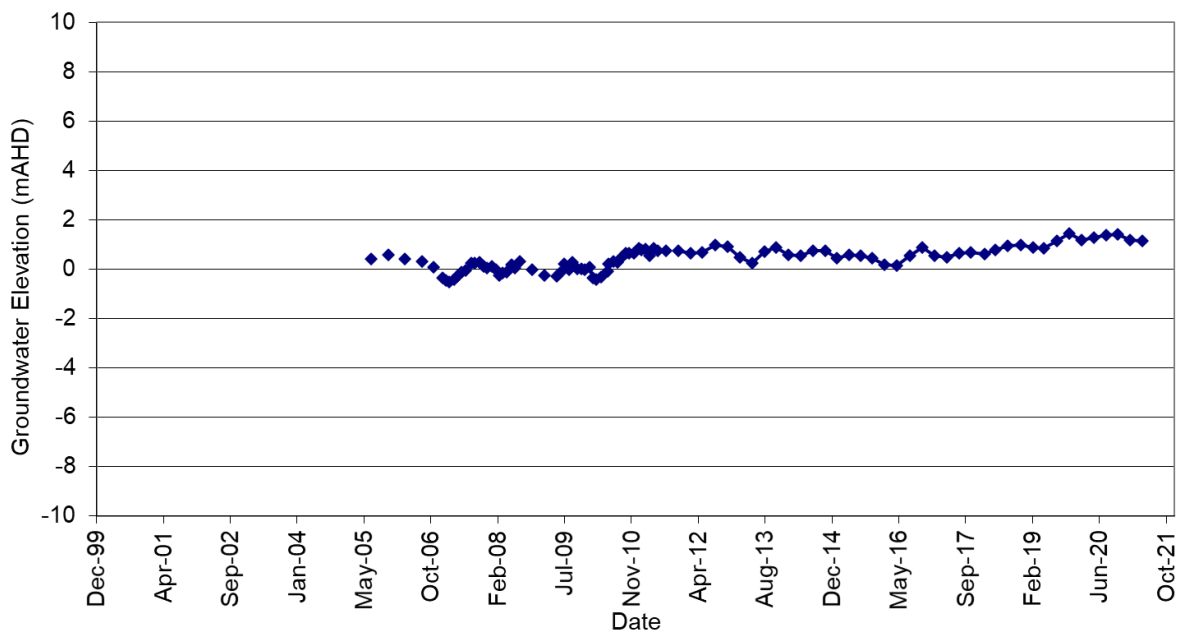
WRK966214



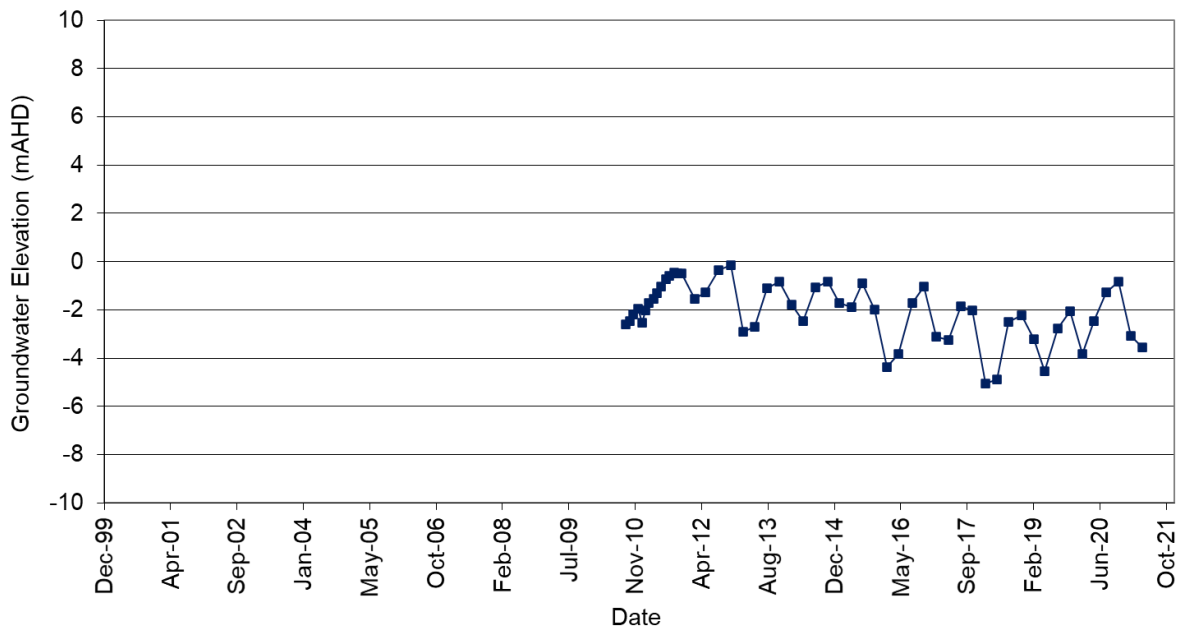
**WRK966215 - Zone 6, 32.5-71.2, Sherwood**



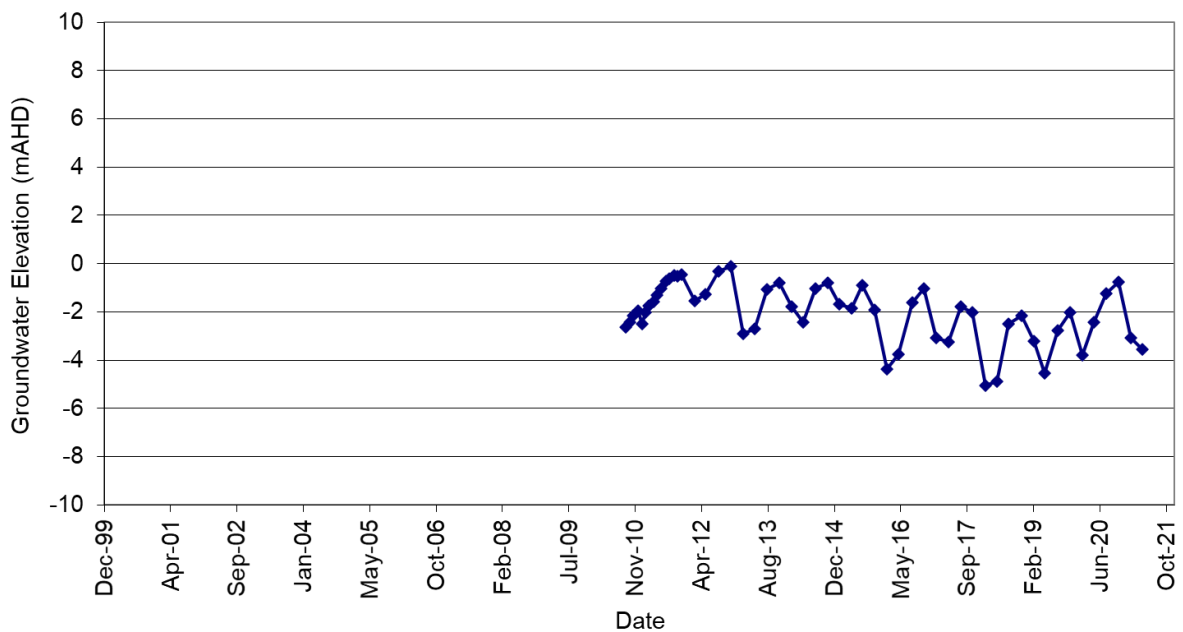
**WRK966216 - Zone 6, 87.5-90m, Older Volcanics**



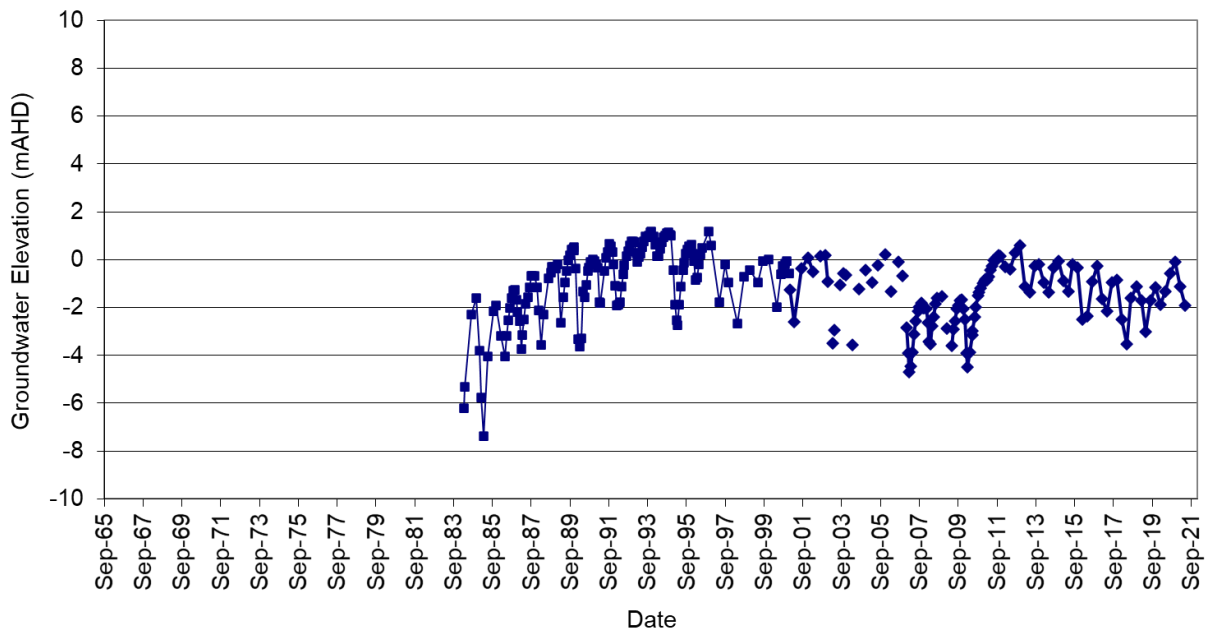
**WRK057105 - Zone 1, 35.8-41.8m, Sherwood**



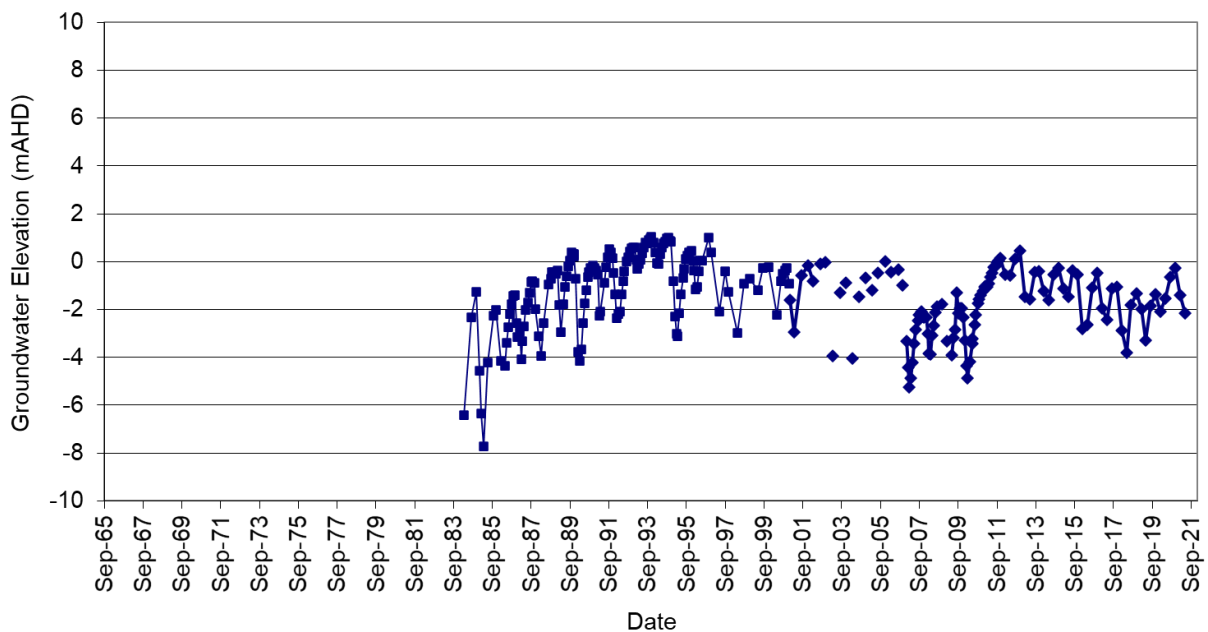
**WRK057103 Zone 1, 70-73m, Older Volcanics**

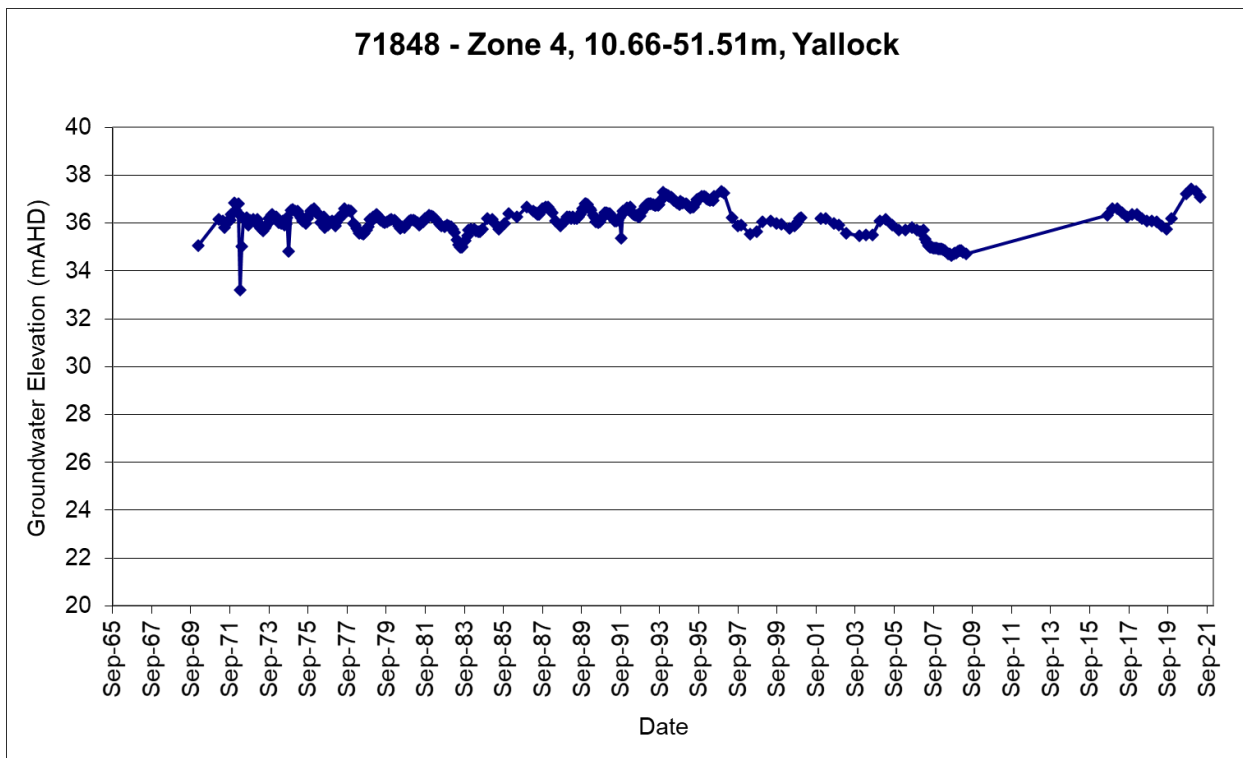
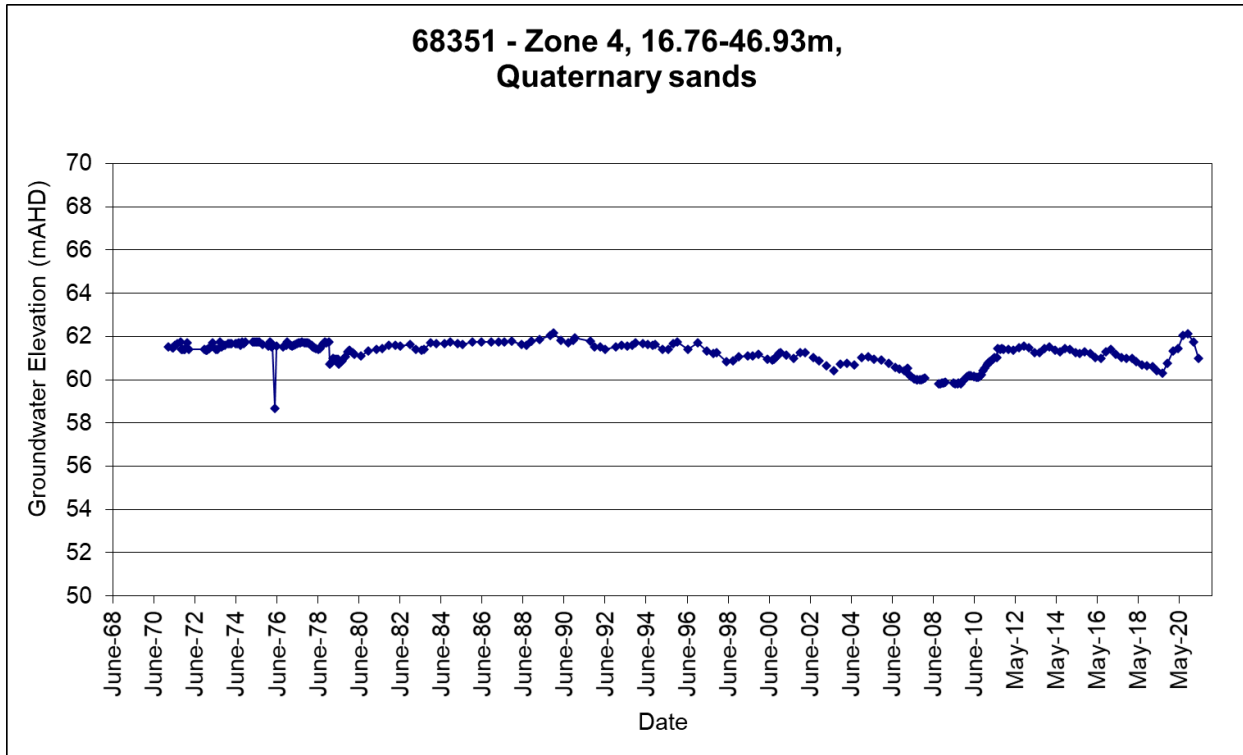


**71194 - Zone 1, 34-51m, Baxter & Sherwood**



**71195 - Zone 1, 82-94.5m, Sherwood**

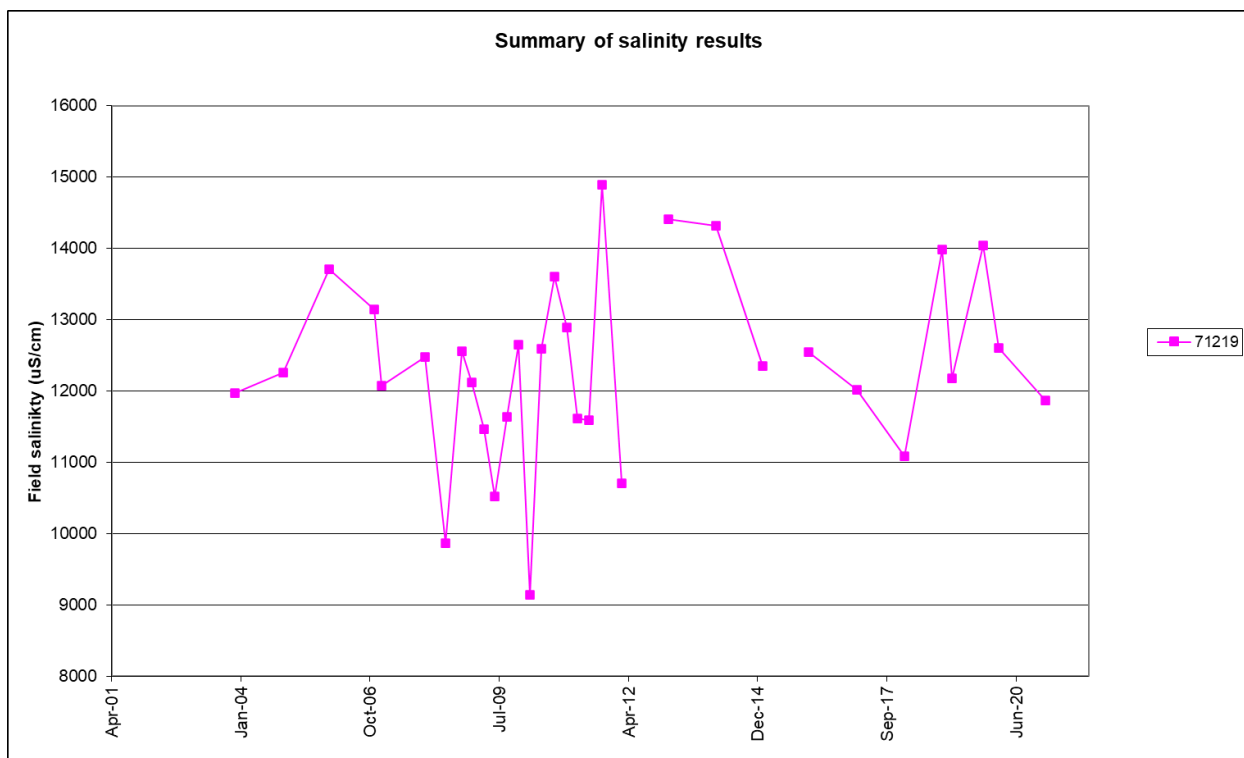
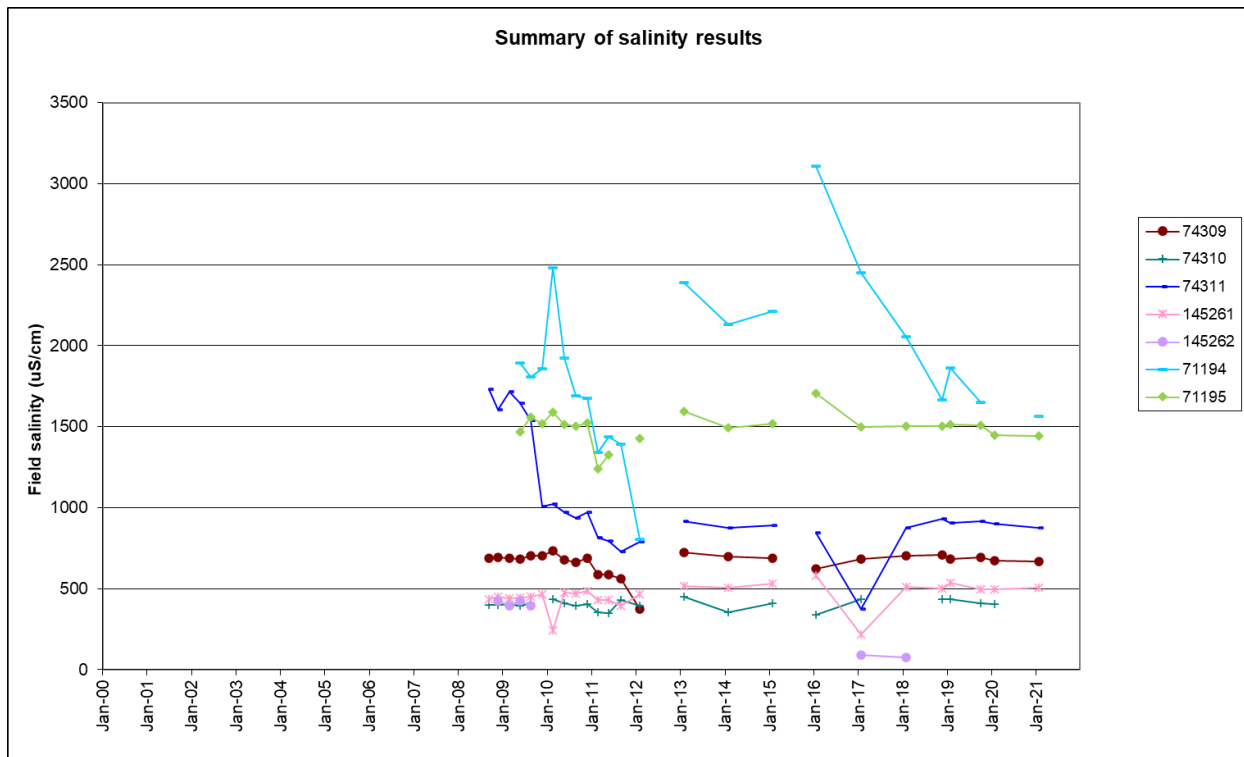






### 5.1.4 Salinity

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



### 5.1.5 Links for Compliance

[Zero Tolerance To Water Theft In Victoria | Premier of Victoria](#)

[Compliance | Southern Rural Water \(srw.com.au\)](#)

[Non-urban water compliance and enforcement in Victoria](#)