



# **Koo Wee Rup Groundwater Management Plan Annual Report**

2010-11

## Foreword

This report is submitted to the Minister for Water and Port Phillip & Westernport 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

<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 Annual Volume)</b>	12,915 ML
<b>Scheduled Plan Review</b>	30 September 2016
<b>Implementation Authority</b>	Southern Rural Water
<b>Relevant CMA</b>	Port Phillip & Westernport Catchment Management Authority
<b>Report Period</b>	1 July 2010 – 30 June 2011

There were no significant issues identified in this report affect the Plan implementation.

Monitoring and metering indicate no significant changes in the condition of the resource or water usage patterns that require review of the Plan.

Signed



Craig Parker  
Acting Chief Executive Officer

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## 1 Introduction

This report summarises licence information, metered usage and monitoring data collected for the period between July 1<sup>st</sup> 2010 and June 30<sup>th</sup> 2011 in accordance with the recommendations given in the Koo Wee Rup Groundwater Management Plan (GMP).

The Koo Wee Rup Water Supply Protection Area (WSPA) is separated into 8 zones and comprises the groundwater resource, mainly in the Westernport sequence (Baxter, Sherwood and Yallock formations). The Westernport sequence is generally considered a single aquifer system, as there is a hydraulic connection between each individual formation. Taking this into account, there has been no vertical limits placed on the depth of the WSPA. However basaltic clay of the Older Volcanics is considered to form a semi-confining layer between the Westernport sequence and the underlying Older Volcanics/Childers formations.

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

The Koo Wee Rup GMP identifies Southern Rural Water (SRW) as the authority responsible for managing and administering the plan.

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 and cause to be carried out groundwater level monitoring and metering programs;
- 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 Koo Wee Rup 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 sustainability of the aquifer(s);
- Trading of existing consumptive use allocations will only occur in accordance with all relevant provisions of the Water Act 1989 and/or any supplementary rules adopted for the Koo Wee Rup WSPA;
- No new groundwater licences will be issued if the total of all groundwater licence entitlements exceed the PCV declared for the Koo Wee Rup WSPA, unless allowed for by prescriptions 7 & 8.

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).

## 2 Key Observations

### 2.1 Rainfall

Rainfall during the reporting period was 1046mm (measured at Koo Wee Rup). Koo Wee Rup has an average rainfall of 780mm per year. Records at this station go back to 1958, which indicate this is the wettest 12 months on record since this time.

### 2.2 Water Levels

Groundwater levels are measured in fifty (50) bores, monitoring the Quaternary Sands, Westernport Group, Older Volcanics and Childers aquifers.

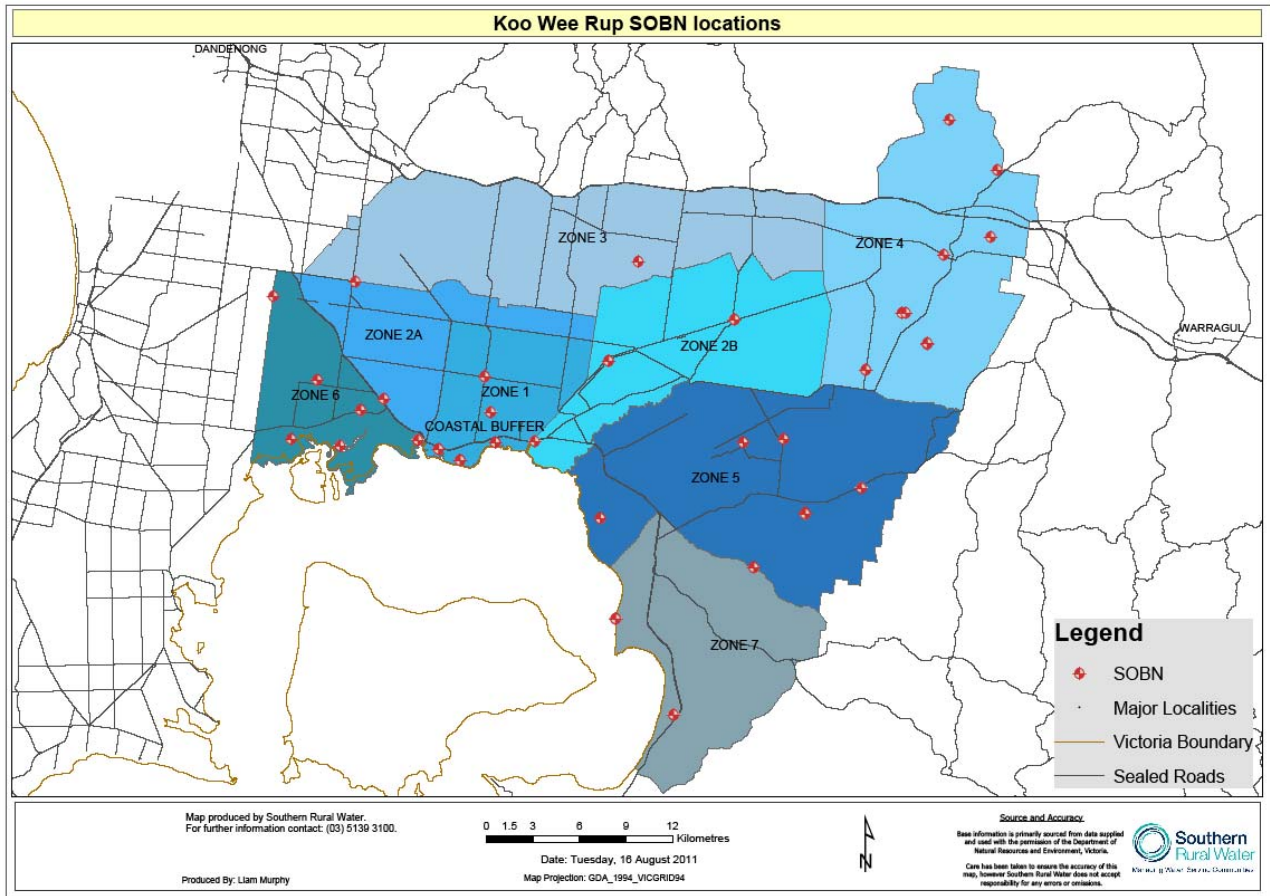
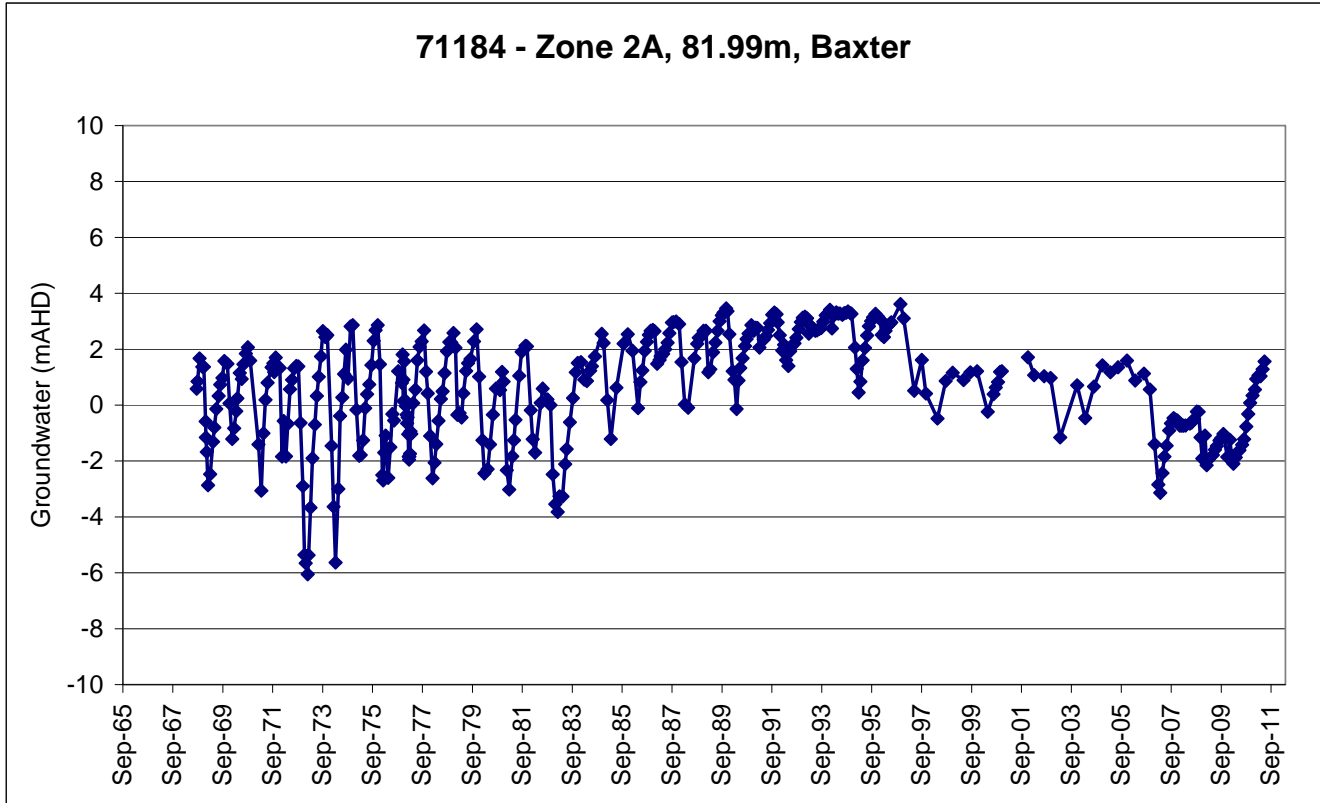


Figure 1: SOBN locations in Koo Wee Rup WSPA (see Appendix 1 for more detail).



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

All hydrographs are presented in appendix 2.

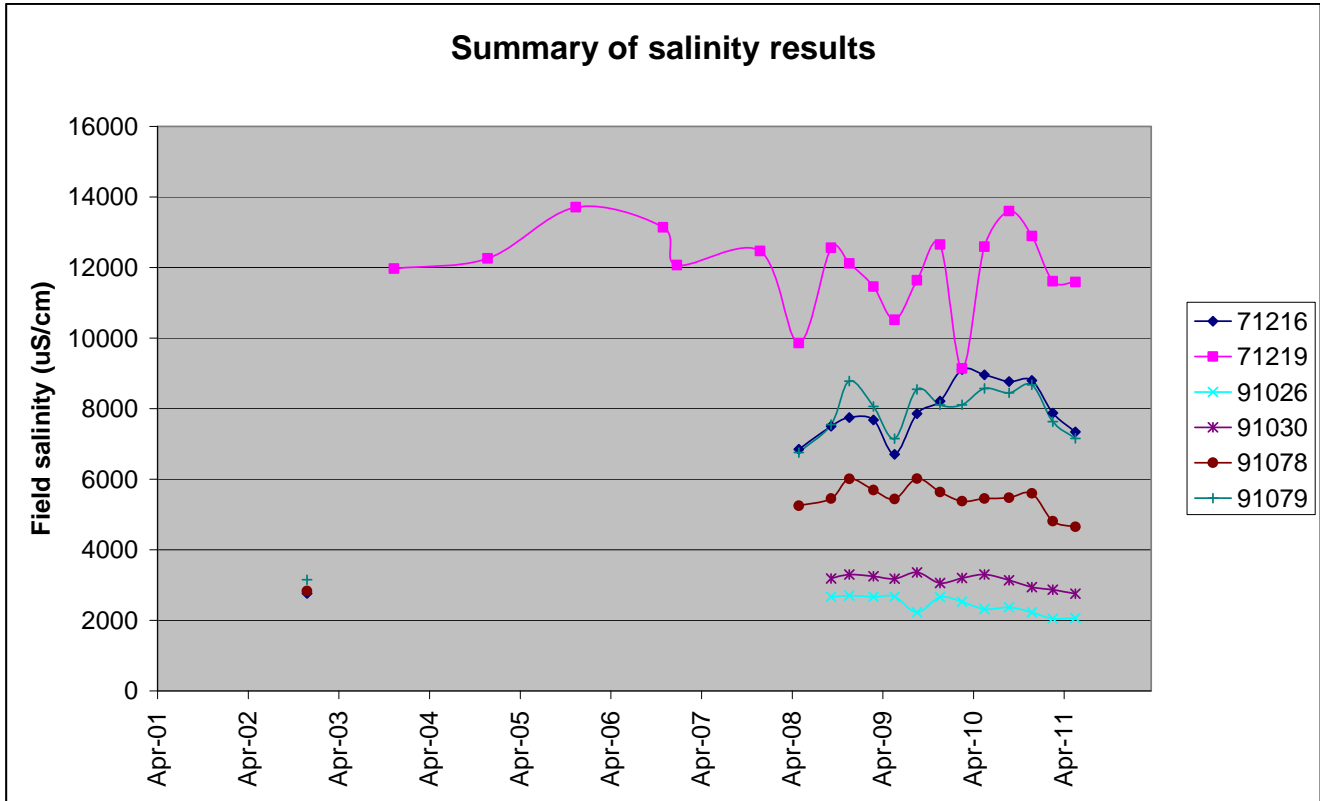
The review of the groundwater elevation data indicates:

- Long term declining water levels across the WSPA, with most bores falling by 3m or less over forty years. Generally, water levels in most bores are similar to levels seen 10-15 years ago. In the last 12 months levels have generally recovered significantly; and
- As of June 2011, a total of eleven bores had groundwater levels below sea level. As of July 2011, only 4 monitored bores have water levels below sea level. Levels are still rising in all of these bores.

### 2.3 Salinity

Salinity has been relatively stable over the past 5 years, but readings have fallen in the past 12 months due to increased recharge. Salinity will continue to be monitored and reviewed on a quarterly basis.

All salinity graphs are presented in appendix 3.



**Figure 3: Graph showing salinity in KWR.**

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

## 2.4 Water Use

The following table provides detail on water use in the 2010-11 year as compared to four previous years.

<b>At 30 June</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
No. of licences	393	390	386	382	371
Total allocated volume (ML)	13,708.0	13,837.2	12,825.7	12,414.7	12,018.0
No. of metered licences*	268	270	267	208	205
Total volume metered (ML)*	12,092	12,182.6	11,810.9	9,722.1	9,575.8
Metered volume used (ML)	6,451.8	4,195.1	5,036	3,377.6	1,939.4
Use % of allocation	47%	30%	39%	27%	16%
No. of licences with use greater than allocation	44	20	25	23	10
Permissible Consumptive Volume (PCV)	12,915.0	12,915.0	12,915.0	12,915.0	12,915.0
Use as a % of PCV	50%	32%	39%	26%	15%
No. of D&S bores	3,000	3,000	3,000	1,563	1,492
D & S bores estimated use <sup>#</sup>	6,000	6,000	6,000	3,126	2,984
Estimated D & S use from licenses bores <sup>^</sup>	786	780	772	764	742

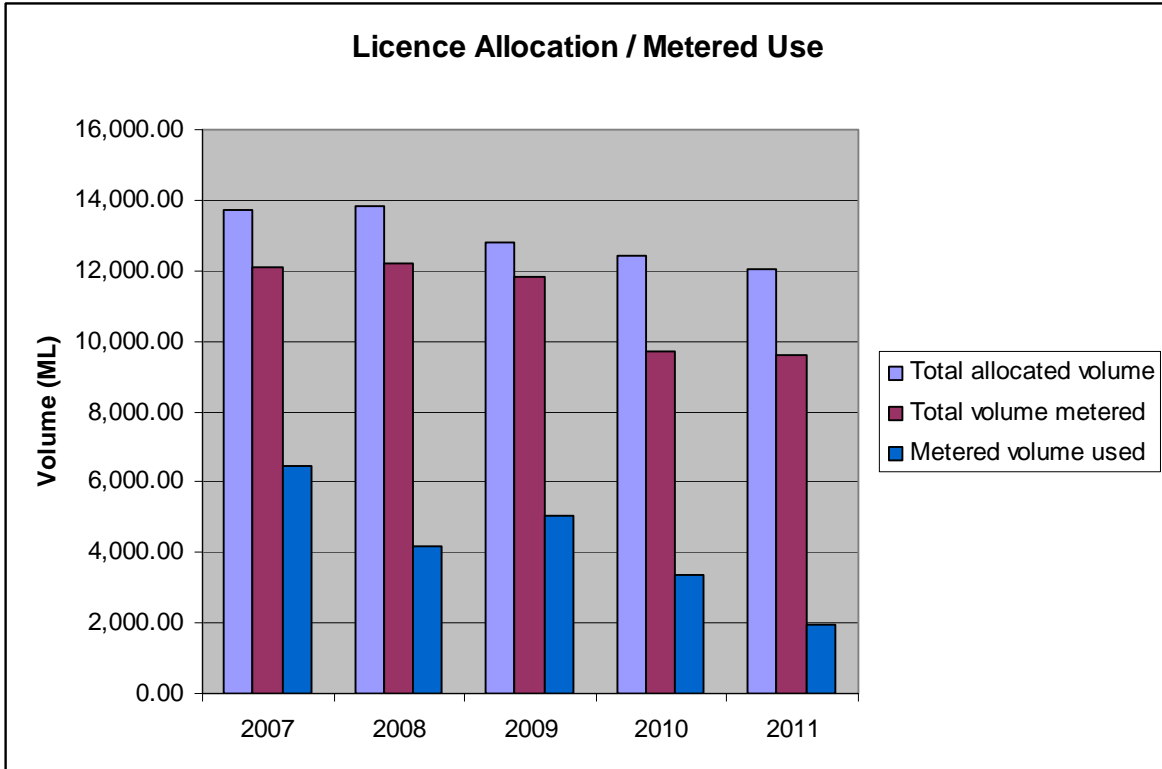
\* The number of meters and total volume metered for 2007, 2008 and 2009 is not accurate as licences were incorrectly shown as metered in SRW's metering system. This was rectified in 2010.

<sup>#</sup>Estimated 2ML per bore

<sup>^</sup>Estimated 2ML per licence.

The usage during the reporting period was significantly lower than previous years due to the above average rainfall.





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

## 2.5 Non compliance

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

Licence No	Licence Volume	Amount taken	Amount overused	Comment
865184 - expired	0	2.9	2.9	Stock use only, meter to be removed.
9016895 - expired	0	2.9	2.9	Stock use only, meter to be removed.
9025782 – expired	0	0.3	0.3	Stock use only, meter to be removed.
BEE021669	1.2	2.1	0.9	Stock use recorded through meter.
BEE022066	3	5.4	2.4	Investigation ongoing.
BEE024022	986	1072	85.6	Meters fitted incorrectly. Will be rectified.
BEE027228	1	20.8	19.8	Metered dairy bore. Licence is currently under review as part of the Dairy Shed Water Transition program.
BEE027956	1	2.9	1.9	Metered dairy bore. Licence is currently under review as part of the Dairy Shed Water Transition program.
BEE029373 – exp	0	3.4	3.4	Investigation ongoing.
BEE030780	68	85	17	Investigation ongoing.
<b>Totals</b>	<b>1,060.2</b>	<b>1,197.7</b>	<b>137.1</b>	

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.

### 3 Plan Implementation

#### 3.1 Monitoring

##### 3.1.1 Prescriptions

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

Plan Requirement:	Activity / Reference	Complies
<p>13. The Department must ensure that monitoring bores are properly maintained and replaced if necessary; and</p> <p>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 them being received.</p>	<p>The monitoring bores are owned and managed by the Department of Sustainability &amp; Environment (DSE).</p> <p>All bores have minor maintenance carried out annually which includes site clearance, rust removal, painting, and ensuring the bore is secure and safe.</p> <p>The DSE carries out maintenance on bores that have been identified by the field service provider through the Extra Works Advice. This is bore specific.</p>	<p>Yes</p>
<p>15. The Department and the Corporation must ensure that water level monitoring and investigations are carried out at appropriate locations throughout the Protection Area to:</p> <p>i. assess annual and long term impact on water levels from groundwater pumping;</p> <p>ii. monitor regional and local seasonal drawdown;</p> <p>iii. examine interaction between groundwater and surface water;</p> <p>iv. provide information for future resource assessments; and</p> <p>v. monitor the impacts of groundwater pumping generally across the Protection Area and in areas of high intensity groundwater pumping.</p>	<p>SRW works closely with the DSE to ensure that the monitoring program meets the requirements of the Plan.</p> <p>If SRW identifies bores of greater interest, monitoring may be undertaken in addition to the DSE's monitoring program.</p> <p>SRW regularly reviews the groundwater level monitoring program and data.</p>	<p>Yes</p>
<p>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</p>	<p>SRW regularly reviews the groundwater level monitoring program. Monitoring program is presented in Appendix 1</p>	<p>Yes</p>

but may be reviewed and amended by the Corporation, as necessary).		
17. The Corporation must ensure that water quality monitoring is carried out at appropriate locations throughout the Protection Area to provide information that allows assessment of changes in the groundwater salinity.	SRW regularly reviews the salinity monitoring program and data. Salinity monitoring program is presented in Appendix 1	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

### 3.1.2 Issues Affecting Implementation

No issues affecting implementation of monitoring prescriptions.

## 3.2 Metering

### 3.2.1 Prescriptions

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

Prescription	Activity	Complies
10. All meters will comply with State metering policy and the Corporation's 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
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 read twice. The meter readings and usage data were recorded and stored in SRW's metering system.	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 request any licensee's to read their meter and provide the meter reading.	Yes

### 3.2.2 Compliance and Exceptions

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

### 3.2.3 Issues Affecting Implementation

There are no issues to report.

### 3.2.4 Metering activities

	<b>Year to 30 June 2011</b>	<b>Total for WSPA at 30 June 2011</b>
Number of licences issued	0	371
Number of meters installed	0	250
Meters requiring recalibration	0	
Meters replaced	30*	
Meters read (1 – date)	Jan 2011	
Meters read (2 – date)	May/Jun 2011	
Number of estimated readings	0	

\* 51 meters were recently replaced, but only 30 of the replacements occurred in the 2010/11 year. The remainder were replaced in the 2009/10 year.

### 3.3 Restrictions on Licensing and Licence Transfers

#### 3.3.1 Prescriptions

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

Plan Requirement:	Activity/Reference	Complies
<p>1. Temporary trade of water entitlement IS allowed within a zone or coastal sub-zone and from one zone to another zone provided that:</p> <p>(i) Where usage has exceeded 80% of allocation over the previous 2 years, water levels have recovered appropriately*;</p> <p>(ii) Transfer does not occur into coastal sub-zones**;</p> <p>(iii) Transfer does not occur into zones 1, 2B, 4 and 5; and</p> <p>(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).</p> <p>(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).</p>	<p>Nine temporary transfers were processed during the reporting period in accordance with this prescription.</p>	<p>Yes</p>
<p>2. Permanent trade of Water Entitlement shall be allowed within zones and from one zone to another zone provided that:</p> <p>(i) Where usage has exceeded 80% of allocation over the previous 2 years, water levels have recovered appropriately*;</p> <p>(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.</p> <p>(iii) Transfer does not occur into zones 1, 2B, 4 &amp; 5; and</p> <p>(iv) Transfer does not occur into coastal sub-zones.</p>	<p>No permanent transfers were processed during the reporting period.</p>	<p>Yes</p>
<p>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.</p>	<p>The rules relating to land parcels were changed, which has delayed making licences authoritative. All licences are located in the Water Register.</p>	<p>Yes</p>
<p>4. No new groundwater licenses shall be issued, except as described in Prescriptions 7 and 8.</p>	<p>No new licences were issued.</p>	<p>Yes</p>
<p>5. The total licence entitlement/allocation shall not exceed 12,826 ML (licence entitlement at time of writing), or any volume adjusted in accordance with Prescriptions 6 to 8.</p>		<p>Yes</p>
<p>6. If a groundwater licence is surrendered, revoked or not renewed the total entitlement in Prescription 3 will be reduced by that licence volume.</p>	<p>No activity to report.</p>	<p>Yes</p>
<p>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</p>	<p>No activity to report.</p>	<p>Yes</p>

not exceed the PCV (12,915ML at time of writing).		
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.	No dairy licences were issued or upgraded during the reporting period.	Yes
9. The Corporation must report the details of any licence referred to in Prescriptions 6 to 8 in the annual report.	No activity to report.	Yes

### 3.3.2 Compliance and Exceptions

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

### 3.3.3 Issues Affecting Implementation

No issues affecting implementation.

## 3.4 Licensing Activities

The following table provides details of licensing activities.

Year to 30 June 2011	No.	Volume ML
New licences issued	0	0
Additional volumes on existing licences	0	0
Licences revoked	0	0
Permanent transfers	0	0
Temporary transfers	9	248.2
D&S Bores notifying use	11	22.0*

\*estimate of DS volume only

### 3.4.1 Issues Affecting Implementation

No issues affecting implementation.

## 4 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.*

Review of the groundwater elevation data indicates that:

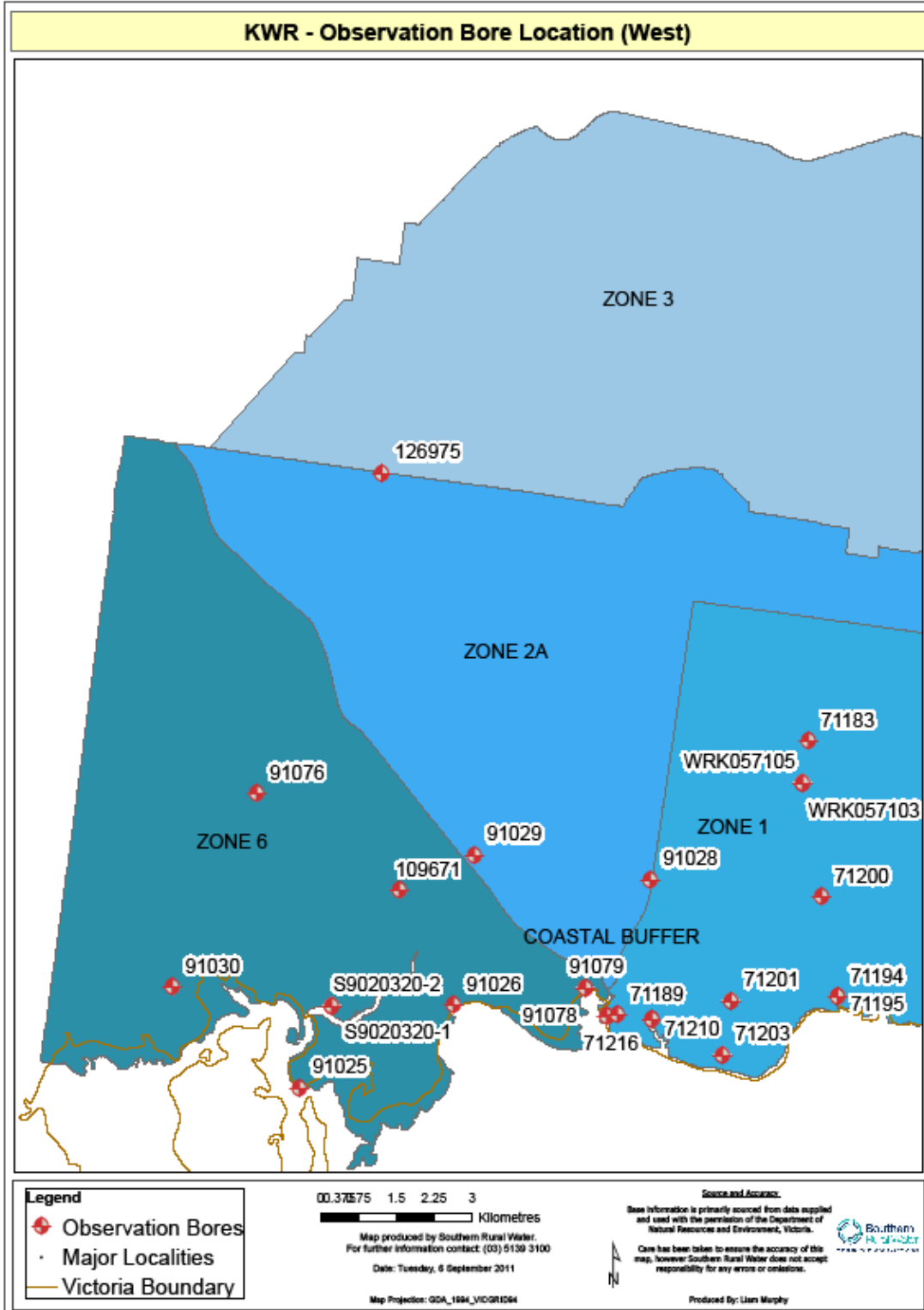
- Long term declining water levels across the WSPA, with most bores falling by 3m or less over forty years. However, water levels in most bores are similar to levels seen 10-15 years ago. And have last 12 months levels have generally recovered significantly.

- As of June 2011, a total of eleven bores had groundwater levels below sea level. As of July 2011, only 4 monitored bores have water levels below sea level. Levels are still rising in all of these bores.

Therefore, it is considered that the groundwater resources of the WSPA are being managed sustainably. No changes are proposed for the monitoring strategy in 2011-12.

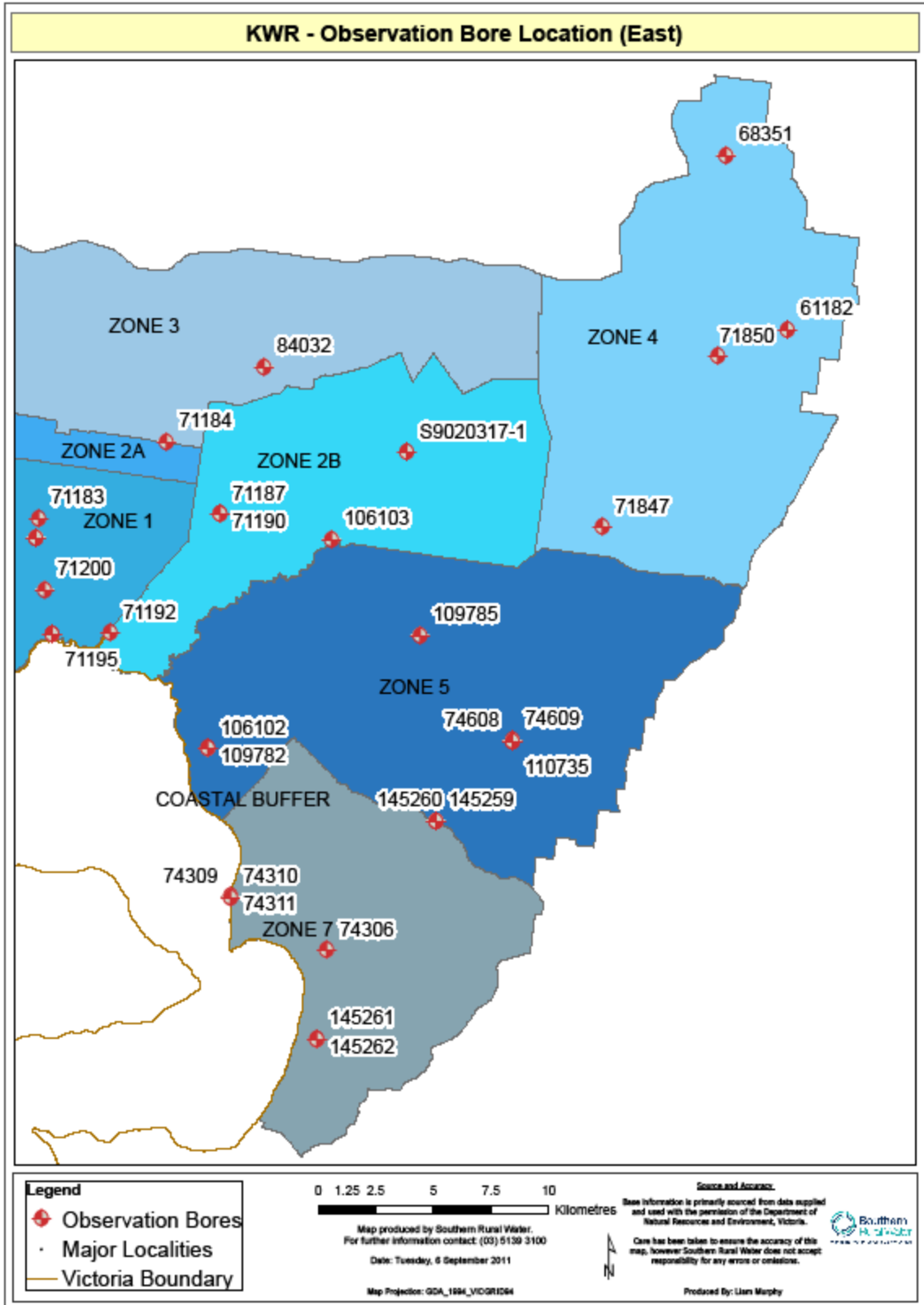
## 5 Appendices

### 5.1.1 Monitoring program details







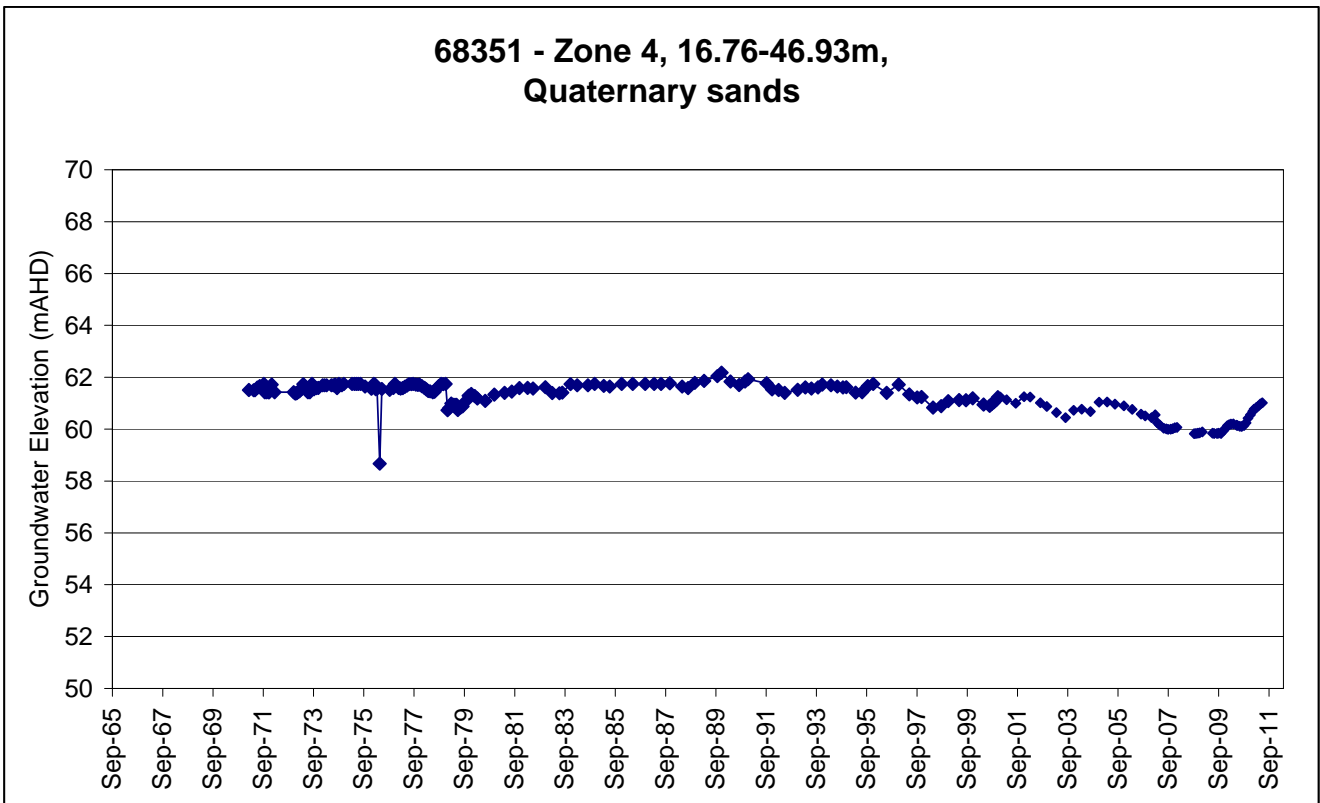
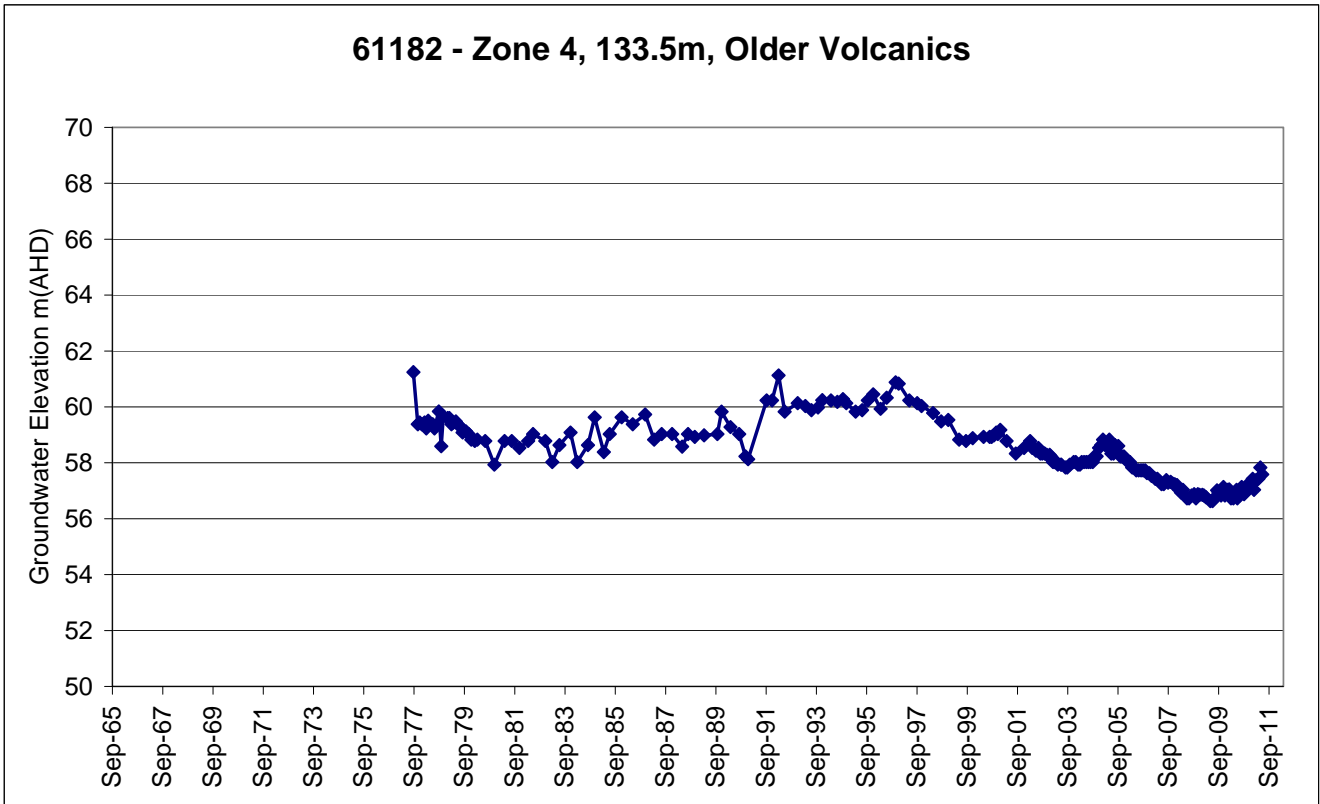


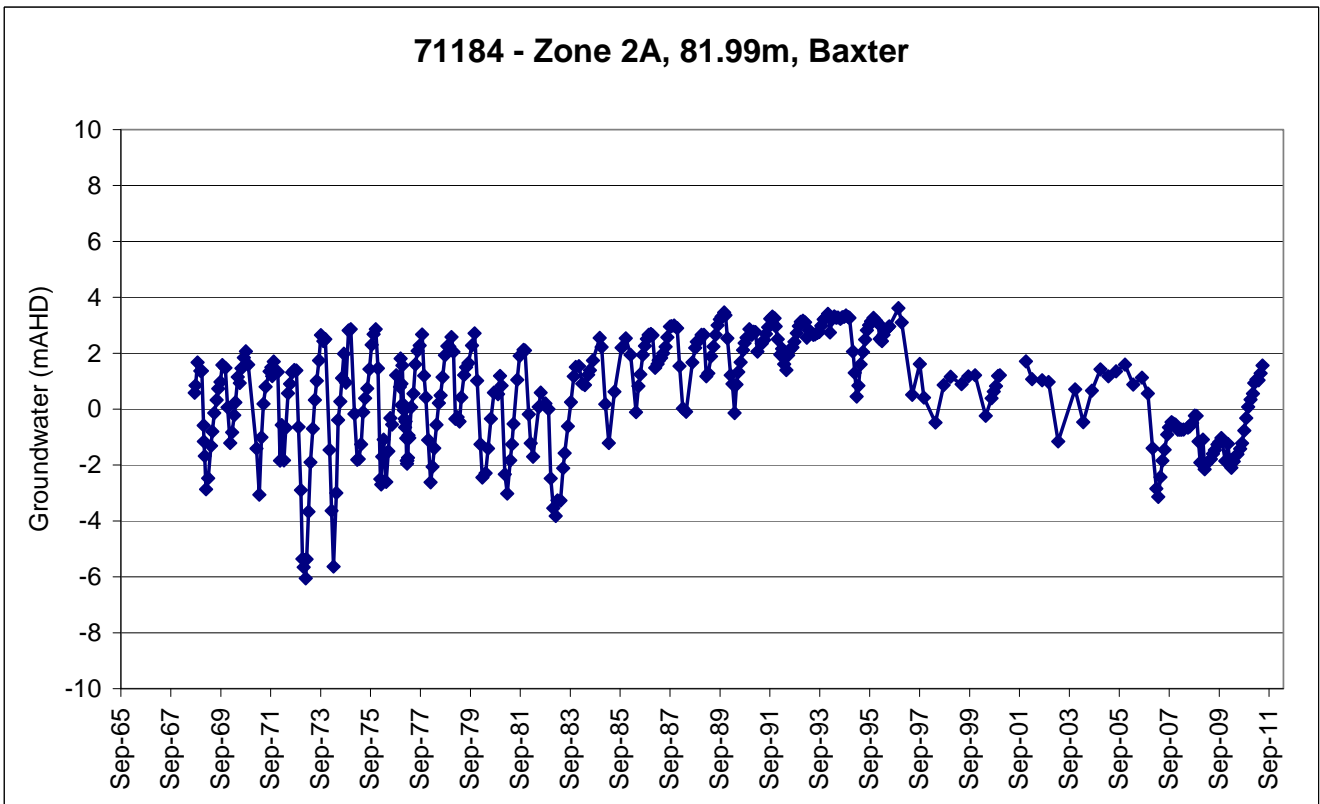
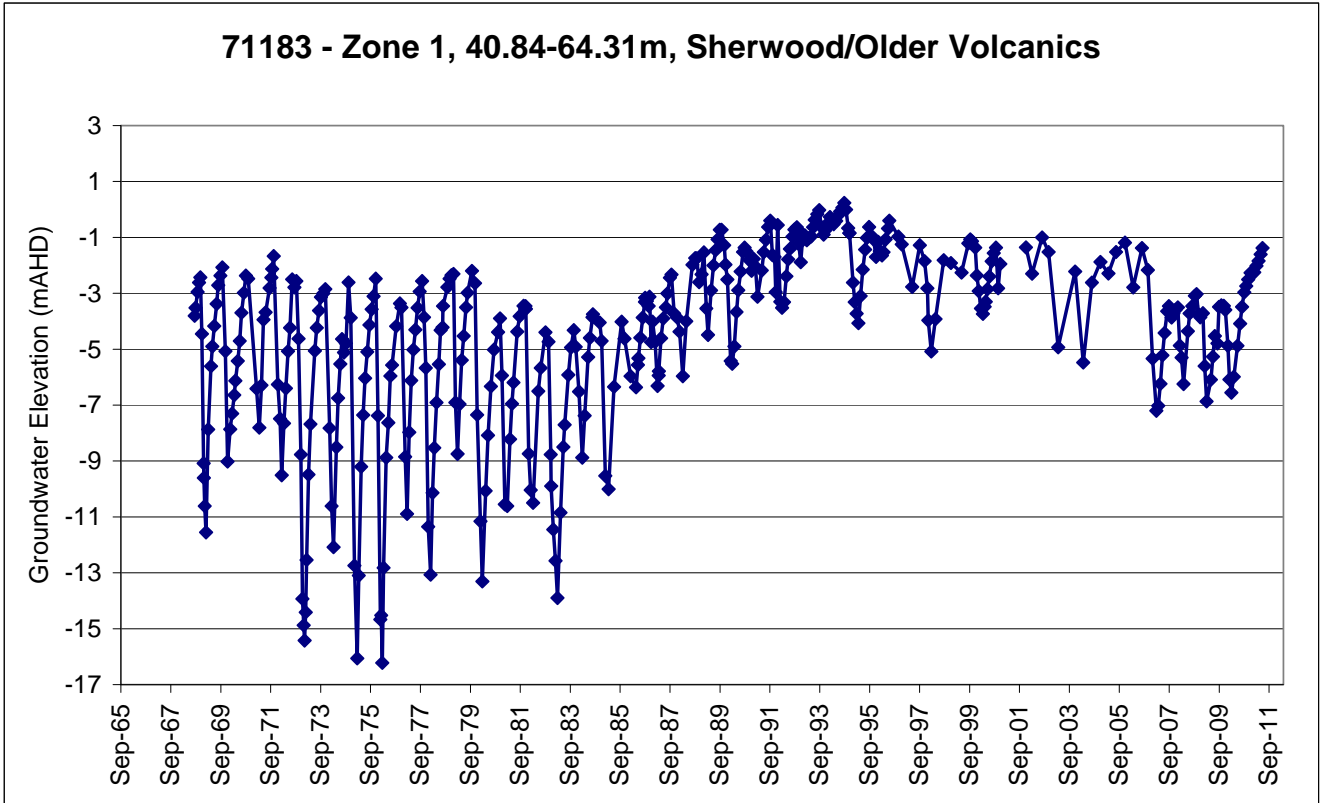
**Groundwater monitoring program summary**

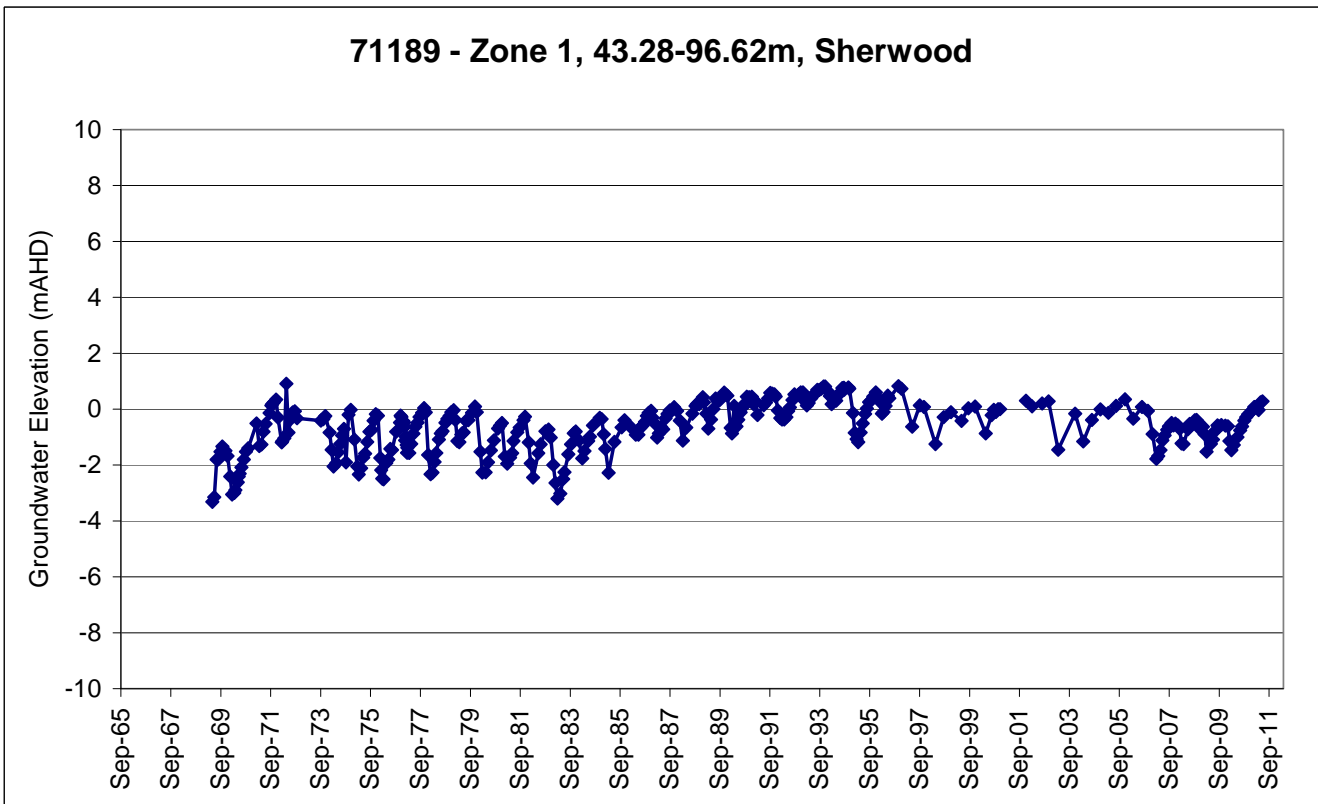
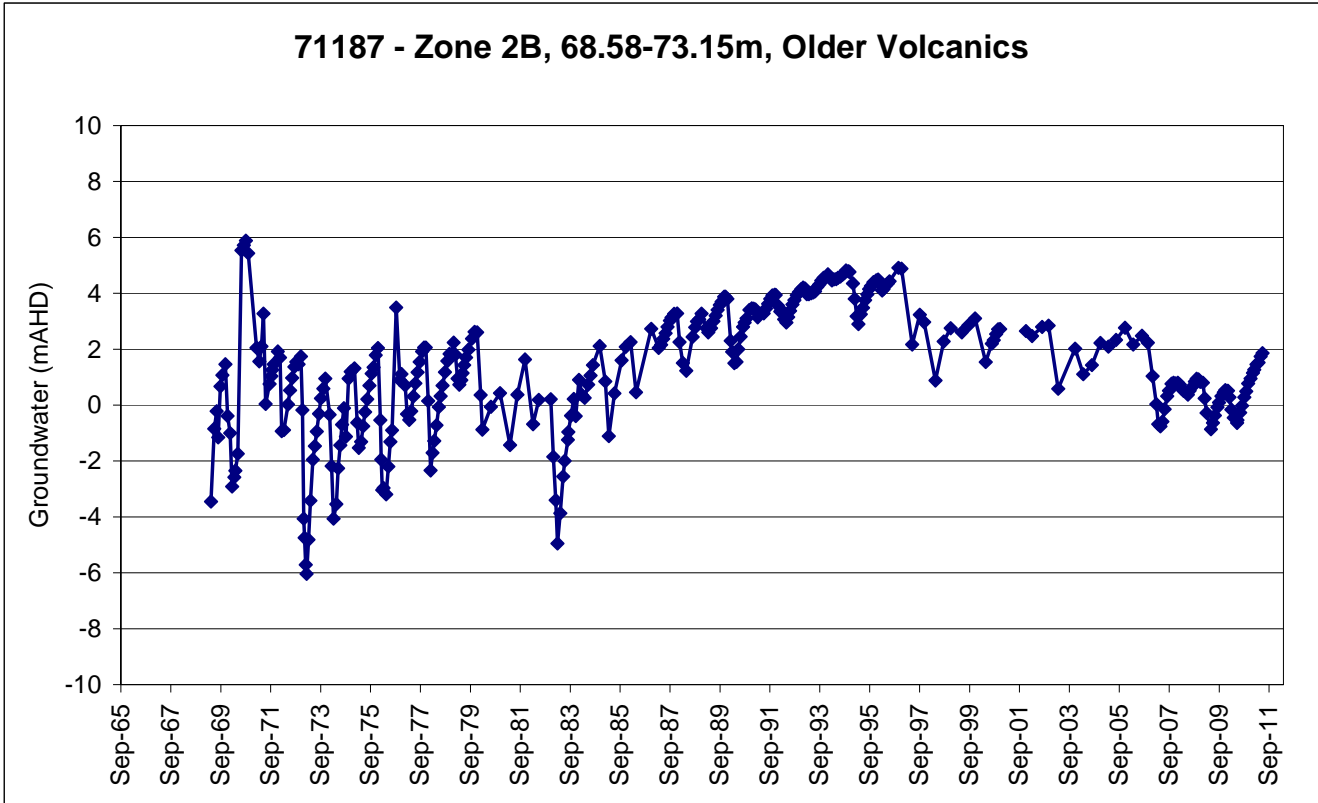
<b>BHID</b>	<b>Zone</b>	<b>Formation</b>	<b>GW Level</b>	<b>Salinity</b>
71216	1	Baxter	Monthly	Quarterly
71219	1	Baxter	Monthly	Quarterly
WRK057103	1	Older Volcanics	Monthly	
71189	1	Sherwood	Monthly	Quarterly
71200	1	Sherwood	Monthly	Quarterly
71201	1	Sherwood	Monthly	
71203	1	Sherwood	Monthly	Quarterly
71210	1	Sherwood	Monthly	
71215	1	Sherwood	Monthly	Quarterly
WRK057105	1	Sherwood	Monthly	
71183 (recently decommissioned)	1	Sherwood & Older Volcanics	Monthly	
71194	1	Baxter, Sherwood	Monthly	Quarterly
71195	1	Sherwood	Monthly	Quarterly
71184	2A	Baxter	Monthly	
126975	2A	Older Volcanics	Monthly	
91028 (to be decommissioned)	2A	Sherwood	Monthly	
91029	2A	Sherwood	Monthly	
71190		Baxter	Monthly	
106103	2B	Baxter	No Access	
71192	2B	Baxter, Sherwood, Volcanics	Monthly	Quarterly
71187	2B	Older Volcanics	Monthly	
S9020317/1	2B	Yallock	Monthly	
84032	3	Older Volcanics	Monthly	
61182	4	Older Volcanics	Monthly	
68351	4	Quaternary Sands	Monthly	
71847	4	Yallock	Monthly	
71850	4	Yallock	Monthly	
74608	5	Older Volcanics	Monthly	
<b>BHID</b>	<b>Zone</b>	<b>Formation</b>	<b>GW Level</b>	<b>Salinity</b>
109785	5	Older Volcanics	Monthly	

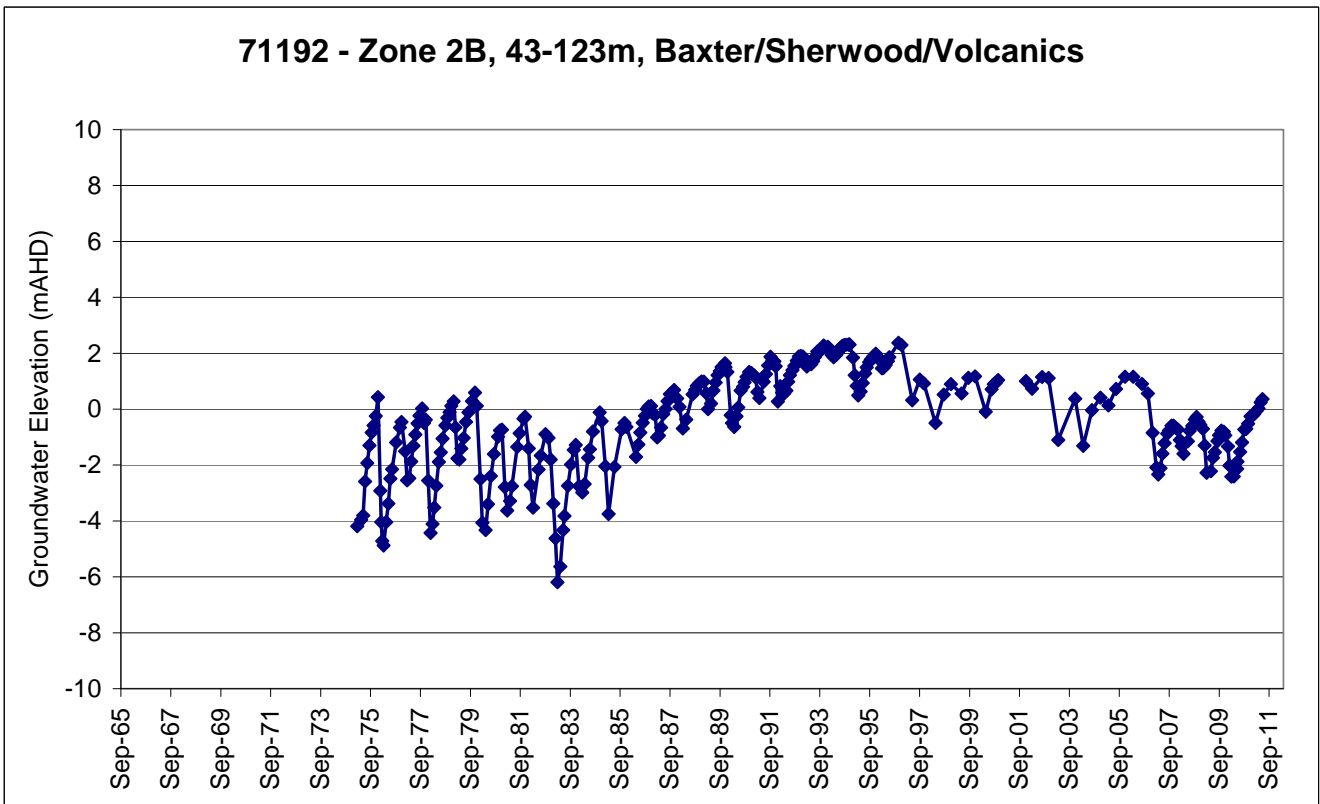
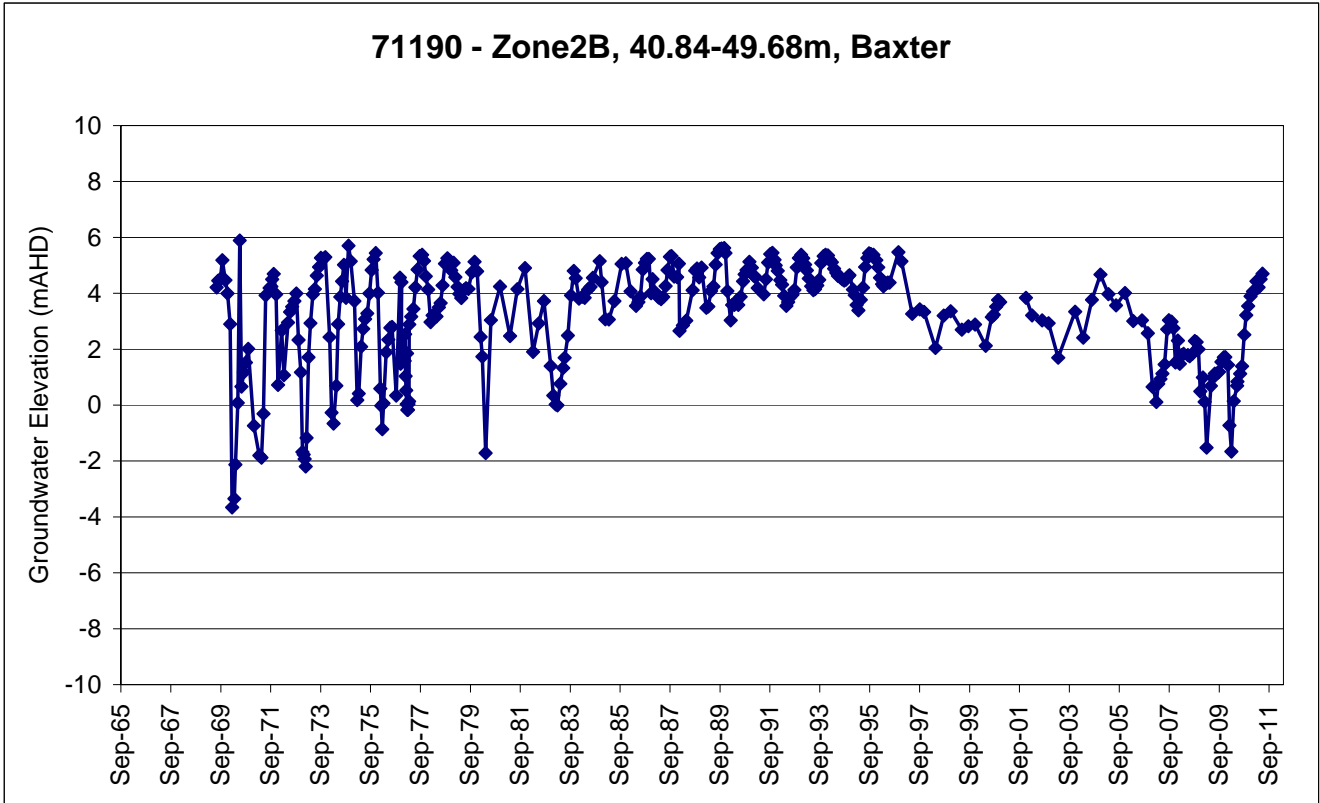
110735	5	Quaternary Sands	Monthly	
74609	5	Yallock	Monthly	
91079	6	Baxter	Monthly	Quarterly
109671	6	Baxter	Monthly	
S9020320/2	6	Older Volcanics	Monthly	
91025	6	Sherwood	Monthly	Quarterly
91026	6	Sherwood	Monthly	Quarterly
91030	6	Sherwood	Monthly	Quarterly
91078	6	Sherwood	Monthly	Quarterly
S9020320/1	6	Sherwood	Monthly	
91076	6	Silurian Bedrock	Monthly	
74311	7	Baxter	Monthly	Quarterly
74306	7	Childers	Monthly	
145260	7	Childers	Monthly	
145262	7	Childers	Monthly	
74309	7	Older Volcanics	Monthly	Quarterly
74310	7	Sherwood	Monthly	Quarterly
145259	7	Westernport	Monthly	
145261	7	Westernport	Monthly	Quarterly
106102	5(Private land)	Baxter	Monthly	Quarterly
109782	5(Private land)	Childers	Monthly	

5.1.2 Hydrographs

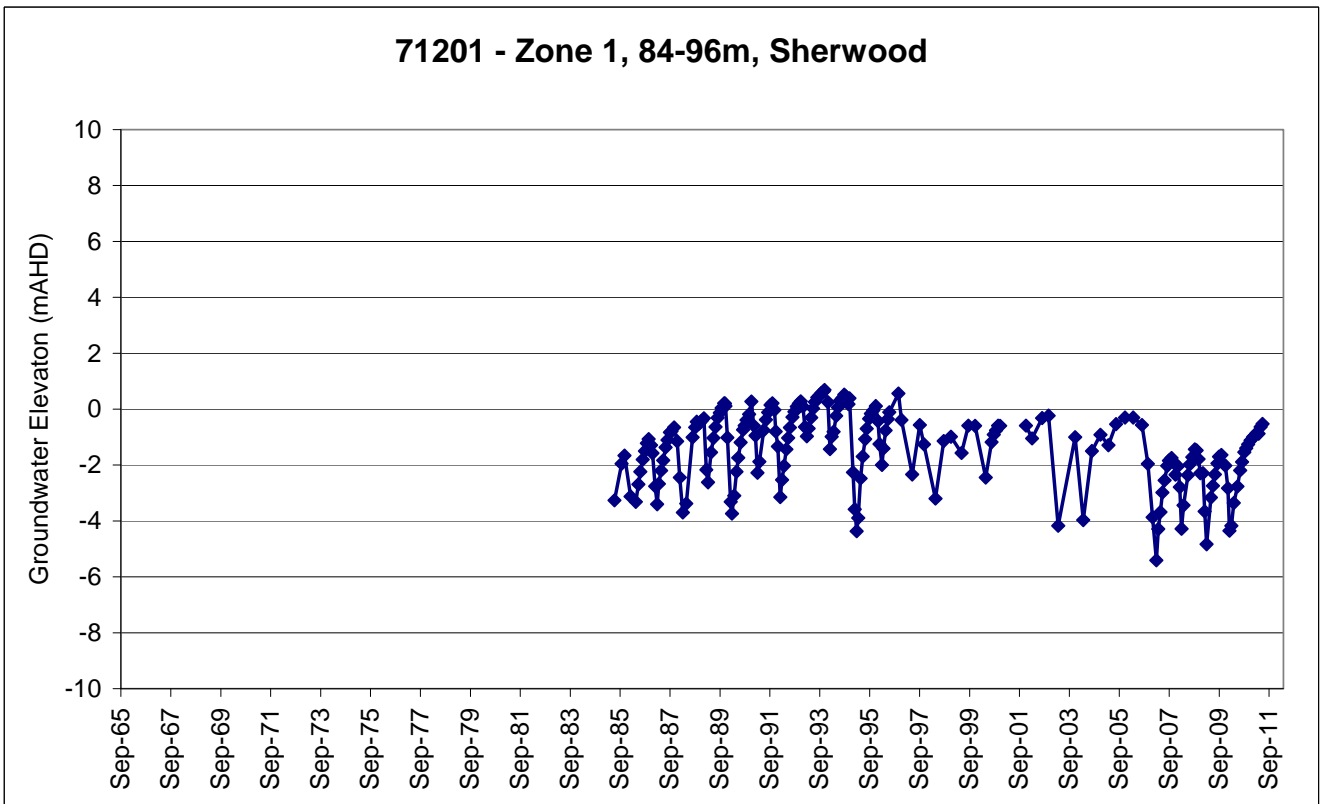
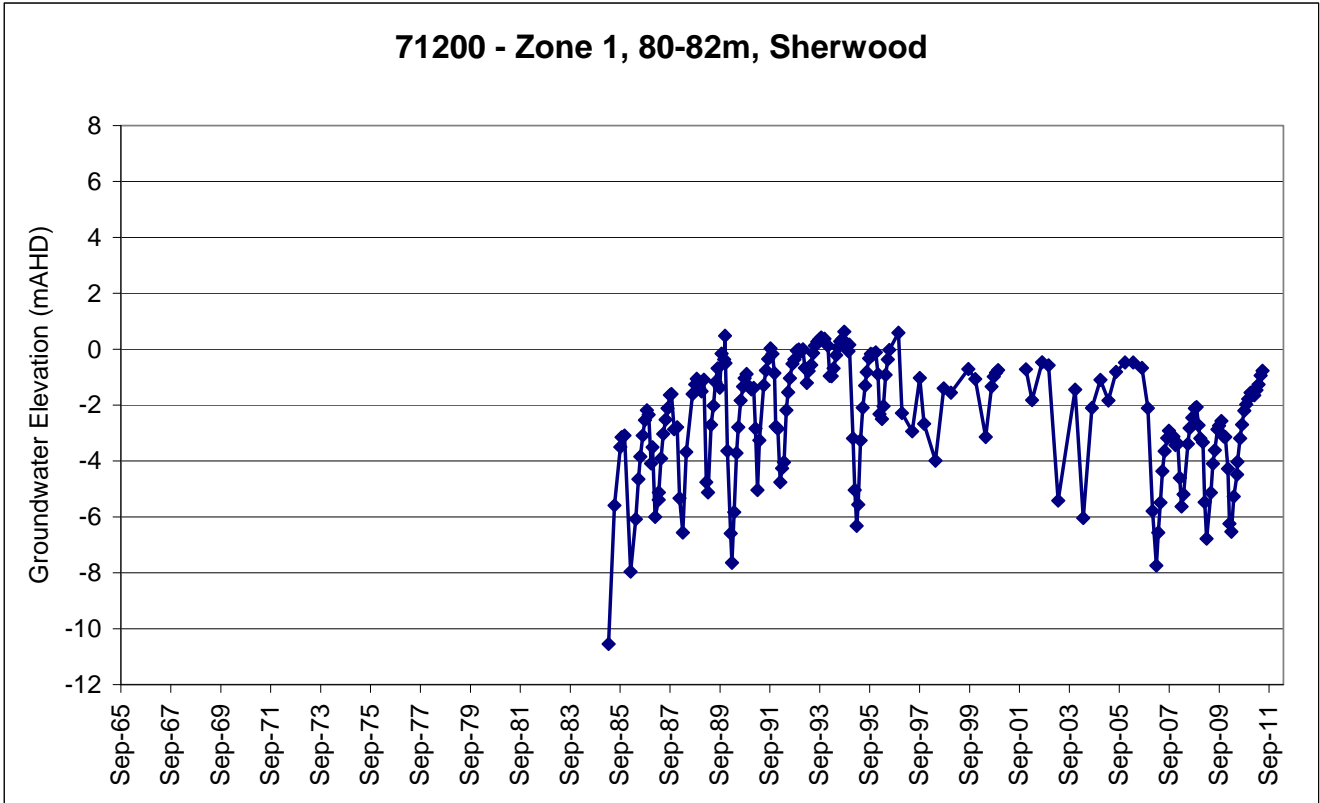


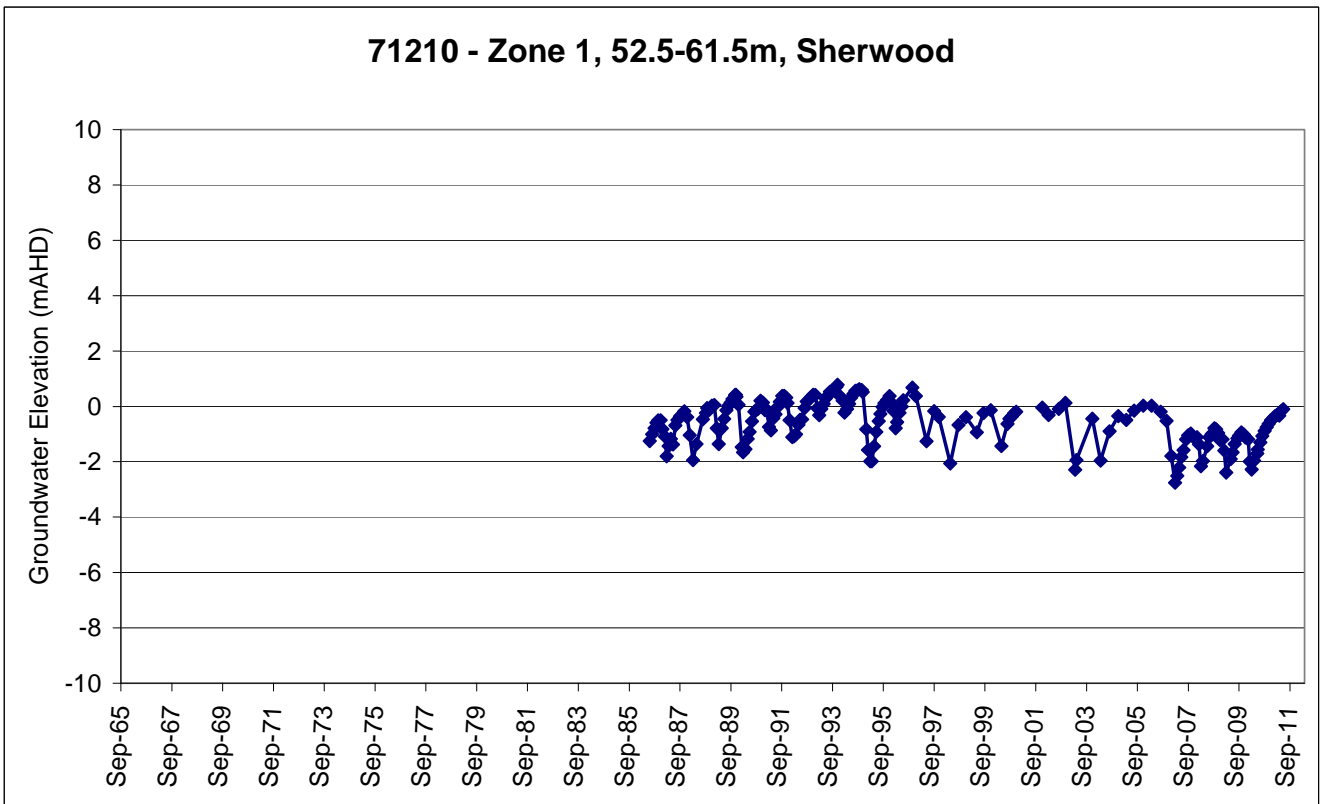
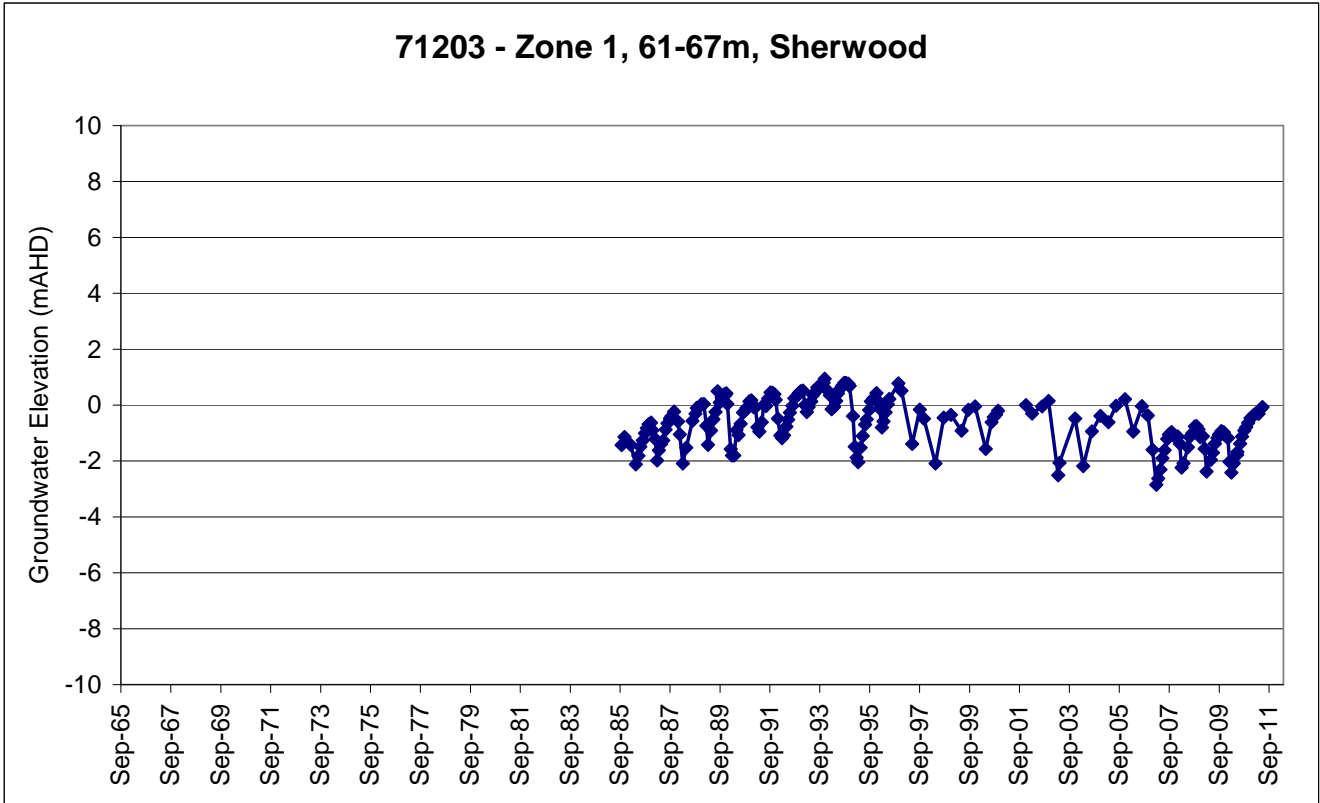


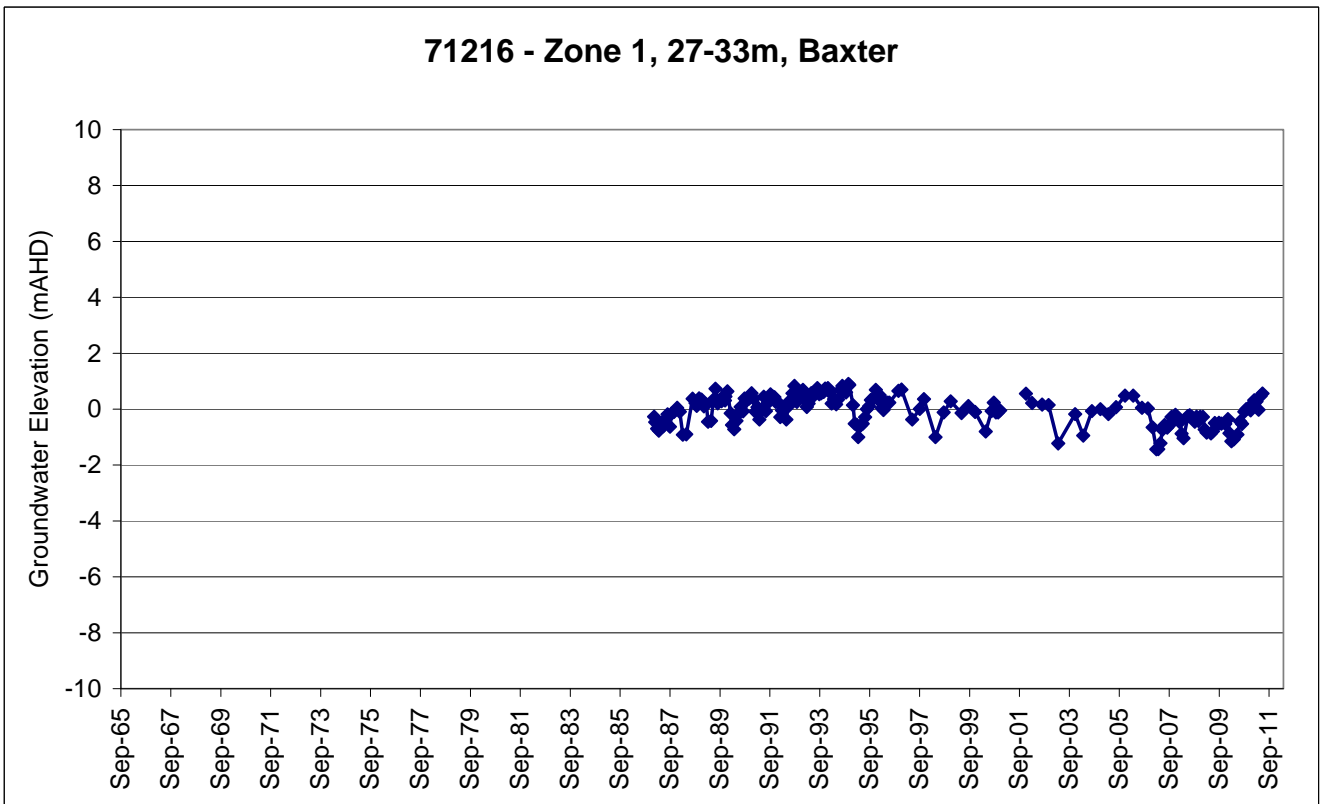
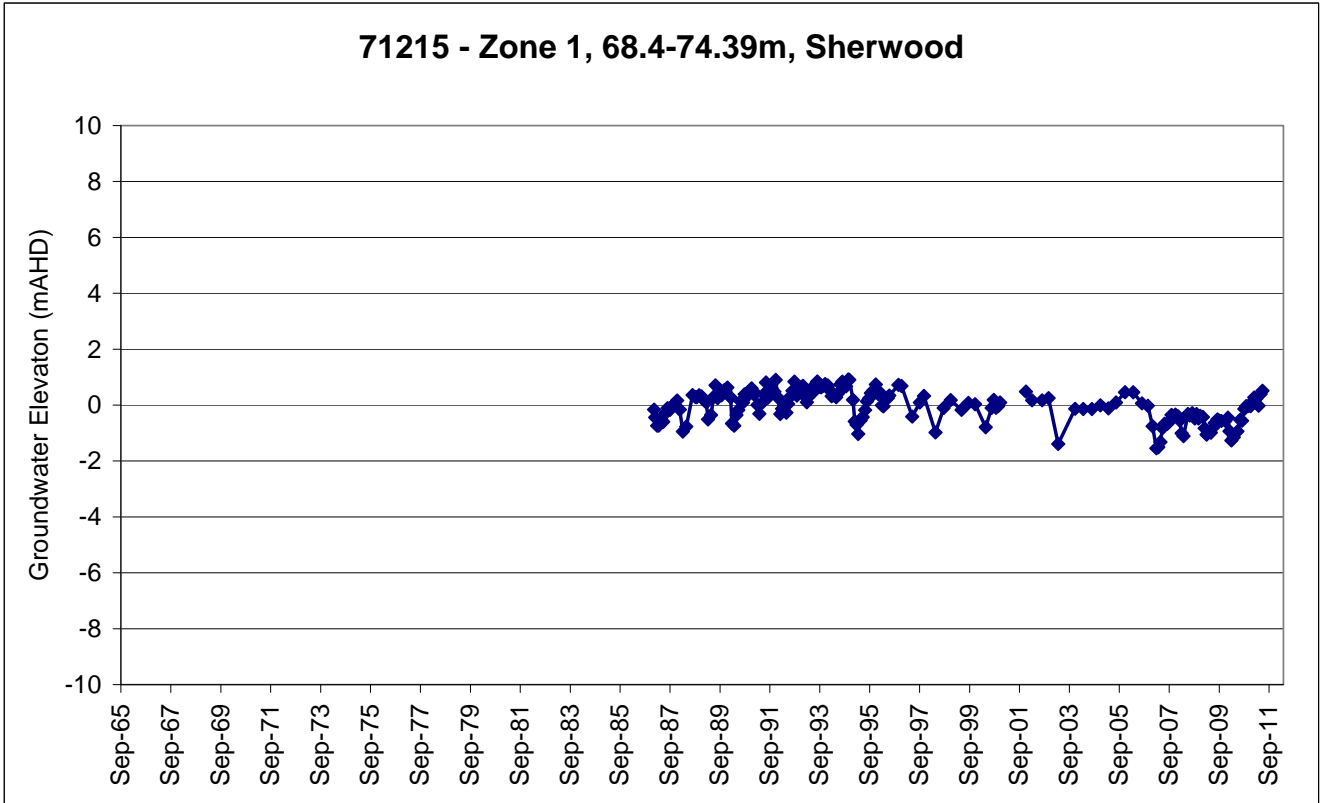


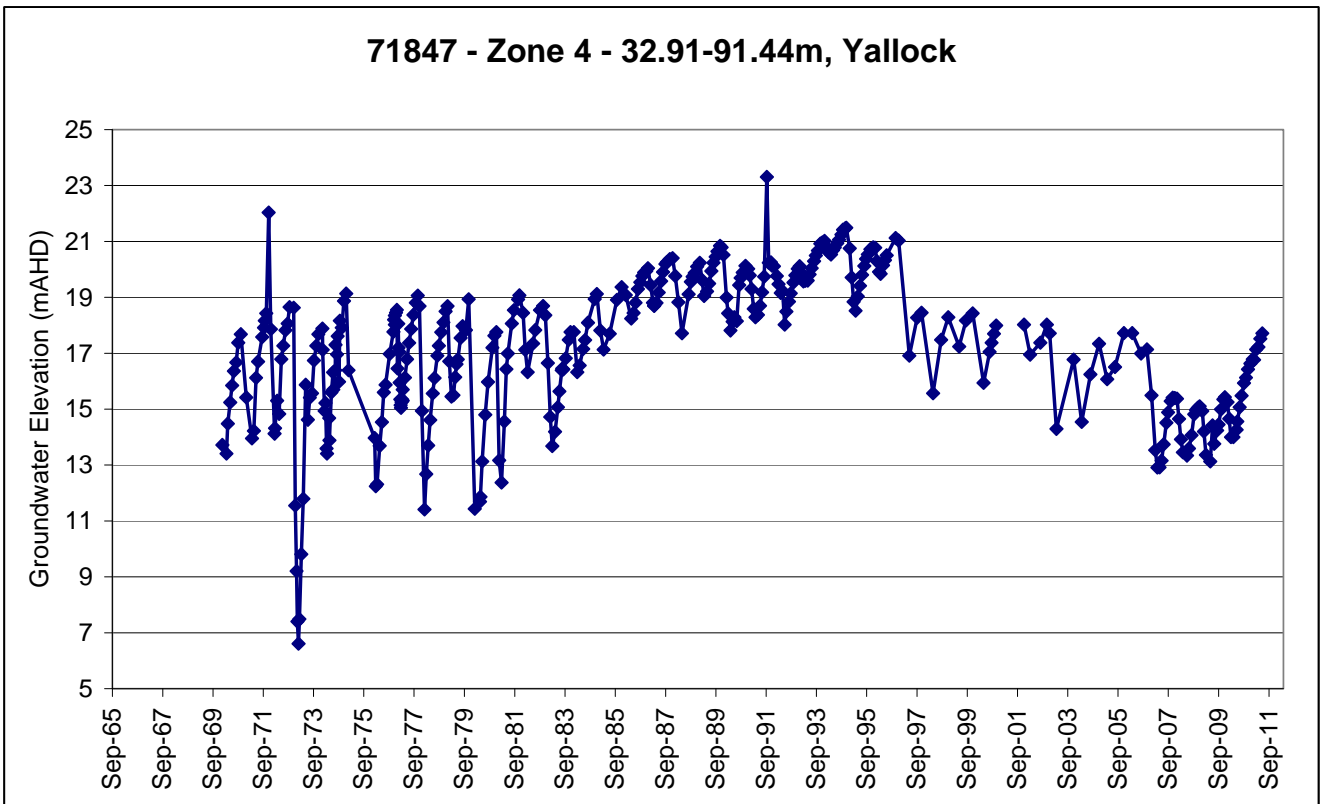
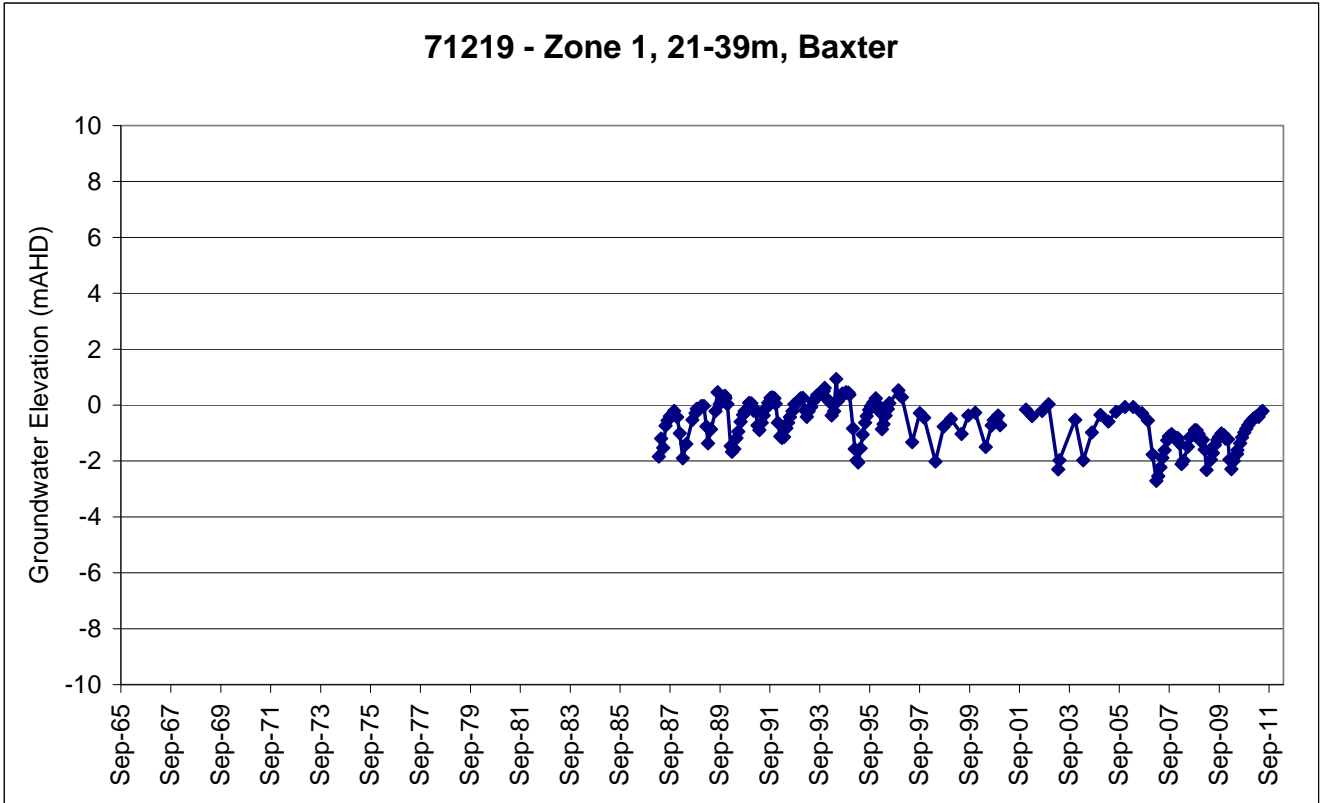


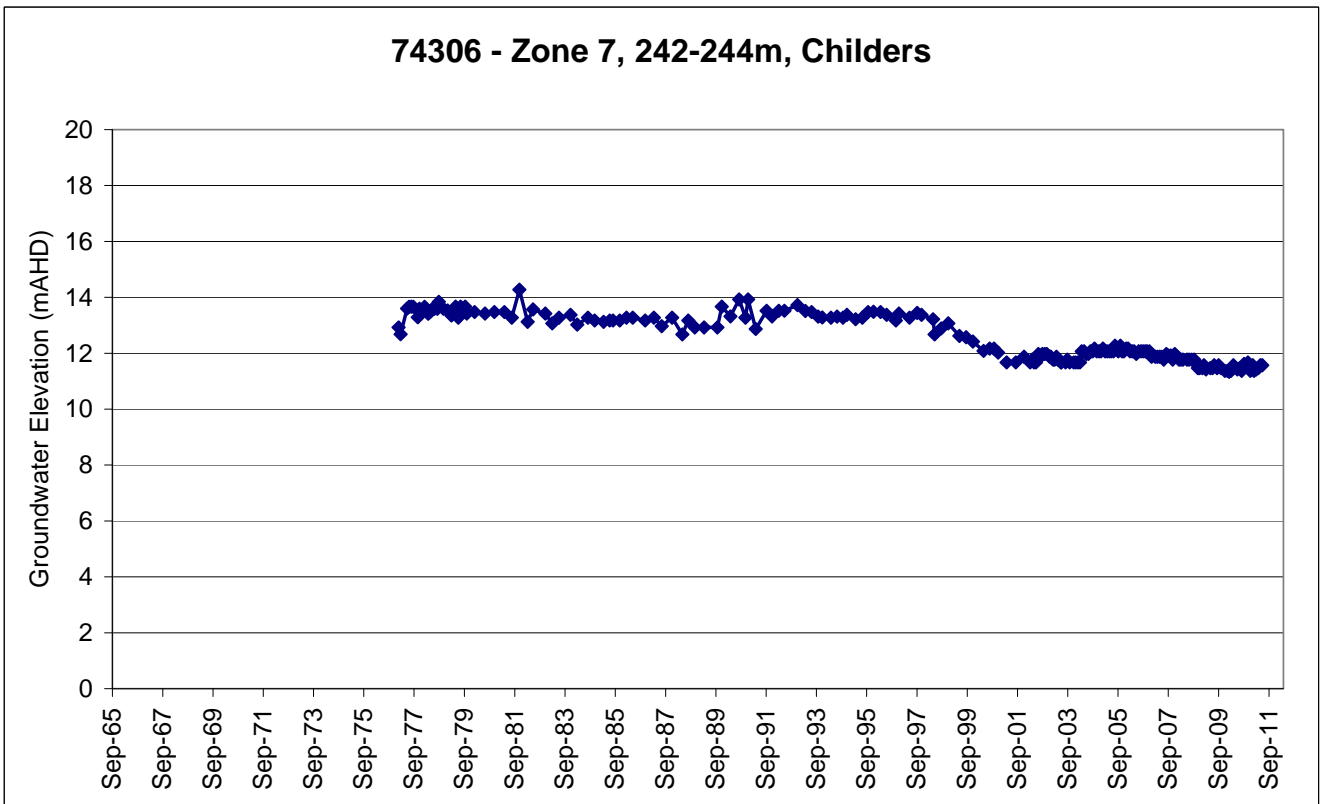
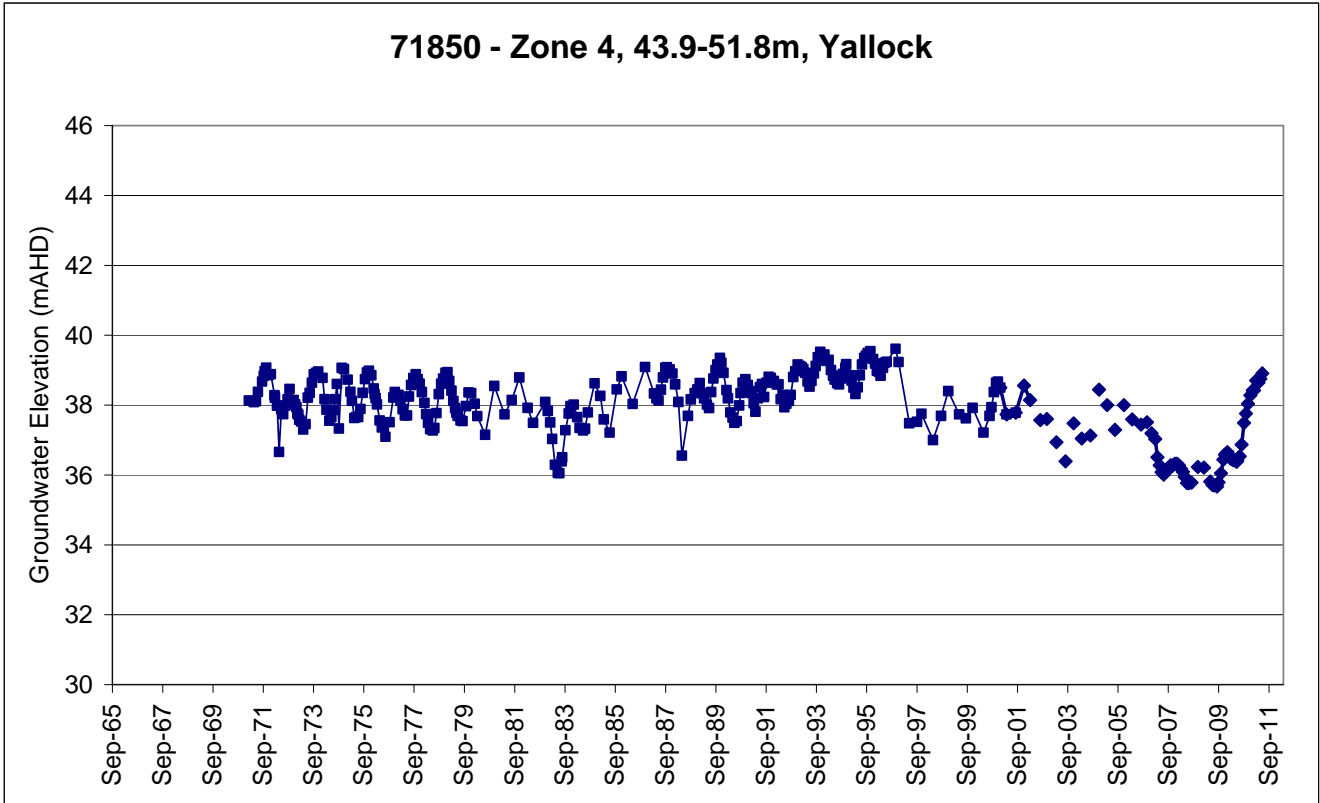


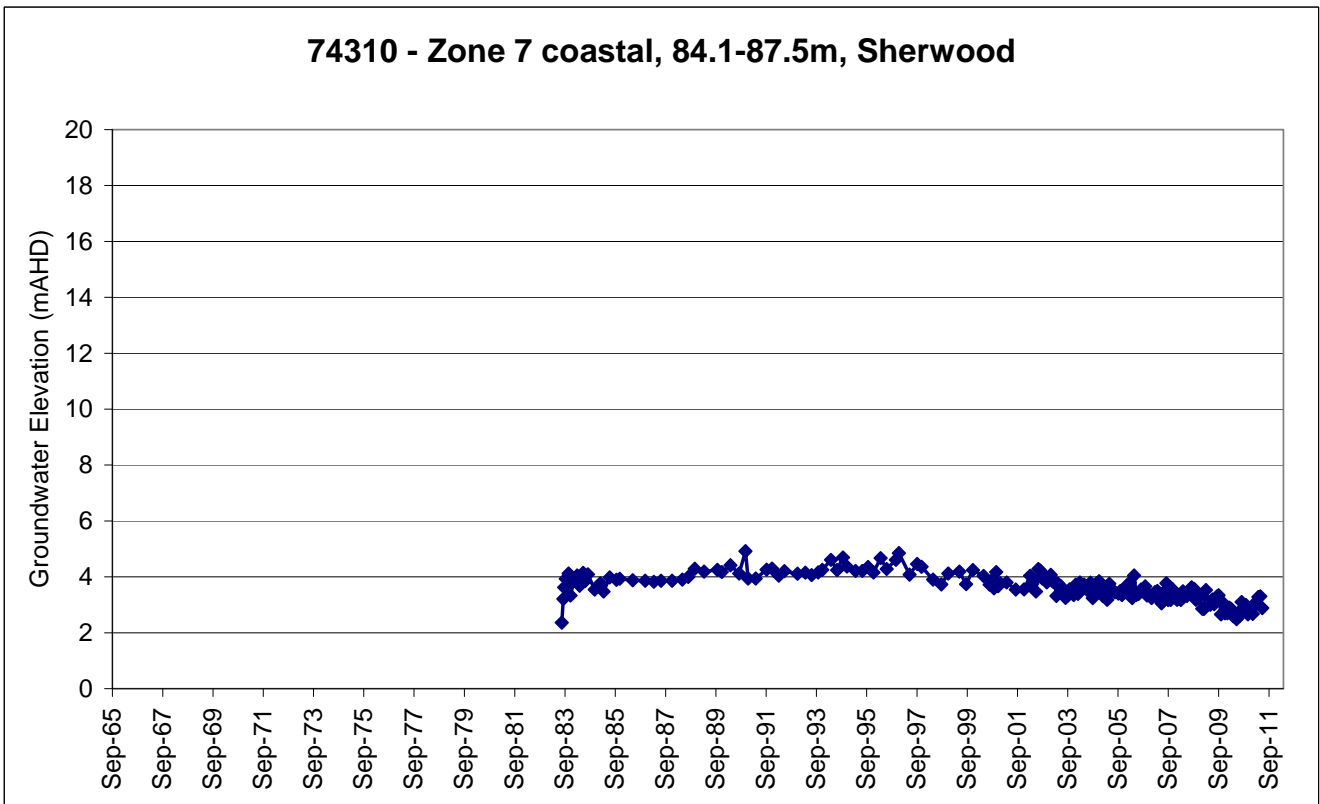
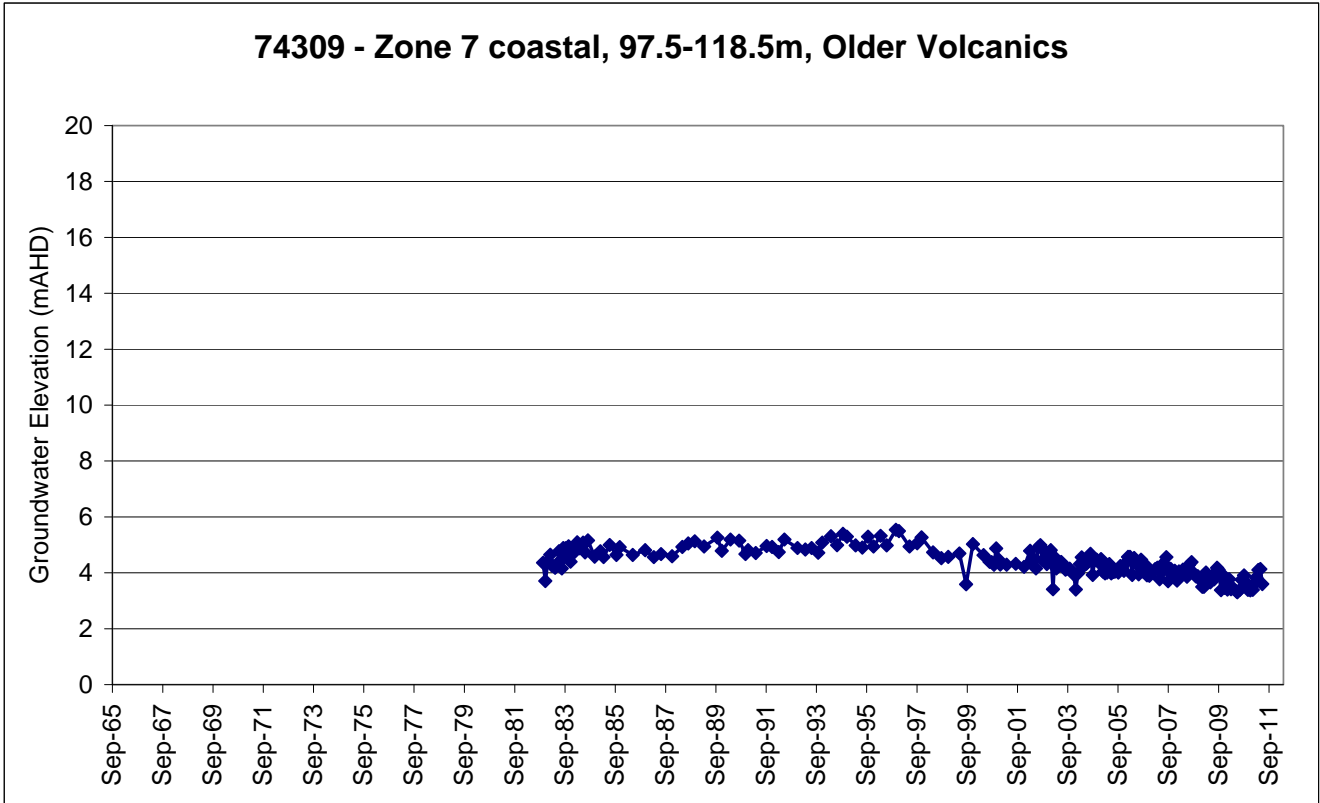


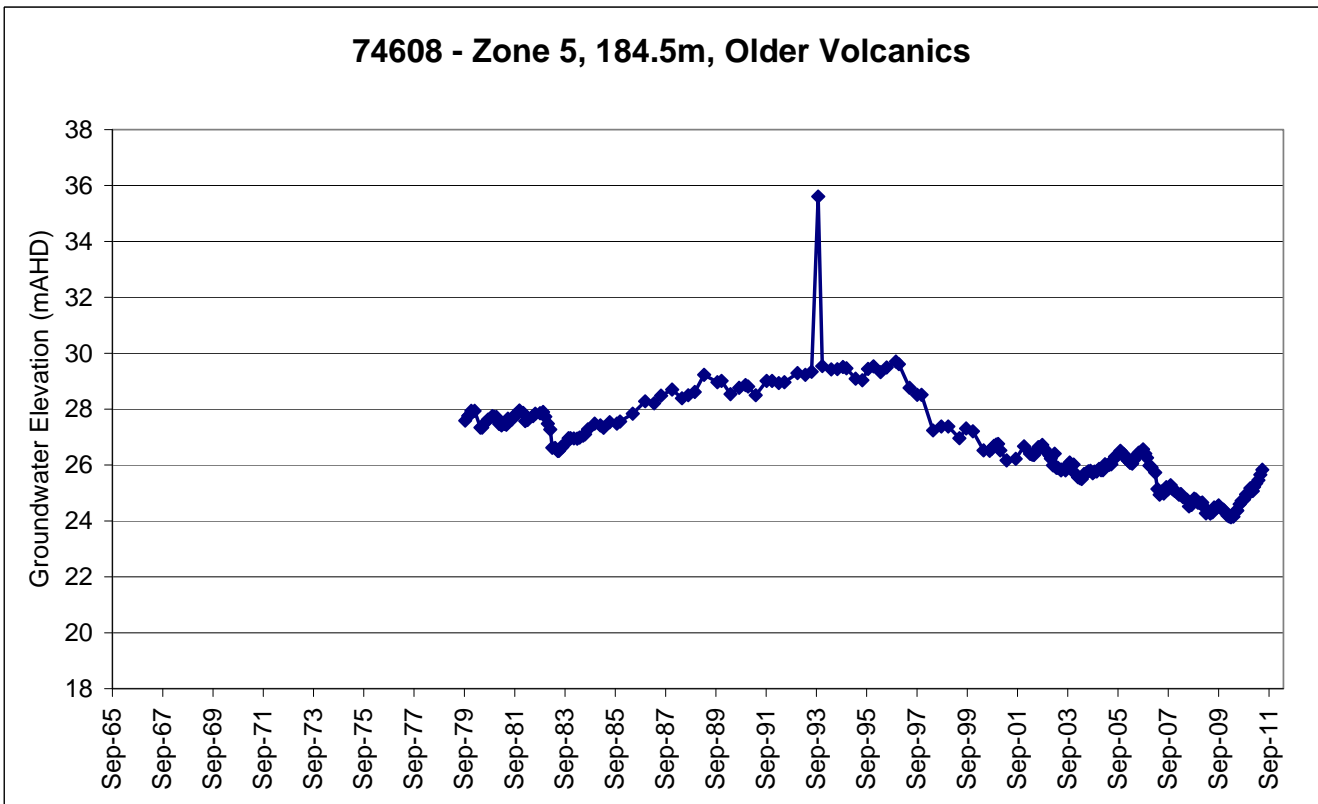
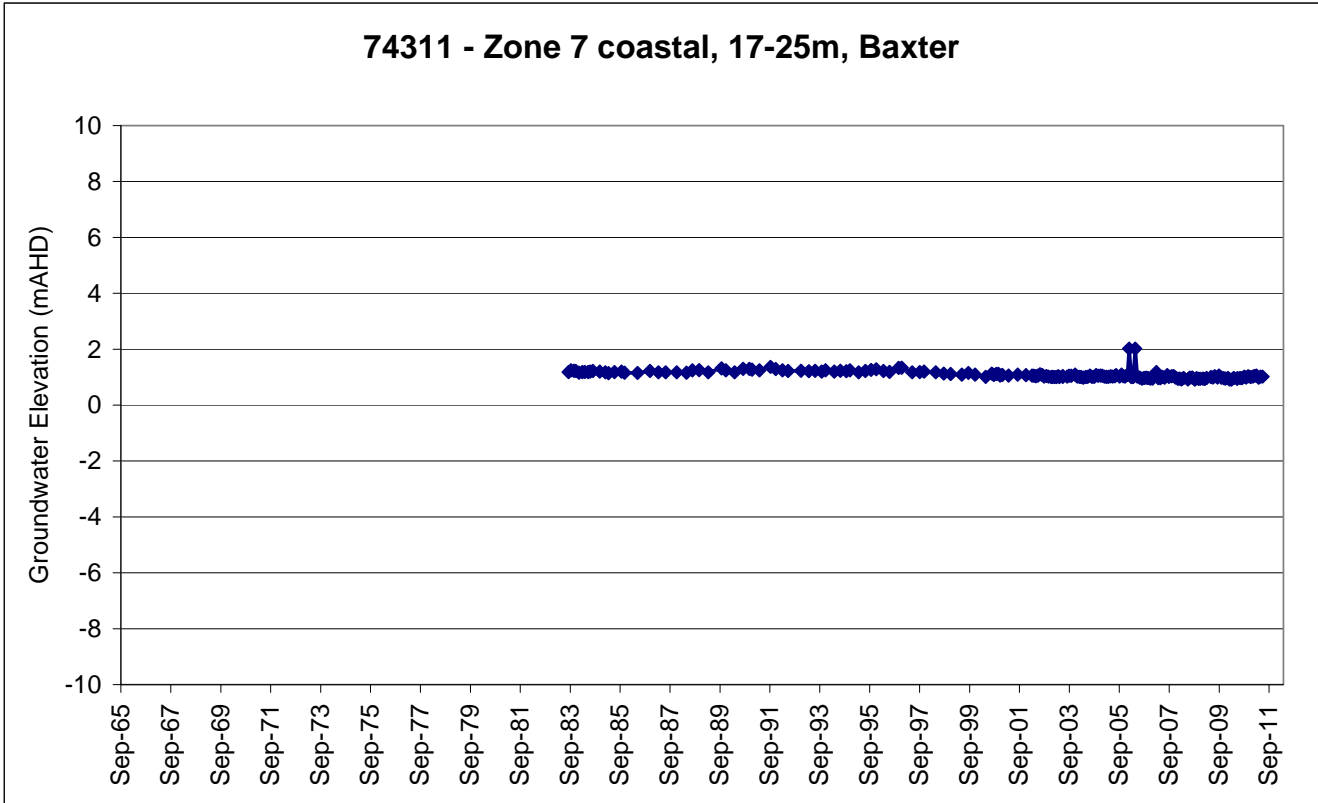


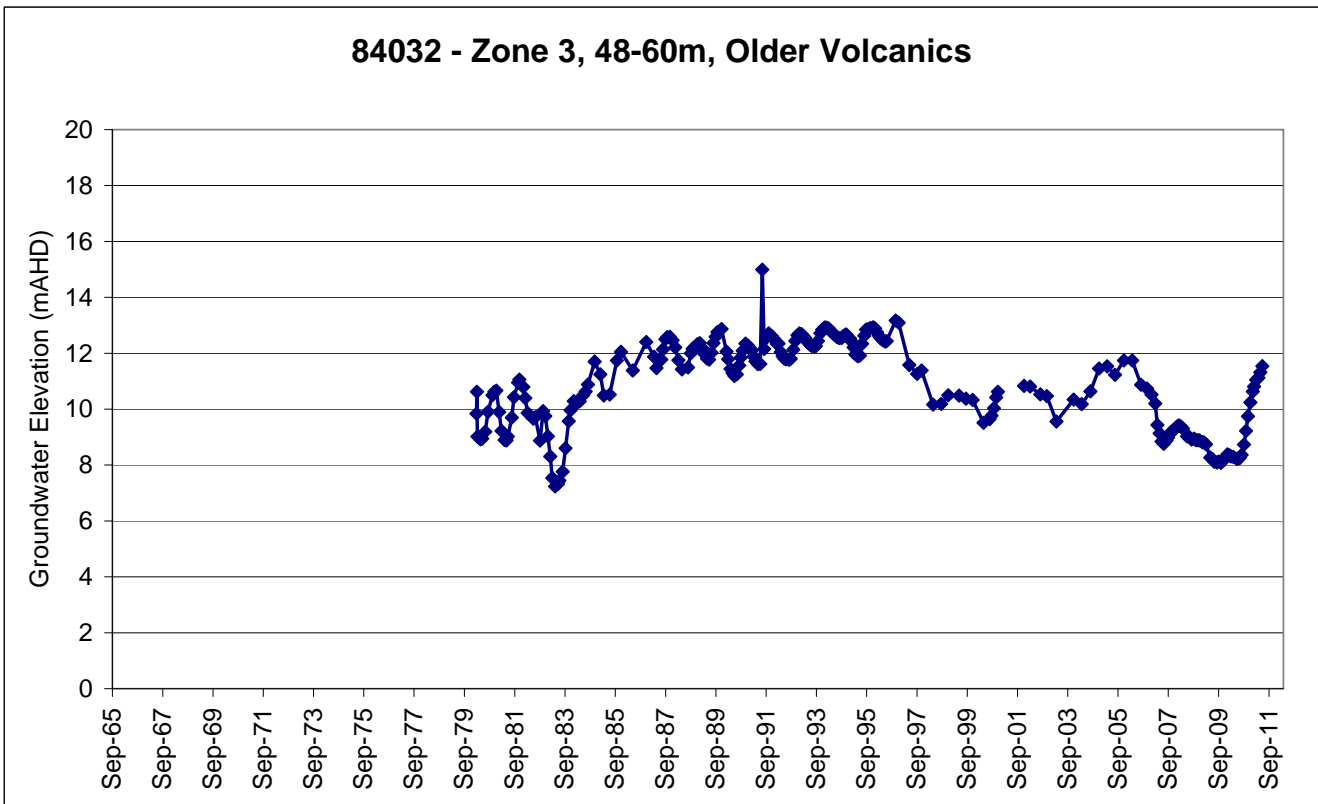
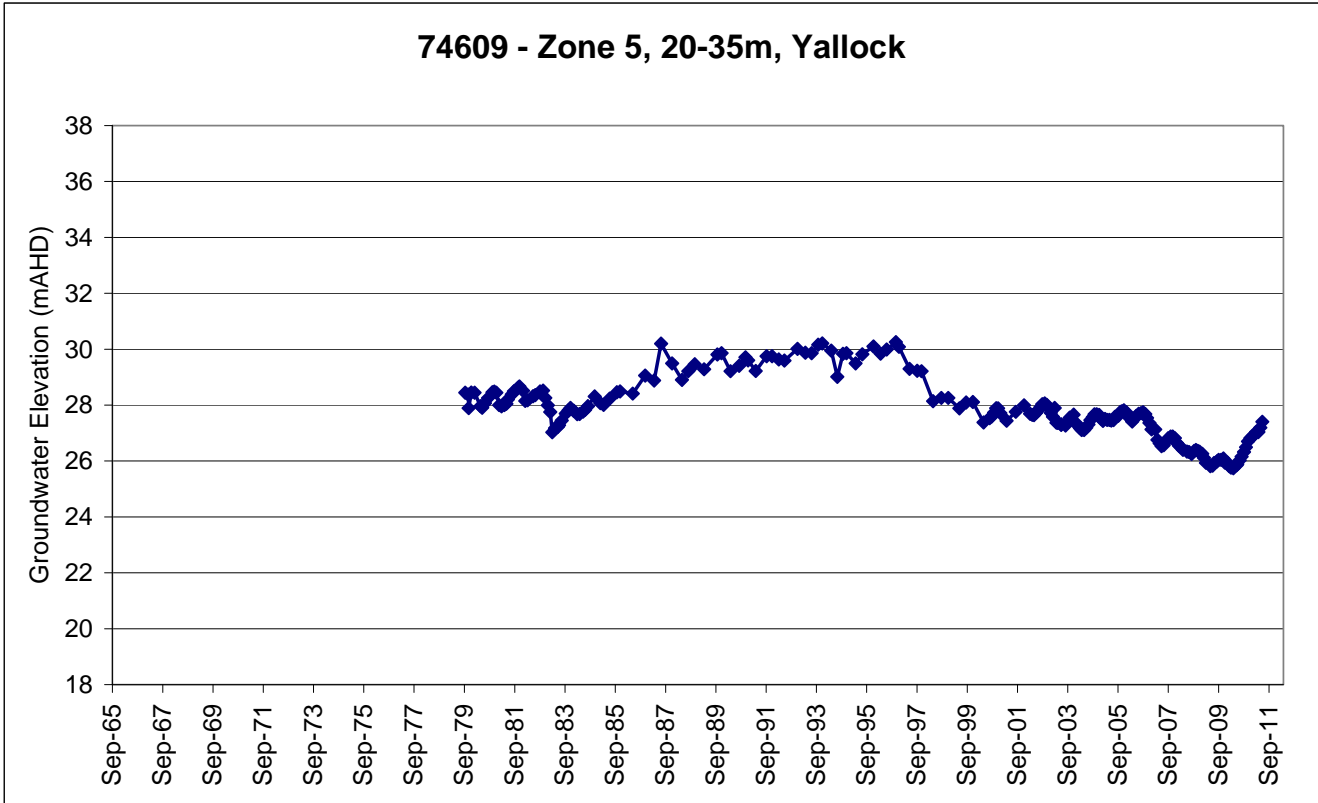




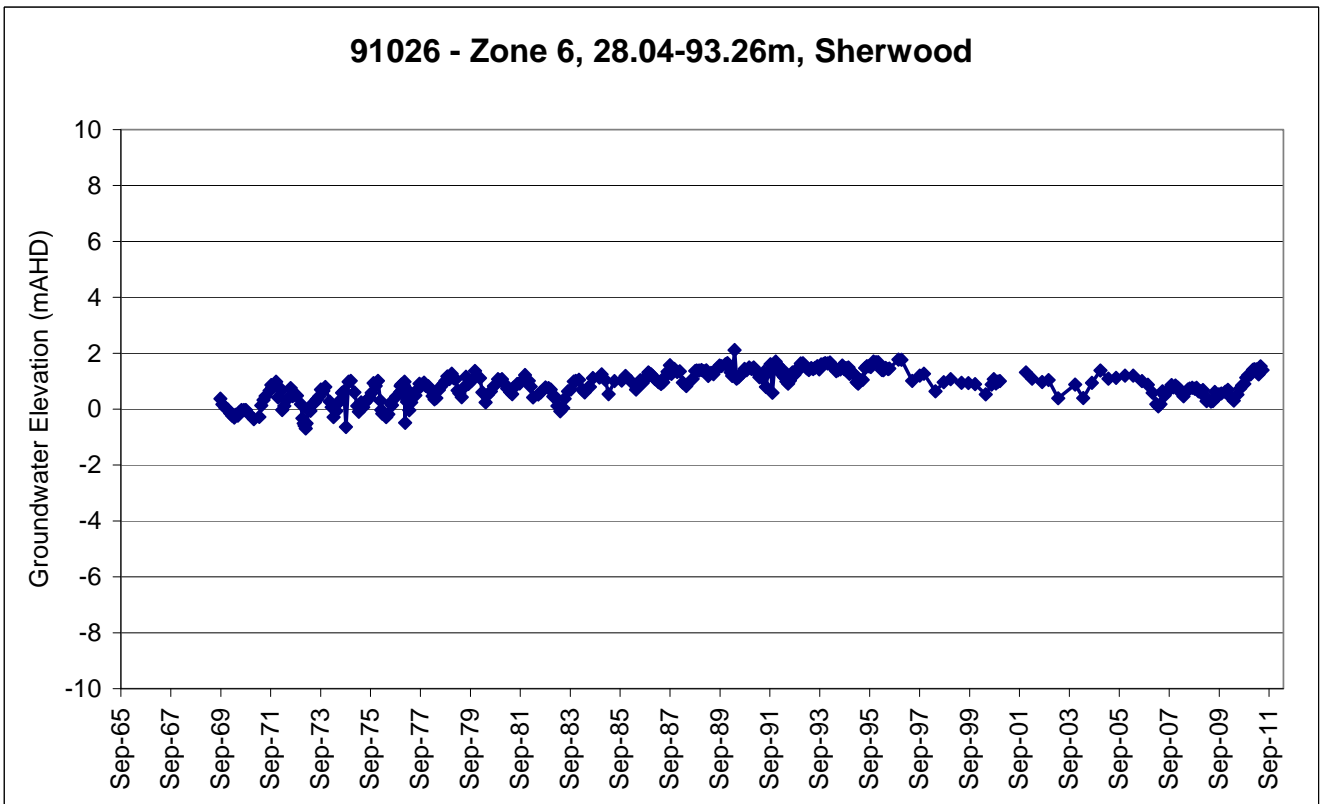
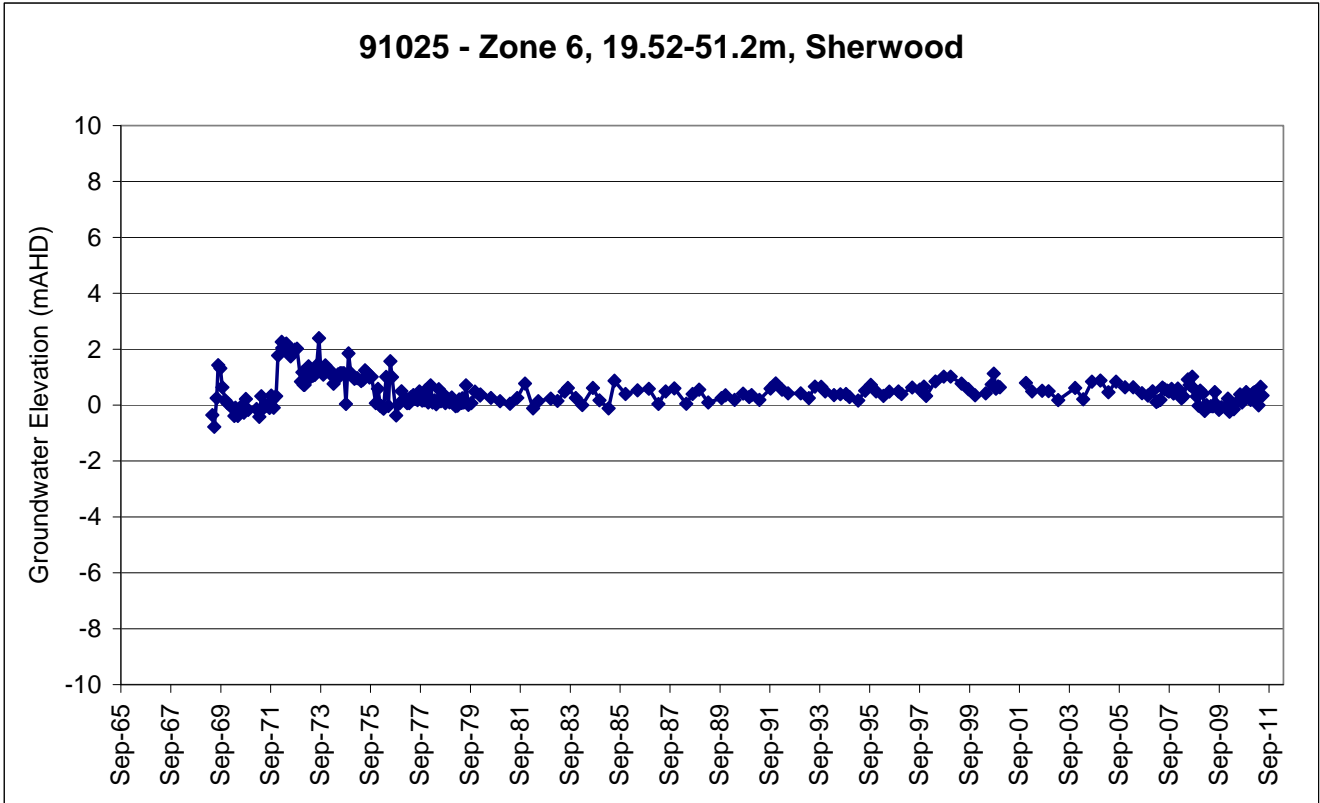


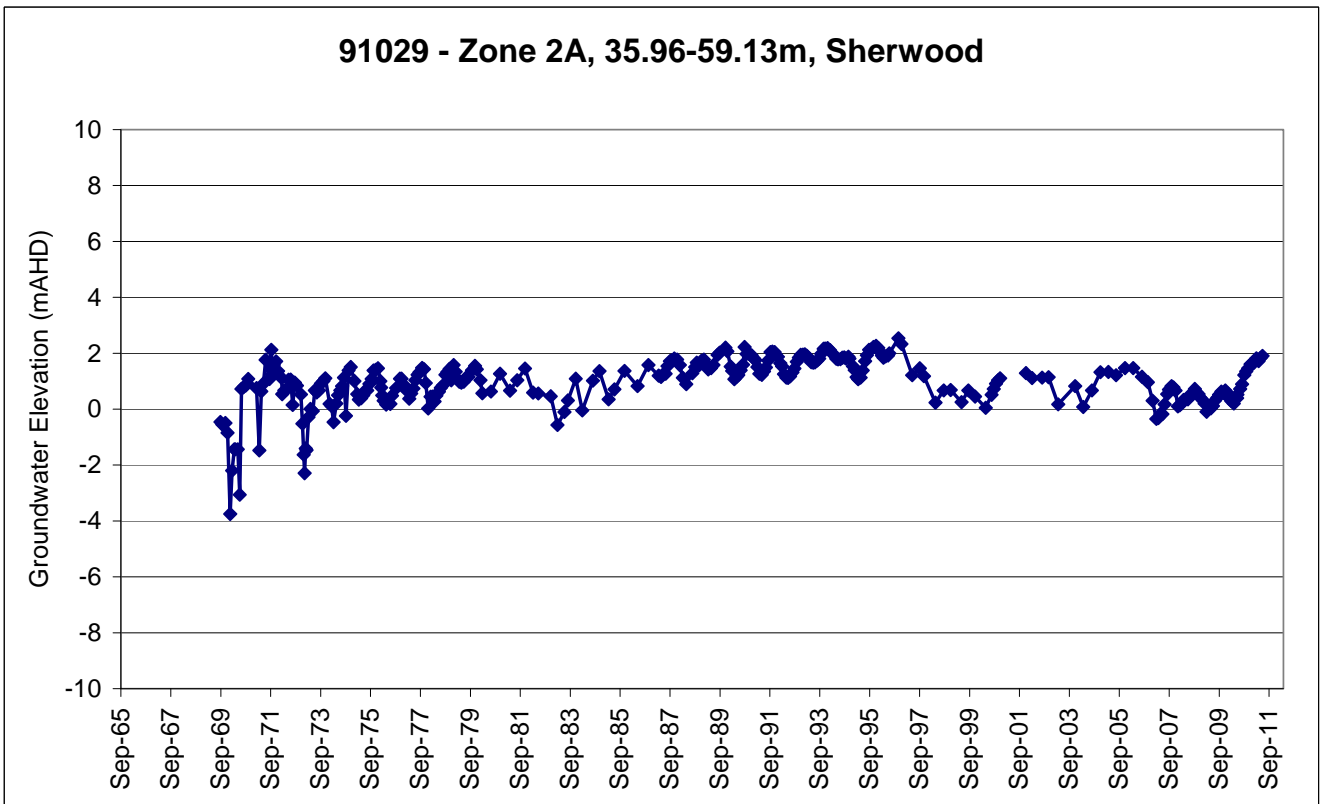
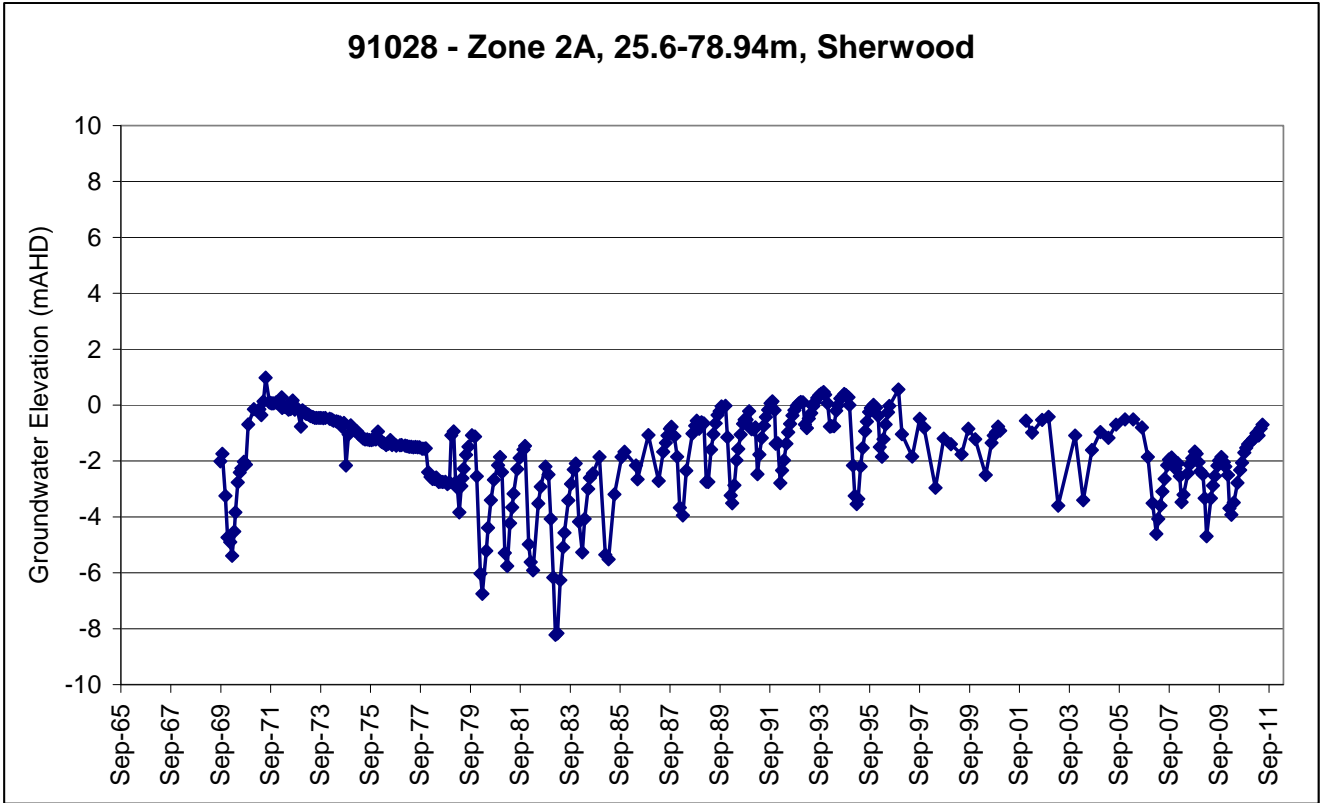


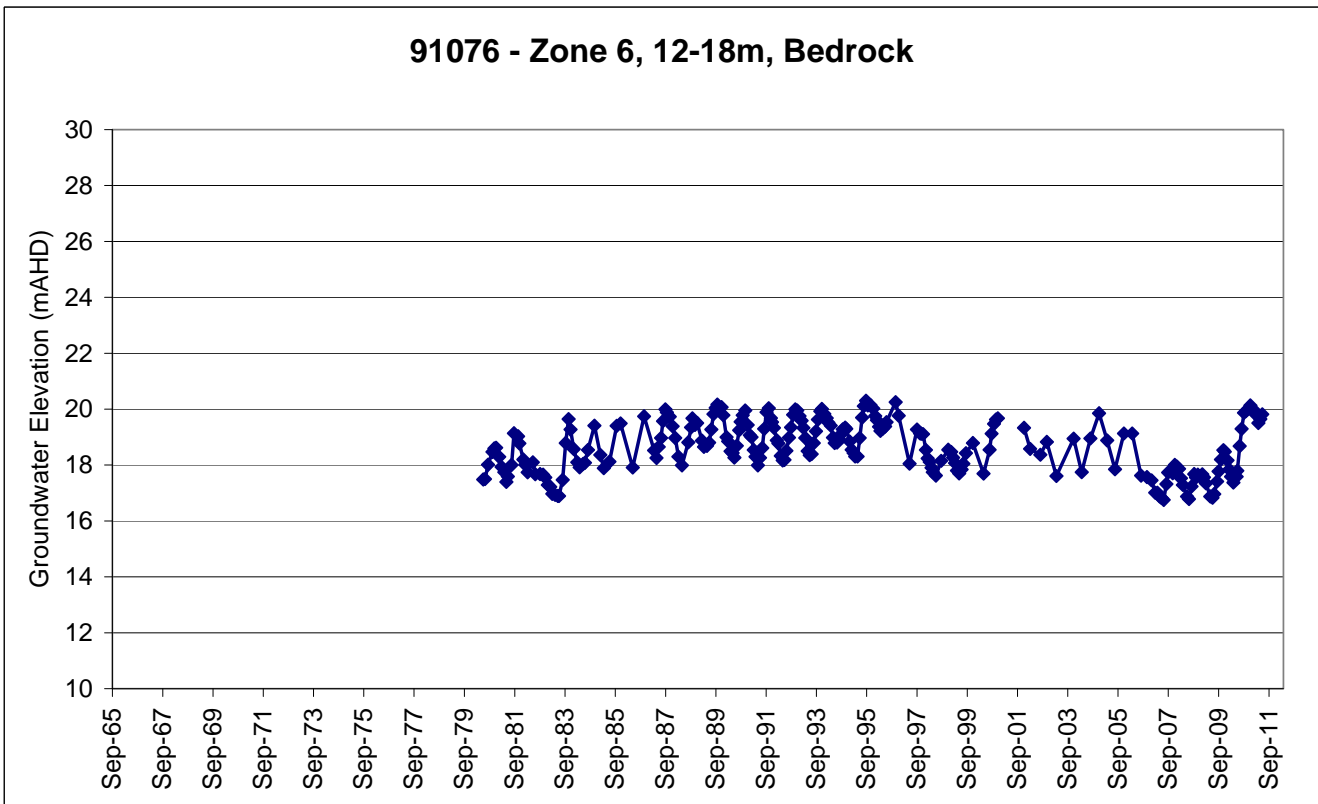
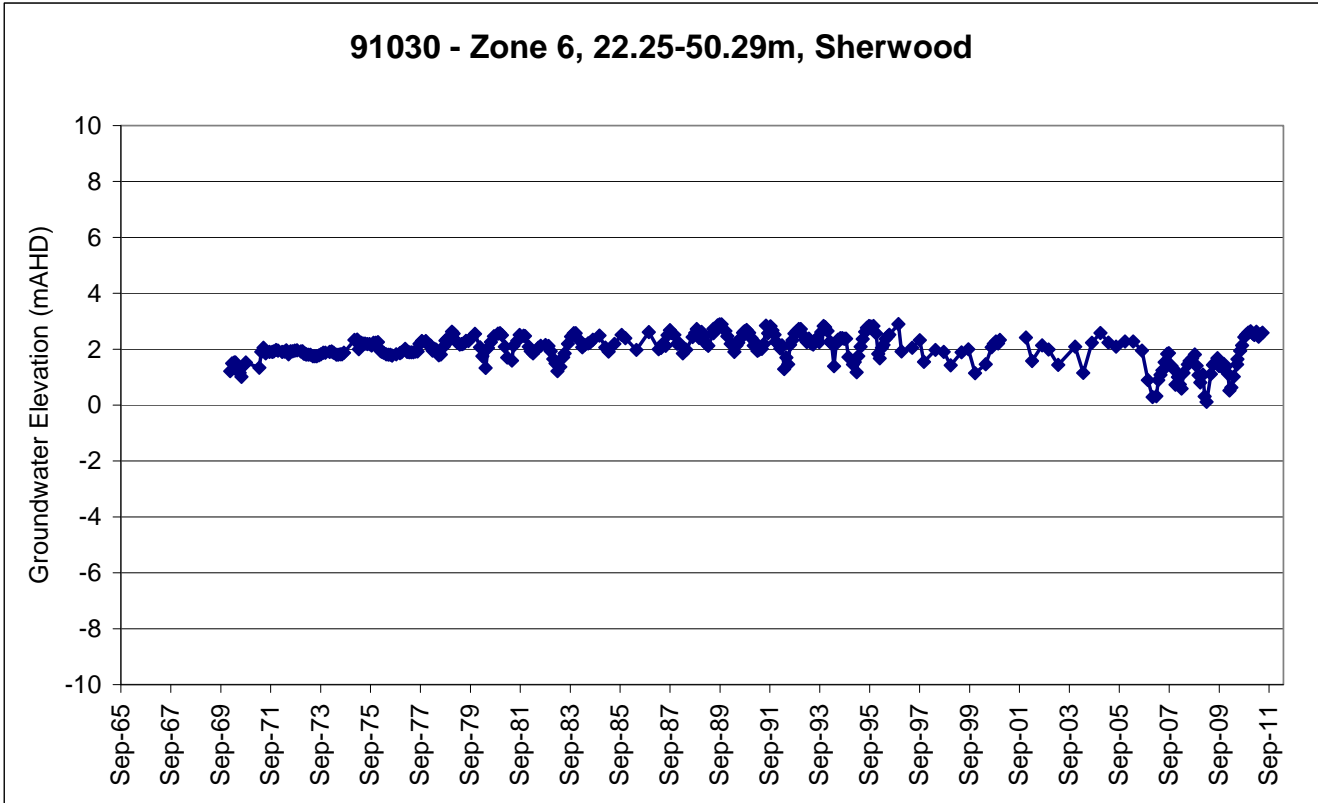


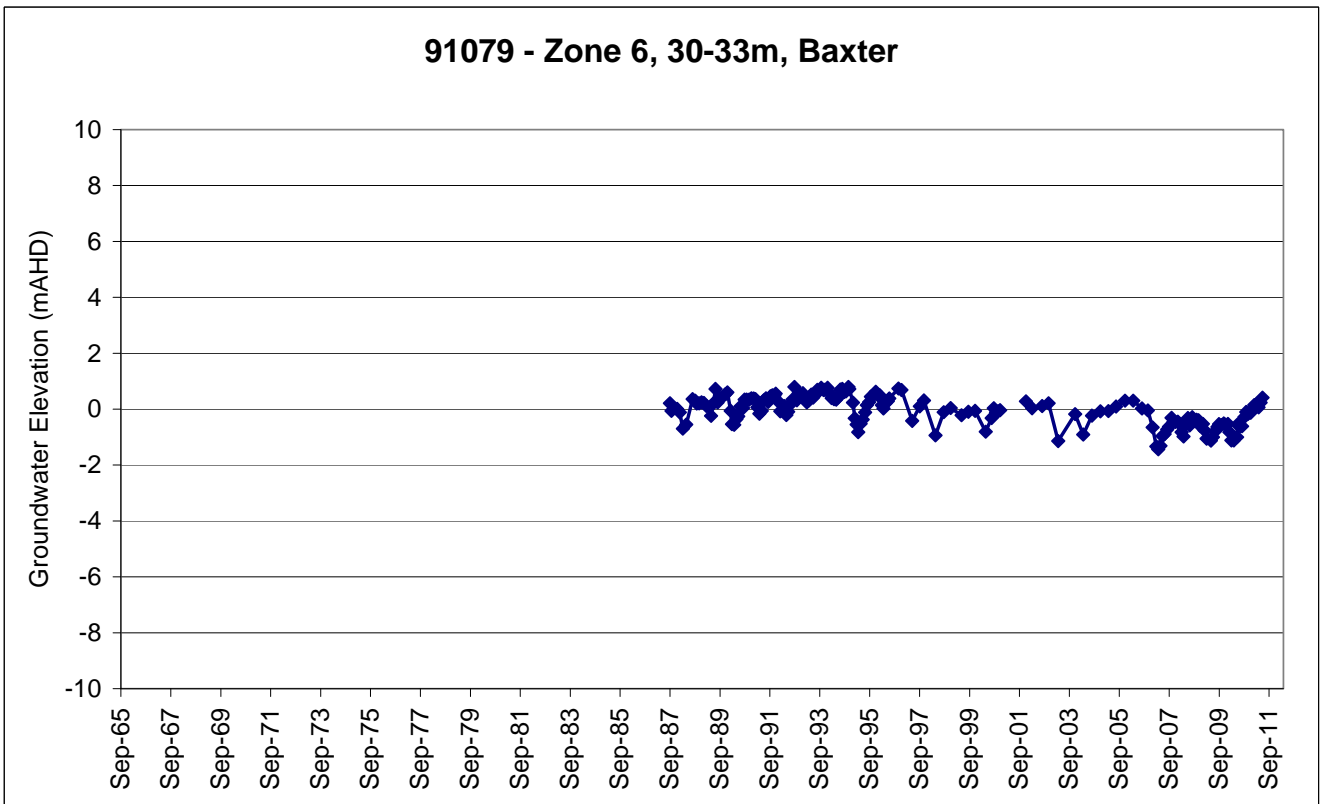
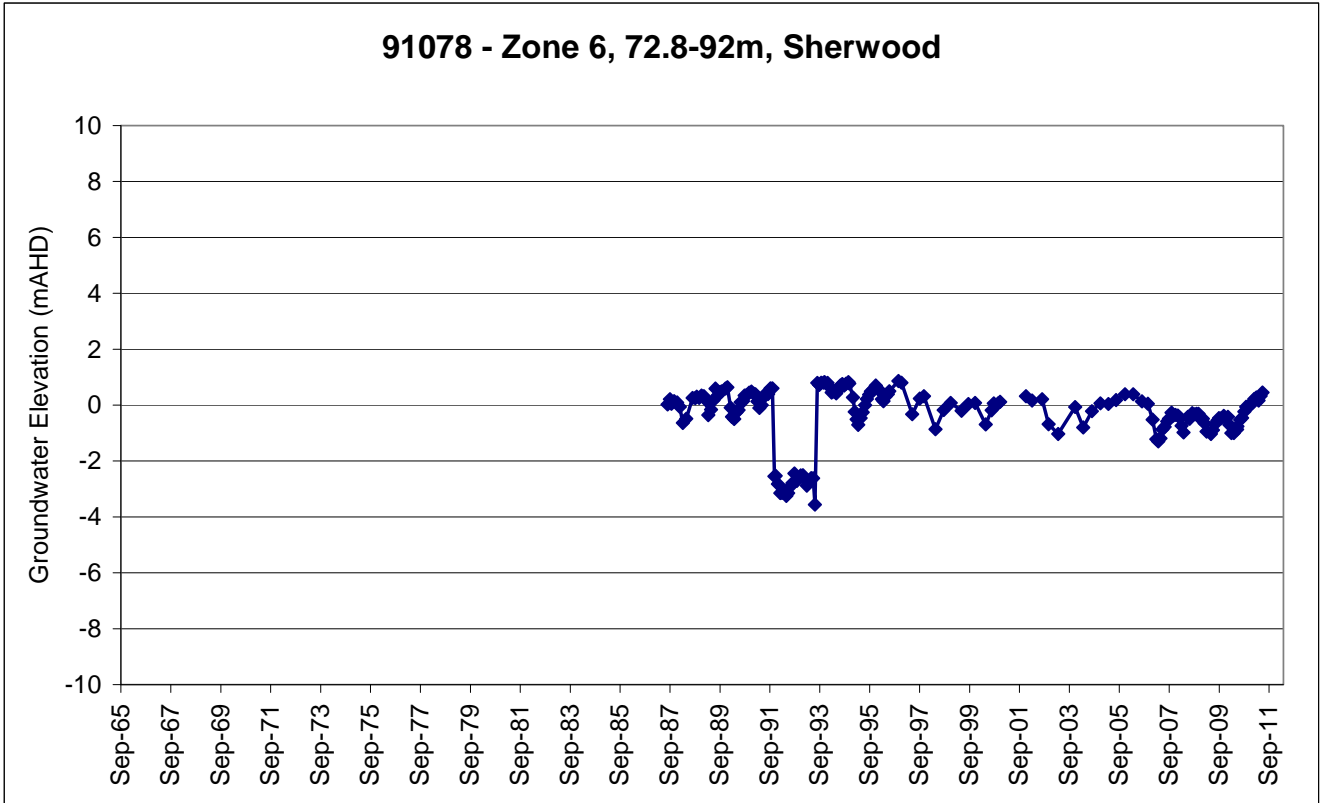


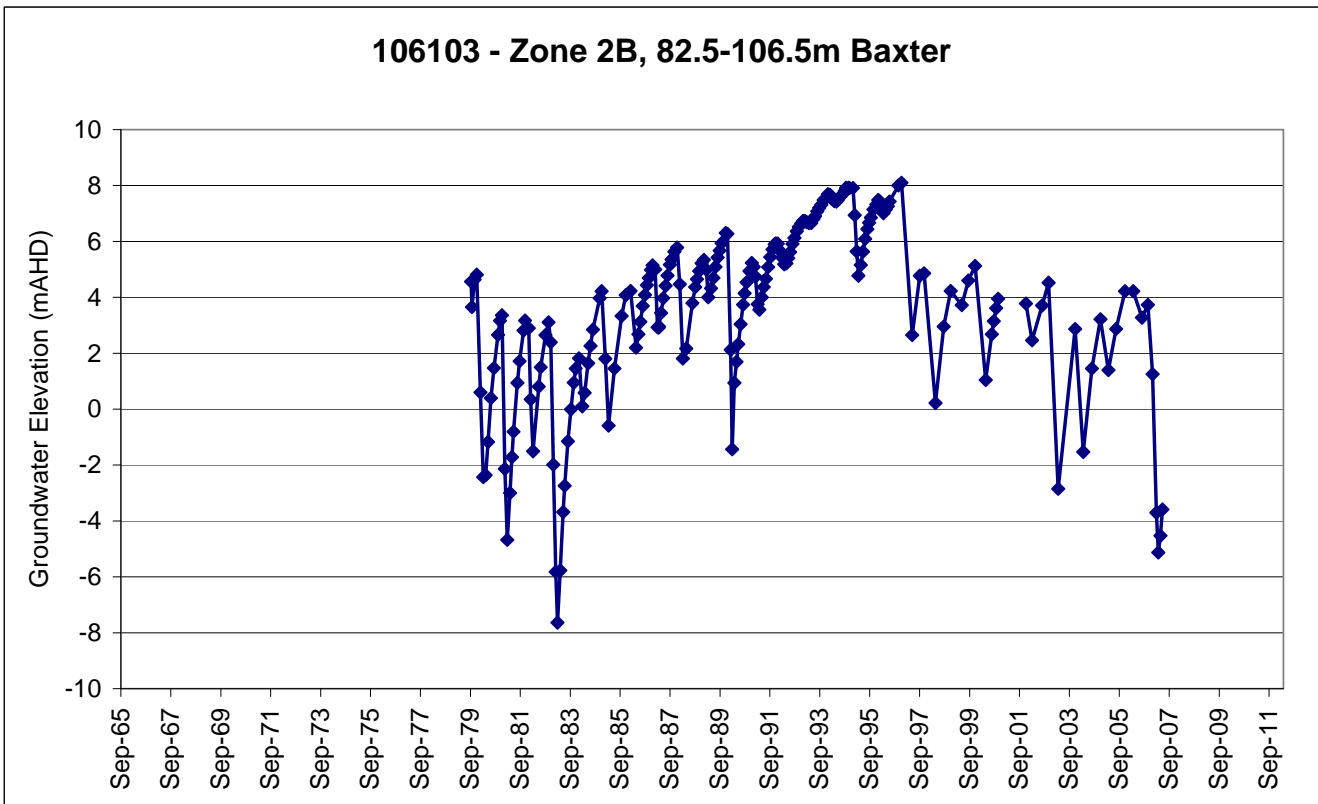
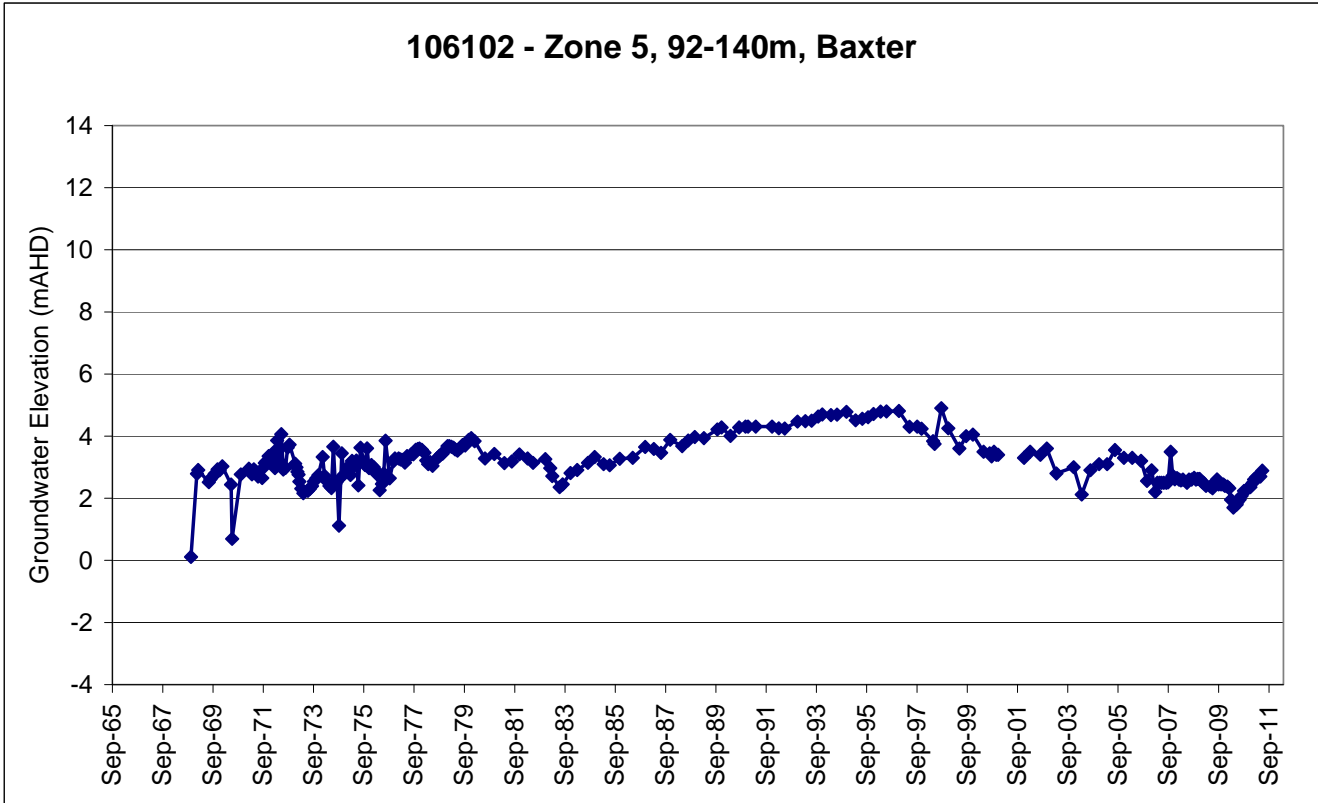


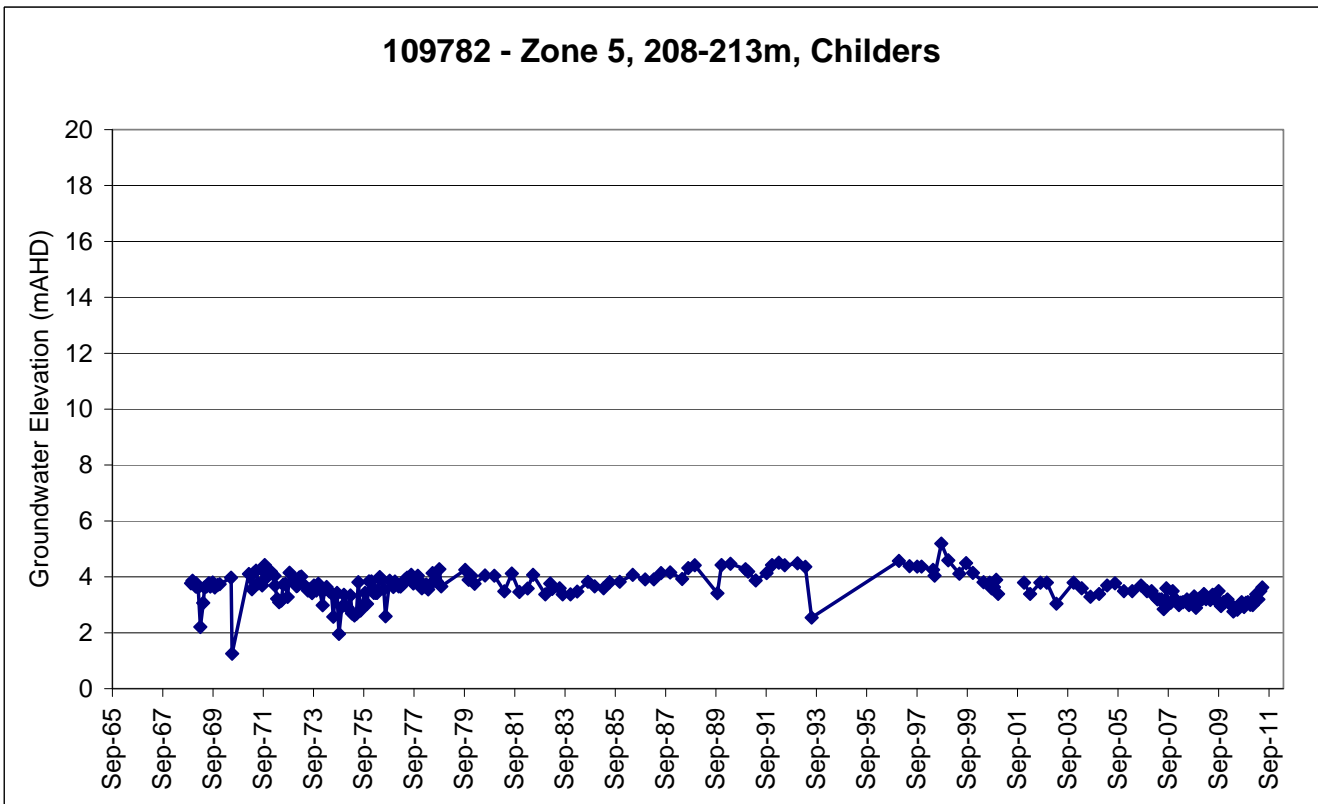
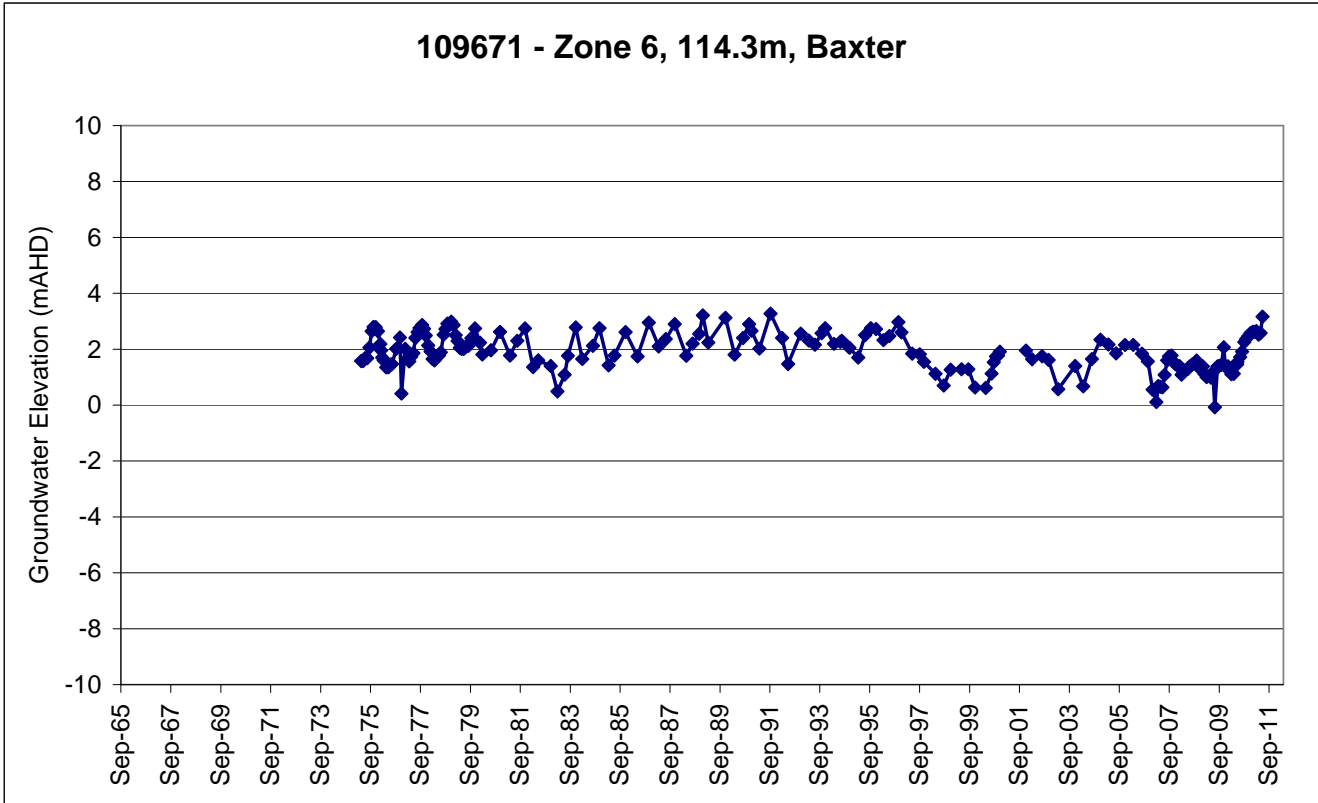


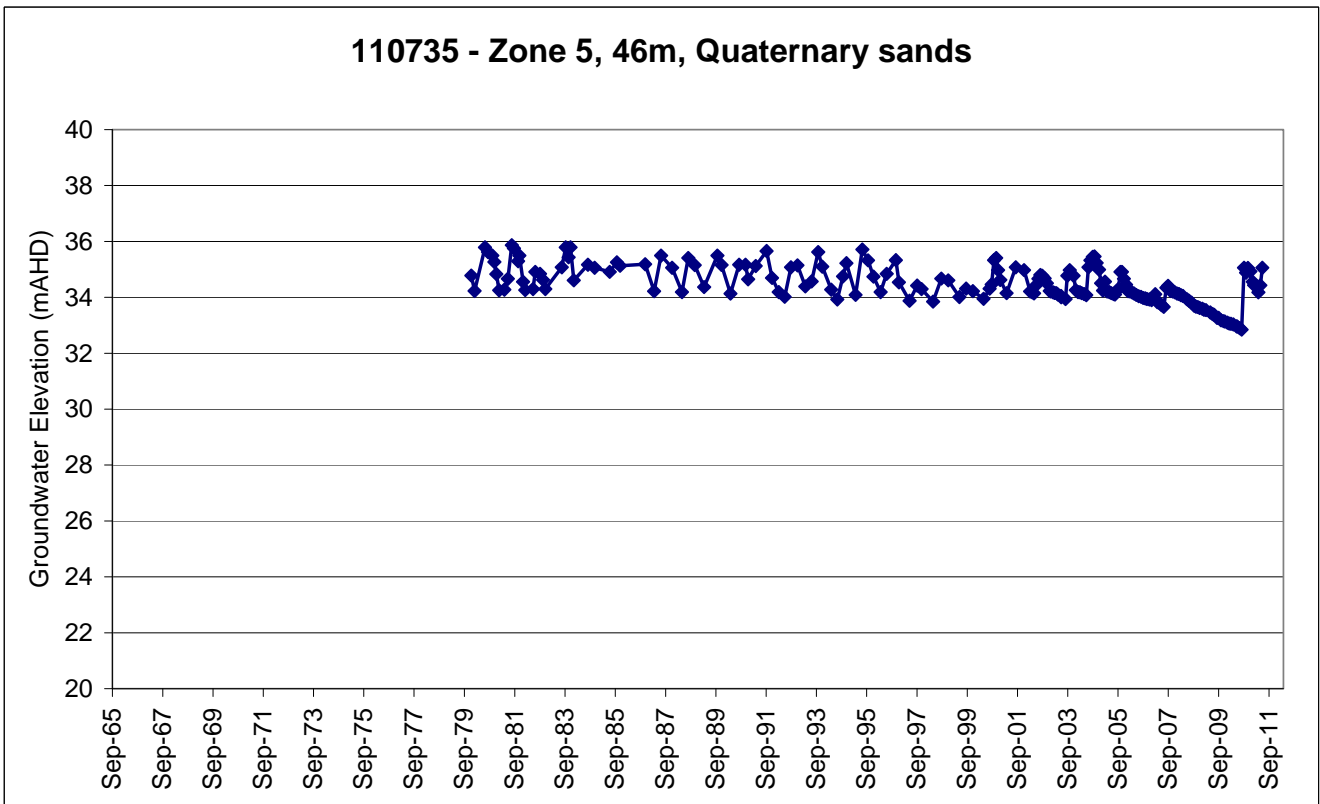
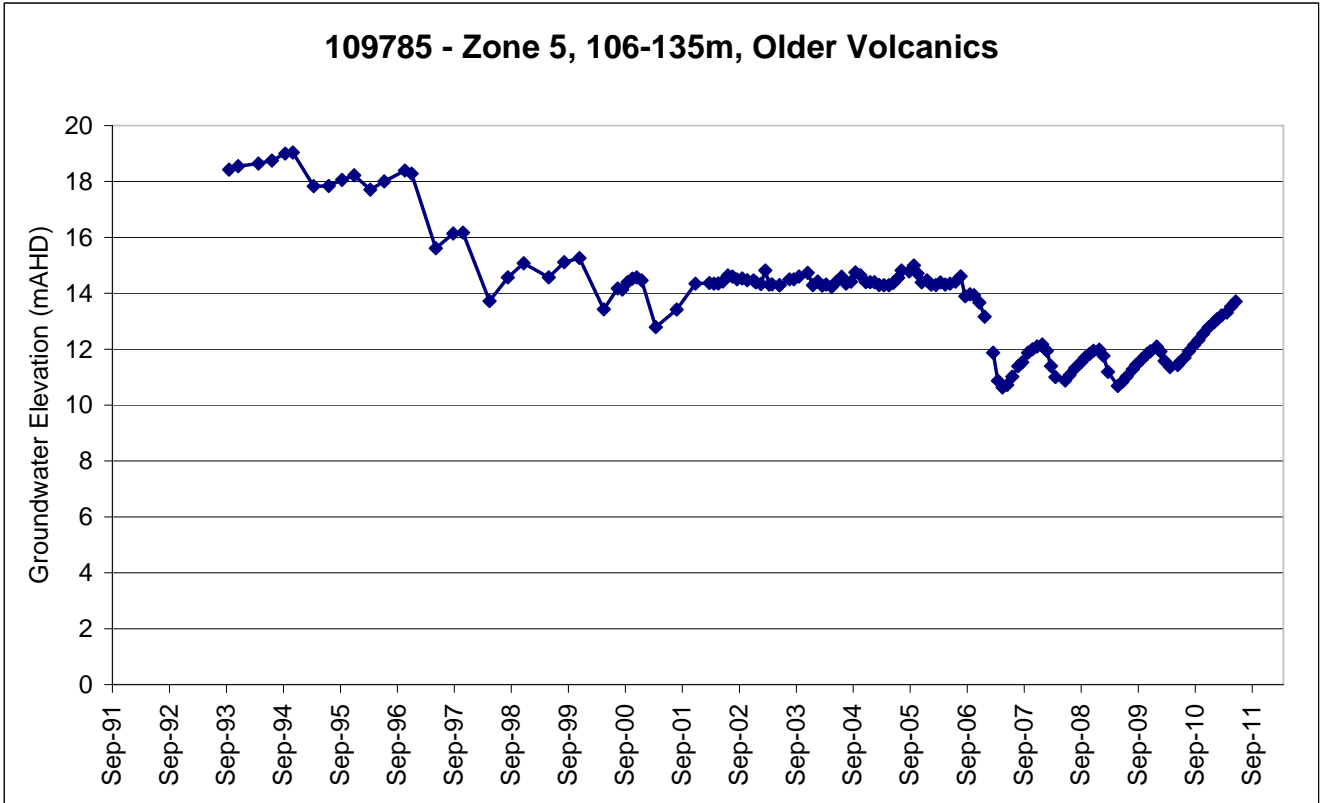


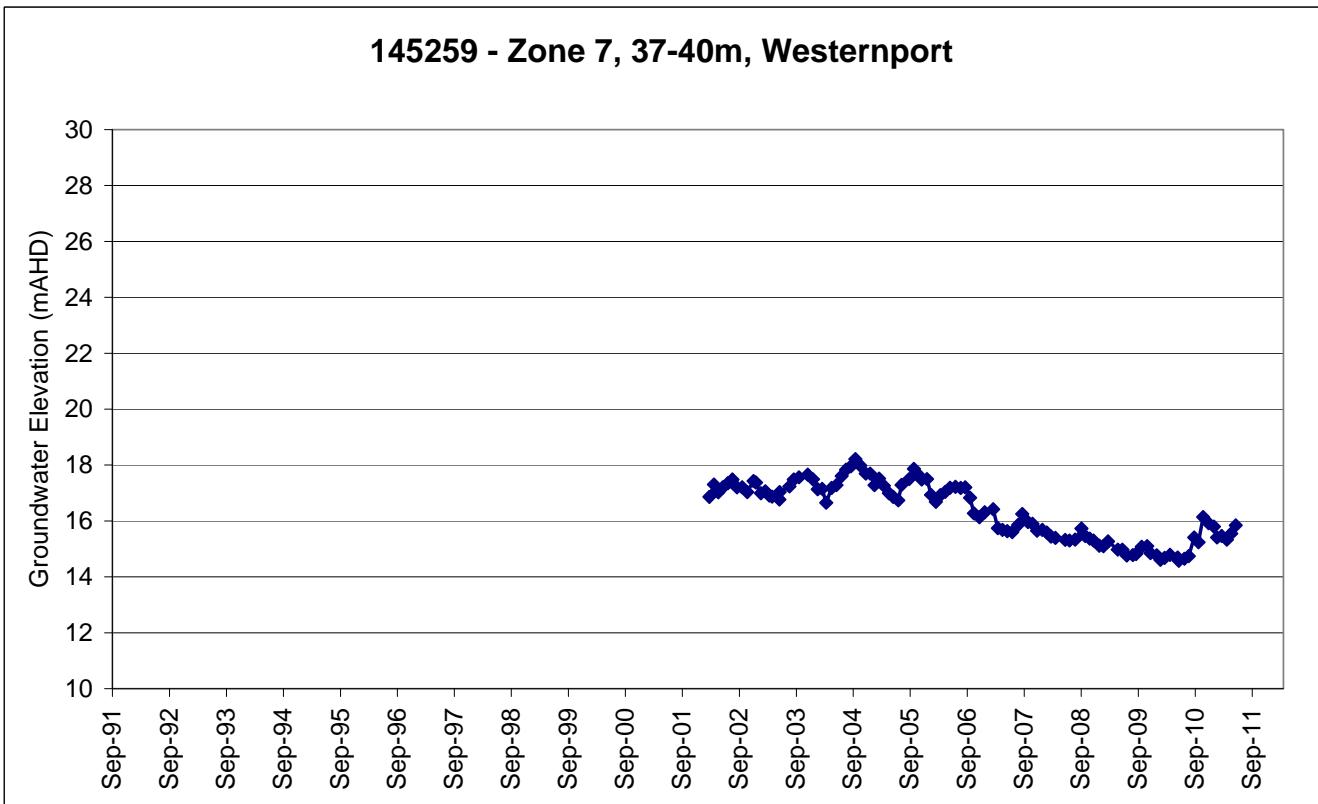
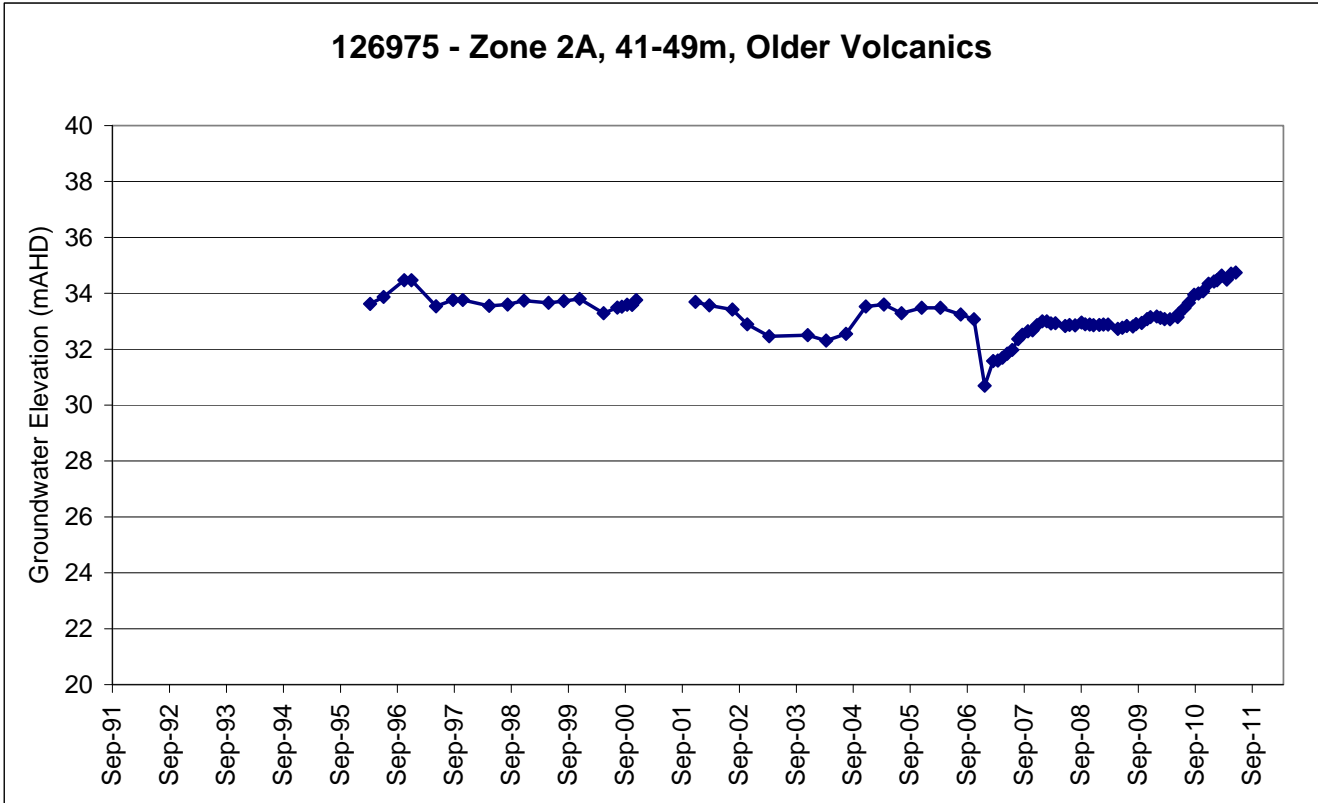




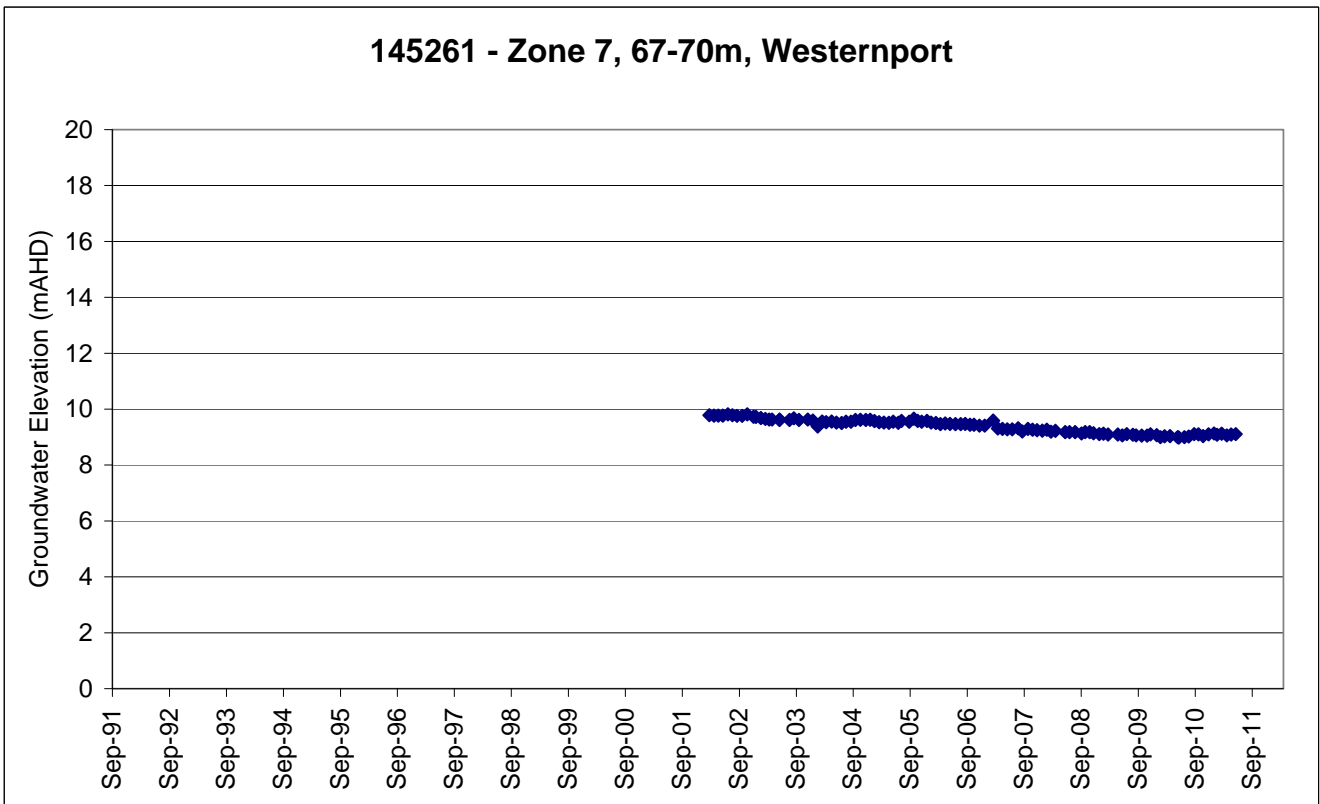
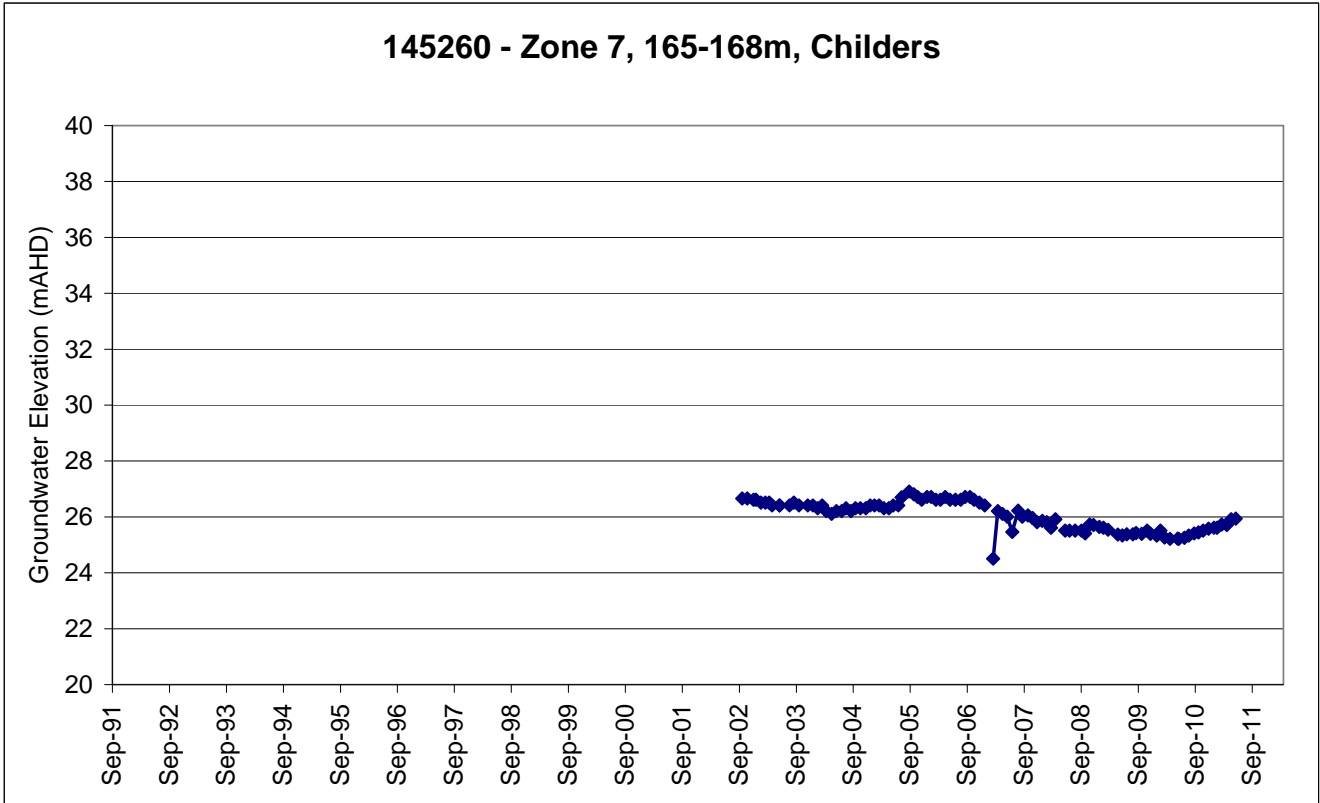


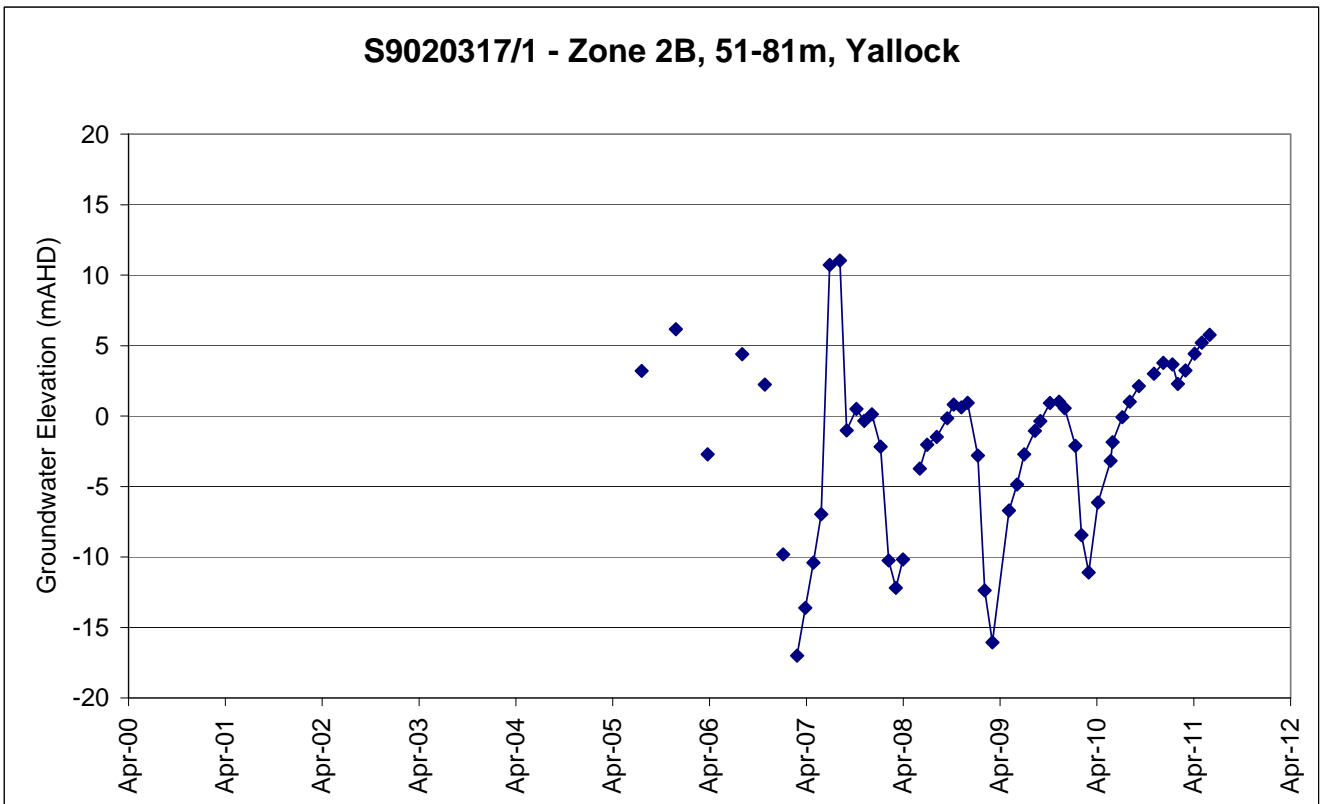
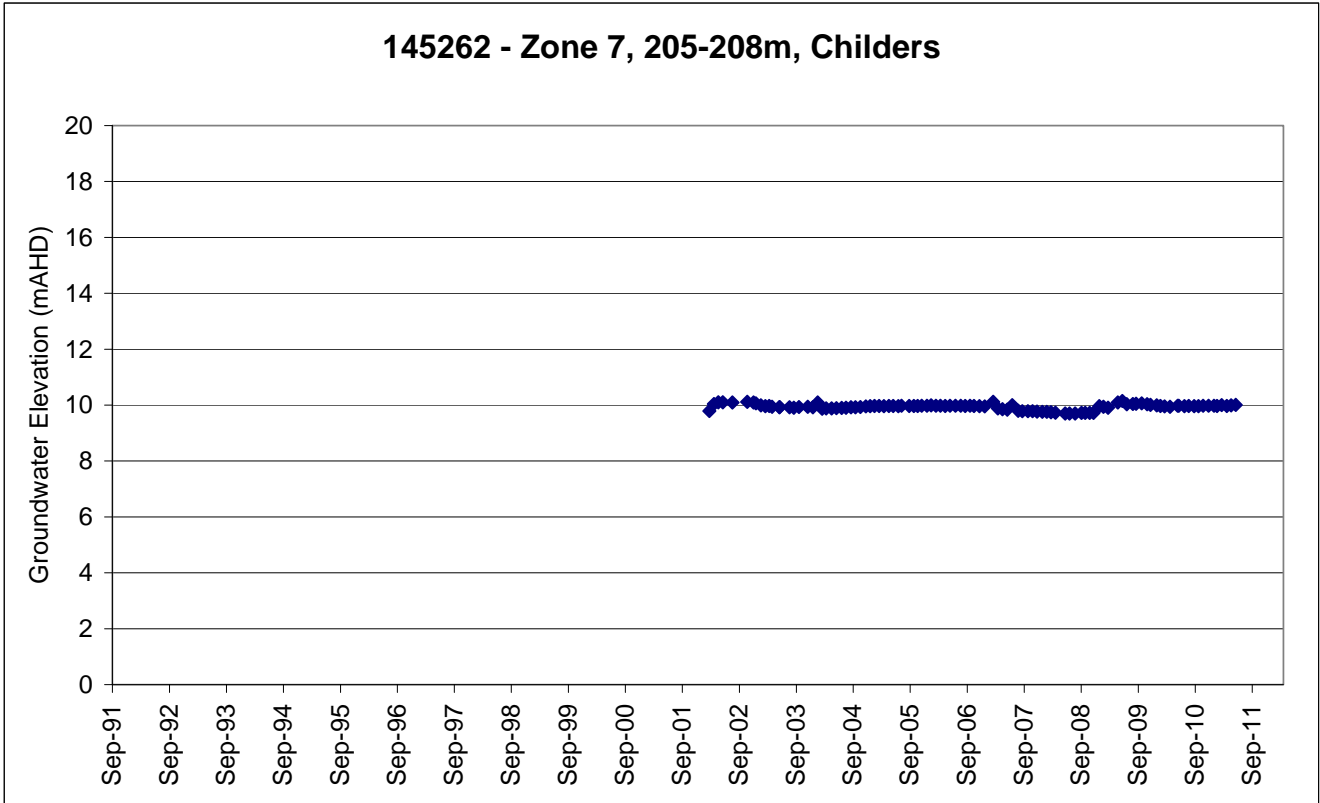


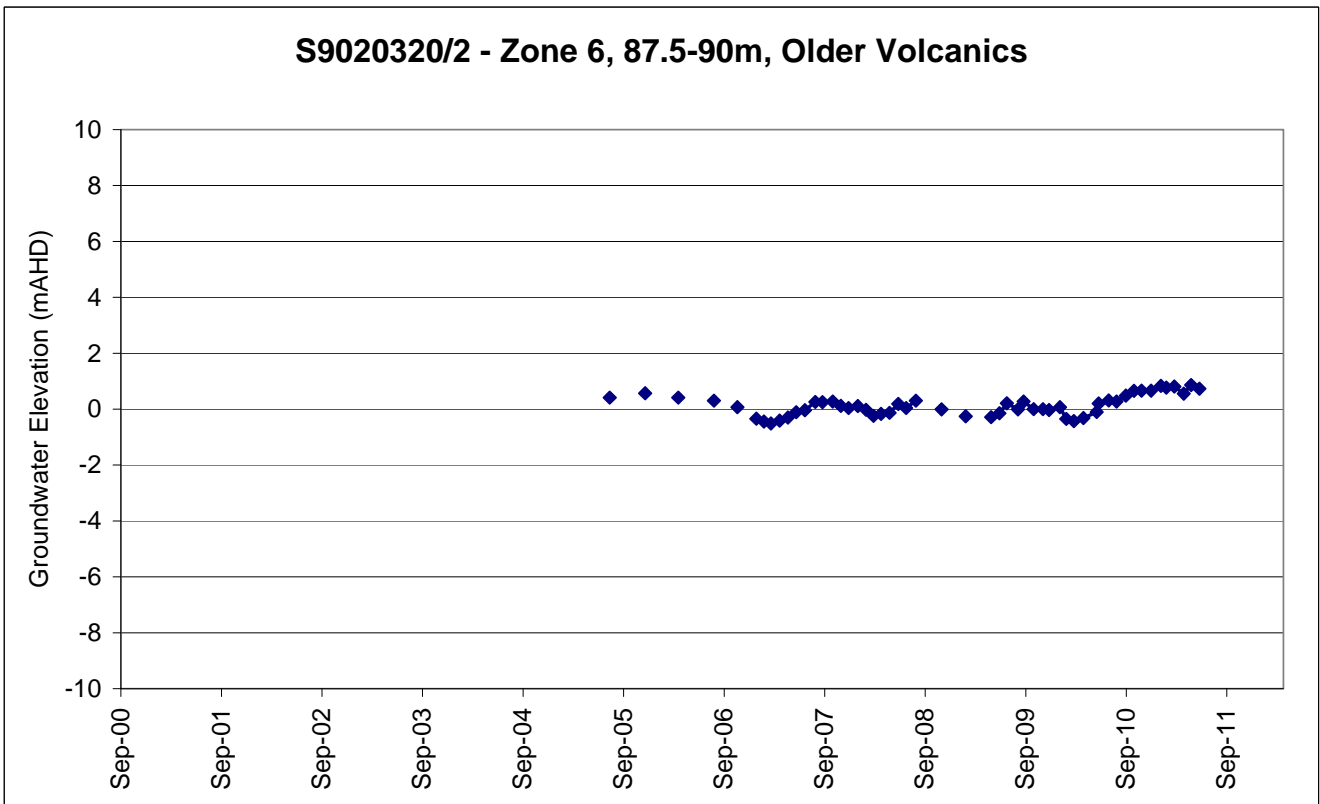
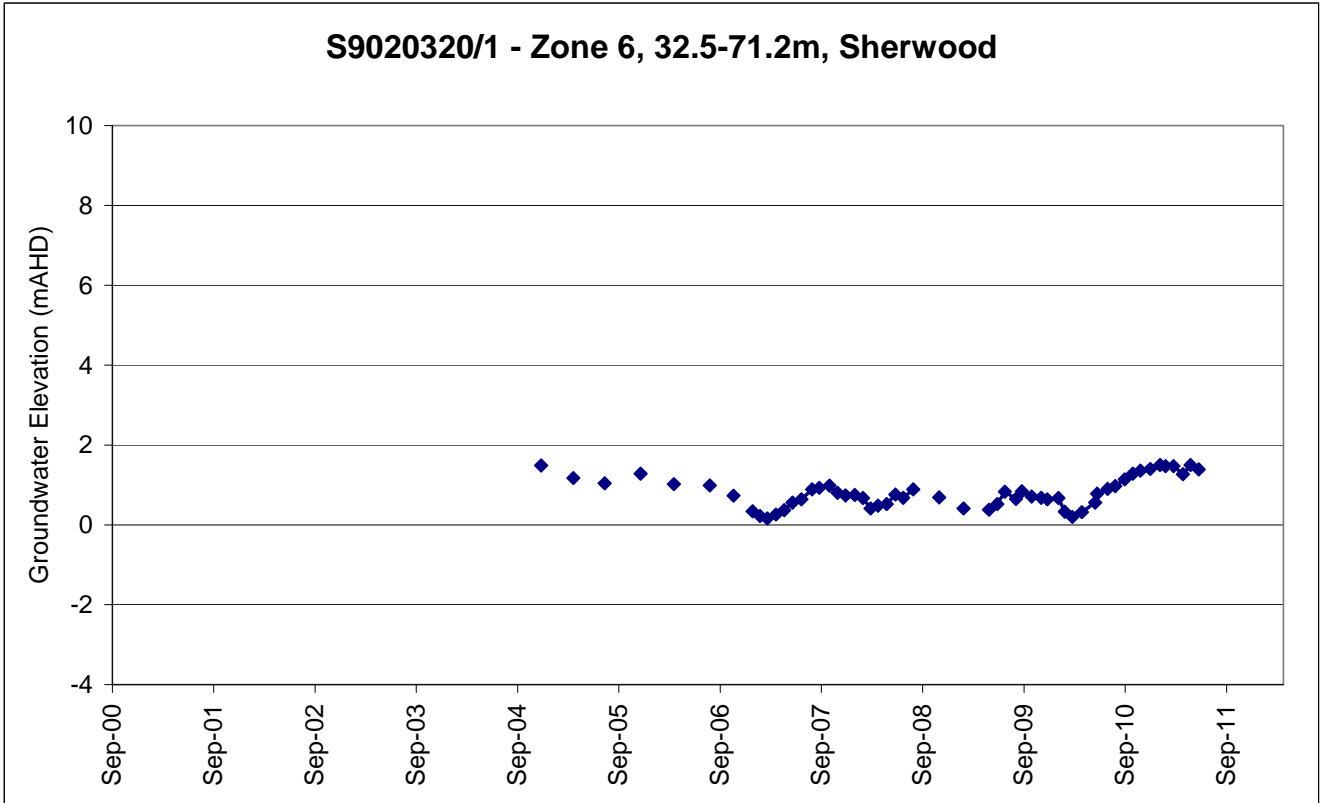


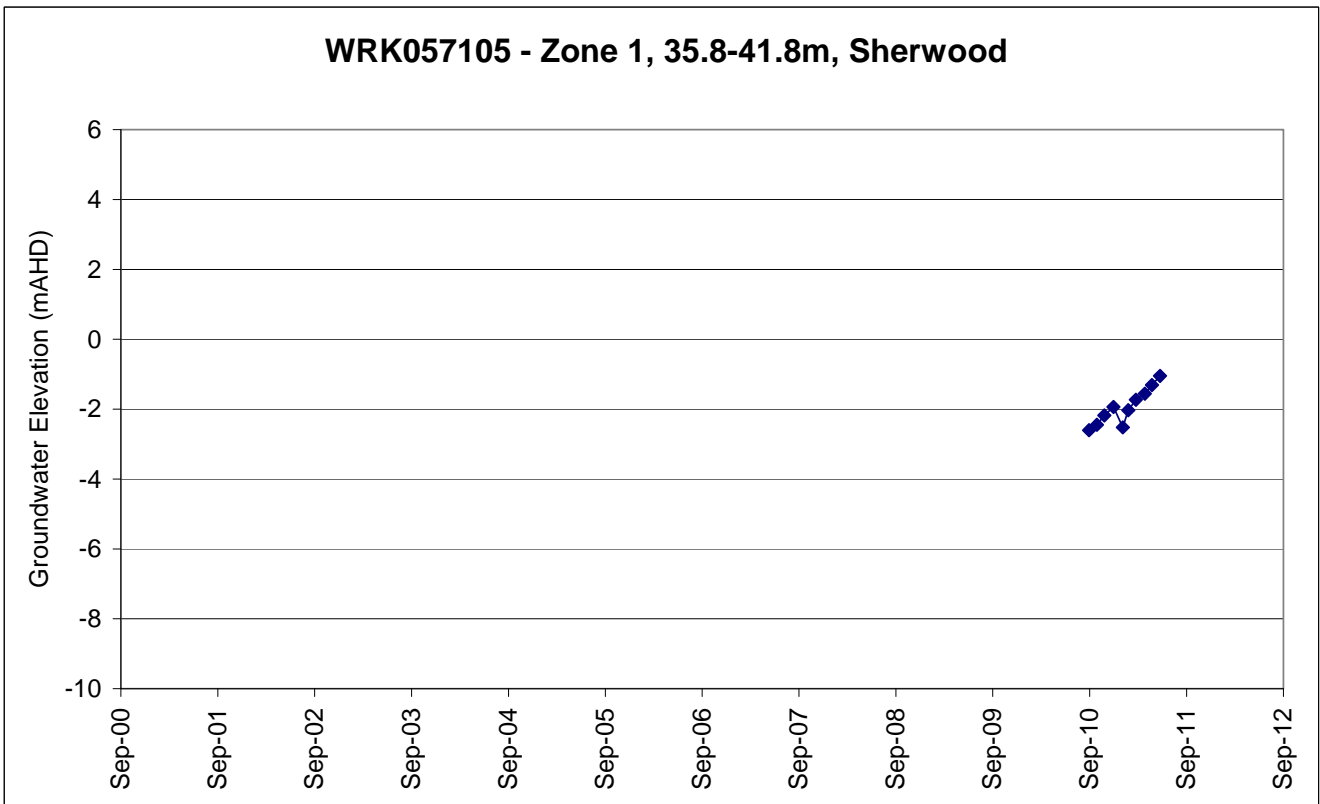
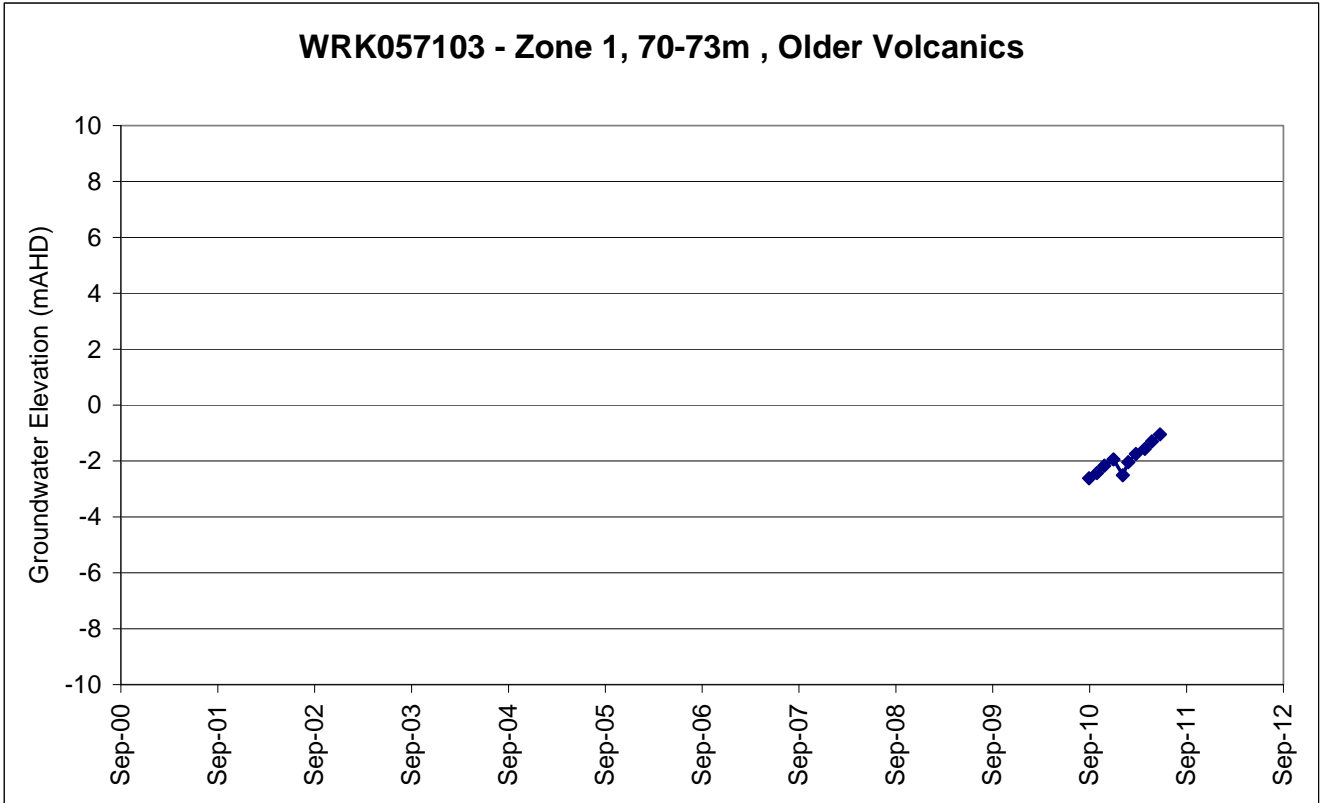


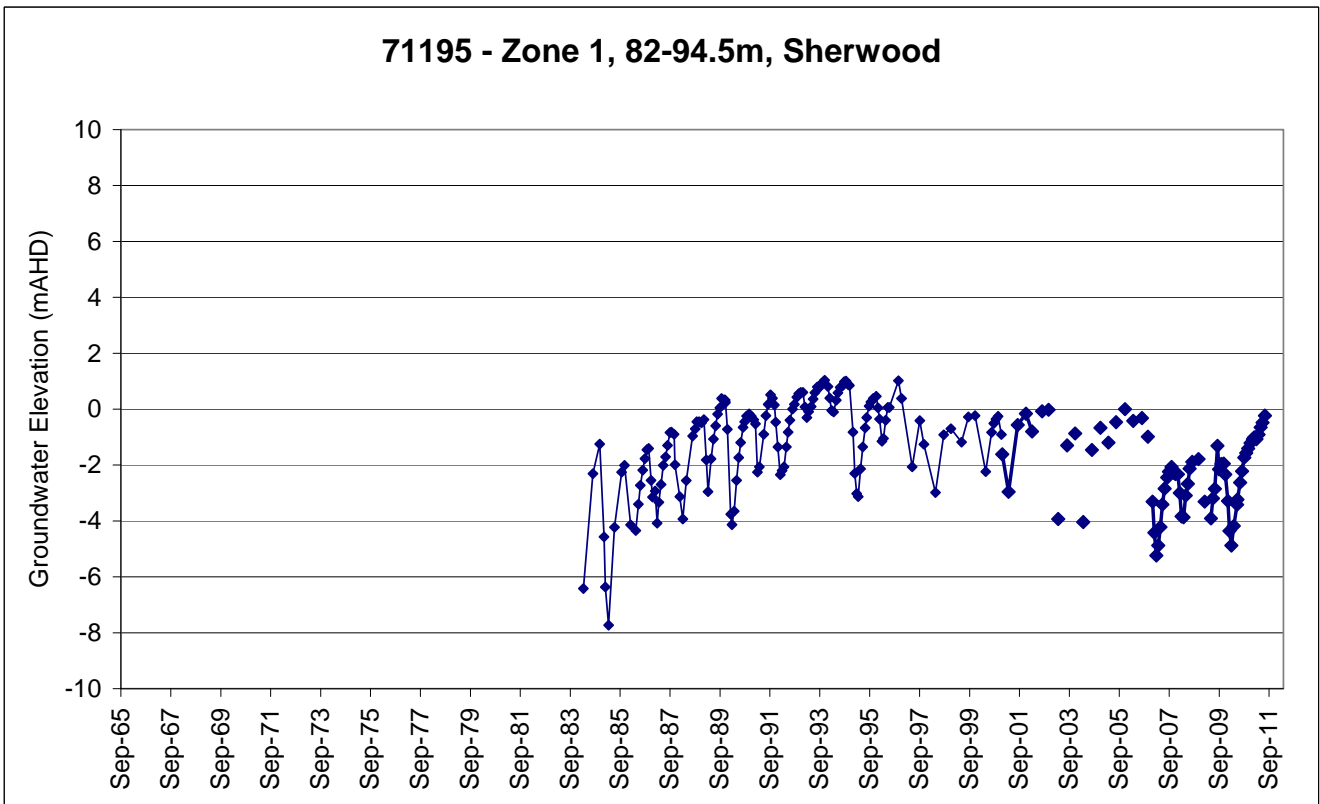
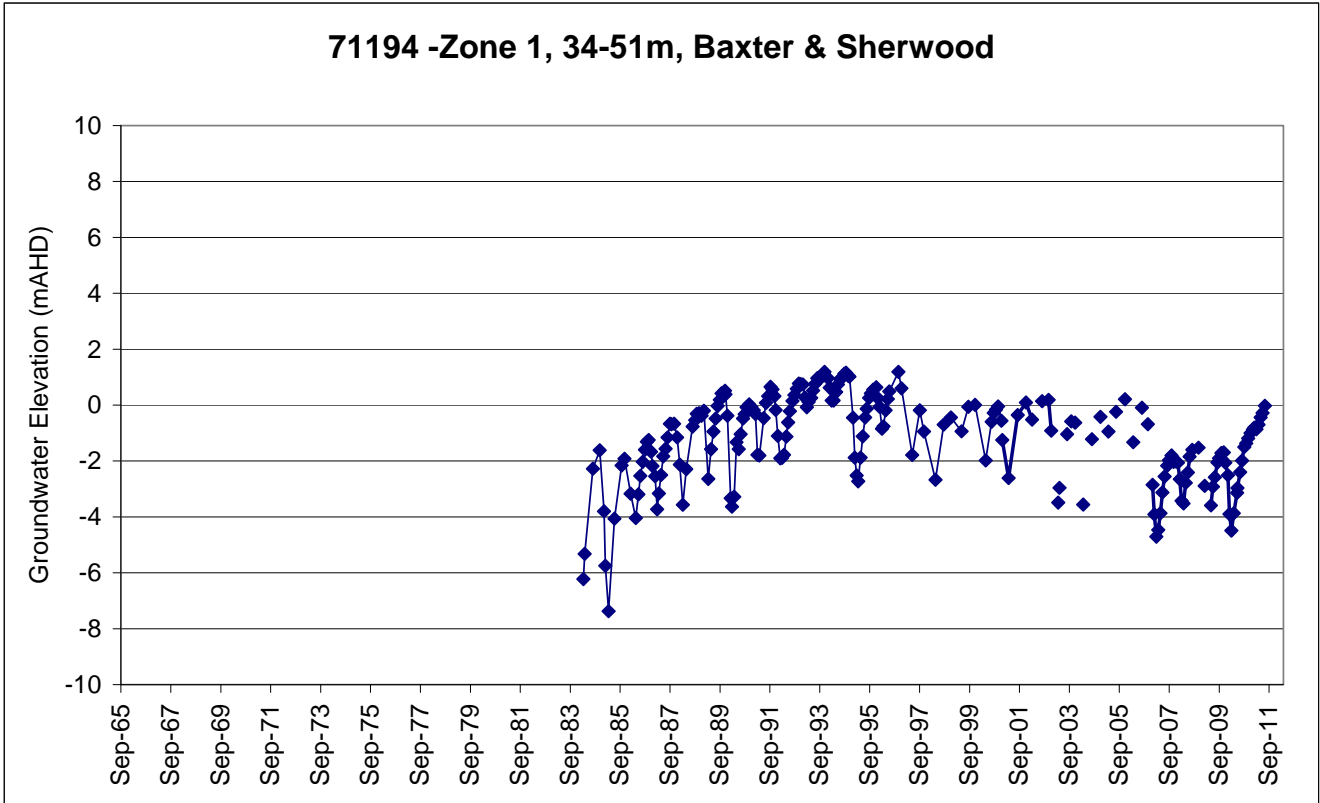












### 5.1.3 Salinity

