

WANNON WATER

Annual Water Outlook

November
2019

The logo for Wannon Water, featuring a stylized white wave graphic above the text.

wannonWATER

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Our Region



Overview

Wannon Water supplies water to an estimated residential population of 89,000 people, from four surface water systems and 10 groundwater systems. Supply from all these sources is secure over the coming 18 month outlook period, with no water restrictions expected beyond Permanent Water Saving Measures. If a dry scenario eventuates, up to 720 megalitres (ML) may be transferred from Rocklands Reservoir to local storages in the Grampians and up to 40 ML from the Willaura System to Glenthompson. For all systems, the likelihood of water restrictions within the outlook period is “rare” (less than four per cent).

System	Towns supplied	Primary source of supply	Likely water restriction status in outlook period	Supply (transfer) measures planned for dry scenario (to May 2021)
Otways	Warrnambool, Allansford, Koroit, Camperdown, Cobden, Lismore, Derrinallum, Mortlake, Noorat, Glenormiston, Simpson, Terang	Gellibrand River and Arkins Creek supplemented by groundwater and roofwater	Permanent Water Savings Measures only	None
Grampians	Balmoral, Cavendish, Hamilton, Tarrington, Dunkeld	Little Tea Tree Creek and Glenelg River tributaries (Grampians National Park); Rocklands Reservoir	Permanent Water Savings Measures only	720 ML transfer from Rocklands Reservoir to local storages
Glenthompson	Glenthompson	Yuppekiar Creek; Mt William Creek and bores	Permanent Water Savings Measures only	40 ML transfer from Willaura; 10ML transfer from Railway Reservoir
Konongwootong	None (rural customers only)	Den Hills Creek	Permanent Water Savings Measures only	None
Groundwater systems	Portland Port Fairy Heywood Dartmoor Macarthur Port Campbell, Peterborough, Timboon Casterton, Coleraine, Sandford, Merino Penshurst Caramut Darlington	Otway lower aquifers; Bridgewater Formation aquifer; Newer volcanic aquifers	Permanent Water Savings Measures only	None

1.0 Key achievements

Over the last year, the capacity to harvested greater volumes of roof water locally in Warrnambool has been increased through the construction and commissioning of works in the Gateway Industrial Park and adjacent to the Northern Edge Estate.

Gateway Industrial Park:

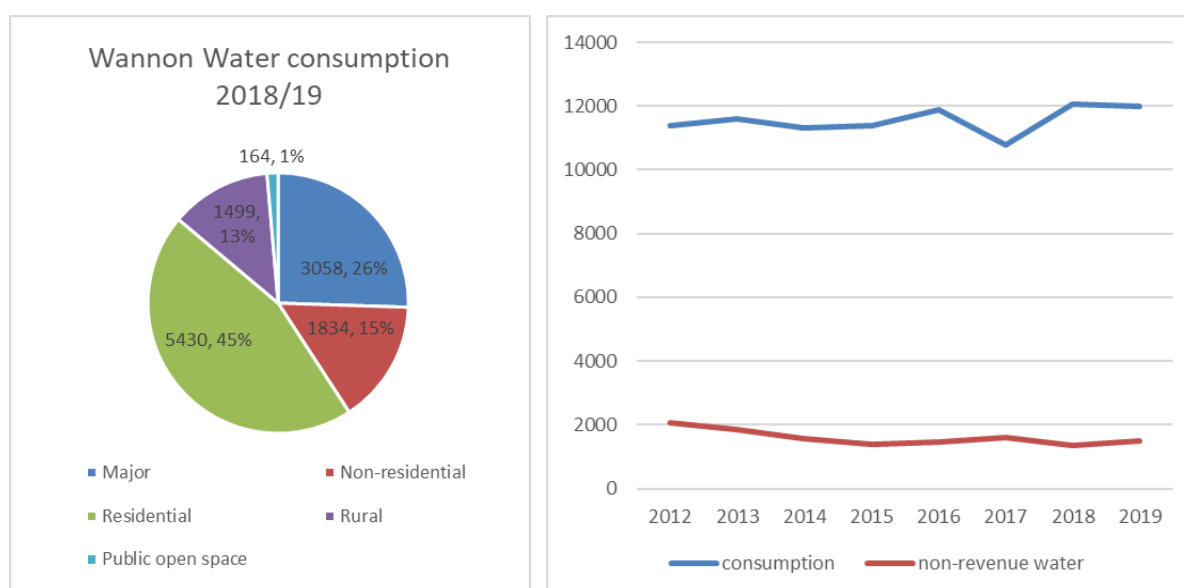
Construction of roof water harvesting pipework, pump station and connecting supply main to the Dales Road Storage enabling the harvesting of rainwater from shed roofs built on 22 industrial lots with a potential yield of 25 ML/yr.

Northern Edge Estate:

Extension of the trunk roof water harvesting main and construction of a 150 kL detention tank enabling the harvesting of roof water from an additional 75 houses when subdivision has progressed.

2.0 Water consumption

Consumption across all of Wannon Water's customer districts in 2018/19 was 11,986 ML. Non-revenue water in urban districts was 1,484 ML (12.6% of bulk water). Consumption decreased by 1% and non-revenue water increased by 1% compared to the previous year.



3.0 Climate influences

3.1 Longer-term climate trends

Victoria's climate has shown a warming and drying trend over recent decades, and this trend is expected to continue. In comparison to historical conditions we are already experiencing:

- Higher temperatures;

- Reductions in rainfall in autumn and winter, and in some locations, increases in rainfall during the warmer months; and,
- In many catchments across Victoria, a shift in the streamflow response to rainfall, with less streamflow generated for the same amount of rain.

Although there will still be a lot of variability in Victoria's climate, the chances of experiencing warmer conditions and less streamflow is now higher than in past decades.

3.2 Seasonal climate outlook – 24 October

The chance of above median rainfall in south-west Victoria in November to January is 30-40%, which means that a dry start to summer is expected. A strong positive Indian Ocean Dipole (IOD) is continuing to influence Australian climate, while a negative Southern Annular Mode (SAM) is also likely for the remainder of spring. Both these drivers typically bring warmer and drier conditions to our region. Further details: <http://www.bom.gov.au/climate/outlooks>.

The above climate outlook has little impact on the water availability presented in the next section. The climate outlook is for three months; the forecast water availability is for 18 months.

4.0 Supply system descriptions

System	Water sources	Nature of the supply system	Town(s) supplied	Residential population served (2016)	Major commercial customers
Otways	Arkins Creek	The Otways system is "run of river" and flows are very reliable. The forecast for the Otway System assumes that the streamflow in the Gellibrand River combined with the North Otway (Carlisle river) bores will continue to enable the system storages to be operated according to the storage target curves. This has been the case for the past 40 years.	Warrnambool, Allansford, Koroit, Camperdown, Cobden, Lismore, Derrinallum, Mortlake, Noorat, Glenormiston, Simpson, Terang	46,944	Warrnambool Cheese and Butter, Bega Koroit, Fonterra Dennington, Fonterra Cobden, Camperdown Dairy Company, Midfield International, Midfield CoProducts, South West Healthcare
	Northern Pump Station - Gellibrand River water				
	Southern Pump Station - Gellibrand River water				
	North Otway - Carlisle River bores (Wiridjil Gravel aquifer)				
	Albert Park bores (Warrnambool – Southwest Limestone aquifer)	Local groundwater at Warrnambool and Mortlake is shandied into the water supply. Roof water from new houses now supplies up to one per cent of Warrnambool's water needs. The Curdievale bore was constructed in 2015 as an emergency source and for future system augmentation. Blue green algae blooms in system storages are a concern but the risk is manageable.			
	Absaloms bores (Mortlake - Newer Volcanics aquifer)				
	Warrnambool - harvested roofwater				
	Curdievale bore (Otway lower aquifers zone 2) - emergency only				

System	Water sources	Nature of the supply system	Town(s) supplied	Residential population served (2016)	Major commercial customers
Grampians	Little Tea Tree Creek tributaries (Grampians National Park)	Balmoral is supplied from Rocklands Reservoir. There are seven weirs and offtakes from Little Tea Tree Creek and Glenelg River tributaries that flow by gravity into the main pipeline to Cavendish and to local storages north of Hamilton. In summer, the Headworks bore is operated to supply Cavendish if the Grampians offtakes yield insufficient water. In the Millenium Drought, the system went onto water restrictions. A pipeline from Rocklands Reservoir constructed in 2010 has made the supply system secure, but since 2010, Little Tea Tree Creek flows have been very reliable and transfers from Rocklands have been minimal.	Balmoral, Cavendish, Hamilton, Tarrington, Dunkeld	11,750	
	Glenelg River tributaries (Grampians National Park)				
	Rocklands Reservoir				
	Bores in the Grampians National Park (Grampians sandstone aquifer)				
Glenthompson	Yuppekiar Creek	The Glenthompson Reservoir is on Yuppekiar Creek. In many years there are very low inflows in this system. Glenthompson's supply reliability depends on our 58 ML bulk entitlement in the Willaura System, which is managed by Grampians Wimmera Mallee Water and sources water from Mt William Creek and bores in the Grampians National Park.	Glenthompson	224	
	Transfers from the Willaura System (Mt William Creek and bores)				

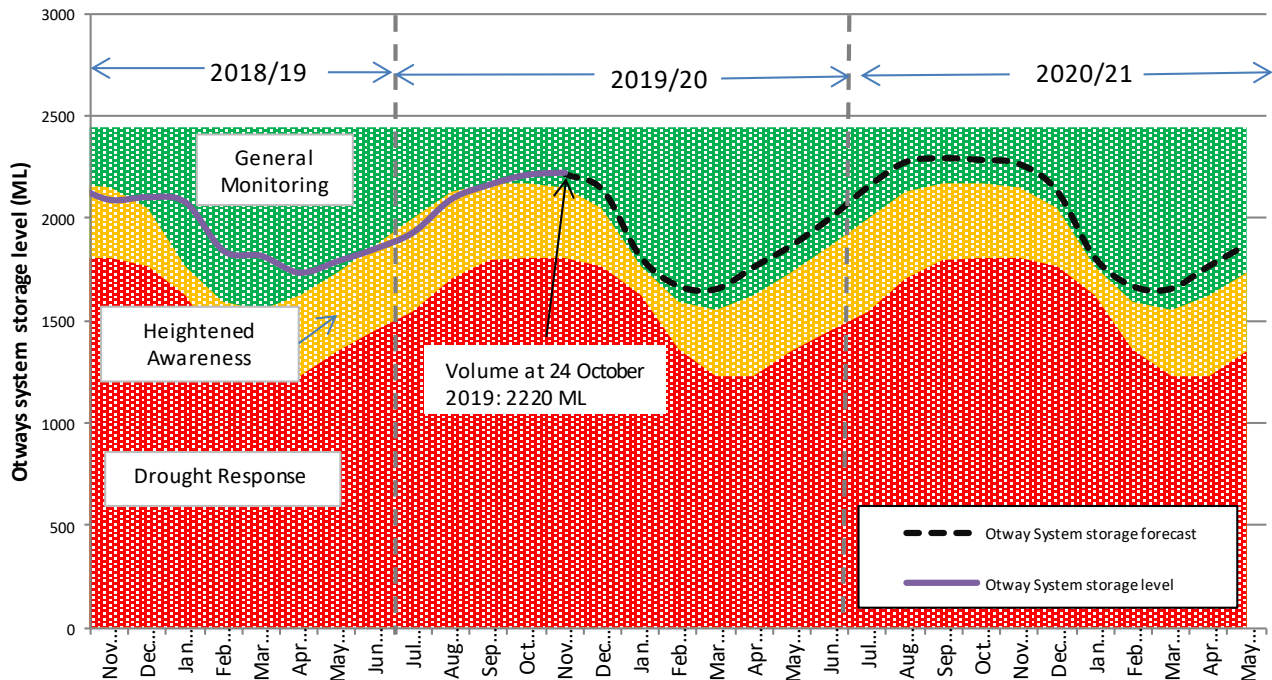
System	Water sources	Nature of the supply system	Town(s) supplied	Residential population served (2016)	Major commercial customers
Konongwootong	Den Hills Creek	Konongwootong Reservoir was the historic source for Coleraine and part of Casterton. The system now only supplies rural customers through individual water supply agreements.	None	0 (64 rural connections)	
Groundwater systems:		Wannon Water's 10 groundwater supply systems were all secure through the Millenium Drought and are expected to remain secure into the future. Water restrictions are not normally part of the management of these systems.			
Portland	Otway lower aquifers (zone 2)		Portland	11,297	Alcoa, Port of Portland
Port Fairy	Otway lower aquifers (zone 2)		Port Fairy	5,000	SunPharma
Heywood	Otway lower aquifers (zone 2)		Heywood	1,441	
Dartmoor	Otway lower aquifers (zone 1)		Dartmoor	281	
Macarthur	Otway lower aquifers (zone 1)		Macarthur	322	

System	Water sources	Nature of the supply system	Town(s) supplied	Residential population served (2016)	Major commercial customers
Port Campbell System	Otway lower aquifers (zone 3)		Port Campbell, Peterborough, Timboon	2,215	
Tullich System	Bridgewater formation (unconfined)		Casterton, Coleraine, Sandford, Merino	3,386	
Penshurst	Newer volcanic aquifer (unconfined)		Penshurst	610	
Caramut	Newer volcanics (unconfined)		Caramut	124	
Darlington	Basalt aquifer (unconfined)		Darlington	43	

5.0 Water outlook

5.1 Otways system

5.1.1 Forecast water availability



5.1.2 Forecast assumptions

The forecast for the Otways system assumes that the streamflow in the Gellibrand River combined with the Carlisle River bores will continue to enable the system storages to be operated according to the storage target curves. This has been the case for the past 40 years accordingly there is no dry or wet scenarios shown on the above graph.

5.1.3 System status November 2019

Mode 1: General Monitoring

Otways system storages were above target levels as of 17 October 2019. Storage levels are expected to track above the heightened awareness level without any need for drought response. Water availability is expected to remain within the General Monitoring operating mode.

Wannon Water has three operational modes, defined in our Drought Preparedness Plan and Urban Water Strategy as:

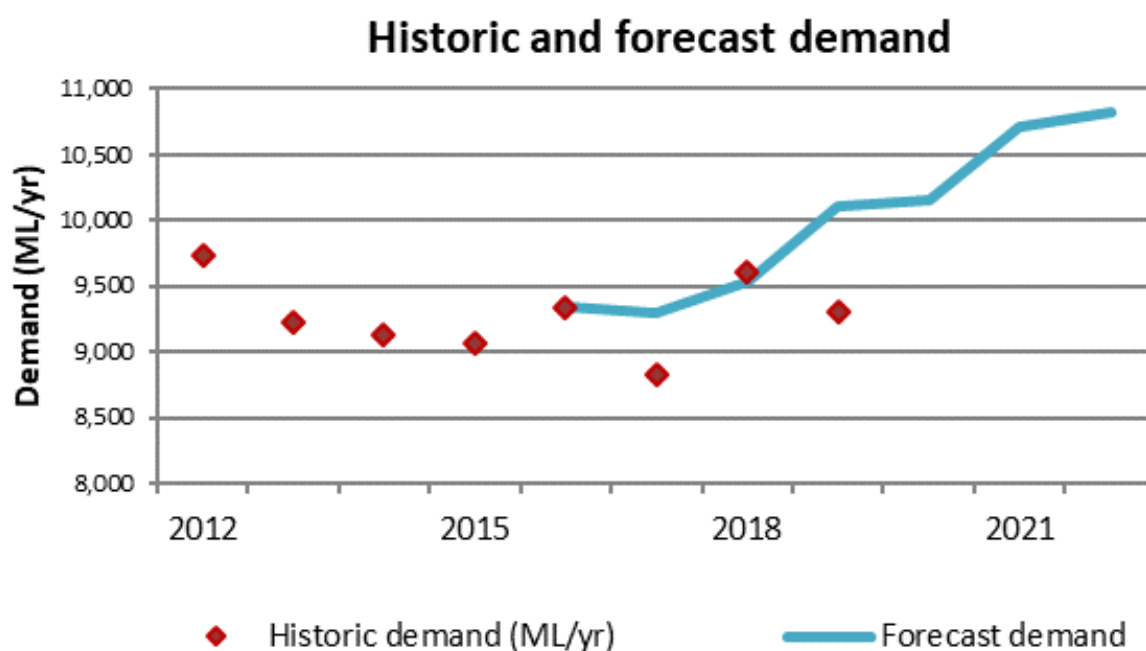
Mode 1 General Monitoring

Mode 2 Heightened Awareness

Mode 3 Drought Response.

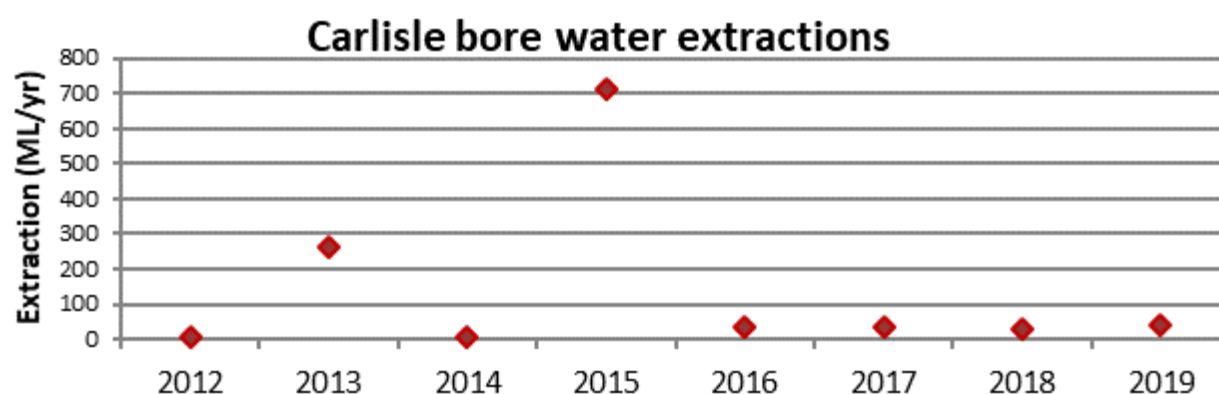
Water restrictions and other demand-side measures are only implemented in Mode 3.

5.1.4 Recorded and forecast demand

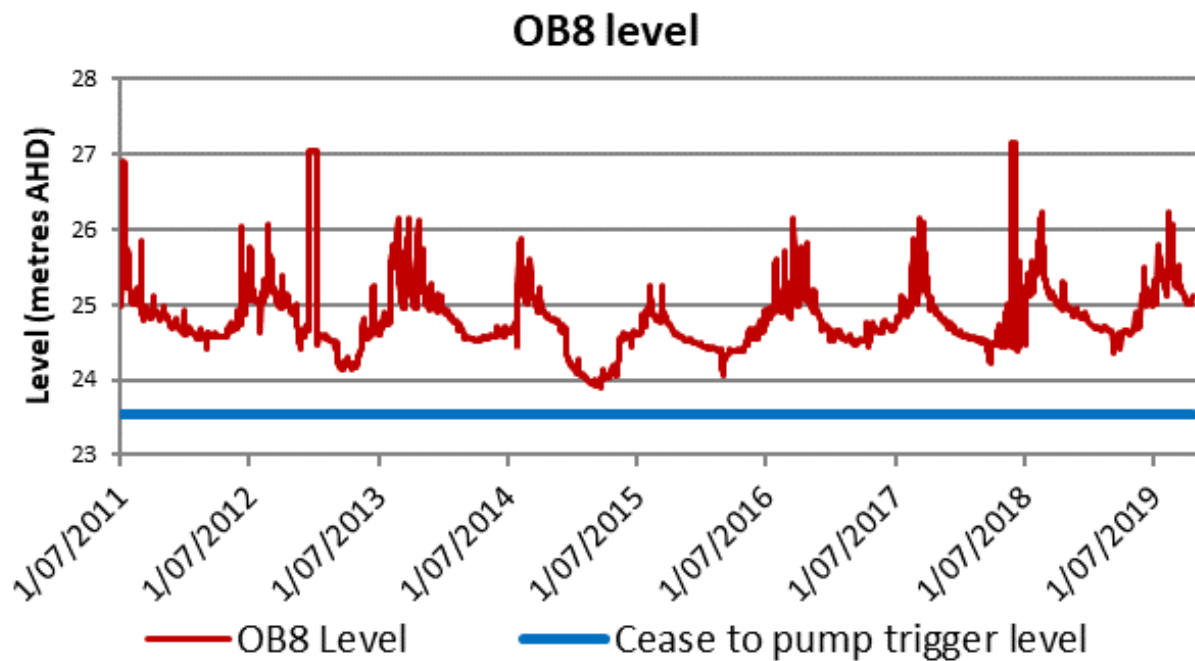


Demand is climate-adjusted bulk water supplied to towns and rural customers, plus an allowance for water treatment plant losses, storage losses, and other system losses. The forecast demand is from the March 2017 Urban Water Strategy. The demand is around 9,500 ML per year. The lack of growth in demand is primarily due to anticipated growth in the dairy processing sector not occurring as forecast in 2016/17.

5.1.5 Carlisle Bore water extractions



The Carlisle River bores are used (at 6ML/d) when streamflow in the Gellibrand River falls below diversion thresholds. Streamflow fell below diversion thresholds in March and April 2013. The extraction in 2015 was due to operational trials. The water level in the Carlisle River observation bore (OB8) remains well above the trigger to cease pumping from the bore.

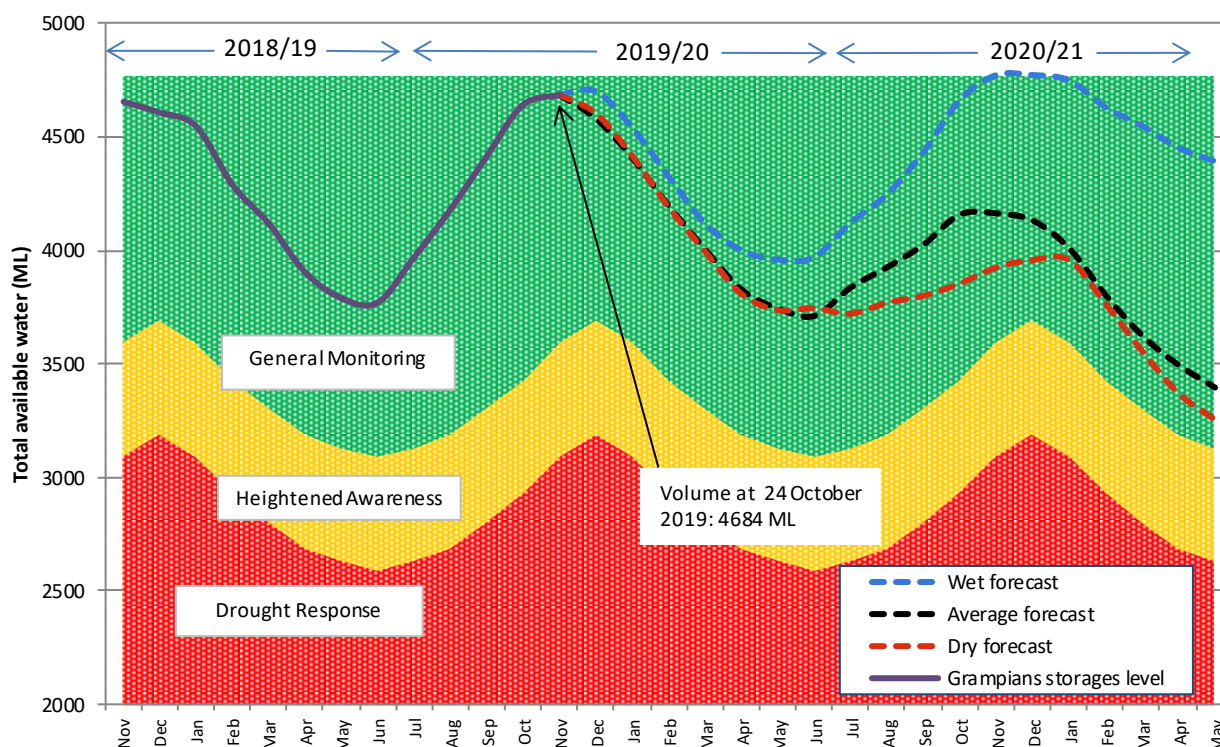


5.1.6 Otways system Action Plan

Action	Timing
Ongoing system monitoring as detailed under Mode 1: General Monitoring	2020
Continue to expand the roof water harvesting scheme	2020
Continue tracking demand against forecasts	2020
Update Annual Water Outlook	Nov 2020

5.2 Grampians system

5.2.1 Forecast water availability



5.2.2 Forecast assumptions

Forecast Rocklands transfer:
(November 2019 - May 2021)

Wet forecast: 0 ML
Average forecast: 0 ML
Dry forecast: 720 ML

Headworks inflow scenarios:

Nov 2000 - April 2002 inflows
Nov 1997 - April 1999 inflows
Nov 2005 - April 2007 inflows

The 720 ML dry forecast transfer assumes the Rocklands water TDS (salt levels) allows mixing with other water to achieve water with a TDS (total dissolved solids) of less than 500 mg/L. "System storage capacity" is the capacity of local storages plus the Rocklands Bulk Entitlement of 2,120 ML.

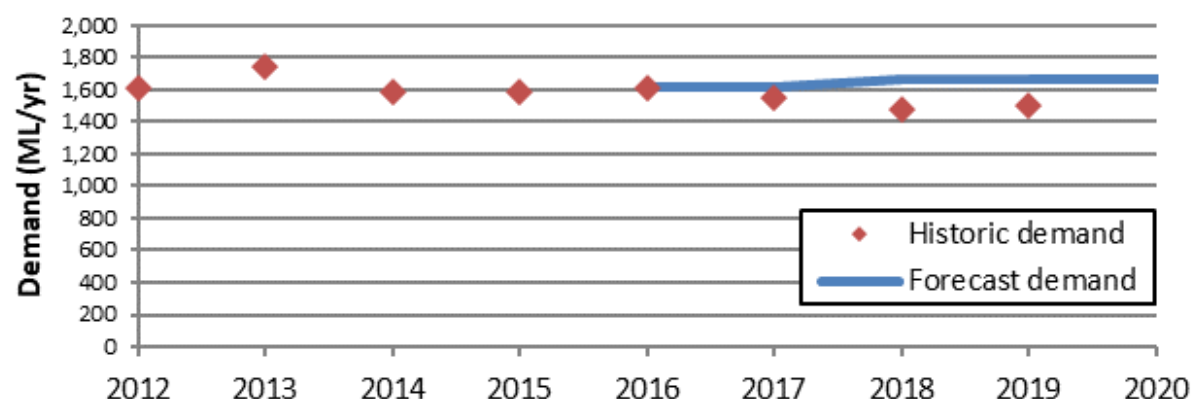
5.2.3 System status November 2019

Mode 1: General Monitoring

Local system storages almost filled following good inflows in winter and spring. The 18 month forecasts indicate that under a range of inflow scenarios, water availability will remain within the General Monitoring operating mode.

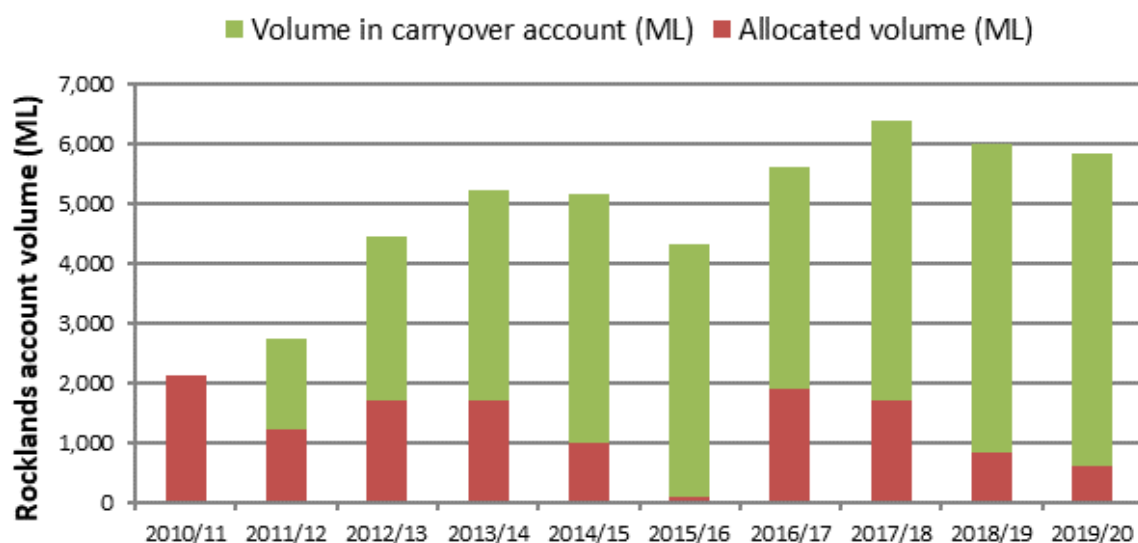
When local storage levels fall in dry conditions, Wannon Water will transfer water from Rocklands Reservoir into the local storages. This transfer is not likely to be required in the next 12 months.

5.2.4 Recorded and forecast demand



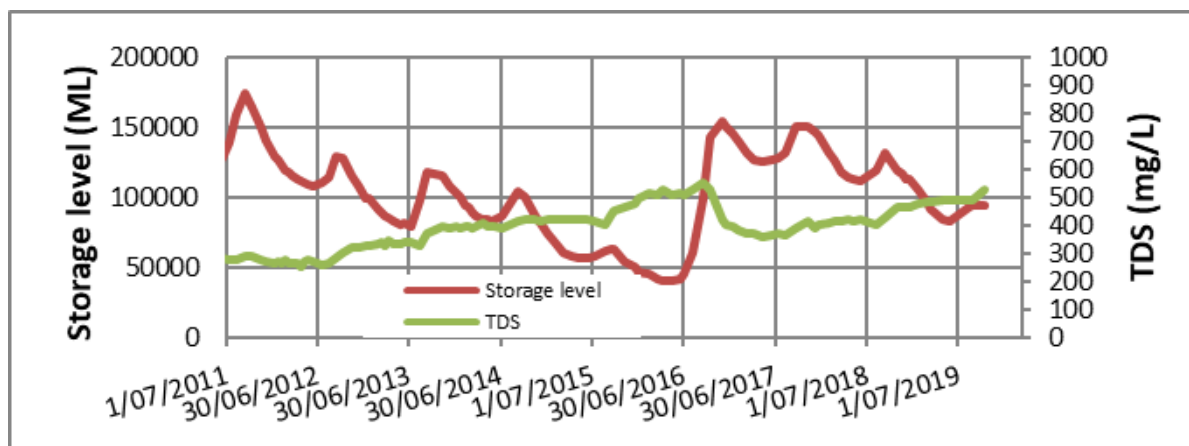
Demand is climate-adjusted bulk water supplied to towns and rural customers, plus an allowance for water treatment plant losses, storage losses, and other system losses. The forecast demand is from the March 2017 Urban Water Strategy. Demand is around 1,500 ML per year.

5.2.5 Rocklands account volume



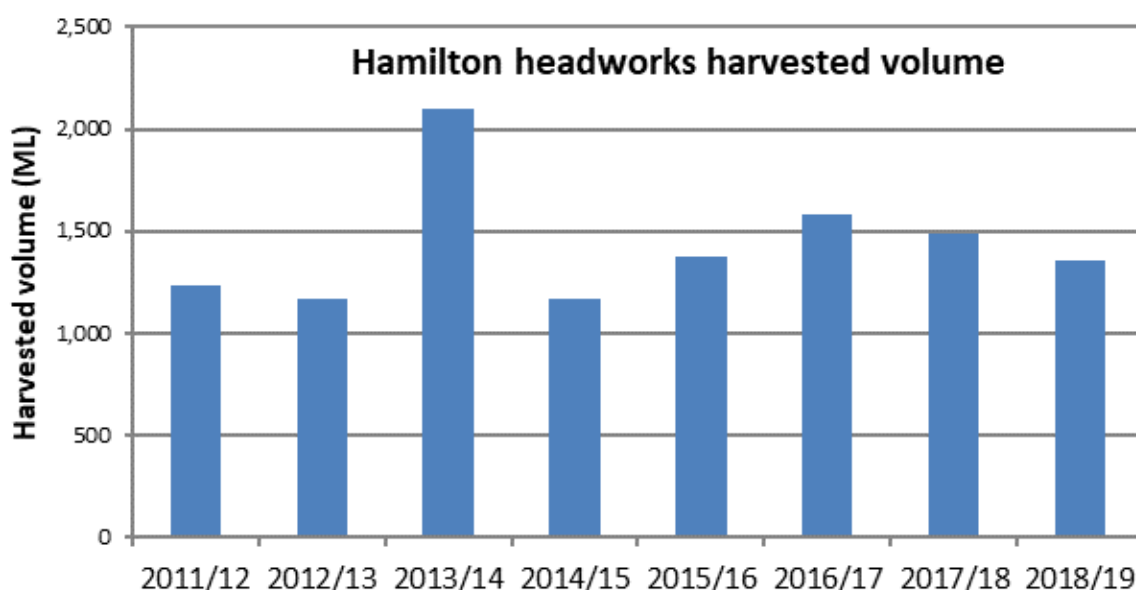
This chart shows the volume held by Wannon Water in Rocklands Reservoir (allocations as of 1 October; carry-over as of 1 October less 15% for evaporation). Wannon Water has a Bulk Entitlement of 2,120 ML a year. The accumulation of water above 2,120 ML will help provide for years when the allocation is less than 100%.

5.2.6 Rocklands Salinity



The salinity of the water held in Rocklands Reservoir can increase in dry conditions. TDS (total dissolved solids) greater than 500mg/L and greater than 700mg/L are triggers that may result in transfer of water to local storages.

5.2.7 Harvested volume from local streams



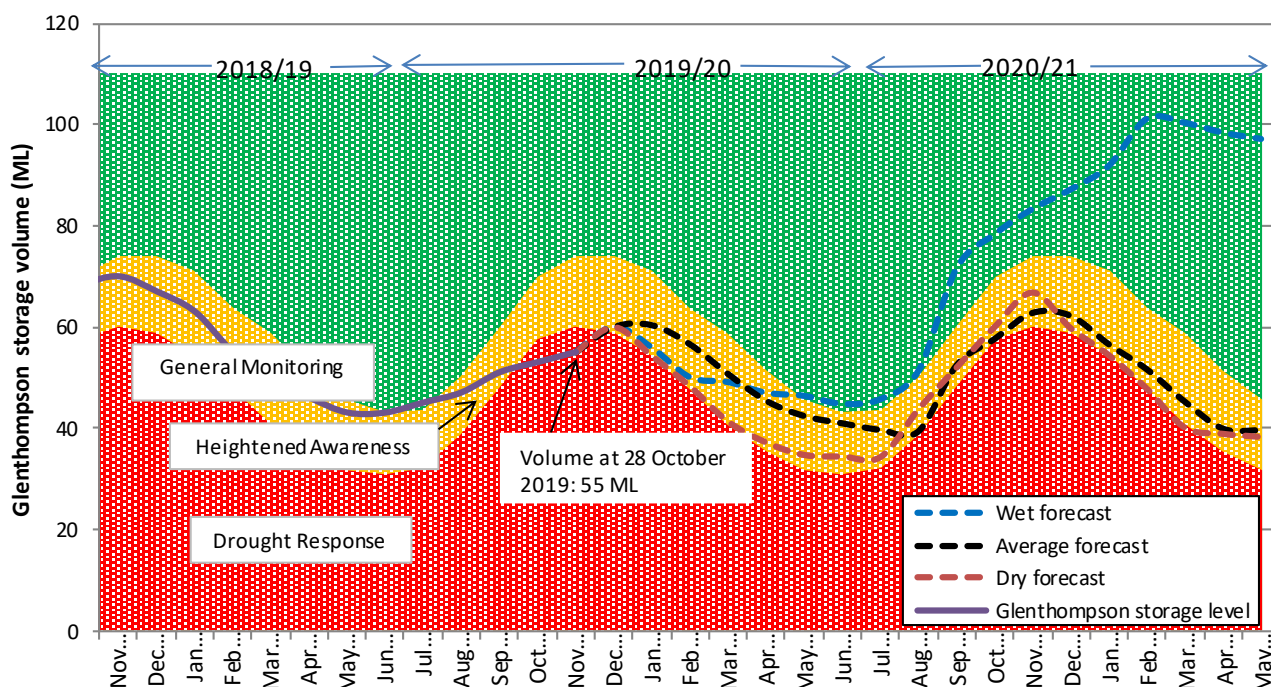
Harvested volume from Grampians streams in the Hamilton Headworks has been high over the past seven years, and reliable over summer. The local bores (which provide water to Cavendish in dry summers) have not been required to supply more than 4 ML in any of these years.

5.2.8 Grampians system Action Plan

Action	Timing
Ongoing system monitoring as detailed under Mode 1: General Monitoring operating mode	2020
Maintain communication with Grampians Wimmera Mallee Water regarding future Rockland allocation volumes	2020
Continue to monitor consumption	2020
Update Annual Water Outlook	Nov 2020

5.3 Glenthompson system

5.3.1 Forecast water availability



5.3.2 Forecast assumptions

Forecast Willaura transfer:
(November 2019 - May 2021)

Wet forecast:	0 ML	25 ML
Average forecast:	10 ML- Aug '20	27 ML
Dry forecast:	40 ML-July-Nov '20	29 ML

Headworks inflow scenarios:

Nov 2009 - Apr 2011 inflows
Nov 1978 - Apr 1980 inflows
Nov 1981 - Apr 1983 inflows

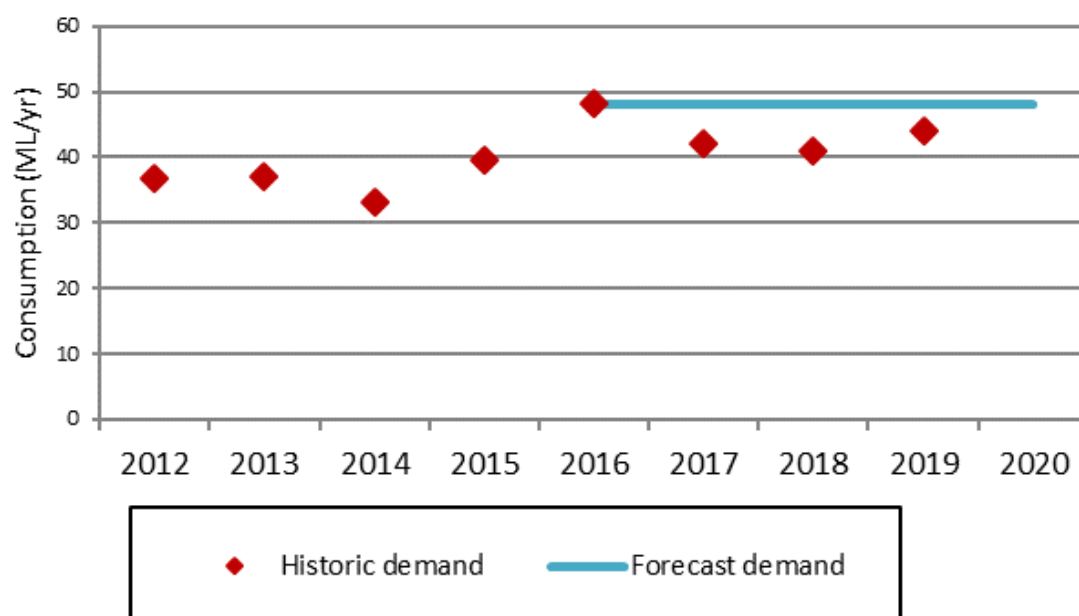
All forecasts assume an additional 25 ML/yr demand from rural customers upstream of the storage is met from the Willaura system.

5.3.3 System status November 2019

Mode 2: Heightened Awareness

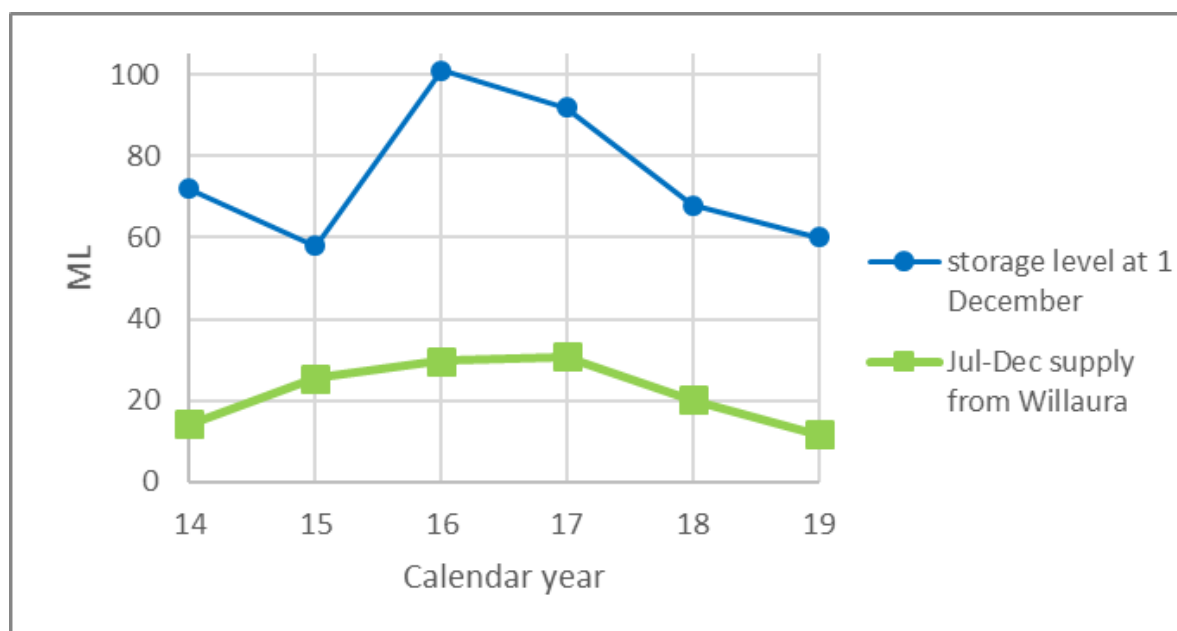
As of 28 October 2019, the Glenthompson storage level was 55 ML, in the drought response zone. Victrack have consented to a transfer of water from Railway Reservoir that will lift the Glenthompson storage levels into the heightened awareness zone. In the absence of significant local runoff, status will remain at "heightened awareness" for the foreseeable future. Wannon Water and Grampians Wimmera Mallee Water continue to work collaboratively to maintain a secure supply to Glenthompson and all the communities that are reliant on this system.

5.3.4 Recorded and forecast demand



Demand is climate-adjusted bulk water supplied to Glenthompson and rural customers, plus an allowance for water treatment plant losses and other system losses. The forecast demand is from the March 2017 Urban Water Strategy. Demand is around 45 ML per year and is dependent on the volume of rural demand.

5.3.5 Storage Level and Supply from Willaura



Note that the recovery in storage level in 2016/2017 was associated with both local catchment inflows and with greater than 30ML of Jul-Dec supply from Willaura, neither of which have occurred in the first half of 2019/20 (note that the reported value for 19/20 is based on data to 28 October 2019).

Wannon Water has a Bulk Entitlement of 58 ML in the Willaura system. Access is shared via a Grampians Wimmera Mallee Water (GWMW) pipeline. Glenthompson is

about 15% of the total Willaura system demand. The GWMW system is currently under stress, and there are plans to connect to the East Grampians Pipeline, which will alleviate this stress. Wannon Water and Grampians Wimmera Mallee Water continue to work collaboratively to maintain supply to all the communities that are reliant on this system.

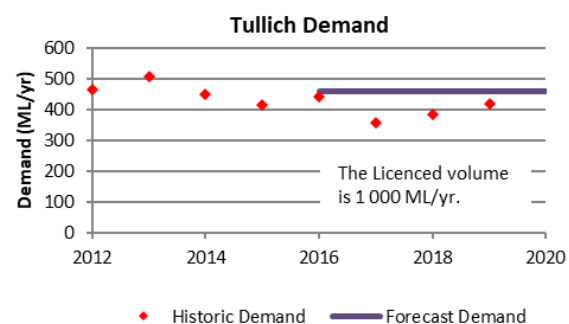
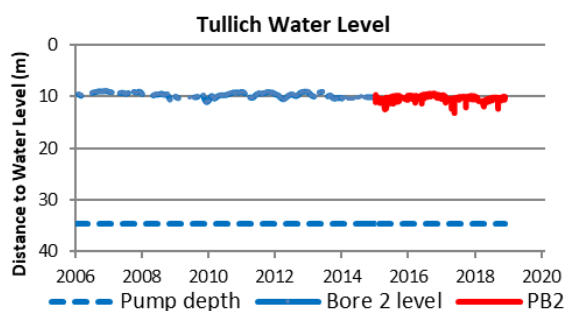
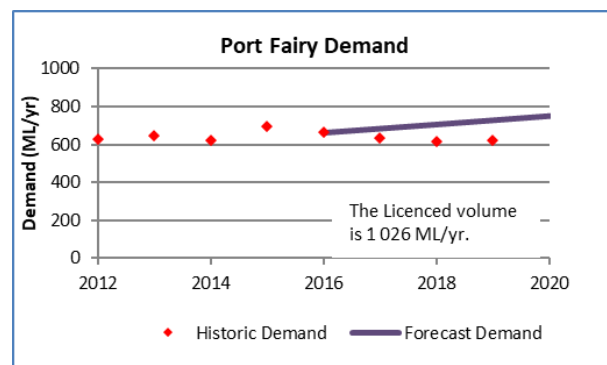
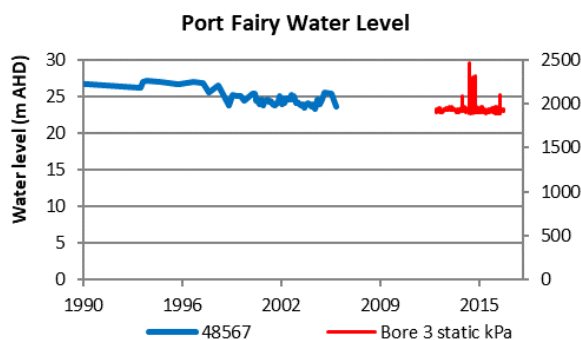
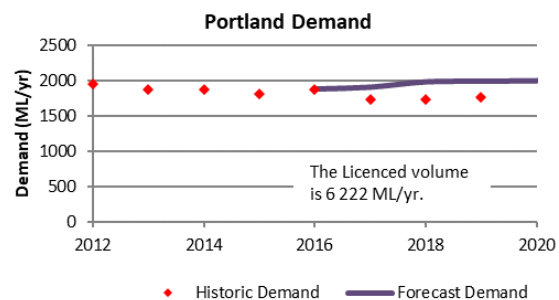
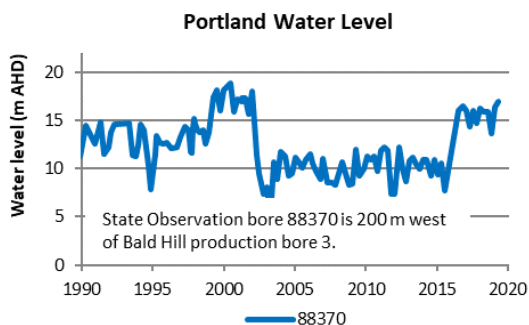
5.3.6 Glenthompson system Action Plan

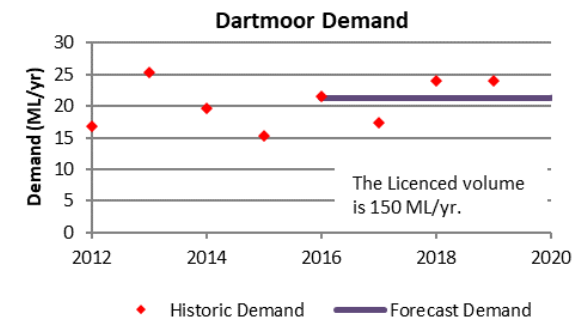
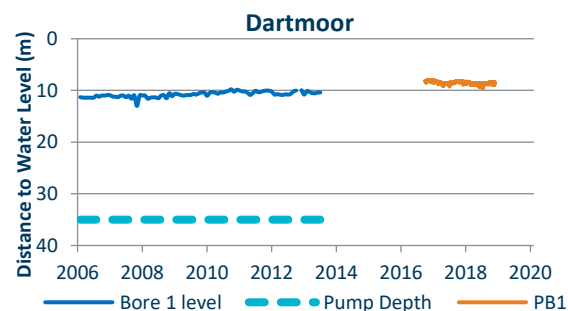
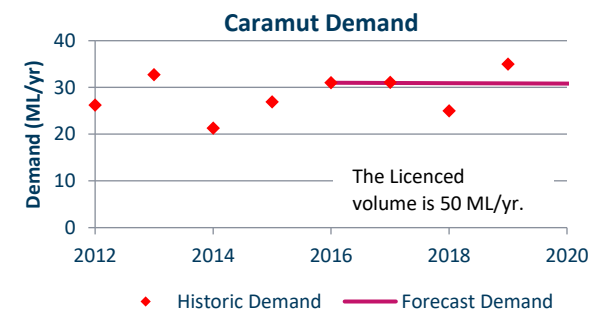
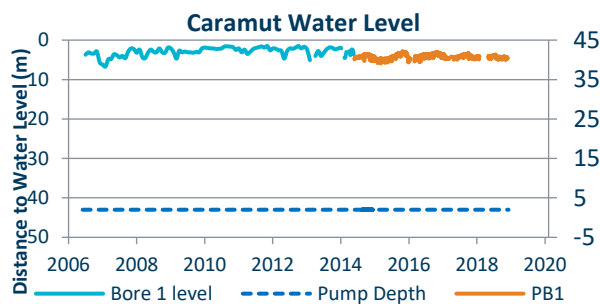
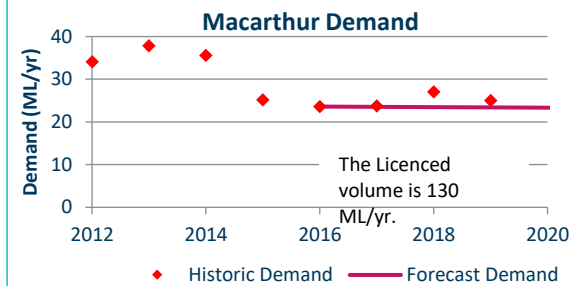
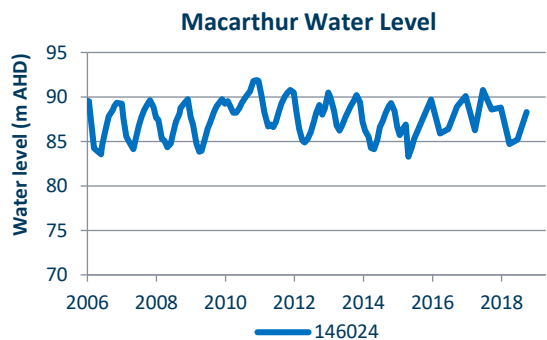
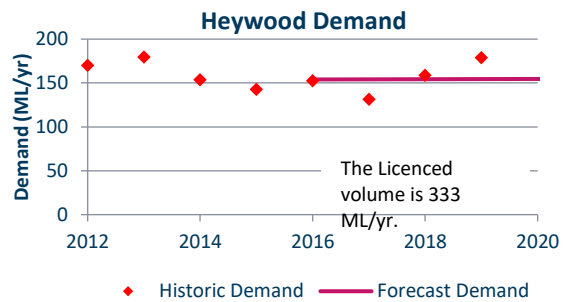
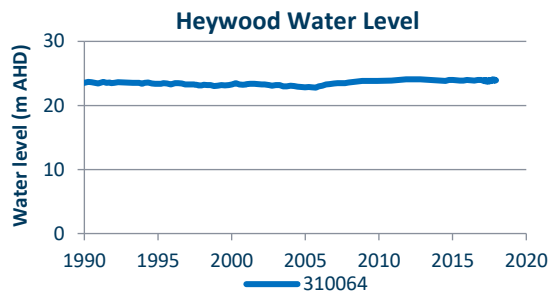
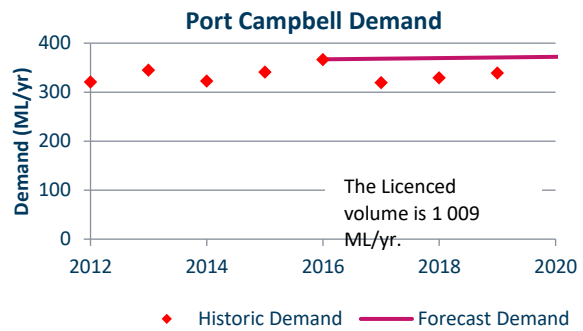
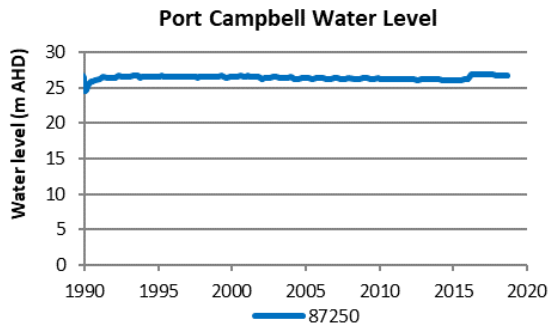
Action	Timing
Transfer 10ML of water from Railway Reservoir	Nov 2019
System monitoring as detailed under Mode 2: Heightened Awareness	2020
Work with Grampians Wimmera Mallee Water to formalise access arrangements to water	2020
Work with Grampians Wimmera Mallee Water to improve the Willaura supply	2020
Continue tracking demand against forecasts	2020
Update Annual Water Outlook	Nov 2020

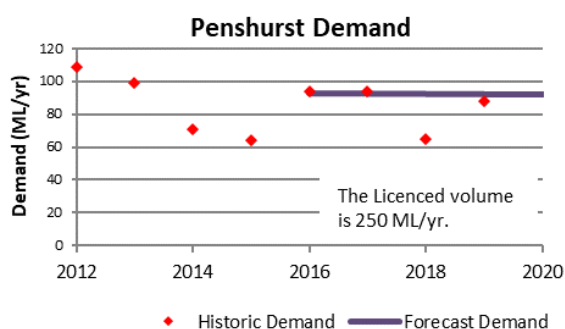
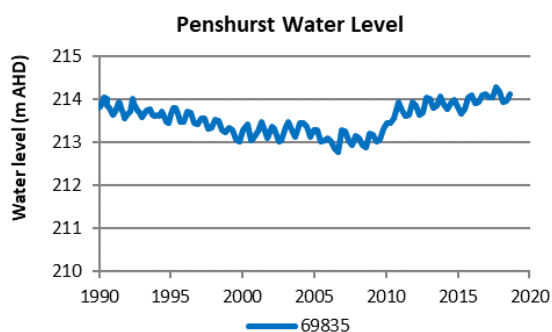
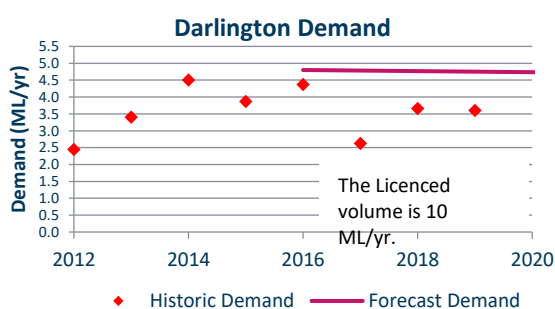
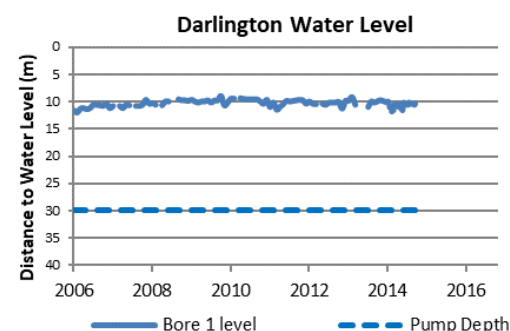
5.4 Groundwater systems

5.4.1 Water availability overview

The following graphs show the measured groundwater level (left hand one) and the historic demand compared to forecast demand (right hand one) for each of the water supply systems supplied by groundwater. The groundwater level trends show some fluctuation over time but are stable over the longer term meaning they are not being adversely impacted by demand or lack of recharge. Different coloured traces is where the observation bore being used to monitor groundwater levels has been replaced with a new bore. PB below stands for “pumped bore” – bores used by Wannon Water to extract groundwater for the town.







5.4.2 Groundwater systems status November 2018

Mode 1: General Monitoring

Wannon Water's 10 groundwater supply systems were all secure through the Millenium Drought, are currently providing reliable supply, and are expected to remain secure into the future. Water restrictions are not normally part of the management of these systems.

5.4.3 Groundwater systems Action Plan

Action	Timing
Continue bore level monitoring	2020
Continue tracking demand against forecasts	2020
Update Annual Water Outlook	November 2020



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