

WANNON WATER

# Water Quality Annual Report

2018/19



wannonWATER



Prepared for  
**Department of Health and Human Services**  
**(Water Program)**  
September 2019

## TABLE OF CONTENTS

<b>1.</b>	<b>INTRODUCTION .....</b>	<b>4</b>
	Defining drinking water.....	4
	Sources of water .....	4
<b>2.</b>	<b>MANAGING WATER QUALITY .....</b>	<b>10</b>
	Undertakings under Section 30 of <i>The Act</i> .....	10
	Variation to aesthetic standards .....	10
	Regulated water .....	10
	Non-potable supplies .....	11
<b>3.</b>	<b>ENSURING SAFE DRINKING WATER.....</b>	<b>12</b>
	Water Quality Management System .....	12
	Risk Management Plan Audit .....	12
<b>4.</b>	<b>WATER TREATMENT.....</b>	<b>13</b>
<b>5.</b>	<b>MAINTAINING HIGH QUALITY WATER .....</b>	<b>15</b>
	Staff awareness and training.....	15
	Distribution system.....	15
	Water treatment plant changes and improvements .....	15
<b>6.</b>	<b>DRINKING WATER QUALITY RESULTS 2018/19.....</b>	<b>17</b>
	Sampling frequency .....	17
	Testing programs .....	17
	Interpreting the results .....	17
	<i>Safe Drinking Water Regulations 2015 Standards</i> .....	18
	<i>Escherichia coli (E. coli)</i> .....	18
	Trihalomethanes results.....	19
	Turbidity .....	20
	Other – may pose a risk to human health.....	21
	Fluoride.....	21
	Manganese results.....	23
	Lead results .....	24
	Copper results.....	25
	Arsenic results .....	26
	Water treatment related chemicals.....	27
	Inorganics .....	27
	Polycyclic aromatic hydrocarbon results.....	27
	Disinfection by-products.....	27
	Pesticide/Herbicide results.....	28
	Industrial chemical results .....	29
	Radionuclides – Gross Beta, Gross Alpha radioactivity results .....	30
	Other results .....	30
	Aesthetic parameters .....	31
	Iron results .....	33
	Colour results.....	35
	Alkalinity and hardness .....	36
	Total Dissolved Solids results .....	37
<b>7.</b>	<b>EMERGENCY, INCIDENT AND EVENT MANAGEMENT .....</b>	<b>39</b>
	Section 22 incidents.....	39
	Section 18 incidents.....	41
	Other incidents.....	41
	Customer complaints .....	41
<b>8.</b>	<b>GLOSSARY.....</b>	<b>45</b>



# 1. INTRODUCTION

Wannon Water is committed to providing safe, reliable drinking water to south-west Victoria. Wannon Water provides water and sewer services to a population of approximately 84,000 people (100,000 during peak season). The area serviced extends from the South Australian border in the west, to Balmoral in the north, to Lismore in the east and the lower Gellibrand River catchment on the coast.

Wannon Water has aligned its drinking water quality management system with the Australian Drinking Water Guidelines 2011 (ADWG) and Hazard Analysis and Critical Control Point (HACCP) risk management principles. Wannon Water will continue to improve its drinking water quality management program to ensure that water is delivered to customers within the limits of the *Safe Drinking Water Act 2003* and associated Regulations.

This 2018/19 Drinking Water Quality Annual Report has been developed in accordance with the requirements of the *Safe Drinking Water Act 2003* and *Safe Drinking Water Regulations 2015*. The report highlights the programs and initiatives Wannon Water has in place to provide safe drinking water to the people living in Wannon Water's water sampling localities.

Wannon Water has a comprehensive water quality monitoring program extending across a region of 24,500 square kilometres. Samples are collected from: raw water sources, water entry points, water storages, and at specific points in the reticulation representing the "customer's tap". All samples collected are analysed by an independent laboratory certified by the National Association of Testing Authorities (NATA).

The high standard of drinking water provided is reflected in customers' continued satisfaction with Wannon Water's performance.

**The 2019 customer value survey showed that 96 per cent of domestic customers were satisfied with the water supply from Wannon Water, while 81 per cent of customers were satisfied with their water quality.**

## Defining drinking water

The *Safe Drinking Water Act 2003* defines three types of water quality categories.

**Drinking Water** – Water that is intended for human consumption or for purposes connected with human consumption, such as the preparation of food or the making of ice for consumption or for the preservation

of unpackaged food, whether or not the water is used for other purposes.

**Regulated Water** – This is water that is not intended for human consumption, but could be mistaken as drinking water. If there is a potential for the supply to be mistaken as drinking water, then the Secretary to the Department of Health and Human Services – may declare the water as Regulated Water.

**Non Potable Water** – This is water that is not intended for human consumption and cannot be mistaken as drinking water. This water falls outside the *Safe Drinking Water Act 2003* and *Safe Drinking Water Regulations 2015*.

## Sources of water

During 2018/19, Wannon Water supplied drinking water to residential, rural, commercial and industrial customers. The water is harvested from a variety of sources and supplied through approximately 1,907 kilometres of water mains.

Wannon Water harvested approximately 14,861 megalitres (ML) of water to supply its customers. This water comes from an array of sources, namely protected catchment areas, agricultural land, groundwater and, in three supply systems, is supplied/subsidised with raw water supply from another regional water corporation. Specifically Rocklands Reservoir supplies Balmoral and subsidises the Hamilton system and various source water is supplied from the Willaura pipeline to Glenhompson. The Warnambool supply is also supplemented with an innovative roof water harvesting network collecting rainwater from rooftops in residential subdivisions and a new industrial estate. This water is supplied to customers with varying degrees of treatment, dependent on the characteristics of the raw water quality. Wannon Water also provides water to areas outside our catchment to Parks Victoria at the Twelve Apostles Visitor Centre. This water supply is taken from one of three drinking water sites.

During 2018/19, Wannon Water continued sanitary surveys for its source waters in accordance with the *Safe Drinking Water Regulations 2015*. This has enabled catchments to be classified into a category based on the vulnerability for pathogen ingress and complete a Health Based Target (HBT) assessment for all Wannon Water supply systems.

Figure 1-1 illustrates the localities and where the water is sourced from. Table 1-1 details: Wannon Water's water sampling localities; the sources of supply; how the water is stored subsequent to treatment and the treatment facilities operated by Wannon Water.



### Figure 1-1 - Wannon Water Service Area

**Table 1-1 - Source water and treatment systems summary**

Water sampling locality	Population supplied <sup>1</sup>	Source water	Raw water storage	Treatment plant	Treated water storage
Allansford - via Warrnambool Water Treatment Plant (WTP)	370	Arkins Creeks (3)	Gellibrand Tank	Warrnambool WTP	Allansford clear water storage
		Gellibrand River	South Otway Tank	Allansford Disinfection Plant (DP)	
		Carlisle Bores (2)	Ewen's Hill Reservoir		
		– via North Otway Pipeline	Plantation Rd Storage		
			Tank Hill Reservoir		
		Gellibrand River – South Otway Pipeline	Warrnambool Storage1		
			Warrnambool Storage 2		
	Albert Park Bores (3)	Brierly Basin			
	Roof water (North Warrnambool)	Albert Park Raw Water Storage			
Balmoral	150	Rocklands Reservoir (Grampians Wimmera Mallee Water)	Balmoral Service Basin	Balmoral WTP	Balmoral clear water storage
Camperdown (Rural)	400	Arkins Creeks (3)	Gellibrand Tank	Camperdown WTP	Camperdown (Rural) clear water storage
		Gellibrand River	Donald's Hill Reservoir		
		Carlisle Bores (2)			
		– via North Otway Pipeline			
Camperdown (Urban)	1840	Arkins Creeks (3)	Gellibrand Tank	Camperdown WTP	Camperdown (Urban) service basin
		Gellibrand River	Donald's Hill Reservoir		Mt Leura Tank
		Carlisle Bores (2)			Park Lane elevated storage
		– via North Otway Pipeline			
Caramut	80	Caramut Bores (2)	Caramut Service Basin	Caramut DP	Caramut clear water storage
			Caramut Tank (Raw Water)		
Casterton	990	Tullich Bores (4)	N/A	Casterton WTP	Casterton clear water storage
					Casterton Arundel Road Basin
Cavendish	100	Grampians National Park	Cavendish Service Basin	Cavendish Disinfection Plant	Cavendish clear water storage
		7 streams on the western slopes of the Victoria Range and drought relief bores (2)			
Cobden	900	Arkins Creeks (3)	Gellibrand Tank	Cobden WTP	Cobden clear water storage
		Gellibrand River	Cobden Service Basin		
		Carlisle Bores (2)			
		– via North Otway Pipeline			
Coleraine - via Casterton WTP	620	Tullich Bores (4)	N/A	Casterton WTP	Casterton clear water storage
				Coleraine DP	Casterton Arundel Road Basin
					Coleraine clear water storage
Darlington (Regulated Supply)	22	Darlington Bore (1)	Darlington Elevated Tank	Nil Treatment	N/A
Dartmoor	140	Dartmoor Bore (1)	N/A	Dartmoor DP	Dartmoor clear water storage
Derrinalum - via Camperdown WTP	250 <sup>2</sup>	Arkins Creeks (3)	Gellibrand Tank	Camperdown WTP	Camperdown (Rural) clear water storage
		Gellibrand River	Donald's Hill Reservoir	Ettrick's Springs DP	Camperdown (Urban) service basin

Water sampling locality	Population supplied <sup>1</sup>	Source water	Raw water storage	Treatment plant	Treated water storage				
		Carlisle Bores (2)		Lismore/Derrinallum Tank DP	Lismore Tank				
		– via North Otway Pipeline							
Dunkeld - via Hamilton WTP		Grampians National Park	Hayes Reservoir	Hamilton WTP	Hamilton clear water storage				
		7 streams on the western slopes of the Victoria Range and drought relief bores (2)	Cruckoor Reservoir	Dunkeld DP					
			Hartwicks Reservoir						
		Rocklands Reservoir (Grampians Wimmera Mallee Water)	Hamilton Service Basins 1 & 2	Dunkeld Covered Basin					
Glenthompson	130	Yuppeckiar Creek Catchment and Grampians Wimmera Mallee Water	Glenthompson Reservoir	Glenthompson WTP	Glenthompson clear water storage				
Hamilton	5410	Grampians National Park	Hayes Reservoir	Hamilton WTP	Hamilton clear water storage				
		7 streams on the western slopes of the Victoria Range and drought relief bores (2)	Cruckoor Reservoir						
			Hartwicks Reservoir						
		Rocklands Reservoir (Grampians Wimmera Mallee Water)	Hamilton Service Basins 1 & 2						
Heywood	760	Heywood Bores (2)	N/A	Heywood WTP	Heywood clear water storage				
Koroit - via Warrnambool WTP	790	Arkins Creeks (3)	Gellibrand Tank	Warrnambool WTP	Warrnambool clear water storage				
		Gellibrand River	South Otway Tank		Harrington Road clear water storage				
		Carlisle Bores (2)	Ewen's Hill Reservoir		Dennington elevated storage				
		– via North Otway Pipeline	Plantation Rd Storage	Illowa (Koroit) DP	Koroit Basin				
		Tank Hill Reservoir							
		Gellibrand River – South Otway Pipeline	Warrnambool Storage 1						
		Warrnambool Storage 2							
		Albert Park Bores (3)	Brierly Basin						
Roof water (North Warrnambool)	Albert Park Raw Water Storage								
Lismore - via Camperdown WTP	250 <sup>2</sup>	Arkins Creeks (3)	Gellibrand Tank	Camperdown WTP	Camperdown (Rural) clear water storage				
		Gellibrand River	Donald's Hill Reservoir	Ettrick's Springs DP	Camperdown (Urban) service basin				
		Carlisle Bores (2)		Lismore/Derrinallum Tank DP	Lismore Tank				
		– via North Otway Pipeline							
Macarthur	170	Macarthur Bore	N/A	Macarthur WTP	Macarthur clear water storage				
Merino - via Casterton WTP	180	Tullich Bores - Bore Field (4)	N/A	Casterton WTP	Casterton clear water storage				
				Casterton Arundel Road Basin					
Merino DP				Merino DP	Merino clear water storage				
				Mortlake - via Terang WTP	690	Arkins Creeks (3)	Gellibrand Tank	Terang WTP	Terang clear water storage
						Gellibrand River	Ewen's Hill Reservoir	Mortlake DP	Noorat Tank
Carlisle Bores (2)									

Water sampling locality	Population supplied <sup>1</sup>	Source water	Raw water storage	Treatment plant	Treated water storage
		– via North Otway Pipeline and Absalom’s Bore (2)	Absalom’s Bore Balance Tank		Mortlake clear water storage
Noorat/Glenormiston - via Terang WTP	260	Arkins Creeks (3)	Gellibrand Tank	Terang WTP	Terang clear water storage
		Gellibrand River	Ewen’s Hill Reservoir		Noorat Tank
		Carlisle Bores (2)			
		– via North Otway Pipeline			
Paaratte - via Port Campbell WTP	30	Port Campbell Bore (1)	N/A	Port Campbell WTP	Paaratte Tower
Penshurst	320	Penshurst Bore (1)	N/A	Penshurst DP	Penshurst clear water storage
Peterborough - via Port Campbell WTP	350	Port Campbell Bore (1)	N/A	Port Campbell WTP	Port Campbell clear water storage Brumby’s Road Tank
Port Campbell	300	Port Campbell Bore (1)	N/A	Port Campbell WTP	Port Campbell clear water storage
Port Fairy	2350	Port Fairy Bores (2)	N/A	Port Fairy WTP	Port Fairy clear water storage
Portland	5800	Wyatt Street Bore (1)	N/A	Portland Wyatt St WTP	Portland Wyatt St clear water storage (currently offline)
		Bald Hill Bores (2)		Portland Bald Hill WTP	Portland clear water storage
Purnim	100	Arkins Creeks (3)	Gellibrand Tank	Purnim DP	Purnim elevated storage
		Gellibrand River	Ewen’s Hill Reservoir		
		Carlisle Bores (2)	Tank Hill Reservoir		
		– via North Otway Pipeline	Purnim Raw Water Tank		
Sandford - via Casterton WTP	90	Tullich Bores - (4)	N/A	Casterton WTP	Casterton clear water storage
					Casterton Arundel Road Basin
Simpson	110	Arkins Creeks (3)	Gellibrand Tank	Simpson WTP	Simpson clear water storage
		Gellibrand River	Simpson Service Basin		
		Carlisle Bores (2)			
		– via North Otway Pipeline			
Tarrington - via Hamilton WTP	160	Grampians National Park	Hayes Reservoir	Hamilton WTP	Hamilton clear water storage
		7 streams on the western slopes of the Victoria Range and drought relief bores (2)	Cruckoor Reservoir		Tarrington Pierrepoint Tank
			Hartwich’s Reservoir		
			Rocklands Reservoir (Grampians Wimmera Mallee Water)		
Terang	1090	Arkins Creeks (3)	Gellibrand Tank	Terang WTP	Terang clear water storage
		Gellibrand River	Ewen’s Hill Reservoir		
		Carlisle Bores (2)			
		– via North Otway Pipeline			
Timboon - via Port Campbell WTP	600	Port Campbell Bore (1)	N/A	Port Campbell WTP	Port Campbell clear water storage
					Peterborough Road Tank
					Timboon Basin



Water sampling locality	Population supplied <sup>1</sup>	Source water	Raw water storage	Treatment plant	Treated water storage
					Timboon Elevated Tank
					Timboon Rands Road Tank
Warrnambool	16000	Arkins Creeks (3)	Gellibrand Tank	Warrnambool WTP	Warrnambool clear water storage
		Gellibrand River	South Otway Tank		Liebig St Basin
		Carlisle Bores (2)	Ewen's Hill Reservoir		Liebig St elevated storage
		– via North Otway Pipeline	Plantation Rd Storage		East Warrnambool elevated storage
			Tank Hill Reservoir		Doohley's Hill elevated storage
		Gellibrand River – South Otway Pipeline	Warrnambool Storage 1		Warrnambool West elevated storage
			Warrnambool Storage 2		Harrington Road clear water storage
		Albert Park Bores (3)	Brierly Basin		Harrington Road elevated storage
		Roof water (North Warrnambool)	Albert Park Raw Water Storage		Hopkins Point Road Tank

N/A not applicable

1 The figure used is the number of connections

2 Assumption (Lismore and Derrinallum customers 500)

## 2. MANAGING WATER QUALITY

Wannon Water bases its water quality compliance on the ADWG, as governed by the *Safe Drinking Water Act 2003* and associated regulations. These guidelines are used for establishing microbiological, physical and chemical monitoring programs, which provide the basis for assessing drinking water quality.

### Water quality Schedule 2 standards

The Safe Drinking Water Regulations 2015 specify the water quality standards and the frequency at which they will be sampled. An explanation of the water quality standards is given below.

***Escherichia coli (E. coli)*** - is a bacterial species belonging to the Coliforms group. It is only found naturally in the digestive tract of warm blooded animals. The presence of *E. coli* is indicative that faecal contamination may have occurred. One sample per week is required per locality. The water quality standard for *E. coli* is zero organisms per 100mL. Any detection of *E. coli* must be thoroughly investigated and the investigation will confirm whether or not the standard was met (a false positive) or not. Specifically:

- All other factors that would indicate the presence of *E. coli* in that water are not present in the water in the water sampling locality at the time of the investigation; and
- The drinking water treatment process applied, or other specified actions taken by the water supplier, are such as would be reasonably expected to have eliminated the presence of *E. coli* in the water sampling locality at the relevant time; and
- All plant and infrastructure associated with the water treatment process were operating to specification at all relevant times; and
- There were no issues arising from degradation of plant or infrastructure in or around the relevant water sampling locality that could reasonably be suspected to have contributed to the presence of *E. coli* in the drinking water in that water sampling locality.

**Trihalomethanes** - forms when chlorine reacts with naturally-occurring organic matter in the water supply. One sample per month is required per locality. Trihalomethanes (THMs) has a standard limit of 0.25 mg/L.

**Turbidity** - is a measure of particulate and suspended matter in water (cloudiness). Turbidity is caused by the presence of fine suspended matter such as clay, silt, colloidal particles and micro-organisms. Turbidity is measured in Nephelometric Turbidity Units (NTU). One sample per week is required per locality. The standard is defined as the 95<sup>th</sup> percentile of results for samples

in any 12 month period must be less than or equal to 5.0 NTU.

Wannon Water's water sampling programs monitors for additional algal, microbiological, chemical, physical and radiological parameters. Results from the monitoring of the parameters that have a potential health or aesthetic impact on customers are presented in Section 6.

### Undertakings under Section 30 of the Act

Should drinking water continually not meet the quality criterion then the Corporation is required to commit to an undertaking with the Department of Health and Human Services (DHHS) to remediate the problem. **Wannon Water did not apply for any undertakings in 2018/19.**

### Variation to aesthetic standards

In accordance with the *Safe Drinking Water Act 2003* a water supplier may apply to the Minister for Health for an exemption to a water quality standard. The Minister will, if satisfied, exempt the water supplier from complying with the water quality standard, as it applies to drinking water supplied by the water supplier. As noted, approved exemptions release water suppliers from the requirement to meet a specified quality standard for a period of time, but do not release them from the obligation to minimise any risk to the public. **Wannon Water did not apply for any exemptions in 2018/19.**

### Regulated water

The Minister for Health has declared the following systems as regulated water:

- Darlington was declared a regulated water supply on 7 September 2006 (Gazette number G36). Darlington's water is sourced from a bore at Darlington. The number of properties connected to this system is 22.
- North Otway Pipeline was declared a regulated water supply on 26 June 2008 (Gazette number S168). The North Otway Pipeline is sourced from Arkins Creek Catchment and Gellibrand River Catchment and is supplemented in the drier months from the Carlisle River Borefield. The number of properties connected to the system is 454.

In accordance with section 7 of the *Safe Drinking Water Act 2003* Wannon Water has a regulated water risk management plan that covers the two regulated water localities.

Wannon Water communicates to customers and the general public via notices on the regular water bill and a 12 monthly notice for each non-drinking water supply. This information is also included in the new customer welcome package. Customers are offered stickers or signage at any time where required.

Wannon Water has a list of where public taps are located. Wannon Water communicates the locations of signage to the Environmental Health Officer of the relevant councils on an annual basis and will supply council with extra signage if new public taps are installed.

### **Non-potable supplies**

Nine of the 34 localities contain customers that are supplied with non-potable water.

All these customers are known as non-drinking water 'supply-by-agreement' customers. They have each signed a contract with Wannon Water that indicates that the water is not fit for human consumption.

Customers also receive regular notifications via the billing process. These customers receive water from the system prior to disinfection.

### 3. ENSURING SAFE DRINKING WATER

#### Water Quality Management System

Wannon Water maintains a drinking water quality management system based on Hazard Analysis Critical Control Point (HACCP) and the ADWG risk management principles. Wannon Water utilises a multiple barrier approach to ensure that drinking water is safe and aesthetically pleasing. The strength of this approach is that if a barrier is compromised it is able to be compensated for by the effective operation of the remaining barriers. This approach minimises the likelihood of contaminants passing through the treatment system and potentially causing harm to consumers.

The barriers utilised are:

- Catchment management and source water protection;
- Detention in protected reservoirs or storages;
- Extraction management;
- Treatment;
- Disinfection; and
- Maintenance of the distribution system; including maintaining adequate chlorine or chloramine residuals.

Raw (source) water from surface and groundwater supplies may contain contaminants such as sediment, microorganisms and dissolved organic compounds. Such water may not be aesthetically pleasing or safe to drink. To create a safe drinking supply Wannon Water monitors at various locations from source to tap and then treats the water through differing processes. The treated water is then reticulated through a number of storage tanks and pipes before being delivered to customers.

#### Risk Management Plan Audit

The *Safe Drinking Water Act 2003* (the Act) requires water suppliers to prepare, implement, review, and revise risk management plans for their supply of drinking water. Under Section 11 of the Act, a water supplier must have their management plan audited.

Wannon Water was not required to undertake an audit of their risk management plan this reporting period.

A HACCP surveillance audit was conducted in May 2019. Overall the auditor found the system was in keeping with the ISO 9001 requirements and was appropriate to the nature and scale of operations in place. One minor non-conformance was identified relating to water distribution system critical control points and reporting requirements detailed in Wannon Waters Critical Control Plan. The finding detailed critical control points in the distribution system may be missing the intent of HACCP and operational or alert

limits may be more suitable. To resolve this non-conformance a review of alert and critical controls for reticulation sites will be finalized in the 2019/20 reporting period ensuring critical control limits are being used as intended. The review will include how critical control point exceedances are documented.

## 4. WATER TREATMENT

Water treatment at Wannon Water varies by system, ranging from no treatment for regulated water supplies, to full treatment via a water treatment plant.

Table 4-1 details the treatment processes utilised within each of Wannon Water's drinking water treatment plants.

The water treatment processes employed during 2018/19 were similar to 2017/18. Changes and improvements to the system are outlined in Section 5.

**Table 4-1 - Treatment Processes and Added Substances 2018/19**

Plants	Raw Water Detention	Cooling / aeration towers	Upstream Water Treatment Plant	Pre-Chlorination Sodium Hypo	pH Adjust			Coagulation	Flocculation			Clarification		Filtration	Activated Carbon	Adsorption	Calgon	Disinfection			pH Adjust			Fluoridisation	Clear Water Storage
				Caustic soda	Soda Ash	Hydrated Lime	Carbon Dioxide	Ferric Chloride	Aluminium chlorohydrate (ACH)	Aluminium Sulphate	Polyelectrolyte Nalco 3482	Magnafloc LT20 flocculant	Polymer Nalclear 8170PULN					Polymer Klaraid	Clarifier	Dissolved air floatation	Chlorine gas	Sodium hypochlorite	Aqueous ammonia		
Allansford			✓																✓						✓
Balmoral	✓								✓								✓		✓	✓					✓
Camperdown	✓						✓			✓							✓			✓				✓	✓
Caramut																			✓						✓
Carlisle River																			✓						
Casterton				✓					✓				✓			✓			✓						
Cavendish	✓																		✓				✓		✓
Cobden	✓					✓				✓				✓	✓		✓					✓			✓
Coleraine			✓																✓		✓				✓
Dartmoor																			✓						✓
Dunkeld			✓																✓						
Ewen's Hill	✓													✓					✓		✓				
Glenthompson	✓								✓						✓	✓	✓		✓	✓	✓				✓
Hamilton	✓					✓				✓			✓			✓	✓		✓				✓	✓	✓
Heywood		✓																✓	✓						✓
Koroit			✓																✓						✓
Ettrick Springs			✓																✓						
Lismore/Derrinallum			✓																✓						✓
Macarthur				✓					✓				✓			✓			✓						✓
Merino			✓																✓						✓
Mortlake			✓																✓		✓				✓
Penshurst																			✓		✓				✓
Port Campbell	✓																✓		✓						✓
Port Fairy	✓																	✓							✓
Portland Wyatt St	✓																		✓						✓
Portland Bald Hill		✓																	✓						✓
Purnim	✓																		✓		✓				
Simpson	✓				✓					✓						✓			✓			✓			✓
Tank Hill	✓																		✓			✓			
Terang	✓				✓					✓				✓	✓		✓		✓				✓		✓
Warrnambool	✓									✓	✓				✓	✓		✓					✓	✓	

^ See Glossary for description of each treatment process

### Treatment process changes

UV disinfection was added to the Penshurst, Caramut and Mortlake plants.

Added lime dosing at the Cavendish WTP.

## **Treatment process issues**

The Warrnambool WTP saw issues with fluoride dosing equipment clogging resulting in reduced dosing ability. Ongoing scheduled maintenance of the fluoride dosing plant has helped reduce extended outages. See hotspot townships in Section 7 below for more information.

Reports made under s. 22 of the Act are detailed in section 7. Emergency incident and event management.



## 5. MAINTAINING HIGH QUALITY WATER

### Staff awareness and training

Wannon Water has adopted the Best Practice Guidelines for Victorian Framework for Water Treatment Operator Competencies. Wannon Water is dedicated to providing relevant employees with water industry training and awareness via formal training and attendance at relevant conferences and information sessions. In 2018/19 this included:

- Certification III and IV in Water Industry Operations
- Attendance at Water Industry Operators Association (WIOA) Conference
- Oz Water Conference
- Attendance at Victorian Drinking Water Network meetings
- Internal refresher training

### Distribution System

#### Flushing program

Wannon Water has a regular preventative flushing program for drinking water localities. Frequency of flushing is risk-based and Wannon Water utilises field data and customer feedback in scheduling the program, which is reviewed as required.

Reactive flushing is carried out to remove colour or turbidity in response to reaching critical limits or when a customer complaint is received. Flushing is also used to increase chlorine residual at locations where water usage is low.

Wannon Water also uses network diagnostics to determine the effectiveness of flushing programs.

#### Air scouring program

Wannon Water utilises contractors to conduct air scouring within its reticulation systems. Frequency of air scouring is risk based. Air scouring was conducted at Coleraine, Dunkeld, Hamilton, Merino and Sandford in this reporting period.

#### Water mains renewal program

Wannon Water has an asset replacement program created and prioritised via a risk-based process using event information, condition assessments and asset modelling. In 2018/19 Wannon Water spent approximately \$1.68 million replacing approximately 4.3 kilometres of water mains at Casterton, Dunkeld, Coleraine, Hamilton, Penshurst and Warrnambool.

#### Tank cleaning program

Wannon Water utilises contractors on a regular basis to inspect or clean tanks within the distribution system and storages at water treatment plants. In 2018/19 cleaning and inspection occurred at:

- Casterton WTP - Clear Water Storage
- Coleraine Service Basin - Clear Water Storage
- Dunkeld Service Basin 1 - Potable Water Storage
- Timboon - Leahys Lane Service Basin - Potable Water Storage – inspected only
- Timboon - Curdies Rd Tank - Potable Water Storage – inspected only
- Timboon - Rands Rd Tank - Potable Water Storage – inspected only

This program is carried out to ensure structural integrity of the storage and to optimize water quality to the customer.

### Water treatment plant changes and improvements

#### Cobden WTP

Filter refurbishment and filter media replacement

#### Cavendish DP

Lime dosing system and pH analyser installed.

**Penshurst WTP**

UV system installed

**Caramut WTP**

UV system installed

**Mortlake WTP**

Relined the clear water storage

UV system installed

**Warrnambool**

Inline mixer installed at Harrington Road treated water storage tank

Tank Hill reservoir raw water storage embankment works.

## 6. DRINKING WATER QUALITY RESULTS 2018/19

### Sampling frequency

The frequency of sampling of the water quality parameters (*Escherichia coli*, Trihalomethanes and turbidity) is specified in Schedule 2 of the Safe Drinking Water Regulations 2015. Wannon Water uses its risk assessment process to select an appropriate sampling frequency for additional microbiological, chemical, physical, radiological and algal monitoring.

### Testing programs

The number of samples collected and frequency of testing varies for each locality according to population and risk. The geographic location of customer sampling taps is designed to ensure that the samples collected are representative of the supply system. The sampling program is reviewed on a regular basis to align with changes in the risk profile for each locality.

**During 2018/19 Wannon Water performed more than 48,600 individual tests. Approximately 38 per cent of the tests were sampled at customer's taps within 34 localities.**

All scheduled testing was conducted resulting in 52 out of 52 Schedule 2 regulatory samples being analysed for *E.coli*, turbidity and Trihalomethane at 34 localities.

### Interpreting the results

The units of results are dependent on the parameter being analysed. The most common unit used within this report is milligrams per litre (**mg/L**). This unit is interchangeable with parts per million (ppm). Other units within this report include:

- **cfu/100mL** used for measurement of *E.coli*;
- Nephelometric Turbidity Units (**NTU**) a measurement for turbidity;
- **pH units** for measurement of pH;
- Platinum-Cobalt (**Pt.-Co.**) units for measurement of colour. This unit is interchangeable with Hazen Units (HU);
- **mg/L as calcium carbonate (CaCO<sub>3</sub>)** used for measuring total hardness.

#### More than one sample collected per week –

Localities where more than one sample is collected per week are marked with an asterisk (\*).

**Less than limit of detection** – The symbol for less than (<) is used when the concentration of a parameter is less than what can be detected accurately by the instrument. The level which an instrument can accurately detect is known as the “limit of detection”.

## Safe Drinking Water Regulations 2015 Standards

### *Escherichia coli* (*E. coli*)

**Standard:** No *E.coli* per 100 millilitres of drinking water, with the exception of any false positive sample.

**Outcome:** The Standard was met at all localities comparable to the 2017/18 monitoring period there were no non-compliant results, an improvement of one less than 2016/17.

**Table 6-1 *E. coli* results by locality 2018/19**

#### *E.coli*

Water sampling locality	Frequency of sampling	Number of samples	Maximum detected (cfu/100mL)	No. of investigations conducted (s. 22)	No. of samples where standard not met (s.18)
ALLANSFORD	Weekly	52	0	0	0
BALMORAL	Weekly	52	0	0	0
CAMPERDOWN (RURAL)	Weekly	52	0	0	0
CAMPERDOWN (URBAN)	Weekly	52	0	0	0
CARAMUT	Weekly	52	0	0	0
CASTERTON	Weekly	52	1	1	0
CAVENDISH	Weekly	52	0	0	0
COBDEN	Weekly	52	0	0	0
COLERAINE	Weekly	52	0	0	0
DARTMOOR	Weekly	52	0	0	0
DERRINALLUM	Weekly	52	0	0	0
DUNKELD	Weekly	52	0	0	0
GLENTHOMPSON	Weekly	52	0	0	0
HAMILTON*	Weekly	104	0	0	0
HEYWOOD	Weekly	52	0	0	0
KOROIT	Weekly	52	0	0	0
LISMORE	Weekly	52	0	0	0
MACARTHUR	Weekly	52	0	0	0
MERINO	Weekly	52	0	0	0
MORTLAKE	Weekly	52	0	0	0
NOORAT/GLENORMISTON	Weekly	52	0	0	0
PAARATTE	Weekly	52	0	0	0
PENSHURST	Weekly	52	0	0	0
PETERBOROUGH	Weekly	52	0	0	0
PORT CAMPBELL	Weekly	52	17	2	0
PORT FAIRY*	Weekly	104	2	1	0
PORTLAND*	Weekly	104	0	0	0
PURNIM	Weekly	52	1	1	0
SANDFORD	Weekly	52	0	0	0
SIMPSON	Weekly	52	0	0	0
TARRINGTON	Weekly	52	0	0	0
TERANG	Weekly	52	0	0	0
TIMBOON	Weekly	52	0	0	0
WARRNAMBOOL*	Weekly	156	0	0	0

## Trihalomethanes Results

**Standard:** Less than or equal to 0.25 milligrams per litre of drinking water

**Outcome:** The Standard was met at all localities with the exception of Cavendish. Trihalomethanes have remained stable across Wannon Water for the past two years with the exception of Cavendish which continued to see an increase due to changes in plant operations as described in section 7 hotspot townships.

**Table 6-2 Trihalomethanes results by locality 2018/19**

### Trihalomethanes

Water sampling locality	Frequency of sampling	Number of samples	Max. mg/L	Average (mg/L)	No. of samples where standard was not met (s.18)) <sup>1</sup>
ALLANSFORD	Monthly	12	0.114	0.092	0
BALMORAL	Monthly	12	0.156	0.121	0
CAMPERDOWN (RURAL)	Monthly	12	0.106	0.071	0
CAMPERDOWN (URBAN)	Monthly	12	0.067	0.050	0
CARAMUT	Monthly	12	0.042	0.029	0
CASTERTON	Monthly	12	0.144	0.117	0
CAVENDISH	Monthly	12	0.291	0.179	2
COBDEN	Monthly	12	0.113	0.071	0
COLERAINE	Monthly	12	0.169	0.144	0
DARTMOOR	Monthly	12	0.005	0.004	0
DERRINALLUM	Monthly	12	0.146	0.110	0
DUNKELD	Monthly	12	0.079	0.057	0
GLENTHOMPSON	Monthly	12	0.134	0.080	0
HAMILTON*	Monthly	24	0.015	0.010	0
HEYWOOD	Monthly	12	0.026	0.018	0
KOROIT	Monthly	12	0.135	0.101	0
LISMORE	Monthly	12	0.114	0.096	0
MACARTHUR	Monthly	12	0.061	0.044	0
MERINO	Monthly	12	0.153	0.134	0
MORTLAKE	Monthly	12	0.115	0.091	0
NOORAT/GLENORMISTON	Monthly	12	0.101	0.077	0
PAARATTE	Monthly	12	0.021	0.016	0
PENSHURST	Monthly	12	0.083	0.031	0
PETERBOROUGH	Monthly	12	0.026	0.022	0
PORT CAMPBELL	Monthly	12	0.027	0.022	0
PORT FAIRY*	Monthly	24	0.004	0.004	0
PORTLAND*	Monthly	24	0.004	0.004	0
PURNIM	Monthly	12	0.137	0.116	0
SANDFORD	Monthly	12	0.174	0.144	0
SIMPSON	Monthly	12	0.080	0.053	0
TARRINGTON	Monthly	12	0.015	0.009	0
TERANG	Monthly	12	0.080	0.055	0
TIMBOON	Monthly	12	0.081	0.053	0
WARRNAMBOOL*	Monthly	36	0.113	0.084	0

1 - For Trihalomethanes, if the result is greater than 0.25mg/L, then the locality is non-compliant.

## Turbidity

**Standard:** The 95<sup>th</sup> percentile of results for samples in any 12 month period must be less than or equal to 5.0 NTU

**Outcome:** The Standard was met at all localities, which is consistent with the previous two years.

**Table 6-3 Turbidity results by locality 2018/19**

### Turbidity

Water sampling locality	Frequency of sampling	Number of samples	Maximum turbidity in a sample (NTU)	Maximum 95th percentile of turbidity results in any 12 months (NTU)	No. of 95 <sup>th</sup> percentile of results in any 12 months above standard (s.18)
ALLANSFORD	Weekly	52	18.0	1.3	0
BALMORAL	Weekly	52	1.6	0.3	0
CAMPERDOWN (RURAL)	Weekly	52	1.8	0.4	0
CAMPERDOWN (URBAN)	Weekly	52	0.4	0.2	0
CARAMUT	Weekly	52	0.4	0.2	0
CASTERTON	Weekly	52	0.4	0.2	0
CAVENDISH	Weekly	52	0.8	0.5	0
COBDEN	Weekly	52	0.5	0.2	0
COLERAINE	Weekly	52	0.7	0.2	0
DARTMOOR	Weekly	52	0.1	0.1	0
DERRINALLUM	Weekly	52	1.3	0.3	0
DUNKELD	Weekly	52	0.6	0.2	0
GLENTHOMPSON	Weekly	52	0.5	0.2	0
HAMILTON *	Weekly	104	0.6	0.2	0
HEYWOOD	Weekly	52	2.1	1.0	0
KOROIT	Weekly	52	2.1	0.3	0
LISMORE	Weekly	52	1.5	0.4	0
MACARTHUR	Weekly	52	0.3	0.1	0
MERINO	Weekly	52	1.1	0.2	0
MORTLAKE	Weekly	52	2.5	0.5	0
NOORAT/GLENORMISTON	Weekly	52	0.2	0.1	0
PAARATTE	Weekly	52	0.4	0.2	0
PENSHURST	Weekly	52	30.0	1.9	0
PETERBOROUGH	Weekly	52	1.1	0.2	0
PORT CAMPBELL	Weekly	52	1.4	0.3	0
PORT FAIRY *	Weekly	104	3.0	0.6	0
PORTLAND *	Weekly	104	3.6	0.2	0
PURNIM	Weekly	52	1.6	0.8	0
SANDFORD	Weekly	52	0.3	0.1	0
SIMPSON	Weekly	52	0.4	0.1	0
TARRINGTON	Weekly	52	1.4	0.3	0
TERANG	Weekly	52	0.4	0.1	0
TIMBOON	Weekly	52	4.1	0.4	0
WARRNAMBOOL *	Weekly	156	1.3	0.2	0



## Other – may pose a risk to human health

### Fluoride

**Standard** All samples of drinking water collected within a locality not to exceed 1.5 mg/L (ADWG – Health).

**Outcome:** The standard was met at all localities, which is consistent with the previous two years.

**Table 6-4 Fluoride results by locality 2018/19**

#### Fluoride

Water sampling locality	Frequency of sampling	Number of samples	Target optimum operating fluoride concentration (mg/L)	Maximum (mg/L)	Average (mg/L)	No. of samples where standard was not met (s.18)
ALLANSFORD +	Weekly	52	0.9	0.99	0.88	0
BALMORAL	Yearly	1	-	0.10	0.10	0
CAMPERDOWN (RURAL)	Yearly	1	-	0.10	0.10	0
CAMPERDOWN (URBAN)	Yearly	1	-	0.10	0.10	0
CARAMUT	Yearly	1	-	0.10	0.10	0
CASTERTON	Yearly	1	-	0.10	0.10	0
CAVENDISH	Yearly	1	-	0.10	0.10	0
COBDEN	Yearly	1	-	0.10	0.10	0
COLERAINE	Yearly	1	-	0.10	0.10	0
DARTMOOR	Yearly	1	-	0.10	0.10	0
DERRINALLUM	Yearly	1	-	0.10	0.10	0
DUNKELD +	Weekly	52	0.9	1.00	0.89	0
GLENTHOMPSON	Yearly	1	-	0.10	0.10	0
HAMILTON + *	Weekly	104	0.9	1.10	0.87	0
HEYWOOD	Yearly	1	-	0.40	0.40	0
KOROIT +	Weekly	52	0.9	0.98	0.88	0
LISMORE	Yearly	1	-	0.10	0.10	0
MACARTHUR	Yearly	1	-	0.42	0.42	0
MERINO	Yearly	1	-	0.10	0.10	0
MORTLAKE	Yearly	1	-	0.10	0.10	0
NOORAT/GLENORMISTON	Yearly	1	-	0.10	0.10	0
PAARATTE	Yearly	1	-	0.14	0.14	0
PENSHURST	Yearly	1	-	0.10	0.10	0
PETERBOROUGH	Yearly	1	-	0.13	0.13	0
PORT CAMPBELL	Yearly	1	-	0.13	0.13	0
PORT FAIRY^	Yearly	1	-	0.79	0.79	0
PORTLAND^*	Monthly	12	-	1.10	0.99	0
PURNIM	Yearly	1	-	0.10	0.10	0
SANDFORD	Yearly	1	-	0.10	0.10	0
SIMPSON	Yearly	1	-	0.10	0.10	0

TARRINGTON +	Weekly	52	-	0.99	0.87	0
TERANG	Yearly	1	-	0.10	0.10	0
TIMBOON	Yearly	1	-	0.13	0.13	0
WARRNAMBOOL + *	Weekly	156	0.9	0.99	0.89	0

+ Fluoride added to drinking water supply. For supplies where fluoride has been added, compliance is measured against the ADWG health guideline value.

\* More than one sample site was analysed per week for fluoride (based on population) where fluoride is added to the supply.

^ It is noted that the Port Fairy and Portland localities have naturally occurring fluoride which achieves the average concentration.

## Manganese results

**Standard** All samples of drinking water collected within a locality in any 12-month period having a concentration less than 0.5 mg/L (ADWG).

**Outcome:** The standard was met at all localities, which is consistent with the previous two years.

**Table 6-5 Manganese results by locality 2018/19**

Manganese						
Water sampling locality	Frequency of sampling	Number of samples	No. of non-complying samples	Maximum result (mg/L)	Average (mg/L)	No. of samples where standard was not met (s.18)
ALLANSFORD	Monthly	12	0	0.0024	0.0012	0
BALMORAL	Monthly	12	0	0.0143	0.0071	0
CAMPERDOWN (RURAL)	Monthly	12	0	0.0164	0.0044	0
CAMPERDOWN (URBAN)	Monthly	12	0	0.0115	0.0035	0
CARAMUT	Monthly	12	0	0.0004	0.0002	0
CASTERTON	Monthly	12	0	0.0175	0.0053	0
CAVENDISH	Monthly	12	0	0.0053	0.0017	0
COBDEN	Monthly	12	0	0.0050	0.0022	0
COLERAINE	Monthly	12	0	0.0119	0.0037	0
DARTMOOR	Monthly	12	0	0.0001	0.0001	0
DERRINALLUM	Monthly	12	0	0.0177	0.0040	0
DUNKELD	Monthly	12	0	0.0039	0.0022	0
GLENTHOMPSON	Monthly	12	0	0.0022	0.0009	0
HAMILTON	Monthly	12	0	0.0092	0.0049	0
HEYWOOD	Monthly	12	0	0.0723	0.0585	0
KOROIT	Monthly	12	0	0.0114	0.0022	0
LISMORE	Monthly	12	0	0.0506	0.0070	0
MACARTHUR	Monthly	12	0	0.0003	0.0001	0
MERINO	Monthly	12	0	0.0068	0.0029	0
MORTLAKE	Monthly	12	0	0.0039	0.0016	0
NOORAT/GLENORMISTON	Monthly	12	0	0.0018	0.0008	0
PAARATTE	Monthly	12	0	0.0035	0.0019	0
PENSHURST	Monthly	12	0	0.0008	0.0004	0
PETERBOROUGH	Monthly	12	0	0.0013	0.0003	0
PORT CAMPBELL	Monthly	12	0	0.0073	0.0018	0
PORT FAIRY	Monthly	12	0	0.0173	0.0105	0
PORTLAND	Monthly	12	0	0.0037	0.0010	0
PURNIM	Monthly	12	0	0.0132	0.0058	0
SANDFORD	Monthly	12	0	0.0058	0.0019	0
SIMPSON	Monthly	12	0	0.0109	0.0021	0
TARRINGTON	Monthly	12	0	0.0060	0.0032	0
TERANG	Monthly	12	0	0.0043	0.0016	0
TIMBOON	Monthly	12	0	0.0034	0.0009	0
WARRNAMBOOL	Monthly	12	0	0.0023	0.0015	0

## Lead results

**Standard** All samples of drinking water collected within a locality in any 12-month period having a concentration less than 0.01 mg/L (ADWG).

**Outcome:** The standard was met at all localities, which is consistent with the previous two years.

**Table 6-6 Lead results by locality 2018/19**

### Lead

Water sampling locality	Frequency of sampling	Number of samples	No. of non-complying samples	Maximum result (mg/L)	Average (mg/L)	No. of samples where standard was not met (s.18)
ALLANSFORD	Yearly	1	0	<0.0001	<0.0001	0
BALMORAL	Yearly	1	0	0.0001	0.0001	0
CAMPERDOWN (RURAL)	Yearly	1	0	<0.0001	<0.0001	0
CAMPERDOWN (URBAN)	Yearly	1	0	0.0001	0.0001	0
CARAMUT	Yearly	1	0	0.0003	0.0003	0
CASTERTON	Yearly	1	0	0.0004	0.0004	0
CAVENDISH	Yearly	1	0	0.0002	0.0002	0
COBDEN	Yearly	1	0	0.0001	0.0001	0
COLERAINE	Yearly	1	0	0.0006	0.0006	0
DARTMOOR	Yearly	1	0	<0.0001	<0.0001	0
DERRINALLUM	Yearly	1	0	<0.0001	<0.0001	0
DUNKELD	Yearly	1	0	0.0003	0.0003	0
GLENTHOMPSON	Yearly	1	0	0.0001	0.0001	0
HAMILTON	Yearly	1	0	<0.0001	<0.0001	0
HEYWOOD	Yearly	1	0	0.0007	0.0007	0
KOROIT	Yearly	1	0	0.0001	0.0001	0
LISMORE	Yearly	1	0	<0.0001	<0.0001	0
MACARTHUR	Yearly	1	0	0.0002	0.0002	0
MERINO	Yearly	1	0	0.0004	0.0004	0
MORTLAKE	Yearly	1	0	0.0005	0.0005	0
NOORAT/GLENORMISTON	Yearly	1	0	<0.0001	<0.0001	0
PAARATTE	Yearly	1	0	0.0002	0.0002	0
PENSHURST	Yearly	1	0	0.0002	0.0002	0
PETERBOROUGH	Yearly	1	0	0.0002	0.0002	0
PORT CAMPBELL	Yearly	1	0	0.0003	0.0003	0
PORT FAIRY	Yearly	1	0	0.0002	0.0002	0
PORTLAND	Yearly	1	0	0.0004	0.0004	0
PURNIM	Yearly	1	0	0.0019	0.0019	0
SANDFORD	Yearly	1	0	0.0006	0.0006	0
SIMPSON	Yearly	1	0	0.0001	0.0001	0
TARRINGTON	Yearly	1	0	0.0001	0.0001	0
TERANG	Yearly	1	0	0.0002	0.0002	0
TIMBOON	Yearly	1	0	0.0011	0.0011	0
WARRNAMBOOL	Yearly	1	0	0.0003	0.0003	0

## Copper results

**Standard** All samples of drinking water collected within a locality in any 12-month period having a concentration less than 2 mg/L (ADWG).

**Outcome:** The standard was met at all localities, which is consistent with the previous two years.

**Table 6-7 Copper results by locality 2018/19**

### Copper

Water sampling locality	Frequency of sampling	Number of samples	No. of non-complying samples	Maximum result (mg/L)	Average (mg/L)	No. of samples where standard was not met (s.18)
ALLANSFORD	Yearly	1	0	0.011	0.011	0
BALMORAL	Yearly	1	0	0.046	0.046	0
CAMPERDOWN (RURAL)	Yearly	1	0	0.001	0.001	0
CAMPERDOWN (URBAN)	Yearly	1	0	0.002	0.002	0
CARAMUT	Yearly	1	0	0.006	0.006	0
CASTERTON	Yearly	1	0	0.070	0.070	0
CAVENDISH	Yearly	1	0	0.014	0.014	0
COBDEN	Yearly	1	0	0.002	0.002	0
COLERAINE	Yearly	1	0	0.027	0.027	0
DARTMOOR	Yearly	1	0	0.004	0.004	0
DERRINALLUM	Yearly	1	0	0.002	0.002	0
DUNKELD	Yearly	1	0	0.008	0.008	0
GLENTHOMPSON	Yearly	1	0	0.007	0.007	0
HAMILTON	Yearly	1	0	0.001	0.001	0
HEYWOOD	Yearly	1	0	0.007	0.007	0
KOROIT	Yearly	1	0	0.079	0.079	0
LISMORE	Yearly	1	0	0.001	0.001	0
MACARTHUR	Yearly	1	0	0.006	0.006	0
MERINO	Yearly	1	0	0.014	0.014	0
MORTLAKE	Yearly	1	0	0.011	0.011	0
NOORAT/GLENORMISTON	Yearly	1	0	0.005	0.005	0
PAARATTE	Yearly	1	0	0.002	0.002	0
PENSHURST	Yearly	1	0	0.007	0.007	0
PETERBOROUGH	Yearly	1	0	0.001	0.001	0
PORT CAMPBELL	Yearly	1	0	0.002	0.002	0
PORT FAIRY	Yearly	1	0	0.013	0.013	0
PORTLAND	Yearly	1	0	0.006	0.006	0
PURNIM	Yearly	1	0	0.066	0.066	0
SANDFORD	Yearly	1	0	0.108	0.108	0
SIMPSON	Yearly	1	0	0.006	0.006	0
TARRINGTON	Yearly	1	0	0.013	0.013	0
TERANG	Yearly	1	0	0.007	0.007	0
TIMBOON	Yearly	1	0	0.001	0.001	0
WARRNAMBOOL	Yearly	1	0	0.010	0.010	0

## Arsenic results

**Standard** All samples of drinking water collected within a locality in any 12-month period having a concentration less than 0.01 mg/L (ADWG).

**Outcome:** The standard was met at all localities, which is consistent with the previous two years.

**Table 6-8 Arsenic results by locality 2018/19**

### Arsenic

Water sampling locality	Frequency of sampling	Number of samples	No. of non-complying samples	Maximum result (mg/L)	Average (mg/L)	No. of samples where standard was not met (s.18)
ALLANSFORD	Yearly	1	0	0.0003	0.0003	0
BALMORAL	Yearly	1	0	0.0004	0.0004	0
CAMPERDOWN (RURAL)	Yearly	1	0	<0.0003	<0.0003	0
CAMPERDOWN (URBAN)	Yearly	1	0	<0.0003	<0.0003	0
CARAMUT	Yearly	1	0	0.0007	0.0007	0
CASTERTON	Yearly	1	0	<0.0003	<0.0003	0
CAVENDISH	Yearly	1	0	<0.0003	<0.0003	0
COBDEN	Yearly	1	0	<0.0003	<0.0003	0
COLERAINE	Yearly	1	0	<0.0003	<0.0003	0
DARTMOOR	Yearly	1	0	<0.0003	<0.0003	0
DERRINALLUM	Yearly	1	0	<0.0003	<0.0003	0
DUNKELD	Yearly	1	0	<0.0003	<0.0003	0
GLENTHOMPSON	Yearly	1	0	0.0005	0.0005	0
HAMILTON	Yearly	1	0	<0.0003	<0.0003	0
HEYWOOD	Yearly	1	0	<0.0003	<0.0003	0
KOROIT	Yearly	1	0	<0.0003	<0.0003	0
LISMORE	Yearly	1	0	<0.0003	<0.0003	0
MACARTHUR	Weekly	52	0	0.0044	0.0005	0
MERINO	Yearly	1	0	<0.0003	<0.0003	0
MORTLAKE	Yearly	1	0	0.0008	0.0008	0
NOORAT/GLENORMISTON	Yearly	1	0	<0.0003	<0.0003	0
PAARATTE	Yearly	1	0	<0.0003	<0.0003	0
PENSHURST	Yearly	1	0	0.0017	0.0017	0
PETERBOROUGH	Yearly	1	0	<0.0003	<0.0003	0
PORT CAMPBELL	Yearly	1	0	<0.0003	<0.0003	0
PORT FAIRY	Yearly	1	0	0.0035	0.0035	0
PORTLAND	Yearly	1	0	0.0003	0.0003	0
PUENIM	Yearly	1	0	<0.0003	<0.0003	0
SANDFORD	Yearly	1	0	<0.0003	<0.0003	0
SIMPSON	Yearly	1	0	<0.0003	<0.0003	0
TARRINGTON	Yearly	1	0	<0.0003	<0.0003	0
TERANG	Yearly	1	0	<0.0003	<0.0003	0
TIMBOON	Yearly	1	0	<0.0003	<0.0003	0
WARRNAMBOOL	Yearly	1	0	<0.0003	<0.0003	0



### Water treatment-related chemicals

Table 6-9 lists the water treatment-related chemicals monitored at each locality during 2018/19. All test results were less than the ADWG health-related guideline values.

**Table 6-9 water treatment-related chemical sampling summary and health-related guideline values**

Parameter	Sampling frequency	ADWG value (mg/L)
1,1,1-Trichloropropan-2-one	Yearly *	-
1,1,3-Trichloropropan-2-one	Yearly *	-
1,1-Dichloropropan-2-one	Yearly *	-
1,3-Dichloropropan-2-one	Yearly *	-
2,4,6-Trichlorophenol	Yearly *	-
2,4-Dichlorophenol	Yearly *	0.2
2-Chlorophenol	Yearly *	0.3
Carbon tetrachloride	Yearly *	0.003
Cyanogen Chloride	Yearly *	0.08
Trichloroacetaldehyde	Quarterly/ Yearly *	0.021

\*All results were less than detection limits.

### Inorganics

Table 6-10 lists the metals monitored at each locality during 2018/19. All localities recorded levels less than the ADWG health-related guideline values.

**Table 6-10 – metals sampling summary and health-related guideline values**

Parameter	Sampling frequency	ADWG value (mg/L)
Cadmium	Yearly	0.002
Chromium	Yearly	0.05
Nickel	Yearly	0.02
Zinc	Yearly	3
Tin	Yearly	-
Silver	Yearly	0.1
Beryllium	Yearly	0.06
Uranium	Yearly	0.017
Iodide	Yearly	0.5
Molybdenum	Yearly	0.05
Boron	Yearly	4
Barium	Yearly	2
Selenium	Yearly	0.01
Mercury	Yearly	0.001

### Polycyclic aromatic hydrocarbon results

Table 6-11 lists the suite of polycyclic aromatic hydrocarbons monitored at each locality during 2018/19.

**Table 6-11 - PAH sampling summary and health related guideline values**

Parameter	Sampling frequency	ADWG value (mg/L)
Acenaphthene	Yearly *	-
Acenaphthylene	Yearly *	-
Anthracene	Yearly *	-
Benz(a)anthracene	Yearly *	-
Benzo(a)pyrene	Yearly *	0.00001
Benzo(b)fluoranthene	Yearly *	-
Benzo(g,h,i)perylene	Yearly *	-
Benzo(k)fluoranthene	Yearly *	-
Chrysene	Yearly *	-
Dibenz(a,h)anthracene	Yearly *	-
Fluoranthene	Yearly *	-
Indeno(1,2,3-cd)pyrene	Yearly *	-
Phenanthrene	Yearly *	-
Pyrene	Yearly *	-
Total PAH	Yearly *	-

\*All results were less than detection limits.

### Disinfection by-products

#### Chlorite

Wannon Water does not disinfect with chlorine dioxide. Therefore this parameter is not included in the testing regime. Table 6-12 lists the chloramine disinfection by-products monitored at each locality during 2018/19. All test results were less than the ADWG health-related guideline values.

**Table 6-12 – chloramine disinfection by-products sampling summary and health-related guideline values**

Parameter	Sampling frequency	ADWG value (mg/L)
Nitrate (as nitrate)	Monthly/Quarterly*	50
Nitrite (as nitrite)	Monthly/Yearly**	3
1,2-Dibromo-3-Chloropropane	Yearly	-
1,2-Dibromoethane	Yearly	-

\* Monthly at Mortlake and quarterly at Caramut only.

\*\* Monthly at localities where ammonia is added to the drinking water supply, yearly at all other localities.

## Pesticide/herbicide results

Table 6-13 lists the pesticides and herbicides monitored at representative raw water storage and rivers/creeks during 2018/19. All test results were less than the detection limits which were below the ADWG values.

**Table 6-13 – pesticide and herbicide sampling summary and health-related guideline values**

Parameter	Sampling frequency	ADWG value (mg/L)
2,4,5-T	Yearly	100
2,4,5-TP	Yearly	0.1
2,4,6-T	Yearly	20
2,4-D	Yearly	0.03
2,4-DB	Yearly	-
2,4-DP	Yearly	0.03
2,6-D	Yearly	-
4,4-DDD	Yearly	-
4,4-DDE	Yearly	-
4,4-DDT	Yearly	0.009
4-Chlorophenoxy acetic acid	Yearly	-
Aldrin	Yearly	0.0003
Ametryn	Yearly	0.07
Atrazine	Yearly	0.02
BHC (Alpha Isomer)	Yearly	-
BHC (Beta Isomer)	Yearly	-
BHC (Delta Isomer)	Yearly	-
Chlordane	Yearly	0.0015
Chloropyrifos	Yearly	10
CIS-1,3-Dichloropropene	Yearly	-
cis-Chlordane	Yearly	0.002
Dicamba	Yearly	0.1
Dieldrin	Yearly	0.003
Endosulphan 1	Yearly	0.02
Endosulphan 2	Yearly	0.02
Endosulphan Sulphate	Yearly	0.02
Endrin	Yearly	-
Endrin Aldehyde	Yearly	-
Endrin Ketone	Yearly	-
Glyphosate	Yearly	1
Heptachlor	Yearly	0.0003
Heptachlor Epoxide	Yearly	0.0003
Hexachlorbenzene	Yearly	-
Hexazinone	Yearly	400
Lindane	Yearly	0.01
MCPA	Yearly	0.04
MCPB	Yearly	-
Mecoprop	Yearly	-
Methoxychlor	Yearly	0.3
Molinate	Yearly	4
oxy-Chlordane	Yearly	0.11
Prometon	Yearly	-
Prometryn	Yearly	-
Propazine	Yearly	0.05
Propiconazole	Yearly	100
Simazine	Yearly	0.02
Simetryn	Yearly	-
Temephos	Yearly	400
Terbutryn	Yearly	0.4
Tertbutylazine	Yearly	0.01
Trans-1,3-Dichloropropene	Yearly	-
Trans-Chlordane	Yearly	0.011
Trichlopyr	Yearly	0.02

## Industrial chemical results

Table 6-14 lists industrial chemical health-related parameters tested at each locality during 2018/19. All test results were below the ADWG health limits.

**Table 6-14 – Industrial chemicals sampling summary and health-based guideline values**

Parameter	Sampling frequency	ADWG value
1,1,1,2-Tetrachlorethane	Yearly	-
1,1,1-Trichloroethane	Yearly	-
1,1,2,2-Tetrachloroethane	Yearly	-
1,1,2-Trichloroethane	Yearly	-
1,1-Dichloroethane	Yearly	-
1,1-Dichloroethene	Yearly	0.03
1,1-Dichloropropene	Yearly	-
1,2,3-Trichlorobenzene	Yearly	-
1,2,3-Trichloropropane	Yearly	-
1,2,4-Trichlorobenzene	Yearly	0.03
1,2,4-Trimethylbenzene	Yearly	-
1,2-Dichlorobenzene	Yearly	1.5
1,2-Dichloroethane	Yearly	0.003
1,2-Dichloropropane	Yearly	-
1,3,5-Trimethylbenzene	Yearly	-
1,3-Dichlorobenzene	Yearly	0.02
1,3-Dichloropropane	Yearly	-
1,4-Dichlorobenzene	Yearly	0.04
2,2-Dichloropropane	Yearly	-
2-Chlorotoluene	Yearly	-
4-Chlorotoluene	Yearly	-
Benzene	Yearly	0.0011
Bromobenzene	Yearly	-
Bromochloromethane	Yearly	-
Carbon Disulphide	Yearly	-
Chlorobenzene	Yearly	0.3
CIS-1,2-Dichloroethene	Yearly	0.06
Dibromomethane	Yearly	-
Ethylbenzene	Yearly	0.3
Hexachloro-1,3-Butadiene	Yearly	0.0007
Isopropylbenzene	Yearly	-
M-&P-Xylene	Yearly	0.6
Methylenechloride	Yearly	0.04
N-Butylbenzene	Yearly	-
N-Propylbenzene	Yearly	-
o-Xylene	Yearly	0.6
P-Isopropyltoluene	Yearly	-
Sec-Butylbenzene	Yearly	-
Styrene	Yearly	0.03
Tert-Butylbenzene	Yearly	-
Tetrachloroethene	Yearly	0.05
Toluene	Yearly	0.8
Trans-1,2-Dichloroethene	Yearly	0.06
Tributyltin as Sn	Yearly	10.1
Trichloroethene	Yearly	-
Vinyl chloride	Yearly	0.0003

## Algae results

Wannon Water has an obligation to notify DHHS if the presence of Blue Green Algae (BGA) may pose a consumption risk for drinking water supplies. The Blue Green Algae circular (DELWP) sets out different ways toxic BGA species are measured. Where blooms relates to drinking water the triggers are:

- Total microcystins  $\geq 1.3$  ug/L (microcystin\_LR toxicity equivalents);
- $\geq 6500$  cells/mL *Microcystis aeruginosa*;
- Total combined biovolume of known toxic species  $\geq 0.6$  mm<sup>3</sup>/L;
- Total combined biovolume of all cyanobacterial  $> 10$ mm<sup>3</sup>/L; or
- BGA is present in drinking water at levels that may cause widespread public complaint for example through taste and odour. If this occurs then a section 22 report in accordance with the Safe Drinking Water Act should be made.

During 2018/19 Wannon Water collected samples following a risk-rated approach, sampling monthly to fortnightly from all storages that supplied raw water for treatment into drinking water localities. These samples were sent to a NATA-certified laboratory for algal identification and counts. The sampling frequency was increased if blue green algae were detected and the numbers were noted to be increasing. or if geosmin and methylisoborneol levels were above taste and odour thresholds.

## Radionuclides – Gross Beta, Gross Alpha radioactivity results

Table 6-15 lists the radionuclides monitored in surface water (rivers/creeks) during 2016/17. All test results were less than the detection limits. No radionuclide monitoring was conducted during 2018/19.

**Table 6-15 – Radionuclides sampling summary and health-related guideline values**

Parameter	Sampling frequency	ADWG value (Bq/L)
Gross Alpha	Every two years in bores, every 5 years in surface water	0.5
Gross Beta	Every two years in bores, every 5 years in surface water	0.5

The Australian Drinking Water Guidelines recommend Gross Alpha and Gross Beta parameters are screened every two years for groundwater supplies and every five years for surface water supplies.

Surface waters and groundwater bores are scheduled to be sampled in 2019/20.

## Other results

Table 6-16 lists other parameters tested at the customer tap during 2018/19. All test results were less than the ADWG health-related guideline values.

**Table 6-16 - Other parameters sampling summary and health-based guideline values**

Parameter	Sampling frequency	ADWG value (mg/L)
Sulphate	Quarterly	500

## Aesthetic parameters - pH results

**Guideline** The guideline limit for pH is 6.5-8.5 pH units. There is no health-based guideline.

**Table 6-17 pH results by locality 2018/19**

pH				
Water sampling locality	Frequency of sampling	Number of samples	Maximum (pH units)	Minimum (pH units)
ALLANSFORD	Weekly	52	7.6	7.1
BALMORAL	Weekly	52	7.6	6.8
CAMPERDOWN (RURAL)	Weekly	52	9.3	7.2
CAMPERDOWN (URBAN)	Weekly	52	7.5	7.0
CARAMUT	Weekly	52	8.3	7.6
CASTERTON	Weekly	52	7.9	7.3
CAVENDISH	Weekly	52	9.5	6.2
COBDEN	Weekly	52	7.8	6.6
COLERAINE	Weekly	52	8.0	7.5
DARTMOOR	Weekly	52	8.0	7.7
DERRINALLUM	Weekly	52	9.8	7.8
DUNKELD	Weekly	52	6.8	6.4
GLENTHOMPSON	Weekly	52	8.8	7.3
HAMILTON	Weekly	104*	7.2	6.6
HEYWOOD	Weekly	52	8.6	8.2
KOROIT	Weekly	52	7.7	7.1
LISMORE	Weekly	52	9.1	7.4
MACARTHUR	Weekly	52	8.2	7.8
MERINO	Weekly	52	7.9	7.6
MORTLAKE	Weekly	52	8.1	7.3
NOORAT/GLENORMISTON	Weekly	52	9.2	7.2
PAARATTE	Weekly	52	8.3	8.0
PENSHURST	Weekly	52	8.8	8.1
PETERBOROUGH	Weekly	52	8.4	8.1
PORT CAMPBELL	Weekly	52	8.2	8.0
PORT FAIRY	Weekly	104*	8.5	8.3
PORTLAND	Weekly	104*	8.8	8.4
PURNIM	Weekly	52	7.2	6.8
SANDFORD	Weekly	52	7.9	7.5
SIMPSON	Weekly	52	7.4	7.1
TARRINGTON	Weekly	52	7.4	6.5
TERANG	Weekly	52	7.7	6.9
TIMBOON	Weekly	52	8.3	8.1
WARRNAMBOOL	Weekly	156*	7.6	6.8

\* More than one sample per week

### **Description**

A pH of less than 6.5 may be corrosive, greater than pH 8 progressively decreases efficiency of chlorination, greater than 8.5 may cause scale and taste problems. New concrete tanks and cement-mortar lined pipes can significantly increase pH and a value of up to 9.2 may be acceptable provided monitoring indicates no deterioration in microbial quality.

### **Management of high pH**

#### Camperdown Rural, Derrinallum and Lismore

These localities are all supplied from Camperdown WTP. Regular flushing is conducted to reduce detention times in cement-lined mains and improve pH levels. Gaseous chlorine is utilised to assist in reducing high pH levels.

#### Cavendish and Noorat/Glenormiston

These localities are both small in population and frequently experience low demand, which leads to long detention times in cement lined mains. Regular flushing is conducted to reduce detention times and improve pH levels.

## Iron results

**Guideline** The guideline value for iron is 0.3 mg/L. There is no health-related guideline value.

**Table 6-18 Iron results by locality 2018 /19**

Iron				
Water sampling locality	Frequency of sampling	Number of samples	Maximum (mg/L)	Average result (mg/L)
ALLANSFORD	Monthly	12	0.034	0.015
BALMORAL	Monthly	12	0.288	0.105
CAMPERDOWN (RURAL)	Monthly	12	0.100	0.027
CAMPERDOWN (URBAN)	Monthly	12	0.027	0.018
CARAMUT	Monthly	12	0.016	0.008
CASTERTON	Monthly	12	0.046	0.011
CAVENDISH	Monthly	12	0.401	0.112
COBDEN	Monthly	12	0.035	0.018
COLERAINE	Monthly	12	0.048	0.020
DARTMOOR	Monthly	12	0.006	0.003
DERRINALLUM	Monthly	12	0.135	0.033
DUNKELD	Monthly	12	0.216	0.079
GLENTHOMPSON	Monthly	12	0.133	0.046
HAMILTON	Monthly	12	0.089	0.052
HEYWOOD	Monthly	12	0.053	0.017
KOROIT	Monthly	12	0.421	0.059
LISMORE	Monthly	12	0.178	0.051
MACARTHUR	Monthly	12	0.016	0.008
MERINO	Monthly	12	0.053	0.016
MORTLAKE	Monthly	12	0.349	0.095
NOORAT/GLENORMISTON	Monthly	12	0.050	0.014
PAARATTE	Monthly	12	0.419	0.228
PENSHURST	Monthly	12	0.050	0.021
PETERBOROUGH	Monthly	12	0.146	0.039
PORT CAMPBELL	Monthly	12	0.813	0.211
PORT FAIRY	Monthly	12	0.166	0.110
PORTLAND	Monthly	12	0.262	0.051
PURNIM	Monthly	12	0.309	0.200
SANDFORD	Monthly	12	0.012	0.006
SIMPSON	Monthly	12	0.033	0.013
TARRINGTON	Monthly	12	0.137	0.051
TERANG	Monthly	12	0.015	0.008
TIMBOON	Monthly	12	0.167	0.099
WARRNAMBOOL	Monthly	12	0.033	0.021

**Description**

Iron occurs naturally in water, the taste threshold is 0.3 mg/L. High concentrations stain laundry and fittings. Iron bacteria cause pipe blockages, taste/odour and corrosion. Flushing of the reticulation system may be conducted in instances where the taste threshold is exceeded through routine sampling



## Colour results

**Guideline** 15 HU. There is no health-based guideline.

**Table 6-19 True colour results by locality 2018/19**

True colour				
Water sampling locality	Frequency of sampling	Number of samples	Maximum (Pt-Co)	Average result (Pt-Co)
ALLANSFORD	Monthly	12	1	1
BALMORAL	Monthly	12	2	2
CAMPERDOWN (RURAL)	Monthly	12	1	1
CAMPERDOWN (URBAN)	Monthly	12	2	1
CARAMUT	Monthly	12	1	1
CASTERTON	Monthly	12	1	1
CAVENDISH	Monthly	12	13	5
COBDEN	Monthly	12	2	1
COLERAINE	Monthly	12	1	1
DARTMOOR	Monthly	12	1	1
DERRINALLUM	Monthly	12	1	1
DUNKELD	Monthly	12	1	1
GLENTHOMPSON	Monthly	12	2	2
HAMILTON	Monthly	12	3	2
HEYWOOD	Monthly	12	2	1
KOROIT	Monthly	12	1	1
LISMORE	Monthly	12	1	1
MACARTHUR	Monthly	12	1	1
MERINO	Monthly	12	1	1
MORTLAKE	Monthly	12	1	1
NOORAT/GLENORMISTON	Monthly	12	2	1
PAARATTE	Monthly	12	1	1
PENSHURST	Monthly	12	1	1
PETERBOROUGH	Monthly	12	1	1
PORT CAMPBELL	Monthly	12	2	1
PORT FAIRY	Monthly	12	2	1
PORTLAND	Monthly	12	4	4
PURNIM	Monthly	12	7	5
SANDFORD	Monthly	12	1	1
SIMPSON	Monthly	12	1	1
TARRINGTON	Monthly	12	2	2
TERANG	Monthly	12	1	1
TIMBOON	Monthly	12	1	1
WARRNAMBOOL	Monthly	12	1	1

## Description

Colour is an important aesthetic characteristic for customer acceptance. Treatment processes can be optimised to remove colour.

## Management of colour

The colour of the Cavendish water supply is derived from the raw source water of the Grampians headworks. Surface water run-off, particularly the initial flows of the wet season, tends to be high in colour due to high levels of tannin. Cavendish is a disinfection-only plant and therefore there is no capacity for colour removal. Wannon Water selectively harvests the Cavendish water supply which will reduce the risk of receiving high coloured water to the plant.

## Alkalinity and Hardness

### Alkalinity guideline

There is no health-based or aesthetic guideline for alkalinity however low levels (<50) can corrode surfaces. High levels (>200) tend to deposit calcium carbonate on pipes, fittings and hot water services.

**Description** Alkalinity is the ability of water to buffer changes in pH.

### Hardness guideline

The guideline limit for hardness is 200 mg/L as calcium carbonate ( $\text{CaCO}_3$ ). There is no health-based guideline.

**Description** Caused by calcium and magnesium salts. Hard water is difficult to lather.

Less than 60 mg/L  $\text{CaCO}_3$  – soft but possible corrosive

60-200 mg/L  $\text{CaCO}_3$  – good quality

200-500 mg/L  $\text{CaCO}_3$  – increasing scaling problems

Greater than 500 mg/L  $\text{CaCO}_3$  – severe scaling

Alkalinity and hardness is not controllable by treatment processes at any of Wannon Water localities. Wannon Water has a large data set of very consistent data for localities where source water is groundwater and hence elected not to test for these parameters during 2018/19. There is some variation found in surface water, hence representative samples are collected monthly for each of these alternate supply systems. Refer to Tables 6-20 and 6-21 for the 2018/19 representative results for source waters.

**Table 6-20 Total alkalinity as  $\text{CaCO}_3$  results by locality 2018/19**

Total Alkalinity as $\text{CaCO}_3$				
Water sampling locality	No. of Samples	No. of non-complying samples	Maximum result (mg/L $\text{CaCO}_3$ )	Average (mg/L $\text{CaCO}_3$ )
BALMORAL	12	0	16	13
CAMPERDOWN (URBAN)	12	0	20	14
CAVENDISH	12	0	13	11
GLENTHOMPSON	12	0	33	26
HAMILTON	12	0	9	7
WARRNAMBOOL	12	0	40	35

**Table 6-21 Total hardness as CaCO<sub>3</sub> results by locality 2018/19****Total Hardness as CaCO<sub>3</sub>**

Water sampling locality	No. of samples	No. of non-complying samples	Maximum result (mg/L)	Average (mg/L)
BALMORAL	12	0	107	99
CAMPERDOWN (URBAN)	12	0	46	37
CAVENDISH	12	0	31	27
GLENTHOMPSON	12	0	95	83
HAMILTON	12	0	80	75
WARRNAMBOOL	12	0	69	66

**Total Dissolved Solids results**

**Guideline** 600 mg/L. There is no health-based guideline.

**Table 6-22 Total Dissolved Solids results by locality 2018/19****Total Dissolved Solids**

Treatment Plant	Water sampling locality	Frequency of sampling	Number of samples	Maximum result (mg/L)
Balmoral WTP	Balmoral	Quarterly	4	530
Camperdown WTP	Camperdown, Derrinallum, Lismore	Quarterly	4	140
Caramut DP	Caramut	Quarterly	4	230
Casterton WTP	Casterton, Coleraine, Sandford, Merino	Quarterly	4	490
Cavendish DP	Cavendish	Quarterly	4	87
Cobden WTP	Cobden	Quarterly	4	150
Dartmoor WTP	Dartmoor	Quarterly	4	400
Glenthompson WTP	Glenthompson	Quarterly	4	490
Hamilton WTP	Dunkeld, Hamilton, Tarrington	Quarterly	4	160
Heywood WTP	Heywood	Quarterly	4	680
Macarthur WTP	Macarthur	Quarterly	4	1000
Mortlake DP	Mortlake	Quarterly	4	210
Penshurst DP	Penshurst	Quarterly	4	810
Port Campbell WTP	Peterborough, Port Campbell, Timboon	Quarterly	4	300
Port Fairy WTP	Port Fairy	Quarterly	4	910
Portland Bald Hill WTP	Portland	Quarterly	4	680
Purnim DP	Purnim	Quarterly	4	120
Simpson WTP	Simpson	Quarterly	4	140
Terang WTP	Mortlake, Noorat/ Glenormiston, Terang	Quarterly	4	140
Warrnambool WTP	Allansford, Koroit, Warrnambool	Quarterly	4	190

**Description**

Based on taste:

Less than 600 mg/L is regarded as good quality drinking water.

600 – 900 mg/L is regarded as fair quality

900 – 1200 mg/L is regarded as poor quality

Greater than 1200 mg/L is regarded as unacceptable

**Management of Total Dissolved Solids**

Total Dissolved Solids is not controllable by treatment at any of Wannon Water's localities. This is an opportunity for improvement in some of the groundwater supplied townships. An initiative has been implemented for Portland, Port Fairy and Heywood to reduce drinking water salinity and improve the aesthetics of these supplies.

## 7. EMERGENCY, INCIDENT AND EVENT MANAGEMENT

Whilst every effort is made to prevent water quality incidents from occurring, there will inevitably be times when things go wrong. Such instances may be due to equipment failure, human error or unforeseen events.

Wannon Water has incident management plans to manage such events to ensure the minimum possible impact on water quality. The incident management plans are a component of Wannon Water's Emergency Management Plan which uses the principles of prevention, response and recovery as outlined in the Australian Inter-Service Incidents Management System (AIIMS) structure. The objectives of the Emergency Management Plan are to ensure continuity of services and may include:

- Incidents resulting in waste discharges to the environment;
- A dam safety incident;
- A major Information and Communications Technology (ICT) incident;
- Potential security risks, including but not limited to terrorist attacks;
- Risks to water quality.

Wannon Water undertakes regular training and joint exercises in emergency simulations and emergency management with key stakeholders. These sessions are designed to put systems, processes and facilities into an environment as close as possible to a real event. The exercises provide participants with an opportunity to test communications, planning and management procedures and to include emergency management training.

### Section 22 Incidents

The objective of Section 22 of the *Safe Drinking Water Act 2003* is to protect public health. Wannon Water must inform the DHHS of any potential or actual contaminated water supplied for drinking purposes. Information relating to all Section 22 incidents during 2018/19 is listed in Table 7-1.

**Table 7-1 – Section 22 incidents 2018/19**

Date (and duration) of incident	Location of incident	Nature of incident	Potentially affected/ affected drinking water supplies	Actions taken in response to incident
16/08/2018 to 18/08/2018 (2 days)	Casterton clear water storage	<i>E.coli</i> 1 cfu/100 mL and total Coliforms 12 cfu/100 mL	Casterton & Sandford	The investigation indicated that the result was a false positive because the drinking water treatment process was adequate to deliver safe drinking water and eliminate the presence of bacteria. Contamination likely occurred during the sampling process. It was noted weather conditions were windy with slight rain at the time of sampling. No further action was taken. The initial positive result was reported 2 days after initial notification which is outside of DHHS requirements to report immediately. Internal processes were refined to ensure immediate reporting requirements to DHHS are met.
10/09/2018 (1 day)	Purnim reticulation	<i>E.coli</i> 1 cfu/100 mL and total Coliforms 1 cfu/100 mL	Purnim	The investigation indicated that the result was a false positive because the drinking water treatment process was adequate to deliver safe drinking water and eliminate the presence of bacteria. Contamination likely occurred during the sampling or analysis process.

<b>18/09/2018 to 20/09/2018 (2 days)</b>	Port Fairy reticulation	<i>E.coli</i> 2 cfu/100 mL and total Coliforms >100 cfu/100 mL	Port Fairy	The investigation indicated that the result was a false positive because the drinking water treatment process was adequate to deliver safe drinking water and eliminate the presence of bacteria. Contamination likely occurred during the sampling or analysis process.
<b>17/12/2018 to 19/12/2018 (2 days)</b>	Port Campbell clear water storage	<i>E.coli</i> 1 cfu/100 mL and total Coliforms >100 cfu/100 mL	Port Campbell, Peterborough, Paaratte & Timboon	The investigation found that the result was a false positive and the source of the <i>E.coli</i> was by inadequate sampling technique. An interview with the sampler revealed the tap was not flamed or run for 30 seconds prior to taking the sample as per correct protocol. The water treatment plant was running effectively and was not compromised in the lead-up to the detection. A message of correct sampling technique was reinforced to all samplers following the incident.
<b>18/03/2019 to 20/03/2019 (2 days)</b>	Port Campbell reticulation	<i>E.coli</i> 17 cfu/100 mL and total Coliforms >100 cfu/100 mL	Port Campbell, Peterborough, Paaratte & Timboon	The investigation indicated that the result was a false positive because the drinking water treatment processes at the WTP was satisfactory to deliver safe drinking water and eliminate the presence of bacteria. There were no issues at the Port Campbell WTP or distribution system that could reasonably be suspected to have contributed to the presence of <i>E.coli</i> . Contamination likely occurred during the sampling or analysis process.
<b>23/04/2019 to 25/04/2019 (2 days)</b>	Twelve Apostles Visitor Centre	Section 22 submitted in error.	Twelve Apostles visitor information centre	<i>E. coli</i> was detected in a source water tank sample. The <i>E. coli</i> detection was determined to be a false positive and caused by sampling error. The detection was not in a drinking water sample and there was no risk to drinking water. The Section 22 was reported in error. Internal procedures have been updated to improve reporting protocols.

## Section 18 incidents

The objective of Section 18 of the *Safe Drinking Water Act 2003* is to indicate where drinking water has not complied with drinking water quality standards. Wannon Water must inform the DHHS when drinking water does not or is not likely to comply with any relevant water quality standard. Information relating to all Section 18 incidents during 2018/19 is listed in Table 7-2.

**Table 7-2 – Section 18 incidents 2018/19**

Date (and duration) of incident	Location of incident	Nature of incident	Potentially affected/ affected drinking water supplies	Actions taken in response to incident
7/11/2018, 6/02/2019 (2 single days)	Cavendish reticulation	THM results exceeded the ADWG health guideline values on two occasions	Cavendish	<ul style="list-style-type: none"> <li>Install UVT and actuated valve at head of Cavendish plant to improve selective harvesting of source water. This has been purchased and waiting for Cultural Heritage approval for installation.</li> <li>Improved UV cleaning program.</li> <li>Increased flushing in Cavendish reticulation.</li> <li>Allocated funds in Pricing Submission for plant upgrades.</li> </ul>

## Other incidents

Wannon Water communicates other water quality-related events to DHHS. Information relating to those which occurred during 2018/19 is listed in Table 7-3.

**Table 7-3 – Other incidents 2018/19**

Date (and duration) of incident	Location of incident	Nature of incident	Potentially affected/ affected drinking water supplies	Actions taken in response to incident
6/08/2018 (3 days)	Warrnambool WTP	Fluoride dosing offline >72 hours	Warrnambool, Koroit and Allansford	A small leak was identified in the fluoride dosing system at the Warrnambool WTP. Maintenance of the system was required with gaskets replaced and the flow meter cleaned which resulted in fluoride dosing being offline for 118 hours.

## Customer complaints

Wannon Water is actively committed to the successful and efficient management of complaints and disputes to ensure effective customer service and satisfaction levels.

Wannon Water adopts the ESC definition of a complaint as 'any customer contact with respect to water quality'.

The collection, processing and reporting of Wannon Water's complaints is managed through a customer relationship database, allowing Wannon Water to meet its obligations under the Customer Service Code issued by the Essential Services Commissions reporting principles. This is also supported by Wannon Water's Customer Charter.

All customer complaints are investigated to determine the cause and significance of the complaint. Operational changes or capital improvements which optimise treated water quality may be implemented in response to valid and significant customer complaints.

In response to a complaint, customers are contacted directly and a site/vicinity inspection conducted. Appropriate action is then taken. This action will vary depending on the nature of the complaint.

Multiple complaints from a single locality are monitored closely. If the number of complaints within the locality exceeds 10 in any 24-hour period, an incident response team is assembled to investigate the event. Appropriate actions are then taken using the AIIMS structure and Wannon Water's Emergency Management Plan.

The total number of complaints for 2018/19 was lower than previous years due to widespread algae-related taste and odour issues in 2017/18. A summary of the types of complaints received is presented in Table 7-4, with all localities recording less than one complaint per 100 customers.

**Table 7-4 – Types of complaints compared to previous years**

Type of complaint <sup>^</sup>	2018/19	2017/18	2016/17	Comparison with previous reporting periods	Comments
Alleged illness <sup>#</sup>	10	4	6	No significant change	
Coloured water	83	90	96	No significant change	
Other	10	9	11	No significant change	
Taste/odour	46	103	39	Decrease of 57 complaints from previous reporting period	60 due to Warrnambool algae issues in March 2018

<sup>^</sup> for the purposes of the complaints section, the term "customer" has the same meaning as that used by the Essential Services Commission, that is a customer = a connection.

<sup>#</sup> alleged illness complaints include skin irritation.



**Table 7-5 – Types of complaints by locality**

Locality	Alleged Illness / Heath Effects	Coloured Water	General WQ Complaint	Other	Taste/Odour	Total complaints
Allansford	0	1	0	0	0	1
Camperdown	0	3	0	0	1	4
Camperdown Rural	1	1	0	1	1	4
Casterton	0	2	0	0	0	2
Cavendish	0	0	0	0	0	0
Cobden Urban	0	2	0	0	2	4
Cobden	1	0	0	1	0	2
Coleraine	0	0	0	2	0	2
Dartmoor	0	0	0	1	0	1
Dunkeld	1	1	0	0	0	2
Glenthompson	0	0	0	0	0	0
Hamilton	2	14	0	1	3	20
Heywood	0	5	0	0	0	5
Koroit	0	2	0	0	1	3
Lismore and Derrinallum	0	8	0	2	1	11
Merino	0	1	0	0	1	2
Mortlake	0	6	0	0	1	7
Noorat & Glenormiston	1	2	0	0	0	3
Penshurst	0	0	0	0	0	0
Peterborough	0	5	0	1	2	8
Port Campbell	0	1	0	0	0	1
Port Fairy	1	7	0	0	3	11
Portland	1	4	0	0	7	12
Purnim	0	0	0	0	3	3
Simpson	0	0	0	0	1	1
Terang	0	0	0	0	0	0
Timboon	0	0	0	0	0	0
Warrnambool	2	18	0	1	19	40

Wannon Water continued to maintain its proactive approach to customer complaints by continuing to:

- Allocate specific resources to trouble-shoot hot spot townships identified in the 2018/19 period.
- Maintain resourcing to meet the scheduled flushing program for each of Wannon Water's localities.
- Take a proactive approach by the Operations Branch to quality trend variances.

### Hot spot townships

The Port Fairy township was systematically flushed and had a sequestering agent added to the water just prior to Christmas to clean the reticulation before the tourist season. These activities kept the number of customer complaints in this locality low compared to previous years.

Cavendish township has had persistent issues with disinfection by-product formation due to colour and organic matter in the raw water supply. Historically Wannon Water has managed disinfection by-product

formation at Cavendish by using chloramination, but following two separate detections of E. coli in 2017, Wannon Water took actions to reduce disinfection by-products whilst not compromising disinfection. Those actions include cessation of ammonia addition as ammonia addition reduces the strength of disinfection; switching from sodium hypochlorite to gaseous chlorine; routinely optimising the UV system; allowing reduced chlorine when effective; selectively harvesting raw water to obtain higher quality water with lower organics; and increased routine flushing of the township's reticulation network.

Seasonal Blue Green Algae producing taste and odour compounds affecting multiple raw water storages caused an increase in customer complaints in the Warrnambool region over the summer months due to the inability to remove such compounds at the Warrnambool WTP. Highly impacted raw water storages were isolated to manage the algae blooms while raw water was selectively harvested from other storages in an attempt to reduce customer dissatisfaction. Customers were kept informed via local media sources.

## 8. GLOSSARY

Adsorption	Process to remove dissolved organic matter, particles, algal toxins and compounds causing taste and odour problems. Granulated activated carbon (GAC) is used for adsorption at Wannon Water.
ADWG	Australian Drinking Water Guidelines (2011)
AIIMS	Australian Inter-Service Incidents Management System
BGA	Blue Green Algae
Dissolved Air Flotation (DAF)	Treatment process for coarse removal of particles through air flotation
DHHS	Department of Health and Human Services Victoria
DP	Disinfection Plant
CCP	Critical control point
Clarification	Two main primary solids removal processes are utilised; sedimentation and dissolved air flotation
Coagulation	Treatment to destabilise colloidal particles (turbidity and colour) by neutralising the surface charge of the particle to allow floc formation. Coagulants used at Wannon Water are ferric chloride, aluminium chlorohydrate (ACH) and aluminium sulphate (alum)
Cooling/ aeration towers	Treatment process which cools water via aeration.
Disinfection	Treatment process to kill bacteria and viruses. Note all drinking water supplied by Wannon Water is disinfected (chlorination, chloramination or UV disinfection) to ensure that microorganisms are eliminated. Chlorine gas, sodium hypochlorite, aqueous ammonia and UV are used for disinfection.
Filtration	Treatment process which remove suspended material by passing through a granular media such as sand.
Flocculation	Used to increase the floc size to enhance clarification and aid filtration. Flocculants used at Wannon Water include polyelectrolyte Nalco, Magnafloc, polymer Nalclex and polymer Klaraid.
Fluoridation	Treatment process to provide a dental health benefit. Fluorosilicic acid is used for fluoridation at Wannon Water.
HACCP	Hazard Analysis and Critical Control Point. A system that identifies evaluates and controls hazards.
Mean	The average of a number of numerical values.
ML	Megalitre – one million litres
NATA	National Association of Testing Authorities, Australia.
Oxidation	Process used to convert soluble contaminants to insoluble contaminants for easier removal. Sodium hypochlorite is used for oxidation at Wannon Water.
pH correction/ stabilisation	Treatment to adjust pH, to aid coagulation, to prevent corrosion or scaling and to optimise disinfection. Caustic soda, soda ash and hydrated lime are used for pH correction at Wannon Water.
Raw water	Water that has not been treated in any way.
Raw water detention	Clarification, via settling, microbial die-off and reducing variability in water quality.
Risk assessment	The overall process of risk identification, risk analysis and risk evaluation. Risk analysis the systematic process to understand the nature of and to deduce the level of risk. Risk evaluation the process of comparing the level of risk against risk criteria.
SDWA	<i>Safe Drinking Water Act 2003</i>
SDWR	Safe Drinking Water Regulations 2015

Sedimentation	Treatment process for coarse removal of particles through settling under gravity
Sequestration	Treatment process which involves the addition of sequestering agents to keeps dissolved iron and manganese from oxidising and precipitating. Calgon is used as a sequestering agent at Wannon Water.
WTP	Water Treatment Plant

Information regarding water treatment can be obtained from Wannon Water's web site:

[www.wannonwater.com.au](http://www.wannonwater.com.au)

Results for water quality parameters can be provided upon request from Wannon Water via:

Tel 1300 926 666

Fax 03 5565 6050

Email [info@wannonwater.com.au](mailto:info@wannonwater.com.au)

Address PO Box 1158 Warrnambool Vic 3280





Wannon Water  
PO Box 1158  
Warrnambool Vic 3280

Telephone 1300 926 666  
Email [info@wannonwater.com.au](mailto:info@wannonwater.com.au)

**[wannonwater.com.au](http://wannonwater.com.au)**

