

2013/14

# Water Quality ANNUAL REPORT



Prepared for: Department of Health  
(Water Program)

Dated: October 2014



*Cover photo (taken by Ian Bail) – A new “Quiet Place” was established in partnership with Gunditj Mirring Traditional Owners Aboriginal Corporation to acknowledge the indigenous cultural values associated with the site and to recognise the Fighting Waterholes Massacre” that occurred there in 1840. This photo was taken at Konongwootong Reservoir at the ceremony on 8 July 2014. The ceremony included a traditional dance, the planting of commemorative trees and a traditional smoking ceremony. The Quiet Place includes a walking track, interpretive signage and three stones designed to encourage visitor contemplation.*

The Quiet Place is the first component of the Master plan for Konongwootong Reservoir. The next component of the Master plan includes works to improve angling and recreational opportunities such as upgrading the angler parking and access to the boat launching area, creating an alternative access to the northern end of the reservoir, improved trails, seating and fishing platforms, including a floating pontoon. There will also be new picnicking facilities and an ecofriendly toilet. The area will also be revegetated.

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# I. INTRODUCTION

Wannon Water is committed to providing safe, reliable drinking water to South-west Victoria. Wannon Water provides water and water reclamation services to a population of approximately 82,941 people (100,000 during peak season) in South-west Victoria. 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 our customers within the limits of the *Safe Drinking Water Act 2003* and associated Regulations.

This 2013/14 Drinking Water Quality annual report has been developed in accordance with the requirements of the *Safe Drinking Water Act 2003*. 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 "customers tap". All samples collected are analysed by an independent laboratory certified by the National Association of Testing Authorities (NATA).

During 2013/14, Wannon Water continued to achieve a high level of compliance against the requirements of the *Safe Drinking Water Act 2003*.

The high standard of drinking water provided is reflected in customers' continued satisfaction with Wannon Water's performance. The 2014 customer satisfaction survey showed that 93% of domestic customers were satisfied or very satisfied with the performance of Wannon Water.

## 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 exists, then the Minister for Health will 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 2005*.

## Sources of Water

During 2013/14, 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 1,882 kilometres of water mains.

Wannon Water harvested approximately 11,360 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 instances, supply from another regional water corporation. This water is supplied to customers with varying degrees of treatment, dependent on the characteristics of the quality.

Table I-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 9 -1 illustrates the localities and where the water is sourced from.

Table I-1 - Source water and treatment systems summary

Water Sampling Locality	Source Water	Raw Water Storage	Treatment Plant	Number of customers <sup>1</sup>
Allansford - via Warrnambool Water Treatment Plant (WTP)	Arkins Creeks (3)	Gellibrand Tank	Warrnambool WTP	360
	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 Storage East		
		Warrnambool Storage West		
	Albert Park Bores (3)	Brierly Basin		
	Roof water (North Warrnambool)	Albert Park Raw Water Storage		
Balmoral	Rocklands Reservoir (Grampians Wimmera Mallee Water)	Balmoral Service Basin	Balmoral WTP	150
Camperdown (Rural)	Arkins Creeks (3)	Gellibrand Tank	Camperdown WTP	390
	Gellibrand River	Donald's Hill Reservoir		
	Carlisle Bores (2)			
	– via North Otway Pipeline			
Camperdown (Urban)	Arkins Creeks (3)	Gellibrand Tank	Camperdown WTP	1800
	Gellibrand River	Donald's Hill Reservoir		
	Carlisle Bores (2)			
	– via North Otway Pipeline			
Caramut	Caramut Bores (2)	Caramut Service Basin	Caramut DP	80
		Caramut Tank (Raw Water)		
Casterton	Tulich Bores (4)	N/A	Casterton WTP	990
Cavendish	Grampians National Park	Cavendish Service Basin	Cavendish Disinfection Plant	90
	7 streams on the western slopes of the Victoria Range and drought relief bores (2)			
Cobden	Arkins Creeks (3)	Gellibrand Tank	Cobden WTP	910
	Gellibrand River	Cobden Service Basin		
	Carlisle Bores (2)			
	– via North Otway Pipeline			
Coleraine - via Casterton WTP	Tulich Bores (4)	N/A	Casterton WTP	610
			Coleraine DP	
Darlington (Regulated Supply)	Darlington Bore (1)	Darlington Elevated Tank	Nil Treatment	20
Dartmoor	Dartmoor Bore (1)	N/A	Dartmoor DP	140
Derrinallum - via Camperdown WTP	Arkins Creeks (3)	Gellibrand Tank	Camperdown WTP	240 <sup>2</sup>
	Gellibrand River	Donald's Hill Reservoir	Ettrick's Springs DP	
	Carlisle Bores (2)		Lismore/Derrinallum Tank DP	
	– via North Otway Pipeline			
Dunkeld - via Hamilton WTP	Grampians National Park	Hayes Reservoir	Hamilton WTP	380
	7 streams on the western slopes of the Victoria Range and drought relief bores (2)	Cruckoor Reservoir	Dunkeld DP	
		Hartwichs Reservoir		
		Hamilton Service Basins 1 & 2		
	Grampians Wimmera Mallee Water (Rocklands Reservoir)			
Glenthompson	Yuppeckiar Creek Catchment and	Glenthompson Reservoir	Glenthompson WTP	130
	Grampians Wimmera Mallee Water (32ML supplementary purchase from	Railway Reservoir		

Water Sampling Locality	Source Water	Raw Water Storage	Treatment Plant	Number of customers <sup>1</sup>
	Willaura Catchment)			
Hamilton	Grampians National Park	Hayes Reservoir	Hamilton WTP	5380
	7 streams on the western slopes of the Victoria Range and drought relief bores (2)	Cruckoor Reservoir		
		Hartwicks Reservoir		
		Hamilton Service Basins 1 & 2		
	Grampians Wimmera Mallee Water (Rocklands Reservoir)			
Heywood	Heywood Bores (2)	N/A	Heywood WTP	760
Koroit - via Warrnambool WTP	Arkins Creeks (3)	Gellibrand Tank	Warrnambool WTP	760
	Gellibrand River	South Otway Tank	Illowa (Koroit) DP	
	Carlisle Bores (2)	Ewen’s Hill Reservoir		
	– via North Otway Pipeline	Plantation Rd Storage		
		Tank Hill Reservoir		
	Gellibrand River – South Otway Pipeline	Warrnambool Storage East		
		Warrnambool Storage West		
	Albert Park Bores (3)	Brierly Basin		
Roof water (North Warrnambool)	Albert Park Raw Water Storage			
Lismore - via Camperdown WTP	Arkins Creeks (3)	Gellibrand Tank	Camperdown WTP	240 <sup>2</sup>
	Gellibrand River	Donald’s Hill Reservoir	Ettrick’s Springs DP	
	Carlisle Bores (2)		Lismore/Derrinallum Tank DP	
	– via North Otway Pipeline			
Macarthur	Macarthur Bore	N/A	Macarthur WTP	180
Merino - via Casterton WTP	Tullich Bores - Bore Field (4)	N/A	Casterton WTP	180
			Merino DP	
Mortlake - via Terang WTP	Arkins Creeks (3)	Gellibrand Tank	Terang WTP	670
	Gellibrand River	Ewen’s Hill Reservoir	Mortlake DP	
	Carlisle Bores (2)	Absolom’s Bore Balance Tank		
	– via North Otway Pipeline			
	and Absolom’s Bore (2)			
Noorat/Glenormiston - via Terang WTP	Arkins Creeks (3)	Gellibrand Tank	Terang WTP	250
	Gellibrand River	Ewen’s Hill Reservoir		
	Carlisle Bores (2)			
	– via North Otway Pipeline			
Paaratte - via Port Campbell WTP	Port Campbell Bore (1)	N/A	Port Campbell WTP	30
Penshurst	Penshurst Bore (1)	N/A	Penshurst DP	320
Peterborough - via Port Campbell WTP	Port Campbell Bore (1)	N/A	Port Campbell WTP	350
Port Campbell	Port Campbell Bore (1)	N/A	Port Campbell WTP	300
Port Fairy	Port Fairy Bores (2)	N/A	Port Fairy WTP	2280
Portland	Wyatt Street Bore (1)	N/A	Portland Wyatt St WTP	5760
	Bald Hill Bores (2)		Portland Bald Hill WTP	
Purnim	Arkins Creeks (3)	Gellibrand Tank	Purnim DP	90
	Gellibrand River	Ewen’s Hill Reservoir		
	Carlisle Bores (2)	Tank Hill Reservoir		

Water Sampling Locality	Source Water	Raw Water Storage	Treatment Plant	Number of customers <sup>1</sup>
	– via North Otway Pipeline	Purnim Raw Water Tank		
Sandford - via Casterton WTP	Tullich Bores - (4)	N/A	Casterton WTP	90
Simpson	Arkins Creeks (3)	Gellibrand Tank	Simpson WTP	110
	Gellibrand River	Simpson Service Basin		
	Carlisle Bores (2)			
	– via North Otway Pipeline			
Tarrington - via Hamilton WTP	Grampians National Park	Hayes Reservoir	Hamilton WTP	160
	7 streams on the western slopes of the Victoria Range and drought relief bores (2)	Cruckoor Reservoir		
		Hartwich’s Reservoir		
		Grampians Wimmera Mallee Water (Rocklands Reservoir)		
Terang	Arkins Creeks (3)	Gellibrand Tank	Terang WTP	1090
	Gellibrand River	Ewen’s Hill Reservoir		
	Carlisle Bores (2)			
	– via North Otway Pipeline			
Timboon - via Port Campbell WTP	Port Campbell Bore (1)	N/A	Port Campbell WTP	600
Warrnambool	Arkins Creeks (3)	Gellibrand Tank	Warrnambool WTP	15540
	Gellibrand River	South Otway Tank		
	Carlisle Bores (2)	Ewen’s Hill Reservoir		
	– via North Otway Pipeline	Plantation Rd Storage		
		Tank Hill Reservoir		
	Gellibrand River – South Otway Pipeline	Warrnambool Storage East		
		Warrnambool Storage West		
	Albert Park Bores (3)	Brierly Basin		
Roof water (North Warrnambool)	Albert Park Raw Water Storage			

N/A not applicable

<sup>1</sup> The figure used is the number of connections<sup>2</sup> Assumption of a 50% customer split (Lismore and Derrinallum customers 480)



## 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 Standards

The Safe Drinking Water Regulations 2005 specify the water quality standards and the frequency at which they will be sampled. A brief explanation of the mandated 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. The water quality standard for *E. coli* is zero organisms per 100mL in 98% of samples collected within the locality in any 12 month period.

**Chlorine Based Disinfection By-Product Chemicals** - are compounds which form when chlorine reacts with naturally-occurring organic matter in the water supply. The most significant disinfection by-products are trihalomethanes (THMs), chloroacetic acid, dichloroacetic acid and trichloroacetic acid. The standard limits for THMs, chloroacetic acid, dichloroacetic acid and trichloroacetic acid are 0.25 mg/L, 0.15 mg/L, 0.10 mg/L and 0.10 mg/L, respectively.

**Aluminium** - may be present naturally in waters through leaching from soil and rocks. It may also be present through the addition of aluminium-based coagulants used for water treatment, such as aluminium sulphate. The standard limit for aluminium is 0.2 mg/L (acid soluble).

**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). Based on aesthetic considerations, the standard is defined as the 95% upper confidence limit of the mean of samples of drinking water collected in a 12 month period must be less than or equal to 5.0 NTU.

Wannon Water also 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 to remediate the problem. There are no undertakings in place and Wannon Water did not apply for any undertakings in 2013/14.

### Variation to Aesthetic Standards

No variations under section 19 or 21 of the Act were sought.

### Exemptions from water quality 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.

There is naturally occurring aluminium in the Cavendish supply, which does not pose a risk to public health. Consultation was undertaken with Cavendish customers, and an exemption from complying with the aluminium water quality standard was granted by the Minister on 30 June 2013; the exemption applies until 30 June 2018.

### 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 450.

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.

### Non-potable supplies

Nine of the 34 systems 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. 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 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**

A regulatory audit was required between 1 September 2013 and 30 April 2014. Wannon Water conducted its audit in November 2013. The audit covered the period from December 2011 to the date of the audit. The audit was carried out by Frank Kiss of KISS Water Quality.

The audit found that Wannon Water complied with the obligations imposed by the Safe Drinking Water Act 2003 (refer to certificate page 11). No non-conformances were identified in the audit.



ABN: 97006400000

## Schedule 1

Regulation 8

Safe Drinking Water Regulations 2005

### RISK MANAGEMENT PLAN AUDIT CERTIFICATE

Certificate Number: 78

Audit period: 29 August 2011 to 11 November 2013

To: Mr Leon de Villiers, Manager Risk Services  
Wannon Region Water Corporation,  
25 Gateway Road, Warrnambool, VIC., 3280

Australian Business Number (ABN): 94 007 404 851

I, *Frank Kiss*, after conducting a risk management plan audit of the water supplied by *Wannon Region Water Corporation*, am of the opinion that—

*Wannon Region Water Corporation* has complied with the obligations imposed by section 8(1) of the *Safe Drinking Water Act 2003* during the audit period.

A handwritten signature in black ink, appearing to read 'Frank Kiss'.

Signature of approved auditor:

Date: 17 December 2013

## 4. WATER TREATMENT

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

Some of the processes incorporated in treating water include:

- Raw water detention – clarification, via settling, microbial die-off and reducing variability in water quality.
- Oxidation - used to convert soluble contaminants to insoluble contaminants for easier removal. Sodium hypochlorite is used for oxidation.
- Coagulation - to destabilise colloidal particles (turbidity and colour) by neutralising the surface charge of the particle to allow floc formation. Coagulants used are ferric chloride, aluminium chlorohydrate (ACH) and aluminium sulphate (alum)
- Flocculation - to increase the floc size to enhance clarification and aid filtration. Flocculants used include polyelectrolyte Nalco, Magnafloc, polymer Nalclear and polymer Klaraid.
- Cooling/ aeration towers – cool water via aeration.
- Clarification - two main primary solids removal processes are utilised;
- Sedimentation for coarse removal of particles through settling under gravity;
- Dissolved Air Flotation (DAF) for coarse removal of particles through air flotation;
- Filtration - remove suspended material;
- Adsorption - remove dissolved organic matter, particles, algal toxins and compounds causing taste and odour problems. Granulated activated carbon (GAC) is used for adsorption.
- Sequestration - involves the addition of sequestering agents to keeps dissolved iron and manganese from oxidising and precipitating. Calgon is used as a sequestering agent.
- Disinfection - to kill bacteria and viruses. Note all drinking water supplied by Wannon Water is disinfected (chlorination or chloramination) to ensure that microorganisms are eliminated. Chlorine gas, sodium hypochlorite and aqueous ammonia are used for disinfection.
- pH correction/ stabilisation - 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.
- Fluoridation – for dental health benefits. Fluorosilicic acid is used for fluoridation.
- Storage - to provide adequate contact time for effective disinfection.

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

The water treatment processes employed during 2013/14 were similar to 2012/13. Changes and improvements to the system are outlined in Section 5.



Table 4-1 - Treatment Processes and Added Substances 2013/14

Plants	Raw Water Detention	Cooling / aeration towers	Upstream Water Treatment Plant	pH Adjust				Coagulation		Flocculation			Clarification		Filtration	Adsorption		Sequestration	Disinfection				pH Adjust				Fluoridisation	Clear Water Storage	
				Pre-Chlorination Sodium Hypo	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	Activated Carbon	Calgon	Chlorine gas	Sodium hypochlorite	Aqueous ammonia	UV	Caustic soda			Soda Ash
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	✓																				✓		✓						✓
Sandford			✓																		✓	✓							✓
Simpson	✓				✓					✓						✓	✓			✓	✓			✓					✓
Tank Hill	✓																			✓	✓			✓					✓
Terang	✓				✓					✓				✓	✓		✓			✓	✓				✓				✓
Warrnambool	✓								✓	✓	✓				✓	✓	✓			✓	✓				✓		✓	✓	✓

\*Pressure filters plus iron sorption filters

## Legend

	Raw Water
	Oxidation
	Coagulation, Flocculation and Clarification
	Filtration
	Sequestration
	Disinfection
	Fluoridation
	Treated Water Storage

## 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 2013/14 this included:

- Internal auditor training
- Certification III and IV in Water Industry Operations
- Attendance at Water Industry Operators Association (WIOA) Conference (Victoria, New South Wales and Queensland)
- Oz Water Conference
- Attendance at Victorian Drinking Water Network meetings
- Attendance at the AWA Catchment Management for Water Quality Seminar
- Attendance at the Department of Health Rainwater Tank Seminar

### Distribution System

#### Flushing Program

Wannon Water has a regular 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.

Wannon Water uses flushing 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.

#### Air Scouring Program

Wannon Water utilises contractors to conduct air scouring on a regular basis. Frequency of air scouring is risk based. Localities where air scouring occurred in 2013/14 included:

- Casterton
- Cavendish
- Glenthompson
- Merino
- Port Fairy
- Sandford

### Tank Cleaning Program

Wannon Water utilises contractors on a regular basis to inspect and clean tanks within the distribution system and storages at water treatment plants. In 2013/14

- Inspections occurred at:
  - Hamilton clear water storage
  - Portland clear water storage
  - Warrnambool clear water storage
- Cleaning occurred at:
  - Cavendish clear water storage
  - Dunkeld clear water storage
  - Glenthompson clear water storage
  - Heywood clear water storage

### Water Treatment Plant Changes and Improvements

#### Cobden WTP and Terang WTP

Filters were covered in at both the Cobden WTP and Terang WTP improving the performance at both locations.

#### Ettrick Springs DP

The disinfection process was altered from sodium hypochlorite to chlorine gas. This is discussed further under the section entitled pH – Compliance Summary.

#### Conversion of chloraminated systems

Wannon Water continued its program to reduce ammonia exceedances. The process involved converting chloraminated systems back to chlorinated systems by cessation of ammonia dosing. The Systems included Camperdown and Hamilton, which include the localities of Camperdown, Lismore, Derrinallum, Hamilton, Dunkeld and Tarrington. The program of works resulted in long term changes to the disinfection modes in some localities. The Camperdown System, which includes Lismore and Derrinallum, remained as chlorinated systems at the end of the reporting period. The conversion successfully removed biofilms from the system resulting in reduced ammonia levels and compliance being achieved.

NOTE: Ammonia is added to systems for two principle reasons: it reduces the amount of disinfection by-products (Schedule 2 parameters) in systems which have high organics in their source water; and it helps maintain chlorine residual in long systems/mains.

#### Isolation of storages

During 2013/14 internal trigger levels for Blue Green Algae were exceeded at Ewen's Hill Reservoir Terang, which also supplies Noorat/Glenormiston and Mortlake and Simpson raw water storage. These storages were isolated from the system via bypass and directly fed by source water until the blooms subsided. Simpson raw water storage was dosed with copper sulphate as the biomass was causing operational issues for the Simpson WTP.

## 6. DRINKING WATER QUALITY RESULTS 2012/13

### Sampling Frequency

The frequency of sampling of the water quality standards (*Escherichia coli*, disinfection by-products, aluminium and turbidity) is specified in Schedule 2 of the Safe Drinking Water Regulations 2005. Wannon Water uses its risk assessment process to select an appropriate sampling frequency for additional microbiological, chemical, physical, radiological and algal monitoring.

Regulation 11 of the Safe Drinking Water Regulations 2005 (the Regulations) provides that the Secretary to the Department of Health may, by notice published in the Government Gazette, vary the frequencies specified in Schedule 2 of the Regulations at which samples of drinking water are to be collected at a water sampling point located within a water sampling locality. On 5 June 2009 the Secretary approved a variation to the frequency at which a sample of drinking water for *Escherichia coli* (*E.coli*) and turbidity were to be collected at the localities where the population was greater than 5000:

- Port Fairy – from 1 sample per week to 2 samples per week
- Portland – from 1 sample per week to 2 samples per week
- Hamilton – from 1 sample per week to 2 samples per week
- Warrnambool – from 1 sample per week to 3 samples per week

### 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 are collected representative of the supply system. The sampling program is reviewed on a regular basis to align with changes in the risk profile of each locality.

During 2013/14 Wannon Water performed over 41,000 individual tests. Approximately 63% of the tests were sampled at customer's taps within 34 localities.

With the exception of Schedule 2 parameters, where weekly samples are collected, a total number of 51 samples are collected in the reporting period, as a reduced sampling program is utilised during Christmas week.

On occasion, scheduled testing will be missed for various reasons, such as human error, broken or missing sample bottles or the sample point being out of action (e.g. bore not operational at time of sampling). Any missed regulatory

samples are communicated to the Department of Health at the time.

### 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:

- **orgs/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 (\*).

**Missing tests** – All missing tests are marked with the hash symbol (#) within the report and due to reasons stated under Testing Programs.

**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".

**Weekly testing** – All tests marked with a "W" are tested weekly, except during Christmas week.

**Aesthetic exceedance** – All tests marked with "A<sup>x</sup>" are aesthetic exceedance, "x" indicating the number of exceedances.

**Thermal bores only** – All tests marked with an "H" are conducted at localities with thermal bore/s only, namely Heywood, Port Campbell, Port Fairy and Portland.

**Escherichia coli (E. coli)**

**Standard** At least 98% of all samples of drinking water collected within a locality in any 12 month period to contain no *E. coli* (SDWR).

Table 6-1 *E. coli* results by locality 2013/14

<b>E.coli</b>						
Locality	Sampling Frequency	No. of Samples	No. of Non complying samples	% samples with no E.coli	Max result (orgs/100ml)	Compliant (Yes/No)
ALLANSFORD	Weekly	52	0	100.0	0	Yes
BALMORAL	Weekly	52	0	100.0	0	Yes
CAMPERDOWN (RURAL)	Weekly	52	0	100.0	0	Yes
CAMPERDOWN (URBAN)	Weekly	52	1	98.1	4	Yes
CARAMUT	Weekly	52	0	100.0	0	Yes
CASTERTON	Weekly	52	0	100.0	0	Yes
CAVENDISH	Weekly	52	0	100.0	0	Yes
COBDEN	Weekly	52	0	100.0	0	Yes
COLERAINE	Weekly	52	0	100.0	0	Yes
DARTMOOR	Weekly	52	0	100.0	0	Yes
DERRINALUM	Weekly	52	0	100.0	0	Yes
DUNKELD	Weekly	52	0	100.0	0	Yes
GLENTHOMPSON	Weekly	52	0	100.0	0	Yes
HAMILTON	Weekly*	104	0	100.0	0	Yes
HEYWOOD	Weekly	52	1	98.1	1	Yes
KOROIT	Weekly	52	0	100.0	0	Yes
LISMORE	Weekly	52	0	100.0	0	Yes
MACARTHUR	Weekly	52	0	100.0	0	Yes
MERINO	Weekly	52	0	100.0	0	Yes
MORTLAKE	Weekly	52	0	100.0	0	Yes
NOORAT/GLENORMISTON	Weekly	52	0	100.0	0	Yes
PAARATTE	Weekly	52	0	100.0	0	Yes
PENSHURST	Weekly	52	0	100.0	0	Yes
PETERBOROUGH	Weekly	52	0	100.0	0	Yes
PORT CAMPBELL	Weekly	52	0	100.0	0	Yes
PORT FAIRY	Weekly*	104	0	100.0	0	Yes
PORTLAND	Weekly*	104	0	100.0	0	Yes
PURNIM	Weekly	52	0	100.0	0	Yes
SANDFORD	Weekly	52	0	100.0	0	Yes
SIMPSON	Weekly	52	0	100.0	0	Yes
TARRINGTON	Weekly	52	1	98.1	1	Yes
TERANG	Weekly	52	0	100.0	0	Yes
TIMBOON	Weekly	52	0	100.0	0	Yes
WARRNAMBOOL	Weekly*	156	0	100.0	0	Yes

\* Weekly sampling with increases for population (ADWG, Section 9.5.2)



## Chlorine-based Disinfection By-Product Chemicals

### Compliance – Trihalomethanes Results

**Standard** All samples of drinking water collected within a locality in any 12 month period must not exceed 0.25 mg/L (SDWR)

Table 6-2 Trihalomethanes results by locality 2013/14

I - For total trihalomethanes, if the maximum result is 0.255mg/L or greater, then the locality is non-compliant

#### Trihalomethanes

Locality	Sampling Frequency	No. of Samples	No. of Non complying samples	Maximum result (mg/L)	Compliant (Yes/No)
ALLANSFORD	Monthly	12	0	0.100	Yes
BALMORAL	Monthly	12	0	0.160	Yes
CAMPERDOWN (RURAL)	Monthly	12	0	0.070	Yes
CAMPERDOWN (URBAN)	Monthly	12	0	0.057	Yes
CARAMUT	Monthly	12	0	0.037	Yes
CASTERTON	Monthly	12	0	0.160	Yes
CAVENDISH	Monthly	12	0	0.063	Yes
COBDEN	Monthly	12	0	0.082	Yes
COLERAINE	Monthly	12	0	0.230	Yes
DARTMOOR	Monthly	12	0	0.005	Yes
DERRINALLUM	Monthly	12	0	0.140	Yes
DUNKELD	Monthly	12	0	0.220	Yes
GLENTHOMPSON	Monthly	12	1	0.280	No
HAMILTON	Monthly	12	0	0.190	Yes
HEYWOOD	Monthly	12	0	0.019	Yes
KOROIT	Monthly	12	0	0.110	Yes
LISMORE	Monthly	12	0	0.120	Yes
MACARTHUR	Monthly	12	0	0.041	Yes
MERINO	Monthly	12	0	0.160	Yes
MORTLAKE	Monthly	12	0	0.140	Yes
NOORAT/GLENORMISTON	Monthly	12	0	0.180	Yes
PAARATTE	Monthly	12	0	0.011	Yes
PENSHURST	Monthly	12	0	0.033	Yes
PETERBOROUGH	Monthly	12	0	0.017	Yes
PORT CAMPBELL	Monthly	12	0	0.020	Yes
PORT FAIRY	Monthly	12	0	<0.001	Yes
PORTLAND	Monthly	12	0	0.001	Yes
PURNIM	Monthly	12	0	0.150	Yes
SANDFORD	Monthly	12	0	0.180	Yes
SIMPSON	Monthly	12	0	0.061	Yes
TARRINGTON	Monthly	12	0	0.170	Yes
TERANG	Monthly	12	0	0.140	Yes
TIMBOON	Monthly	12	0	0.068	Yes
WARRNAMBOOL	Monthly	12	0	0.089	Yes

### Non Compliance Regarding Trihalomethanes

The Glenthompson water sampling locality experienced a single non-conformance (Figure 6-1). This was a result of the conversion from a chloraminated supply to chlorination as discussed in Section 5 and was quickly rectified by converting the Glenthompson Water Treatment Plant back to a chloramination dosing system. This non-compliance did not create any risk to public health.

Maximum result for Trihalomethanes is 0.25 mg/L or greater (red line)

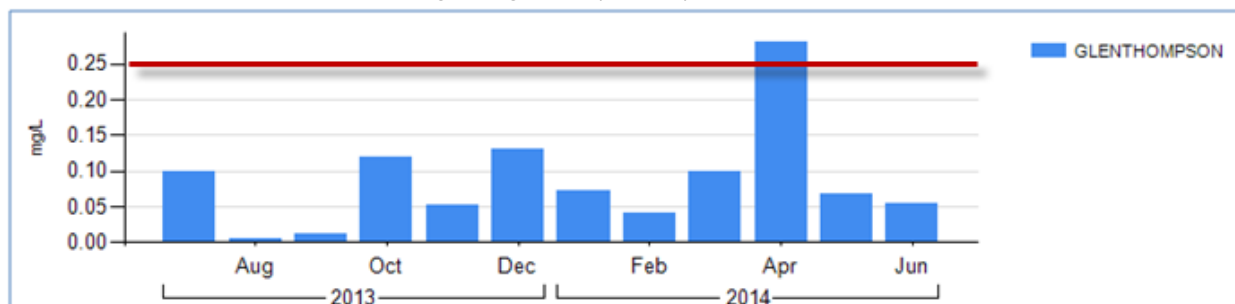


Figure 6-1- Glenthompson Trihalomethanes 2013/14

## Compliance – Chloroacetic Acid Results

**Standard** All samples of drinking water collected within a locality in any 12 month period must not exceed 0.15 mg/L (SDWR)

Table 6-3 Chloroacetic acid results by locality 2013/14

### Chloroacetic Acid

Locality	Sampling Frequency	No. of Samples	No. of Non complying samples	Maximum result (mg/L)	Compliant (Yes/No) <sup>1</sup>
ALLANSFORD	Monthly	12	0	<0.002	Yes
BALMORAL	Monthly	12	0	<0.002	Yes
CAMPERDOWN (RURAL)	Monthly	12	0	<0.002	Yes
CAMPERDOWN (URBAN)	Monthly	12	0	<0.002	Yes
CARAMUT	Monthly	12	0	<0.002	Yes
CASTERTON	Monthly	12	0	<0.002	Yes
CAVENDISH	Monthly	12	0	0.019	Yes
COBDEN	Monthly	12	0	<0.002	Yes
COLERAINE	Monthly	12	0	<0.002	Yes
DARTMOOR	Monthly	12	0	<0.002	Yes
DERRINALLUM	Monthly	12	0	<0.002	Yes
DUNKELD	Monthly	12	0	<0.002	Yes
GLENTHOMPSON	Monthly	12	0	0.005	Yes
HAMILTON	Monthly	12	0	0.003	Yes
HEYWOOD	Monthly	12	0	<0.002	Yes
KOROIT	Monthly	12	0	<0.002	Yes
LISMORE	Monthly	12	0	<0.002	Yes
MACARTHUR	Monthly	12	0	<0.002	Yes
MERINO	Monthly	12	0	<0.002	Yes
MORTLAKE	Monthly	12	0	0.003	Yes
NOORAT/GLENORMISTON	Monthly	12	0	<0.002	Yes
PAARATTE	Monthly	12	0	<0.002	Yes
PENSHURST	Monthly	12	0	<0.002	Yes
PETERBOROUGH	Monthly	12	0	<0.002	Yes
PORT CAMPBELL	Monthly	12	0	<0.002	Yes
PORT FAIRY	Monthly	12	0	<0.002	Yes
PORTLAND	Monthly	12	0	<0.002	Yes
PURNIM	Monthly	12	0	<0.002	Yes
SANDFORD	Monthly	12	0	<0.002	Yes
SIMPSON	Monthly	12	0	<0.002	Yes
TARRINGTON	Monthly	12	0	<0.002	Yes
TERANG	Monthly	12	0	<0.002	Yes
TIMBOON	Monthly	12	0	<0.002	Yes
WARRNAMBOOL	Monthly	12	0	<0.002	Yes

<sup>1</sup> - For chloroacetic acid, if the maximum result is 0.155mg/L or greater, then the locality is non-compliant

## Compliance – Dichloroacetic Acid Results

**Standard** All samples of drinking water collected within a locality in any 12 month period must not exceed 0.10 mg/L (SDWR)

Table 6-4 Dichloroacetic acid results by locality 2013/14

### Dichloroacetic Acid

Locality	Sampling Frequency	No. of Samples	No. of Non complying samples	Maximum result (mg/L)	Compliant (Yes/No) <sup>1</sup>
ALLANSFORD	Monthly	12	0	0.017	Yes
BALMORAL	Monthly	12	0	0.019	Yes
CAMPERDOWN (RURAL)	Monthly	12	0	0.008	Yes
CAMPERDOWN (URBAN)	Monthly	12	0	0.010	Yes
CARAMUT	Monthly	12	0	<0.002	Yes
CASTERTON	Monthly	12	0	0.015	Yes
CAVENDISH	Monthly	12	0	0.064	Yes
COBDEN	Monthly	12	0	0.017	Yes
COLERAINE	Monthly	12	0	0.020	Yes
DARTMOOR	Monthly	12	0	<0.002	Yes
DERRINALLUM	Monthly	12	0	0.021	Yes
DUNKELD	Monthly	12	0	0.017	Yes
GLENTHOMPSON	Monthly	12	0	0.030	Yes
HAMILTON	Monthly	12	0	0.030	Yes
HEYWOOD	Monthly	12	0	<0.002	Yes
KOROIT	Monthly	12	0	0.009	Yes
LISMORE	Monthly	12	0	0.008	Yes
MACARTHUR	Monthly	12	0	<0.002	Yes
MERINO	Monthly	12	0	0.017	Yes
MORTLAKE	Monthly	12	0	0.033	Yes
NOORAT/GLENORMISTON	Monthly	12	0	0.032	Yes
PAARATTE	Monthly	12	0	<0.002	Yes
PENSHURST	Monthly	12	0	<0.002	Yes
PETERBOROUGH	Monthly	12	0	<0.002	Yes
PORT CAMPBELL	Monthly	12	0	<0.002	Yes
PORT FAIRY	Monthly	12	0	<0.002	Yes
PORTLAND	Monthly	12	0	<0.002	Yes
PURNIM	Monthly	12	0	0.025	Yes
SANDFORD	Monthly	12	0	0.016	Yes
SIMPSON	Monthly	12	0	0.011	Yes
TARRINGTON	Monthly	12	0	0.003	Yes
TERANG	Monthly	12	0	0.024	Yes
TIMBOON	Monthly	12	0	<0.002	Yes
WARRNAMBOOL	Monthly	12	0	0.018	Yes

<sup>1</sup> - For dichloroacetic acid, if the maximum result is 0.145mg/L or greater, then the locality is non-compliant

## Compliance – Trichloroacetic Acid Results

**Standard** All samples of drinking water collected within a locality in any 12 month period must not exceed 0.10 mg/L (SDWR)

Table 6-5 Trichloroacetic acid results by locality 2013/14

### Trichloroacetic Acid

Locality	Sampling Frequency	No. of Samples	No. of Non complying samples	Maximum result (mg/L)	Compliant (Yes/No) <sup>1</sup>
ALLANSFORD	Monthly	12	0	0.030	Yes
BALMORAL	Monthly	12	0	0.004	Yes
CAMPERDOWN (RURAL)	Monthly	12	0	0.007	Yes
CAMPERDOWN (URBAN)	Monthly	12	0	0.008	Yes
CARAMUT	Monthly	12	0	<0.002	Yes
CASTERTON	Monthly	12	0	0.007	Yes
CAVENDISH	Monthly	12	0	0.015	Yes
COBDEN	Monthly	12	0	0.017	Yes
COLERAINE	Monthly	12	0	0.013	Yes
DARTMOOR	Monthly	12	0	<0.002	Yes
DERRINALLUM	Monthly	12	0	0.019	Yes
DUNKELD	Monthly	12	0	0.020	Yes
GLENTHOMPSON	Monthly	12	0	0.009	Yes
HAMILTON	Monthly	12	0	0.022	Yes
HEYWOOD	Monthly	12	0	<0.002	Yes
KOROIT	Monthly	12	0	0.032	Yes
LISMORE	Monthly	12	0	0.011	Yes
MACARTHUR	Monthly	12	0	<0.002	Yes
MERINO	Monthly	12	0	0.012	Yes
MORTLAKE	Monthly	12	0	0.052	Yes
NOORAT/GLENORMISTON	Monthly	12	0	0.048	Yes
PAARATTE	Monthly	12	0	<0.002	Yes
PENSHURST	Monthly	12	0	<0.002	Yes
PETERBOROUGH	Monthly	12	0	<0.002	Yes
PORT CAMPBELL	Monthly	12	0	<0.002	Yes
PORT FAIRY	Monthly	12	0	<0.002	Yes
PORTLAND	Monthly	12	0	<0.002	Yes
PURNIM	Monthly	12	0	0.039	Yes
SANDFORD	Monthly	12	0	0.011	Yes
SIMPSON	Monthly	12	0	0.008	Yes
TARRINGTON	Monthly	12	0	0.004	Yes
TERANG	Monthly	12	0	0.043	Yes
TIMBOON	Monthly	12	0	<0.002	Yes
WARRNAMBOOL	Monthly	12	0	0.018	Yes

<sup>1</sup> - For trichloroacetic acid, if the maximum result is 0.145mg/L or greater, then the locality is non-compliant

## **Ozone-based Disinfection By-Product Chemicals**

Wannon Water does not use ozone in any treatment or disinfection plants. All the raw waters are sourced from surface and groundwater that have not been pre-treated with ozone.

The ADWG states “Bromate is a possible by-product of disinfection using ozone, otherwise unlikely to be found in drinking water”. Based on this information Wannon Water considers the risk of bromate low and did not sample for it during 2013/14.

Another disinfection by-product of ozone is formaldehyde. Formaldehyde may also enter a drinking water supply via deposition from the atmosphere or via industry spills. Wannon Water’s risk assessments have not identified any industries that utilise formaldehyde within the catchments. Wannon Water undertook base line formaldehyde monitoring in 2006/07 with all results returning less than the analytical detection limit. Based on this information Wannon Water considers the risk of formaldehyde low and did not sample for it during 2013/14.

## Aluminium

**Standard** All samples of drinking water collected within a locality in any 12 month period must not exceed 0.2 mg/L (Acid Soluble) (SDWR)

Table 6-6 Aluminium results by locality 2013/14

### Aluminium (Acid Soluble)

Locality	Sampling Frequency	No. of Samples	No. of Non complying samples	Maximum result (mg/L)	Compliant (Yes/No)
ALLANSFORD	Monthly	12	0	0.11	Yes
BALMORAL	Monthly	12	0	0.12	Yes
CAMPERDOWN (RURAL)	Monthly	12	0	0.04	Yes
CAMPERDOWN (URBAN)	Monthly	12	0	0.05	Yes
COBDEN	Monthly	12	1	0.30	No
DERRINALLUM	Monthly	12	0	0.04	Yes
DUNKELD	Monthly	12	0	0.10	Yes
GLENTHOMPSON	Monthly	12	0	0.12	Yes
HAMILTON	Monthly	12	0	0.10	Yes
KOROIT	Monthly	12	0	0.15	Yes
LISMORE	Monthly	13	0	0.04	Yes
MORTLAKE	Monthly	12	0	0.03	Yes
NOORAT/GLENORMISTON	Monthly	12	0	0.05	Yes
SIMPSON	Monthly	12	1	0.28	No
TARRINGTON	Monthly	12	0	0.08	Yes
TERANG	Monthly	12	0	0.13	Yes
WARRNAMBOOL	Monthly	12	1	0.30	No

If the maximum result for acid-soluble aluminium is 0.25 mg/L or greater, then the locality is non-compliant.

- Supplies not utilising aluminium compounds in the water treatment process are not required to be sampled as part of the regulatory requirement.

Wannon Water's risk assessment identified that acid soluble aluminium should be monitored in all localities where an aluminium-based coagulant is used within the treatment process.

## Non-Compliance Regarding Aluminium

Maximum result for acid-soluble aluminium is 0.25 mg/L or greater (red line)

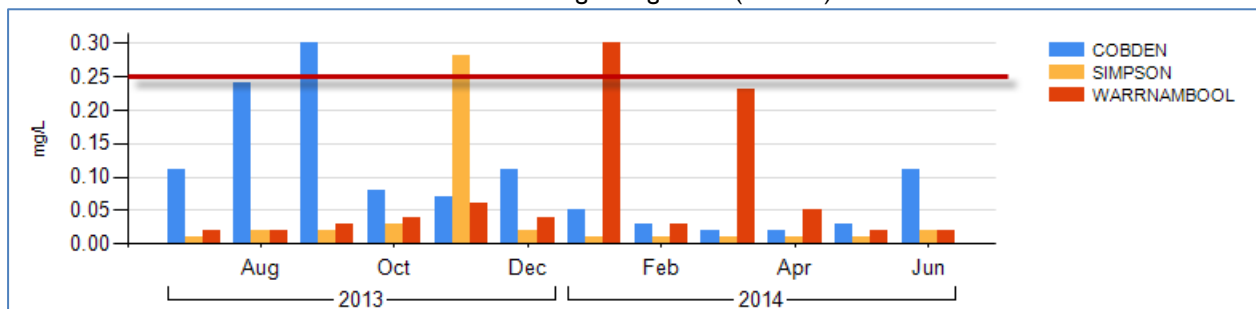


Figure 6-2 – Aluminium (acid soluble) in the Cobden, Simpson and Warrnambool reticulations 2013-14

**Cobden**

The Cobden water sampling locality experienced a single non-conformance (Figure 6.2). This was a result of a natural decline in alkalinity due to changing of source water. Soda ash was added into the raw water pipe and this eliminated the issue.

**Simpson**

The Simpson water sampling locality experienced a single non-conformance (Figure 6.2). This was a result of a natural decline in alkalinity caused via by-passing the raw storage due to a blue-green algae bloom.

**Warrnambool**

The Warrnambool water sampling locality experienced a single non-conformance (Figure 6-2). This was a result of build-up of sediment in the main, which was quickly rectified via flushing.



## Turbidity

**Standard** 95% upper confidence limit (UCL) of the mean of samples of drinking water collected in a 12 month period must be less than or equal to 5.0 NTU (SDWR)

Table 6-7 Turbidity results by locality 2013/14

Turbidity					
Locality	Sampling Frequency	No. of Samples	Maximum result NTU	95% UCL of Mean	Compliant (Yes/No)
ALLANSFORD	Weekly	52	3.40	0.4	Yes
BALMORAL	Weekly	52	2.70	0.6	Yes
CAMPERDOWN (RURAL)	Weekly	52	1.90	0.4	Yes
CAMPERDOWN (URBAN)	Weekly	52	0.40	0.2	Yes
CARAMUT	Weekly	52	5.40	0.6	Yes
CASTERTON	Weekly	52	0.50	0.2	Yes
CAVENDISH	Weekly	52	13.00	1.9	Yes
COBDEN	Weekly	52	0.80	0.2	Yes
COLERAINE	Weekly	52	4.30	0.4	Yes
DARTMOOR	Weekly	52	0.40	0.1	Yes
DERRINALLUM	Weekly	52	1.60	0.3	Yes
DUNKELD	Weekly	52	3.10	0.4	Yes
GLENTHOMPSON	Weekly	52	1.70	0.5	Yes
HAMILTON	Weekly*	104	0.50	0.2	Yes
HEYWOOD	Weekly	52	3.40	1.0	Yes
KOROIT	Weekly	52	2.20	0.3	Yes
LISMORE	Weekly	52	0.30	0.2	Yes
MACARTHUR	Weekly	52	0.40	0.1	Yes
MERINO	Weekly	52	11.00	0.8	Yes
MORTLAKE	Weekly	52	1.30	0.2	Yes
NOORAT/GLENORMISTON	Weekly	52	0.30	0.1	Yes
PAARATTE	Weekly	52	4.40	0.4	Yes
PENSHURST	Weekly	52	7.80	1.1	Yes
PETERBOROUGH	Weekly	52	0.30	0.2	Yes
PORT CAMPBELL	Weekly	52	0.30	0.1	Yes
PORT FAIRY	Weekly*	104	1.10	0.2	Yes
PORTLAND	Weekly*	104	1.40	0.2	Yes
PURNIM	Weekly	52	5.00	1.1	Yes
SANDFORD	Weekly	52	0.20	0.1	Yes
SIMPSON	Weekly	52	1.70	0.3	Yes
TARRINGTON	Weekly	52	0.50	0.3	Yes
TERANG	Weekly	52	1.90	0.2	Yes
TIMBOON	Weekly	52	0.40	0.2	Yes
WARRNAMBOOL	Weekly*	156	4.30	0.3	Yes

\* Weekly sampling with increases for population (ADWG, Section 9.5.2)

## Fluoride

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

Table 6-8 Fluoride results by locality 2013/14

### Fluoride

Locality	Sampling Frequency	No. of Samples	Maximum	Minimum	Average	Compliant	Meeting obligation ^ (Yes/No)
ALLANSFORD	Weekly	52	1.00	0.49	0.86	Yes	Yes
DUNKELD	Weekly	52	0.87	0.05	0.64	Yes	Yes
HAMILTON	Weekly*	104	0.96	0.05	0.66	Yes	Yes
KOROIT	Weekly	52	1.00	0.73	0.88	Yes	Yes
PORTLAND	Weekly*	104	1.20	0.63	0.94	Yes	Yes
TARRINGTON	Weekly	52	0.89	0.05	0.67	Yes	Yes
WARRNAMBOOL	Weekly*	156	1.10	0.49	0.85	Yes	Yes

\* More than one sample site was analysed for fluoride

^ For fluoridated supplies this is achieved if the annual average concentration of fluoride was greater than 0.6 mg/L.

## Other – May Pose A Risk To Human Health

### 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)

Table 6-9 Manganese results by locality 2013/14

Manganese					
Locality	Sampling Frequency	No. of Samples	No. of Non complying samples	Maximum result (mg/L)	Compliant (Yes/No)
ALLANSFORD	Quarterly	4	0	0.003	Yes
BALMORAL	Weekly W	51	0	0.055	Yes
CAMPERDOWN (RURAL)	Quarterly	4	0	0.002	Yes
CAMPERDOWN (URBAN)	Quarterly	4	0	0.005	Yes
CARAMUT	Quarterly	4	0	0.002	Yes
CASTERTON	Weekly W	51	0	0.017	Yes
CAVENDISH	Quarterly	4	0	0.003	Yes
COBDEN	Weekly	51	0	0.096	Yes
COLERAINE	Weekly W	51	0	0.010	Yes
DARTMOOR	Quarterly	4	0	0.002	Yes
DERRINALLUM	Quarterly	4	0	0.002	Yes
DUNKELD	Quarterly	4	0	0.028	Yes
GLENTHOMPSON	Weekly W	51	0	0.009	Yes
HAMILTON	Quarterly	4	0	0.022	Yes
HEYWOOD	Weekly W A <sup>1</sup>	51	0	0.210	Yes
KOROIT	Quarterly	4	0	0.003	Yes
LISMORE	Quarterly	4	0	0.002	Yes
MACARTHUR	Quarterly	4	0	0.002	Yes
MERINO	Weekly W	51	0	0.009	Yes
MORTLAKE	Quarterly	4	0	0.002	Yes
NOORAT/GLENORMISTON	Quarterly	4	0	0.056	Yes
PAARATTE	Quarterly	4	0	0.002	Yes
PENSHURST	Quarterly	4	0	0.006	Yes
PETERBOROUGH	Quarterly	4	0	0.002	Yes
PORT CAMPBELL	Quarterly	4	0	0.002	Yes
PORT FAIRY	Weekly W A <sup>1</sup>	102	0	0.130	Yes
PORTLAND	Monthly	12	0	0.003	Yes
PURNIM	Weekly W	51	0	0.056	Yes
SANDFORD	Weekly W	51	0	0.002	Yes
SIMPSON	Quarterly	4	0	0.003	Yes
TARRINGTON	Quarterly	4	0	0.011	Yes
TERANG	Quarterly	4	0	0.002	Yes
TIMBOON	Quarterly	4	0	0.002	Yes
WARRNAMBOOL	Quarterly	4	0	0.003	Yes

If the maximum result manganese is 0.55 mg/L or greater, then the locality is non-compliant.

W- Tested weekly, except Christmas week.

A - Exceedance of aesthetic limit.

## 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)

Table 6-10 Lead results by locality 2013/14

### Lead

Locality	Sampling Frequency	No. of Samples	No. of Non complying samples	Maximum result (mg/L)	Compliant (Yes/No)
ALLANSFORD	Yearly	1	0	<0.001	Yes
BALMORAL	Yearly	1	0	<0.001	Yes
CAMPERDOWN (RURAL)	Yearly	1	0	<0.001	Yes
CAMPERDOWN (URBAN)	Yearly	1	0	<0.001	Yes
CARAMUT	Quarterly	4	0	<0.001	Yes
CASTERTON	Yearly	1	0	<0.001	Yes
CAVENDISH	Yearly	1	0	<0.001	Yes
COBDEN	Yearly	1	0	<0.001	Yes
COLERAINE	Yearly	1	0	0.001	Yes
DARTMOOR	Quarterly	4	0	<0.001	Yes
DERRINALLUM	Yearly	1	0	<0.001	Yes
DUNKELD	Yearly	1	0	<0.001	Yes
GLENTHOMPSON	Yearly	1	0	<0.001	Yes
HAMILTON	Yearly	1	0	<0.001	Yes
HEYWOOD	Yearly	1	0	<0.001	Yes
KOROIT	Yearly	1	0	<0.001	Yes
LISMORE	Yearly	1	0	<0.001	Yes
MACARTHUR	Quarterly	4	0	<0.001	Yes
MERINO	Yearly	1	0	<0.001	Yes
MORTLAKE	Yearly	1	0	<0.001	Yes
NOORAT/GLENORMISTON	Yearly	1	0	<0.001	Yes
PAARATTE	Quarterly	4	0	0.001	Yes
PENSHURST	Quarterly	4	0	<0.001	Yes
PETERBOROUGH	Quarterly	4	0	<0.001	Yes
PORT CAMPBELL	Quarterly	4	0	<0.001	Yes
PORT FAIRY	Quarterly	4	0	<0.001	Yes
PORTLAND	Yearly	1	0	<0.001	Yes
PUENIM	Yearly	1	0	<0.001	Yes
SANDFORD	Yearly	1	0	<0.001	Yes
SIMPSON	Quarterly	4	0	<0.001	Yes
TARRINGTON	Yearly	1	0	<0.001	Yes
TERANG	Yearly	1	0	<0.001	Yes
TIMBOON	Quarterly	4	0	<0.001	Yes
WARRNAMBOOL	Yearly	1	0	<0.001	Yes

## 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)

Table 6-11 Copper results by locality 2013/14

Copper					
Locality	Sampling Frequency	No. of Samples	No. of Non complying samples	Maximum result (mg/L)	Compliant (Yes/No)
ALLANSFORD	Quarterly	4	0	0.022	Yes
BALMORAL	Quarterly	4	0	0.073	Yes
CAMPERDOWN (RURAL)	Quarterly	4	0	0.008	Yes
CAMPERDOWN (URBAN)	Quarterly	4	0	0.017	Yes
CARAMUT	Quarterly	4	0	0.078	Yes
CASTERTON	Quarterly	4	0	0.710	Yes
CAVENDISH	Quarterly	4	0	0.010	Yes
COBDEN	Quarterly	4	0	0.013	Yes
COLERAINE	Quarterly	4	0	0.330	Yes
DARTMOOR	Quarterly	4	0	0.009	Yes
DERRINALLUM	Quarterly	4	0	0.001	Yes
DUNKELD	Quarterly	4	0	0.007	Yes
GLENTHOMPSON	Quarterly	4	0	0.008	Yes
HAMILTON	Quarterly	4	0	0.016	Yes
HEYWOOD	Quarterly	4	0	0.006	Yes
KOROIT	Quarterly	4	0	0.033	Yes
LISMORE	Quarterly	4	0	0.002	Yes
MACARTHUR	Quarterly	4	0	0.013	Yes
MERINO	Quarterly	4	0	0.026	Yes
MORTLAKE	Quarterly	4	0	0.006	Yes
NOORAT/GLENORMISTON	Quarterly	4	0	0.064	Yes
PAARATTE	Quarterly	4	0	0.035	Yes
PENSHURST	Quarterly	4	0	0.009	Yes
PETERBOROUGH	Quarterly	4	0	0.007	Yes
PORT CAMPBELL	Quarterly	4	0	0.008	Yes
PORT FAIRY	Quarterly	4	0	0.005	Yes
PORTLAND	Quarterly	4	0	0.005	Yes
PURNIM	Quarterly	4	0	0.057	Yes
SANDFORD	Quarterly	4	0	0.094	Yes
SIMPSON	Quarterly	4	0	0.010	Yes
TARRINGTON	Quarterly	4	0	0.004	Yes
TERANG	Quarterly	4	0	0.016	Yes
TIMBOON	Quarterly	4	0	0.005	Yes
WARRNAMBOOL	Quarterly	4	0	0.009	Yes

## 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)

Table 6-12 Arsenic results by locality 2013/14

Arsenic					
Locality	Sampling Frequency	No. of Samples	No. of Non complying samples	Maximum result (mg/L)	Compliant (Yes/No)
ALLANSFORD	Yearly	1	0	<0.001	Yes
BALMORAL	Yearly	1	0	<0.001	Yes
CAMPERDOWN (RURAL)	Yearly	1	0	<0.001	Yes
CAMPERDOWN (URBAN)	Yearly	1	0	<0.001	Yes
CARAMUT	Yearly	1	0	<0.001	Yes
CASTERTON	Yearly	1	0	<0.001	Yes
CAVENDISH	Yearly	1	0	<0.001	Yes
COBDEN	Yearly	1	0	<0.001	Yes
COLERAINE	Yearly	1	0	<0.001	Yes
DARTMOOR	Yearly	1	0	<0.001	Yes
DERRINALLUM	Yearly	1	0	<0.001	Yes
DUNKELD	Yearly	1	0	<0.001	Yes
GLENTHOMPSON	Yearly	1	0	<0.001	Yes
HAMILTON	Yearly	1	0	<0.001	Yes
HEYWOOD	Yearly	1	0	<0.001	Yes
KOROIT	Yearly	1	0	<0.001	Yes
LISMORE	Yearly	1	0	<0.001	Yes
MACARTHUR	Weekly	51	0	0.003	Yes
MERINO	Yearly	1	0	<0.001	Yes
MORTLAKE	Yearly	1	0	<0.001	Yes
NOORAT/GLENORMISTON	Yearly	1	0	<0.001	Yes
PAARATTE	Yearly	1	0	<0.001	Yes
PENSHURST	Yearly	1	0	0.002	Yes
PETERBOROUGH	Yearly	1	0	<0.001	Yes
PORT CAMPBELL	Yearly	1	0	<0.001	Yes
PORT FAIRY	Yearly	1	0	0.003	Yes
PORTLAND	Yearly	1	0	<0.001	Yes
PURNIM	Yearly	1	0	<0.001	Yes
SANDFORD	Yearly	1	0	<0.001	Yes
SIMPSON	Yearly	1	0	<0.001	Yes
TARRINGTON	Yearly	1	0	<0.001	Yes
TERANG	Yearly	1	0	<0.001	Yes
TIMBOON	Yearly	1	0	<0.001	Yes
WARRNAMBOOL	Yearly	1	0	<0.001	Yes

## Water treatment related chemicals

Table 6-13 lists the water treatment related chemicals monitored at each locality during 2013/14. All test results were less than the ADWG health-related guideline values.

Table 6-13 water treatment related chemical sampling summary and health-related guideline values

Parameter	Sampling frequency	ADWG Value (mg/L)
1,1,1-Trichloropropan-2-one	Quarterly	-
1,1,3-Trichloropropan-2-one	Quarterly	-
1,1-Dichloropropan-2-one	Quarterly	-
1,3-Dichloropropan-2-one	Quarterly	-
2,4,6-Trichlorophenol	Quarterly	-
2,4-Dichlorophenol	Quarterly	0.2
2-Chlorophenol	Quarterly	0.3
Acrylamide	Quarterly	0.0002
Carbon tetrachloride	Quarterly	0.003
Cyanogen Chloride	Quarterly	0.08
Epichlorohydrin	Quarterly	0.0005
Trichloroacetaldehyde	Quarterly	0.021

## Inorganics

Table 6-14 lists the metals monitored at each locality during 2013/14. All localities recorded levels less than the ADWG health-related guideline values.

Table 6-14 – metals sampling summary and health-related guideline values

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

## Polycyclic Aromatic Hydrocarbon Results

Table 6- lists the suite of polycyclic aromatic hydrocarbons monitored at each locality during 2013/14. All test results were below the limit of detection.

Table 6-15 - PAH sampling summary and health related guideline values

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

## Disinfection by-products

### Chlorite

Wannon Water does not disinfect with chlorine dioxide therefore this parameter is not included in the testing regime.

### Nitrate and Nitrite

Table 6-16 lists the chloramine disinfection by-products monitored at each locality during 2013/14. All test results with the exception of a single nitrite result at Cavendish were less than the ADWG health-related guideline values (refer to Table 7.2).

Table 6-16 – chloramine disinfection by-products sampling summary and health-related guideline values

Parameter	Sampling Frequency	ADWG Value (mg/L)
Nitrate (as nitrate)	Monthly	50
Nitrite (as nitrite)	Monthly	3

## Pesticide/Herbicide Results

Table 6-17 lists the pesticides and herbicides monitored at representative raw water storage and rivers/creeks during 2013/14. All test results were less than the ADWG health-related guideline values.

Table 6-17 – pesticide and herbicide sampling summary and health-related guideline values

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

## Industrial Chemical Results

Table 6-18 lists industrial chemical health-related parameters tested at each locality during 2013/14. All test results were less than the ADWG health-related guideline values.

Table 6-18 – Industrial chemicals sampling summary and health-based guideline values

Parameter	Sampling Frequency	ADWG Value
1,1,1,2-Tetrachlorethane	Annually	-
1,1,1-Trichloroethane	Annually	-
1,1,2,2-Tetrachloroethane	Annually	-
1,1,2-Trichloroethane	Annually	-
1,1-Dichloroethane	Annually	-
1,1-Dichloroethene	Annually	-
1,1-Dichloropropene	Annually	-
1,2,3-Trichlorobenzene	Annually	-
1,2,3-Trichloropropane	Annually	-
1,2,4-Trichlorobenzene	Annually	-
1,2,4-Trimethylbenzene	Annually	-
1,2-Dichlorobenzene	Annually	-
1,2-Dichloroethane	Annually	-
1,2-Dichloropropane	Annually	-
1,3,5-Trimethylbenzene	Annually	-
1,3-Dichlorobenzene	Annually	-
1,3-Dichloropropane	Annually	-
1,4-Dichlorobenzene	Annually	-
2,2-Dichloropropane	Annually	-
2-Chlorotoluene	Annually	-
4-Chlorotoluene	Annually	-
Benzene	Annually	-
Bromobenzene	Annually	-
Bromochloromethane	Annually	-
Carbon Disulphide	Annually	-
Chlorobenzene	Annually	-
CIS-1,2-Dichloroethene	Annually	-
Dibromomethane	Annually	-
di-Octyl Phthalate	Annually	-
Ethylbenzene	Annually	-
Hexachloro-1,3-Butadiene	Annually	-
Isopropylbenzene	Annually	-
M-&P-Xylene	Annually	-
Methylenechloride	Annually	-
N-Butylbenzene	Annually	-
N-Propylbenzene	Annually	-
o-Xylene	Annually	-
P-Isopropyltoluene	Annually	-
Sec-Butylbenzene	Annually	-
Styrene	Annually	-
Tert-Butylbenzene	Annually	-
Tetrachloroethene	Annually	-
Toluene	Annually	-
Trans-1,2-Dichloroethene	Annually	-
Tributyltin as Sn	Annually	-
Trichloroethene	Annually	-
Vinyl chloride	Annually	-



## Algae Results

During 2013/14 Wannon Water collected samples on a fortnightly basis from all raw water storages and permanent rivers that supply raw water to 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. Raw water sources were isolated if possible.

The Blue-Green Algae Circular 2013 /14 (Department of Environment and Primary Industries) lists the following triggers for action and notification to the Department of Health of a blue green algae (BGA) incident as:

- Total microcystins  $\geq 1.3$  ug/L
- $\geq 6500$  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
- Bloom may cause widespread public complaint for example through taste and odour

## Radionuclides – Gross Beta, Gross Alpha Radioactivity Results

Table 6-19 lists the radionuclides monitored at each locality during 2013/14. All test results were less than the ADWG health-related guideline values.

Table 6-19 – radionuclides sampling summary and health-related guideline values

Parameter	Sampling Frequency	ADWG Value (Bq/L)
Gross Alpha	Annually	0.5
Gross Beta	Annually	0.5

## Other Results

Table 6-20 lists other parameters tested at the customer tap during 2013/14. All test results were less than the ADWG health-related guideline values.

Table 6-20 - Other parameters sampling summary and health-based guideline values

Parameter	Sampling Frequency	ADWG Value (mg/L)
Sulphate	Quarterly	500
<i>Naegleria</i> <sup>H</sup>	Monthly	-
<i>M. kansasii</i> <sup>H</sup>	Monthly	-

H – Localities with thermal bore/s only, namely Heywood, Port Campbell, Port Fairy and Portland.

## Aesthetic Parameters

Wannon Water has an internal Key Performance Indicator (KPI) of 90% for aesthetic water quality parameters controllable by treatment plants or field operation to be less than the aesthetic limits set within the ADWG. Wannon Water was compliant with its aesthetic KPI.

### pH

#### Compliance Summary

- Refer to Table 6-21
- 91% of samples collected from sites during 2013/14 which were controllable by treatment plant operations, were less than 8.5 and greater than 6.5 pH units as recommended in the ADWG.
- 97% of all pH samples collected from sites during 2013/14 which were controllable by treatment plant operations, were less than 9.2 and greater than 6.5 pH units as recommended in the ADWG providing monitoring shows that there is no deterioration in microbiological quality.
- Balmoral, Cavendish, Portland and Glenthompson – pH increases are due to long detention times in the cement lined mains. There is a regular flushing program to reduce the detention times.
- Derrinallum and Lismore – Disinfection was changed from sodium hypochlorite to chlorine gas at Ettrick Springs during 2013/14. This change at Ettrick Springs has improved the pH in these localities although further optimisation is required.

### Alkalinity

#### Compliance Summary

- Refer to Table 6-22
- Alkalinity is not controllable by treatment processes at any of Wannon Water's localities.
- Casterton, Coleraine, Dartmoor, Heywood, Macarthur, Merino, Port Fairy and Portland are all sourced from groundwater. The levels of alkalinity are typical of these systems. All systems are between 200-500 mg/L and hence can have scaling problems.
- The Macarthur community was consulted about treatment options to reduce alkalinity prior to moving from a regulated water supply to a drinking water supply. The community voted against these treatment processes.

## Hardness

#### Compliance Summary

- Refer to Table 6-23
- Hardness is not controllable by treatment processes at any of Wannon Water's localities.
- The Casterton supply system, Dartmoor, Macarthur and Penshurst are all sourced from groundwater. The levels of hardness are typical of these systems. All systems are between 200-500 mg/L and hence can have scaling problems.
- The Macarthur community was consulted about treatment options to reduce hardness prior to moving from a regulated water supply to a drinking water supply. The community voted against these treatment processes.

## Iron

#### Compliance Summary

- Refer to Table 6-24
- 97% of samples collected from sites during 2013/14 which were controllable by treatment plant operations were less than 0.3 mg/L as recommended in the ADWG.
- All exceedances were isolated incidents, the response action is initially indirect, being to flush if field tests indicate turbidity or colour issues or if a customer contact is received. When the result is received the relevant team is notified and flushing is conducted usually rectifying the issue.

## Colour

#### Compliance Summary

- Refer to Table 6-25
- 99.5% of samples collected from sites during 2013/14 which were controllable by treatment plant operations were less than 15 HU as recommended in the ADWG.
- Cavendish – The colour of the Cavendish supply is derived from the raw source water of the Grampians Headworks. Surface water run-off, particularly the initial flows, tends to be high in colour. Cavendish is a disinfection-only plant and therefore there is no capacity for colour removal.
- All exceedances were isolated; the response action is to flush if field tests indicate colour issues or if a customer contact is received. When the result is received the relevant team is notified and flushing is conducted usually rectifying the issue.

## **Total Dissolved Solids**

### Compliance Summary

- Total dissolved solids are not controllable by treatment processes at any of Wannon Water's localities. Heywood, Macarthur, Penshurst, Port Fairy and Portland are all sourced from groundwater. The levels are typical of these systems.
- Glenthompson's Total dissolved solids has increased this year due to the source water having a larger bore water component.
- The Macarthur community was consulted about treatment options to reduce total dissolved solids prior to moving from a regulated water supply to a drinking water supply. The community voted against these treatment processes

## pH Results

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

**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 tolerated provided monitoring indicates no deterioration in microbial quality.

Table 6-21 pH results by locality 2013/14

pH				
Locality	Sampling Frequency	No. of Samples	Max	Min
ALLANSFORD	Weekly	52	7.5	7.1
BALMORAL	Weekly	52	8.6	6.8
CAMPERDOWN (RURAL)	Weekly	52	8.5	6.9
CAMPERDOWN (URBAN)	Weekly	52	7.8	6.6
CARAMUT	Weekly	52	8.8	7.6
CASTERTON	Weekly	52	7.9	7.4
CAVENDISH	Weekly	52	8.8	7.1
COBDEN	Weekly	52	8.0	6.7
COLERAINE	Weekly	52	8.0	7.6
DARTMOOR	Weekly	52	8.0	7.5
DERRINALLUM	Weekly	52	10.1	6.9
DUNKELD	Weekly	52	7.4	6.7
GLENTHOMPSON	Weekly	52	9.6	7.4
HAMILTON	Weekly*	104	8.0	6.8
HEYWOOD	Weekly	52	8.6	8.3
KOROIT	Weekly	52	7.6	7.0
LISMORE	Weekly	52	10.2	6.5
MACARTHUR	Weekly	52	8.2	7.9
MERINO	Weekly	52	7.9	7.6
MORTLAKE	Weekly	52	8.1	7.6
NOORAT/GLENORMISTON	Weekly	52	8.7	6.9
PAARATTE	Weekly	52	8.2	7.8
PENSHURST	Weekly	52	8.8	7.9
PETERBOROUGH	Weekly	52	8.5	7.9
PORT CAMPBELL	Weekly	52	8.2	7.7
PORT FAIRY	Weekly *	104	8.6	8.1
PORTLAND	Weekly*	104	8.8	8.4
PURNIM	Weekly	52	7.4	6.9
SANDFORD	Weekly	52	7.9	7.5
SIMPSON	Weekly	52	7.6	6.7
TARRINGTON	Weekly	52	10.2	6.9
TERANG	Weekly	52	7.4	6.5
TIMBOON	Weekly	52	8.4	7.9
WARRNAMBOOL	Weekly*	156	7.8	6.8

\* More than one sample

NOTE: pH is analysed in the same test set as turbidity and E.coli, hence result during Christmas week

## Alkalinity Results

**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

**Table 6-22 Total Alkalinity as  $\text{CaCO}_3$  by locality 2013/14**

Total Alkalinity as $\text{CaCO}_3$			
Locality	Sampling Frequency	No. of Samples	Maximum result (mg/L $\text{CaCO}_3$ )
ALLANSFORD	Quarterly	4	43
BALMORAL	Quarterly	4	17
CAMPERDOWN (RURAL)	Quarterly	4	16
CAMPERDOWN (URBAN)	Quarterly	4	15
CARAMUT	Quarterly	4	120
CASTERTON	Quarterly	4	210
CAVENDISH	Quarterly	4	24
COBDEN	Quarterly	4	24
COLERAINE	Quarterly	4	210
DARTMOOR	Quarterly	4	240
DERRINALLUM/LISMORE	Quarterly	4	14
DUNKELD	Quarterly	4	14
GLENTHOMPSON	Quarterly	4	34
HAMILTON	Quarterly	4	14
HEYWOOD	Quarterly	4	250
KOROIT	Quarterly	4	42
MACARTHUR	Quarterly	4	410
MERINO	Quarterly	4	210
MORTLAKE	Quarterly	4	61
NOORAT/GLENORMISTON	Quarterly	4	22
PAARATTE	Quarterly	4	140
PENSHURST	Quarterly	4	200
PETERBOROUGH	Quarterly	4	140
PORT CAMPBELL	Quarterly	4	140
PORT FAIRY	Quarterly	4	330
PORTLAND	Quarterly	4	360
PURNIM	Quarterly	4	23
SIMPSON	Quarterly	4	21
TARRINGTON	Quarterly	4	11
TERANG	Quarterly	4	17
TIMBOON	Quarterly	4	150
WARRNAMBOOL	Quarterly	4	64

## Hardness Results

**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

Table 6-14 Hardness as  $\text{CaCO}_3$  results by locality 2013/14

### Total Hardness as $\text{CaCO}_3$

Locality	Sampling Frequency	No. of Samples	Maximum result (mg/L)
ALLANSFORD	Quarterly	4	66
BALMORAL	Quarterly	4	85
CAMPERDOWN (RURAL)	Quarterly	4	41
CAMPERDOWN (URBAN)	Quarterly	4	41
CARAMUT	Quarterly	4	100
CASTERTON	Quarterly	4	240
CAVENDISH	Quarterly	4	23
COBDEN	Quarterly	4	31
COLERAINE	Quarterly	4	240
DARTMOOR	Quarterly	4	240
DUNKELD	Quarterly	4	55
GLENTHOMPSON	Quarterly	4	140
HAMILTON	Quarterly	4	56
HEYWOOD	Quarterly	4	160
KOROIT	Quarterly	4	67
MACARTHUR	Quarterly	4	320
MERINO	Quarterly	4	240
MORTLAKE	Quarterly	4	59
NOORAT/GLENORMISTON	Quarterly	4	30
PAARATTE	Quarterly	4	150
PENSHURST	Quarterly	4	420
PETERBOROUGH	Quarterly	4	150
PORT CAMPBELL	Quarterly	4	150
PORT FAIRY	Quarterly	4	180
PORTLAND	Quarterly	4	150
PUENIM	Quarterly	4	27
SIMPSON	Quarterly	4	30
TARRINGTON	Quarterly	4	58
TERANG	Quarterly	4	29
TIMBOON	Quarterly	4	150
WARRNAMBOOL	Quarterly	4	69

## Iron Results

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

**Description** Occurs naturally in water. Taste threshold is 0.3 mg/L. High concentrations stain laundry and fittings. Iron bacteria cause blockages, taste/odour and corrosion.

Table 6-24 Iron results by locality 2013 /14

Iron			
Locality	Sampling Frequency	No. of Samples	Maximum result (mg/L)
ALLANSFORD	Quarterly	4	0.034
BALMORAL	Weekly W A <sup>5</sup>	51	1.000
CAMPERDOWN (RURAL)	Quarterly	4	0.029
CAMPERDOWN (URBAN)	Quarterly	4	0.023
CARAMUT	Quarterly A <sup>1</sup>	4	0.490
CASTERTON	Weekly W	51	0.100
CAVENDISH	Quarterly	4	0.290
COBDEN	Weekly W	51	0.071
COLERAINE	Weekly W	51	0.130
DARTMOOR	Quarterly	4	0.007
DERRINALLUM	Quarterly	4	0.061
DUNKELD	Quarterly A <sup>1</sup>	4	0.520
GLENTHOMPSON	Weekly W A <sup>1</sup>	51	0.430
HAMILTON	Quarterly	4	0.099
HEYWOOD	Weekly W	51	0.096
KOROIT	Quarterly	4	0.040
LISMORE	Quarterly	4	0.070
MACARTHUR	Quarterly	4	0.007
MERINO	Weekly W	51	0.096
MORTLAKE	Quarterly	4	0.099
NOORAT/GLENORMISTON	Quarterly	4	0.052
PAARATTE	Quarterly	4	0.036
PENSHURST	Quarterly	4	0.069
PETERBOROUGH	Quarterly	4	0.028
PORT CAMPBELL	Quarterly	4	0.033
PORT FAIRY	Weekly* WA <sup>7</sup>	102	0.990
PORTLAND	Monthly	12	0.150
PURNIM	Weekly W A <sup>3</sup>	51	0.540
SANDFORD	Weekly W	51	0.051
SIMPSON	Quarterly	4	0.036
TARRINGTON	Quarterly	4	0.063
TERANG	Quarterly	4	0.021
TIMBOON	Quarterly	4	0.034
WARRNAMBOOL	Quarterly	4	0.023

\*More than one sample taken

W- Tested weekly, except Christmas week    A - Exceedance of aesthetic limit.

## Colour Results

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

**Description** An important aesthetic characteristic for customer acceptance. Treatment processes can be optimised to remove colour.

**Table 6-25 True Colour results by locality 2013/14**

True Colour			
Locality	Sampling Frequency	No. of Samples	Maximum result (Pt-Co)
ALLANSFORD	Quarterly	4	1
BALMORAL	Weekly W	51	6
CAMPERDOWN (RURAL)	Quarterly	4	1
CAMPERDOWN (URBAN)	Quarterly	4	1
CARAMUT	Quarterly	4	1
CASTERTON	Weekly W	51	3
CAVENDISH	Quarterly A <sup>2</sup>	4	74
COBDEN	Weekly W A <sup>1</sup>	51	19
COLERAINE	Weekly W	51	3
DARTMOOR	Quarterly	4	1
DERRINALLUM	Quarterly	4	2
DUNKELD	Quarterly	4	1
GLENTHOMPSON	Weekly W	51	7
HAMILTON	Quarterly	4	2
HEYWOOD	Weekly W	51	2
KOROIT	Quarterly	4	1
LISMORE	Quarterly	4	2
MACARTHUR	Quarterly	4	1
MERINO	Weekly W	51	2
MORTLAKE	Quarterly	4	1
NOORAT/GLENORMISTON	Quarterly	4	2
PAARATTE	Quarterly	4	1
PENSHURST	Quarterly	4	1
PETERBOROUGH	Quarterly	4	1
PORT CAMPBELL	Quarterly	4	1
PORT FAIRY	Weekly* W	102	2
PORTLAND	Monthly	12	3
PURNIM	Weekly W	51	8
SANDFORD	Weekly W	51	4
SIMPSON	Quarterly	4	2
TARRINGTON	Quarterly	4	3
TERANG	Quarterly	4	1
TIMBOON	Quarterly	4	1
WARRNAMBOOL	Quarterly	4	2

\*More than one sample taken

W- Tested weekly, except Christmas week    A - Exceedance of aesthetic limit.



## Total Dissolved Solids Results

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

**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

Table 6-26 Total Dissolved Solids results by locality 2013/14

Total Dissolved Solids			
Locality	Sampling Frequency	No. of Samples	Maximum result (mg/L)
ALLANSFORD	Quarterly	4	200
BALMORAL	Quarterly	4	500
CAMPERDOWN (RURAL)	Quarterly	4	120
CAMPERDOWN (URBAN)	Quarterly	4	130
CARAMUT	Quarterly	4	270
CASTERTON	Quarterly	4	520
CAVENDISH	Quarterly	4	150
COBDEN	Quarterly	4	150
COLERAINE	Quarterly	4	510
DARTMOOR	Quarterly	4	410
DUNKELD	Quarterly	4	180
GLENTHOMPSON	Quarterly	4	690
HAMILTON	Quarterly	4	170
HEYWOOD	Quarterly	4	680
KOROIT	Quarterly	4	210
MACARTHUR	Quarterly	4	1,000
MERINO	Quarterly	4	540
MORTLAKE	Quarterly	4	220
NOORAT/GLENORMISTON	Quarterly	4	130
PAARATTE	Quarterly	4	310
PENSHURST	Quarterly	4	810
PETERBOROUGH	Quarterly	4	310
PORT CAMPBELL	Quarterly	4	310
PORT FAIRY	Quarterly	4	930
PORTLAND	Quarterly	4	790
PURNIM	Quarterly	4	140
SIMPSON	Quarterly	4	120
TARRINGTON	Quarterly	4	180
TERANG	Quarterly	4	120
TIMBOON	Quarterly	4	320
WARRNAMBOOL	Quarterly	4	190

## Analysis of Results

### Compliance as a Percentage of Localities

Table 6-15 shows the percentage of localities compliant with each of the Safe Drinking Water Regulation 2005 (SDWR) Schedule 2 parameters, which has been relatively consistent over the past four years. Over the past four years there has been improvement in the areas of THMs and aluminium. Since 2012 there has been a slight drop in Trihalomethanes compliance due to the introduction of chloramination burns (discussed in Section 5 – Water Treatment Plant Changes and Improvements), but as previously mentioned this has not posed a risk to public health.

Table 6-15 Compliance as a Percentage of Localities

Parameter	% of Localities Receiving Compliant Water			
	2013/14	2012/13	2011/12	2010/11
<i>Escherichia coli</i>	100	100	99.85	100
Trihalomethanes	99.8	99.7	100	99.5
Chloroacetic acid	100	100	100	100
Dichloroacetic acid	100	100	100	99.5
Trichloroacetic acid	100	100	100	99.5
Aluminium (acid soluble)	98.6	99.1	99.1	92.6
Turbidity	100	100	100	100

The number of localities changed from 33 in 2010/11 to 34 in 2011/12 when Macarthur was added as a drinking water locality effective 1<sup>st</sup> July 2011.

### Compliance as a Percentage of Population

The percentage of Wannon Water customers that were supplied with drinking water that complied with the SDWR Schedule 2 standards are detailed in Table 6-16. The percentage of customers receiving compliant water has remained relatively steady over the past two years for all parameters except acid soluble aluminium, where there was a significant improvement between 2009 and 2012. The drop in percentage compliance for aluminium was due to the locality of Warrnambool experiencing a single aluminium exceedance. As explained on Page 24, this was not a systemic issue, but a localised issue in a section of main (which did not pose a risk to public health), however the population of Warrnambool is significant, hence the decline in compliance as a percentage of population for Aluminium (acid soluble).

Table 6-16 Compliance as a Percentage of Population

Parameter	% of Customers Receiving Compliant Water			
	2013/14	2012/13	2011/12	2010/11
<i>Escherichia coli</i>	100	100	99.3	100
Trihalomethanes	99.8	99.9	100	99.8
Chloroacetic acid	100	100	100	100
Dichloroacetic acid	100	100	100	99.7
Trichloroacetic acid	100	100	100	99.8
Aluminium (acid soluble)	80.6	99.9	99.9	72.8
Turbidity	100	100	100	100

## 7. EMERGENCY AND INCIDENT 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:

- The safety of customers, employees and the community in general;
- Continuity of operations;
- Protection of the environment; and
- Compliance with legislated and regulatory requirements

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 Department of Health of any potential or actual contaminated water supplied for drinking purposes. Information relating to all Section 22 incidents during 2013/14 is listed in Table 7-2.

### Other Incidents

Wannon Water communicates other water quality related incidents to the Department of Health. Information relating to incidents which occurred during 2013/14 is listed in Table 7-3.

### Customer Complaints

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

Wannon Water's Corporate Complaints Management process is a "roadmap" to complaints management, allowing for a fair and detailed consideration of complaints and provides for genuine internal review if the complainant remains dissatisfied.

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 Commission, under its reporting principles. This is also supported by Wannon Water's Customer Charter.

The number of water quality customer complaints was similar to last year for all complaint types, with the exception of taste/odour, where there was a reduction in the number of complaints from 19 to six; however the total number of complaints for 2013/14 was very low. The decrease in taste/odour complaints is attributed to the difference in taste and odour experienced in the Warrnambool system which has now been dosing with chlorine only for over 12 months. The dosing has been fine-tuned and customers have also become accustomed to the altered taste of the water.

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

- Allocate specific resources to trouble shoot areas where there have historically been customer
- Maintained resourcing to meet the scheduled flushing program for each of Wannon Water's localities
- Improved chemical dosing in a number of towns, such as Camperdown, Glenthompson and Hamilton, which improved quality within the reticulation.

- Proactive approach taken by Treatment Services Branch to quality trend variances

The Port Fairy Township was again flushed, just prior to Christmas 2013, to clean the reticulation before the tourist season. These activities kept the number of customer complaints this locality low.

A summary of the complaints received is presented in Table 7-1, with all localities recording less than 1 complaint per 100 customers.

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 five in any 24 hour period, an incident response team is assembled and the cause investigated. Appropriate actions are then taken using AIIIMS structure and Wannon Water's Emergency Management Plan.

During 2013/14 there were no instances where more than five water quality complaints were received within any 24 hour period.

Table 7-1 – Customer complaints 2013/14 by type

Type of complaint	No. of complaints	No. of complaints per 100 customers supplied <sup>^</sup>
Discoloured water	8	0.018
Taste/ odour	6	0.014
Blue Water	0	0
Air in Water	0	0
Alleged illness <sup>#</sup>	1	0.002
Other	6	0.014

<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.

## Incidents Notified pursuant to Section 22 of SDWA

Table 7-2 – Section 22 incidents 2013/14

Date (and Duration) of Incident	Location of Incident	Nature of Incident	Potentially Affected/ Affected Drinking Water Supplies	Actions Taken in Response to Incident
22 October 2013	Heywood	E.coli – 1 org/100mL	Heywood	Validation of the plant performance and system via trending of online monitoring and field testing results, validation of contact time for disinfection at time of event; retest sample site then flush area. No issues found. No E.coli detected in resample. DH notified of initial and resample result.
9 April 2014	Cavendish	Nitrate as N 1.3 mg/L	Cavendish	Inspection of the sample site and resample, no issues found, levels in clear water storage were compliant. Levels detected in resample were below ADWG limit. DH notified of initial and resample result.
15 April 2014	Tarrington	E.coli – 1 org/100mL	Tarrington	Validation of the plant performance and system via trending of online monitoring and field testing results, validation of contact time for disinfection at time of event; retest sample site then flush area. No issues found. No E.coli detected in resample. DH notified of initial and resample result.
11 June 2014	Camperdown Urban	E.coli – 4 org/100mL	Camperdown System	Validation of the plant performance and system via trending of online monitoring and field testing results, validation of contact time for disinfection at time of event; retest sample site then flush area. No issues found. No E.coli detected in resample. DH notified of initial and resample result.

**Incidents Notified pursuant to Section 18 of SDWA**

Table 7-3 – Section 18 incidents 2013/14

Date (and Duration) of Incident	Location of Incident	Nature of Incident	Potentially Affected/ Affected Drinking Water Supplies	Actions Taken in Response to Incident
2 September 2013	Cobden	Aluminium (Acid Soluble) 0.3 mg/L	Cobden	The raw water storage was manually dosed with lime to increase the alkalinity and the buffering capacity of the water. Pre-pH correction of soda ash into the raw water pipe prior to alum dosing was also conducted.
4 November 2013	Simpson	Aluminium (Acid Soluble) 0.28mg/L	Simpson System	The Simpson raw water storage was returned to service ten days after copper sulphate dosing, providing time to stabilise the water quality prior to treatment.
8 January 2014	Warrnambool	Aluminium (Acid Soluble) 0.3 mg/L	Warrnambool	Flushing was conducted at the site. The Warrnambool WTP plant performance was investigated and found to be performing well.
8 April 2014	Glenthompson	Trihalomethanes 0.28mg/L	Glenthompson System	This was a result of the conversion from a chloraminated supply to chlorination and was quickly rectified by converting the plant back to a chloraminated supply.

## Other Incidents/Issues

Table 7-3 – Other incidents 2013/14

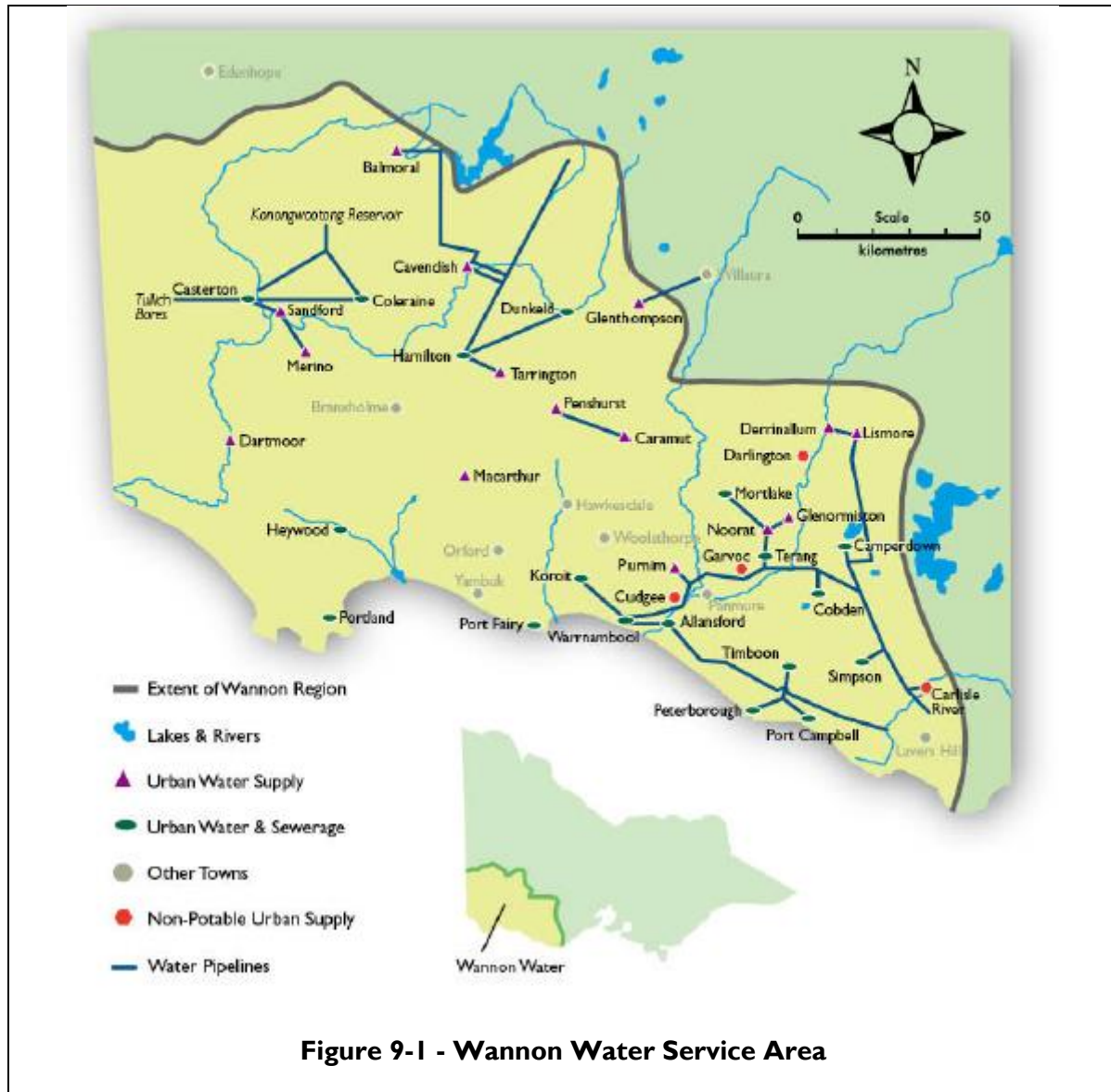
Date (and Duration) of Incident	Location of Incident	Nature of Incident	Potentially Affected/ Affected Drinking Water Supplies	Actions Taken in Response to Incident
2 August – 4 September 2013	Hamilton	Fluoride dosed below the required optimal concentration as fluoride dosing was shutdown	Dunkeld, Hamilton and Tarrington	The fluoride pumps were replaced and fluoride dosing was reinstated.
9 July 2013	Caramut reticulation	5.4 NTU Turbidity due to accumulation in the mains	Caramut	Validation of the plant performance and system via trending of online monitoring and field testing results. The reticulation was flushed.
13 July 2013	Purnim reticulation	5 NTU Turbidity due to accumulation in the mains	Purnim	Validation of the plant performance and system via trending of online monitoring and field testing results. The reticulation was flushed.
27 July 2013	Merino reticulation	11 NTU Turbidity due to accumulation in the mains	Merino	Validation of the plant performance and system via trending of online monitoring and field testing results. The reticulation was flushed.
23 April 2014	Penshurst reticulation	7.8 NTU Turbidity due to accumulation in the mains	Penshurst	Validation of the plant performance and system via trending of online monitoring and field testing results. The reticulation was flushed.
25 June 2014	Cavendish reticulation	13 NTU Turbidity due to accumulation in the mains	Cavendish	Validation of the plant performance and system via trending of online monitoring and field testing results. The reticulation was flushed.

## 8. GLOSSARY

ADWG	Australian Drinking Water Guidelines (2011)
AIMS	Australian Inter-Service Incidents Management System
BGA	Blue Green Algae
DH	Department of Health Victoria
DP	Disinfection Plant
CCP	Critical control point
GAC	Granulated Activated Carbon
HACCP	Hazard Analysis and Critical Control Point. A system that identifies evaluates and controls hazards.
KPI	Key Performance Indicator
Mean	The average of a number of numerical values.
ML	Megalitre – one million litres
NATA	National Association of Testing Authorities, Australia.
UCL	Upper Confidence Limit
Raw Water	Water that has not been treated in any way.
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 2005
WHO	World Health Organisation
WTP	Water Treatment Plant



## 9. WANNON WATER SERVICE AREA MAP



Information regarding water treatment and the latest water quality information can be obtained from Wannon Water's web site:

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

Wannon Water published the results of SDWR Schedule 2 parameters for each of the localities on the website on a monthly basis.

Results for additional 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