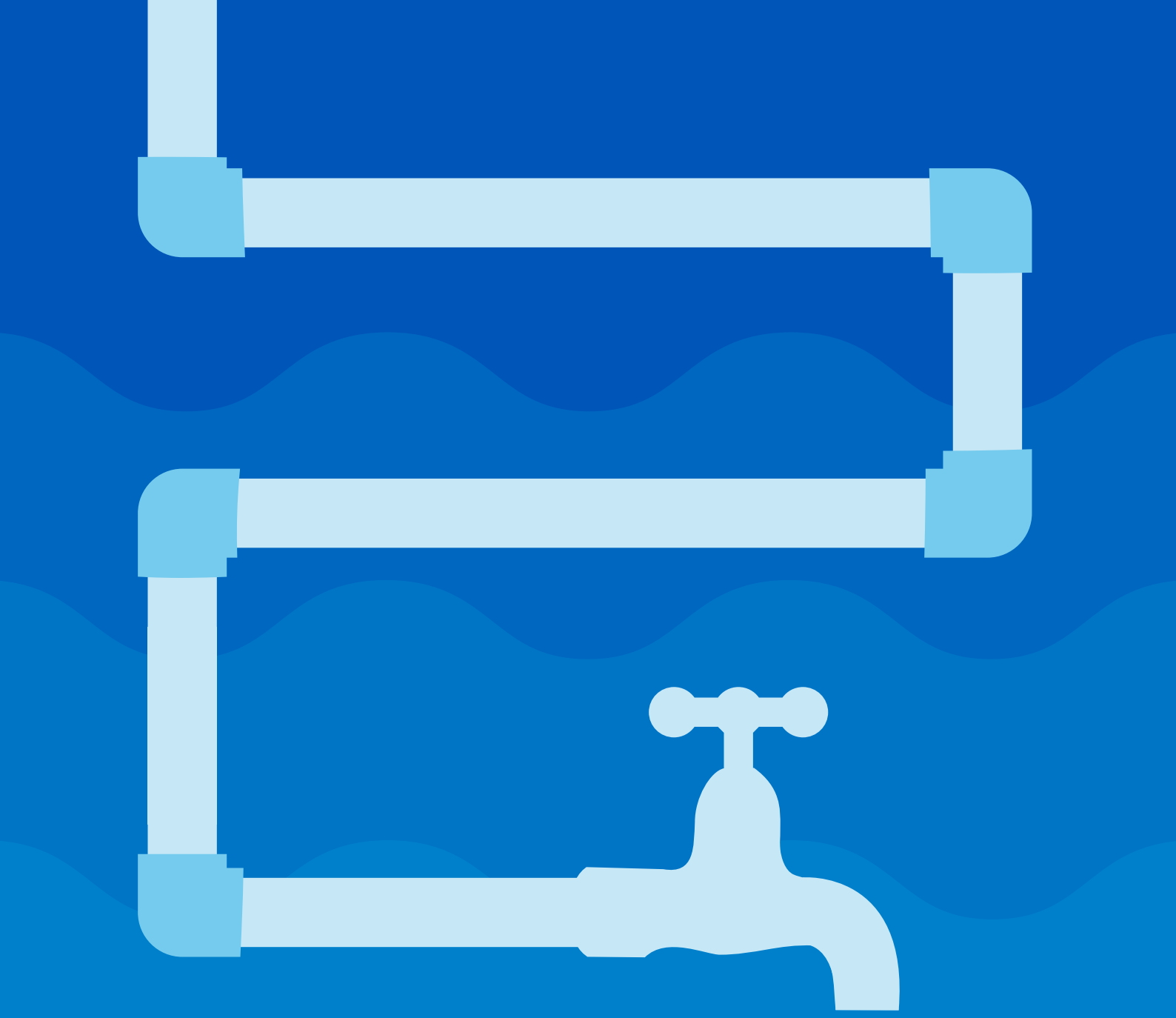

City West Water™

Drinking Water Quality Report

2018

Glossary of Terms

ADWG 2011	Australian Drinking Water Guidelines 2011. Published by the National Health & Medical Research Council of Australia.
DHHS	Victorian Department of Health and Human Services
Escherichia coli	*Escherichia coli*, a bacterium which is considered to indicate the presence of faecal contamination and therefore, health risk.
HACCP	Hazard Analysis and Critical Control Points certification for protecting drinking water quality
mg/L	Milligrams per litre
NTU	Nephelometric Turbidity Units
orgs/100mL	Organisms per 100 millilitres
Regulations (2015)	Safe Drinking Water Regulations (2015) Victoria
Section 22 notification	Notification under Section 22 of the Safe Drinking Water Act 2003 of known or suspected water contamination
<	"less than" symbol.
>	"greater than" symbol

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From our Managing Director

Welcome to City West Water's 2018 Annual Drinking Water Quality Report. Each year we produce such a report to update our customers and the community on details of the quality of drinking water that we have been supplying throughout our service area. This 2018 Report addresses the 12 month period between 1 July 2017 and 30 June 2018.

Our corporate strategy is to be an exceptional service provider that puts customers first and benefits the community. Safe, high quality drinking water is a life-giving resource; its provision contributes to community health and hygiene. We strive to deliver our services in a reliable and affordable way that is accessible to everyone in our community.

Our service area is growing and encompasses the inner and western suburbs of Melbourne, including Melbourne's central business district. We supply drinking water to our customers via an extensive, largely underground network of over 4,900 km of water mains, as well as associated valves, holding tanks, pumping stations and secondary disinfection plants. Our priority as an exceptional service provider is to manage and operate this network so that our customers continue to reliably receive the high quality, pleasant tasting, safe drinking water for which Melbourne has long been renowned.

The information presented in this report explains the sources of our drinking water, how it is treated so that it is safe to consume without further treatment, and demonstrates in detail how the quality consistently meets and surpasses drinking water quality standards and targets. We verify the quality of the drinking water supply via a comprehensive monitoring program that also allows us to identify potential improvements to benefit our customers and community.

Throughout 2017-18 we routinely tested over 3,000 water samples, most of which were obtained from customers' premises. I am pleased to report that this independent chemical and microbial testing continued to demonstrate that the quality of our drinking water supply meets standards in Victoria's *Safe Drinking Water Act 2003* and associated *Safe Drinking Water Regulations 2015*. Details of the testing undertaken and results obtained form a major part of this report.

Further to monitoring the supplied water quality, we also rely upon feedback from customers to advise of local issues that may arise. Such feedback is recorded as water quality related customer complaints. During 2017-18 were received 72 complaints per 100000 customers.

Our drinking water quality management processes are endorsed through an uninterrupted history of successfully retaining drinking water HACCP certification and compliance of our water quality Risk Management Plan with Victoria's Safe Drinking Water Act 2003.

City West Water is committed to continuing its record of reliably providing high quality, safe drinking water to all our customers and community. I am confident that you will find the information contained in this report helpful in better understanding the great quality of our drinking water supply.

David Ryan
Managing Director

1. Introduction

With this publically available report City West Water complies with section 26 of the *Safe Drinking Water Act 2003* which requires public disclosure of all water quality monitoring information.

City West Water is one of three metropolitan water retailers established under section 85(1A) of the *Water Act 1989* (Vic). Our Board of Directors is appointed by the Victorian Government and is responsible for setting and overseeing the implementation of the policies, objectives and strategies of the business. We provide drinking water, trade waste, recycled water, stormwater and sewerage services to approximately 459,000 residential and non-residential customers in Melbourne's inner and western suburbs and central business district.

Melbourne Water provides City West Water with a bulk water supply and a waste water treatment service. Melbourne Water manages the water catchments, reservoirs and primary treatment, as well as a network of large water mains that interconnect with our own water supply network. This interconnection means that risks associated with water supply are shared between the wholesaler (Melbourne Water) and retailer (City West Water). To manage these risks and to clearly assign the rights and obligations of both parties, we have a contractual arrangement (Bulk Water Supply Agreement) with Melbourne Water, as well as cross business contingency plans and operational arrangements.

Our management of the water supply system and drinking water quality is given the highest priority to reflect public health considerations and community expectations. In line with our Drinking Water Quality Policy we closely follow the risk management principles outlined in *Victoria's Safe Drinking Water Act 2003* and associated *Safe Drinking Water Regulations 2015*. This commitment to safeguarding drinking water quality has continued to be independently recognised through our consistent retention of the internationally recognised Hazard Analysis and Critical Control Points (HACCP) certification.

1.1 Characterisation of the system

1.1.1 Source water system

Our water supply originates from Melbourne's well established water supply catchment and reservoir system, which has provided the city with a reliable, high quality water supply for many years. This extensive system, managed by Melbourne Water, lies mainly to the east of Melbourne and extends as far as Thomson Reservoir, approximately 120 kilometres from our service area.

More specifically, water is supplied to City West Water from three major storages within the system. Two of the storages, Silvan Reservoir (near Mount Dandenong) and Sugarloaf Reservoir (near Yarra Glen), are east of Melbourne. The third, Greenvale Reservoir, is to the north, near Somerton. The relative proportion of water supplied to us from the three reservoirs can vary, depending on factors such as local water demands, weather conditions, maintenance works and longer term population changes. Over the last decade or so, on average about 25 per cent of our bulk supply has come from Silvan, 25 per cent from Greenvale and 50 per cent from Sugarloaf. During 2017-18 these percentages were 15, 12 and 73, respectively.

The supply from Silvan Reservoir originates from protected, natural catchments (including the Thomson and Upper Yarra catchments) where activities such as industry, farming, urbanisation and tourism (which could pollute the water supply) are highly restricted. Greenvale Reservoir which does not have a catchment, receives its water supply from Silvan Reservoir. Long storage periods (ranging between months and years) in these pristine reservoirs enhance water quality. As a result, the only active water treatment process that is applied to this water is chlorination (chlorine gas at Silvan; sodium hypochlorite at Greenvale) and pH correction with lime.

Sugarloaf Reservoir draws most of its water from the middle reaches of the Yarra River where the catchment is unprotected, containing urban areas, light industry and agricultural activities. A smaller proportion also comes from Maroondah Reservoir via the Maroondah Aqueduct. On average, the source waters pumped into Sugarloaf Reservoir are stored for months before being treated (via aluminium-based coagulation and flocculation, sand filtration, gas chlorination and pH correction with lime) at Melbourne Water's nearby Winneke water treatment plant.

Melbourne Water adds fluoride to all of City West Water's bulk water in line with the requirements of the *Victorian Health (Fluoridation) Act* (1973). This is in the form of fluorosilicic acid at both the Silvan Reservoir supply and Winneke water treatment plant.

The quality of the bulk water supply is monitored by Melbourne Water before it enters City West Water's distribution system. This monitoring has two components:

- sites upstream of treatment, comprising rivers, streams, aqueducts and reservoirs. These sites are monitored at varying frequencies, largely to characterise overall long term background water quality and to monitor for seasonal and possible longer term changes. Parameters tested include organic chemicals, nutrients and microbes.
- sites downstream of water treatment, where the monitoring is more intense than at upstream sites and is largely focussed on verifying the quality of post-treatment product water. Frequencies of this monitoring ranges between continuous at chlorine dosing points, daily and weekly, depending on the sites and parameters measured (for example, microbial testing, water clarity and purity).

The overall water supply system and water delivery arrangements during the past year have continued unchanged from preceding years.

1.1.2 City West Water system

We distribute water to over 1 million people and to businesses at some 460,000 properties. The water is distributed through an extensive network of over 4,900 kilometres of water mains, 10 pumping stations, 8 holding tanks (or service reservoirs/tanks) and 5 secondary chlorination plants. This network encompasses central and western Melbourne, including inner suburbs such as Fitzroy, Collingwood, Richmond and the central business district, to outer western suburbs as far west as Little River. The network is fully enclosed, protecting the water from possible contamination during its delivery to customers. For the purpose of water quality monitoring our 714 square kilometre service area is divided into 15 water sampling localities (refer Figure 1.1) based on sources of water supply and similar pressure.

The water supply source(s) for each of our 15 water sampling localities are shown in Table 1.1

Figure 1.1 City West Water's water service area showing its 15 water sampling localities and sources of bulk water supply.

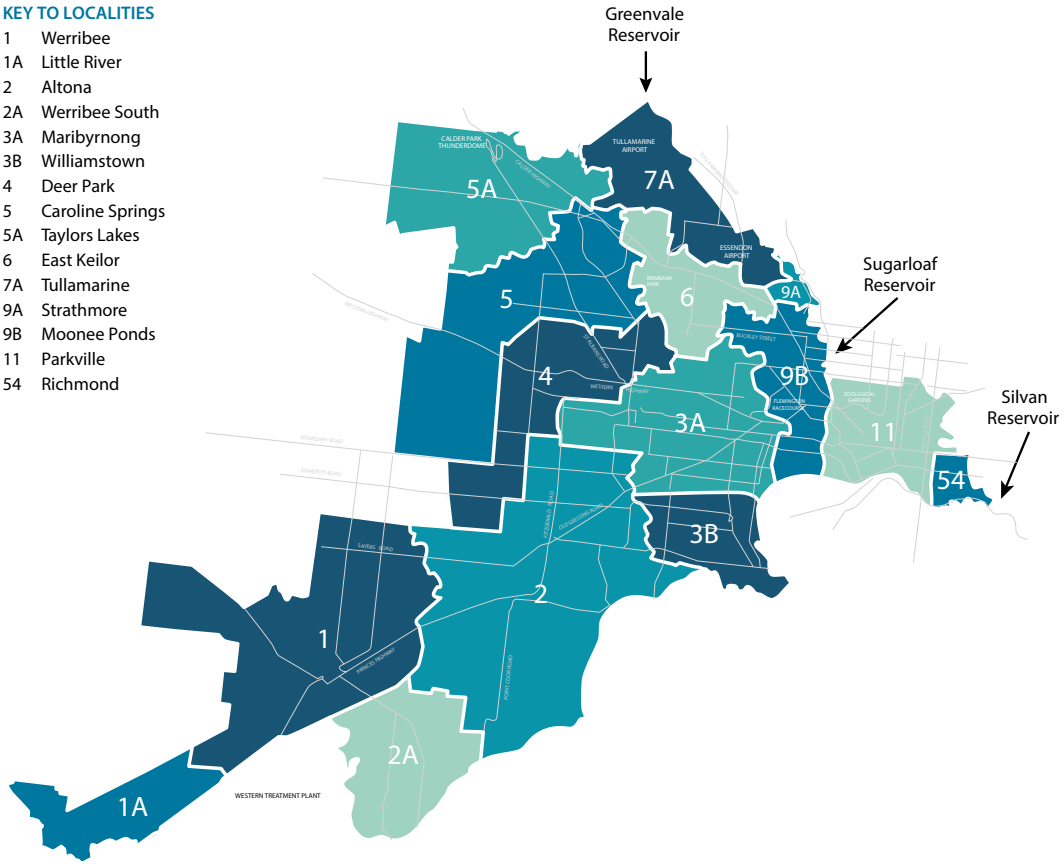


Table 1.1 2017-18 supply sources for our water sampling localities

Water sampling locality	Source water	Treatment plant	Population supplied (2016 census)
Altona	Yarra River; Maroondah, Silvan & Greenvale Reservoirs	Winneke Silvan Greenvale	117,900
Caroline Springs	Yarra River; Maroondah & Greenvale Reservoirs	Winneke Greenvale	103,800
Deer Park	Yarra River; Maroondah, Silvan & Greenvale Reservoirs	Winneke Silvan Greenvale	58,000
East Keilor	Yarra River; Maroondah, Silvan & Greenvale Reservoirs	Winneke Silvan Greenvale	41,300
Little River	Yarra River; Maroondah, Silvan & Greenvale Reservoirs	Winneke Silvan Greenvale	670
Maribyrnong	Yarra River; Maroondah & Silvan Reservoirs	Winneke Silvan	120,900
Moonee Ponds	Yarra River; Maroondah & Silvan Reservoirs	Winneke Silvan	73,500
Parkville	Yarra River; Maroondah & Silvan Reservoirs	Winneke Silvan	157,600
Richmond	Yarra River; Maroondah & Silvan Reservoirs	Winneke Silvan	24,900
Strathmore	Yarra River; Maroondah, Silvan & Greenvale Reservoirs	Winneke Silvan Greenvale	8,100
Taylors Lakes	Yarra River; Maroondah & Greenvale Reservoirs	Winneke Greenvale	67,800
Tullamarine	Yarra River; Maroondah & Greenvale Reservoirs	Winneke Greenvale	10,500
Werribee	Yarra River; Maroondah, Silvan & Greenvale Reservoirs	Winneke Silvan Greenvale	136,700
Werribee South	Yarra River; Maroondah, Silvan & Greenvale Reservoirs	Winneke Silvan Greenvale	2,000
Williamstown	Yarra River; Maroondah & Silvan Reservoirs	Winneke Silvan	50,000

2. Water treatment and quality management system

2.1 Water treatment

The water quality treatment processes used for City West Water's source or bulk water supply are outlined in Section 1.1.1.

Notwithstanding Melbourne Water's source or bulk water disinfection by chlorination, additional secondary chlorination (using liquid sodium hypochlorite) is undertaken within our service area by:

- Melbourne Water, with 4 secondary chlorination plants servicing the water sampling localities of Werribee, Deer Park, Caroline Springs and Altona
- City West Water, with a further 5 secondary chlorination plants servicing the water sampling localities of East Keilor, Little River, Richmond, Werribee and Werribee South.

In addition, the local water supply at Little River is dosed with gaseous carbon dioxide in order to assist with maintaining neutral pH levels.

Table 2.1 summarises the water treatment processes used on the water supplied to each water sampling locality.

Table 2.1 Drinking water treatment processes

	Drinking Water Treatment Processes									
	Clarification	Filtration	Disinfection	Other		Added Substances				
Treatment plant#	Coagulation and flocculation	Sand filtration	Chlorination	pH correction	Fluoridation	Alum	Chlorine gas	Chlorine liquid (sodium hypochlorite)	Lime	Fluorosilicic acid
Winneke	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Greenvale	✓	✓	✓	✓	✓	✓	✓*	✓*	✓	
Silvan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

*chlorination at Greenvale was changed from gas to liquid in January 2017

#treatment plants applicable to individual localities are shown in Table 1.1.

2.2 Issues

No adverse water treatment issues originated within City West Water's service area during 2017-18.

3. Emergency, incident and event management

This part of the report is for reporting emergencies, incidents and events that may have led to known or suspected contamination of the drinking water supply, including those that were reported to DHHS in line with Section 22 of the *Safe Drinking Water Act 2003*. We made one such report in 2017-18.

On 4 January 2018, City West Water reported to DHHS that complaints of a change in the taste of drinking water had been received from customers in the Tullamarine area. The cause of the change was identified as reduced flows in a coal tar enamel lined water main that supplies water from Melbourne Water's Greenvale Reservoir to the Tullamarine area. Melbourne Water carried out this flow reduction in its wholesale water distribution system as part of network re-configuration for the summer period. Both Melbourne Water and City West Water undertook extensive flushing of their respective networks to remove the affected water. A total of 24 complaints were received between 3 and 5 January. City West Water's Operational Control Centre provided information to affected customers and a field officer addressed their concerns on-site. We worked with Melbourne Water to put in place actions to prevent future such taste variations.

4. Drinking Water Quality Monitoring

A significant part of our water supply activities involves monitoring the quality of the water being supplied to customers. We have a water monitoring program of regular, day to day sampling and testing from many locations throughout the distribution network of 15 water sampling localities. This includes some 450 purpose built sampling fittings (referred to as 'customer taps') located at the point of supply, adjacent to water meters at properties across our service area. The number of customer taps sites in each water sampling locality is distributed in proportion to locality populations.

We also have a regular water quality sampling and testing program for each of our eight service reservoirs/tanks. In addition, Melbourne Water monitors the quality of bulk water supplies at points upstream of delivery points to City West Water. The results of all these tests are scrutinised under the Bulk Water Supply Agreement between the two corporations.

Between 1 July 2017 and 30 June 2018, we routinely collected and tested over 3,000 microbiological and 900 physical/chemical water samples, mainly from customer taps sites, but also from mains and service reservoirs/tanks. Monitoring was undertaken under contract by a government approved, specialised and quality certified laboratory. The extent of this monitoring is based on requirements of *Safe Drinking Water Regulations 2015* as well as guidance from the *Australian Drinking Water Guidelines 2011* (ADWG 2011), including consideration of locality population numbers for bacterial monitoring.

As well as guiding the design of monitoring programs, ADWG 2011 provides a basis for assessing the quality of drinking water. Microbiological assessment is based principally on the bacterium *Escherichia coli (E. coli),* which is considered to definitively indicate the presence of faecal contamination and, therefore, health risk.

Physical/chemical assessment and monitoring is based on a combination of parameters that indicate physical/aesthetic characteristics, such as pH, colour and turbidity (the clarity of the water), as well as the chemical quality of the water (i.e. levels of chlorine, iron, fluoride, dissolved salts, aluminium, copper and other heavy metals). Contact information for obtaining further details of all water quality testing outlined in this report is provided in Further Information on page 23.

In line with *Safe Drinking Water Regulations 2015* sample results from reticulation sites such as water mains and service reservoirs/tanks that are both spatially and hydraulically within individual water sampling localities, are added to the associated customer tap data.

City West Water's sampling sites (other than customer taps) and the water sampling locality to which they are associated for water quality performance reporting purposes are listed in Table 4.1 as follows:

Table 4.1 City West Water's sampling sites (other than customer taps) and associated water sampling localities

Sampling site	Sampling locality to which water quality data are included
Little River elevated tank	Little River
Little River ground level tank no. 1	Little River
Little River ground level tank no. 2	Little River
Hillside elevated tank	Taylors Lakes
Cowies Hill elevated tank	Werribee
Ballan Road tank	Werribee
Werribee South elevated tank	Werribee South
Werribee South ground level tank	Werribee South
Werribee South main at Maltby bypass	Werribee South

5. Drinking Water Quality Standards

Since 1 July 2004, the management of drinking water in Victoria has been governed by the *Safe Drinking Water Act 2003*. Under this Act, *Safe Drinking Water Regulations 2015* specifies scheduled water quality standards for a number of water quality parameters. The standards currently in place are listed in table 4.2:

Table 4.2 Water quality parameters, standards and frequency of sampling

Water quality parameter	Standard (Regulations 2015)	Relevant sampling frequency for each locality
Escherichia coli (E. coli)	No *E. coli* per 100mL of drinking water, with the exception of any false positive sample	one sample per week
Trihalomethanes	Less than or equal to 0.25 mg/L of drinking water	one sample per month
Turbidity	The 95th percentile of results for samples any 12 month period must be ≤5.0 NTU	one sample per week

The tables in sections 5.1 to 5.3 report 2017-18 compliance of water quality standard parameters against the water quality scheduled standards specified in Victoria's *Safe Drinking Water Regulations 2005 and Safe Drinking Water Regulations 2015*.

5.1 *Escherichia coli (E. coli)*

Standard: All samples of drinking water collected are found to contain no *Escherichia coli* per 100 millilitres of drinking water, with the exemption of any false positive sample.

Results: *E. coli* 1 July to 30 June 2018

Table 5.1 *E. coli* summary results in drinking water samples obtained from reticulation system sampling sites (customer taps, water mains, service reservoirs/tanks) tested between 1 July 2017 and 30 June 2018

Water sampling locality (locality number)	Sampling frequency	Number of samples	Maximum detected (orgs/100mL)	Average	Number of detections and investigations conducted (s. 22)	Number of samples where standard was not met (s. 18)
Altona (2)	>weekly	308	<1	<1	0	0
Caroline Springs (5)	>weekly	306	<1	<1	0	0
Deer Park (4)	>weekly	188	<1	<1	0	0
East Keilor (6)	>weekly	150	<1	<1	0	0
Little River (1A)	>weekly	118	<1	<1	0	0
Maribyrnong (3A)	>weekly	361	<1	<1	0	0
Moonee Ponds (9B)	>weekly	228	<1	<1	0	0
Parkville (11)	>weekly	385	<1	<1	0	0
Richmond (54)	>weekly	105	<1	<1	0	0
Strathmore (9A)	>weekly	78	<1	<1	0	0
Taylors Lakes (5A)	>weekly	240	<1	<1	0	0
Tullamarine (7A)	>weekly	84	<1	<1	0	0
Werribee (1)	>weekly	450	<1	<1	0	0
Werribee South (2A)	>weekly	117	<1	<1	0	0
Williamstown (3B)	>weekly	156	<1	<1	0	0

E. coli reticulation system data demonstrate compliance with the standard (100% samples with no E. coli) in each of City West Water's 15 water sampling localities between 1 July 2017 and 30 June 2018.

Sampling frequencies in each locality exceeded that prescribed by the Safe Drinking Water Regulations 2015 (i.e. one sample per week in each locality; refer Table 4.2). This was done in order to meet the more intense surveillance of internationally recognised population based frequencies, as advocated in ADWG 2011.

5.2 Total trihalomethanes

Standard: Total trihalomethanes less than or equal to 0.25 milligrams per litre of drinking water.

Results: **Total trihalomethanes** 1 July 2017 to 30 June 2018

Table 5.2 Total trihalomethanes summary results in drinking water samples obtained from reticulation system sampling sites (customer taps, water mains, service reservoirs/tanks) tested between 1 July 2017 and 30 June 2018

Water sampling locality (locality number)	Frequency of Sampling	Number of samples	Drinking water quality standard (mg/L)	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met (s. 18)
Altona (2)	monthly	13	0.25	0.068	0.050	0
Caroline Springs (5)	monthly	13	0.25	0.074	0.042	0
Deer Park (4)	monthly	13	0.25	0.063	0.042	0
East Keilor (6)	monthly	13	0.25	0.056	0.036	0
Little River (1A)	>monthly	52	0.25	0.088	0.061	0
Maribyrnong (3A)	monthly	13	0.25	0.070	0.052	0
Moonee Ponds (9B)	monthly	13	0.25	0.076	0.056	0
Parkville (11)	monthly	13	0.25	0.053	0.043	0
Richmond (54)	monthly	13	0.25	0.110	0.087	0
Strathmore (9A)	monthly	13	0.25	0.089	0.062	0
Taylors Lakes (5A)	>monthly	26	0.25	0.087	0.041	0
Tullamarine (7A)	monthly	13	0.25	0.085	0.037	0
Werribee (1)	>monthly	37	0.25	0.090	0.058	0
Werribee South (2A)	>monthly	52	0.25	0.069	0.031	0
Williamstown (3B)	monthly	13	0.25	0.061	0.045	0

Total trihalomethanes data demonstrate compliance with the standard (0.25 mg/L) in each of City West Water's 15 water sampling localities between 1 July 2017 and 30 June 2018.

5.3 Turbidity

Standard: The 95th percentile of results for samples in any given 12 month period must be less than or equal to 5.0 Nephelometric Turbidity Units (NTU).

Results: **Turbidity** 1 July 2017 to 30 June 2018

Table 5.3 Turbidity summary results in drinking water samples obtained from reticulation system sampling sites (customer taps, water mains, service reservoirs/tanks) tested between 1 July 2017 and 30 June 2018

Water sampling locality (locality number)	Frequency of Sampling	Number of samples	Maximum turbidity in a sample (NTU)	95th percentile of turbidity results in any 12 months (NTU)	Number of 95th percentile results in any 12 months above standard (s.18)
Altona (2)	weekly	52	1.4	0.4	0
Caroline Springs (5)	weekly	52	0.9	0.9	0
Deer Park (4)	weekly	52	0.9	0.8	0
East Keilor (6)	weekly	52	0.9	0.5	0
Little River (1A)	>weekly	91	2.2	0.6	0
Maribyrnong (3A)	weekly	52	0.7	0.5	0
Moonee Ponds (9B)	weekly	52	0.7	0.6	0
Parkville (11)	weekly	52	0.9	0.7	0
Richmond (54)	weekly	52	1.0	0.9	0
Strathmore (9A)	weekly	52	1.1	0.8	0
Taylors Lakes (5A)	>weekly	65	1.5	1.1	0
Tullamarine (7A)	weekly	50	0.9	0.9	0
Werribee (1)	>weekly	76	0.8	0.5	0
Werribee South (2A)	>weekly	91	1.1	0.7	0
Williamstown (3B)	weekly	52	0.8	0.4	0

Turbidity data demonstrate compliance with the standard (95th percentile ≤5 NTU) in each of City West Water's 15 water sampling localities between 1 July 2017 and 30 June 2018.

5.4 Summary performance against water quality standards

During 2017-18, City West Water met the monitoring and water quality requirements of *Safe Drinking Water Regulations 2015* for drinking water samples obtained from reticulation system sampling sites (water mains, customer taps, service reservoirs/tanks).

6. Other water quality standards

(algae toxin, pathogen, chemical or substance that may pose a risk to human health)

In addition to the water quality parameters designated as standards by *Safe Drinking Water Regulations 2015*, we have also monitored a range of other microbiological and chemical parameters that provide further information on the overall quality of our drinking water supply. Among such other parameters that were monitored in 2017-18, those for which there is a health-related *ADWG 2011* guideline are listed in Table 6.1. In addition, data on aesthetic and other parameters that provide an additional comprehensive characterisation of the water, as well as assisting the needs of customers (e.g. industry, residents, students and researchers) are contained in Section 7 and Appendices A and B.

Table 6.1 Other water quality standards (algae toxin, pathogen, chemical or substance that may pose a risk to human health) monitored in drinking water samples obtained from reticulation system sampling sites (water mains, customer taps, service reservoirs/tanks) and tested between 1 July 2017 and 30 June 2018

Parameter	ADWG 2011 health guideline	Frequency of testing	Met the guideline?
Microbiological			
Vibrio spp. *Shigella* spp. *Yersinia* spp. *Salmonella* spp. *Campylobacter* spp. *Giardia* spp. *Cryptosporidium* spp. *Enterococci* *Coliphage*	these parameters should not be present in drinking water	3 to 4 samples per month (3 samples per locality per year) This monitoring ceased in December 2017.	yes (none detected)
Chemical*	(mg/L)		
Arsenic	0.01	annually per locality	yes (not detected)
Cadmium	0.002	annually per locality	yes (not detected)
Chlorine	5	>weekly per locality	Yes
Chromium	0.05	annually per locality	yes (not detected)
Copper	2	annually per locality	Yes
Cyanide	0.08	annually per locality	yes (not detected)
Fluoride	1.5	fortnightly per locality	Yes
Lead	0.01	annually per locality	yes (not detected)
Manganese	0.1	fortnightly per locality	Yes
Mercury	0.001	annually per locality	yes (not detected)
Nitrate	50	annually per locality	Yes
Sulphate	250	annually per locality	Yes
Zinc	3 (aesthetic only)	annually per locality	Yes

*sample numbers, maximum/average/minimum levels and compliance details for each sampling locality are shown in Appendix A tables.

Since levels of all health-related parameters tested satisfied *ADWG 2011* guideline values for samples from reticulation system sampling sites, no related remedial water quality actions were necessary.

As our water supply distribution network is completely enclosed, any monitoring for organic chemicals (including pesticides) and radioactivity is undertaken at locations upstream of this network. Melbourne Water tests for these substances with respect to its major storage reservoirs such as Silvan and Sugarloaf, where the potential for contamination is greater. Results of this monitoring are provided to City West Water. No significant detections (with respect to *ADWG 2011* guidelines) in the bulk water supply were reported during 2017-18.

7. Aesthetic characteristics

Aesthetic water quality characteristics are those classified by *ADWG 2011* guidelines as not having health impacts. Monitoring results for aesthetic water quality parameters comprising pH, colour, hardness, alkalinity and iron are shown in Table 7.1. Note that our colour tests are reported as apparent colour while the *ADWG 2011* guideline of 15 platinum cobalt units (PCU) refers to true colour. Due to the omission of a filtering step in the test for apparent colour, the subsequent result values are at least equal to, but not less than, the equivalent true colour values. As a result, true colour compliance with respect to the *ADWG 2011* guideline is assured in all cases where apparent colour levels are within the guideline. Past investigations have shown that for Melbourne's water supply, an apparent colour level of 25 PCU is equivalent to a true colour level of 15 PCU.

Table 7.1 Detailed monitoring results for pH, apparent colour, hardness, alkalinity and iron in drinking water samples obtained from reticulation system sampling sites (water mains, customer taps, service reservoirs/tanks) and tested between 1 July 2017 and 30 June 2018

Water Sampling Locality (locality number)	Parameter	Frequency of Sampling	Number of samples	Minimum	Maximum	Aesthetic operating range (As per *ADWG 2011*)
Altona (2)	pH#	fortnightly	26	7.1	8.4	6.5-8.5 or 6.5-9.2
	apparent colour *	fortnightly	26	<2	4	<25Pt/Co
	hardness	annually	1	20	20	<200mg/L
	alkalinity	annually	1	12	12	NA
	iron	fortnightly	26	<0.01	0.03	<0.3mg/L
Caroline Springs (5)	pH	fortnightly	26	7.2	8.8	6.5-8.5 or 6.5-9.2
	apparent colour	fortnightly	26	<2	6	<25Pt/Co
	hardness	annually	1	19	19	<200mg/L
	alkalinity	annually	1	13	13	NA
	iron	fortnightly	26	<0.01	0.1	<0.3mg/L
Deer Park (4)	pH	fortnightly	26	7.1	9.0	6.5-8.5 or 6.5-9.2
	apparent colour	fortnightly	26	<2	4	<25Pt/Co
	hardness	annually	1	25	25	<200mg/L
	alkalinity	annually	1	15	15	NA
	iron	fortnightly	26	<0.01	0.07	<0.3mg/L
East Keilor (6)	pH	fortnightly	26	7.1	7.9	6.5-8.5 or 6.5-9.2
	apparent colour	fortnightly	26	<2	6	<25Pt/Co
	hardness	annually	1	25	25	<200mg/L
	alkalinity	annually	1	12	12	NA
	iron	fortnightly	26	<0.01	0.05	<0.3mg/L
Little River (1A)	pH	>fortnightly	65	6.4	9.0	6.5-8.5 or 6.5-9.2
	apparent colour	>fortnightly	65	<2	6	<25Pt/Co
	hardness	annually	1	28	28	<200mg/L
	alkalinity	annually	1	17	17	NA
	iron	>fortnightly	65	<0.01	0.1	<0.3mg/L

Water Sampling Locality (locality number)	Parameter	Frequency of Sampling	Number of samples	Minimum	Maximum	Aesthetic operating range (As per *ADWG 2011*)
Maribyrnong (3A)	pH	fortnightly	26	7.2	7.5	6.5-8.5 or 6.5-9.2
	apparent colour	fortnightly	26	<2	4	<25Pt/Co
	hardness	annually	1	24	24	<200mg/L
	alkalinity	annually	1	12	12	NA
	iron	fortnightly	26	0.01	0.05	<0.3mg/L
Moonee Ponds (9B)	pH	fortnightly	26	6.8	7.4	6.5-8.5 or 6.5-9.2
	apparent colour	fortnightly	26	<2	6	<25Pt/Co
	hardness	annually	1	17	17	<200mg/L
	alkalinity	annually	1	14	14	NA
	iron	fortnightly	26	<0.01	0.07	<0.3mg/L
Parkville (11)	pH	fortnightly	26	7.1	7.4	6.5-8.5 or 6.5-9.2
	apparent colour	fortnightly	26	<2	6	<25Pt/Co
	hardness	annually	1	24	24	<200mg/L
	alkalinity	annually	1	12	12	NA
	iron	fortnightly	26	<0.01	0.12	<0.3mg/L
Richmond (54)	pH	fortnightly	26	7.2	7.5	6.5-8.5 or 6.5-9.2
	apparent colour	fortnightly	26	4	8	<25Pt/Co
	hardness	annually	1	16	16	<200mg/L
	alkalinity	annually	1	14	14	NA
	iron	fortnightly	26	0.05	0.11	<0.3mg/L
Strathmore (9A)	pH	fortnightly	26	7.2	8.6	6.5-8.5 or 6.5-9.2
	apparent colour	fortnightly	26	<2	8	<25Pt/Co
	hardness	annually	1	16	16	<200mg/L
	alkalinity	annually	1	14	14	NA
	iron	>fortnightly	26	0.01	0.08	<0.3mg/L
Taylors Lakes (5A)	pH	fortnightly	39	7.1	8.5	6.5-8.5 or 6.5-9.2
	apparent colour	>fortnightly	39	<2	10	<25Pt/Co
	hardness	annually	1	17	17	<200mg/L
	alkalinity	annually	1	13	13	NA
	iron	>fortnightly	39	0.03	0.18	<0.3mg/L

Water Sampling Locality (locality number)	Parameter	Frequency of Sampling	Number of samples	Minimum	Maximum	Aesthetic operating range (As per *ADWG 2011*)
Tullamarine (7A)	pH	fortnightly	26	7.1	8.3	6.5-8.5 or 6.5-9.2
	apparent colour	fortnightly	26	<2	8	<25Pt/Co
	hardness	annually	1	26	26	<200mg/L
	alkalinity	annually	1	16	16	NA
	iron	fortnightly	26	<0.01	0.08	<0.3mg/L
Werribee (1)	pH	>fortnightly	50	7.2	8.6	6.5-8.5 or 6.5-9.2
	apparent colour	>fortnightly	50	<2	6	<25Pt/Co
	hardness	annually	1	26	26	<200mg/L
	alkalinity	annually	1	15	15	NA
	iron	>fortnightly	50	<0.01	0.07	<0.3mg/L
Werribee South (2A)	pH	>fortnightly	65	7.3	8.4	6.5-8.5 or 6.5-9.2
	apparent colour	>fortnightly	65	<2	10	<25Pt/Co
	hardness	annually	1	21	21	<200mg/L
	alkalinity	annually	1	16	16	NA
	iron	>fortnightly	65	<0.01	0.19	<0.3mg/L
Williamstown (3B)	pH	fortnightly	26	7.1	7.4	6.5-8.5 or 6.5-9.2
	apparent colour	fortnightly	26	<2	4	<25Pt/Co
	hardness	annually	1	26	26	<200mg/L
	alkalinity	annually	1	13	13	NA
	iron	fortnightly	26	<0.01	0.04	<0.3mg/L

Units: pH (units); apparent colour (platinum cobalt units); hardness (mg/L as calcium carbonate); alkalinity (mg/L as calcium carbonate); iron (mg/L).

tolerable upper value of 9.2 where there are cement lined water mains.

*Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).

All 2017-18 water colour, hardness and iron monitoring data complied with the respective aesthetic operating ranges levels of 25 PCU, 200 mg/L and 0.3 mg/L. There is no guideline for alkalinity. Of the 505 samples tested for pH, there were 8 instances where pH readings were not within the *ADWG 2011* guideline range of 6.5 to 8.5. Five of these exceeded 8.5 (maximum 9) but not the tolerable upper value of 9.2, whilst another five were marginally below 6.5 (minimum 6.4). Such minor variations do not have health implications as, according to ADWG 2011, adverse health effects may occur at pH levels less than 4 or greater than 11.

8. Analysis of results – trends

This section of the report examines:

a) trends over time of water quality parameters tested that are designated as standards in *Safe Drinking Water Regulations (2015).*

b) trends over time and between localities of parameters listed in Appendix A tables that have a corresponding Victorian standard or *ADWG 2011* guideline.

Data analysed in this section is based on drinking water samples obtained from reticulation system sampling sites (customer taps, water mains and service reservoirs/tanks).

8.1 Historical compliance of standard parameters

Table 8.1 summarises trends over time (and extent of compliance) of water quality parameters that are scheduled standards in *Safe Drinking Water Regulations (2015).*

Table 8.1 Compliance time trends of scheduled standard parameters

Parameter	Standard (2015 Regulations)	Localities compliant (% of customers supplied with compliant water)			
		2017-18	2016-17	2015-16	2014-15
E. coli	<1 per 100mL	15 / 15 (100%)	15 / 15 (100%)	15 / 15 (100%)	15 / 15 (100%)
Trihalomethanes	0.25 mg/L	15 / 15 (100%)	15 / 15 (100%)	15 / 15 (100%)	15 / 15 (100%)
Turbidity	95th percentile not to exceed 5.0 NTU	15 / 15 (100%)	15 / 15 (100%)	15 / 15 (100%)	15 / 15 (100%)

A comprehensive outline of our monitoring data for individual localities, together with monitoring frequencies, Victorian standards and *ADWG 2011* guidelines for both health-related and aesthetic water quality data, is contained in Appendix A tables. Contact information for obtaining further details of all water quality testing outlined in this report is provided in the Further Information section on page 23.

8.2 Parameter trends over time and between localities

Analysis of parameter trends over time and between localities is used as a tool to better understand and possibly highlight water quality issues throughout our service area. This part of the report looks at such trends over the past three years in terms of the key parameters listed in Appendix A tables. Graphical representations of trends are contained in Appendix B and briefly discussed below.

E. coli (refer Figure B.1 in Appendix B)

E. coli performance in our drinking water has consistently complied with the 2015 Victorian standards in all water sampling localities.

Free chlorine (refer Figure B.2 in Appendix B)

All of our drinking water supply is disinfected with chlorine. The more active form (free chlorine) is present in all water sampling localities, with levels well within the maximum *ADWG 2011* guideline of 5 mg/L. Nevertheless, average levels amongst individual localities can be markedly different; this being largely due to relative proximity to chlorine dosing points. For example, the Taylors Lakes and Tullamarine localities are situated close to primary chlorination at Greenvale Reservoir, while the Little River, East Keilor and Werribee South localities are served by secondary re-chlorination plants. Year-to-year variations within water sampling localities reflect changes to chlorine dosing rates and bulk water sources.

Aluminium (refer Figure B.3 in Appendix B)

Overall aluminium levels in the water supply are low. Apparent variations at these levels are considered to be related to natural differences in the catchments rather than from artificial treatment dosing. For example, aluminium is only used in water treatment at the Winneke Treatment Plant, yet the water sampling localities more likely to receive water from this source (Moonee Ponds, Parkville, Altona, Werribee) do not exhibit markedly higher aluminium levels as compared with other localities.

Arsenic, cadmium, chromium, cyanide, lead, mercury, zinc

These substances have been monitored on an annual basis. As shown in the Appendix A tables, test results have consistently been either well within guideline levels or below analytical detection limits.

Chloride (refer Figure B.4 in Appendix B)

Chloride levels are quite low (well within guideline levels) and relatively consistent amongst the water sampling localities.

Colour (refer Figure B.5 in Appendix B)

ADWG 2011 refers to 'true colour' of water; however we have continued the historical practice of measuring the more conservative 'apparent colour', which gives higher readings. Nevertheless, our average apparent colour levels have been within the *ADWG 2011* True Colour guideline of 15 PCU. Higher colour levels in the Richmond locality are associated with its traditional bulk supply source from Silvan Reservoir. Average colour levels are generally consistent within individual sampling localities.

Copper (refer Figure B.6 in Appendix B)

Copper levels in the water supply are low and consistently well within the *ADWG 2011* health and aesthetic guidelines.

Electrical conductivity (EC) – (refer Figure B.7 in Appendix B)

We measure EC as a surrogate for total dissolved solids (TDS). *ADWG 2011* advises that its TDS guideline level of 600 mg/L can be substituted by an EC level of approximately 900 µs/cm. EC levels are quite low and relatively consistent within each water sampling locality. Slight trend of increased EC levels reflects greater supply from Sugarloaf/Winneke.

Fluoride (refer Figure B.8 in Appendix B)

Fluoride levels in the water supply are the result of fluoridation of the bulk supply (refer Section 1.1.1). Dosing is normally controlled such that levels are generally maintained between approximately 0.9 and 1.0 mg/L. Average fluoride levels in 2017-18 were lower due to variable fluoride dosing mainly at Winneke treatment plant.

Hardness (refer Figure B.9 in Appendix B)

Water hardness levels are quite low and relatively consistent within each water sampling locality.

Iron (refer Figure B.10 in Appendix B)

Overall, slightly higher iron levels in the Taylors Lakes and Richmond water sampling localities are consistent with their source water comprising more of the relatively greater iron containing water from Silvan and Greenvale reservoirs. Nevertheless, variations occur due to changes in bulk water sources. A decline in iron levels reflects an overall greater supply from Sugarloaf/Winneke.

Manganese (refer Figure B.11 in Appendix B)

Manganese levels in the water supply are low and consistently well within the guidelines.

Nitrate (refer Figure B.12 in Appendix B)

Nitrate levels in the water supply are low and consistently well within the guidelines.

pH (refer Figure B.13 in Appendix B)

Average pH levels in all localities are within guideline levels. The slightly higher levels in Werribee South are consistent with the presence of cement lined mains. Note that Little River also has cement lined mains but its pH is being controlled by dosing the local water supply with carbon dioxide gas.

Sodium (refer Figure B.14 in Appendix B)

Sodium levels are quite low and relatively consistent among the water sampling localities.

Turbidity (refer Figure B.15 in Appendix B)

Turbidity levels in all localities continue to be within the standard. Variations between individual water sampling localities are a reflection of their source waters. For example, localities with lower turbidity tend to be supplied more from Sugarloaf/Winneke, while higher turbidity localities tend to be supplied to a greater extent from Silvan and Greenvale reservoirs.

Sulphate (refer Figure B.16 in Appendix B)

Sulphate levels are quite low and relatively consistent within each water quality locality. Lower sulphate (as well as sodium, hardness, conductivity and chloride – as per earlier Figures) levels in Caroline Springs, Richmond and Taylors Lakes localities are a reflection of the Silvan reservoir source. At the same time, higher turbidity, iron and colour in these localities also reflects Silvan as the source of the water.

Total trihalomethanes – (refer Figure B.17 in Appendix B)

Total trihalomethanes concentrations are relatively low (in comparison with the Victorian standard) and consistent among water sampling localities. Localities with higher levels tend to be more remote from primary chlorination.

9. Complaints relating to water quality

During 2017-18, City West Water received 330 complaints related to water supply quality. The various categories of complaints were distributed as shown in Table 9.1.

Table 9.1 Water quality related customer complaints received over the last three years

Complaint category	Numbers received				
	2017-18	2016-17	2015-16	Comparison with previous reporting periods	Comments
Discoloured water	210	338	187	Decrease of 128 from previous reporting period.	No specific cause for the decrease was identified.
Taste/odour	92 (21 chlorine)*	43 (5 chlorine)*	31 (6 chlorine)*	Significant increase	Refer Section 3 - Emergency, incident and event management.
Air in water	11	47	19	Decrease of 36 from previous reporting period.	No specific cause for the decrease was identified.
Other (alleged illness) (blocked filter) (blue-green water) (staining)	17 (2) (3) (6) (6)	7 (1) (3) (1) (2)	6 (0) (6) (0) (0)	No significant change.	Nil.
Total	**330**	**435**	**243**	Decrease of 105 from previous reporting period.	As per discoloured water.
No. of properties	459,000	445,000	429,000	-	-
Complaints per 100 properties	0.072	0.098	0.057	-	-

* Number of complaints received of chlorine taste or odour.

The water quality complaints received during 2017-18 in each water sampling locality are shown in Table 9.2.

Table 9.2 Water quality related customer complaints received during 2017-18 per water sampling locality.

Water sampling locality (Locality number)	Numbers received				
	Discoloured water	Taste/odour	Air in water	Other (alleged illness) (blocked filter) (blue-green water) (staining)	Total complaints
Altona (2)	23	4	0	1	28
Caroline Springs (5)	48	14	2	1	65
Deer Park (4)	13	3	0	0	16
East Keilor (6)	7	3	1	0	11
Little River (1A)	0	0	0	0	0
Maribyrnong (3A)	18	6	3	6	33
Moonee Ponds (9B)	10	1	1	4	16
Parkville (11)	20	4	0	1	25
Richmond (54)	7	4	1	2	14
Strathmore (9A)	0	0	0	0	0
Taylors Lakes (5A)	20	4	1	1	26
Tullamarine (7A)	2	25	0	0	27
Werribee (1)	33	19	0	1	53
Werribee South (2A)	1	0	0	0	1
Williamstown (3B)	8	5	2	0	15

Complaints and responses

We provide individual responses to water quality related complaints. These can range between verbal clarification of reported issues to onsite investigations and remedial action. In terms of the major complaint categories, our responses are as follows.

Discoloured (e.g. brown) water

Discoloured water is generally caused by the suspension of accumulated natural sediments in water mains. It can be triggered by the opening or closing of valves and reinstatement of mains into service following repairs. Discoloured water can also result from older, rusting galvanised iron pipes inside a customer's property. Calls to City West Water are assessed by trained staff and, where the discoloured water is deemed to be originating from the water main, targeted mains flushing is generally undertaken.

Alleged illness

Complaints of water related illness are referred to our Water Quality Scientist for detailed discussion, analysis and investigation. Customers may be advised to seek medical advice.

White water (air in water)

White water (water with a cloudy appearance that clarifies within a few minutes) indicates the presence of tiny, harmless air bubbles. It tends to be associated with maintenance and repair works, when air can enter water pipes. As the aerated water is used by customers, its appearance returns to normal. In the past we often responded to customers' concerns with targeted mains flushing, however with increasing emphasis on the need to conserve water, we spend more time on explaining the phenomenon and obtaining customer agreement to not flush water mains.

Blue-green water

On occasion, customers at a small number of properties report blue-green water (water that has a cloudy to blue-green appearance, possibly containing blue-green particles, and having an unpleasant bitter taste). This is caused by accelerated corrosion of customers' internal copper water pipes and appears to be restricted to cold water pipes.

Blue-green water must not be consumed (by drinking or in the preparation of food) because it can cause vomiting. The prolonged consumption of water containing elevated copper levels can have adverse health effects.

As blue-green water originates from a property's internal copper pipes, customers can manage the problem by flushing their tap with fresh mains water. This means running their tap until the water becomes clear.

Taste or odour

A change in taste or odour of tap water can occur occasionally and is generally apparent as a chlorine-like or earthy, musty sensation. Fluctuations in chlorine levels (and hence, the perception of chlorine taste or odour) occur from time to time, largely due to changed water demands and flow rates. Our response to customers reporting chlorine taste/odour involves providing an explanation, as well as considering changes to chlorine dosing.

Other tastes/odours can result when water flows are slower and during flow reversals in large pipes. In such cases the cause is identified and, where appropriate, a combination of targeted flushing and/or changes to flow regimes are implemented.

10. Risk management plan audit results

Pursuant to the *Safe Drinking Water Act 2003*, we have a documented water quality Risk Management Plan that is subject to independent audit (at approximately two year intervals) in terms of its content and implementation. Our Plan was audited for the sixth time in March 2018, during which it was examined to determine compliance with the obligations imposed by Section 7(1) of the *Safe Drinking Water Act 2003*. In this regard, the audit:

- determined whether City West Water met all the requirements described under Section 7(1);
- determined whether the Risk Management Plan met all the specifications in the Act (Section 9) and its Regulations in an effective manner;
- inspected all documents specified in the Regulations;
- determined whether the identified water quality control measures and control measure combinations are in place operationally and are adequate to control water safety risks.

The audit concluded that the water quality Risk Management Plan complies with the obligations imposed by Section 7(1) of the SDWA during the audit period (March 2016 to April 2018). A copy of the audit certificate is in Appendix C. Notwithstanding the plan's compliance with the *Act*, the audit identified several opportunities for improvement. An outline of these opportunities for improvement, together with actions to address these is contained in Appendix C.

Significant portions of the Risk Management Plan are based on our HACCP plan which itself is audited internally on a quarterly basis, as well as annually by an external, independent auditor. The HACCP plan specifically addresses issues such as staff training and development, calibration of equipment and maintenance and inspections of assets. Each of these is examined during the independent annual audits. The HACCP system is highly regarded and well known in the food industry for protecting the welfare and safety of consumers. It is based on the identification and management of risks (to quality) at key points within a production or product delivery process.

The HACCP certification demonstrates that we attend to those parts of our network and operations that have an impact on water quality. Maintenance of HACCP certification requires continual vigilance and improvements to our water quality management operations. We are driving our performance to continue meeting the HACCP requirements.

11. Undertakings under Section 30 of the *Safe Drinking Water Act 2003*

City West Water has not entered into any undertakings with DHHS, pursuant to section 30 of the *Safe Drinking Water Act 2003*.

12. Exemptions from water quality standards under Section 20 and conditions imposed under Section 21 of the *Safe Drinking Water Act 2003*

City West Water did not have any Section 20 or Section 21 exemptions in place.

13. Variation to aesthetic standards under Section 19 of the Act and conditions imposed under Section 21 of the *Safe Drinking Water Act 2003*

City West Water did not have any Section 19 variations.

14. Regulated water

Regulated water is water that is the subject of a declaration made by the Minister for Health concerning water that is not drinking water. We do not manage any water supplies that have been declared as 'regulated water'.

15. Further Information

This report is also available on City West Water's website: citywestwater.com.au

For further information on this report please contact 131 691 or enquiries@citywestwater.com.au

For water quality issues please contact 132 642

Written enquiries can be addressed to: City West Water, Locked Bag 350, Sunshine, Victoria, 3020

Appendix A Water quality data by locality

(based on results of tests on drinking water samples obtained from reticulation system sampling sites (water mains, customer taps, service reservoirs/tanks) tested between 1 July 2017 and 30 June 2018)

WATER SAMPLING LOCALITY	Altona	LOCALITY No.	2
FOR PERIOD	1 July 2017 to 30 June 2018	POPULATION (2016 Census)	117,900

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling frequency	No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000*	<1	<1	5	>weekly	308	308	100%
Total Coliforms	orgs/100mL	N	<1	<1	2	>weekly	308	-	-
E. coli	orgs/100mL	100%<1[#]	<1	<1	<1	>weekly	308	308	100%
Free Chlorine	mg/L	5	<0.05	0.18	0.54	>weekly	308	308	100%
Total Chlorine	mg/L	5	<0.05	0.27	0.66	>weekly	308	308	100%
Alkalinity (as $CaCO_3$)	mg/L	N	12	12	12	annually	1	-	-
Aluminium (acid soluble)	mg/L	0.2	0.02	0.03	0.03	>monthly	13	13	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	annually	1	1	100%
Calcium	mg/L	N	5.1	5.1	5.1	annually	1	-	-
Chloride	mg/L	250	17	17	17	annually	1	1	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	annually	1	1	100%
Colour	Pt/Co	25**	<2	2	4	fortnightly	26	26	100%
Conductivity	µS/cm	~900	97	113	130	fortnightly	26	26	100%
Copper	mg/L	1	0.004	0.004	0.004	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.15	0.70	0.88	>fortnightly	27	27	100%
Hardness (as $CaCO_3$)	mg/L	200	20	20	20	annually	1	1	100%
Iron	mg/L	0.3	<0.01	0.02	0.03	fortnightly	26	26	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	1.8	1.8	1.8	annually	1	-	-
Manganese	mg/L	0.1	<0.001	0.001	0.003	fortnightly	26	26	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO_3)	mg/L	50	1.37	1.37	1.37	annually	1	1	100%
pH	units	6.5-8.5	7.1	7.4	8.4	fortnightly	26	26	100%
pH	units	6.5-9.2	7.1	7.4	8.4	fortnightly	26	26	100%
Potassium	mg/L	N	1.1	1.1	1.1	annually	1	-	-
Silica (SiO_2)	mg/L	80	3.8	3.8	3.8	annually	1	1	100%
Sodium	mg/L	180	7.7	7.7	7.7	annually	1	1	100%
Sulphate	mg/L	250	7.4	7.4	7.4	annually	1	1	100%
Total Organic Carbon	mg/L	N	1.8	1.8	1.8	annually	1	-	-
Total Phosphorus	mg/L	N	0.006	0.006	0.006	annually	1	-	-
Total Dissolved Solids	mg/L	600	35	35	35	annually	1	1	100%
Turbidity	NTU	5[1]	<0.1	0.4[1]	1.4	weekly	52	-	within standard
Zinc	mg/L	3	0.003	0.003	0.003	annually	1	1	100%
Dibromochloromethane	mg/L	N	0.005	0.006	0.008	>monthly	13	-	-
Dichlorobromomethane	mg/L	N	0.011	0.015	0.018	>monthly	13	-	-
Bromoform	mg/L	N	<0.001	<0.001	<0.001	>monthly	13	-	-
Chloroform	mg/L	N	0.019	0.028	0.047	>monthly	13	-	-
Total Trihalomethanes	mg/L	0.25	0.038	0.050	0.068	>monthly	13	13	100%
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	0.015	0.015	0.015	annually	1	1	100%

* Internal City West Water guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
[1] Victorian standard: 95th percentile (shown) less than or equal to 5 NTU. As a result, performance is not expressed as a percentage.

WATER SAMPLING LOCALITY	Caroline Springs	LOCALITY No.	5
FOR PERIOD	1 July 2017 to 30 June 2018	POPULATION (2016 Census)	103,800

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling frequency	No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000*	<1	<1	650	>weekly	306	306	100%
Total Coliforms	orgs/100mL	N	<1	<1	130	>weekly	306	-	-
E. coli	orgs/100mL	100%<1#	<1	<1	<1	>weekly	306	306	100%
Free Chlorine	mg/L	5	<0.01	0.20	0.65	>weekly	306	306	100%
Total Chlorine	mg/L	5	<0.05	0.30	0.82	>weekly	306	306	100%
Alkalinity (as $CaCO_3$)	mg/L	N	13	13	13	annually	1	-	-
Aluminium (acid soluble)	mg/L	0.2	<0.01	0.02	0.03	>monthly	13	13	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	annually	1	1	100%
Calcium	mg/L	N	4.5	4.5	4.5	annually	1	-	-
Chloride	mg/L	250	17	17	17	annually	1	1	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	annually	1	1	100%
Colour	Pt/Co	25**	<2	4	6	fortnightly	26	26	100%
Conductivity	µS/cm	~900	61	85	130	fortnightly	26	26	100%
Copper	mg/L	1	0.010	0.010	0.010	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.67	0.82	0.88	>fortnightly	28	28	100%
Hardness (as $CaCO_3$)	mg/L	200	19	19	19	annually	1	1	100%
Iron	mg/L	0.3	<0.01	0.04	0.10	fortnightly	26	26	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	1.8	1.8	1.8	annually	1	-	-
Manganese	mg/L	0.1	<0.001	0.003	0.008	fortnightly	26	26	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO_3)	mg/L	50	1.15	1.15	1.15	annually	1	1	100%
pH	units	6.5-8.5	7.2	7.5	8.8	fortnightly	26	25	96.2%
pH	units	6.5-9.2	7.2	7.5	8.8	fortnightly	26	26	100%
Potassium	mg/L	N	1.1	1.1	1.1	annually	1	-	-
Silica (SiO_2)	mg/L	80	3.1	3.1	3.1	annually	1	1	100%
Sodium	mg/L	180	7.5	7.5	7.5	annually	1	1	100%
Sulphate	mg/L	250	7.2	7.2	7.2	annually	1	1	100%
Total Organic Carbon	mg/L	N	3.4	3.4	3.4	annually	1	-	-
Total Phosphorus	mg/L	N	0.007	0.007	0.007	annually	1	-	-
Total Dissolved Solids	mg/L	600	70	70	70	annually	1	1	100%
Turbidity	NTU	5[1]	<0.1	0.9[1]	0.9	weekly	52	-	within standard
Zinc	mg/L	3	0.002	0.002	0.002	annually	1	1	100%
Dibromochloromethane	mg/L	N	<0.001	0.003	0.007	>monthly	13	-	-
Dichlorobromomethane	mg/L	N	0.004	0.009	0.014	>monthly	13	-	-
Bromoform	mg/L	N	<0.001	<0.001	<0.001	>monthly	13	-	-
Chloroform	mg/L	N	0.012	0.030	0.063	>monthly	13	-	-
Total Trihalomethanes	mg/L	0.25	0.023	0.042	0.074	>monthly	13	13	100%
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	0.006	0.006	0.006	annually	1	1	100%

* Internal City West Water guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
[1] Victorian standard: 95th percentile (shown) less than or equal to 5 NTU. As a result, performance is not expressed as a percentage.

WATER SAMPLING LOCALITY	Deer Park	LOCALITY No.	4
FOR PERIOD	1 July 2017 to 30 June 2018	POPULATION (2016 Census)	58,000

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling frequency	No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000*	<1	<1	120	>weekly	187	187	100%
Total Coliforms	orgs/100mL	N	<1	<1	<1	>weekly	188	-	-
E. coli	orgs/100mL	100%<1#	<1	<1	<1	>weekly	188	188	100%
Free Chlorine	mg/L	5	<0.05	0.25	0.47	>weekly	188	188	100%
Total Chlorine	mg/L	5	0.09	0.36	0.60	>weekly	188	188	100%
Alkalinity (as $CaCO_3$)	mg/L	N	15	15	15	annually	1	-	-
Aluminium (acid soluble)	mg/L	0.2	0.02	0.02	0.03	>monthly	13	13	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	annually	1	1	100%
Calcium	mg/L	N	6.6	6.6	6.6	annually	1	-	-
Chloride	mg/L	250	19	19	19	annually	1	1	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	annually	1	1	100%
Colour	Pt/Co	25**	<2	2	4	fortnightly	26	26	100%
Conductivity	µS/cm	~900	69	111	140	fortnightly	26	26	100%
Copper	mg/L	1	0.007	0.007	0.007	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.06	0.72	0.90	>fortnightly	28	28	100%
Hardness (as $CaCO_3$)	mg/L	200	25	25	25	annually	1	1	100%
Iron	mg/L	0.3	<0.01	0.02	0.07	fortnightly	26	26	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	2.0	2.0	2.0	annually	1	-	-
Manganese	mg/L	0.1	<0.001	0.001	0.004	fortnightly	26	26	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO_3)	mg/L	50	1.51	1.51	1.51	annually	1	1	100%
pH	units	6.5-8.5	7.1	7.4	9.0	fortnightly	26	25	96.2%
pH	units	6.5-9.2	7.1	7.4	9.0	fortnightly	26	26	100%
Potassium	mg/L	N	1.2	1.2	1.2	annually	1	-	-
Silica (SiO_2)	mg/L	80	3.4	3.4	3.4	annually	1	1	100%
Sodium	mg/L	180	8.5	8.5	8.5	annually	1	1	100%
Sulphate	mg/L	250	9.5	9.5	9.5	annually	1	1	100%
Total Organic Carbon	mg/L	N	1.7	1.7	1.7	annually	1	-	-
Total Phosphorus	mg/L	N	0.006	0.006	0.006	annually	1	-	-
Total Dissolved Solids	mg/L	600	40	40	40	annually	1	1	100%
Turbidity	NTU	5[1]	<0.1	0.8[1]	0.9	weekly	52	-	within standard
Zinc	mg/L	3	0.002	0.002	0.002	annually	1	1	100%
Dibromochloromethane	mg/L	N	0.002	0.006	0.009	>monthly	13	-	-
Dichlorobromomethane	mg/L	N	0.007	0.013	0.019	>monthly	13	-	-
Bromoform	mg/L	N	<0.001	0.001	0.001	>monthly	13	-	-
Chloroform	mg/L	N	0.012	0.023	0.041	>monthly	13	-	-
Total Trihalomethanes	mg/L	0.25	0.031	0.042	0.063	>monthly	13	13	100%
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%

* Internal City West Water guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
[1] Victorian standard: 95th percentile (shown) less than or equal to 5 NTU. As a result, performance is not expressed as a percentage.

WATER SAMPLING LOCALITY	East Keilor	LOCALITY No.	6
FOR PERIOD	1 July 2017 to 30 June 2018	POPULATION (2016 Census)	41,300

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling frequency	No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000*	<1	<1	72	>weekly	150	150	100%
Total Coliforms	orgs/100mL	N	<1	<1	<1	>weekly	150	-	-
E. coli	orgs/100mL	100%<1#	<1	<1	<1	>weekly	150	150	100%
Free Chlorine	mg/L	5	<0.05	0.26	0.67	>weekly	150	150	100%
Total Chlorine	mg/L	5	0.09	0.36	0.83	>weekly	150	150	100%
Alkalinity (as $CaCO_3$)	mg/L	N	12	12	12	annually	1	-	-
Aluminium (acid soluble)	mg/L	0.2	0.02	0.02	0.03	>monthly	13	13	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	annually	1	1	100%
Calcium	mg/L	N	6.6	6.6	6.6	annually	1	-	-
Chloride	mg/L	250	19	19	19	annually	1	1	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	annually	1	1	100%
Colour	Pt/Co	25**	<2	2	6	fortnightly	26	26	100%
Conductivity	µS/cm	~900	63	113	130	fortnightly	26	26	100%
Copper	mg/L	1	0.010	0.010	0.010	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.05	0.71	0.89	>fortnightly	28	28	100%
Hardness (as $CaCO_3$)	mg/L	200	25	25	25	annually	1	1	100%
Iron	mg/L	0.3	<0.01	0.02	0.05	fortnightly	26	26	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	2.2	2.2	2.2	annually	1	-	-
Manganese	mg/L	0.1	<0.001	0.001	0.006	fortnightly	26	26	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO_3)	mg/L	50	1.55	1.55	1.55	annually	1	1	100%
pH	units	6.5-8.5	7.1	7.4	7.9	fortnightly	26	26	100%
pH	units	6.5-9.2	7.1	7.4	7.9	fortnightly	26	26	100%
Potassium	mg/L	N	1.3	1.3	1.3	annually	1	-	-
Silica (SiO_2)	mg/L	80	3.7	3.7	3.7	annually	1	1	100%
Sodium	mg/L	180	9.7	9.7	9.7	annually	1	1	100%
Sulphate	mg/L	250	11.0	11.0	11.0	annually	1	1	100%
Total Organic Carbon	mg/L	N	1.0	1.0	1.0	annually	1	-	-
Total Phosphorus	mg/L	N	<0.005	<0.005	0.003	annually	1	-	-
Total Dissolved Solids	mg/L	600	72	72	72	annually	1	1	100%
Turbidity	NTU	5[1]	<0.1	0.5[1]	0.9	weekly	52	-	within standard
Zinc	mg/L	3	0.004	0.004	0.004	annually	1	1	100%
Dibromochloromethane	mg/L	N	0.001	0.007	0.009	>monthly	13	-	-
Dichlorobromomethane	mg/L	N	0.005	0.012	0.020	>monthly	13	-	-
Bromoform	mg/L	N	<0.001	0.001	0.001	>monthly	13	-	-
Chloroform	mg/L	N	0.008	0.017	0.026	>monthly	13	-	-
Total Trihalomethanes	mg/L	0.25	0.023	0.036	0.056	>monthly	13	13	100%
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%

* Internal City West Water guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
[1] Victorian standard: 95th percentile (shown) less than or equal to 5 NTU. As a result, performance is not expressed as a percentage.

WATER SAMPLING LOCALITY	Little River	LOCALITY No.	1A
FOR PERIOD	1 July 2017 to 30 June 2018	POPULATION (2016 Census)	670

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling frequency	No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000*	<1	<1	4	>weekly	118	118	100%
Total Coliforms	orgs/100mL	N	<1	<1	1	>weekly	118	-	-
E. coli	orgs/100mL	100%<1#	<1	<1	<1	>weekly	118	118	100%
Free Chlorine	mg/L	5	<0.05	0.26	0.65	>weekly	118	118	100%
Total Chlorine	mg/L	5	<0.05	0.34	0.71	>weekly	118	118	100%
Alkalinity (as $CaCO_3$)	mg/L	N	17	17	17	annually	1	-	-
Aluminium (acid soluble)	mg/L	0.2	<0.01	0.02	0.09	>fortnightly	52	52	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	annually	1	1	100%
Calcium	mg/L	N	8.7	8.7	8.7	annually	1	-	-
Chloride	mg/L	250	19	19	19	annually	1	1	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	annually	1	1	100%
Colour	Pt/Co	25**	<2	2	6	>fortnightly	65	65	100%
Conductivity	µS/cm	~900	81	122	150	>fortnightly	65	65	100%
Copper	mg/L	1	<0.001	<0.001	<0.001	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.11	0.70	0.98	>fortnightly	67	67	100%
Hardness (as $CaCO_3$)	mg/L	200	28	28	28	annually	1	1	100%
Iron	mg/L	0.3	<0.01	0.03	0.10	>fortnightly	65	65	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	1.4	1.4	1.4	annually	1	-	-
Manganese	mg/L	0.1	<0.001	0.002	0.007	>fortnightly	65	65	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO_3)	mg/L	50	1.37	1.37	1.37	annually	1	1	100%
pH	units	6.5-8.5	6.4	7.1	9.0	>fortnightly	65	61	93.8%
pH	units	6.5-9.2	6.4	7.1	9.0	>fortnightly	65	62	95.4%
Potassium	mg/L	N	1.200	1.200	1.200	annually	1	-	-
Silica (SiO_2)	mg/L	80	3.7	3.7	3.7	annually	1	1	100%
Sodium	mg/L	180	9.4	9.4	9.4	annually	1	1	100%
Sulphate	mg/L	250	9.4	9.4	9.4	annually	1	1	100%
Total Organic Carbon	mg/L	N	1.0	1.0	1.0	annually	1	-	-
Total Phosphorus	mg/L	N	0.008	0.008	0.008	annually	1	-	-
Total Dissolved Solids	mg/L	600	50	50	50	annually	1	1	100%
Turbidity	NTU	5[1]	<0.1	0.6[1]	2.2	weekly	91	-	within standard
Zinc	mg/L	3	<0.001	<0.001	<0.001	annually	1	1	100%
Dibromochloromethane	mg/L	N	0.003	0.008	0.011	>fortnightly	52	-	-
Dichlorobromomethane	mg/L	N	0.011	0.018	0.026	>fortnightly	52	-	-
Bromoform	mg/L	N	<0.001	0.001	0.001	>fortnightly	52	-	-
Chloroform	mg/L	N	0.019	0.035	0.055	>fortnightly	52	-	-
Total Trihalomethanes	mg/L	0.25	0.044	0.061	0.088	>fortnightly	52	52	100%
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	0.014	0.014	0.014	annually	1	1	100%

* Internal City West Water guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
[1] Victorian standard: 95th percentile (shown) less than or equal to 5 NTU. As a result, performance is not expressed as a percentage.

WATER SAMPLING LOCALITY	Maribyrnong	LOCALITY No.	3A
FOR PERIOD	1 July 2017 to 30 June 2018	POPULATION (2016 Census)	120,900

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling frequency	No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000*	<1	<1	14	>weekly	361	361	100%
Total Coliforms	orgs/100mL	N	<1	<1	4	>weekly	361	-	-
E. coli	orgs/100mL	100%<1#	<1	<1	<1	>weekly	361	361	100%
Free Chlorine	mg/L	5	<0.01	0.22	0.58	>weekly	361	361	100%
Total Chlorine	mg/L	5	<0.05	0.31	0.75	>weekly	361	361	100%
Alkalinity (as $CaCO_3$)	mg/L	N	12	12	12	annually	1	-	-
Aluminium (acid soluble)	mg/L	0.2	0.02	0.03	0.04	>monthly	13	13	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	annually	1	1	100%
Calcium	mg/L	N	5.9	5.9	5.9	annually	1	-	-
Chloride	mg/L	250	19	19	19	annually	1	1	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	annually	1	1	100%
Colour	Pt/Co	25**	<2	3	4	fortnightly	26	26	100%
Conductivity	µS/cm	~900	80	103	130	fortnightly	26	26	100%
Copper	mg/L	1	0.008	0.008	0.008	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.12	0.73	0.87	>fortnightly	27	27	100%
Hardness (as $CaCO_3$)	mg/L	200	24	24	24	annually	1	1	100%
Iron	mg/L	0.3	0.01	0.03	0.05	fortnightly	26	26	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	2.2	2.2	2.2	annually	1	-	-
Manganese	mg/L	0.1	<0.001	0.002	0.004	fortnightly	26	26	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO_3)	mg/L	50	1.46	1.46	1.46	annually	1	1	100%
pH	units	6.5-8.5	7.2	7.3	7.5	fortnightly	26	26	100%
pH	units	6.5-9.2	7.2	7.3	7.5	fortnightly	26	26	100%
Potassium	mg/L	N	1.3	1.3	1.3	annually	1	-	-
Silica (SiO_2)	mg/L	80	3.9	3.9	3.9	annually	1	1	100%
Sodium	mg/L	180	9.6	9.6	9.6	annually	1	1	100%
Sulphate	mg/L	250	10.0	10.0	10.0	annually	1	1	100%
Total Organic Carbon	mg/L	N	1.0	1.0	1.0	annually	1	-	-
Total Phosphorus	mg/L	N	<0.005	<0.005	0.003	annually	1	-	-
Total Dissolved Solids	mg/L	600	40	40	40	annually	1	1	100%
Turbidity	NTU	5[1]	<0.1	0.5[1]	0.7	weekly	52	-	within standard
Zinc	mg/L	3	0.003	0.003	0.003	annually	1	1	100%
Dibromochloromethane	mg/L	N	0.004	0.006	0.007	>monthly	13	-	-
Dichlorobromomethane	mg/L	N	0.009	0.013	0.017	>monthly	13	-	-
Bromoform	mg/L	N	<0.001	<0.001	<0.001	>monthly	13	-	-
Chloroform	mg/L	N	0.014	0.032	0.052	>monthly	13	-	-
Total Trihalomethanes	mg/L	0.25	0.031	0.052	0.070	>monthly	13	13	100%
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	0.007	0.007	0.007	annually	1	1	100%

* Internal City West Water guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
[1] Victorian standard: 95th percentile (shown) less than or equal to 5 NTU. As a result, performance is not expressed as a percentage.

WATER SAMPLING LOCALITY	Moonee Ponds	LOCALITY No.	9B
FOR PERIOD	1 July 2017 to 30 June 2018	POPULATION (2016 Census)	73,500

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling frequency	No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000*	<1	<1	90	>weekly	228	228	100%
Total Coliforms	orgs/100mL	N	<1	<1	10	>weekly	228	-	-
E. coli	orgs/100mL	100%<1#	<1	<1	<1	>weekly	228	228	100%
Free Chlorine	mg/L	5	<0.01	0.13	0.49	>weekly	228	228	100%
Total Chlorine	mg/L	5	<0.05	0.22	0.62	>weekly	228	228	100%
Alkalinity (as $CaCO_3$)	mg/L	N	14	14	14	annually	1	-	-
Aluminium (acid soluble)	mg/L	0.2	0.02	0.03	0.05	>monthly	13	13	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	annually	1	1	100%
Calcium	mg/L	N	4.2	4.2	4.2	annually	1	-	-
Chloride	mg/L	250	12	12	12	annually	1	1	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	annually	1	1	100%
Colour	Pt/Co	25**	<2	4	6	fortnightly	26	26	100%
Conductivity	µS/cm	~900	70	91	130	fortnightly	26	26	100%
Copper	mg/L	1	0.016	0.016	0.016	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.37	0.76	0.87	>fortnightly	28	28	100%
Hardness (as $CaCO_3$)	mg/L	200	17	17	17	annually	1	1	100%
Iron	mg/L	0.3	<0.01	0.04	0.07	fortnightly	26	26	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	1.6	1.6	1.6	annually	1	-	-
Manganese	mg/L	0.1	<0.001	0.003	0.007	fortnightly	26	26	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO_3)	mg/L	50	1.20	1.20	1.20	annually	1	1	100%
pH	units	6.5-8.5	6.8	7.2	7.4	fortnightly	26	26	100%
pH	units	6.5-9.2	6.8	7.2	7.4	fortnightly	26	26	100%
Potassium	mg/L	N	0.9	0.9	0.9	annually	1	-	-
Silica (SiO_2)	mg/L	80	4.9	4.9	4.9	annually	1	1	100%
Sodium	mg/L	180	5.6	5.6	5.6	annually	1	1	100%
Sulphate	mg/L	250	4.8	4.8	4.8	annually	1	1	100%
Total Organic Carbon	mg/L	N	1.6	1.6	1.6	annually	1	-	-
Total Phosphorus	mg/L	N	0.006	0.006	0.006	annually	1	-	-
Total Dissolved Solids	mg/L	600	60	60	60	annually	1	1	100%
Turbidity	NTU	5[1]	<0.1	0.6[1]	0.7	weekly	52	-	within standard
Zinc	mg/L	3	0.003	0.003	0.003	annually	1	1	100%
Dibromochloromethane	mg/L	N	0.002	0.004	0.007	>monthly	13	-	-
Dichlorobromomethane	mg/L	N	0.009	0.012	0.016	>monthly	13	-	-
Bromoform	mg/L	N	<0.001	0.001	0.001	>monthly	13	-	-
Chloroform	mg/L	N	0.011	0.039	0.061	>monthly	13	-	-
Total Trihalomethanes	mg/L	0.25	0.028	0.056	0.076	>monthly	13	13	100%
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	0.024	0.024	0.024	annually	1	1	100%

* Internal City West Water guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
[1] Victorian standard: 95th percentile (shown) less than or equal to 5 NTU. As a result, performance is not expressed as a percentage.

WATER SAMPLING LOCALITY	Parkville	LOCALITY No.	11
FOR PERIOD	1 July 2017 to 30 June 2018	POPULATION (2016 Census)	157,600

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling frequency	No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000*	<1	<1	82	>weekly	383	383	100%
Total Coliforms	orgs/100mL	N	<1	<1	16	>weekly	385	-	-
E. coli	orgs/100mL	100%<1#	<1	<1	<1	>weekly	385	385	100%
Free Chlorine	mg/L	5	<0.01	0.25	0.68	>weekly	385	385	100%
Total Chlorine	mg/L	5	<0.05	0.35	0.90	>weekly	385	385	100%
Alkalinity (as $CaCO_3$)	mg/L	N	12	12	12	annually	1	-	-
Aluminium (acid soluble)	mg/L	0.2	0.02	0.03	0.04	>monthly	13	13	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	annually	1	1	100%
Calcium	mg/L	N	6.0	6.0	6.0	annually	1	-	-
Chloride	mg/L	250	19	19	19	annually	1	1	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	annually	1	1	100%
Colour	Pt/Co	25**	<2	3	6	fortnightly	26	26	100%
Conductivity	µS/cm	~900	58	110	130	fortnightly	26	26	100%
Copper	mg/L	1	0.005	0.005	0.005	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.09	0.72	0.90	>fortnightly	28	28	100%
Hardness (as $CaCO_3$)	mg/L	200	24	24	24	annually	1	1	100%
Iron	mg/L	0.3	<0.01	0.03	0.12	fortnightly	26	26	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	2.2	2.2	2.2	annually	1	-	-
Manganese	mg/L	0.1	<0.001	0.002	0.007	fortnightly	26	26	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO_3)	mg/L	50	1.46	1.46	1.46	annually	1	1	100%
pH	units	6.5-8.5	7.1	7.2	7.4	fortnightly	26	26	100%
pH	units	6.5-9.2	7.1	7.2	7.4	fortnightly	26	26	100%
Potassium	mg/L	N	1.2	1.2	1.2	annually	1	-	-
Silica (SiO_2)	mg/L	80	4.0	4.0	4.0	annually	1	1	100%
Sodium	mg/L	180	9.7	9.7	9.7	annually	1	1	100%
Sulphate	mg/L	250	10.0	10.0	10.0	annually	1	1	100%
Total Organic Carbon	mg/L	N	1.1	1.1	1.1	annually	1	-	-
Total Phosphorus	mg/L	N	<0.005	<0.005	0.003	annually	1	-	-
Total Dissolved Solids	mg/L	600	35	35	35	annually	1	1	100%
Turbidity	NTU	5[1]	<0.1	0.7[1]	0.9	weekly	52	-	within standard
Zinc	mg/L	3	0.004	0.004	0.004	annually	1	1	100%
Dibromochloromethane	mg/L	N	0.003	0.006	0.008	>monthly	13	-	-
Dichlorobromomethane	mg/L	N	0.009	0.013	0.017	>monthly	13	-	-
Bromoform	mg/L	N	<0.001	<0.001	<0.001	>monthly	13	-	-
Chloroform	mg/L	N	0.014	0.024	0.038	>monthly	13	-	-
Total Trihalomethanes	mg/L	0.25	0.031	0.043	0.053	>monthly	13	13	100%
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	0.005	0.005	0.005	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	0.007	0.007	0.007	annually	1	1	100%

* Internal City West Water guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
[1] Victorian standard: 95th percentile (shown) less than or equal to 5 NTU. As a result, performance is not expressed as a percentage.

WATER SAMPLING LOCALITY	Richmond	LOCALITY No.	54
FOR PERIOD	1 July 2017 to 30 June 2018	POPULATION (2016 Census)	24,900

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling frequency	No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000*	<1	<1	38	>weekly	105	105	100%
Total Coliforms	orgs/100mL	N	<1	<1	10	>weekly	105	-	-
E. coli	orgs/100mL	100%<1#	<1	<1	<1	>weekly	105	105	100%
Free Chlorine	mg/L	5	<0.05	0.22	0.62	>weekly	105	105	100%
Total Chlorine	mg/L	5	0.07	0.31	0.68	>weekly	105	105	100%
Alkalinity (as $CaCO_3$)	mg/L	N	14	14	14	annually	1	-	-
Aluminium (acid soluble)	mg/L	0.2	0.02	0.04	0.05	>monthly	13	13	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	annually	1	1	100%
Calcium	mg/L	N	4.3	4.3	4.3	annually	1	-	-
Chloride	mg/L	250	8	8	8	annually	1	1	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	annually	1	1	100%
Colour	Pt/Co	25**	4	7	8	fortnightly	26	26	100%
Conductivity	µS/cm	~900	54	60	66	fortnightly	26	26	100%
Copper	mg/L	1	0.006	0.006	0.006	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.62	0.79	0.85	>fortnightly	28	28	100%
Hardness (as $CaCO_3$)	mg/L	200	16	16	16	annually	1	1	100%
Iron	mg/L	0.3	0.05	0.08	0.11	fortnightly	26	26	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	1.3	1.3	1.3	annually	1	-	-
Manganese	mg/L	0.1	0.003	0.005	0.014	fortnightly	26	26	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO_3)	mg/L	50	0.80	0.80	0.80	annually	1	1	100%
pH	units	6.5-8.5	7.2	7.4	7.5	fortnightly	26	26	100%
pH	units	6.5-9.2	7.2	7.4	7.5	fortnightly	26	26	100%
Potassium	mg/L	N	0.7	0.7	0.7	annually	1	-	-
Silica (SiO_2)	mg/L	80	6.7	6.7	6.7	annually	1	1	100%
Sodium	mg/L	180	4.4	4.4	4.4	annually	1	1	100%
Sulphate	mg/L	250	1.6	1.6	1.6	annually	1	1	100%
Total Organic Carbon	mg/L	N	1.8	1.8	1.8	annually	1	-	-
Total Phosphorus	mg/L	N	0.007	0.007	0.007	annually	1	-	-
Total Dissolved Solids	mg/L	600	22	22	22	annually	1	1	100%
Turbidity	NTU	5[1]	<0.1	0.9[1]	1.0	weekly	52	-	within standard
Zinc	mg/L	3	0.002	0.002	0.002	annually	1	1	100%
Dibromochloromethane	mg/L	N	<0.001	0.001	0.001	>monthly	13	-	-
Dichlorobromomethane	mg/L	N	0.009	0.010	0.013	>monthly	13	-	-
Bromoform	mg/L	N	<0.001	<0.001	<0.001	>monthly	13	-	-
Chloroform	mg/L	N	0.054	0.076	0.100	>monthly	13	-	-
Total Trihalomethanes	mg/L	0.25	0.064	0.087	0.110	>monthly	13	13	100%
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	0.037	0.037	0.037	annually	1	1	100%

* Internal City West Water guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
[1] Victorian standard: 95th percentile (shown) less than or equal to 5 NTU. As a result, performance is not expressed as a percentage.

WATER SAMPLING LOCALITY	Strathmore	LOCALITY No.	9A
FOR PERIOD	1 July 2017 to 30 June 2018	POPULATION (2016 Census)	8,100

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling frequency	No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000*	<1	<1	68	>weekly	78	78	100%
Total Coliforms	orgs/100mL	N	<1	<1	45	>weekly	78	-	-
E. coli	orgs/100mL	100%<1#	<1	<1	<1	>weekly	78	78	100%
Free Chlorine	mg/L	5	<0.05	0.08	0.27	>weekly	78	78	100%
Total Chlorine	mg/L	5	0.05	0.16	0.34	>weekly	78	78	100%
Alkalinity (as $CaCO_3$)	mg/L	N	13	13	13	annually	1	-	-
Aluminium (acid soluble)	mg/L	0.2	0.02	0.03	0.04	>monthly	13	13	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	annually	1	1	100%
Calcium	mg/L	N	4.2	4.2	4.2	annually	1	-	-
Chloride	mg/L	250	10	10	10	annually	1	1	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	annually	1	1	100%
Colour	Pt/Co	25**	<2	5	8	fortnightly	26	26	100%
Conductivity	µS/cm	~900	60	84	130	fortnightly	26	26	100%
Copper	mg/L	1	0.012	0.012	0.012	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.54	0.77	0.89	>fortnightly	28	28	100%
Hardness (as $CaCO_3$)	mg/L	200	16	16	16	annually	1	1	100%
Iron	mg/L	0.3	0.01	0.05	0.08	fortnightly	26	26	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	1.4	1.4	1.4	annually	1	-	-
Manganese	mg/L	0.1	<0.001	0.003	0.007	fortnightly	26	26	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO_3)	mg/L	50	0.97	0.97	0.97	annually	1	1	100%
pH	units	6.5-8.5	7.2	7.4	8.6	fortnightly	26	25	96.2%
pH	units	6.5-9.2	7.2	7.4	8.6	fortnightly	26	26	100%
Potassium	mg/L	N	0.8	0.8	0.8	annually	1	-	-
Silica (SiO_2)	mg/L	80	5.7	5.7	5.7	annually	1	1	100%
Sodium	mg/L	180	5.1	5.1	5.1	annually	1	1	100%
Sulphate	mg/L	250	3.6	3.6	3.6	annually	1	1	100%
Total Organic Carbon	mg/L	N	2.0	2.0	2.0	annually	1	-	-
Total Phosphorus	mg/L	N	<0.005	<0.005	0.003	annually	1	-	-
Total Dissolved Solids	mg/L	600	35	35	35	annually	1	1	100%
Turbidity	NTU	5[1]	<0.1	0.8[1]	1.1	weekly	52	-	within standard
Zinc	mg/L	3	0.004	0.004	0.004	annually	1	1	100%
Dibromochloromethane	mg/L	N	0.001	0.003	0.008	>monthly	13	-	-
Dichlorobromomethane	mg/L	N	0.009	0.011	0.016	>monthly	13	-	-
Bromoform	mg/L	N	<0.001	0.001	0.001	>monthly	13	-	-
Chloroform	mg/L	N	0.018	0.046	0.076	>monthly	13	-	-
Total Trihalomethanes	mg/L	0.25	0.040	0.062	0.089	>monthly	13	13	100%
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	0.028	0.028	0.028	annually	1	1	100%

* Internal City West Water guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
[1] Victorian standard: 95th percentile (shown) less than or equal to 5 NTU. As a result, performance is not expressed as a percentage.

WATER SAMPLING LOCALITY	Taylors Lakes	LOCALITY No.	5A
FOR PERIOD	1 July 2017 to 30 June 2018	POPULATION (2016 Census)	67,800

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling frequency	No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000*	<1	2	1700	>weekly	240	240	100%
Total Coliforms	orgs/100mL	N	<1	1	200	>weekly	240	-	-
E. coli	orgs/100mL	100%<1#	<1	<1	<1	>weekly	240	240	100%
Free Chlorine	mg/L	5	<0.01	0.35	0.83	>weekly	240	240	100%
Total Chlorine	mg/L	5	<0.05	0.47	0.95	>weekly	240	240	100%
Alkalinity (as $CaCO_3$)	mg/L	N	16	16	16	annually	1	-	-
Aluminium (acid soluble)	mg/L	0.2	<0.01	0.02	0.03	>monthly	26	26	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	annually	1	1	100%
Calcium	mg/L	N	4.3	4.3	4.3	annually	1	-	-
Chloride	mg/L	250	10	10	10	annually	1	1	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	annually	1	1	100%
Colour	Pt/Co	25**	<2	5	10	>fortnightly	39	39	100%
Conductivity	µS/cm	~900	57	65	71	>fortnightly	39	39	100%
Copper	mg/L	1	0.003	0.003	0.003	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.53	0.81	0.89	>fortnightly	41	41	100%
Hardness (as $CaCO_3$)	mg/L	200	17	17	17	annually	1	1	100%
Iron	mg/L	0.3	0.03	0.07	0.18	>fortnightly	39	39	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	1.4	1.4	1.4	annually	1	-	-
Manganese	mg/L	0.1	0.001	0.005	0.012	>fortnightly	39	39	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO_3)	mg/L	50	0.13	0.13	0.13	annually	1	1	100%
pH	units	6.5-8.5	7.1	7.5	8.5	>fortnightly	39	39	100%
pH	units	6.5-9.2	7.1	7.5	8.5	>fortnightly	39	39	100%
Potassium	mg/L	N	0.8	0.8	0.8	annually	1	-	-
Silica (SiO_2)	mg/L	80	2.8	2.8	2.8	annually	1	1	100%
Sodium	mg/L	180	5.5	5.5	5.5	annually	1	1	100%
Sulphate	mg/L	250	1.6	1.6	1.6	annually	1	1	100%
Total Organic Carbon	mg/L	N	1.4	1.4	1.4	annually	1	-	-
Total Phosphorus	mg/L	N	0.010	0.010	0.010	annually	1	-	-
Total Dissolved Solids	mg/L	600	20	20	20	annually	1	1	100%
Turbidity	NTU	5[1]	<0.1	1.06[1]	1.5	weekly	65	-	within standard
Zinc	mg/L	3	0.002	0.002	0.002	annually	1	1	100%
Dibromochloromethane	mg/L	N	<0.001	0.001	0.002	>monthly	26	-	-
Dichlorobromomethane	mg/L	N	0.003	0.007	0.011	>monthly	26	-	-
Bromoform	mg/L	N	<0.001	<0.001	<0.001	>monthly	26	-	-
Chloroform	mg/L	N	0.012	0.033	0.075	>monthly	26	-	-
Total Trihalomethanes	mg/L	0.25	0.016	0.041	0.087	>monthly	26	26	100%
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	0.010	0.010	0.010	annually	1	1	100%

* Internal City West Water guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
[1] Victorian standard: 95th percentile (shown) less than or equal to 5 NTU. As a result, performance is not expressed as a percentage.

WATER SAMPLING LOCALITY	Tullamarine	LOCALITY No.	7A
FOR PERIOD	1 July 2017 to 30 June 2018	POPULATION (2016 Census)	10,500

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling frequency	No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000*	<1	1	940	>weekly	83	83	100%
Total Coliforms	orgs/100mL	N	<1	<1	200	>weekly	84	-	-
E. coli	orgs/100mL	100%<1#	<1	<1	<1	>weekly	84	84	100%
Free Chlorine	mg/L	5	<0.05	0.29	0.71	>weekly	84	84	100%
Total Chlorine	mg/L	5	<0.05	0.38	0.78	>weekly	84	84	100%
Alkalinity (as $CaCO_3$)	mg/L	N	14	14	14	annually	1	-	-
Aluminium (acid soluble)	mg/L	0.2	<0.01	0.02	0.03	>monthly	13	13	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	annually	1	1	100%
Calcium	mg/L	N	6.7	6.7	6.7	annually	1	-	-
Chloride	mg/L	250	19	19	19	annually	1	1	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	annually	1	1	100%
Colour	Pt/Co	25**	<2	3	8	fortnightly	26	26	100%
Conductivity	µS/cm	~900	60	96	130	fortnightly	26	26	100%
Copper	mg/L	1	0.007	0.007	0.007	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	<0.05	0.72	0.88	>fortnightly	28	28	100%
Hardness (as $CaCO_3$)	mg/L	200	26	26	26	annually	1	1	100%
Iron	mg/L	0.3	<0.01	0.03	0.08	fortnightly	26	26	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	2.2	2.2	2.2	annually	1	-	-
Manganese	mg/L	0.1	<0.001	0.002	0.010	fortnightly	26	26	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO_3)	mg/L	50	1.51	1.51	1.51	annually	1	1	100%
pH	units	6.5-8.5	7.1	7.4	8.3	fortnightly	26	26	100%
pH	units	6.5-9.2	7.1	7.4	8.3	fortnightly	26	26	100%
Potassium	mg/L	N	1.3	1.3	1.3	annually	1	-	-
Silica (SiO_2)	mg/L	80	3.8	3.8	3.8	annually	1	1	100%
Sodium	mg/L	180	9.8	9.8	9.8	annually	1	1	100%
Sulphate	mg/L	250	11.0	11.0	11.0	annually	1	1	100%
Total Organic Carbon	mg/L	N	1.1	1.1	1.1	annually	1	-	-
Total Phosphorus	mg/L	N	0.006	0.006	0.006	annually	1	-	-
Total Dissolved Solids	mg/L	600	62	62	62	annually	1	1	100%
Turbidity	NTU	5[1]	<0.1	0.9[1]	0.9	weekly	50	-	within standard
Zinc	mg/L	3	0.001	0.001	0.001	annually	1	1	100%
Dibromochloromethane	mg/L	N	<0.001	0.004	0.008	>monthly	13	-	-
Dichlorobromomethane	mg/L	N	0.004	0.010	0.016	>monthly	13	-	-
Bromoform	mg/L	N	<0.001	0.001	0.001	>monthly	13	-	-
Chloroform	mg/L	N	0.011	0.022	0.072	>monthly	13	-	-
Total Trihalomethanes	mg/L	0.25	0.019	0.037	0.085	>monthly	13	13	100%
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%

* Internal City West Water guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
[1] Victorian standard: 95th percentile (shown) less than or equal to 5 NTU. As a result, performance is not expressed as a percentage.

WATER SAMPLING LOCALITY	Werribee	LOCALITY No.	1
FOR PERIOD	1 July 2017 to 30 June 2018	POPULATION (2016 Census)	136,700

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling frequency	No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000*	<1	<1	74	>weekly	448	448	100%
Total Coliforms	orgs/100mL	N	<1	<1	9	>weekly	450	-	-
E. coli	orgs/100mL	100%<1#	<1	<1	<1	>weekly	450	450	100%
Free Chlorine	mg/L	5	<0.05	0.30	0.63	>weekly	449	449	100%
Total Chlorine	mg/L	5	<0.05	0.40	0.81	>weekly	449	449	100%
Alkalinity (as $CaCO_3$)	mg/L	N	15	15	15	annually	1	-	-
Aluminium (acid soluble)	mg/L	0.2	0.02	0.03	0.03	fortnightly	37	37	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	annually	1	1	100%
Calcium	mg/L	N	7.2	7.2	7.2	annually	1	-	-
Chloride	mg/L	250	19	19	19	annually	1	1	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	annually	1	1	100%
Colour	Pt/Co	25**	<2	3	6	>fortnightly	50	50	100%
Conductivity	µS/cm	~900	78	112	130	>fortnightly	50	50	100%
Copper	mg/L	1	0.003	0.003	0.003	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.11	0.70	0.88	>fortnightly	52	52	100%
Hardness (as $CaCO_3$)	mg/L	200	26	26	26	annually	1	1	100%
Iron	mg/L	0.3	<0.01	0.02	0.07	>fortnightly	50	50	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	2.1	2.1	2.1	annually	1	-	-
Manganese	mg/L	0.1	<0.001	0.002	0.008	>fortnightly	50	50	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO_3)	mg/L	50	1.37	1.37	1.37	annually	1	1	100%
pH	units	6.5-8.5	7.2	7.4	8.6	>fortnightly	50	49	98.0%
pH	units	6.5-9.2	7.2	7.4	8.6	>fortnightly	50	50	100%
Potassium	mg/L	N	1.3	1.3	1.3	annually	1	-	-
Silica (SiO_2)	mg/L	80	4.3	4.3	4.3	annually	1	1	100%
Sodium	mg/L	180	9.2	9.2	9.2	annually	1	1	100%
Sulphate	mg/L	250	9.6	9.6	9.6	annually	1	1	100%
Total Organic Carbon	mg/L	N	1.2	1.2	1.2	annually	1	-	-
Total Phosphorus	mg/L	N	<0.005	<0.005	<0.005	annually	1	-	-
Total Dissolved Solids	mg/L	600	48	48	48	annually	1	1	100%
Turbidity	NTU	5[1]	<0.1	0.5[1]	0.8	weekly	76	-	within standard
Zinc	mg/L	3	0.002	0.002	0.002	annually	1	1	100%
Dibromochloromethane	mg/L	N	0.003	0.007	0.010	monthly	37	-	-
Dichlorobromomethane	mg/L	N	0.011	0.017	0.025	monthly	37	-	-
Bromoform	mg/L	N	<0.001	0.001	0.001	monthly	37	-	-
Chloroform	mg/L	N	0.018	0.034	0.057	monthly	37	-	-
Total Trihalomethanes	mg/L	0.25	0.038	0.058	0.090	monthly	37	37	100%
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	0.012	0.012	0.012	annually	1	1	100%

* Internal City West Water guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
[1] Victorian standard: 95th percentile (shown) less than or equal to 5 NTU. As a result, performance is not expressed as a percentage.

WATER SAMPLING LOCALITY	Werribee South	LOCALITY No.	2A
FOR PERIOD	1 July 2017 to 30 June 2018	POPULATION (2016 Census)	2,000

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling frequency	No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000*	<1	<1	590	>weekly	117	117	100%
Total Coliforms	orgs/100mL	N	<1	<1	200	>weekly	117	-	-
E. coli	orgs/100mL	100%<1#	<1	<1	<1	>weekly	117	117	100%
Free Chlorine	mg/L	5	<0.01	0.33	0.79	>weekly	117	117	100%
Total Chlorine	mg/L	5	<0.05	0.42	0.94	>weekly	117	117	100%
Alkalinity (as $CaCO_3$)	mg/L	N	16	16	16	annually	1	-	-
Aluminium (acid soluble)	mg/L	0.2	<0.01	0.02	0.04	>fortnightly	52	52	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	annually	1	1	100%
Calcium	mg/L	N	5.9	5.9	5.9	annually	1	-	-
Chloride	mg/L	250	18	18	18	annually	1	1	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	annually	1	1	100%
Colour	Pt/Co	25**	<2	4	10	>fortnightly	65	65	100%
Conductivity	µS/cm	~900	78	112	130	>fortnightly	65	65	100%
Copper	mg/L	1	0.002	0.002	0.002	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.13	0.77	1.30	>fortnightly	66	66	100%
Hardness (as $CaCO_3$)	mg/L	200	21	21	21	annually	1	1	100%
Iron	mg/L	0.3	<0.01	0.07	0.19	>fortnightly	65	65	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	1.5	1.5	1.5	annually	1	-	-
Manganese	mg/L	0.1	<0.001	0.002	0.010	>fortnightly	65	65	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO_3)	mg/L	50	1.37	1.37	1.37	annually	1	1	100%
pH	units	6.5-8.5	7.3	7.6	8.4	>fortnightly	65	65	100%
pH	units	6.5-9.2	7.3	7.6	8.4	>fortnightly	65	65	100%
Potassium	mg/L	N	1.0	1.0	1.0	annually	1	-	-
Silica (SiO_2)	mg/L	80	3.4	3.4	3.4	annually	1	1	100%
Sodium	mg/L	180	7.8	7.8	7.8	annually	1	1	100%
Sulphate	mg/L	250	7.7	7.7	7.7	annually	1	1	100%
Total Organic Carbon	mg/L	N	1.2	1.2	1.2	annually	1	-	-
Total Phosphorus	mg/L	N	0.008	0.008	0.008	annually	1	-	-
Total Dissolved Solids	mg/L	600	72	72	72	annually	1	1	100%
Turbidity	NTU	5[1]	<0.1	0.7[1]	1.1	weekly	91	-	within standard
Zinc	mg/L	3	0.001	0.001	0.001	annually	1	1	100%
Dibromochloromethane	mg/L	N	<0.001	0.004	0.010	>fortnightly	52	-	-
Dichlorobromomethane	mg/L	N	<0.001	0.009	0.021	>fortnightly	52	-	-
Bromoform	mg/L	N	<0.001	0.001	0.001	>fortnightly	52	-	-
Chloroform	mg/L	N	<0.001	0.018	0.048	>fortnightly	52	-	-
Total Trihalomethanes	mg/L	0.25	0.002	0.031	0.069	>fortnightly	52	52	100%
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	0.012	0.012	0.012	annually	1	1	100%

* Internal City West Water guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
[1] Victorian standard: 95th percentile (shown) less than or equal to 5 NTU. As a result, performance is not expressed as a percentage.

WATER SAMPLING LOCALITY	Williamstown	LOCALITY No.	3B
FOR PERIOD	1 July 2017 to 30 June 2018	POPULATION (2016 Census)	50,000

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling frequency	No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000*	<1	<1	320	>weekly	156	156	100%
Total Coliforms	orgs/100mL	N	<1	<1	<1	>weekly	156	-	-
E. coli	orgs/100mL	100%<1#	<1	<1	<1	>weekly	156	156	100%
Free Chlorine	mg/L	5	<0.05	0.22	0.57	>weekly	156	156	100%
Total Chlorine	mg/L	5	0.05	0.31	0.69	>weekly	156	156	100%
Alkalinity (as $CaCO_3$)	mg/L	N	13	13	13	annually	1	-	-
Aluminium (acid soluble)	mg/L	0.2	0.02	0.03	0.03	>monthly	13	13	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	annually	1	1	100%
Calcium	mg/L	N	6.7	6.7	6.7	annually	1	-	-
Chloride	mg/L	250	19	19	19	annually	1	1	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	annually	1	1	100%
Colour	Pt/Co	25**	<2	2	4	fortnightly	26	26	100%
Conductivity	µS/cm	~900	96	116	130	fortnightly	26	26	100%
Copper	mg/L	1	0.005	0.005	0.005	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.15	0.71	0.89	>fortnightly	27	27	100%
Hardness (as $CaCO_3$)	mg/L	200	26	26	26	annually	1	1	100%
Iron	mg/L	0.3	<0.01	0.02	0.04	fortnightly	26	26	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	2.4	2.4	2.4	annually	1	-	-
Manganese	mg/L	0.1	<0.001	0.001	0.003	fortnightly	26	26	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO_3)	mg/L	50	1.46	1.46	1.46	annually	1	1	100%
pH	units	6.5-8.5	7.1	7.3	7.4	fortnightly	26	26	100%
pH	units	6.5-9.2	7.1	7.3	7.4	fortnightly	26	26	100%
Potassium	mg/L	N	1.3	1.3	1.3	annually	1	-	-
Silica (SiO_2)	mg/L	80	4.0	4.0	4.0	annually	1	1	100%
Sodium	mg/L	180	10.0	10.0	10.0	annually	1	1	100%
Sulphate	mg/L	250	11.0	11.0	11.0	annually	1	1	100%
Total Organic Carbon	mg/L	N	1.2	1.2	1.2	annually	1	-	-
Total Phosphorus	mg/L	N	0.005	0.005	0.005	annually	1	-	-
Total Dissolved Solids	mg/L	600	38	38	38	annually	1	1	100%
Turbidity	NTU	5[1]	<0.1	0.4[1]	0.8	weekly	52	-	within standard
Zinc	mg/L	3	0.002	0.002	0.002	annually	1	1	100%
Dibromochloromethane	mg/L	N	0.005	0.007	0.008	>monthly	13	-	-
Dichlorobromomethane	mg/L	N	0.010	0.014	0.018	>monthly	13	-	-
Bromoform	mg/L	N	<0.001	<0.001	<0.001	>monthly	13	-	-
Chloroform	mg/L	N	0.016	0.024	0.035	>monthly	13	-	-
Total Trihalomethanes	mg/L	0.25	0.034	0.045	0.061	>monthly	13	13	100%
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	0.006	0.006	0.006	annually	1	1	100%

* Internal City West Water guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
[1] Victorian standard: 95th percentile (shown) less than or equal to 5 NTU. As a result, performance is not expressed as a percentage.

ALL WATER SAMPLING LOCALITIES			
FOR PERIOD	**1 July 2017 to 30 June 2018**	**POPULATION (2016 Census)**	**973,670**

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max	Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000*	<1	<1	1,700	3271	3268	99.9%
Total Coliforms	orgs/100mL	N	<1	<1	200	3279	-	-
E. coli	orgs/100mL	100%<1[#]	<1	<1	<1	3279	3279	100%
Free Chlorine	mg/L	5	<0.01	0.24	0.83	3278	3278	100%
Total Chlorine	mg/L	5	<0.05	0.34	0.95	3278	3278	100%
Alkalinity (as $CaCO_3$)	mg/L	N	12	14	17	15	-	-
Aluminium (acid soluble)	mg/L	0.2	<0.01	0.02	0.09	310	310	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	15	15	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	15	15	100%
Calcium	mg/L	N	4.2	5.8	8.7	15	-	-
Chloride	mg/L	250	8	16	19	15	15	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	15	15	100%
Colour	Pt/Co	25**	<2	3	10	505	505	100%
Conductivity	µS/cm	~900	54	102	150	505	505	100%
Copper	mg/L	1	<0.001	0.007	0.016	15	15	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	15	15	100%
Dissolved Oxygen	mg/L	N	8.2	9.7	11.3	26	-	-
Fluoride	mg/L	1.5	0.03	0.74	1.30	531	531	100%
Hardness (as $CaCO_3$)	mg/L	200	16	22	28	15	15	100%
Iron	mg/L	0.3	<0.01	0.04	0.19	505	505	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	15	15	100%
Magnesium	mg/L	N	1.3	1.8	2.4	15	-	-
Manganese	mg/L	0.1	<0.001	0.002	0.014	505	505	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	15	15	100%
Nitrate (NO_3)	mg/L	50	0.13	1.25	1.55	15	15	100%
pH	units	6.5-8.5	6.4	7.4	9.0	505	497	98.4%
pH	units	6.5-9.2	6.4	7.4	9.0	505	502	99.4%
Potassium	mg/L	N	0.7	1.1	1.3	15	-	-
Silica (SiO2)	mg/L	80	2.8	4.1	6.7	15	15	100%
Sodium	mg/L	180	4.4	8.0	10.0	15	15	100%
Sulphate	mg/L	250	1.6	7.7	11.0	15	15	100%
Temperature	oC	N	12.4	18.2	23.8	26	-	-
Total Organic Carbon	mg/L	N	1.0	1.5	3.4	15	-	-
Total Phosphorus	mg/L	N	<0.005	0.005	0.010	15	-	-
Total Dissolved Solids	mg/L	600	20	47	72	15	15	100%
Turbidity	NTU	5[1]	<0.1	0.8[1]	2.2	893	-	within standard
Zinc	mg/L	3	0.001	0.002	0.004	15	15	100%
Dibromochloromethane	mg/L	N	<0.001	0.005	0.011	310	-	-
Dichlorobromomethane	mg/L	N	<0.001	0.013	0.026	310	-	-
Bromoform	mg/L	N	<0.001	0.001	0.001	310	-	-
Chloroform	mg/L	N	<0.001	0.031	0.100	310	-	-
Total Trihalomethanes	mg/L	0.25	0.002	0.049	0.110	310	310	100%
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	15	15	100%
Dichloroacetic acid	mg/L	0.1	<0.005	0.003	0.005	15	15	100%
Trichloroacetic acid	mg/L	0.1	<0.005	0.012	0.037	15	15	100%

* Internal City West Water guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
[1] Victorian standard: 95th percentile (shown) less than or equal to 5 NTU. As a result, performance is not expressed as a percentage.

Appendix B Spatial and time-based water quality summaries

(based on results of tests on drinking water samples obtained from reticulation system sampling sites (water mains, customer taps, service reservoirs/tanks) tested between 1 July 2017 and 30 June 2018)

Figure B.1 *E. coli* performance in water sampling localities
(between 2015-16 and 2017-18, from left to right within each locality)

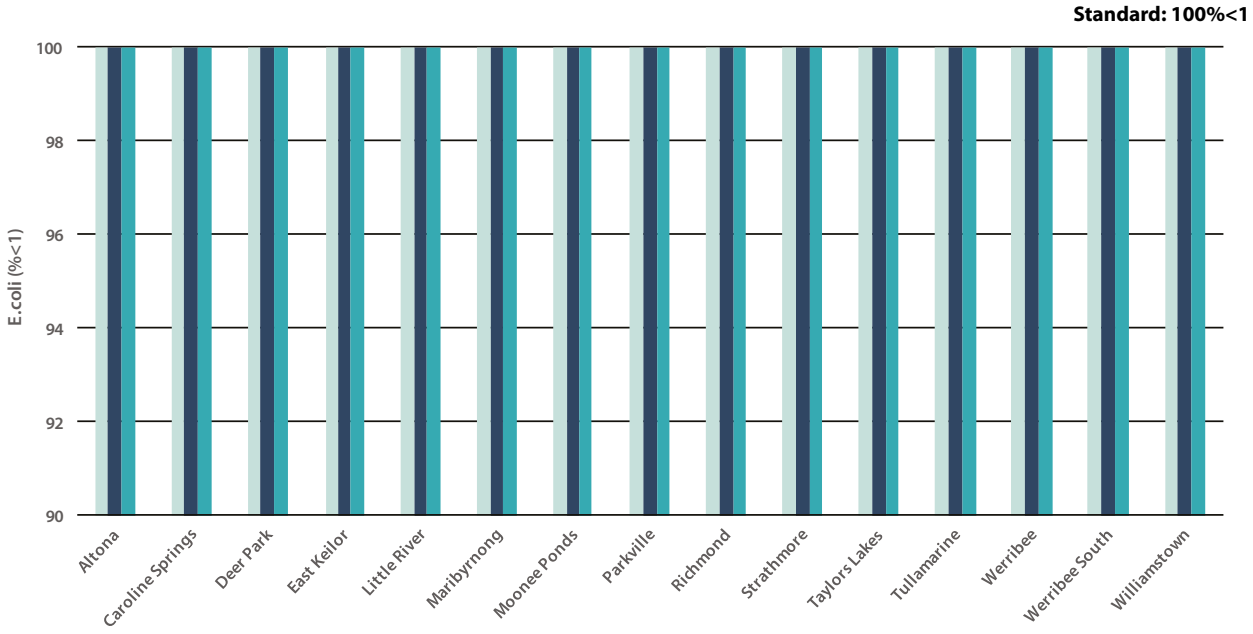


Figure B.2 Annual average free chlorine concentrations in water sampling localities
(between 2015-16 and 2017-18, from left to right within each locality)

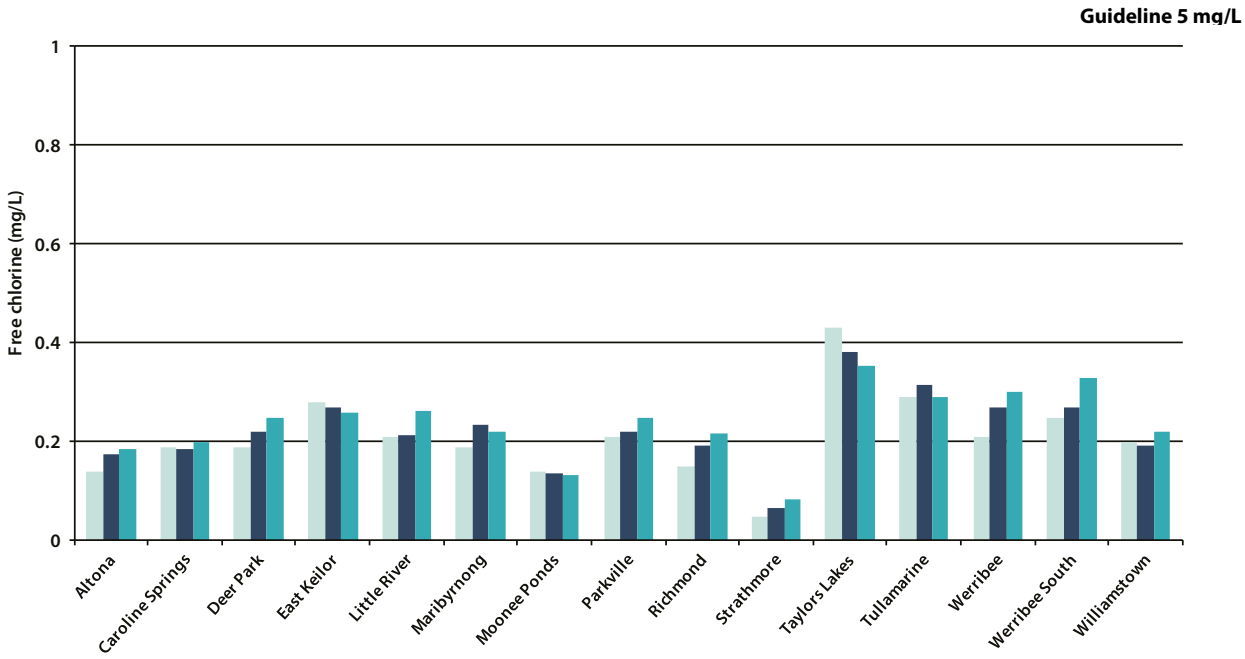


Figure B.3 Average aluminium concentrations in water sampling localities (between 2015-16 and 2017-18, from left to right within each locality)

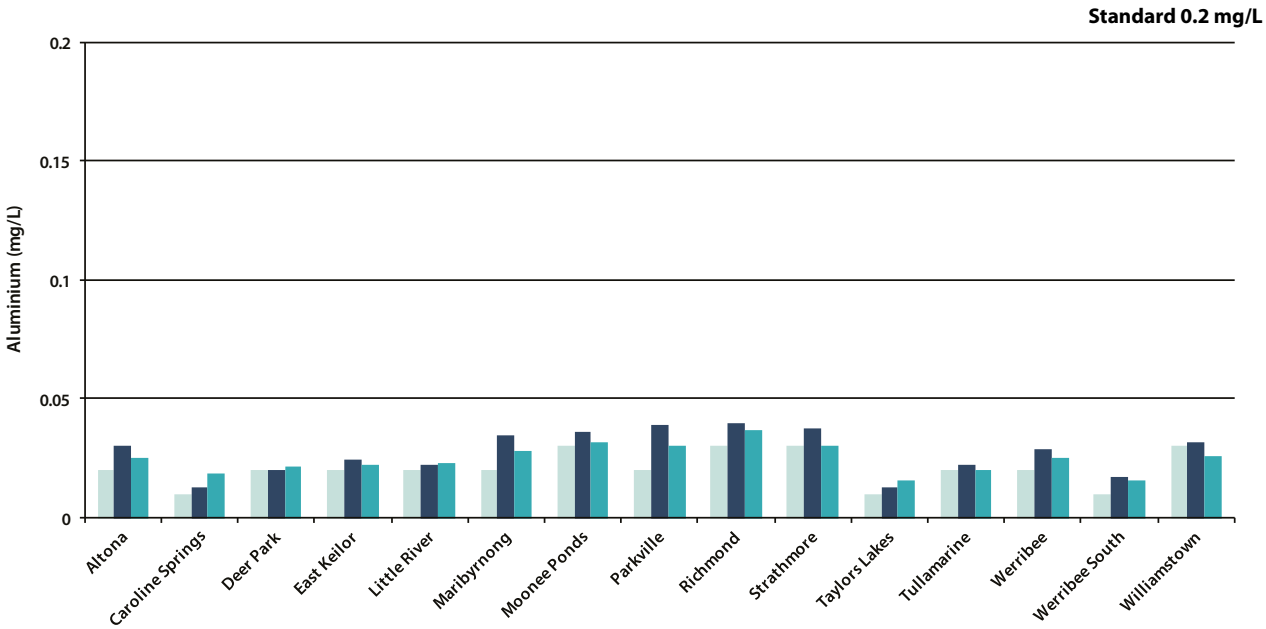


Figure B.4 Chloride concentrations in water sampling localities (between 2015-16 and 2017-18, from left to right within each locality)

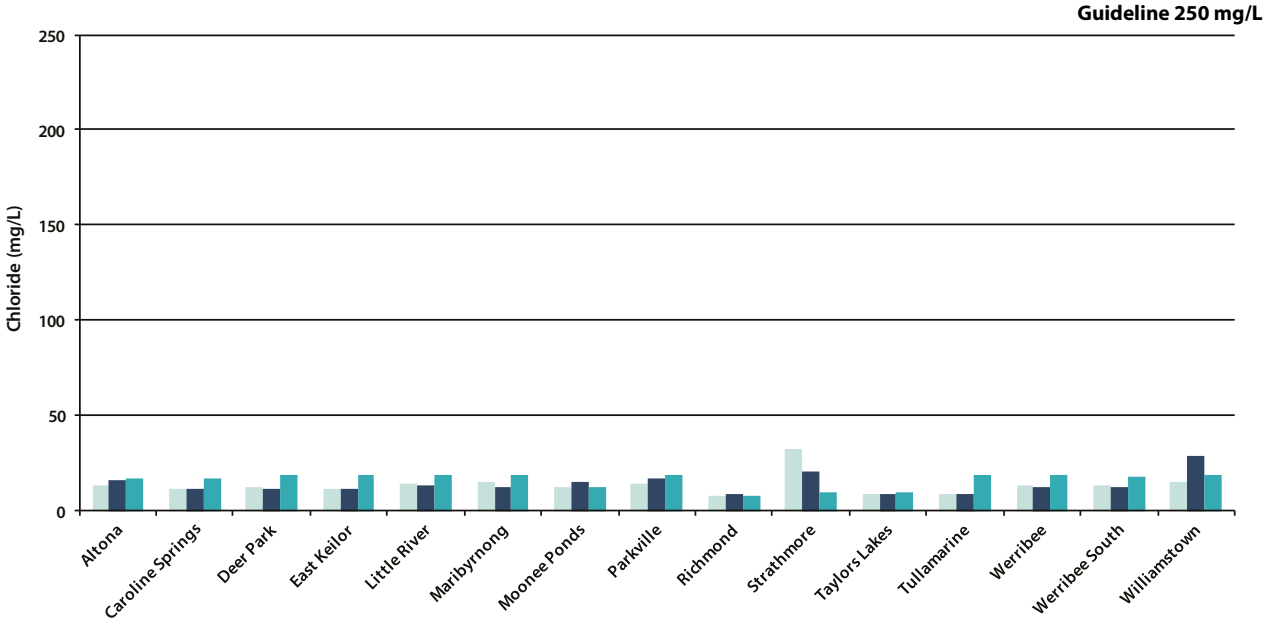


Figure B.5 Average apparent colour levels in water sampling localities (between 2015-16 and 2017-18, from left to right within each locality)

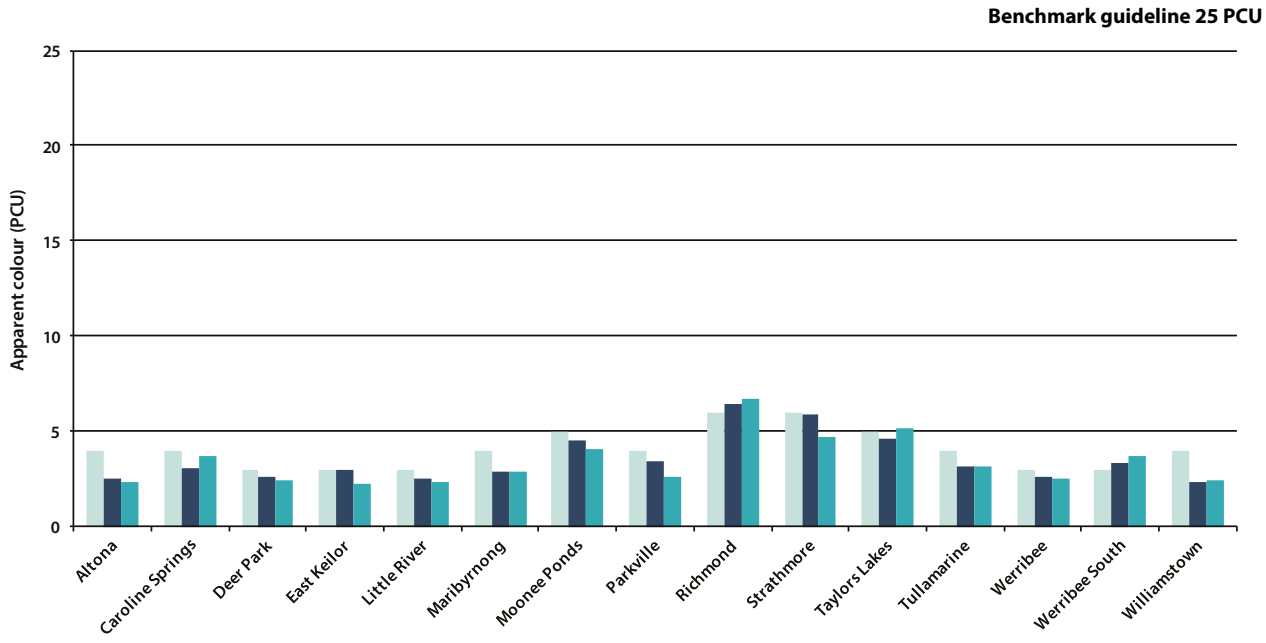


Figure B.6 Copper concentrations in water sampling localities (between 2015-16 and 2017-18, from left to right within each locality)

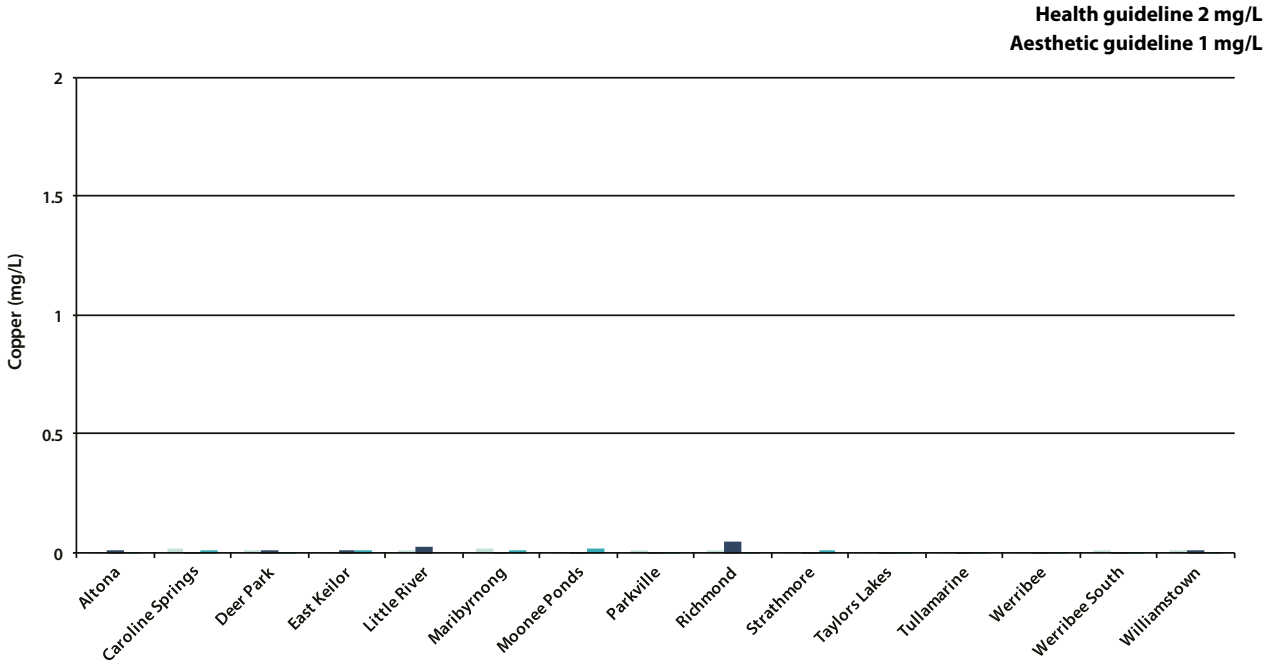


Figure B.7 Average electrical conductivity levels in water sampling localities (between 2015-16 and 2017-18, from left to right within each locality)

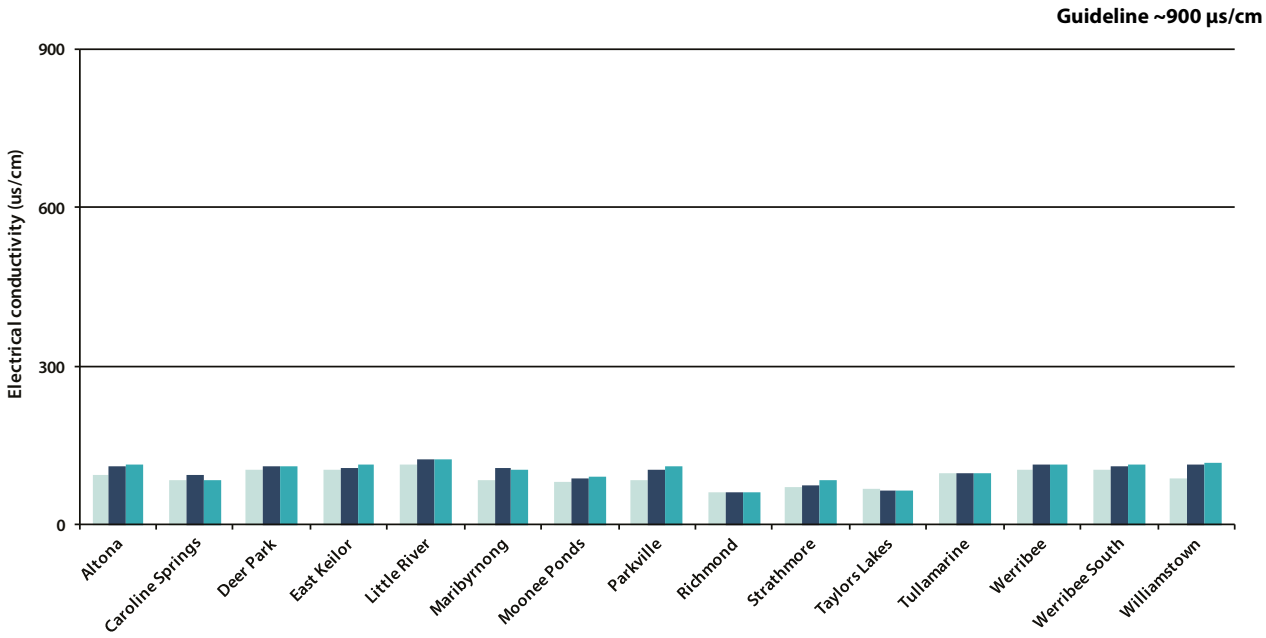


Figure B.8 Average fluoride concentrations in water sampling localities (between 2015-16 and 2017-18, from left to right within each locality)

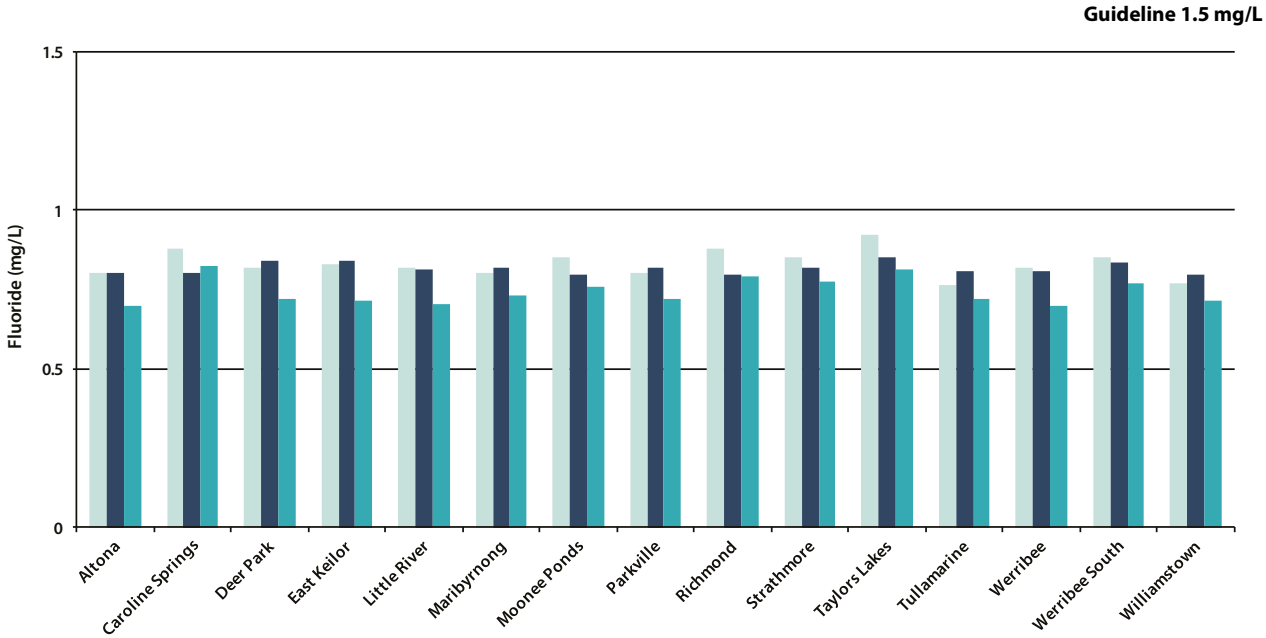


Figure B.9 Hardness concentrations in water sampling localities
(between 2015-16 and 2017-18, from left to right within each locality)

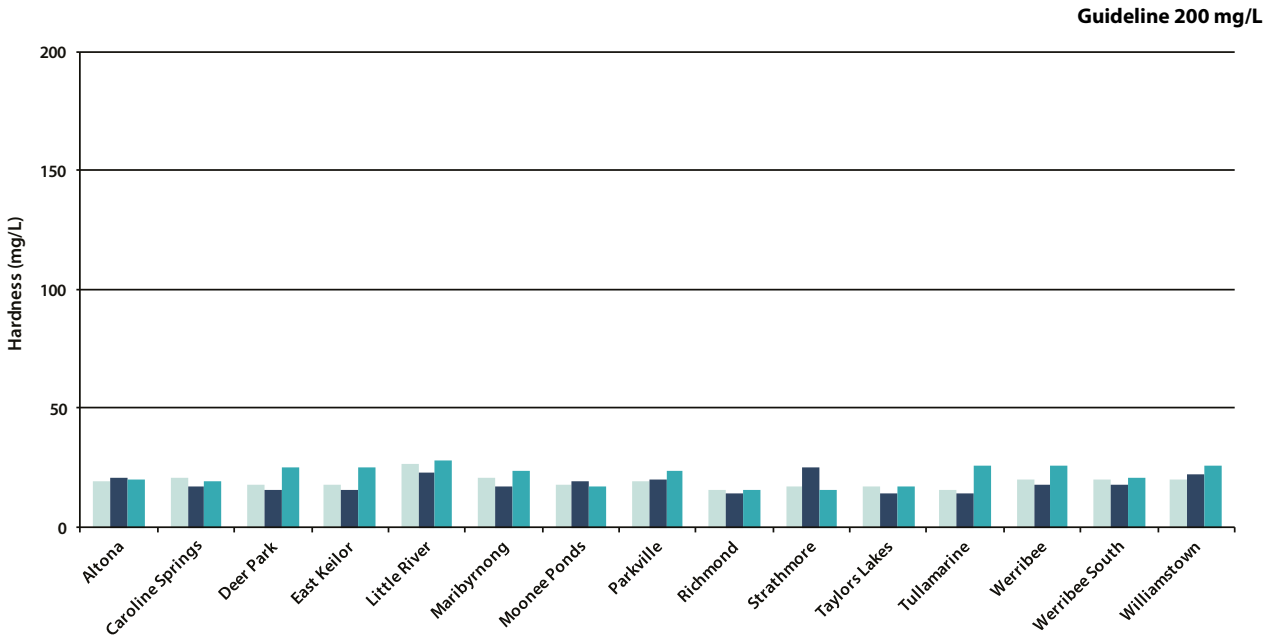


Figure B.10 Average iron concentrations in water sampling localities
(between 2015-16 and 2017-18, from left to right within each locality)

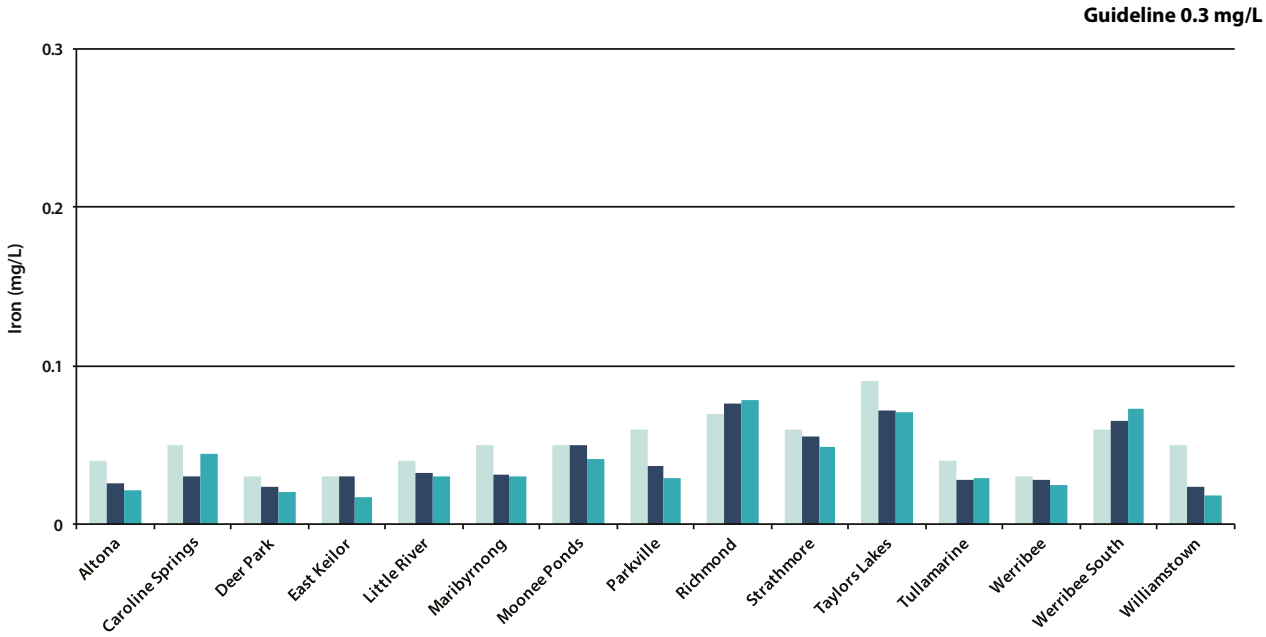


Figure B.11 Average manganese concentrations in water sampling localities (between 2015-16 and 2017-18, from left to right within each locality)

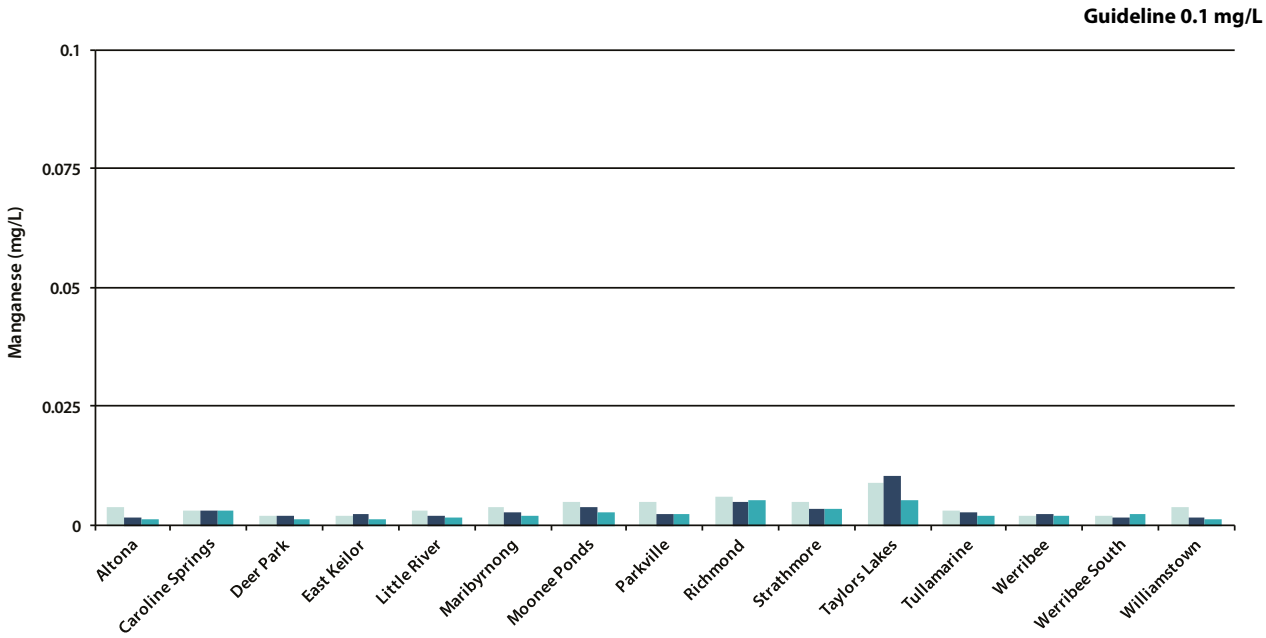


Figure B.12 Nitrate concentrations in water sampling localities (between 2015-16 and 2017-18, from left to right within each locality)

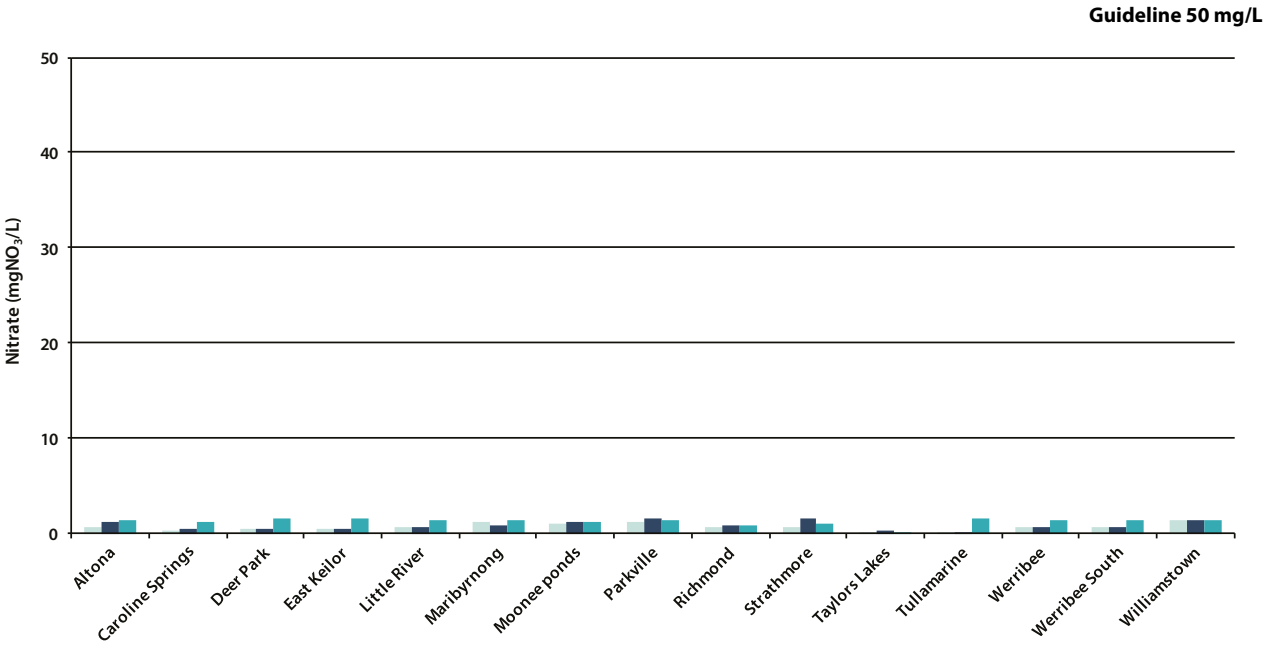


Figure B.13 Average pH values in water sampling localities
(between 2015-16 and 2017-18, from left to right within each locality)

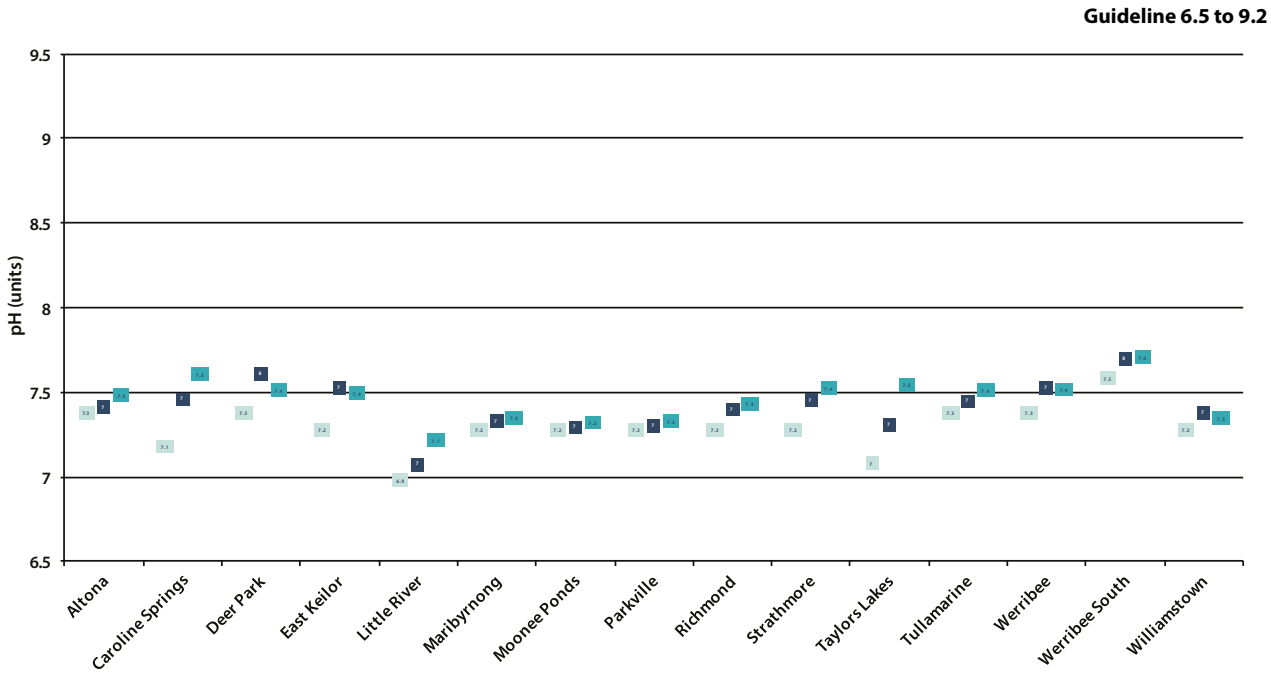


Figure B.14 Sodium concentrations in water sampling localities
(between 2015-16 and 2017-18, from left to right within each locality)

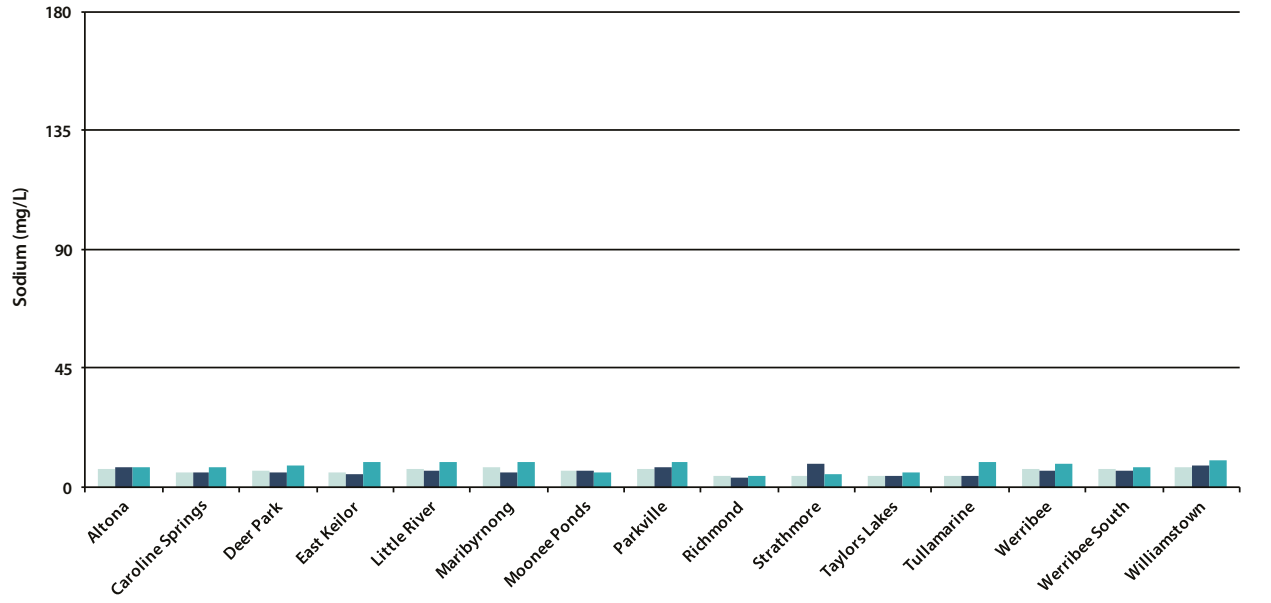


Figure B.15 Summary turbidity levels in water sampling zones
(between 2015-16 and 2017-18, from left to right within each locality)

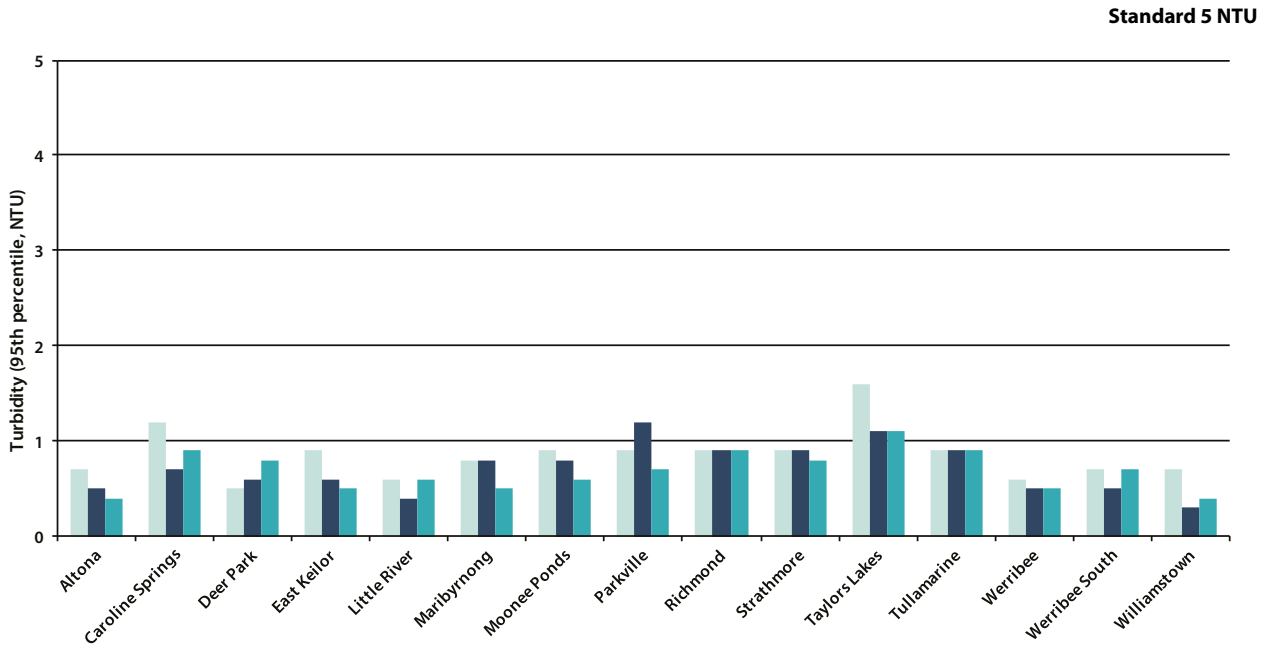


Figure B.16 Sulphate concentrations in water sampling localities
(between 2015-16 and 2017-18, from left to right within each locality)

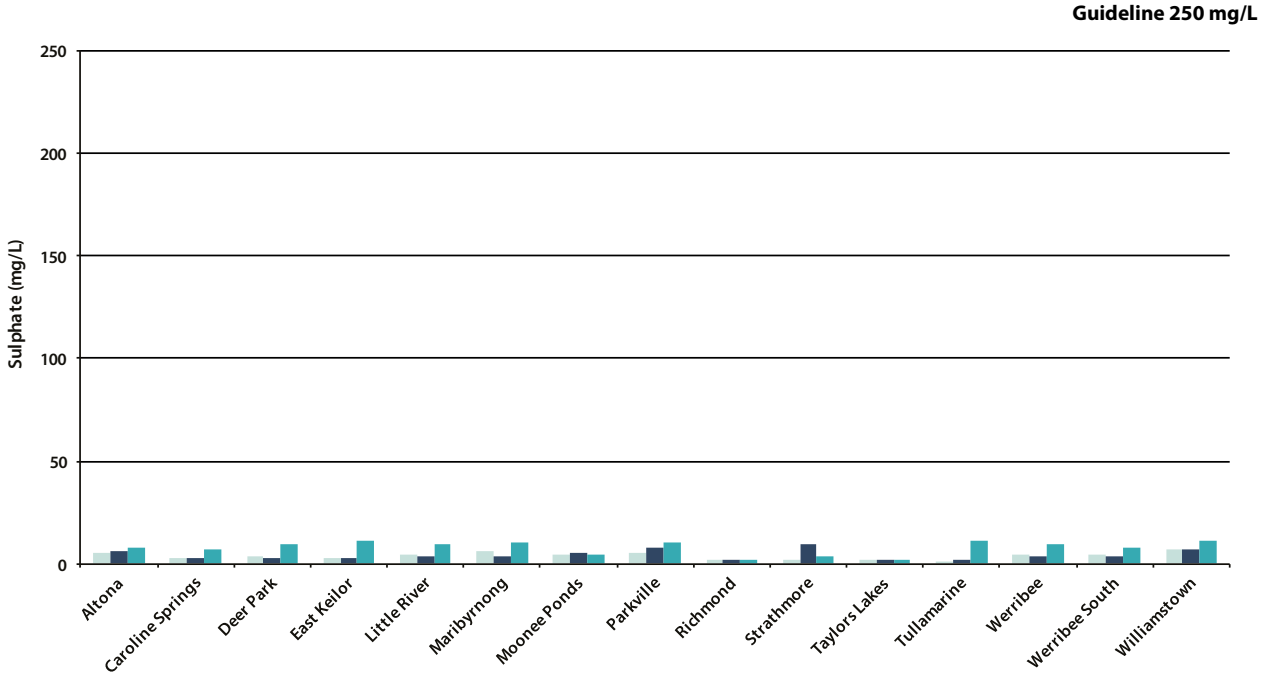
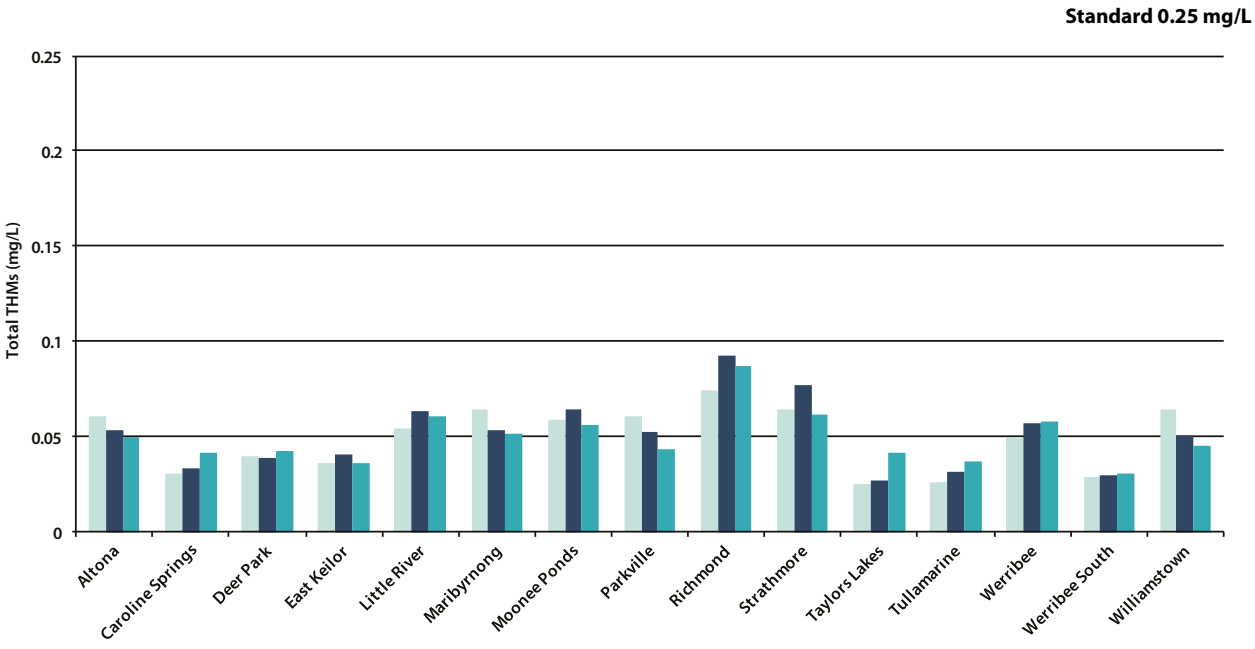


Figure B.17 Average total trihalomethane concentrations in water sampling localities (between 2015-16 and 2017-18, from left to right within each locality)



Appendix C 2018 Risk Management Plan regulatory audit certificate

RMP SYSTEMS CleanCloud Systems

ABN 46 122 146 767

Regulation 10

Schedule 1 - Risk Management Plan Audit Certificate

Safe Drinking Water Regulations 2015

Certificate Number: 148

Audit Period: 15th March 2016 to 16th April 2018

To: Mr David Ryan
Managing Director
City West Water Corporation
Locked Bag 350
Sunshine VIC 3020

Australian Business Number (ABN): 70 066 902 467

I, Thomas Teunissen, after conducting a risk management plan audit of the water supplied by City West Water Corporation, am of the opinion that:

City West Water Corporation has complied with the obligations imposed by Section 7(1) of the ***Safe Drinking Water Act 2003*** during the audit period.

Date: 16th April 2018

Signature of approved auditor:

Thomas Teunissen

Level 27, 101 Collins St, Melbourne VIC 3000
Mobile: 0410 624 604 Tel: 03 8609 1429 Fax: 03 864 00 581
Email: tom@rmpsystems.com

City West Water: 2018 Drinking Water Risk Management Plan Audit

Response to opportunities for improvement

#	Suggested opportunity for Improvement	CWW Response to opportunities for improvement
1	Drone or camera on rafts could be used to assist with, for example, tank inspections. There are many advances in technology which may be now more viable for implementation.	City West Water (CWW) is currently investigating and trialing the use of camera drones for water tank condition inspections. We will implement the recommendations of our trial by 30 December 2018.
2	With storage tanks it may be worth considering the latest industry best practice. For example, investigate if solid steel roofs may increase reliability and simplify ongoing maintenance.	CWW will undertake a review and gap analysis of our current practice for tank design and construction to ensure that best practice is considered in the materials selected. Recommendations will be adopted in risk management plan for future tanks.
3	For your sampling taps suggest considering a yearly audit, and replacement where required.	Our current practice involves regular inspection of water sampling taps during water sampling activities by CWW's laboratory contractor. On average, individual sampling taps are checked six times annually. CWW also maintain a register to track tap conditions, and the condition of tap is reported on a weekly basis by the by the laboratory to CWW for rectification. We believe that the intent of this audit finding is being met and do not intend to take any further action.
4	Suggest further updating website to highlight drinking water quality with advice from HACCP technical team.	CWW's website is currently being reviewed and enhanced with regard to providing information on drinking water quality. HACCP team members are being consulted to provide technical accuracy. Any updates to the website will be implemented by 30 December 2018.
5	Suggest considering that the HACCP team integrate especially closely, for example common work areas. This will help to reduce the chances of technical 'silos' are developing.	CWW will establish an arrangement for co-locating drinking water quality staff in our Footscray Head Office once per week to facilitate closer communication with the rest of the HACCP team and operational staff. This is an addition to the regular HACCP team meetings. This will commence in July 2018.
6	Suggest maintenance contractor graph both pH and free active chlorine residual. Other parameters could also be considered to optimize water chemistry. Suggest a yearly chemistry performance review with suggestion for upgrades and tightening Key Performance Indicators.	CWW will hold a discussion with maintenance contractor to explore opportunities for improving monitoring of the dosing systems. This will occur in July, with any outcomes implemented immediately.

City West Water
ABN 70 066 902 467
1 McNab Avenue, Footscray Vic 3011
Locked Bag 350, Sunshine Vic 3020

ABN 70 066 902 467

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