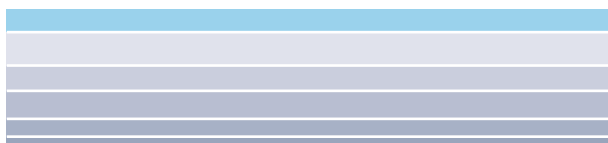
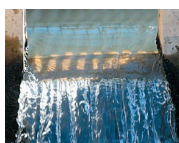
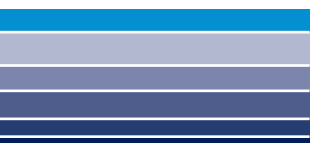


2021/2022 Safe Drinking Water Act 2003 ANNUAL REPORT



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1 Overview

This report, to the Secretary to the Department of Health (DH), has been prepared to satisfy the annual reporting requirement under Section 26 of the *Safe Drinking Water Act 2003* (the Act), for Coliban Water, as a Water Supplier, to produce an annual water quality report.

Coliban Water is one of the major urban water corporations in Victoria. Led by our vision of *Water to Live, Grow and Enjoy*, we manage, maintain and operate 35 reservoirs and water storage basins across North-Central Victoria, and provide water and wastewater services to rural and urban customers across an area of 16,550 square kilometres (Figure 1).

Our service region includes 49 towns, extending from Cohuna and Echuca in the north, to Kyneton and Trentham in the south. The western boundary incorporates Boort, Wedderburn, Bealiba and Dunolly, and the eastern boundary includes Heathcote and Tooborac.

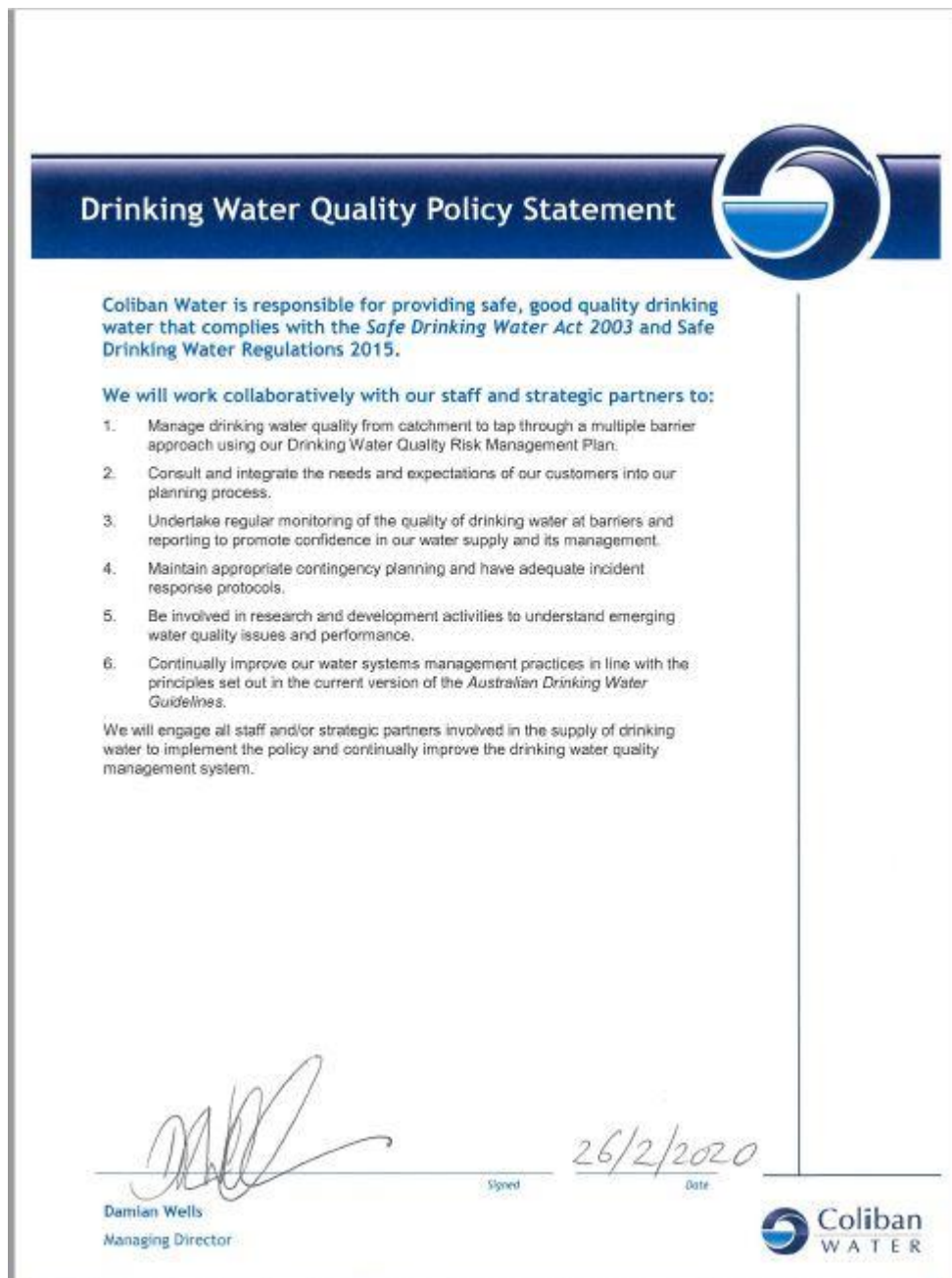
Raw water is sourced from eight individual water supply systems: the Coliban, Campaspe, Wimmera, Loddon, Goulburn and Murray River systems, and two groundwater sources. Coliban Water has 19 water treatment plants (WTPs), providing drinking water to 42 separate water sampling localities. We also have seven regulated water supply systems.

Figure 1: Coliban Water Service Region



Coliban Water is committed to the provision of safe drinking water as outlined in our Drinking Water Quality Policy Statement. As a minimum, this policy statement is reviewed every two years, and, as such, is currently being reviewed.

Our Drinking Water Quality Policy Statement is as follows:



1.1 Characterisation of the System

Coliban Water operates various types of water supply systems. Bendigo, Castlemaine and Kyneton are supplied with water harvested from headwork reservoirs on the Coliban River (Upper Coliban, Lauriston and Malmesbury Reservoirs) that are managed by Coliban Water. Water is transported to Bendigo and Castlemaine by open channel and stored in the Sandhurst and McCay Reservoirs, respectively, which are both off-stream storages managed by Coliban Water. Water for Kyneton is supplied via a pipeline direct from Lauriston Reservoir. The three water treatments plants (WTPs) servicing these areas are owned and operated by Bendigo Water Services Pty Ltd (Veolia Water), and treated water is supplied to Coliban Water under a 25-year contract, which commenced in 2001.

Supply to Bendigo is supplemented by water from both Lake Eppalock (a major reservoir on the Campaspe River, managed by Goulburn-Murray Water) and the Waranga Western Channel (Goulburn System, also managed by Goulburn-Murray Water).

WTPs servicing the other 16 systems are owned by Coliban Water and are operated by Service Stream. Service Stream operate the WTPs under an operations and maintenance service contract, which commenced 1 July 2013.

Two of these systems rely on groundwater supplies, and the other systems receive raw water by diversions from either water courses, irrigation channels or pipelines directly managed by Coliban Water, or managed by Grampians Wimmera Mallee Water or Goulburn-Murray Water, as bulk water suppliers to Coliban Water. For the purposes of the Act, Grampians Wimmera Mallee Water and Goulburn-Murray Water are water storage managers for Coliban Water. The water storage managers work closely with Coliban Water, communicating raw water data regularly, with direct contact when issues are identified, enabling water treatment plant operators to be prepared for managing the changes to raw water.

All raw water supplied to Coliban Water's water treatment plants is sourced from open catchments. All identified catchment risks are included in the risk register that forms part of Coliban Water's Drinking Water Quality Risk Management Plan, and they are managed as required.

The Safe Drinking Water Regulations 2015 requires water suppliers to detail the methodology used to quantify microbial hazards in source waters. Coliban Water has applied the Microbial Health Based Targets manual, developed by Water Services Association of Australia (WSAA), to meet this requirement. This work required all catchments supplying water to water treatment plants to be assessed, together with analysis of raw water data, to identify the appropriate source water category. Each source water category has an associated level of potential pathogen risk that the water treatment plants need to manage. The processes at each water treatment plant are then aligned with the source water category to identify the level of pathogen risk post treatment.

The information from the catchment/source water/treatment plant review enables Coliban Water to identify which of its water treatment plants and their processes may require enhancement to manage the potential pathogen risk in the source water. Where a potential pathogen risk has been identified, options to reduce the risk are assessed, which can result in a treatment plant upgrade, or asset modifications. All of our water treatment plants have critical control points throughout the process, which will firstly alarm the operators if outside the required range, and then stop the process if certain critical limits are exceeded.

Coliban Water also supplies seven townships with water that is classified as Regulated Water, as detailed in Section 6 of the Act (see part 7 of this report for more details). Regulated Water is water that is not intended for drinking, but which could be reasonably be mistaken as drinking water.

1.2 Source Water Protection

Coliban Water works in partnership with the North Central Catchment Management Authority, local government, Goulburn Murray Water, Grampians Wimmera Mallee Water and Landcare Groups to address issues affecting water quality in the catchments (Coliban, Campaspe, Loddon, Wimmera and Murray River catchments) from where drinking water is sourced.

Our catchments and operational areas are closely managed to ensure we monitor our land for fire and tree hazards, manage our pest plant obligations, whilst also protecting water quality in our storages. We also work to enhance river health and support biodiversity across our lands and catchments.

Through our fire hazard management programs, we take a proactive approach to reducing fuel loads to minimise risks to adjacent landowners, high value assets, as well as public areas. We also work collaboratively with other agencies through regional forums to prepare for upcoming and future fire seasons.

Coliban Water engages with Traditional Owner enterprises such as Djandak (Dja Dja Wurrung Enterprises Pty Ltd) to deliver land and natural resource management outcomes on Country and identify opportunities to work together collaboratively. This includes sensitively managing access to areas around the storages and across sites that contain cultural heritage.

Since the release in February 2015 of our *Drinking Water Storages and Land Management Plan*, numerous Catchment Works Agreements have been entered into with adjoining landowners, effectively removing stock access from adjoining private property to raw water supplies around the Malmsbury and Upper Coliban

Reservoirs. Negotiations with landowners with respect to fencing at Lauriston Reservoir are ongoing, with positive progress being made towards the protection of water quality from 'Catchment to Tap'.

We are responsible for providing statutory and strategic land use planning engagement with municipalities where sewerage is not connected, and we are a determining referral authority under section 55 of the *Planning and Environment Act 1987*. As part of our role in special water supply catchments, declared under the *Catchment and Land Protection Act 1994*, we provided responses to planning permit applications referred to us by local government under clause 66.02-5 – 'Special Water Supply Catchment' of the Victorian Planning Provisions and relevant municipal planning schemes.

Our responses provide support to local government, by recommending conditions to applications for the use and development of privately-owned land in open water supply catchments, so as to ensure minimal impacts on the quality and quantity of water available to the environment and for use in water supply to the townships that we service. We have, on occasions, objected to the issuing of a planning permit, where we consider there is potential for adverse impacts.

In September 2017, Department of Environment, Land, Water and Planning (DELWP) released a Statewide Framework for Catchment Partnership Agreements. The purpose of Catchment Partnership Agreements is to strengthen coordination, collaboration and accountability, reduce duplication, and provide clarity on roles and responsibilities between key catchment management partners. Coliban Water is a partner organisation, established through the Catchment Partnership Agreement, which was signed in June 2018 with the North Central Catchment Management Authority (North Central CMA) and other partner organisations. Our ongoing role as a partner organisation has seen our continued participation on the regional Catchment Partnership Forum and provided us representation on the Steering Committee convened by North Central CMA for the renewal of the North Central Regional Catchment Strategy.

The Memorandum of Understanding (MoU) between Coliban Water and North Central CMA was reviewed and an updated 2021-22 Action Plan that supports the Coliban Water – North Central CMA MoU formulated. The MoU enables the protection and enhancement of the beneficial uses of catchment areas and the environment, with a focus on risks to water security from climate change and land-use change. A key action outlined in the MoU addendum Action Plan was the continued development and implementation of the Upper Coliban Catchment Integrated Catchment Management Plan (ICMP).

In addition to the collaborative work undertaken under the MoU, North Central CMA has continued work under the monitoring and maintenance phase of the Kyneton Offsets Project. This includes pest plant management of revegetated sites and replanting of revegetation to ensure an 80% survival rate for planted vegetation. These works are re-establishing riparian zones and will prevent nutrients and pathogens from entering the waterway where the works were undertaken.

The ICMP was developed from work that commenced in 2015/16, in response to various threats facing the Upper Coliban Catchment (UCC). Through active participation by a range of stakeholders, including landholders within the catchment, local Landcare groups, local and Victorian government agencies, and Goulburn-Murray Water, the ICMP is a comprehensive analysis of the benefits and costs of protecting and enhancing the UCC. The ICMP is a key step in the delivery of safe drinking water supply and a key principle of 'Catchment to Tap' multi-barrier approach for the production of safe drinking water.

The ICMP will enable the provision of a safe and secure water supply for communities in central and northern Victoria, along with enhanced river, biodiversity and catchment health outcomes. The ICMP has a 20-year horizon, and has been developed around three specific, measurable, achievable, realistic and time-bound goals which address future development pressures, waterway protection and habitat connectivity goals.

Delivery and implementation of the ICMP is through a Coliban Water and North Central CMA partnership program, now entering its fourth year of operation, called 'A Healthy Coliban Catchment' (AHCC). The program involves a range of on-ground actions (stock exclusion from waterways, riparian regeneration and revegetation, willow removal) and strategic planning through municipal planning scheme amendments and the development of Environmental Significance Overlay controls to protect and enhance source water supplies.

As was the case during the previous year, COVID-related issues continued to impact the delivery of on-ground works, including the unavailability of Loddon Prison work crews. Clean-up of the damage caused by the 2019 storm event continued to engage contractors, making them unavailable to undertake any on-ground works for this project. Weed control works were delayed by the loss of a significant contractor due to COVID, which also delayed associated revegetation works.

Whilst the delivery of on-ground works was delayed, interest in the program is still strong. North Central CMA's Project Manager and Catchment Restoration Officer are currently working through a backlog of approximately 50 landholders who wish to participate in the program.

Branded farm gate signage has been produced for distribution to program participants across the Upper Coliban catchment. These are being distributed by North Central CMA's catchment restoration officer.

The table below summarises both the 2021/22 outputs, and the four-year outputs for the AHCC program.

2021/22 and overall outputs for the AHCC program

Activity	Units	2021/22 Outputs	Total Outputs
Fence Installed	km	6	30.3
Weed Control	Ha	38	277.8
Grazing Management Change	ha	2.1	90.1
Native Vegetation Established	ha	33.9	99.5
Off Stream Watering	OSWP	9	69
Workshops	No. Participants	112	131
Field Days	No. Participants	43	93
Training Events	No. Participants	28	53

1.2.1 Raw Water Monitoring Parameters

The following table details the parameters for which monitoring is undertaken in all the raw water sources from which water is extracted, treated and then supplied as drinking water. The program is reviewed every year (or more frequently, depending on seasonal conditions). All monitoring is performed by an independent National Association of Testing Authorities, Australia (NATA)-accredited laboratory.

The raw water monitoring is conducted for the purposes of managing risks to the water treatment process. The sampling frequency for each parameter can vary depending on the identified risk for the different raw water e.g. *E. coli* is sampled weekly for some locations and monthly for others. The data from the raw water monitoring program does not represent the quality of drinking water supplied to customers.

Table 1: Raw Water Monitoring Parameters and Frequency

Group	Parameter	Sampling Frequency ¹
Bacteria	Coliforms	Weekly September to April and monthly remainder of year or Monthly or Quarterly
	<i>E. coli</i>	Weekly, Weekly September to April and, monthly remainder of year, Fortnightly, Monthly or Quarterly
	Enterococci	Weekly, Fortnightly or Monthly
Protozoa	<i>Cryptosporidium</i>	Weekly, Fortnightly or Monthly
Physical and chemical	pH	Weekly September to April and, monthly remainder of year or Monthly or Quarterly
	Turbidity	
	Colour	
	Electrical conductivity	
	Alkalinity	
	Hardness	Quarterly
Inorganic	Arsenic	Quarterly
	Cadmium	
	Chromium	
	Cyanide	
	Mercury	
	Nitrate	
	Selenium	
	Sodium	
	Sulphate	
	Chloride	
	Antimony	

Group	Parameter	Sampling Frequency ¹
	Barium	Quarterly or Annually
	Boron	
	Beryllium	
Organic	MIB	Weekly or Fortnightly September to April and monthly remainder of year or Monthly September to April, or Monthly or Fortnightly
	Geosmin	
	TOC (Total Organic Carbon)	Monthly or Quarterly
Corrosion Products	Iron	Fortnightly or Monthly or Quarterly
	Manganese	
	Copper	Quarterly
	Lead	
	Zinc	
	Nickel	
Cyanobacteria (Blue Green Algae)	BGA count	Weekly – September to April, monthly remainder of the year or Fortnightly – September to April, monthly remainder of the year
	BGA ID	
	Biovolume	
Bromide	Bromide	Monthly
Fluoride	Fluoride	Quarterly
Nutrients	Total phosphorus	Weekly September to April and monthly remainder of year
	Total nitrogen	
Organic (Fungicides/Herbicides/Insecticides)	Numerous (refer Appendix B)	Six monthly or Annual

Note:

- 1 Water sampling localities are assessed individually and the sampling frequencies for each parameter are allocated depending on the risk.

1.3 Water Supply Systems

A summary of general water supply system information is presented in Table 2.

Table 2: Water Sampling Locality, Population, Source Water, Storage & Water Treatment Plant information for 2021-22

Water Sampling Locality	Population supplied ¹	Source Water	Raw Water Storage	Water Treatment Plant (WTP)
Axedale	410	Upper Coliban Reservoir Lauriston Reservoir Malmsbury Reservoir Lake Eppalock Waranga Western Channel	Sandhurst Reservoir	Bendigo WTP
Bendigo Northern	35330			
Bendigo Southern	40350			
Bendigo Spring Gully	12630			
Bendigo Raywood	190			
Bendigo Sebastian	180			
Big Hill	880			
Epsom - Huntly	10130			
Junortoun	3340			
Maiden Gully - Marong	7140			
Strathfieldsaye	7000			
Boort	830	Waranga Western Channel	Boort Basin	Boort WTP
Bridgewater-Inglewood	1350	South West Loddon Pipeline Loddon River	Bridgewater Basins	Bridgewater WTP
Castlemaine	11281	Upper Coliban Reservoir Lauriston Reservoir Malmsbury Reservoir	McCay Reservoir	Castlemaine WTP
Fryerstown	170			
Guildford	260			
Harcourt	1100			
Maldon	1730			
Newstead	800			
Taradale - Elphinstone	490			
Cohuna	2440	Gunbower Creek	Nil	Cohuna WTP
Echuca	14960	Murray River	Nil	Echuca WTP
Elmore	840	Groundwater Bore No.3 Groundwater Bore No.4	Nil	Elmore WTP
Goornong	420	Campaspe River	Goornong Basin	Goornong WTP
Gunbower	340	Taylors Creek	Nil	Gunbower WTP
Heathcote	2190	Caledonia	Caledonia	Heathcote WTP

Water Sampling Locality	Population supplied ¹	Source Water	Raw Water Storage	Water Treatment Plant (WTP)
Tooborac	110	Reservoir Lake Eppalock Waranga Western Channel Upper Coliban Reservoir Lauriston Reservoir Malmsbury Reservoir	Reservoir	
Korong Vale	210	Grampian Wimmera Mallee Pipeline	Korong Vale Basins	Korong Vale WTP
Wedderburn	880	South West Loddon Pipeline		
Kyneton	6530	Lauriston Reservoir	Lauriston Reservoir	Kyneton WTP
Malmsbury	740	Upper Coliban Reservoir		
Tylden	320			
Bealiba	150	Loddon River	Nil	Laanecoorie WTP
Dunolly	760			
Laanecoorie	60			
Tarnagulla	190			
Leitchville	370	Gunbower Creek Cohuna Channel	Nil	Leitchville WTP
Lockington	490	Waranga Western Channel	Lockington Basins	Lockington WTP
Pyramid Hill	580	Pyramid Hill Channel	Pyramid Hill Basin	Pyramid Hill WTP
Rochester	2960	Waranga Western Channel Campaspe River	Nil	Rochester WTP
Serpentine	150	East Loddon stock and domestic pipeline	Serpentine Raw Water Tank	Serpentine WTP
Trentham	1470	Groundwater Reservoir 1 and 2	Trentham Reservoir 1 and 2	Trentham WTP

Note:

1 Population is calculated using property connection numbers multiplied by mean household size from the 2021 census.



2 Drinking Water Treatment Processes

2.1 Water Treatment

The following table provides a summary of the water treatment processes used to produce drinking water for each water sampling locality¹ and the chemicals that are added during the various water treatment processes. There were no changes to the water sampling localities during 2021/22.

Appendix C contains a more detailed version of the table below.

Table 3: Water treatment processes

Water Sampling Locality	Treatment Plant	Treatment Processes	Added Substances	Comments
Axedale Bendigo Northern Bendigo Southern Bendigo Spring Gully Bendigo Raywood Bendigo Sebastian Big Hill Epsom - Huntly Junortoun Maiden Gully - Marong Strathfieldsaye	Bendigo WTP	Oxidation Coagulation/flocculation Microfiltration Ozonation BAC filtration Fluoridation pH correction Chloramination	Potassium permanganate Carbon dioxide Aluminium chlorohydrate Ozone Hydrofluorosilicic acid Lime Chlorine gas Ammonia	

Water Sampling Locality	Treatment Plant	Treatment Processes	Added Substances	Comments
Boort	Boort WTP	Coagulation/flocculation Clarification Dual-media filtration pH correction Chlorination	Powdered activated carbon ² Aluminium sulphate Polyelectrolyte Caustic soda Chlorine gas	Ultrasonic algae buster systems were installed at Boort raw water basin during 2021-22
Bridgewater-Inglewood	Bridgewater WTP	Coagulation/flocculation Clarification Dual-media filtration GAC filtration UV radiation pH correction Chlorination/ Chloramination ³	Sulphuric acid Powdered activated carbon Ultrion Caustic soda Chlorine gas Ammonia	Reverse Osmosis process has been decommissioned and removed from site.
Castlemaine Fryerstown Guildford Harcourt Maldon Newstead Taradale - Elphinstone	Castlemaine WTP	Coagulation/flocculation Microfiltration Ozonation BAC filtration Fluoridation pH correction Chlorination	Carbon dioxide Aluminium chlorohydrate Ozone Hydrofluorosilicic acid Lime Chlorine gas	

Water Sampling Locality	Treatment Plant	Treatment Processes	Added Substances	Comments
Cohuna	Cohuna WTP	Coagulation/flocculation Clarification Oxidation Dual-media filtration pH correction Chlorination	Powdered activated carbon Caustic soda Aluminium sulphate Polyelectrolyte Chlorine gas Sodium hypochlorite Sodium Fluoride	
Echuca	Echuca WTP	Coagulation/flocculation Clarification Oxidation Dual-media filtration Fluoridation pH correction Chlorination	Powdered activated carbon Caustic soda Aluminium sulphate Polyelectrolyte Hydrofluorosilicic acid Chlorine gas Sodium hypochlorite	
Elmore	Elmore WTP	pH correction UV radiation	Caustic soda	

Water Sampling Locality	Treatment Plant	Treatment Processes	Added Substances	Comments
Goornong	Goornong WTP	Coagulation/flocculation Clarification Sand filtration pH correction Chlorination	Powdered activated carbon ² Aluminium sulphate Soda ash Sodium hypochlorite	
Gunbower	Gunbower WTP	Ion Exchange Coagulation/flocculation Clarification Microfiltration GAC filtration UV disinfection Chlorination	Powdered activated carbon ² MIEX resin Aluminium Chlorohydrate Caustic soda Chlorine gas	
Heathcote Tooborac	Heathcote WTP	Coagulation/flocculation Clarification Oxidation Dual-media filtration UV radiation pH correction Chlorination/ Chloramination ³	Powdered activated carbon (PAC) Caustic soda Aluminium sulphate Sodium hypochlorite Polyelectrolyte Chlorine gas Ammonia	



Water Sampling Locality	Treatment Plant	Treatment Processes	Added Substances	Comments
Korong Vale Wedderburn	Korong Vale WTP	Coagulation/flocculation Clarification Dual-media filtration pH correction Chloramination	Powdered activated carbon ² Caustic soda Aluminium sulphate Polyelectrolyte Chlorine gas Ammonia	
Kyneton Malmsbury Tylden	Kyneton WTP	Coagulation/flocculation Microfiltration Ozonation BAC filtration Fluoridation pH correction Chlorination	Carbon dioxide Aluminium Chlorohydrate Ozone Hydrofluorosilicic acid Lime Chlorine gas	
Bealiba Dunolly Laanecoorie Tarnagulla	Laanecoorie WTP	Coagulation/flocculation Clarification Oxidation Dual Media filtration UV radiation pH correction Chlorination/ Chloramination ³	Powdered activated carbon Aluminium sulphate Polyelectrolyte Caustic soda Chlorine gas Ammonia Sodium hypochlorite	

Water Sampling Locality	Treatment Plant	Treatment Processes	Added Substances	Comments
Leitchville	Leitchville WTP	Coagulation/flocculation Clarification Microfiltration pH correction UV radiation Chlorination	Powdered activated carbon Aluminium sulphate Polyelectrolyte Caustic soda Chlorine gas	
Lockington	Lockington WTP	Coagulation/flocculation DAFF pH correction Chlorination	Powdered activated carbon ² Aluminium Chlorohydrate (ACH) Polyelectrolyte Caustic soda Calcium Hypochlorite	Ultrasonic algae buster systems were installed at Lockington raw water basin during 2021-22.
Pyramid Hill	Pyramid Hill WTP	Coagulation/flocculation Clarification Dual-media filtration pH correction Chlorination	Aluminium sulphate Aluminium Chlorohydrate (ACH) Polyelectrolyte Caustic soda Chlorine gas	

Water Sampling Locality	Treatment Plant	Treatment Processes	Added Substances	Comments
Rochester	Rochester WTP	Coagulation/flocculation Clarification Microfiltration GAC filtration pH correction Chlorination	Aluminium sulphate Chlorine gas Caustic Soda	
Serpentine	Serpentine WTP	Coagulation/flocculation Clarification Dual-media filtration pH correction Chlorination	Aluminium sulphate Polyelectrolyte Caustic soda Chlorine gas	
Trentham	Trentham WTP	Ultrafiltration GAC filtration Chlorination	Chlorine gas	Ultrasonic algae buster systems were installed at Trentham raw water basin during 2021-22.

Note:

- 1 A water sampling locality is a discrete area of similar water quality.
- 2 There is no permanent PAC dosing system at these treatment plants; however, there is provision for a mobile PAC dosing system to be added into the process when required.
- 3 Primary disinfection occurs through chlorination, and then the treated water is chloraminated, in order to maintain disinfection residual for a longer period of time.



2.2 Improvements to water supply and treatment

This year some of the major Water Treatment Plant (WTP) improvement works included:

- The air compressor at Gunbower WTP was replaced.
- The Granular Activated Carbon (GAC) media was replaced at Gunbower and Trentham WTPs.
- Chlorguard automatic shut off systems, which are used to shut down faulty chlorine systems, were installed at Cohuna, Heathcote, Leitchville, Pyramid Hill, Bridgewater, Laanecoorie and Korong Vale WTPs.
- Ultrasonic algae buster systems were installed at Lockington, Boort and Trentham WTPs.
- The clarifiers at the Cohuna WTP were cleaned.

Across our region, we replaced approximately 6.67 kilometres of water mains as part of our ongoing water mains renewal program, at a cost of just over one million dollars. The mains were renewed using directional boring, a trenchless technology that reduces the need for excavations and results in overall cost savings of 25 to 50 per cent.

We identify sites for replacement by analysing a range of criteria including the criticality, risk to customers, number of failures, number of supply interruptions, number of customers impacted and the assessed remaining useful life of the asset. This year, 2 kilometres of water main were renewed in the regional township of Castlemaine.

At a cost of approximately \$130,000, in excess of 195 kilometres of water mains cleaning was completed in Castlemaine, Epsom, Guildford, Raywood, Sebastian, and Spring Gully.

This program removes sediment from the water mains and improves chlorine residuals across our networks using multiple techniques, including air scouring. Air scouring involves forcing a mixture of compressed air and water through the system to remove naturally occurring sediment and other particles. This method of mains cleaning is safe, uses minimal water compared to other methods, and is environmentally friendly.

Our ongoing water mains cleaning program helps protect the integrity of the water system, enhances the drinking water quality we supply to customers and ensures our water continues to meet Australian Drinking Water Guidelines.

In our water supply network, there are in excess of 11,500 water isolation valves that play an important role in ensuring water supply is maintained to customers. A valve maintenance program has been implemented that involves proactively exercising (opening and closing) valves to confirm their location (mapped into our Geographic Information System [GIS]), condition and operability. This ensures that the valves can be located quickly and are functioning correctly allowing isolation of water mains in case of any planned or unplanned events. This year, 718 valves were exercised in the suburbs of Bendigo CBD, Castlemaine, and Kyneton.

2.3 Issues

During 2021/22 the drinking water supplied to our customers was of a high standard, except as described below.

Schedule 2 of Victoria's Safe Drinking Water Regulations 2015 (SDWR) lists three specific drinking water quality standards that apply to all drinking water supplies in Victoria: *Escherichia coli* (*E. coli*), Total Trihalomethanes (THMs) and Turbidity, all of which have mandated limits, and frequencies for sampling and testing.

All of our drinking water supplies were compliant with the SDWR Schedule 2 drinking water standard during 2021/22.

The SDWR also require that any drinking water that is supplied to customers must not contain any toxin, pathogen, substance or chemical, whether alone or in combination with another toxin, pathogen, substance or chemical, in such amounts that may pose a risk to human health.

There were a few instances where elevated results for some chemicals were recorded during the monitoring of the drinking water that we supply; and the circumstances associated with their detection are described below.

2.3.1 Health Based and Aesthetic Guideline Value Exceedances

In April 2022, a weekly routine chlorine sample collected from our Belvoir Park tank exceeded the health-based guideline value of 5.0 mg/L specified in the Australian Drinking Water Guidelines (ADWG). On the same day, chlorine samples were also taken from customer tap sites that are supplied from this tank and all were compliant with the chlorine guideline value in ADWG, confirming that no customers were supplied with non-compliant drinking water. The subsequent investigation concluded there was a chlorine spike in the sample line at the time of sampling. As this was an exceedance of a health-based guideline value in the ADWG, a Section 18 notification, under the *Safe Drinking Water Act 2003* (the Act), was made to Department of Health (DH).

A range of organisms that grow naturally in water bodies can produce substances that can create unpleasant tastes and odours (T&O) in drinking water supplies. The most common of these substances are Geosmin and 2-Methylisoborneol (MIB). While these substances create unpleasant T&Os in drinking water, they do not pose a risk to public health.

Elevated concentrations of these T&O compounds, but primarily Geosmin, were experienced across the Murray River System in August 2021, which affected the quality of drinking water produced by the Cohuna and Leitchville Water Treatment Plants (WTPs) that draw raw water from the Murray River and its tributaries. Given that the concentration of Geosmin in the raw water was extremely high, the concentration of Geosmin in the treated drinking water leaving these two WTPs exceeded the T&O threshold of 10 ng/L, which is mentioned in the ADWG, on a couple of occasions during this period. Given the potential for widespread customer complaints to occur as a result of the presence of these compounds in drinking water, DH was proactively notified under the Act. We continue to optimise our water treatment processes to manage these raw water events.

There were also some other isolated water quality incidents that occurred during the reporting period. The circumstances leading to the events, and actions taken in response, are described below.

2.3.2 Event Incidents Reported to Department of Health

Following a burst water event on the pipeline that supplies Maldon in October 2021, widespread customer complaints were received from the customers in Maldon, describing the drinking water that they were receiving as discoloured and cloudy. During the work to mend the burst main, air became trapped in main, and due to the length of the main, it required a large volume of water to remove the air. While flushing was being undertaken, it took a few days for the air to be removed at the extremities of the network. Work has been undertaken on the network to better manage the removal of air. Due to the number of complaints received, Coliban Water advised DH of the event, and completed a Section 22 report under the Act.

A high wind storm event occurred in the Wedderburn area in November 2021. A site inspection of the Wedderburn tank identified a roof sheet on the ground in the tank compound. Access to the tank roof could not be undertaken until the following day, as a cherry-picker was required. During discussions with DH on Friday 5 November 2021, it was agreed to issue a precautionary 'Boil Water Advisory', as we were unable to confirm if the drinking water had been potentially contaminated. Social media was used to advise Wedderburn customers of the advisory, followed by a town doorknock the next day, with information given directly to customers. Notices were left at properties if the customer was not home. An information table was established outside the local supermarket as another way to inform customers.

When the tank roof was accessed the following day, it was identified that there was another loose roof panel, which was mended at the same time as the other roof sheet was replaced. The roof was also investigated for any other issues.

Water sampling was undertaken in the morning, and again in the afternoon, from both the tank and around the town. All results were within the ADWG guideline values, which enables the 'Boil Water Advisory' to be lifted later that day, on Sunday 7 November 2021. DH was continually updated with information throughout the event. A Section 22 report was completed and forwarded to DH. This event supports the Coliban Water project included in Planning Submission 2023 to add chlorine analysers on tank outlets.

The Echuca Water Treatment Plant pumps water to a high-level storage tank in Echuca, as required, to supply the Echuca network. In February 2022 a power flicker disabled the automatic starting of the pumps to supply the high-level storage. While the issues were being rectified, the supply to the section of Echuca supplied by this storage tank were impacted by low pressure. Positive pressure was maintained during this time, but as

the pressure was lower than normal, it triggered numerous customer contacts. DH were advised of the event and a Section 22 report was submitted.

2.3.3 Fluoride Shutdowns

DH was notified of the following fluoride shutdowns during 2021/22, as the fluoride concentration in the drinking water was less than 0.6mg/L for a continuous period of >72 hours. Details of the shutdowns are below:

1. The Echuca WTP fluoride system shut down on Monday 1 August 2021, due to the failure of the transfer pump. (i.e. transfers fluoride from the fluoride bulk tank to the fluoride day tank). The transfer pump could not be fixed and a replacement was ordered. The new pump was fitted and the system was operational on Wednesday 10 August 2021. An additional pump has now been added to the critical spares to reduce the time the system cannot operate.
2. The Cohuna WTP fluoride system shut down on Saturday 30 October 2021 following a discharge from the safety shower (which is adjacent to the fluoride system) overflowing into the fluoride dosing pit. The water caused the level sensor in the pit to shut down the fluoride system. After pumping the water out of the pit, the system couldn't be reset and it was identified that an electrician was required. On the afternoon of Monday 1 November 2021, an electrician attended site and rectified the issue, and the fluoride system was restarted. As a result of the overflow, the drain from the safety shower was diverted away from the dosing pit to prevent this issue reoccurring.

3 Emergency Incident and Event Management

3.1 Section 22 Reports

The following reports were made to the Water Program of DH under Section 22 of the Act. Five Section 22 reports were submitted to DH within the required timeframe.

Table 4: Section 22 Reports 2021/22

Date incident occurred	Drinking water locality affected	Nature of Incident	Actions taken in response to the incident
13/07/2021	Cohuna	A range of organisms that grow naturally in water bodies can produce substances that can create unpleasant tastes and odours (T&O) in drinking water supplies. The most common of these substances are Geosmin and 2- Methylisoborneol (MIB). While these substances create unpleasant tastes and odours in drinking water they do not pose a risk to public health.	The plant consists of a Powdered Activated Carbon (PAC) dosing system to reduce T&O compounds. Management of the T&O is achieved by ensuring the PAC dosing system was optimized.
22/07/2021	Leitchville	Elevated concentrations of these T&O compounds, but mainly Geosmin, were impacting the raw water in Gunbower Creek which was the source water for Cohuna, and Leitchville Water Treatment Plants (WTPs) at this time. The concentration of T&O causing compounds was exceeding the capacity of the treatment process leading the treated water leaving these two WTP to be exceeding the T&O threshold (10 ng/L), mentioned in the ADWG, on a few occasions during July 2021.	PAC is part of the treatment process at Leitchville WTP, but is only in use when the WTP is being supplied from the Cohuna Main Channel. Winter maintenance was being completed on the Cohuna Main Channel at this time, so the PAC was not in use, but once the maintenance work had been completed, and water quality verified, supply was transferred back and the PAC treatment system was available to manage the issue.

Date incident occurred	Drinking water locality affected	Nature of Incident	Actions taken in response to the incident
18/10/2021	Maldon	<p>On 14 October 2021, network operators responded to a burst main on the 375mm water supply main between Castlemaine and Maldon. The repair was completed successfully as per normal procedures, which included flushing the mains afterwards in an attempt to remove entrapped air. Maldon customers were not without water at any time as there was sufficient supply in the Maldon tank.</p> <p>Between 18 October 2021 and 29 October 2021, Coliban Water received widespread complaints from the township of Maldon describing the drinking water as discoloured and cloudy. In total Coliban Water received twenty-one (21) complaints during this period, from 15 different properties.</p> <p>Due to the length of the rising main, removing all entrapped air is difficult and can take days to move through the network.</p>	<p>Following the repair works to the 375mm main on 14 October 2021, network operators operated the air valves on the main to remove as much air as possible. Flushing was also undertaken in the Maldon network to assist with the turnover of the tank.</p> <p>Flushing was initially undertaken as a site-specific activity, but as more contacts were received it was expanded across the network.</p> <p>Water quality sampling at all customer tap sample points was undertaken on Saturday 23 October to verify the quality of the drinking water being supplied.</p> <p>Flushing in the Maldon network continued until Coliban Water's incident management team was satisfied the turbidity of the water had improved and no additional customer complaints were received.</p> <p>An additional fire plug has been installed to assist the removal of air.</p>

Date incident occurred	Drinking water locality affected	Nature of Incident	Actions taken in response to the incident
03/11/2021	Wedderburn	<p>During the afternoon on Friday 5 November 2021, following a storm event on the preceding Wednesday evening, an inspection of the Wedderburn Tank found a single sheet of colourbond roofing iron located in the tank compound. It was considered likely to be from the tank roof, as it matched the colour and type of the roof, and there are no other buildings in the vicinity.</p> <p>There was a concern that drinking water quality could have been adversely impacted so, in consultation with DH, a Boil Water Advisory was issued for the Wedderburn sampling locality on the Friday evening.</p>	<p>Water quality samples for chlorine and turbidity were taken from the tank outlet on Friday night.</p> <p>Communications to the Wedderburn community was initiated on Friday by the following means:</p> <ul style="list-style-type: none"> • SMS messages sent, • Coliban Water website update • Twitter & Facebook media posts • Loddon Shire (Local Government) after hours notified. • Media alert to all media agencies • No vulnerable customer sites remained open (Schools and Health Care Centre closed for the weekend) • Phone call made to the local pub <p>Saturday morning, 6 November, the tank roof was inspected and it was confirmed that a sheet was missing and a second was damaged. Works were immediately undertaken to replace the sheets with two new sheets. It was noted that there were no signs of debris or contamination.</p> <p>The town was door knocked on Saturday 6 November, together with an information table outside the supermarket for enquires and where bottled water was also made available.</p> <p>Tank and network sampling were undertaken on Saturday 6 November, morning and afternoon, and again on Sunday 7 November, with all results compliant. Following this, and in consultation with DH, the Boil Water Advisory was lifted.</p>

Date incident occurred	Drinking water locality affected	Nature of Incident	Actions taken in response to the incident
28/02/2022	Echuca	<p>On the evening of Monday 28 February 2022, power supply was lost to the Echuca water treatment plant (potentially associated with a power flick) which resulted in a short period (~15min) when treated water was unable to be transferred from the Clear Water Storage tanks at the WTP to the Echuca elevated tank (800kl) reducing pressure and supply in the Echuca East area.</p> <p>Customer contact to the after hours call centre commenced around 6.45pm, with the last call being received at approximately 7.30pm. During this time approximately 120 calls were received with majority between 6.45pm – 7.15pm.</p>	<p>On-call operator arranged for the closest operator to attend site.</p> <p>Operation of the high lift pumps was reinstated.</p> <p>Following the system being restored to normal operation and the pressure functioning normally, flushing was commenced, followed by chlorine residual testing.</p>

4 Drinking Water Quality Standards

The Safe Drinking Water Regulations 2015, specify specific water quality standards under Schedule 2. Any exceedance of water quality standards is notifiable to the DH under Section 18 of the Act.

4.1 Section 18 Notifications

The following notifications were made to the Water Program of DH under Section 18 of the Act. The Section 18 notification were submitted to DH within the required timeframe.

Table 5: Section 18 Notifications 2021/22

Date incident occurred	Drinking water locality affected	Nature of Incident	Actions taken in response to the incident
22/02/22	Big Hill	<p>A sample collected from the Belvoir Park tank, as part of Coliban Water's sampling program, had an elevated level of chlorine (5.9mg/L), which exceeded the ADWG health-based guideline value for chlorine (5.0mg/L).</p> <p>Result was not reported until data review at the end of day 26/04/22.</p>	<p>The Laboratory Manager (NATA laboratory) was contacted to confirm the result.</p> <p>Results for samples taken on the same day from the Big Hill Tank, (which is upstream of the Belvoir Park Tank) were verified to be compliant.</p> <p>As part of network management, this tank was visited twice a week and chlorine checked, and if required a chlorine tablet(s) would be dosed.</p> <p>Customer complaints were checked, and none had been received.</p> <p>A chlorine analyser has been installed on the pipeline from the tank to enable continual chlorine monitoring, and enable better understanding of chlorine table dosing.</p>

4.2 Water Quality Sampling Program

The Safe Drinking Water Regulations 2015 require water suppliers to incorporate a water sampling program into their risk management plan. Coliban Water's water sampling program is reviewed annually. Coliban Water's water sampling program, is separated into three categories - raw water, storage tanks and contact points (i.e. storage tanks that are used to provide contact time for chlorine or chloramine disinfection) and distribution networks (i.e. customer taps).

Raw water sites include catchments, raw water storage reservoirs/basins and irrigation storages. Storage tanks and contact points include storage tanks in both our potable and non-potable (regulated) water supplies. The final verification monitoring is undertaken at customer tap sites. The parameters included in the sampling program include the Safe Drinking Water Regulations 2015 Schedule 2 requirements, together with the parameters that would identify any algal toxins, pathogens, chemical, radiological or other substances that may pose a risk to human health, and the parameters which are included in the program are based on system-specific and catchment-based risk assessments.

During the review process consideration is given to:

- ADWG recommendations;
- The likelihood of a particular hazard being present in the water, and historical data trends; and
- Operational changes.

With regard to raw water quality monitoring, additional consideration was given to seasonal impacts on water quality and data required to assess microbial hazards.

The following changes were made to the water quality sampling programs for 2021/22.

1. *Raw Water*

- Increased frequency of taste & odour (T&O) testing at the below locations due to high seasonal variation observed in concentration of T&O compounds, particularly in the last two years:
 - Cohuna Main Channel at Leitchville
 - Gunbower Creek at Thompsons Weir Leitchville
 - Gunbower Creek at Cohuna
 - Taylors Creek, Gunbower
 - Murray River at Echuca
 - Bridgewater WTP Raw Water Inlet
 - Boort Service Basin
 - Waranga Channel at Rochester
 - Heathcote Raw Water Inlet
 - Trentham Reservoirs No.1 and No.2
- Decreased T&O testing frequency at Sandhurst-Heathcote Pipeline to seasonal-fortnightly, as sampling is already being undertaken at Sandhurst Reservoir.
- Changes to parameters for organic pesticide, herbicide and fungicide monitoring in all raw water sources following review completed by RMIT University.

2. *Tanks/Contact Points*

- Addition of quarterly NDMA sampling at the Heathcote Contact Point (CWS) to identify potential risk of disinfection by-products (DBPs) formation.
- Addition of monthly THM sampling at the following tank sites to identify potential risk of DBPs formation.
 - Echuca High Street Tower Outlet
 - Goornong H/L Tank – Tyler Street
- Addition of quarterly NDMA sampling at Big Hill Tank Outlet to identify potential risk of DBPs formation in the distribution system.
- Removal of monthly THM sampling at Belvoir Park tanks outlet, as the Bendigo system uses Monochloramine for disinfection and there is reduced risk of THM formation.

3. *Distribution Network (Customer taps)*

- Changes to the frequency of disinfectant residual and bacteriological sampling at customer taps in the following water sampling localities (WSLs). This is due to population changes in the WSL. The frequency of sampling was calculated using guidelines provided in Table 9.4 of the ADWG:
 - Bendigo (Southern)
 - Bendigo (Northern)
 - Bendigo (Spring Gully)
 - Maiden Gully-Marong
 - Strathfieldsaye
 - Epsom-Huntly
 - Castlemaine
 - Kyneton

- Echuca

4.2.1 Samples Within the Water Quality Sampling Program

During 2021/22 the following samples were not collected and analysed as outlined in our water quality sampling program.

Parameter	Water Sampling Locality	Sample Location	Reason
<i>Escherichia coli</i>	Big Hill	Exit/Storage Point	No water coming from the sample point
Total Chlorine	Big Hill	Exit/Storage Point	No water coming from the sample point
Monochloramine	Big Hill	Exit/Storage Point	No water coming from the sample point
Turbidity	Bridgewater/Inglewood	Exit/Storage Point	Updated programming created scheduling error, resulting in missed samples.
	Leitchville	Exit/Storage Point	
	Sebastian	Exit/Storage Point	
	Trentham	Exit/Storage Point	
Colour	Bridgewater/Inglewood	Exit/Storage Point	Updated programming created scheduling error, resulting in missed samples
	Leitchville	Exit/Storage Point	
	Sebastian	Exit/Storage Point	
	Trentham	Exit/Storage Point	
Electrical Conductivity	Bridgewater/Inglewood	Exit/Storage Point	Updated programming created scheduling error, resulting in missed samples
	Leitchville	Exit/Storage Point	
	Sebastian	Exit/Storage Point	
	Trentham	Exit/Storage Point	
pH	Bridgewater/Inglewood	Exit/Storage Point	Updated programming created scheduling error, resulting in missed samples
	Leitchville	Exit/Storage Point	
	Sebastian	Exit/Storage Point	
	Trentham	Exit/Storage Point	
THMs	Bridgewater/Inglewood	Exit/Storage Point	Updated programming created scheduling error, resulting in missed samples
	Leitchville	Exit/Storage Point	
	Sebastian	Exit/Storage Point	
	Trentham	Exit/Storage Point	
Iron	Elmore	Exit/Storage Point	Updated programming created scheduling error, resulting in missed samples
	Goornong	Exit/Storage Point	
Manganese	Elmore	Exit/Storage Point	Updated programming created scheduling error, resulting in missed samples
	Goornong	Exit/Storage Point	
Chlorine	Korong Vale	Exit/Storage Point	Updated programming created scheduling error, resulting in missed samples
Aluminum	Boort	Exit/Storage Point	Updated programming created

Parameter	Water Sampling Locality	Sample Location	Reason
	Bridgewater-Inglewood	Exit/Storage Point	scheduling error, resulting in missed samples
	Cohuna	Exit/Storage Point	
	Goornong	Exit/Storage Point	
	Gunbower	Exit/Storage Point	
	Heathcote	Exit/Storage Point	
	Korong Vale	Exit/Storage Point	
	Laanecoorie	Exit/Storage Point	
	Leitchville	Exit/Storage Point	
	Lockington	Exit/Storage Point	
	Pyramid Hill	Exit/Storage Point	
	Rochester	Exit/Storage Point	
	Serpentine	Exit/Storage Point	

4.3 Water Quality Monitoring results

The following table is a comparison of the analysis for each parameter in the monitoring programs for the period from 2019/20 to 2021/22.

Sections 4.4.1 and 4.4.2 contain the individual data tables for each parameter sampled, as per the monitoring program undertaken during 2021/22.

4.3.1 Analysis of Water Sampling Results

Coliban Water has undertaken substantial water quality monitoring for a number of years. The following table refers to compliance with the parameters in our drinking water sampling programs for 2019/20 – 2021/22.

Table 6: Water Quality Parameter Comparison Results 2019/20 to 2021/22

Parameter	Compliant Localities 2019/20	Compliant Localities 2020/21	Compliant Localities 2021/22
<i>Escherichia coli</i> ¹	88%	100%	100%
Trihalomethanes ¹	93%	100%	100%
Turbidity ¹	100%	100%	100%
Chloroacetic acid ²	100%	100%	100%
Dichloroacetic acid ²	100%	100%	100%
Trichloroacetic acid ²	100%	100%	100%
Bromate ²	100%	100%	100%
Formaldehyde ²	100%	100%	100%
Aluminium ³	98%	98%	100%
Fluoride ²	100%	100%	100%
Arsenic ²	100%	100%	100%
Cadmium ²	100%	100%	100%
Chlorine ²	98%	100%	98%
Chromium ²	100%	100%	100%
Cyanide ²	100%	100%	100%

Parameter	Compliant Localities 2019/20	Compliant Localities 2020/21	Compliant Localities 2021/22
Mercury ²	100%	100%	100%
Nitrate ²	100%	100%	100%
Selenium ²	100%	100%	100%
Sulphate ²	100%	100%	100%
Manganese ²	100%	100%	100%
Copper ²	100%	100%	100%
Lead ²	100%	100%	100%
Nickel ²	100%	100%	100%
Gross alpha ²	100%	100%	100%
Gross beta ²	100%	100%	100%
Nitrite ²	100%	100%	100%
pH ³	81%	74%	79%
Hardness ³	100%	100%	100%
Iron ³	95%	100%	98%
True Colour ³	98%	100%	100%
Electrical Conductivity ³	100%	100%	100%
Sodium ³	100%	100%	100%
Chloride ³	93%	100%	100%
Zinc ³	100%	100%	100%
Ammonia ³	93%	98%	98%
NDMA ²	90%	98%	100%
Total no. water sampling localities	42	42	42

Note:

- 1 This parameter is a water quality standard as listed in Schedule 2 of the SDW Regulations 2015.
- 2 This parameter is a water quality standard with reference to the relevant ADWG health-based guideline value.
- 3 This parameter has an ADWG aesthetic guideline value.

Coliban Water's compliance against each sampled parameter in 2021/22 has experienced an improvement across most parameters, compared to the two previous years. Sections 4.3.1.1 and 4.3.1.2 contain the details for the non-compliant parameters for 2021/22.

4.3.1.1 Actions Undertaken for Non-compliant Health Parameters

Chlorine

The chlorine result that exceeded the health-based guideline value in the ADWG was recorded in the Big Hill water sampling locality, which is supplied from the Bendigo WTP. Details of the actions undertaken in response to this exceedance are included in Section 4.1- Section 18 Notifications.

4.3.1.2 Actions Undertaken for Aesthetic Parameters That Were Not Met

pH

Nine water sampling localities did not meet the ADWG aesthetic guideline value range for pH (pH 6.5 to 8.5). These localities, except for Serpentine and Sebastian, are supplied treated water from chloramination treatment systems. An elevated pH (>8.0) is maintained to improve the effectiveness of chloramination. Also, some of these systems have long cement-lined mains in the network, with alkalinity drawn out from the cement, and this causes a rise in alkalinity levels and an increase in pH. Coliban Water has a routine water mains renewal program to replace the water mains based on a number of criteria such as age, size,

population served, and frequency of failures etc. These cement-lined pipes will be renewed with pipes made of an appropriate material when they meet the criteria for renewal.

Ammonia

Sample collected from the Big Hill treated water storage tank returned a result for ammonia exceeding the aesthetic guideline value (0.5 mg/L) of the ADWG on one occasion. This water sampling locality is supplied from the Bendigo WTP and water is disinfected by chloramination.

One of the issues associated with the use of chloramination as a disinfection process is the potential for nitrification to occur within distribution networks, which can contribute to an increase in ammonia in drinking water. Therefore, the short-term spike (one sample) in the ammonia concentration observed at the Big Hill tank could be attributed to nitrification in the distribution network.

Iron

A customer tap sample collected within the Kyneton sampling locality exceeded the iron aesthetic guideline value 0.3 mg/L. This result occurred at the same time a high turbidity result was received for this sample point. The issue was investigated and whilst no issues were identified, the water main was flushed and resample results were consistent with normal sample results for this locality.

4.4 Water Quality Data for Sampling Localities: 1 July 2021 - 30 June 2022

As described in Section 4.2, Coliban Water undertakes a comprehensive water quality monitoring program that includes collecting samples from various points in the water supply system:

- Exit points from water treatment plants and water storage tanks into the distribution system.
- Customer tap sites, which are dedicated sampling points that are prior to the customer's water meter.

4.4.1 Treated Water Results from WTP Exit/Storage Points

Following are tables that detail the sampling results for each parameter at WTP exit/storage points in each of the water sampling localities.

Escherichia coli (E. coli) – WTP exit/storage points for 2021-22

E. coli is monitored in all water sampling localities as it is an indicator of the potential presence of faecal contamination in water.

Table 7: *E. coli* results for WTP exit/storage points (Water quality standard: No *Escherichia coli* per 100mL of drinking water, with the exception of any false positive samples^a)

Water Sampling Locality	Sampling Frequency	Number of Samples ¹	Maximum detected (orgs/100 mL)	Number of detections and investigations conducted (s.22)	Number of samples where standard was not met
Axedale	Weekly	53	0	0	0
Bealiba	Weekly	52	0	0	0
Bendigo (Northern)	Twice Weekly	105	0	0	0
Bendigo (Southern)	Twice Weekly	210	0	0	0
Bendigo (Spring Gully)	Twice Weekly	105	0	0	0
Big Hill ²	Weekly	105	0	0	0
Boort	Weekly	104	0	0	0
Bridgewater - Inglewood	Weekly	104	0	0	0
Castlemaine	Twice Weekly/ Weekly	157	0	0	0
Cohuna	Weekly	105	0	0	0
Dunolly	Weekly	52	0	0	0
Echuca	Weekly	104	0	0	0
Elmore	Weekly	52	0	0	0
Epsom - Huntly	Twice Weekly	105	0	0	0
Fryerstown	Weekly	52	0	0	0
Goornong	Weekly	104	0	0	0
Guildford	Twice Weekly	105	0	0	0
Gunbower	Weekly	104	0	0	0
Harcourt	Twice Weekly/ Weekly	157	0	0	0
Heathcote	Weekly	53	0	0	0
Junortoun	Twice Weekly	105	0	0	0
Korong Vale	Weekly	104	0	0	0
Kyneton	Twice Weekly/ Weekly	157	0	0	0
Laanecoore	Weekly	52	0	0	0
Leitchville	Weekly	52	0	0	0
Lockington	Weekly	52	0	0	0
Maiden Gully - Marong	Twice Weekly	105	0	0	0
Maldon	Weekly	52	0	0	0
Malmsbury	Twice Weekly/ Weekly	157	0	0	0
Newstead	Weekly	52	0	0	0
Pyramid Hill	Weekly	52	0	0	0

Water Sampling Locality	Sampling Frequency	Number of Samples ¹	Maximum detected (orgs/100 mL)	Number of detections and investigations conducted (s.22)	Number of samples where standard was not met
Raywood	Weekly	53	0	0	0
Rochester	Weekly	52	0	0	0
Sebastian	Weekly	53	0	0	0
Serpentine	Weekly	52	0	0	0
Strathfieldsaye	Twice Weekly	105	0	0	0
Taradale - Elphinstone	Twice Weekly	105	0	0	0
Tarnagulla	Weekly	52	0	0	0
Tooborac	Weekly	53	0	0	0
Trentham	Weekly	52	0	0	0
Tylden	Weekly	52	0	0	0
Wedderburn	Weekly	52	0	0	0

Note:

- 1 The number of samples will vary due to the different number of exit/storage samples points within each water sampling locality.
- 2 Unable to collect the sample as no water was coming from the sample point.

Trihalomethanes (THM) – WTP exit/storage points for 2021-22

Trihalomethanes are formed as a by-product, predominantly when chlorine is used to disinfect water to make it safe for drinking. They represent one group of chemicals generally referred to as disinfection by-products.

Table 8: Trihalomethanes results for WTP exit/storage points (Water quality standard for THM is 0.25 mg/L)

Water Sampling Locality	Sampling Frequency	Number of Samples ¹	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	Monthly	12	0.0580	0.0460	0
Bealiba	Monthly	12	0.1200	0.0888	0
Bendigo (Northern)	Monthly	12	0.0130	0.0082	0
Bendigo (Southern)	Monthly	12	0.0130	0.0082	0
Bendigo (Spring Gully)	Monthly	12	0.0130	0.0082	0
Big Hill	Monthly	12	0.0130	0.0082	0
Boort	Monthly	12	0.1300	0.1065	0
Bridgewater – Inglewood ²	Monthly	22	0.0250	0.0147	0
Castlemaine	Monthly	24	0.1300	0.0821	0
Cohuna	Monthly	12	0.0840	0.0459	0
Dunolly	Monthly	12	0.1700	0.1063	0
Echuca	Monthly	12	0.0700	0.0417	0
Elmore	Monthly	12	<0.001	<0.001	0
Epsom - Huntly	Monthly	12	0.0130	0.0082	0
Fryerstown	Monthly	12	0.1300	0.0910	0
Goornong	Monthly	24	0.1700	0.1048	0
Guildford	Monthly	12	0.1160	0.0921	0
Gunbower	Monthly	12	0.0890	0.0494	0
Harcourt	Monthly	24	0.1160	0.0896	0
Heathcote	Monthly	12	0.1300	0.0817	0
Junortoun	Monthly	12	0.0130	0.0082	0
Korong Vale	n/a	n/a	n/a	n/a	n/a
Kyneton	Monthly	24	0.1300	0.0895	0
Laanecoorie	Monthly	12	0.1900	0.1055	0
Leitchville ²	Monthly	11	0.0640	0.0370	0
Lockington	Monthly	12	0.0490	0.0307	0
Maiden Gully - Marong	Monthly	12	0.0130	0.0082	0
Maldon	Monthly	12	0.1100	0.0898	0
Malmsbury	Monthly	24	0.1170	0.0893	0
Newstead	Monthly	12	0.1100	0.0784	0
Pyramid Hill	Monthly	12	0.0530	0.0303	0
Raywood	Monthly	12	0.0760	0.0538	0
Rochester	Monthly	12	0.0310	0.0254	0
Sebastian ²	Monthly	11	0.0100	0.0074	0
Serpentine	Monthly	12	0.0530	0.0363	0
Strathfieldsaye	Monthly	12	0.0130	0.0082	0
Taradale - Elphinstone	n/a	n/a	n/a	n/a	n/a
Tarnagulla	Monthly	12	0.1500	0.1004	0
Tooborac	Monthly	12	0.0700	0.0558	0
Trentham ²	Monthly	11	0.0480	0.0260	0
Tylden	Monthly	12	0.1000	0.0808	0
Wedderburn	n/a	n/a	n/a	n/a	n/a

Note:

n/a – sampling is not required, either because there is no definitive exit point into the water sampling locality from which a sample could be collected, or Coliban Water's risk assessments has indicated that THM sampling is not necessary to manage water quality risks.

- 1 The number of samples will vary due to the different number of exit/storage samples points within each locality.
- 2 Scheduling error resulted in missed sample.

Turbidity – WTP exit/storage points for 2021-22

Turbidity is a measure of the particulate matter in water and is monitored in all water sampling localities. High turbidity in the reticulation may indicate poor operation of the water treatment process and/or increased risk of microbiological contamination.

Table 9: Turbidity results for WTP exit/storage points (Water quality standard: 95th percentile of results over 12 month period must be ≤ 5.0 NTU)

Water Sampling Locality	Sampling Frequency	Number of Samples ¹	Maximum value (NTU)	95 th percentile of results (NTU)	Number of 95 th percentile of results above standard
Axedale	Monthly	12	0.1	0.1	0
Bealiba	Monthly	12	0.3	0.2	0
Bendigo (Northern)	Twice Weekly	105	0.3	0.2	0
Bendigo (Southern)	Twice Weekly	210	0.3	0.2	0
Bendigo (Spring Gully)	Twice Weekly	105	0.3	0.2	0
Big Hill	Monthly	24	0.2	0.2	0
Boort	Monthly	25	0.5	0.2	0
Bridgewater – Inglewood ²	Monthly	22	0.2	0.1	0
Castlemaine	Twice Weekly/Mthly	117	0.3	0.2	0
Cohuna	Monthly	12	0.2	0.2	0
Dunolly	Monthly	12	0.1	0.1	0
Echuca	Monthly	25	0.2	0.1	0
Elmore	Monthly	12	0.2	0.1	0
Epsom - Huntly	Twice Weekly	105	0.3	0.2	0
Fryerstown	Monthly	13	0.1	0.1	0
Goornong	Monthly	25	0.3	0.2	0
Guildford	Twice Weekly	105	0.3	0.1	0
Gunbower	Monthly	25	0.4	0.3	0
Harcourt	Twice Weekly/Mthly	117	0.3	0.1	0
Heathcote	Monthly	12	0.1	0.1	0
Junortoun	Twice Weekly	105	0.3	0.2	0
Korong Vale	Monthly	25	0.5	0.4	0
Kyneton	Twice Weekly/Mthly	117	0.3	0.1	0
Laanecoorie	Monthly	12	0.1	0.1	0
Leitchville ²	Monthly	11	0.1	0.1	0
Lockington	Monthly	12	0.1	0.1	0
Maiden Gully - Marong	Twice Weekly	105	0.3	0.2	0
Maldon	Monthly	12	0.2	0.1	0
Malmsbury	Twice Weekly/Mthly	117	0.3	0.1	0
Newstead	Monthly	13	0.2	0.1	0
Pyramid Hill	Monthly	13	0.2	0.2	0
Raywood	Monthly	12	0.5	0.3	0
Rochester	Monthly	12	0.2	0.1	0
Sebastian ²	Monthly	11	0.1	0.1	0
Serpentine	Monthly	12	0.2	0.1	0
Strathfieldsaye	Twice Weekly	105	0.2	0.2	0
Taradale - Elphinstone	Twice Weekly	105	0.2	0.1	0
Tarnagulla	Monthly	12	0.3	0.2	0
Tooborac	Monthly	12	0.4	0.3	0
Trentham ²	Monthly	11	0.1	0.1	0
Tylden	Monthly	12	0.1	0.1	0
Wedderburn	Monthly	12	1.5	0.6	0

Note:

- 1 The number of samples will vary due to the different number of exit/storage samples points within each locality.
- 2 Scheduling error resulted in missed sample.

Fluoride – WTP exit/storage points for 2021-22

Table 10: Fluoride results for WTP exit/storage points (Water quality standard - ADWG health-based guideline value: 1.5 mg/L)

Water Sampling Locality	Sampling Frequency	Number of Samples	Target optimum operating fluoride concentration (mg/L)	Max (mg/L)	Min (mg/L)	Ave (mg/L)	Number of samples where standard was not met
Axedale	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Bealiba	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Bendigo (Northern)	Twice Weekly	105	0.9	1.000	0.830	0.918	0
Bendigo (Southern)	Twice Weekly	105	0.9	1.000	0.830	0.918	0
Bendigo (Spring Gully)	Twice Weekly	105	0.9	1.000	0.830	0.918	0
Big Hill	Twice Weekly	105	0.9	1.000	0.830	0.918	0
Boort	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Bridgewater - Inglewood	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Castlemaine	Twice Weekly	105	0.9	1.000	0.810	0.900	0
Cohuna	Monthly	12	0.8	0.930	0.700	0.794	0
Dunolly	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Echuca	Monthly	12	0.8	0.900	<0.05	0.733	0
Elmore	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	Twice Weekly	105	0.9	1.000	0.830	0.918	0
Fryerstown	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Goorong	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Guildford	Twice Weekly	105	0.9	1.000	0.810	0.900	0
Gunbower	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Harcourt	Twice Weekly	105	0.9	1.000	0.810	0.900	0
Heathcote	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Junortoun	Twice Weekly	105	0.9	1.000	0.830	0.918	0
Korong Vale	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Kyneton	Twice Weekly	105	0.9	1.100	0.800	0.882	0
Laanecoorie	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Leitchville	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Lockington	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Maiden Gully - Marong	Twice Weekly	105	0.9	1.000	0.830	0.918	0
Maldon	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Malmsbury	Twice Weekly	105	0.9	1.100	0.800	0.882	0
Newstead	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Pyramid Hill	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Raywood	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Rochester	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sebastian	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Serpentine	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Strathfieldsaye	Twice Weekly	105	0.9	1.000	0.830	0.918	0
Taradale - Elphinstone	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tarnagulla	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tooborac	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Trentham	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tylden	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Wedderburn	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Note:

Fluoride is only currently added to drinking water at the Bendigo, Castlemaine, Cohuna, Echuca and Kyneton Water Treatment Plants.

n/a – not applicable, as the drinking water is not fluoridated.

Bromate – WTP exit/storage points for 2021-22

Table 11: Bromate results for WTP exit/storage points (Water quality standard - ADWG health-based guideline value: 0.02 mg/L)

Water Sampling Locality	Sampling Frequency	Number of Samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	n/a	n/a	n/a	n/a	n/a
Bealiba	n/a	n/a	n/a	n/a	n/a
Bendigo (Northern)	Monthly	12	0.01	0.00	0
Bendigo (Southern)	Monthly	12	0.01	0.00	0
Bendigo (Spring Gully)	Monthly	12	0.01	0.00	0
Big Hill	Monthly	12	0.01	0.00	0
Boort	n/a	n/a	n/a	n/a	n/a
Bridgewater - Inglewood	n/a	n/a	n/a	n/a	n/a
Castlemaine	Monthly	12	0.00	0.00	0
Cohuna	n/a	n/a	n/a	n/a	n/a
Dunolly	n/a	n/a	n/a	n/a	n/a
Echuca	n/a	n/a	n/a	n/a	n/a
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	Monthly	12	0.01	0.00	0
Fryerstown	n/a	n/a	n/a	n/a	n/a
Goornong	n/a	n/a	n/a	n/a	n/a
Guildford	Monthly	12	0.00	0.00	0
Gunbower	n/a	n/a	n/a	n/a	n/a
Harcourt	Monthly	12	0.00	0.00	0
Heathcote	n/a	n/a	n/a	n/a	n/a
Junortoun	Monthly	12	0.01	0.00	0
Korong Vale	n/a	n/a	n/a	n/a	n/a
Kyneton	Monthly	12	0.00	0.00	0
Laanecoorie	n/a	n/a	n/a	n/a	n/a
Leitchville	n/a	n/a	n/a	n/a	n/a
Lockington	n/a	n/a	n/a	n/a	n/a
Maiden Gully - Marong	Monthly	12	0.01	0.00	0
Maldon	n/a	n/a	n/a	n/a	n/a
Malmsbury	Monthly	12	0.00	0.00	0
Newstead	n/a	n/a	n/a	n/a	n/a
Pyramid Hill	n/a	n/a	n/a	n/a	n/a
Raywood	n/a	n/a	n/a	n/a	n/a
Rochester	n/a	n/a	n/a	n/a	n/a
Sebastian	n/a	n/a	n/a	n/a	n/a
Serpentine	n/a	n/a	n/a	n/a	n/a
Strathfieldsaye	Monthly	12	0.01	0.00	0
Taradale - Elphinstone	n/a	n/a	n/a	n/a	n/a
Tarnagulla	n/a	n/a	n/a	n/a	n/a
Tooborac	n/a	n/a	n/a	n/a	n/a
Trentham	n/a	n/a	n/a	n/a	n/a
Tylden	n/a	n/a	n/a	n/a	n/a
Wedderburn	n/a	n/a	n/a	n/a	n/a

Note:

Bromate is monitored in localities where ozone is used in treatment, as ozone can result in the production of this by-products in drinking water.

Ozone is used at the Bendigo, Castlemaine and Kyneton Water Treatment Plants.

Ozone-based disinfection by-products are not deemed to be a significant risk in drinking water supplied by Coliban Water that has not been ozonated, therefore it is not monitored.

Formaldehyde – WTP exit/storage points for 2021-22

Table 12: Formaldehyde results for WTP exit/storage points (Water quality standard - ADWG health-based guideline value: 0.5 mg/L)

Water Sampling Locality	Sampling Frequency	Number of Samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	n/a	n/a	n/a	n/a	n/a
Bealiba	n/a	n/a	n/a	n/a	n/a
Bendigo (Northern)	Monthly	12	0.1	0.0	0
Bendigo (Southern)	Monthly	12	0.1	0.0	0
Bendigo (Spring Gully)	Monthly	12	0.1	0.0	0
Big Hill	Monthly	12	0.1	0.0	0
Boort	n/a	n/a	n/a	n/a	n/a
Bridgewater - Inglewood	n/a	n/a	n/a	n/a	n/a
Castlemaine	Monthly	12	0.1	0.0	0
Cohuna	n/a	n/a	n/a	n/a	n/a
Dunolly	n/a	n/a	n/a	n/a	n/a
Echuca	n/a	n/a	n/a	n/a	n/a
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	Monthly	12	0.1	0.0	0
Fryerstown	n/a	n/a	n/a	n/a	n/a
Goornong	n/a	n/a	n/a	n/a	n/a
Guildford	Monthly	12	0.1	0.0	0
Gunbower	n/a	n/a	n/a	n/a	n/a
Harcourt	Monthly	12	0.1	0.0	0
Heathcote	n/a	n/a	n/a	n/a	n/a
Junortoun	Monthly	12	0.1	0.0	0
Korong Vale	n/a	n/a	n/a	n/a	n/a
Kyneton	Monthly	12	0.1	0.0	0
Laanecoorie	n/a	n/a	n/a	n/a	n/a
Leitchville	n/a	n/a	n/a	n/a	n/a
Lockington	n/a	n/a	n/a	n/a	n/a
Maiden Gully - Marong	Monthly	12	0.1	0.0	0
Maldon	n/a	n/a	n/a	n/a	n/a
Malmsbury	Monthly	12	0.1	0.0	0
Newstead	n/a	n/a	n/a	n/a	n/a
Pyramid Hill	n/a	n/a	n/a	n/a	n/a
Raywood	n/a	n/a	n/a	n/a	n/a
Rochester	n/a	n/a	n/a	n/a	n/a
Sebastian	n/a	n/a	n/a	n/a	n/a
Serpentine	n/a	n/a	n/a	n/a	n/a
Strathfieldsaye	Monthly	12	0.1	0.0	0
Taradale - Elphinstone	n/a	n/a	n/a	n/a	n/a
Tarnagulla	n/a	n/a	n/a	n/a	n/a
Tooborac	n/a	n/a	n/a	n/a	n/a
Trentham	n/a	n/a	n/a	n/a	n/a
Tylden	n/a	n/a	n/a	n/a	n/a
Wedderburn	n/a	n/a	n/a	n/a	n/a

Note:

Formaldehyde is monitored in localities where ozone is used in treatment, as ozone can result in the production of this by-products in drinking water.

Ozone is used at the Bendigo, Castlemaine and Kyneton Water Treatment Plants.

Ozone-based disinfection by-products are not deemed to be a significant risk in drinking water supplied by Coliban Water that has not been ozonated so is not monitored.

Arsenic – WTP exit/storage points for 2021-22

Table 13: Arsenic results for WTP exit/storage points (Water quality standard - ADWG health-based guideline value: 0.01 mg/L)

Water Sampling Locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	n/a	n/a	n/a	n/a	n/a
Bealiba	n/a	n/a	n/a	n/a	n/a
Bendigo (Northern)	Monthly	12	0.0010	0.0006	0
Bendigo (Southern)	Monthly	12	0.0010	0.0006	0
Bendigo (Spring Gully)	Monthly	12	0.0010	0.0006	0
Big Hill	Monthly	12	0.0010	0.0006	0
Boort	n/a	n/a	n/a	n/a	n/a
Bridgewater - Inglewood	n/a	n/a	n/a	n/a	n/a
Castlemaine	Monthly	12	0.0005	0.0005	0
Cohuna	n/a	n/a	n/a	n/a	n/a
Dunolly	n/a	n/a	n/a	n/a	n/a
Echuca	n/a	n/a	n/a	n/a	n/a
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	Monthly	12	0.0010	0.0006	0
Fryerstown	n/a	n/a	n/a	n/a	n/a
Goornong	n/a	n/a	n/a	n/a	n/a
Guildford	Monthly	12	0.0005	0.0005	0
Gunbower	n/a	n/a	n/a	n/a	n/a
Harcourt	Monthly	12	0.0005	0.0005	0
Heathcote	n/a	n/a	n/a	n/a	n/a
Junortoun	Monthly	12	0.0010	0.0006	0
Korong Vale	n/a	n/a	n/a	n/a	n/a
Kyneton	Monthly	12	0.0005	0.0005	0
Laanecoorie	n/a	n/a	n/a	n/a	n/a
Leitchville	n/a	n/a	n/a	n/a	n/a
Lockington	n/a	n/a	n/a	n/a	n/a
Maiden Gully - Marong	Monthly	12	0.0010	0.0006	0
Maldon	n/a	n/a	n/a	n/a	n/a
Malmsbury	Monthly	12	0.0005	0.0005	0
Newstead	n/a	n/a	n/a	n/a	n/a
Pyramid Hill	n/a	n/a	n/a	n/a	n/a
Raywood	n/a	n/a	n/a	n/a	n/a
Rochester	n/a	n/a	n/a	n/a	n/a
Sebastian	n/a	n/a	n/a	n/a	n/a
Serpentine	n/a	n/a	n/a	n/a	n/a
Strathfieldsaye	Monthly	12	0.0010	0.0006	0
Taradale - Elphinstone	n/a	n/a	n/a	n/a	n/a
Tarnagulla	n/a	n/a	n/a	n/a	n/a
Tooborac	n/a	n/a	n/a	n/a	n/a
Trentham	n/a	n/a	n/a	n/a	n/a
Tylden	n/a	n/a	n/a	n/a	n/a
Wedderburn	n/a	n/a	n/a	n/a	n/a

n/a – sampling is not required, either because there is no definitive exit point into the water sampling locality from which a sample could be collected, or Coliban Water's risk assessments has indicated that arsenic sampling is not necessary to manage water quality risks.

Nitrate – WTP exit/storage points for 2021-22

Table 14: Nitrate results for WTP exit/storage points (Water quality standard - ADWG health-based guideline value: 50 mg/L)

Water Sampling Locality	Sampling frequency	Number of samples ¹	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	n/a	n/a	n/a	n/a	n/a
Bealiba	n/a	n/a	n/a	n/a	n/a
Bendigo (Northern)	n/a	n/a	n/a	n/a	n/a
Bendigo (Southern)	n/a	n/a	n/a	n/a	n/a
Bendigo (Spring Gully)	n/a	n/a	n/a	n/a	n/a
Big Hill	Monthly	24	3.5	1.8	0
Boort	n/a	n/a	n/a	n/a	n/a
Bridgewater - Inglewood	Monthly	13	0.5	0.4	0
Castlemaine	n/a	n/a	n/a	n/a	n/a
Cohuna	n/a	n/a	n/a	n/a	n/a
Dunolly	Weekly	52	4.9	1.0	0
Echuca	n/a	n/a	n/a	n/a	n/a
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	n/a	n/a	n/a	n/a	n/a
Fryerstown	n/a	n/a	n/a	n/a	n/a
Goornong	n/a	n/a	n/a	n/a	n/a
Guildford	n/a	n/a	n/a	n/a	n/a
Gunbower	n/a	n/a	n/a	n/a	n/a
Harcourt	n/a	n/a	n/a	n/a	n/a
Heathcote	n/a	n/a	n/a	n/a	n/a
Junortoun	n/a	n/a	n/a	n/a	n/a
Korong Vale	Fortnightly	27	2.4	0.5	0
Kyneton	n/a	n/a	n/a	n/a	n/a
Laanecoorie	n/a	n/a	n/a	n/a	n/a
Leitchville	n/a	n/a	n/a	n/a	n/a
Lockington	n/a	n/a	n/a	n/a	n/a
Maiden Gully - Marong	n/a	n/a	n/a	n/a	n/a
Maldon	n/a	n/a	n/a	n/a	n/a
Malmsbury	n/a	n/a	n/a	n/a	n/a
Newstead	n/a	n/a	n/a	n/a	n/a
Pyramid Hill	n/a	n/a	n/a	n/a	n/a
Raywood	n/a	n/a	n/a	n/a	n/a
Rochester	n/a	n/a	n/a	n/a	n/a
Sebastian	n/a	n/a	n/a	n/a	n/a
Serpentine	n/a	n/a	n/a	n/a	n/a
Strathfieldsaye	n/a	n/a	n/a	n/a	n/a
Taradale - Elphinstone	n/a	n/a	n/a	n/a	n/a
Tarnagulla	Weekly	52	4.2	1.2	0
Tooborac	n/a	n/a	n/a	n/a	n/a
Trentham	n/a	n/a	n/a	n/a	n/a
Tylden	n/a	n/a	n/a	n/a	n/a
Wedderburn	Fortnightly	26	1.8	0.4	0

Note:

1 The number of samples will vary due to the different number of exit/storage samples within each locality.

n/a – sampling is not required, either because there is no definitive exit point into the water sampling locality from which a sample could be collected, or Coliban Water's risk assessments has indicated that nitrate sampling is not necessary to manage water quality risks.

Manganese – WTP exit/storage points for 2021-22

Table 15: Manganese results for WTP exit/storage points (Water quality standard - ADWG health-based guideline value: 0.5 mg/L)

Water Sampling Locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	n/a	n/a	n/a	n/a	n/a
Bealiba	n/a	n/a	n/a	n/a	n/a
Bendigo (Northern)	Monthly	12	0.006	0.003	0
Bendigo (Southern)	Monthly	12	0.006	0.003	0
Bendigo (Spring Gully)	Monthly	12	0.006	0.003	0
Big Hill	Monthly	12	0.006	0.003	0
Boort	Weekly	52	0.050	0.007	0
Bridgewater - Inglewood	Monthly	13	0.002	0.001	0
Castlemaine	Monthly	12	0.007	0.002	0
Cohuna	Weekly	53	0.013	0.003	0
Dunolly	n/a	n/a	n/a	n/a	n/a
Echuca	Weekly	52	0.013	0.003	0
Elmore ¹	Monthly	11	0.003	0.001	0
Epsom - Huntly	Monthly	12	0.006	0.003	0
Fryerstown	n/a	n/a	n/a	n/a	n/a
Goornong ¹	Monthly	11	0.002	0.001	0
Guildford	Monthly	12	0.007	0.002	0
Gunbower	Weekly	52	0.001	0.001	0
Harcourt	Monthly	12	0.007	0.002	0
Heathcote	Weekly	53	0.110	0.006	0
Junortoun	Monthly	12	0.006	0.003	0
Korong Vale	Monthly	13	0.001	0.001	0
Kyneton	Monthly	12	0.004	0.002	0
Laanecoorie	Weekly	52	0.036	0.007	0
Leitchville	Weekly	52	0.010	0.001	0
Lockington	Monthly	12	<0.001	<0.001	0
Maiden Gully - Marong	Monthly	12	0.006	0.003	0
Maldon	n/a	n/a	n/a	n/a	n/a
Malmsbury	Monthly	12	0.004	0.002	0
Newstead	n/a	n/a	n/a	n/a	n/a
Pyramid Hill	Monthly	12	0.012	0.004	0
Raywood	n/a	n/a	n/a	n/a	n/a
Rochester	Weekly	52	0.012	0.002	0
Sebastian	n/a	n/a	n/a	n/a	n/a
Serpentine	Monthly	12	0.005	0.003	0
Strathfieldsaye	Monthly	12	0.006	0.003	0
Taradale - Elphinstone	n/a	n/a	n/a	n/a	n/a
Tarnagulla	n/a	n/a	n/a	n/a	n/a
Tooborac	n/a	n/a	n/a	n/a	n/a
Trentham	Monthly	12	0.002	0.001	0
Tylden	n/a	n/a	n/a	n/a	n/a
Wedderburn	n/a	n/a	n/a	n/a	n/a

Note:

¹ Scheduling issue resulted in missed sample.

n/a – sampling is not required, either because there is no definitive exit point into the water sampling locality from which a sample could be collected, or Coliban Water's risk assessments has indicated that manganese sampling is not necessary to manage water quality risks.

Nitrite – WTP exit/storage points for 2021-22

Table 16: Nitrite Results for WTP exit/storage points (Water quality standard - ADWG health-based guideline value: 3.0 mg/L)

Water Sampling Locality	Sampling frequency	Number of samples ¹	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	n/a	n/a	n/a	n/a	n/a
Bealiba	n/a	n/a	n/a	n/a	n/a
Bendigo (Northern)	n/a	n/a	n/a	n/a	n/a
Bendigo (Southern)	n/a	n/a	n/a	n/a	n/a
Bendigo (Spring Gully)	n/a	n/a	n/a	n/a	n/a
Big Hill	Monthly	24	0.62	0.15	0
Boort	n/a	n/a	n/a	n/a	n/a
Bridgewater - Inglewood	Monthly	13	0.10	0.03	0
Castlemaine	n/a	n/a	n/a	n/a	n/a
Cohuna	n/a	n/a	n/a	n/a	n/a
Dunolly	Weekly	52	0.53	0.13	0
Echuca	n/a	n/a	n/a	n/a	n/a
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	n/a	n/a	n/a	n/a	n/a
Fryerstown	n/a	n/a	n/a	n/a	n/a
Goornong	n/a	n/a	n/a	n/a	n/a
Guildford	n/a	n/a	n/a	n/a	n/a
Gunbower	n/a	n/a	n/a	n/a	n/a
Harcourt	n/a	n/a	n/a	n/a	n/a
Heathcote	n/a	n/a	n/a	n/a	n/a
Junortoun	n/a	n/a	n/a	n/a	n/a
Korong Vale	Fortnightly	27	0.59	0.05	0
Kyneton	n/a	n/a	n/a	n/a	n/a
Laanecoorie	n/a	n/a	n/a	n/a	n/a
Leitchville	n/a	n/a	n/a	n/a	n/a
Lockington	n/a	n/a	n/a	n/a	n/a
Maiden Gully - Marong	n/a	n/a	n/a	n/a	n/a
Maldon	n/a	n/a	n/a	n/a	n/a
Malmsbury	n/a	n/a	n/a	n/a	n/a
Newstead	n/a	n/a	n/a	n/a	n/a
Pyramid Hill	n/a	n/a	n/a	n/a	n/a
Raywood	n/a	n/a	n/a	n/a	n/a
Rochester	n/a	n/a	n/a	n/a	n/a
Sebastian	n/a	n/a	n/a	n/a	n/a
Serpentine	n/a	n/a	n/a	n/a	n/a
Strathfieldsaye	n/a	n/a	n/a	n/a	n/a
Taradale - Elphinstone	n/a	n/a	n/a	n/a	n/a
Tarnagulla	Weekly	52	1.58	0.41	0
Tooborac	n/a	n/a	n/a	n/a	n/a
Trentham	n/a	n/a	n/a	n/a	n/a
Tylden	n/a	n/a	n/a	n/a	n/a
Wedderburn	Fortnightly	26	0.16	0.04	0

Note:

1 The number of samples will vary due to the different number of exit/storage samples within each locality.

n/a – sampling is not required, either because there is no definitive exit point into the water sampling locality from which a sample could be collected, or Coliban Water's risk assessments has indicated that nitrite sampling is not necessary to manage water quality risks.

Aluminium – WTP exit/storage points for 2021-22

Table 17: Aluminium results for WTP exit/storage points (ADWG aesthetic guideline value: 0.2 mg/L)

Water Sampling Locality	Sampling Frequency	Number of Samples	Maximum (mg/L)	Average (mg/L)	Number of samples where guideline was not met
Axedale	n/a	n/a	n/a	n/a	n/a
Bealiba	n/a	n/a	n/a	n/a	n/a
Bendigo (Northern)	Weekly	52	0.050	0.036	0
Bendigo (Southern)	Weekly	52	0.050	0.036	0
Bendigo (Spring Gully)	Weekly	52	0.050	0.036	0
Big Hill	Weekly	52	0.050	0.036	0
Boort ¹	Quarterly	3	0.020	0.013	0
Bridgewater – Inglewood ¹	Quarterly	3	0.180	0.087	0
Castlemaine	Weekly	52	0.040	0.024	0
Cohuna ¹	Quarterly	3	0.020	0.012	0
Dunolly	n/a	n/a	n/a	n/a	n/a
Echuca	Monthly	12	0.070	0.033	0
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	Weekly	52	0.050	0.036	0
Fryerstown	n/a	n/a	n/a	n/a	n/a
Goorong ¹	Monthly	11	0.140	0.062	0
Guildford	Weekly	52	0.040	0.024	0
Gunbower ¹	Quarterly	3	0.060	0.033	0
Harcourt	Weekly	52	0.040	0.024	0
Heathcote ¹	Quarterly	3	0.010	0.008	0
Junortoun	Weekly	52	0.050	0.036	0
Korong Vale ¹	Quarterly	3	0.020	0.012	0
Kyneton	Weekly	52	0.040	0.030	0
Laanecoorie ¹	Quarterly	3	0.020	0.017	0
Leitchville ¹	Quarterly	3	0.010	0.007	0
Lockington ¹	Quarterly	3	0.070	0.053	0
Maiden Gully - Marong	Weekly	52	0.050	0.036	0
Maldon	n/a	n/a	n/a	n/a	n/a
Malmsbury	Weekly	52	0.040	0.030	0
Newstead	n/a	n/a	n/a	n/a	n/a
Pyramid Hill ¹	Quarterly	3	0.040	0.027	0
Raywood	n/a	n/a	n/a	n/a	n/a
Rochester ¹	Quarterly	3	<0.01	<0.01	0
Sebastian	n/a	n/a	n/a	n/a	n/a
Serpentine ¹	Quarterly	3	0.020	0.017	0
Strathfieldsaye	Weekly	52	0.050	0.036	0
Taradale - Elphinstone	n/a	n/a	n/a	n/a	n/a
Tarnagulla	n/a	n/a	n/a	n/a	n/a
Tooborac	n/a	n/a	n/a	n/a	n/a
Trentham	n/a	n/a	n/a	n/a	n/a
Tylden	n/a	n/a	n/a	n/a	n/a
Wedderburn	n/a	n/a	n/a	n/a	n/a

Note:

1 Scheduling issue resulted in missed sample.

n/a – sampling is not required, either because there is no definitive exit point into the water sampling locality from which a sample could be collected, or Coliban Water's risk assessments has indicated that aluminium sampling is not necessary to manage water quality risks.

Iron – WTP exit/storage points for 2021-22

Table 18: Iron results for WTP exit/storage points (ADWG aesthetic guideline value: 0.3mg/L)

Water Sampling Locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where guideline was not met
Axedale	n/a	n/a	n/a	n/a	n/a
Bealiba	n/a	n/a	n/a	n/a	n/a
Bendigo (Northern)	Monthly	12	0.02	0.01	0
Bendigo (Southern)	Monthly	12	0.02	0.01	0
Bendigo (Spring Gully)	Monthly	12	0.02	0.01	0
Big Hill	Monthly	12	0.02	0.01	0
Boort	Weekly	52	0.07	0.03	0
Bridgewater - Inglewood	Monthly	13	0.02	0.01	0
Castlemaine	Monthly	12	0.01	0.01	0
Cohuna	Weekly	53	<0.01	<0.01	0
Dunolly	n/a	n/a	n/a	n/a	n/a
Echuca	Weekly	52	<0.01	<0.01	0
Elmore ¹	Monthly	11	<0.01	<0.01	0
Epsom - Huntly	Monthly	12	0.02	0.01	0
Fryerstown	n/a	n/a	n/a	n/a	n/a
Goornong ¹	Monthly	11	0.02	0.01	0
Guildford	Monthly	12	0.01	0.01	0
Gunbower	Weekly	52	<0.01	<0.01	0
Harcourt	Monthly	12	0.01	0.01	0
Heathcote	Weekly	53	0.02	0.01	0
Junortoun	Monthly	12	0.02	0.01	0
Korong Vale	Monthly	13	<0.01	<0.01	0
Kyneton	Monthly	12	0.02	0.01	0
Laanecoorie	Weekly	52	0.03	0.01	0
Leitchville	Weekly	52	0.06	0.01	0
Lockington	Monthly	12	<0.01	<0.01	0
Maiden Gully - Marong	Monthly	12	0.02	0.01	0
Maldon	n/a	n/a	n/a	n/a	n/a
Malmsbury	Monthly	12	0.02	0.01	0
Newstead	n/a	n/a	n/a	n/a	n/a
Pyramid Hill	Monthly	12	0.02	0.01	0
Raywood	n/a	n/a	n/a	n/a	n/a
Rochester	Weekly	52	<0.01	<0.01	0
Sebastian	n/a	n/a	n/a	n/a	n/a
Serpentine	Monthly	12	0.02	0.01	0
Strathfieldsaye	Monthly	12	0.02	0.01	0
Taradale - Elphinstone	n/a	n/a	n/a	n/a	n/a
Tarnagulla	n/a	n/a	n/a	n/a	n/a
Tooborac	n/a	n/a	n/a	n/a	n/a
Trentham	Monthly	12	<0.01	<0.01	0
Tylden	n/a	n/a	n/a	n/a	n/a
Wedderburn	n/a	n/a	n/a	n/a	n/a

Note:

¹ Scheduling issue resulted in missed sample.

n/a – sampling is not required, either because there is no definitive exit point into the water sampling locality from which a sample could be collected, or Coliban Water's risk assessments has indicated that iron sampling is not necessary to manage water quality risks.

Chlorine – WTP exit/storage points for 2021-22

Table 19: Chlorine results for WTP exit/storage points (ADWG health-based guideline value: 5.0mg/L)

Water Sampling Locality	Sampling frequency	Number of samples ¹	Maximum (mg/L)	Average (mg/L)	Number of samples where guideline was not met
Axedale	Weekly	53	2.2	1.2	0
Bealiba	Weekly	52	1.7	0.9	0
Bendigo (Northern)	n/a	n/a	n/a	n/a	n/a
Bendigo (Southern)	n/a	n/a	n/a	n/a	n/a
Bendigo (Spring Gully)	n/a	n/a	n/a	n/a	n/a
Big Hill ⁴	Weekly	105	5.9	0.9	1 ³
Boort	Weekly	104	4.6	1.7	0
Bridgewater - Inglewood	Weekly	104	2.8	1.6	0
Castlemaine	Weekly	52	2.0	0.9	0
Cohuna	Weekly	105	2.2	1.6	0
Dunolly	Weekly	52	1.4	1.0	0
Echuca	Weekly	104	2.9	1.6	0
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	n/a	n/a	n/a	n/a	n/a
Fryerstown	Weekly	52	2.1	1.3	0
Goornong	Weekly	104	3.0	1.1	0
Guildford	n/a	n/a	n/a	n/a	n/a
Gunbower	Weekly	104	3.4	1.5	0
Harcourt	Weekly	52	2.0	1.2	0
Heathcote	Weekly	53	2.2	1.8	0
Junortoun	n/a	n/a	n/a	n/a	n/a
Korong Vale ²	Weekly	103	3.5	1.8	0
Kyneton	Weekly	52	2.1	1.4	0
Laanecoorie	Weekly	52	2.4	1.7	0
Leitchville	Weekly	52	2.2	1.6	0
Lockington	Weekly	52	2.6	1.8	0
Maiden Gully - Marong	n/a	n/a	n/a	n/a	n/a
Maldon	Weekly	52	1.3	1.0	0
Malmsbury	Weekly	52	1.7	1.2	0
Newstead	Weekly	52	2.0	1.1	0
Pyramid Hill	Weekly	52	2.2	1.6	0
Raywood	Weekly	53	1.7	1.0	0
Rochester	Weekly	52	2.0	1.5	0
Sebastian	Weekly	53	3.6	1.6	0
Serpentine	Weekly	52	3.1	1.6	0
Strathfieldsaye	n/a	n/a	n/a	n/a	n/a
Taradale - Elphinstone	n/a	n/a	n/a	n/a	n/a
Tarnagulla	Weekly	52	1.5	0.7	0
Tooborac	Weekly	53	1.7	1.0	0
Trentham	Weekly	52	2.2	1.7	0
Tylden	Weekly	52	1.9	1.1	0
Wedderburn	Weekly	52	2.2	1.5	0

Note:

- 1 The number of samples will vary due to the different number of exit/storage samples within each locality
 - 2 Scheduling issue resulted in missed sample.
 - 3 Details of exceedance are located in Section 4.3.1.1.
 - 4 Unable to collect the sample as there was no water coming from the sample point.
- n/a – sampling is not required as there is no definitive exit point into the water sampling locality from which a sample is collected.

Ammonia – WTP exit/storage points for 2021-22

Table 20: Ammonia results for WTP exit/storage points (ADWG aesthetic guideline value is 0.5 mg/L)

Water Sampling Locality	Sampling frequency	Number of samples ¹	Maximum (mg/L)	Average (mg/L)	Number of samples where guideline was not met
Axedale	n/a	n/a	n/a	n/a	n/a
Bealiba	Fortnightly	26	0.500	0.179	0
Bendigo (Northern)	Weekly	52	0.380	0.257	0
Bendigo (Southern)	Weekly	52	0.380	0.257	0
Bendigo (Spring Gully)	Weekly	52	0.380	0.257	0
Big Hill	Weekly/Monthly	76	0.380	0.257	0
Boort	n/a	n/a	n/a	n/a	n/a
Bridgewater - Inglewood	Fortnightly/Monthly	39	0.290	0.132	0
Castlemaine	Weekly	52	0.450	0.053	0
Cohuna	n/a	n/a	n/a	n/a	n/a
Dunolly	Weekly	52	0.490	0.240	0
Echuca	n/a	n/a	n/a	n/a	n/a
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	Weekly	52	0.380	0.257	0
Fryerstown	n/a	n/a	n/a	n/a	n/a
Goornong	n/a	n/a	n/a	n/a	n/a
Guildford	Weekly	52	0.450	0.053	0
Gunbower	n/a	n/a	n/a	n/a	n/a
Harcourt	Weekly	52	0.450	0.053	0
Heathcote	Fortnightly	27	0.300	0.170	0
Junortoun	Weekly	52	0.380	0.257	0
Korong Vale	Fortnightly	53	0.500	0.124	0
Kyneton	n/a	n/a	n/a	n/a	n/a
Laanecoorie	Fortnightly	26	0.280	0.162	0
Leitchville	n/a	n/a	n/a	n/a	n/a
Lockington	n/a	n/a	n/a	n/a	n/a
Maiden Gully - Marong	Fortnightly	52	0.380	0.257	0
Maldon	n/a	n/a	n/a	n/a	n/a
Malmsbury	n/a	n/a	n/a	n/a	n/a
Newstead	n/a	n/a	n/a	n/a	n/a
Pyramid Hill	n/a	n/a	n/a	n/a	n/a
Raywood	n/a	n/a	n/a	n/a	n/a
Rochester	n/a	n/a	n/a	n/a	n/a
Sebastian	n/a	n/a	n/a	n/a	n/a
Serpentine	n/a	n/a	n/a	n/a	n/a
Strathfieldsaye	Weekly	52	0.380	0.257	0
Taradale - Elphinstone	n/a	n/a	n/a	n/a	n/a
Tarnagulla	Weekly	52	0.440	0.166	0
Tooborac	n/a	n/a	n/a	n/a	n/a
Trentham	n/a	n/a	n/a	n/a	n/a
Tylden	n/a	n/a	n/a	n/a	n/a
Wedderburn	Fortnightly	26	0.450	0.126	0

Note:

1 The number of samples will vary due to the different number of exit/storage samples within each locality.

n/a – sampling is not required, either because there is no definitive exit point into the water sampling locality from which a sample could be collected, or Coliban Water's risk assessments has indicated that ammonia sampling is not necessary to manage water quality risks.

Alkalinity – WTP exit/storage points for 2021-22

Table 21: Alkalinity results for WTP exit/storage points – whilst there is no ADWG guideline limit for alkalinity, it is monitored for operational purposes.

Water Sampling Locality	Sampling Frequency	Number of Samples	Maximum (mg/L)	Average (mg/L)
Axedale	n/a	n/a	n/a	n/a
Bealiba	n/a	n/a	n/a	n/a
Bendigo (Northern)	Weekly	52	110	55
Bendigo (Southern)	Weekly	52	110	55
Bendigo (Spring Gully)	Weekly	52	110	55
Big Hill	Weekly	52	110	55
Boort	n/a	n/a	n/a	n/a
Bridgewater - Inglewood	n/a	n/a	n/a	n/a
Castlemaine	Weekly	52	61	53
Cohuna	n/a	n/a	n/a	n/a
Dunolly	n/a	n/a	n/a	n/a
Echuca	n/a	n/a	n/a	n/a
Elmore	n/a	n/a	n/a	n/a
Epsom - Huntly	Weekly	52	110	55
Fryerstown	n/a	n/a	n/a	n/a
Goornong	n/a	n/a	n/a	n/a
Guildford	Weekly	52	61	53
Gunbower	n/a	n/a	n/a	n/a
Harcourt	Weekly	52	61	53
Heathcote	n/a	n/a	n/a	n/a
Junortoun	Weekly	52	110	55
Korong Vale	n/a	n/a	n/a	n/a
Kyneton	Weekly	52	60	54
Laanecoorie	n/a	n/a	n/a	n/a
Leitchville	n/a	n/a	n/a	n/a
Lockington	n/a	n/a	n/a	n/a
Maiden Gully - Marong	Weekly	52	110	55
Maldon	n/a	n/a	n/a	n/a
Malmsbury	Weekly	52	60	54
Newstead	n/a	n/a	n/a	n/a
Pyramid Hill	n/a	n/a	n/a	n/a
Raywood	n/a	n/a	n/a	n/a
Rochester	n/a	n/a	n/a	n/a
Sebastian	n/a	n/a	n/a	n/a
Serpentine	n/a	n/a	n/a	n/a
Strathfieldsaye	Weekly	52	110	55
Taradale - Elphinstone	n/a	n/a	n/a	n/a
Tarnagulla	n/a	n/a	n/a	n/a
Tooborac	n/a	n/a	n/a	n/a
Trentham	n/a	n/a	n/a	n/a
Tylden	n/a	n/a	n/a	n/a
Wedderburn	n/a	n/a	n/a	n/a

n/a – sampling is not required, either because there is no definitive exit point into the water sampling locality from which a sample could be collected, or Coliban Water's risk assessments has indicated that alkalinity sampling is not necessary to manage water quality risks.

4.4.2 Treated Water Results from Customer Tap Sample Points

Following are tables of sampling results for each parameter at customer tap sample points in each of the sampling localities.

Escherichia coli (E. coli) – Customer Tap Sites 2021-22

E. coli is monitored in all water sampling localities as it is an indicator of the potential presence of faecal contamination in water.

Table 22: *E. coli* results for customer tap sites (Schedule 2 Drinking water quality standards: No *Escherichia coli* per 100mL of drinking water, with the exception of any false positive sample^).

Water Sampling Locality	Sampling Frequency	Number of Samples	Maximum detected (orgs/100mL)	Number of detections and investigations conducted (s.22)	Number of samples where standard was not met
Axedale	Weekly	53	0	0	0
Bealiba	Weekly	52	0	0	0
Bendigo (Northern)	Weekly	137	0	0	0
Bendigo (Southern)	Weekly	137	0	0	0
Bendigo (Spring Gully)	Weekly	78	0	0	0
Big Hill	Weekly	53	0	0	0
Boort	Weekly	52	0	0	0
Bridgewater-Inglewood	Weekly	52	0	0	0
Castlemaine	Weekly	76	0	0	0
Cohuna	Weekly	52	0	0	0
Dunolly	Weekly	52	0	0	0
Echuca	Weekly	77	0	0	0
Elmore	Weekly	52	0	0	0
Epsom - Huntly	Weekly	64	0	0	0
Fryerstown	Weekly	52	0	0	0
Goornong	Weekly	52	0	0	0
Guildford	Weekly	52	0	0	0
Gunbower	Weekly	52	0	0	0
Harcourt	Weekly	52	0	0	0
Heathcote	Weekly	54	0	0	0
Junortoun	Weekly	53	0	0	0
Korong Vale	Weekly	52	0	0	0
Kyneton	Weekly	62	0	0	0
Laanecoorie	Weekly	52	0	0	0
Leitchville	Weekly	52	0	0	0
Lockington	Weekly	52	0	0	0
Maiden Gully - Marong	Weekly	65	0	0	0
Maldon	Weekly	52	0	0	0
Malmsbury	Weekly	52	0	0	0
Newstead	Weekly	52	0	0	0
Pyramid Hill	Weekly	52	0	0	0
Raywood	Weekly	53	0	0	0
Rochester	Weekly	52	0	0	0
Sebastian	Weekly	53	0	0	0
Serpentine	Weekly	52	0	0	0
Strathfieldsaye	Weekly	65	0	0	0
Taradale - Elphinstone	Weekly	52	0	0	0
Tarnagulla	Weekly	52	0	0	0
Tooborac	Weekly	53	0	0	0

Water Sampling Locality	Sampling Frequency	Number of Samples	Maximum detected (orgs/100mL)	Number of detections and investigations conducted (s.22)	Number of samples where standard was not met
Trentham	Weekly	52	0	0	0
Tylden	Weekly	52	0	0	0
Wedderburn	Weekly	52	0	0	0

Note:

Localities with populations greater than 5,000 have additional sampling to the one sample per week (one additional sample per month for each 5,000 above 5,000 population in accordance with the Australian Drinking Water Guidelines (2011).

^ no false positive *E. coli* results were recorded during 2021-22.

Trihalomethanes (THM) – Customer Tap Sites 2021-22

Trihalomethanes are formed as a by-product, predominantly when chlorine is used to disinfect water for drinking. They represent one group of chemicals generally referred to as disinfection by-products.

Table 23: Trihalomethanes results for customer tap sites (Schedule 2 – Drinking water quality standards - Less than or equal to 0.25 mg/L of drinking water.)

Water Sampling Locality	Sampling Frequency	Number of Samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	Monthly	12	0.0750	0.0555	0
Bealiba	Monthly	12	0.1100	0.0873	0
Bendigo (Northern)	Monthly	12	0.0090	0.0071	0
Bendigo (Southern)	Monthly	12	0.0080	0.0064	0
Bendigo (Spring Gully)	Monthly	12	0.0080	0.0058	0
Big Hill	Monthly	12	0.0330	0.0107	0
Boort	Monthly	12	0.1600	0.1308	0
Bridgewater - Inglewood	Monthly	12	0.0230	0.0145	0
Castlemaine	Monthly	12	0.0880	0.0653	0
Cohuna	Monthly	12	0.1100	0.0578	0
Dunolly	Monthly	12	0.1700	0.1029	0
Echuca	Monthly	12	0.0840	0.0508	0
Elmore	Monthly	12	<0.001	<0.001	0
Epsom - Huntly	Monthly	12	0.0120	0.0075	0
Fryerstown	Monthly	12	0.1500	0.1066	0
Goornong	Monthly	12	0.1700	0.1075	0
Guildford	Monthly	12	0.0970	0.0800	0
Gunbower	Monthly	12	0.0940	0.0542	0
Harcourt	Monthly	12	0.1200	0.0940	0
Heathcote	Monthly	12	0.1200	0.0815	0
Junortoun	Monthly	12	0.0090	0.0073	0
Korong Vale	Monthly	12	0.0210	0.0136	0
Kyneton	Monthly	12	0.1200	0.0753	0
Laanecoorie	Monthly	12	0.1800	0.1128	0
Leitchville	Monthly	12	0.0710	0.0455	0
Lockington	Monthly	12	0.0760	0.0544	0
Maiden Gully - Marong	Monthly	12	0.0100	0.0070	0
Maldon	Monthly	12	0.1300	0.0988	0
Malmsbury	Monthly	12	0.1400	0.0903	0
Newstead	Monthly	12	0.1100	0.0847	0
Pyramid Hill	Monthly	12	0.0790	0.0522	0
Raywood	Monthly	12	0.0840	0.0589	0
Rochester	Monthly	12	0.0480	0.0320	0
Sebastian	Monthly	12	0.0870	0.0450	0
Serpentine	Monthly	12	0.1200	0.0729	0
Strathfieldsaye	Monthly	12	0.0100	0.0064	0
Taradale - Elphinstone	Monthly	12	0.1200	0.0740	0
Tarnagulla	Monthly	12	0.1400	0.0938	0
Tooborac	Monthly	13	0.1100	0.0801	0
Trentham	Monthly	12	0.0490	0.0333	0
Tylden	Monthly	12	0.1200	0.0776	0
Wedderburn	Monthly	12	0.0170	0.0110	0

Turbidity – Customer Tap Sites 2021-22

Turbidity is a measure of the particulate matter in water and is monitored in all water sampling localities. High turbidity in the reticulation may indicate poor operation of the water treatment process and/or increased risk of microbiological contamination.

Table 24: Turbidity results for customer tap sites (Schedule 2 – Drinking water quality standards: 95th percentile of results over 12 month period must be ≤ 5.0 NTU)

Water Sampling Locality	Sampling Frequency	Number of Samples	Maximum value (NTU)	95 th percentile of results (NTU)	Number of 95th percentile of results above standard
Axedale	Weekly	53	0.2	0.1	0
Bealiba	Weekly	52	0.4	0.2	0
Bendigo (Northern)	Weekly	53	0.2	0.2	0
Bendigo (Southern)	Weekly	53	0.7	0.2	0
Bendigo (Spring Gully)	Weekly	53	0.2	0.2	0
Big Hill	Weekly	53	1.1	0.3	0
Boort	Weekly	52	0.5	0.2	0
Bridgewater - Inglewood	Weekly	52	0.1	0.1	0
Castlemaine	Weekly	52	0.5	0.2	0
Cohuna	Weekly	53	0.3	0.1	0
Dunolly	Weekly	52	0.2	0.1	0
Echuca	Weekly	52	0.8	0.1	0
Elmore	Weekly	52	0.1	0.1	0
Epsom - Huntly	Weekly	52	0.2	0.2	0
Fryerstown	Weekly	52	0.2	0.2	0
Goornong	Weekly	52	0.3	0.2	0
Guildford	Weekly	52	0.2	0.2	0
Gunbower	Weekly	52	0.3	0.1	0
Harcourt	Weekly	52	0.2	0.1	0
Heathcote	Weekly	53	0.3	0.2	0
Junortoun	Weekly	53	0.3	0.2	0
Korong Vale	Weekly	52	0.6	0.3	0
Kyneton	Weekly	52	7.5 ¹	0.2	0
Laanecoorie	Weekly	52	0.4	0.2	0
Leitchville	Weekly	52	0.5	0.2	0
Lockington	Weekly	52	0.3	0.1	0
Maiden Gully - Marong	Weekly	52	0.2	0.2	0
Maldon	Weekly	52	0.2	0.2	0
Malmsbury	Weekly	52	0.1	0.1	0
Newstead	Weekly	52	0.3	0.2	0
Pyramid Hill	Weekly	52	0.2	0.1	0
Raywood	Weekly	53	1.0	0.2	0
Rochester	Weekly	52	0.2	0.1	0
Sebastian	Weekly	53	0.6	0.2	0
Serpentine	Weekly	52	0.3	0.2	0
Strathfieldsaye	Weekly	53	0.3	0.2	0
Taradale - Elphinstone	Weekly	52	0.2	0.1	0
Tarnagulla	Weekly	52	0.1	0.1	0
Tooborac	Weekly	53	1.3	1.0	0
Trentham	Weekly	52	0.4	0.1	0
Tylden	Weekly	52	0.4	0.2	0
Wedderburn	Weekly	52	0.9	0.4	0

Note:

- 1 Whilst this one high turbidity result did not exceed the 95th percentile standard it was investigated. There was no identified issue, but the water main was flushed and resample results were consistent with normal samples.

Chloroacetic Acid – Customer Tap Sites 2021-22

Table 25: Chloroacetic Acid results for customer tap sites (Water quality standard - ADWG health-based guideline value: 0.15 mg/L)

Water Sampling Locality	Sampling Frequency	Number of Samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	Quarterly	4	<0.005	<0.005	0
Bealiba	Quarterly	4	<0.005	<0.005	0
Bendigo (Northern)	Quarterly	4	<0.005	<0.005	0
Bendigo (Southern)	Quarterly	4	<0.005	<0.005	0
Bendigo (Spring Gully)	Quarterly	4	<0.005	<0.005	0
Big Hill	Quarterly	4	<0.005	<0.005	0
Boort	Quarterly	4	<0.005	<0.005	0
Bridgewater - Inglewood	Quarterly	4	<0.005	<0.005	0
Castlemaine	Quarterly	4	<0.005	<0.005	0
Cohuna	Quarterly	4	<0.005	<0.005	0
Dunolly	Quarterly	4	<0.005	<0.005	0
Echuca	Quarterly	4	<0.005	<0.005	0
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	Quarterly	4	<0.005	<0.005	0
Fryerstown	Quarterly	4	<0.005	<0.005	0
Goorong	Quarterly	4	<0.005	<0.005	0
Guildford	Quarterly	4	<0.005	<0.005	0
Gunbower	Quarterly	4	<0.005	<0.005	0
Harcourt	Quarterly	4	<0.005	<0.005	0
Heathcote	Quarterly	4	<0.005	<0.005	0
Junortoun	Quarterly	4	<0.005	<0.005	0
Korong Vale	Quarterly	4	<0.005	<0.005	0
Kyneton	Quarterly	4	<0.005	<0.005	0
Laanecoorie	Quarterly	4	<0.005	<0.005	0
Leitchville	Quarterly	4	<0.005	<0.005	0
Lockington	Quarterly	4	<0.005	<0.005	0
Maiden Gully - Marong	Quarterly	4	<0.005	<0.005	0
Maldon	Quarterly	4	<0.005	<0.005	0
Malmsbury	Quarterly	4	<0.005	<0.005	0
Newstead	Quarterly	4	<0.005	<0.005	0
Pyramid Hill	Quarterly	4	<0.005	<0.005	0
Raywood	Quarterly	4	<0.005	<0.005	0
Rochester	Quarterly	4	<0.005	<0.005	0
Sebastian	Quarterly	4	<0.005	<0.005	0
Serpentine	Quarterly	4	<0.005	<0.005	0
Strathfieldsaye	Quarterly	4	<0.005	<0.005	0
Taradale - Elphinstone	Quarterly	4	<0.005	<0.005	0
Tarnagulla	Quarterly	4	<0.005	<0.005	0
Tooborac	Quarterly	4	<0.005	<0.005	0
Trentham	Quarterly	4	<0.005	<0.005	0
Tylden	Quarterly	4	<0.005	<0.005	0
Wedderburn	Quarterly	4	<0.005	<0.005	0

Note:

- 1 Chlorine is not used for disinfection at Elmore. Chlorine-based disinfection by-products are not deemed to be a significant risk in drinking water supplied by Coliban Water that has not been chlorinated.

Dichloroacetic Acid – Customer Tap Sites 2021-22

Table 26: Dichloroacetic Acid results for customer tap sites (Water quality standard - ADWG health-based guideline value: 0.1 mg/L)

Water Sampling Locality	Sampling Frequency	Number of Samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	Quarterly	4	0.018	0.012	0
Bealiba	Quarterly	4	0.017	0.006	0
Bendigo (Northern)	Quarterly	4	0.010	0.005	0
Bendigo (Southern)	Quarterly	4	0.006	0.003	0
Bendigo (Spring Gully)	Quarterly	4	0.006	0.003	0
Big Hill	Quarterly	4	<0.005	<0.005	0
Boort	Quarterly	4	0.020	0.015	0
Bridgewater - Inglewood	Quarterly	4	<0.005	<0.005	0
Castlemaine	Quarterly	4	0.021	0.016	0
Cohuna	Quarterly	4	0.037	0.021	0
Dunolly	Quarterly	4	0.019	0.013	0
Echuca	Quarterly	4	0.029	0.014	0
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	Quarterly	4	0.007	0.006	0
Fryerstown	Quarterly	4	0.034	0.030	0
Goornong	Quarterly	4	0.012	0.007	0
Guildford	Quarterly	4	0.018	0.006	0
Gunbower	Quarterly	4	0.023	0.016	0
Harcourt	Quarterly	4	0.006	0.003	0
Heathcote	Quarterly	4	0.015	0.011	0
Junortoun	Quarterly	4	0.008	0.005	0
Korong Vale	Quarterly	4	0.011	0.005	0
Kyneton	Quarterly	4	0.041	0.026	0
Laanecoorie	Quarterly	4	0.011	0.008	0
Leitchville	Quarterly	4	0.025	0.019	0
Lockington	Quarterly	4	0.011	0.008	0
Maiden Gully - Marong	Quarterly	4	0.008	0.006	0
Maldon	Quarterly	4	<0.005	<0.005	0
Malmsbury	Quarterly	4	0.035	0.021	0
Newstead	Quarterly	4	0.022	0.015	0
Pyramid Hill	Quarterly	4	0.012	0.009	0
Raywood	Quarterly	4	0.018	0.013	0
Rochester	Quarterly	4	0.008	0.006	0
Sebastian	Quarterly	4	0.016	0.007	0
Serpentine	Quarterly	4	0.022	0.014	0
Strathfieldsaye	Quarterly	4	0.007	0.005	0
Taradale - Elphinstone	Quarterly	4	0.023	0.013	0
Tarnagulla	Quarterly	4	0.017	0.008	0
Tooborac	Quarterly	4	0.009	0.005	0
Trentham	Quarterly	4	0.012	0.009	0
Tylden	Quarterly	4	0.037	0.027	0
Wedderburn	Quarterly	4	0.011	0.009	0

Note:

- Chlorine is not used for disinfection at Elmore. Chlorine-based disinfection by-products are not deemed to be a significant risk in drinking water supplied by Coliban Water that has not been chlorinated.

Trichloroacetic Acid – Customer Tap Sites 2021-22

Table 27: Trichloroacetic Acid results for customer tap sites (Water quality standard - ADWG health-based guideline value 0.1 mg/L)

Water Sampling Locality	Sampling Frequency	Number of Samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	Quarterly	4	0.008	0.006	0
Bealiba	Quarterly	4	0.008	0.004	0
Bendigo (Northern)	Quarterly	4	<0.005	<0.005	0
Bendigo (Southern)	Quarterly	4	<0.005	<0.005	0
Bendigo (Spring Gully)	Quarterly	4	<0.005	<0.005	0
Big Hill	Quarterly	4	<0.005	<0.005	0
Boort	Quarterly	4	0.013	0.010	0
Bridgewater - Inglewood	Quarterly	4	<0.005	<0.005	0
Castlemaine	Quarterly	4	0.017	0.011	0
Cohuna	Quarterly	4	0.046	0.024	0
Dunolly	Quarterly	4	<0.005	<0.005	0
Echuca	Quarterly	4	0.042	0.016	0
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	Quarterly	4	<0.005	<0.005	0
Fryerstown	Quarterly	4	0.025	0.021	0
Goornong	Quarterly	4	0.008	0.005	0
Guildford	Quarterly	4	0.014	0.009	0
Gunbower	Quarterly	4	0.025	0.017	0
Harcourt	Quarterly	4	0.020	0.017	0
Heathcote	Quarterly	4	0.006	0.003	0
Junortoun	Quarterly	4	<0.005	<0.005	0
Korong Vale	Quarterly	4	<0.005	<0.005	0
Kyneton	Quarterly	4	0.039	0.024	0
Laanecoorie	Quarterly	4	<0.005	<0.005	0
Leitchville	Quarterly	4	0.035	0.021	0
Lockington	Quarterly	4	0.006	0.004	0
Maiden Gully - Marong	Quarterly	4	<0.005	<0.005	0
Maldon	Quarterly	4	0.006	0.003	0
Malmsbury	Quarterly	4	0.036	0.027	0
Newstead	Quarterly	4	0.019	0.016	0
Pyramid Hill	Quarterly	4	0.007	0.005	0
Raywood	Quarterly	4	0.012	0.008	0
Rochester	Quarterly	4	0.005	0.003	0
Sebastian	Quarterly	4	0.009	0.005	0
Serpentine	Quarterly	4	0.016	0.009	0
Strathfieldsaye	Quarterly	4	<0.005	<0.005	0
Taradale - Elphinstone	Quarterly	4	0.021	0.014	0
Tarnagulla	Quarterly	4	0.008	0.004	0
Tooborac	Quarterly	4	0.010	0.006	0
Trentham	Quarterly	4	0.016	0.011	0
Tylden	Quarterly	4	0.037	0.026	0
Wedderburn	Quarterly	4	<0.005	<0.005	0

Note:

- Chlorine is not used for disinfection at Elmore. Chlorine-based disinfection by-products are not deemed to be a significant risk in drinking water supplied by Coliban Water that has not been chlorinated.

Bromate – Customer Tap Sites 2021-22

Table 28: Bromate results for customer tap sites (Water quality standard - ADWG health-based guideline value: 0.02 mg/L)

Water Sampling Locality	Sampling Frequency	Number of Samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	Monthly	12	<0.005	<0.005	0
Bealiba	n/a	n/a	n/a	n/a	n/a
Bendigo (Northern)	Monthly	12	<0.005	<0.005	0
Bendigo (Southern)	Monthly	12	<0.005	<0.005	0
Bendigo (Spring Gully)	Monthly	12	<0.005	<0.005	0
Big Hill	Monthly	12	<0.005	<0.005	0
Boort	n/a	n/a	n/a	n/a	n/a
Bridgewater - Inglewood	n/a	n/a	n/a	n/a	n/a
Castlemaine	Quarterly	4	<0.005	<0.005	0
Cohuna	n/a	n/a	n/a	n/a	n/a
Dunolly	n/a	n/a	n/a	n/a	n/a
Echuca	n/a	n/a	n/a	n/a	n/a
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	Monthly	12	<0.005	<0.005	0
Fryerstown	Quarterly	4	<0.005	<0.005	0
Goorong	n/a	n/a	n/a	n/a	n/a
Guildford	Quarterly	4	<0.005	<0.005	0
Gunbower	n/a	n/a	n/a	n/a	n/a
Harcourt	Quarterly	4	<0.005	<0.005	0
Heathcote	n/a	n/a	n/a	n/a	n/a
Junortoun	Monthly	12	<0.005	<0.005	0
Korong Vale	n/a	n/a	n/a	n/a	n/a
Kyneton	Quarterly	4	<0.005	<0.005	0
Laanecoorie	n/a	n/a	n/a	n/a	n/a
Leitchville	n/a	n/a	n/a	n/a	n/a
Lockington	n/a	n/a	n/a	n/a	n/a
Maiden Gully - Marong	Monthly	12	<0.005	<0.005	0
Maldon	Quarterly	4	<0.005	<0.005	0
Malmsbury	Quarterly	4	<0.005	<0.005	0
Newstead	Quarterly	4	<0.005	<0.005	0
Pyramid Hill	n/a	n/a	n/a	n/a	n/a
Raywood	Monthly	12	<0.005	<0.005	0
Rochester	n/a	n/a	n/a	n/a	n/a
Sebastian	Monthly	12	<0.005	<0.005	0
Serpentine	n/a	n/a	n/a	n/a	n/a
Strathfieldsaye	Monthly	12	<0.005	<0.005	0
Taradale - Elphinstone	Quarterly	4	<0.005	<0.005	0
Tarnagulla	n/a	n/a	n/a	n/a	n/a
Tooborac	n/a	n/a	n/a	n/a	n/a
Trentham	n/a	n/a	n/a	n/a	n/a
Tylden	Quarterly	4	<0.005	<0.005	0
Wedderburn	n/a	n/a	n/a	n/a	n/a

Note:

Bromate is monitored in localities where ozone is used in treatment, as ozone can result in the production of this by-products in drinking water.

Ozone is used at the Bendigo, Castlemaine and Kyneton Water Treatment Plants. Review of historical data has identified sampling localities supplied from Castlemaine and Kyneton WTP's as low risk, therefore monitoring is quarterly in those localities.

Ozone-based disinfection by-products are not deemed to be a significant risk in drinking water supplied by Coliban Water that has not been ozonated.

Formaldehyde – Customer Tap Sites 2021-22

Table 29: Formaldehyde results for customer tap sites (Water quality standard - ADWG health-based guideline value: 0.5 mg/L)

Water Sampling Locality	Sampling Frequency	Number of Samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	Monthly	12	<0.05	<0.05	0
Bealiba	n/a	n/a	n/a	n/a	n/a
Bendigo (Northern)	Monthly	12	<0.05	<0.05	0
Bendigo (Southern)	Monthly	12	<0.05	<0.05	0
Bendigo (Spring Gully)	Monthly	12	<0.05	<0.05	0
Big Hill	Monthly	12	<0.05	<0.05	0
Boort	n/a	n/a	n/a	n/a	n/a
Bridgewater - Inglewood	n/a	n/a	n/a	n/a	n/a
Castlemaine	Quarterly	4	<0.05	<0.05	0
Cohuna	n/a	n/a	n/a	n/a	n/a
Dunolly	n/a	n/a	n/a	n/a	n/a
Echuca	n/a	n/a	n/a	n/a	n/a
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	Monthly	12	<0.05	<0.05	0
Fryerstown	Quarterly	4	<0.05	<0.05	0
Goornong	n/a	n/a	n/a	n/a	n/a
Guildford	Quarterly	4	<0.05	<0.05	0
Gunbower	n/a	n/a	n/a	n/a	n/a
Harcourt	Quarterly	4	<0.05	<0.05	0
Heathcote	n/a	n/a	n/a	n/a	n/a
Junortoun	Monthly	12	<0.05	<0.05	0
Korong Vale	n/a	n/a	n/a	n/a	n/a
Kyneton	Quarterly	4	<0.05	<0.05	0
Laanecoorie	n/a	n/a	n/a	n/a	n/a
Leitchville	n/a	n/a	n/a	n/a	n/a
Lockington	n/a	n/a	n/a	n/a	n/a
Maiden Gully - Marong	Monthly	12	<0.05	<0.05	0
Maldon	Quarterly	4	<0.05	<0.05	0
Malmsbury	Quarterly	4	<0.05	<0.05	0
Newstead	Quarterly	4	<0.05	<0.05	0
Pyramid Hill	n/a	n/a	n/a	n/a	n/a
Raywood	Monthly	12	<0.05	<0.05	0
Rochester	n/a	n/a	n/a	n/a	n/a
Sebastian	Monthly	12	<0.05	<0.05	0
Serpentine	n/a	n/a	n/a	n/a	n/a
Strathfieldsaye	Monthly	12	<0.05	<0.05	0
Taradale - Elphinstone	Quarterly	4	<0.05	<0.05	0
Tarnagulla	n/a	n/a	n/a	n/a	n/a
Tooborac	n/a	n/a	n/a	n/a	n/a
Trentham	n/a	n/a	n/a	n/a	n/a
Tylden	Quarterly	4	<0.05	<0.05	0
Wedderburn	n/a	n/a	n/a	n/a	n/a

Note:

Formaldehyde is monitored in localities where ozone is used in treatment, as ozone can result in the production of this by-products in drinking water.

Ozone is used at the Bendigo, Castlemaine and Kyneton Water Treatment Plants. Review of historical data has identified sampling localities supplied from Castlemaine and Kyneton WTPs as low risk, therefore monitoring is quarterly in those localities.

Ozone-based disinfection by-products are not deemed to be a significant risk in drinking water supplied by Coliban Water that has not been ozonated.

Fluoride – Customer Tap Sites 2021-22

Table 30: Fluoride results for customer tap sites (Water quality standard - ADWG health-based guideline value: 1.5 mg/L)

Water Sampling Locality	Sampling Frequency	Number of Samples	Target optimum operating fluoride concentration (mg/L)	Max (mg/L)	Min (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	Monthly	12	0.9	0.990	0.870	0.924	0
Bealiba	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Bendigo (Northern)	Monthly	12	0.9	1.000	0.850	0.924	0
Bendigo (Southern)	Monthly	12	0.9	0.990	0.890	0.936	0
Bendigo (Spring Gully)	Monthly	12	0.9	1.000	0.900	0.944	0
Big Hill	Monthly	12	0.9	0.990	0.880	0.933	0
Boort	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Bridgewater - Inglewood	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Castlemaine	Monthly	12	0.9	0.990	0.830	0.925	0
Cohuna	Weekly	52	0.8	0.950	0.270	0.769	0
Dunolly	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Echuca	Weekly	52	0.8	0.980	<0.05	0.751	0
Elmore	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	Monthly	12	0.9	0.960	0.880	0.915	0
Fryerstown	Monthly	12	0.9	0.960	0.820	0.894	0
Goornong	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Guildford	Monthly	12	0.9	0.970	0.820	0.906	0
Gunbower	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Harcourt	Monthly	12	0.9	0.960	0.830	0.905	0
Heathcote	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Junortoun	Monthly	12	0.9	1.000	0.850	0.921	0
Korong Vale	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Kyneton	Weekly	52	0.9	1.100	0.790	0.894	0
Laanecoorie	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Leitchville	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Lockington	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Maiden Gully - Marong	Monthly	12	0.9	0.990	0.840	0.924	0
Maldon	Monthly	12	0.9	0.970	0.840	0.918	0
Malmsbury	Weekly	52	0.9	0.970	0.810	0.892	0
Newstead	Monthly	12	0.9	0.960	0.820	0.903	0
Pyramid Hill	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Raywood	Monthly	12	0.9	0.970	0.860	0.920	0
Rochester	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sebastian	Monthly	12	0.9	0.980	0.850	0.928	0
Serpentine	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Strathfieldsaye	Monthly	12	0.9	1.000	0.890	0.925	0
Taradale - Elphinstone	Monthly	12	0.9	1.100	0.860	0.929	0
Tarnagulla	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tooborac	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Trentham	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tylden	Weekly	52	0.9	0.960	0.800	0.893	0
Wedderburn	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Arsenic – Customer Tap Sites 2021-22

Table 31: Arsenic results for customer tap sites (Water quality standard - ADWG health-based guideline value: 0.01 mg/L)

Water Sampling Locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	Quarterly	4	<0.001	<0.001	0
Bealiba	Quarterly	4	<0.001	<0.001	0
Bendigo (Northern)	Quarterly	4	<0.001	<0.001	0
Bendigo (Southern)	Quarterly	4	<0.001	<0.001	0
Bendigo (Spring Gully)	Quarterly	4	<0.001	<0.001	0
Big Hill	Quarterly	4	<0.001	<0.001	0
Boort	Quarterly	4	<0.001	<0.001	0
Bridgewater - Inglewood	Quarterly	4	<0.001	<0.001	0
Castlemaine	Quarterly	4	<0.001	<0.001	0
Cohuna	Quarterly	4	<0.001	<0.001	0
Dunolly	Quarterly	4	<0.001	<0.001	0
Echuca	Quarterly	4	<0.001	<0.001	0
Elmore	Quarterly	4	<0.001	<0.001	0
Epsom - Huntly	Quarterly	4	<0.001	<0.001	0
Fryerstown	Quarterly	4	<0.001	<0.001	0
Goornong	Quarterly	4	<0.001	<0.001	0
Guildford	Quarterly	4	<0.001	<0.001	0
Gunbower	Quarterly	4	<0.001	<0.001	0
Harcourt	Quarterly	4	<0.001	<0.001	0
Heathcote	Quarterly	4	<0.001	<0.001	0
Junortoun	Quarterly	4	<0.001	<0.001	0
Korong Vale	Quarterly	4	<0.001	<0.001	0
Kyneton	Quarterly	4	<0.001	<0.001	0
Laanecoorie	Quarterly	4	<0.001	<0.001	0
Leitchville	Quarterly	4	<0.001	<0.001	0
Lockington	Quarterly	4	<0.001	<0.001	0
Maiden Gully - Marong	Quarterly	4	<0.001	<0.001	0
Maldon	Quarterly	4	<0.001	<0.001	0
Malmsbury	Quarterly	4	<0.001	<0.001	0
Newstead	Quarterly	4	<0.001	<0.001	0
Pyramid Hill	Quarterly	4	<0.001	<0.001	0
Raywood	Quarterly	4	<0.001	<0.001	0
Rochester	Quarterly	4	<0.001	<0.001	0
Sebastian	Quarterly	4	<0.001	<0.001	0
Serpentine	Quarterly	4	<0.001	<0.001	0
Strathfieldsaye	Quarterly	4	<0.001	<0.001	0
Taradale - Elphinstone	Quarterly	4	<0.001	<0.001	0
Tarnagulla	Quarterly	4	<0.001	<0.001	0
Tooborac	Quarterly	4	<0.001	<0.001	0
Trentham	Quarterly	4	<0.001	<0.001	0
Tylden	Quarterly	4	<0.001	<0.001	0
Wedderburn	Quarterly	4	<0.001	<0.001	0

Cadmium – Customer Tap Sites 2021-22

Table 32: Cadmium results for customer tap sites (Water quality standard - ADWG health-based guideline value: 0.002 mg/L)

Water Sampling Locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	Quarterly	4	<0.0002	<0.0002	0
Bealiba	Quarterly	4	<0.0002	<0.0002	0
Bendigo (Northern)	Quarterly	4	<0.0002	<0.0002	0
Bendigo (Southern)	Quarterly	4	<0.0002	<0.0002	0
Bendigo (Spring Gully)	Quarterly	4	<0.0002	<0.0002	0
Big Hill	Quarterly	4	<0.0002	<0.0002	0
Boort	Quarterly	4	<0.0002	<0.0002	0
Bridgewater - Inglewood	Quarterly	4	<0.0002	<0.0002	0
Castlemaine	Quarterly	4	<0.0002	<0.0002	0
Cohuna	Quarterly	4	<0.0002	<0.0002	0
Dunolly	Quarterly	4	<0.0002	<0.0002	0
Echuca	Quarterly	4	<0.0002	<0.0002	0
Elmore	Quarterly	4	<0.0002	<0.0002	0
Epsom - Huntly	Quarterly	4	<0.0002	<0.0002	0
Fryerstown	Quarterly	4	<0.0002	<0.0002	0
Goorong	Quarterly	4	<0.0002	<0.0002	0
Guildford	Quarterly	4	<0.0002	<0.0002	0
Gunbower	Quarterly	4	<0.0002	<0.0002	0
Harcourt	Quarterly	4	<0.0002	<0.0002	0
Heathcote	Quarterly	4	<0.0002	<0.0002	0
Junortoun	Quarterly	4	<0.0002	<0.0002	0
Korong Vale	Quarterly	4	<0.0002	<0.0002	0
Kyneton	Quarterly	4	<0.0002	<0.0002	0
Laanecoorie	Quarterly	4	<0.0002	<0.0002	0
Leitchville	Quarterly	4	<0.0002	<0.0002	0
Lockington	Quarterly	4	<0.0002	<0.0002	0
Maiden Gully - Marong	Quarterly	4	<0.0002	<0.0002	0
Maldon	Quarterly	4	<0.0002	<0.0002	0
Malmsbury	Quarterly	4	<0.0002	<0.0002	0
Newstead	Quarterly	4	<0.0002	<0.0002	0
Pyramid Hill	Quarterly	4	<0.0002	<0.0002	0
Raywood	Quarterly	4	<0.0002	<0.0002	0
Rochester	Quarterly	4	<0.0002	<0.0002	0
Sebastian	Quarterly	4	<0.0002	<0.0002	0
Serpentine	Quarterly	4	<0.0002	<0.0002	0
Strathfieldsaye	Quarterly	4	<0.0002	<0.0002	0
Taradale - Elphinstone	Quarterly	4	<0.0002	<0.0002	0
Tarnagulla	Quarterly	4	<0.0002	<0.0002	0
Tooborac	Quarterly	4	<0.0002	<0.0002	0
Trentham	Quarterly	4	<0.0002	<0.0002	0
Tylden	Quarterly	4	<0.0002	<0.0002	0
Wedderburn	Quarterly	4	<0.0002	<0.0002	0

Chlorine – Customer Tap Sites 2021-22

Table 33: Chlorine results for customer tap sites (Water quality standard - ADWG health-based guideline value: 5 mg/L)

Water Sampling Locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	Weekly	53	2.10	1.03	0
Bealiba	Weekly	52	1.40	0.59	0
Bendigo (Northern)	Weekly	137	2.10	1.06	0
Bendigo (Southern)	Weekly	137	2.40	1.31	0
Bendigo (Spring Gully)	Weekly	78	2.12	1.07	0
Big Hill	Weekly	53	2.40	0.83	0
Boort	Weekly	52	1.91	0.88	0
Bridgewater - Inglewood	Weekly	52	2.70	1.57	0
Castlemaine	Weekly	76	2.16	1.12	0
Cohuna	Weekly	52	2.01	1.33	0
Dunolly	Weekly	52	1.37	0.79	0
Echuca	Weekly	77	2.18	1.25	0
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	Weekly	64	1.88	1.07	0
Fryerstown	Weekly	52	2.10	0.67	0
Goornong	Weekly	52	2.20	1.14	0
Guildford	Weekly	52	0.89	0.26	0
Gunbower	Weekly	52	2.80	1.33	0
Harcourt	Weekly	52	1.32	0.58	0
Heathcote	Weekly	54	1.93	1.48	0
Junortoun	Weekly	53	1.76	0.64	0
Korong Vale	Weekly	52	2.60	1.50	0
Kyneton	Weekly	62	2.40	1.63	0
Laanecoorie	Weekly	52	1.90	1.08	0
Leitchville	Weekly	52	2.00	1.33	0
Lockington	Weekly	52	1.56	1.05	0
Maiden Gully - Marong	Weekly	65	2.20	1.26	0
Maldon	Weekly	52	1.10	0.68	0
Malmsbury	Weekly	52	1.70	0.81	0
Newstead	Weekly	52	1.50	0.71	0
Pyramid Hill	Weekly	52	1.60	0.98	0
Raywood	Weekly	53	1.44	0.77	0
Rochester	Weekly	52	1.95	1.29	0
Sebastian	Weekly	53	1.90	0.51	0
Serpentine	Weekly	52	2.10	0.72	0
Strathfieldsaye	Weekly	65	2.17	1.44	0
Taradale - Elphinstone	Weekly	52	1.60	0.81	0
Tarnagulla	Weekly	52	1.40	0.49	0
Tooborac	Weekly	53	1.40	0.49	0
Trentham	Weekly	52	2.00	1.37	0
Tylden	Weekly	52	2.20	1.34	0
Wedderburn	Weekly	52	2.20	1.49	0

Localities with populations greater than 5,000 have additional sampling to the one sample per week (one additional sample per month for each 5,000 above 5,000 population in accordance with the Australian Drinking Water Guidelines (2011).

Note:

1 Chlorine is not used for disinfection at Elmore.

Chromium – Customer Tap Sites 2021-22

Table 34: Chromium results for customer tap sites (Water quality standard - ADWG health-based guideline value: 0.05 mg/L)

Water Sampling Locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	Quarterly	4	<0.001	<0.001	0
Bealiba	Quarterly	4	<0.001	<0.001	0
Bendigo (Northern)	Quarterly	4	<0.001	<0.001	0
Bendigo (Southern)	Quarterly	4	<0.001	<0.001	0
Bendigo (Spring Gully)	Quarterly	4	<0.001	<0.001	0
Big Hill	Quarterly	4	<0.001	<0.001	0
Boort	Quarterly	4	<0.001	<0.001	0
Bridgewater - Inglewood	Quarterly	4	<0.001	<0.001	0
Castlemaine	Quarterly	4	<0.001	<0.001	0
Cohuna	Quarterly	4	<0.001	<0.001	0
Dunolly	Quarterly	4	<0.001	<0.001	0
Echuca	Quarterly	4	<0.001	<0.001	0
Elmore	Quarterly	4	<0.001	<0.001	0
Epsom - Huntly	Quarterly	4	<0.001	<0.001	0
Fryerstown	Quarterly	4	<0.001	<0.001	0
Goornong	Quarterly	4	<0.001	<0.001	0
Guildford	Quarterly	4	<0.001	<0.001	0
Gunbower	Quarterly	4	<0.001	<0.001	0
Harcourt	Quarterly	4	<0.001	<0.001	0
Heathcote	Quarterly	4	<0.001	<0.001	0
Junortoun	Quarterly	4	<0.001	<0.001	0
Korong Vale	Quarterly	4	<0.001	<0.001	0
Kyneton	Quarterly	4	<0.001	<0.001	0
Laanecoorie	Quarterly	4	<0.001	<0.001	0
Leitchville	Quarterly	4	<0.001	<0.001	0
Lockington	Quarterly	4	<0.001	<0.001	0
Maiden Gully - Marong	Quarterly	4	<0.001	<0.001	0
Maldon	Quarterly	4	<0.001	<0.001	0
Malmsbury	Quarterly	4	<0.001	<0.001	0
Newstead	Quarterly	4	<0.001	<0.001	0
Pyramid Hill	Quarterly	4	<0.001	<0.001	0
Raywood	Quarterly	4	<0.001	<0.001	0
Rochester	Quarterly	4	<0.001	<0.001	0
Sebastian	Quarterly	4	<0.001	<0.001	0
Serpentine	Quarterly	4	<0.001	<0.001	0
Strathfieldsaye	Quarterly	4	<0.001	<0.001	0
Taradale - Elphinstone	Quarterly	4	<0.001	<0.001	0
Tarnagulla	Quarterly	4	<0.001	<0.001	0
Tooborac	Quarterly	4	<0.001	<0.001	0
Trentham	Quarterly	4	<0.001	<0.001	0
Tylden	Quarterly	4	<0.001	<0.001	0
Wedderburn	Quarterly	4	<0.001	<0.001	0

Cyanide – Customer Tap Sites 2021-22

Table 35: Cyanide results for customer tap sites (Water quality standard - ADWG health-based guideline value: 0.08 mg/L)

Water Sampling Locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	Quarterly	4	<0.005	<0.005	0
Bealiba	Quarterly	4	<0.005	<0.005	0
Bendigo (Northern)	Quarterly	4	<0.005	<0.005	0
Bendigo (Southern)	Quarterly	4	<0.005	<0.005	0
Bendigo (Spring Gully)	Quarterly	4	<0.005	<0.005	0
Big Hill	Quarterly	4	<0.005	<0.005	0
Boort	Quarterly	4	<0.005	<0.005	0
Bridgewater - Inglewood	Quarterly	4	<0.005	<0.005	0
Castlemaine	Quarterly	4	<0.005	<0.005	0
Cohuna	Quarterly	4	<0.005	<0.005	0
Dunolly	Quarterly	4	<0.005	<0.005	0
Echuca	Quarterly	4	<0.005	<0.005	0
Elmore	Quarterly	4	<0.005	<0.005	0
Epsom - Huntly	Quarterly	4	<0.005	<0.005	0
Fryerstown	Quarterly	4	<0.005	<0.005	0
Goorong	Quarterly	4	<0.005	<0.005	0
Guildford	Quarterly	4	<0.005	<0.005	0
Gunbower	Quarterly	4	<0.005	<0.005	0
Harcourt	Quarterly	4	<0.005	<0.005	0
Heathcote	Quarterly	4	<0.005	<0.005	0
Junortoun	Quarterly	4	<0.005	<0.005	0
Korong Vale	Quarterly	4	<0.005	<0.005	0
Kyneton	Quarterly	4	<0.005	<0.005	0
Laanecoorie	Quarterly	4	<0.005	<0.005	0
Leitchville	Quarterly	4	<0.005	<0.005	0
Lockington	Quarterly	4	<0.005	<0.005	0
Maiden Gully - Marong	Quarterly	4	<0.005	<0.005	0
Maldon	Quarterly	4	<0.005	<0.005	0
Malmsbury	Quarterly	4	<0.005	<0.005	0
Newstead	Quarterly	4	<0.005	<0.005	0
Pyramid Hill	Quarterly	4	<0.005	<0.005	0
Raywood	Quarterly	4	<0.005	<0.005	0
Rochester	Quarterly	4	<0.005	<0.005	0
Sebastian	Quarterly	4	<0.005	<0.005	0
Serpentine	Quarterly	4	<0.005	<0.005	0
Strathfieldsaye	Quarterly	4	<0.005	<0.005	0
Taradale - Elphinstone	Quarterly	4	<0.005	<0.005	0
Tarnagulla	Quarterly	4	0.006	0.003	0
Tooborac	Quarterly	4	<0.005	<0.005	0
Trentham	Quarterly	4	<0.005	<0.005	0
Tylden	Quarterly	4	<0.005	<0.005	0
Wedderburn	Quarterly	4	<0.005	<0.005	0

Mercury – Customer Tap Sites 2021-22

Table 36: Mercury results for customer tap sites (Water quality standard - ADWG health-based guideline value: 0.001 mg/L)

Water Sampling Locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	Quarterly	4	<0.0001	<0.0001	0
Bealiba	Quarterly	4	<0.0001	<0.0001	0
Bendigo (Northern)	Quarterly	4	<0.0001	<0.0001	0
Bendigo (Southern)	Quarterly	4	<0.0001	<0.0001	0
Bendigo (Spring Gully)	Quarterly	4	<0.0001	<0.0001	0
Big Hill	Quarterly	4	<0.0001	<0.0001	0
Boort	Quarterly	4	<0.0001	<0.0001	0
Bridgewater - Inglewood	Quarterly	4	<0.0001	<0.0001	0
Castlemaine	Quarterly	4	<0.0001	<0.0001	0
Cohuna	Quarterly	4	<0.0001	<0.0001	0
Dunolly	Quarterly	4	<0.0001	<0.0001	0
Echuca	Quarterly	4	<0.0001	<0.0001	0
Elmore	Quarterly	4	<0.0001	<0.0001	0
Epsom - Huntly	Quarterly	4	<0.0001	<0.0001	0
Fryerstown	Quarterly	4	<0.0001	<0.0001	0
Goorong	Quarterly	4	<0.0001	<0.0001	0
Guildford	Quarterly	4	<0.0001	<0.0001	0
Gunbower	Quarterly	4	<0.0001	<0.0001	0
Harcourt	Quarterly	4	<0.0001	<0.0001	0
Heathcote	Quarterly	4	<0.0001	<0.0001	0
Junortoun	Quarterly	4	<0.0001	<0.0001	0
Korong Vale	Quarterly	4	<0.0001	<0.0001	0
Kyneton	Quarterly	4	<0.0001	<0.0001	0
Laanecoorie	Quarterly	4	<0.0001	<0.0001	0
Leitchville	Quarterly	4	<0.0001	<0.0001	0
Lockington	Quarterly	4	<0.0001	<0.0001	0
Maiden Gully - Marong	Quarterly	4	<0.0001	<0.0001	0
Maldon	Quarterly	4	<0.0001	<0.0001	0
Malmsbury	Quarterly	4	<0.0001	<0.0001	0
Newstead	Quarterly	4	<0.0001	<0.0001	0
Pyramid Hill	Quarterly	4	<0.0001	<0.0001	0
Raywood	Quarterly	4	<0.0001	<0.0001	0
Rochester	Quarterly	4	<0.0001	<0.0001	0
Sebastian	Quarterly	4	<0.0001	<0.0001	0
Serpentine	Quarterly	4	<0.0001	<0.0001	0
Strathfieldsaye	Quarterly	4	<0.0001	<0.0001	0
Taradale - Elphinstone	Quarterly	4	<0.0001	<0.0001	0
Tarnagulla	Quarterly	4	<0.0001	<0.0001	0
Tooborac	Quarterly	4	<0.0001	<0.0001	0
Trentham	Quarterly	4	<0.0001	<0.0001	0
Tylden	Quarterly	4	<0.0001	<0.0001	0
Wedderburn	Quarterly	4	<0.0001	<0.0001	0

Nitrate – Customer Tap Sites 2021-22

Table 37: Nitrate results for customer tap sites (Water quality standard - ADWG health-based guideline value: 50 mg/L)

Water Sampling Locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale ²	Quarterly	4	4.4	3.7	0
Bealiba ¹	Fortnightly	26	4.1	2.5	0
Bendigo (Northern) ¹	Fortnightly	26	3.9	1.8	0
Bendigo (Southern) ¹	Fortnightly	26	3.6	1.7	0
Bendigo (Spring Gully) ¹	Fortnightly	26	3.9	1.8	0
Big Hill ¹	Fortnightly	27	4.0	2.0	0
Boort ²	Quarterly	4	0.6	0.3	0
Bridgewater-Inglewood ¹	Fortnightly	26	0.8	0.3	0
Castlemaine ²	Quarterly	4	0.8	0.6	0
Cohuna ²	Quarterly	4	0.1	0.0	0
Dunolly ¹	Fortnightly	26	3.9	1.1	0
Echuca ²	Quarterly	5	0.5	0.2	0
Elmore ²	Quarterly	4	8.9	6.5	0
Epsom - Huntly ¹	Fortnightly	26	2.4	1.7	0
Fryerstown ²	Quarterly	4	1.2	0.7	0
Goornong ²	Quarterly	4	0.3	0.2	0
Guildford ²	Quarterly	4	0.8	0.6	0
Gunbower ²	Quarterly	4	0.3	0.1	0
Harcourt ²	Quarterly	4	3.5	1.4	0
Heathcote ¹	Fortnightly	26	2.0	0.5	0
Junortoun ¹	Fortnightly	26	5.8	2.2	0
Korong Vale ¹	Fortnightly	26	2.4	0.5	0
Kyneton ²	Quarterly	4	2.5	1.9	0
Laanecoorie ¹	Fortnightly	26	4.3	1.0	0
Leitchville ²	Quarterly	4	0.1	0.0	0
Lockington ²	Quarterly	4	0.3	0.2	0
Maiden Gully - Marong ¹	Fortnightly	26	4.0	1.8	0
Maldon ²	Quarterly	4	1.0	0.7	0
Malmsbury ²	Quarterly	4	2.3	1.8	0
Newstead ²	Quarterly	4	0.8	0.6	0
Pyramid Hill ²	Quarterly	4	0.1	0.1	0
Raywood ²	Quarterly	4	4.2	3.7	0
Rochester ²	Quarterly	4	0.9	0.5	0
Sebastian ²	Quarterly	4	4.0	3.2	0
Serpentine ²	Quarterly	4	1.0	0.6	0
Strathfieldsaye ¹	Fortnightly	27	2.4	1.5	0
Taradale – Elphinstone ²	Quarterly	4	0.9	0.7	0
Tarnagulla ¹	Fortnightly	26	3.2	1.5	0
Tooborac ²	Quarterly	4	2.2	1.8	0
Trentham ²	Quarterly	4	8.4	6.3	0
Tylden ²	Quarterly	4	2.3	1.8	0
Wedderburn ¹	Fortnightly	26	3.2	0.5	0

Note:

- 1 Chloraminated systems are sampled fortnightly, to assist in monitoring for nitrification.
- 2 Chlorinated systems are sampled quarterly.

Selenium – Customer Tap Sites 2021-22

Table 38: Selenium results for customer tap sites (Water quality standard - ADWG health-based guideline value: 0.01 mg/L)

Water Sampling Locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	Quarterly	4	<0.001	<0.001	0
Bealiba	Quarterly	4	<0.001	<0.001	0
Bendigo (Northern)	Quarterly	4	<0.001	<0.001	0
Bendigo (Southern)	Quarterly	4	<0.001	<0.001	0
Bendigo (Spring Gully)	Quarterly	4	<0.001	<0.001	0
Big Hill	Quarterly	4	<0.001	<0.001	0
Boort	Quarterly	4	<0.001	<0.001	0
Bridgewater - Inglewood	Quarterly	4	<0.001	<0.001	0
Castlemaine	Quarterly	4	<0.001	<0.001	0
Cohuna	Quarterly	4	<0.001	<0.001	0
Dunolly	Quarterly	4	<0.001	<0.001	0
Echuca	Quarterly	4	<0.001	<0.001	0
Elmore	Quarterly	4	<0.001	<0.001	0
Epsom - Huntly	Quarterly	4	<0.001	<0.001	0
Fryerstown	Quarterly	4	<0.001	<0.001	0
Goorong	Quarterly	4	<0.001	<0.001	0
Guildford	Quarterly	4	<0.001	<0.001	0
Gunbower	Quarterly	4	<0.001	<0.001	0
Harcourt	Quarterly	4	<0.001	<0.001	0
Heathcote	Quarterly	4	<0.001	<0.001	0
Junortoun	Quarterly	4	<0.001	<0.001	0
Korong Vale	Quarterly	4	<0.001	<0.001	0
Kyneton	Quarterly	4	<0.001	<0.001	0
Laanecoorie	Quarterly	4	<0.001	<0.001	0
Leitchville	Quarterly	4	<0.001	<0.001	0
Lockington	Quarterly	4	<0.001	<0.001	0
Maiden Gully - Marong	Quarterly	4	<0.001	<0.001	0
Maldon	Quarterly	4	<0.001	<0.001	0
Malmsbury	Quarterly	4	<0.001	<0.001	0
Newstead	Quarterly	4	<0.001	<0.001	0
Pyramid Hill	Quarterly	4	<0.001	<0.001	0
Raywood	Quarterly	4	<0.001	<0.001	0
Rochester	Quarterly	4	<0.001	<0.001	0
Sebastian	Quarterly	4	<0.001	<0.001	0
Serpentine	Quarterly	4	<0.001	<0.001	0
Strathfieldsaye	Quarterly	4	<0.001	<0.001	0
Taradale - Elphinstone	Quarterly	4	<0.001	<0.001	0
Tarnagulla	Quarterly	4	<0.001	<0.001	0
Tooborac	Quarterly	4	<0.001	<0.001	0
Trentham	Quarterly	4	<0.001	<0.001	0
Tylden	Quarterly	4	<0.001	<0.001	0
Wedderburn	Quarterly	4	<0.001	<0.001	0

Sulphate – Customer Tap Sites 2021-22

Table 39: Sulphate results for customer tap sites (Water quality standard - ADWG health-based guideline value 500 mg/L)

Water Sampling Locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	Quarterly	4	4.000	3.750	0
Bealiba	Quarterly	4	91.000	72.250	0
Bendigo (Northern)	Quarterly	4	4.000	3.750	0
Bendigo (Southern)	Quarterly	4	4.000	3.500	0
Bendigo (Spring Gully)	Quarterly	4	4.000	3.500	0
Big Hill	Quarterly	4	4.000	3.500	0
Boort	Quarterly	4	47.000	44.250	0
Bridgewater - Inglewood	Quarterly	4	5.000	3.750	0
Castlemaine	Quarterly	4	5.000	5.000	0
Cohuna	Quarterly	4	32.000	24.250	0
Dunolly	Quarterly	4	90.000	70.500	0
Echuca	Quarterly	4	27.000	24.400	0
Elmore	Quarterly	4	9.000	8.250	0
Epsom - Huntly	Quarterly	4	4.000	3.500	0
Fryerstown	Quarterly	4	5.000	4.500	0
Goorong	Quarterly	4	68.000	53.750	0
Guildford	Quarterly	4	5.000	4.250	0
Gunbower	Quarterly	4	2.000	1.750	0
Harcourt	Quarterly	4	5.000	4.500	0
Heathcote	Quarterly	4	64.000	56.000	0
Junortoun	Quarterly	4	4.000	3.500	0
Korong Vale	Quarterly	4	12.000	10.500	0
Kyneton	Quarterly	4	3.000	2.500	0
Laanecoorie	Quarterly	4	83.000	69.000	0
Leitchville	Quarterly	4	30.000	19.750	0
Lockington	Quarterly	4	4.000	3.500	0
Maiden Gully - Marong	Quarterly	4	4.000	3.500	0
Maldon	Quarterly	4	6.000	4.750	0
Malmsbury	Quarterly	4	4.000	3.000	0
Newstead	Quarterly	4	5.000	4.250	0
Pyramid Hill	Quarterly	4	28.000	24.250	0
Raywood	Quarterly	4	4.000	3.250	0
Rochester	Quarterly	4	23.000	20.250	0
Sebastian	Quarterly	4	4.000	3.250	0
Serpentine	Quarterly	4	23.000	22.000	0
Strathfieldsaye	Quarterly	4	4.000	3.750	0
Taradale - Elphinstone	Quarterly	4	5.000	4.250	0
Tarnagulla	Quarterly	4	97.000	72.500	0
Tooborac	Quarterly	4	64.000	56.000	0
Trentham	Quarterly	4	<1	<1	0
Tylden	Quarterly	4	3.000	2.750	0
Wedderburn	Quarterly	4	12.000	10.750	0

Manganese – Customer Tap Sites 2021-22

Table 40: Manganese results for customer tap sites (Water quality standard - ADWG health-based guideline value: 0.5 mg/L)

Water Sampling Locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	Monthly	12	0.001	0.001	0
Bealiba	Monthly	12	0.006	0.003	0
Bendigo (Northern)	Monthly	12	0.004	0.002	0
Bendigo (Southern)	Monthly	12	0.005	0.003	0
Bendigo (Spring Gully)	Monthly	12	0.005	0.002	0
Big Hill	Monthly	12	0.005	0.003	0
Boort	Monthly	12	0.046	0.008	0
Bridgewater - Inglewood	Monthly	12	0.002	0.001	0
Castlemaine	Monthly	12	0.003	0.002	0
Cohuna	Monthly	12	0.006	0.002	0
Dunolly	Monthly	12	0.009	0.004	0
Echuca	Monthly	12	0.014	0.004	0
Elmore	Monthly	12	<0.001	<0.001	0
Epsom - Huntly	Monthly	12	0.005	0.002	0
Fryerstown	Monthly	12	0.006	0.002	0
Goorong	Monthly	12	0.001	0.001	0
Guildford	Monthly	12	0.005	0.001	0
Gunbower	Monthly	12	0.001	0.001	0
Harcourt	Monthly	12	0.006	0.002	0
Heathcote	Monthly	12	0.095	0.010	0
Junortoun	Monthly	12	0.004	0.002	0
Korong Vale	Monthly	12	0.002	0.001	0
Kyneton	Monthly	12	0.031	0.004	0
Laanecoorie	Monthly	12	0.044	0.009	0
Leitchville	Monthly	12	0.009	0.003	0
Lockington	Monthly	12	<0.001	<0.001	0
Maiden Gully - Marong	Monthly	12	0.005	0.002	0
Maldon	Monthly	12	0.004	0.001	0
Malmsbury	Monthly	12	0.003	0.002	0
Newstead	Monthly	12	0.004	0.002	0
Pyramid Hill	Monthly	12	0.011	0.003	0
Raywood	Monthly	12	0.002	0.001	0
Rochester	Monthly	12	0.003	0.001	0
Sebastian	Monthly	13	0.001	0.001	0
Serpentine	Monthly	12	0.002	0.002	0
Strathfieldsaye	Monthly	12	0.006	0.003	0
Taradale - Elphinstone	Monthly	12	0.005	0.002	0
Tarnagulla	Monthly	12	0.009	0.004	0
Tooborac	Monthly	12	0.006	0.002	0
Trentham	Monthly	12	0.002	0.001	0
Tylden	Monthly	12	0.004	0.002	0
Wedderburn	Monthly	12	0.001	0.001	0

Copper – Customer Tap Sites 2021-22

Table 41: Copper results for customer tap sites (Water quality standard - ADWG health-based guideline value: 2.0 mg/L)

Water Sampling Locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	Monthly	12	0.01	0.00	0
Bealiba	Monthly	12	0.01	0.01	0
Bendigo (Northern)	Monthly	12	0.02	0.01	0
Bendigo (Southern)	Monthly	12	0.02	0.01	0
Bendigo (Spring Gully)	Monthly	12	0.03	0.01	0
Big Hill	Monthly	12	0.02	0.01	0
Boort	Monthly	12	0.01	0.00	0
Bridgewater - Inglewood	Monthly	12	0.00	0.00	0
Castlemaine	Monthly	12	0.07	0.02	0
Cohuna	Monthly	12	0.01	0.00	0
Dunolly	Monthly	12	0.02	0.00	0
Echuca	Monthly	12	0.00	0.00	0
Elmore	Monthly	12	0.01	0.00	0
Epsom - Huntly	Monthly	12	0.06	0.01	0
Fryerstown	Monthly	12	0.12	0.03	0
Goornong	Monthly	12	0.00	0.00	0
Guildford	Monthly	12	0.04	0.02	0
Gunbower	Monthly	12	0.01	0.00	0
Harcourt	Monthly	12	0.04	0.02	0
Heathcote	Monthly	12	0.01	0.01	0
Junortoun	Monthly	12	0.02	0.01	0
Korong Vale	Monthly	12	0.00	0.00	0
Kyneton	Monthly	12	0.03	0.01	0
Laanecoorie	Monthly	12	0.00	0.00	0
Leitchville	Monthly	12	0.01	0.00	0
Lockington	Monthly	12	0.00	0.00	0
Maiden Gully - Marong	Monthly	12	0.01	0.01	0
Maldon	Monthly	12	0.05	0.03	0
Malmsbury	Monthly	12	0.02	0.01	0
Newstead	Monthly	12	0.02	0.01	0
Pyramid Hill	Monthly	12	0.02	0.01	0
Raywood	Monthly	12	0.01	0.01	0
Rochester	Monthly	12	0.03	0.01	0
Sebastian	Monthly	12	0.03	0.02	0
Serpentine	Monthly	12	0.02	0.00	0
Strathfieldsaye	Monthly	12	0.01	0.01	0
Taradale - Elphinstone	Monthly	12	0.06	0.02	0
Tarnagulla	Monthly	12	0.02	0.01	0
Tooborac	Monthly	12	0.06	0.01	0
Trentham	Monthly	12	0.03	0.01	0
Tylden	Monthly	12	0.10	0.02	0
Wedderburn	Monthly	12	0.00	0.00	0

Lead – Customer Tap Sites 2020-21

Table 42: Lead results for customer tap sites (Water quality standard - ADWG health-based guideline value: 0.01 mg/L)

Water Sampling Locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	Monthly	12	<0.001	<0.001	0
Bealiba	Monthly	12	<0.001	<0.001	0
Bendigo (Northern)	Monthly	12	<0.001	<0.001	0
Bendigo (Southern)	Monthly	12	<0.001	<0.001	0
Bendigo (Spring Gully)	Monthly	12	<0.001	<0.001	0
Big Hill	Monthly	12	<0.001	<0.001	0
Boort	Monthly	12	0.0010	0.0005	0
Bridgewater - Inglewood	Monthly	12	<0.001	<0.001	0
Castlemaine	Monthly	12	0.0010	0.0005	0
Cohuna	Monthly	12	<0.001	<0.001	0
Dunolly	Monthly	12	<0.001	<0.001	0
Echuca	Monthly	12	<0.001	<0.001	0
Elmore	Monthly	12	<0.001	<0.001	0
Epsom - Huntly	Monthly	12	<0.001	<0.001	0
Fryerstown	Monthly	12	0.0010	0.0005	0
Goorong	Monthly	12	<0.001	<0.001	0
Guildford	Monthly	12	0.0020	0.0008	0
Gunbower	Monthly	12	<0.001	<0.001	0
Harcourt	Monthly	12	<0.001	<0.001	0
Heathcote	Monthly	12	0.0020	0.0006	0
Junortoun	Monthly	12	<0.001	<0.001	0
Korong Vale	Monthly	12	<0.001	<0.001	0
Kyneton	Monthly	12	0.0010	0.0005	0
Laanecoorie	Monthly	12	<0.001	<0.001	0
Leitchville	Monthly	12	<0.001	<0.001	0
Lockington	Monthly	12	<0.001	<0.001	0
Maiden Gully - Marong	Monthly	12	<0.001	<0.001	0
Maldon	Monthly	12	<0.001	<0.001	0
Malmsbury	Monthly	12	<0.001	<0.001	0
Newstead	Monthly	12	<0.001	<0.001	0
Pyramid Hill	Monthly	12	<0.001	<0.001	0
Raywood	Monthly	12	<0.001	<0.001	0
Rochester	Monthly	12	<0.001	<0.001	0
Sebastian	Monthly	12	<0.001	<0.001	0
Serpentine	Monthly	12	<0.001	<0.001	0
Strathfieldsaye	Monthly	12	<0.001	<0.001	0
Taradale - Elphinstone	Monthly	12	0.0020	0.0007	0
Tarnagulla	Monthly	12	<0.001	<0.001	0
Tooborac	Monthly	12	0.0030	0.0008	0
Trentham	Monthly	12	<0.001	<0.001	0
Tylden	Monthly	12	0.0020	0.0006	0
Wedderburn	Monthly	12	0.0010	0.0005	0

Nickel – Customer Tap Sites 2021-22

Table 43: Nickel results for customer tap sites (Water quality standard - ADWG health-based guideline value: 0.02 mg/L)

Water Sampling Locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	Monthly	12	<0.001	<0.001	0
Bealiba	Monthly	12	0.00	0.00	0
Bendigo (Northern)	Monthly	12	0.00	0.00	0
Bendigo (Southern)	Monthly	12	0.00	0.00	0
Bendigo (Spring Gully)	Monthly	12	0.00	0.00	0
Big Hill	Monthly	12	0.00	0.00	0
Boort	Monthly	12	<0.001	<0.001	0
Bridgewater - Inglewood	Monthly	12	<0.001	<0.001	0
Castlemaine	Monthly	12	<0.001	<0.001	0
Cohuna	Monthly	12	<0.001	<0.001	0
Dunolly	Monthly	12	0.00	0.00	0
Echuca	Monthly	12	<0.001	<0.001	0
Elmore	Monthly	12	<0.001	<0.001	0
Epsom - Huntly	Monthly	12	0.00	0.00	0
Fryerstown	Monthly	12	<0.001	<0.001	0
Goornong	Monthly	12	<0.001	<0.001	0
Guildford	Monthly	12	<0.001	<0.001	0
Gunbower	Monthly	12	<0.001	<0.001	0
Harcourt	Monthly	12	<0.001	<0.001	0
Heathcote	Monthly	12	0.00	0.00	0
Junortoun	Monthly	12	<0.001	<0.001	0
Korong Vale	Monthly	12	<0.001	<0.001	0
Kyneton	Monthly	12	<0.001	<0.001	0
Laanecoorie	Monthly	12	0.00	0.00	0
Leitchville	Monthly	12	<0.001	<0.001	0
Lockington	Monthly	12	<0.001	<0.001	0
Maiden Gully - Marong	Monthly	12	0.00	0.00	0
Maldon	Monthly	12	<0.001	<0.001	0
Malmsbury	Monthly	12	<0.001	<0.001	0
Newstead	Monthly	12	<0.001	<0.001	0
Pyramid Hill	Monthly	12	<0.001	<0.001	0
Raywood	Monthly	12	<0.001	<0.001	0
Rochester	Monthly	12	<0.001	<0.001	0
Sebastian	Monthly	12	<0.001	<0.001	0
Serpentine	Monthly	12	<0.001	<0.001	0
Strathfieldsaye	Monthly	12	0.00	0.00	0
Taradale - Elphinstone	Monthly	12	<0.001	<0.001	0
Tarnagulla	Monthly	12	0.00	0.00	0
Tooborac	Monthly	12	0.00	0.00	0
Trentham	Monthly	12	<0.001	<0.001	0
Tylden	Monthly	12	<0.001	<0.001	0
Wedderburn	Monthly	12	<0.001	<0.001	0

Alpha Count – Customer Tap Sites 2021-22

Table 44: Alpha count results for customer tap sites (Water quality standard - ADWG health-based guideline value: 0.5 bq/L)

Water Sampling Locality	Sampling frequency	Number of samples	Value (bq/L)	Number of samples where standard was not met
Axedale	Annual	1	<0.05	0
Bealiba	Annual	1	<0.05	0
Bendigo (Northern)	Annual	1	<0.05	0
Bendigo (Southern)	Annual	1	<0.05	0
Bendigo (Spring Gully)	Annual	1	<0.05	0
Big Hill	Annual	1	<0.05	0
Boort	Annual	1	<0.05	0
Bridgewater - Inglewood	Annual	1	<0.05	0
Castlemaine	Annual	1	<0.05	0
Cohuna	Annual	1	<0.05	0
Dunolly	Annual	1	<0.05	0
Echuca	Annual	1	<0.05	0
Elmore	Annual	1	<0.05	0
Epsom - Huntly	Annual	1	<0.05	0
Fryerstown	Annual	1	<0.05	0
Goornong	Annual	1	<0.05	0
Guildford	Annual	1	<0.05	0
Gunbower	Annual	1	<0.05	0
Harcourt	Annual	1	<0.05	0
Heathcote	Annual	1	<0.05	0
Junortoun	Annual	1	<0.05	0
Korong Vale	Annual	1	<0.05	0
Kyneton	Annual	1	<0.05	0
Laanecoorie	Annual	1	<0.05	0
Leitchville	Annual	1	<0.05	0
Lockington	Annual	1	<0.05	0
Maiden Gully - Marong	Annual	1	<0.05	0
Maldon	Annual	1	<0.05	0
Malmsbury	Annual	1	<0.05	0
Newstead	Annual	1	<0.05	0
Pyramid Hill	Annual	1	<0.05	0
Raywood	Annual	1	<0.05	0
Rochester	Annual	1	<0.05	0
Sebastian	Annual	1	<0.05	0
Serpentine	Annual	1	<0.05	0
Strathfieldsaye	Annual	1	<0.05	0
Taradale - Elphinstone	Annual	1	<0.05	0
Tarnagulla	Annual	1	<0.05	0
Tooborac	Annual	1	<0.05	0
Trentham	Annual	1	<0.05	0
Tylden	Annual	1	<0.05	0
Wedderburn	Annual	1	<0.05	0

Beta Count – Customer Tap Sites 2021-22

Table 45: Beta count results for customer tap sites (Water quality standard - ADWG health-based guideline value: 0.5 bq/L)

Water Sampling Locality	Sampling frequency	Number of samples	Value (bq/L)	Number of samples where standard was not met
Axedale	Annual	1	<0.1	0
Bealiba	Annual	1	<0.1	0
Bendigo (Northern)	Annual	1	<0.10	0
Bendigo (Southern)	Annual	1	<0.10	0
Bendigo (Spring Gully)	Annual	1	<0.10	0
Big Hill	Annual	1	<0.10	0
Boort	Annual	1	<0.10	0
Bridgewater - Inglewood	Annual	1	<0.1	0
Castlemaine	Annual	1	<0.10	0
Cohuna	Annual	1	<0.10	0
Dunolly	Annual	1	<0.10	0
Echuca	Annual	1	<0.10	0
Elmore	Annual	1	<0.10	0
Epsom - Huntly	Annual	1	<0.10	0
Fryerstown	Annual	1	<0.1	0
Goornong	Annual	1	<0.10	0
Guildford	Annual	1	<0.10	0
Gunbower	Annual	1	<0.10	0
Harcourt	Annual	1	<0.10	0
Heathcote	Annual	1	<0.1	0
Junortoun	Annual	1	<0.1	0
Korong Vale	Annual	1	<0.1	0
Kyneton	Annual	1	<0.10	0
Laanecoorie	Annual	1	<0.10	0
Leitchville	Annual	1	<0.1	0
Lockington	Annual	1	<0.1	0
Maiden Gully - Marong	Annual	1	<0.10	0
Maldon	Annual	1	<0.10	0
Malmsbury	Annual	1	<0.10	0
Newstead	Annual	1	<0.10	0
Pyramid Hill	Annual	1	<0.10	0
Raywood	Annual	1	<0.10	0
Rochester	Annual	1	<0.10	0
Sebastian	Annual	1	<0.10	0
Serpentine	Annual	1	<0.1	0
Strathfieldsaye	Annual	1	<0.1	0
Taradale - Elphinstone	Annual	1	<0.1	0
Tarnagulla	Annual	1	<0.10	0
Tooborac	Annual	1	<0.1	0
Trentham	Annual	1	<0.1	0
Tylden	Annual	1	<0.10	0
Wedderburn	Annual	1	<0.1	0

Nitrite – Customer Tap Sites 2021-22

Table 46: Nitrite results for customer tap sites (Water quality standard - ADWG health-based guideline value: 3.0 mg/L)

Water Sampling Locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	n/a	n/a	n/a	n/a	n/a
Bealiba	Fortnightly	26	1.05	0.46	0
Bendigo (Northern)	Fortnightly	26	1.35	0.37	0
Bendigo (Southern)	Fortnightly	26	0.82	0.20	0
Bendigo (Spring Gully)	Fortnightly	26	1.58	0.47	0
Big Hill	Fortnightly	27	1.15	0.34	0
Boort	n/a	n/a	n/a	n/a	n/a
Bridgewater - Inglewood	Fortnightly	26	0.07	0.02	0
Castlemaine	n/a	n/a	n/a	n/a	n/a
Cohuna	n/a	n/a	n/a	n/a	n/a
Dunolly	Fortnightly	26	1.25	0.36	0
Echuca	n/a	n/a	n/a	n/a	n/a
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	Fortnightly	26	1.84	0.59	0
Fryerstown	n/a	n/a	n/a	n/a	n/a
Goornong	n/a	n/a	n/a	n/a	n/a
Guildford	n/a	n/a	n/a	n/a	n/a
Gunbower	n/a	n/a	n/a	n/a	n/a
Harcourt	n/a	n/a	n/a	n/a	n/a
Heathcote	Fortnightly	26	0.07	0.02	0
Junortoun	Fortnightly	26	1.90	0.72	0
Korong Vale	Fortnightly	26	0.46	0.06	0
Kyneton	n/a	n/a	n/a	n/a	n/a
Laanecoorie	Fortnightly	26	0.56	0.07	0
Leitchville	n/a	n/a	n/a	n/a	n/a
Lockington	n/a	n/a	n/a	n/a	n/a
Maiden Gully - Marong	Fortnightly	26	1.15	0.24	0
Maldon	n/a	n/a	n/a	n/a	n/a
Malmsbury	n/a	n/a	n/a	n/a	n/a
Newstead	n/a	n/a	n/a	n/a	n/a
Pyramid Hill	n/a	n/a	n/a	n/a	n/a
Raywood	n/a	n/a	n/a	n/a	n/a
Rochester	n/a	n/a	n/a	n/a	n/a
Sebastian	n/a	n/a	n/a	n/a	n/a
Serpentine	n/a	n/a	n/a	n/a	n/a
Strathfieldsaye	Fortnightly	27	1.02	0.17	0
Taradale - Elphinstone	n/a	n/a	n/a	n/a	n/a
Tarnagulla	Fortnightly	26	1.51	0.45	0
Tooborac	n/a	n/a	n/a	n/a	n/a
Trentham	n/a	n/a	n/a	n/a	n/a
Tylden	n/a	n/a	n/a	n/a	n/a
Wedderburn	Fortnightly	26	0.59	0.07	0

NDMA – Customer Tap Sites 2021-22

Table 47: NDMA results for customer tap sites (Water quality standard - ADWG health-based guideline value: 0.1 ug/L)

Water Sampling Locality	Sampling frequency	Number of samples	Maximum (ug/L)	Average (ug/L)	Number of samples where standard was not met
Axedale	Quarterly	4	0.0040	0.0021	0
Bealiba	Quarterly	4	0.0250	0.0124	0
Bendigo (Northern)	Quarterly	4	<0.003	<0.003	0
Bendigo (Southern)	Quarterly	4	<0.003	<0.003	0
Bendigo (Spring Gully)	Quarterly	4	<0.003	<0.003	0
Big Hill	Quarterly	4	0.0040	0.0021	0
Boort	n/a	n/a	n/a	n/a	n/a
Bridgewater - Inglewood	Quarterly	4	0.0240	0.0134	0
Castlemaine	Quarterly	4	<0.003	<0.003	0
Cohuna	n/a	n/a	n/a	n/a	n/a
Dunolly	Quarterly	4	0.0070	0.0044	0
Echuca	n/a	n/a	n/a	n/a	n/a
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	Quarterly	4	<0.003	<0.003	0
Fryerstown	Quarterly	4	<0.003	<0.003	0
Goorong	n/a	n/a	n/a	n/a	n/a
Guildford	Quarterly	4	<0.003	<0.003	0
Gunbower	n/a	n/a	n/a	n/a	n/a
Harcourt	Quarterly	4	<0.003	<0.003	0
Heathcote	Quarterly	4	0.0040	0.0025	0
Junortoun	Quarterly	4	<0.003	<0.003	0
Korong Vale	Quarterly	4	0.0040	0.0021	0
Kyneton	n/a	n/a	n/a	n/a	n/a
Laanecoorie	Quarterly	4	0.0070	0.0041	0
Leitchville	n/a	n/a	n/a	n/a	n/a
Lockington	n/a	n/a	n/a	n/a	n/a
Maiden Gully - Marong	Quarterly	4	<0.003	<0.003	0
Maldon	Quarterly	4	<0.003	<0.003	0
Malmsbury	n/a	n/a	n/a	n/a	n/a
Newstead	Quarterly	4	<0.003	<0.003	0
Pyramid Hill	n/a	n/a	n/a	n/a	n/a
Raywood	Quarterly	4	<0.003	<0.003	0
Rochester	n/a	n/a	n/a	n/a	n/a
Sebastian	Quarterly	4	0.0040	0.0021	0
Serpentine	n/a	n/a	n/a	n/a	n/a
Strathfieldsaye	Quarterly	4	<0.003	<0.003	0
Taradale - Elphinstone	Quarterly	4	<0.003	<0.003	0
Tarnagulla	Quarterly	4	0.0130	0.0071	0
Tooborac	Quarterly	4	0.0070	0.0038	0
Trentham	n/a	n/a	n/a	n/a	n/a
Tylden	n/a	n/a	n/a	n/a	n/a
Wedderburn	Quarterly	4	0.0050	0.0030	0

Note:

Localities where chloramination is not part of the treatment process have not had NDMA included in their monitoring program.

pH – Customer Tap Sites 2021-22

Table 48: pH results for customer tap sites (operating range: 6.5 - 8.5 pH Units)

Water Sampling Locality	Sampling frequency	Number of samples	Minimum	Maximum
Axedale	Monthly	12	7.8	8.0
Bealiba ¹	Monthly	12	8.2	8.7
Bendigo (Northern)	Monthly	12	7.5	8.0
Bendigo (Southern)	Monthly	12	7.8	8.0
Bendigo (Spring Gully)	Monthly	12	7.6	7.9
Big Hill	Monthly	12	7.6	8.0
Boort	Monthly	12	7.3	7.9
Bridgewater - Inglewood ¹	Monthly	12	7.6	9.0
Castlemaine	Monthly	12	7.2	7.9
Cohuna	Monthly	12	7.4	7.7
Dunolly ¹	Monthly	12	8.4	8.9
Echuca	Monthly	12	7.2	7.8
Elmore	Monthly	12	7.3	8.5
Epsom - Huntly	Monthly	12	7.6	7.9
Fryerstown	Monthly	12	7.4	8.1
Goornong ¹	Monthly	12	7.0	8.4
Guildford	Monthly	12	7.4	7.9
Gunbower ¹	Monthly	12	7.4	7.8
Harcourt	Monthly	12	7.6	8.0
Heathcote	Monthly	12	7.8	8.2
Junortoun	Monthly	12	7.5	8.0
Korong Vale ¹	Monthly	12	7.5	10.3
Kyneton	Monthly	12	7.2	7.8
Laanecoorie	Monthly	12	7.9	8.4
Leitchville	Monthly	12	7.4	7.8
Lockington	Monthly	12	7.6	8.2
Maiden Gully - Marong	Monthly	12	7.6	8.0
Maldon	Monthly	12	7.6	8.1
Malmsbury	Monthly	12	7.4	8.0
Newstead	Monthly	12	7.5	8.0
Pyramid Hill	Monthly	12	7.2	7.8
Raywood	Monthly	12	7.4	7.7
Rochester	Monthly	12	7.1	7.7
Sebastian	Monthly	12	7.6	9.2
Serpentine ¹	Monthly	12	7.3	9.2
Strathfieldsaye	Monthly	12	7.7	8.0
Taradale - Elphinstone	Monthly	12	7.4	8.1
Tarnagulla ¹	Monthly	12	8.3	9.0
Tooborac ¹	Monthly	12	7.9	9.2
Trentham ¹	Monthly	12	7.1	7.7
Tylden	Monthly	12	7.3	8.0
Wedderburn ¹	Monthly	12	7.8	9.4

Note:

1 Refer to section 4.3.1.2 for details on exceedances.

Aluminium – Customer Tap Sites 2021-22

Table 49: Aluminium results for customer tap sites (ADWG aesthetic guideline value: 0.2 mg/L)

Water Sampling Locality	Sampling Frequency	Number of Samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	Quarterly	4	0.04	0.03	0
Bealiba	Quarterly	4	0.02	0.02	0
Bendigo (Northern)	Quarterly	4	0.04	0.04	0
Bendigo (Southern)	Quarterly	4	0.05	0.04	0
Bendigo (Spring Gully)	Quarterly	4	0.05	0.04	0
Big Hill	Quarterly	4	0.04	0.04	0
Boort	Quarterly	4	0.02	0.02	0
Bridgewater - Inglewood	Quarterly	4	0.15	0.07	0
Castlemaine	Quarterly	4	0.02	0.02	0
Cohuna	Quarterly	4	0.04	0.02	0
Dunolly	Quarterly	4	0.03	0.02	0
Echuca	Quarterly	4	0.15	0.06	0
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	Quarterly	4	0.04	0.03	0
Fryerstown	Quarterly	4	0.02	0.02	0
Goorong	Quarterly	4	0.08	0.07	0
Guildford	Quarterly	4	0.02	0.02	0
Gunbower	Quarterly	4	0.08	0.04	0
Harcourt	Quarterly	4	0.02	0.02	0
Heathcote	Quarterly	4	0.03	0.02	0
Junortoun	Quarterly	4	0.04	0.04	0
Korong Vale	Quarterly	4	0.03	0.02	0
Kyneton	Quarterly	4	0.03	0.03	0
Laanecoorie	Quarterly	4	0.03	0.02	0
Leitchville	Quarterly	4	0.01	0.01	0
Lockington	Quarterly	4	0.08	0.06	0
Maiden Gully - Marong	Quarterly	4	0.04	0.04	0
Maldon	Quarterly	4	0.02	0.01	0
Malmsbury	Quarterly	4	0.03	0.03	0
Newstead	Quarterly	4	0.02	0.02	0
Pyramid Hill	Quarterly	4	0.05	0.03	0
Raywood	Quarterly	4	0.04	0.03	0
Rochester	Quarterly	4	<0.01	<0.01	0
Sebastian	Quarterly	4	0.04	0.03	0
Serpentine	Quarterly	4	0.04	0.03	0
Strathfieldsaye	Quarterly	4	0.05	0.04	0
Taradale - Elphinstone	Quarterly	4	0.03	0.02	0
Tarnagulla	Quarterly	4	0.03	0.03	0
Tooborac	Quarterly	4	0.02	0.02	0
Trentham	n/a	n/a	n/a	n/a	n/a
Tylden	Quarterly	4	0.03	0.02	0
Wedderburn	Quarterly	4	0.03	0.02	0

Note:

- 1 An aluminium based product is not used for coagulation at Elmore or Trentham, and therefore aluminium is not deemed to be a significant risk in this water supply.

Hardness – Customer Tap Sites 2021-22

To minimise undesirable build-up of scale in hot water systems, total hardness (as calcium carbonate) in drinking water should not exceed 200 mg/L.

Table 50: Hardness results for customer tap sites (ADWG aesthetic guideline limit: 200mg/L)

Water Sampling Locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where guideline was not met
Axedale	Quarterly	4	110	74	0
Bealiba	Quarterly	4	170	150	0
Bendigo (Northern)	Quarterly	4	67	65	0
Bendigo (Southern)	Quarterly	4	71	64	0
Bendigo (Spring Gully)	Quarterly	4	68	63	0
Big Hill	Quarterly	4	68	64	0
Boort	Quarterly	4	110	89	0
Bridgewater - Inglewood	Quarterly	4	27	23	0
Castlemaine	Quarterly	4	74	65	0
Cohuna	Quarterly	4	20	18	0
Dunolly	Quarterly	4	160	135	0
Echuca	Quarterly	4	19	16	0
Elmore	Quarterly	4	130	108	0
Epsom - Huntly	Quarterly	4	80	65	0
Fryerstown	Quarterly	4	87	70	0
Goornong	Quarterly	4	120	120	0
Guildford	Quarterly	4	83	71	0
Gunbower	Quarterly	4	17	16	0
Harcourt	Quarterly	4	89	73	0
Heathcote	Quarterly	4	120	107	0
Junortoun	Quarterly	4	69	62	0
Korong Vale	Quarterly	4	17	14	0
Kyneton	Quarterly	4	77	67	0
Laanecoorie	Quarterly	4	160	128	0
Leitchville	Quarterly	4	19	18	0
Lockington	Quarterly	4	33	29	0
Maiden Gully - Marong	Quarterly	4	70	63	0
Maldon	Quarterly	4	92	74	0
Malmsbury	Quarterly	4	76	72	0
Newstead	Quarterly	4	86	71	0
Pyramid Hill	Quarterly	4	43	36	0
Raywood	Quarterly	4	100	72	0
Rochester	Quarterly	4	27	22	0
Sebastian	Quarterly	4	100	67	0
Serpentine	Quarterly	4	37	30	0
Strathfieldsaye	Quarterly	4	67	65	0
Taradale - Elphinstone	Quarterly	4	81	72	0
Tarnagulla	Quarterly	4	200	160	0
Tooborac	Quarterly	4	160	120	0
Trentham	Quarterly	4	58	37	0
Tylden	Quarterly	4	74	70	0
Wedderburn	Quarterly	4	18	15	0

Iron – Customer Tap Sites 2021-22

The samples taken for analysis were obtained from the reticulation system. Iron levels may be higher at customers' internal taps, where galvanised iron pipes have been used in customers' plumbing.

Table 51: Iron results for customer tap sites (ADWG aesthetic guideline limit: 0.3 mg/L)

Water Sampling Locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where guideline was not met
Axedale	Monthly	12	0.02	0.01	0
Bealiba	Monthly	12	0.06	0.02	0
Bendigo (Northern)	Monthly	12	0.05	0.02	0
Bendigo (Southern)	Monthly	12	0.02	0.02	0
Bendigo (Spring Gully)	Monthly	12	0.03	0.02	0
Big Hill	Monthly	12	0.17	0.03	0
Boort	Monthly	12	0.08	0.03	0
Bridgewater - Inglewood	Monthly	12	0.02	0.01	0
Castlemaine	Monthly	12	0.02	0.01	0
Cohuna	Monthly	12	0.02	0.01	0
Dunolly	Monthly	12	0.02	0.01	0
Echuca	Monthly	12	0.03	0.01	0
Elmore	Monthly	12	<0.01	<0.01	0
Epsom - Huntly	Monthly	12	0.03	0.01	0
Fryerstown	Monthly	12	0.03	0.02	0
Goornong	Monthly	12	0.08	0.02	0
Guildford	Monthly	12	0.03	0.02	0
Gunbower	Monthly	12	<0.01	<0.01	0
Harcourt	Monthly	12	0.02	0.02	0
Heathcote	Monthly	12	0.04	0.02	0
Junortoun	Monthly	12	0.02	0.01	0
Korong Vale	Monthly	12	0.13	0.05	0
Kyneton ¹	Monthly	12	0.67	0.07	1
Laanecoorie	Monthly	12	0.03	0.02	0
Leitchville	Monthly	12	<0.01	<0.01	0
Lockington	Monthly	12	0.02	0.01	0
Maiden Gully - Marong	Monthly	12	0.02	0.01	0
Maldon	Monthly	12	0.01	0.01	0
Malmsbury	Monthly	12	0.03	0.02	0
Newstead	Monthly	12	0.01	0.01	0
Pyramid Hill	Monthly	12	0.02	0.01	0
Raywood	Monthly	12	0.03	0.02	0
Rochester	Monthly	12	0.02	0.01	0
Sebastian	Monthly	12	0.02	0.02	0
Serpentine	Monthly	12	0.06	0.03	0
Strathfieldsaye	Monthly	12	0.02	0.02	0
Taradale - Elphinstone	Monthly	12	0.03	0.01	0
Tarnagulla	Monthly	12	0.02	0.01	0
Tooborac	Monthly	12	0.30	0.08	0
Trentham	Monthly	12	<0.01	<0.01	0
Tylden	Monthly	12	0.03	0.02	0
Wedderburn	Monthly	12	0.06	0.03	0

Note:

1 Refer to section 4.3.1.2 for details on exceedances.

True Colour – Customer Tap Sites 2021-22

Based on aesthetic considerations, true colour in drinking water should not exceed 15 HU.

Table 52: True Colour results for customer tap sites (ADWG aesthetic guideline limit: 15 HU)

Water Sampling Locality	Sampling frequency	Number of samples ¹	Maximum (HU)	Average (HU)	Number of samples where guideline was not met
Axedale	Monthly	12	<2	<2	0
Bealiba	Monthly	12	4	2	0
Bendigo (Northern)	Monthly	12	2	1	0
Bendigo (Southern)	Monthly	12	2	1	0
Bendigo (Spring Gully)	Monthly	12	2	1	0
Big Hill	Monthly	12	4	1	0
Boort	Monthly	12	<2	<2	0
Bridgewater - Inglewood	Monthly	12	<2	<2	0
Castlemaine	Monthly	12	<2	<2	0
Cohuna	Monthly	12	<2	<2	0
Dunolly	Monthly	12	4	2	0
Echuca	Monthly	12	<2	<2	0
Elmore	Monthly	12	2	1	0
Epsom - Huntly	Monthly	12	2	1	0
Fryerstown	Monthly	12	2	1	0
Goornong	Monthly	12	2	1	0
Guildford	Monthly	12	2	1	0
Gunbower	Monthly	12	<2	<2	0
Harcourt	Monthly	12	<2	<2	0
Heathcote	Monthly	12	2	1	0
Junortoun	Monthly	12	<2	<2	0
Korong Vale	Monthly	12	4	2	0
Kyneton	Monthly	12	2	1	0
Laanecoorie	Monthly	12	4	2	0
Leitchville	Monthly	12	<2	<2	0
Lockington	Monthly	12	<2	<2	0
Maiden Gully - Marong	Monthly	12	<2	<2	0
Maldon	Monthly	12	<2	<2	0
Malmsbury	Monthly	12	<2	<2	0
Newstead	Monthly	12	<2	<2	0
Pyramid Hill	Monthly	12	<2	<2	0
Raywood	Monthly	12	<2	<2	0
Rochester	Monthly	12	<2	<2	0
Sebastian	Monthly	12	<2	<2	0
Serpentine	Monthly	12	<2	<2	0
Strathfieldsaye	Monthly	12	2	1	0
Taradale - Elphinstone	Monthly	12	<2	<2	0
Tarnagulla	Monthly	12	4	2	0
Tooborac	Monthly	12	6	2	0
Trentham	Monthly	12	<2	<2	0
Tylden	Monthly	12	<2	<2	0
Wedderburn	Monthly	12	4	1	0

Electrical Conductivity – Customer Tap Sites 2021-22

Based on taste, total dissolved solids in drinking water should not exceed 600 mg/L, equivalent to approximately 1,200 µS/cm in electrical conductivity.

Table 53: Electrical Conductivity results for customer tap sites (ADWG aesthetic guideline limit: 1,200 µS/cm)

Water Sampling Locality	Sampling frequency	Number of samples	Maximum (µS/cm)	Average (µS/cm)	Number of samples where guideline was not met
Axedale	Monthly	12	260	246	0
Bealiba	Monthly	12	1,100	878	0
Bendigo (Northern)	Monthly	12	240	226	0
Bendigo (Southern)	Monthly	12	250	225	0
Bendigo (Spring Gully)	Monthly	12	240	225	0
Big Hill	Monthly	12	240	226	0
Boort	Monthly	12	540	475	0
Bridgewater - Inglewood	Monthly	12	130	122	0
Castlemaine	Monthly	12	260	239	0
Cohuna	Monthly	12	170	132	0
Dunolly	Monthly	12	1,200	870	0
Echuca	Monthly	12	170	134	0
Elmore	Monthly	12	740	687	0
Epsom - Huntly	Monthly	12	240	229	0
Fryerstown	Monthly	12	270	248	0
Goornong	Monthly	12	680	618	0
Guildford	Monthly	12	270	246	0
Gunbower	Monthly	12	120	100	0
Harcourt	Monthly	12	280	253	0
Heathcote	Monthly	12	730	659	0
Junortoun	Monthly	12	250	229	0
Korong Vale	Monthly	12	170	123	0
Kyneton	Monthly	12	230	213	0
Laanecoorie	Monthly	12	1,200	842	0
Leitchville	Monthly	12	150	121	0
Lockington	Monthly	12	170	145	0
Maiden Gully - Marong	Monthly	12	240	228	0
Maldon	Monthly	12	270	254	0
Malmsbury	Monthly	12	230	214	0
Newstead	Monthly	12	250	240	0
Pyramid Hill	Monthly	12	230	199	0
Raywood	Monthly	12	260	241	0
Rochester	Monthly	12	180	153	0
Sebastian	Monthly	12	250	238	0
Serpentine	Monthly	12	190	173	0
Strathfieldsaye	Monthly	12	240	228	0
Taradale - Elphinstone	Monthly	12	250	238	0
Tarnagulla	Monthly	12	1,200	891	0
Tooborac	Monthly	12	760	685	0
Trentham	Monthly	12	170	125	0
Tylden	Monthly	12	220	213	0
Wedderburn	Monthly	12	130	124	0

Sodium – Customer Tap Sites 2021-22

Based on aesthetic considerations (taste), the concentration of sodium in drinking water should not exceed 180 mg/L.

Table 54: Sodium results for customer tap sites (ADWG aesthetic guideline limit: 180mg/L)

Water Sampling Locality	Sampling Frequency	Number of Samples	Maximum (mg/L)	Average (mg/L)	Number of samples where guideline was not met
Axedale	Quarterly	4	30	20	0
Bealiba	Quarterly	4	120	100	0
Bendigo (Northern)	Quarterly	4	16	16	0
Bendigo (Southern)	Quarterly	4	16	15	0
Bendigo (Spring Gully)	Quarterly	4	16	15	0
Big Hill	Quarterly	4	16	15	0
Boort	Quarterly	4	53	47	0
Bridgewater - Inglewood	Quarterly	4	15	13	0
Castlemaine	Quarterly	4	18	17	0
Cohuna	Quarterly	4	23	16	0
Dunolly	Quarterly	4	100	85	0
Echuca	Quarterly	4	19	16	0
Elmore	Quarterly	4	99	89	0
Epsom - Huntly	Quarterly	4	21	16	0
Fryerstown	Quarterly	4	22	18	0
Goornong	Quarterly	4	76	68	0
Guildford	Quarterly	4	23	18	0
Gunbower	Quarterly	4	11	10	0
Harcourt	Quarterly	4	25	19	0
Heathcote	Quarterly	4	72	71	0
Junortoun	Quarterly	4	16	15	0
Korong Vale	Quarterly	4	13	11	0
Kyneton	Quarterly	4	15	13	0
Laanecoorie	Quarterly	4	97	85	0
Leitchville	Quarterly	4	18	13	0
Lockington	Quarterly	4	17	15	0
Maiden Gully - Marong	Quarterly	4	17	15	0
Maldon	Quarterly	4	24	19	0
Malmsbury	Quarterly	4	16	15	0
Newstead	Quarterly	4	22	18	0
Pyramid Hill	Quarterly	4	21	18	0
Raywood	Quarterly	4	30	21	0
Rochester	Quarterly	4	19	18	0
Sebastian	Quarterly	4	25	18	0
Serpentine	Quarterly	4	20	17	0
Strathfieldsaye	Quarterly	4	16	16	0
Taradale - Elphinstone	Quarterly	4	21	18	0
Tarnagulla	Quarterly	4	120	97	0
Tooborac	Quarterly	4	79	75	0
Trentham	Quarterly	4	9	8	0
Tylden	Quarterly	4	15	14	0
Wedderburn	Quarterly	4	13	11	0

Chloride – Customer Tap Sites 2021-22

Based on aesthetic consideration, the chloride concentration in drinking water should not exceed 250 mg/L.

Table 55: Chloride results for customer tap sites (ADWG aesthetic guideline limit: 250mg/L)

Water Sampling Locality	Sampling Frequency	Number of Samples	Maximum (mg/L)	Average (mg/L)	Number of samples where guideline was not met
Axedale	Quarterly	4	39	38	0
Bealiba	Quarterly	4	220	190	0
Bendigo (Northern)	Quarterly	4	37	34	0
Bendigo (Southern)	Quarterly	4	36	33	0
Bendigo (Spring Gully)	Quarterly	4	35	33	0
Big Hill	Quarterly	4	35	34	0
Boort	Quarterly	4	110	99	0
Bridgewater - Inglewood	Quarterly	4	26	24	0
Castlemaine	Quarterly	4	40	38	0
Cohuna	Quarterly	4	14	11	0
Dunolly	Quarterly	4	180	160	0
Echuca	Quarterly	4	12	9	0
Elmore	Quarterly	4	140	125	0
Epsom - Huntly	Quarterly	4	37	35	0
Fryerstown	Quarterly	4	41	39	0
Goornong	Quarterly	4	150	138	0
Guildford	Quarterly	4	40	37	0
Gunbower	Quarterly	4	14	13	0
Harcourt	Quarterly	4	42	40	0
Heathcote	Quarterly	4	150	143	0
Junortoun	Quarterly	4	36	35	0
Korong Vale	Quarterly	4	22	21	0
Kyneton	Quarterly	4	30	29	0
Laanecoorie	Quarterly	4	170	153	0
Leitchville	Quarterly	4	20	12	0
Lockington	Quarterly	4	29	26	0
Maiden Gully - Marong	Quarterly	4	37	35	0
Maldon	Quarterly	4	42	39	0
Malmsbury	Quarterly	4	32	30	0
Newstead	Quarterly	4	40	38	0
Pyramid Hill	Quarterly	4	34	30	0
Raywood	Quarterly	4	42	38	0
Rochester	Quarterly	4	21	20	0
Sebastian	Quarterly	4	38	36	0
Serpentine	Quarterly	4	45	26	0
Strathfieldsaye	Quarterly	4	34	33	0
Taradale - Elphinstone	Quarterly	4	40	38	0
Tarnagulla	Quarterly	4	210	185	0
Tooborac	Quarterly	4	160	150	0
Trentham	Quarterly	4	14	13	0
Tylden	Quarterly	4	32	30	0
Wedderburn	Quarterly	4	22	21	0

Zinc – Customer Tap Sites 2021-22

Based on aesthetic consideration (taste), the concentration of zinc in drinking water should not exceed 3 mg/L.

Table 56: Zinc results for customer tap sites (ADWG aesthetic guideline limit: 3 mg/L)

Water Sampling Locality	Sampling Frequency	Number of Samples	Maximum (mg/L)	Average (mg/L)	Number of samples where guideline was not met
Axedale	Monthly	12	0.005	0.002	0
Bealiba	Monthly	12	0.036	0.006	0
Bendigo (Northern)	Monthly	12	0.026	0.004	0
Bendigo (Southern)	Monthly	12	0.002	0.001	0
Bendigo (Spring Gully)	Monthly	12	0.003	0.001	0
Big Hill	Monthly	12	0.007	0.002	0
Boort	Monthly	12	0.010	0.005	0
Bridgewater - Inglewood	Monthly	12	0.002	0.001	0
Castlemaine	Monthly	12	0.016	0.005	0
Cohuna	Monthly	12	0.011	0.004	0
Dunolly	Monthly	12	0.004	0.002	0
Echuca	Monthly	12	0.002	0.001	0
Elmore	Monthly	12	0.004	0.002	0
Epsom - Huntly	Monthly	12	0.003	0.001	0
Fryerstown	Monthly	12	0.014	0.008	0
Goornong	Monthly	12	0.005	0.002	0
Guildford	Monthly	12	0.013	0.008	0
Gunbower	Monthly	12	0.003	0.001	0
Harcourt	Monthly	12	0.007	0.003	0
Heathcote	Monthly	12	0.008	0.002	0
Junortoun	Monthly	12	0.005	0.002	0
Korong Vale	Monthly	12	0.012	0.004	0
Kyneton	Monthly	12	0.008	0.003	0
Laanecoorie	Monthly	12	0.013	0.005	0
Leitchville	Monthly	12	0.005	0.003	0
Lockington	Monthly	12	0.002	0.001	0
Maiden Gully - Marong	Monthly	12	0.003	0.001	0
Maldon	Monthly	12	0.009	0.003	0
Malmsbury	Monthly	12	0.016	0.010	0
Newstead	Monthly	12	0.005	0.003	0
Pyramid Hill	Monthly	12	0.007	0.004	0
Raywood	Monthly	12	0.006	0.002	0
Rochester	Monthly	12	0.003	0.002	0
Sebastian	Monthly	12	0.046	0.007	0
Serpentine	Monthly	12	0.013	0.004	0
Strathfieldsaye	Monthly	12	0.003	0.001	0
Taradale - Elphinstone	Monthly	12	0.017	0.005	0
Tarnagulla	Monthly	12	0.004	0.003	0
Tooborac	Monthly	12	0.047	0.007	0
Trentham	Monthly	12	0.010	0.003	0
Tylden	Monthly	12	0.032	0.006	0
Wedderburn	Monthly	12	0.009	0.002	0

Ammonia – Customer Tap Sites 2021-22

Table 57: Ammonia results for customer tap sites (ADWG aesthetic guideline limit: 0.5 mg/L)

Water Sampling Locality	Sampling Frequency	Number of Samples	Maximum (mg/L)	Average (mg/L)	Number of samples where guideline was not met
Axedale	n/a	n/a	n/a	n/a	n/a
Bealiba	Fortnightly	26	0.350	0.153	0
Bendigo (Northern)	Fortnightly	26	0.470	0.224	0
Bendigo (Southern)	Fortnightly	26	0.500	0.229	0
Bendigo (Spring Gully)	Fortnightly	26	0.380	0.181	0
Big Hill ¹	Fortnightly	27	0.540	0.200	1
Boort	n/a	n/a	n/a	n/a	n/a
Bridgewater - Inglewood	Fortnightly	26	0.400	0.157	0
Castlemaine	n/a	n/a	n/a	n/a	n/a
Cohuna	n/a	n/a	n/a	n/a	n/a
Dunolly	Fortnightly	26	0.390	0.201	0
Echuca	n/a	n/a	n/a	n/a	n/a
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	Fortnightly	26	0.460	0.182	0
Fryerstown	n/a	n/a	n/a	n/a	n/a
Goornong	n/a	n/a	n/a	n/a	n/a
Guildford	n/a	n/a	n/a	n/a	n/a
Gunbower	n/a	n/a	n/a	n/a	n/a
Harcourt	n/a	n/a	n/a	n/a	n/a
Heathcote	Fortnightly	26	0.350	0.231	0
Junortoun	Fortnightly	26	0.430	0.130	0
Korong Vale	Fortnightly	26	0.300	0.122	0
Kyneton	n/a	n/a	n/a	n/a	n/a
Laanecoorie	Fortnightly	26	0.460	0.220	0
Leitchville	n/a	n/a	n/a	n/a	n/a
Lockington	n/a	n/a	n/a	n/a	n/a
Maiden Gully - Marong	Fortnightly	26	0.500	0.220	0
Maldon	n/a	n/a	n/a	n/a	n/a
Malmsbury	n/a	n/a	n/a	n/a	n/a
Newstead	n/a	n/a	n/a	n/a	n/a
Pyramid Hill	n/a	n/a	n/a	n/a	n/a
Raywood	n/a	n/a	n/a	n/a	n/a
Rochester	n/a	n/a	n/a	n/a	n/a
Sebastian	n/a	n/a	n/a	n/a	n/a
Serpentine	n/a	n/a	n/a	n/a	n/a
Strathfieldsaye	Fortnightly	27	0.430	0.233	0
Taradale - Elphinstone	n/a	n/a	n/a	n/a	n/a
Tarnagulla	Fortnightly	26	0.400	0.156	0
Tooborac	n/a	n/a	n/a	n/a	n/a
Trentham	n/a	n/a	n/a	n/a	n/a
Tylden	n/a	n/a	n/a	n/a	n/a
Wedderburn	Fortnightly	26	0.240	0.137	0

Note:

1 Refer to section 4.3.1.2 for details on exceedances.

Alkalinity – Customer Tap Sites 2021-22

Table 58: Alkalinity results for customer tap sites - whilst there is no ADWG guideline value for alkalinity it is monitored for operational purposes

Water Sampling Locality	Sampling Frequency	Number of Samples	Maximum (mg/L)	Average (mg/L)
Axedale	Quarterly	4	56	54
Bealiba	Quarterly	4	92	88
Bendigo (Northern)	Quarterly	4	56	54
Bendigo (Southern)	Quarterly	4	58	55
Bendigo (Spring Gully)	Quarterly	4	55	54
Big Hill	Quarterly	4	55	53
Boort	Quarterly	4	50	40
Bridgewater - Inglewood	Quarterly	4	23	19
Castlemaine	Quarterly	4	58	53
Cohuna	Quarterly	4	23	19
Dunolly	Quarterly	4	92	83
Echuca	Quarterly	4	22	21
Elmore	Quarterly	4	150	143
Epsom - Huntly	Quarterly	4	57	54
Fryerstown	Quarterly	4	57	54
Goornong	Quarterly	4	58	55
Guildford	Quarterly	4	60	56
Gunbower	Quarterly	4	26	24
Harcourt	Quarterly	4	62	56
Heathcote	Quarterly	4	64	57
Junortoun	Quarterly	4	57	55
Korong Vale	Quarterly	4	18	14
Kyneton	Quarterly	4	59	55
Laanecoorie	Quarterly	4	84	78
Leitchville	Quarterly	4	22	19
Lockington	Quarterly	4	32	28
Maiden Gully - Marong	Quarterly	4	56	56
Maldon	Quarterly	4	63	59
Malmsbury	Quarterly	4	59	56
Newstead	Quarterly	4	60	54
Pyramid Hill	Quarterly	4	25	22
Raywood	Quarterly	4	55	53
Rochester	Quarterly	4	23	18
Sebastian	Quarterly	4	55	53
Serpentine	Quarterly	4	31	27
Strathfieldsaye	Quarterly	4	56	55
Taradale - Elphinstone	Quarterly	4	60	53
Tarnagulla	Quarterly	4	93	87
Tooborac	Quarterly	4	66	60
Trentham	Quarterly	4	55	34
Tylden	Quarterly	4	57	55
Wedderburn	Quarterly	4	15	14

Apparent Colour – Customer Tap Sites 2021-22

Table 59: Apparent Colour results for customer tap sites -whilst there is no ADWG guideline value for apparent colour it is monitored for operational purposes

Water Sampling Locality	Sampling frequency	Number of samples	Maximum (HU)	Average (HU)
Axedale	Monthly	12	1	1
Bealiba	Monthly	12	6	3
Bendigo (Northern)	Monthly	12	4	1
Bendigo (Southern)	Monthly	12	2	1
Bendigo (Spring Gully)	Monthly	12	4	2
Big Hill	Monthly	12	6	2
Boort	Monthly	12	14	3
Bridgewater - Inglewood	Monthly	12	1	1
Castlemaine	Monthly	12	2	1
Cohuna	Monthly	12	1	1
Dunolly	Monthly	12	6	2
Echuca	Monthly	12	1	1
Elmore	Monthly	12	2	1
Epsom - Huntly	Monthly	12	2	1
Fryerstown	Monthly	12	4	1
Goornong	Monthly	12	2	1
Guildford	Monthly	12	4	1
Gunbower	Monthly	12	1	1
Harcourt	Monthly	12	2	1
Heathcote	Monthly	12	4	2
Junortoun	Monthly	12	2	1
Korong Vale	Monthly	12	6	3
Kyneton	Monthly	12	16	2
Laanecoorie	Monthly	12	6	2
Leitchville	Monthly	12	1	1
Lockington	Monthly	12	1	1
Maiden Gully - Marong	Monthly	12	2	1
Maldon	Monthly	12	1	1
Malmsbury	Monthly	12	1	1
Newstead	Monthly	12	1	1
Pyramid Hill	Monthly	12	1	1
Raywood	Monthly	12	2	1
Rochester	Monthly	12	1	1
Sebastian	Monthly	12	1	1
Serpentine	Monthly	12	2	1
Strathfieldsaye	Monthly	12	2	1
Taradale - Elphinstone	Monthly	12	2	1
Tarnagulla	Monthly	12	6	3
Tooborac	Monthly	12	14	4
Trentham	Monthly	12	1	1
Tylden	Monthly	12	1	1
Wedderburn	Monthly	12	4	2

5 Complaints Relating to Water Quality

5.1 Complaints and Responses

Customer queries/complaints relating to drinking water quality are recorded and followed up using a customer response management (CRM) system. Generally, water quality queries are managed at the time of the enquiry, while complaints are forwarded to Coliban Water's Water Regulations team, or ServiceStream (the corporation's operational partner managing the water distribution network), depending on the type of complaint. The complaint is reviewed and actioned as appropriate.

Some of the actions that can be initiated are:

- Flushing of the main supplying the customer and or flushing of the customer's meter.
- Advisory phone call from Water Regulations team to the customer.
- A visit to the property by a Water Regulations team member.
- A written response to the customer from the Water Regulations Team.

Table 60 summarises the water quality complaints received by Coliban Water in each category as recorded in CRM system between 1 July 2021 and 30 June 2022, and compared to the previous two years.

Complaints recorded fall into five categories, "Alleged illness", "Discoloured Water", "Taste/Odour", "Air in Water", and "Other".

Table 60: Complaints related to Water Quality by Classification.

Types of Complaints	Number of Complaints			Comparison with previous reporting periods	Comments
	2021/22	2020/21	2019/20		
Alleged illness	7	10	12	Reduction from previous two years.	The calls were all unrelated. Complaints were generally related to health conditions, such as a rash/skin irritation, or upset stomach. Water quality was verified after each contact to confirm that the drinking water supplied did not pose an unacceptable health risk.
Discoloured Water	115	105	122	Reduction in complaints compared to 2019-20; minor increase on last financial year.	Burst main events (Castlemaine - 5 calls, Maldon-16 calls) and low water event (Echuca – 4 calls) resulted in multiple calls. No other events triggered clusters of calls for discoloured water.
Taste or Odour	43	102	76	Reduction to previous years.	There were no events connecting any of the calls.
Air in Water	16	15	8	In line with previous year 2020/21.	Four calls of cloudy water (air in water) related to mains repair in Maldon. No consistency with the other calls.
Other	0	0	0	Consistently minimal	All water quality complaints were able to be allocated to the other four categories.
Total	181	232	218	Decrease in overall number of complaints	

Table 61: Complaints related to water quality by water sampling locality 2021/22

Water sampling locality	Types of complaints					Total complaints
	Alleged illness	Discoloured water	Taste or Odour	Air in Water	Other	
Axedale	0	2	0	0	0	2
Bealiba	0	0	0	0	0	0
Bendigo Northern	3	12	6	1	0	22
Bendigo Southern	1	6	2	0	0	9
Bendigo Spring Gully	1	5	1	2	0	9
Big Hill	0	2	0	0	0	2
Boort	0	0	0	0	0	0
Bridgewater-Inglewood	0	0	1	0	0	1
Castlemaine	0	19	6	3	0	28
Cohuna	0	2	8	0	0	10
Dunolly	0	0	0	0	0	0
Echuca	0	16	3	1	0	20
Elmore	1	2	0	0	0	3
Epsom / Huntly	1	5	3	1	0	10
Fryerstown	0	0	0	0	0	0
Goornong	0	2	1	0	0	3
Guildford	0	5	1	2	0	8
Gunbower	0	0	0	0	0	0
Harcourt	0	0	0	0	0	0
Heathcote	0	4	2	0	0	6
Junortoun	0	0	2	1	0	3
Korong Vale	0	1	0	0	0	1
Kyneton	0	2	2	0	0	4
Laanecoorie	0	0	0	0	0	0
Leitchville	0	1	1	0	0	2
Lockington	0	0	0	0	0	0
Maiden Gully / Marong	0	4	1	0	0	5
Maldon	0	16	0	4	0	20
Malmsbury	0	0	0	0	0	0
Newstead	0	1	2	0	0	3
Pyramid Hill	0	0	0	0	0	0
Raywood	0	0	0	0	0	0
Rochester	0	0	1	0	0	1
Sebastian	0	0	0	0	0	0
Serpentine	0	0	0	0	0	0
Strathfieldsaye	0	2	0	0	0	2
Taradale-Elphinstone	0	0	0	0	0	0
Tarnagulla	0	0	0	0	0	0
Tooborac	0	1	0	0	0	1
Trentham	0	1	0	0	0	1
Tylden	0	0	0	0	0	0
Wedderburn	0	4	0	1	0	5
Total Complaints	7	115	43	16	0	181

6 Risk Management Plan Audit Results

6.1 Outcome of the Most Recent Audit

The most recent regulatory audit as required by the Secretary to the Department of Health (DH), was undertaken between 28 July 2020 to 31 July 2020. Coliban Water's Drinking Water Quality Risk Management Plan (DWQRMP) was found to be compliant, with thirteen opportunities for improvement (OFI) identified. Table 62 below lists the opportunities for improvement and action plan for addressing these OFIs.

6.2 Findings and Action Plan for Audit Completed in July 2020

There were thirteen opportunities for improvement (OFI) identified during the audit. Below is the action plan for addressing the OFI, including timeframes, noting some actions have already been completed. OFI that are interconnected, (OFI 1,2,3,5,6,11,12 & 13) have been grouped together, with actions planned to cover this group as a whole.

Table 62: Opportunities for improvement (OFI) from the 2020 regulatory audit of Coliban Water's Drinking Water Quality Risk Management Plan.

OFI No.	Description of OFI	Action	Timeframe
1	It is recommended to expand the risk source assessment hazardous events in the DWQRMP Table 6.1.4-1 to cover clear water storage tanks, and booster chlorination systems within networks. This would then also require updating the DWQRMP and HACCP for these hazardous events.	Review and update as necessary DWQRMP Table 6.1.4-1, and other tables as appropriate. Any changes in DWQRMP Tables to be reflected in the Risk Register.	Completed
2	The network booster chlorination system and associated network storage tanks descriptions and schematics with their operational philosophy should be added to the DWQRMP. This would raise awareness and highlight the importance of networks and the delivery of safe water.	Review booster chlorinator and tank descriptions and schematics and update as necessary in the DWQRMP, including review the Inglewood Basin chlorine dosing system and consider if it should be a CCP or QCP.	Completed
3	Add booster chlorination systems and basins/ tanks as a risk area to the Drinking Water Quality System Risk Register. Please add an event category that addresses the risk for booster chlorination and network storages. Review the CCPs for all chlorination systems.	Expand the Risk Register to enable each basin/tank to be individually risk assessed, which will include booster chlorinators where appropriate, instead of as a group.	Completed
5	It is recommended to revise the Inglewood basin booster chlorination schematic and provide further detail with an operational explanation. See also OFI 2.		
6	Review the Risk Assessment/ HACCP assessment for Inglewood chlorine dosing system and consider the Inglewood Basin chlorination system as a CCP point. This would provide further focus on managing this critical asset that is used for maintaining chlorine residual.		
11	Coliban Water to review the approach and documentation for the Inglewood chlorination point, and consider having it a CCP, as the nomination of a CCP point doesn't mean that it requires to be monitored online. It does mean that this is the last barrier and control point to maintain an identified hazard i.e. water quality aspect. CCP HACCP decision tree Question 3: Is the process step specifically designed to eliminate or reduce the hazard to an acceptable level? Yes – CCP (see OFI 3 & 6).	Booster Chlorinators: <ul style="list-style-type: none"> Review risk assessment Review CCP's Risk Register changes to	30 Nov 2022 30 Nov 2022

OFI No.	Description of OFI	Action	Timeframe
12	It is recommended to review the CCP target, alert and critical limits for all booster chlorination stations. Targets should be meaningful for the management of overdosing and the underdosing risks. Both have potential water quality risk associated with them. Review the risk assessment for the Booster chlorination CCPs.	be risk rated as required.	30 Nov 2022
13	It is recommended that an operational philosophy and more detail documentation is added to the DWQRMP that shows the operational philosophy, the reticulation system and the chlorination system, as per the SCADA screen for all Booster chlorination systems. This will provide clarity about the assets and their operation.	Consider how operational philosophy/management plan could be referenced in the DWQRMP.	
4	When work orders are initiated in Hanson, previous works and inspection reports are not provided. It would be an advantage to the inspection personnel to view what works have been identified as part of previous visits and to see a condition report for the inspected side. This would help elimination of leaks, contamination or other water quality risk exposure and help justify the replacement of assets.	Review current asset management system process and consider if possible/practical access to historic information in the field.	Completed
7	Coliban Water to develop a "transition" plan to work under the Covid-19 requirement as part of "business-as-usual". This will require the business to carry out all maintenance, service delivery and training activities in the world of Covid-19 without compromising safety and operations. The aim is to continue critical operation in a safe environment.	Ensure Coliban Water and Strategic Partners all have a COVID 19 'Business as Usual' plans in place.	Completed
8	The WQ Surveillance rationale is a spreadsheet that identifies monitoring requirements. Recent changes, however, haven't been noted in the "change log" tab. Coliban Water to review the document control process for spreadsheets like the WQ Surveillance rationale and note what changes are made, when they are made and by whom.	Include the 'Rationale' information into the WQ Surveillance Monitoring Program spreadsheet. Changes to the 'Rationale' and Monitoring Program are all captured in one 'change log' tab.	Completed
9	Provide training on obligations under the SDW Act and CW commitment to all managers, executive staff, as a refresher and whenever someone moves internal roles, as well as for new starters. A general training schedule should be included for all CW personnel and further training for all involved in the delivery of the DWQRMP.	Develop presentation and schedule. Verify all new starters are viewing the presentation that is included in their induction. Consider annual general refresher on Water Quality overview for all staff.	Completed
10	Ensure all business units focus on providing training and that training is not put on hold during the Covid-19 pandemic. It is of utmost importance that operational staff have the skills to operate all sites and can cover work tasks for each other.	Training has resumed.	Completed

7 Regulated Water

Regulated water is water that is not intended for use as drinking water, but which could be reasonably mistaken for drinking water. Regulated water is non-potable, not suitable for human consumption and generally does not receive any form of treatment. The Minister for Health may declare a water supply as a regulated water supply under Section 6 of the Act. On 2 January 2006, the Minister for Health declared the following water supply systems as regulated water supplies: Borung, Dingee, Jarklin, Macorna, Mitiamo, Mysia and Wychitella

Coliban Water currently:

- Verifies signage is located at publicly-accessible water supply points (e.g. toilet blocks) advising that the water supply is not suitable for drinking purposes, and this is done on an annual basis.
- Notifies customers on a regular basis that the water is not for drinking and household with 'Do not drink' symbol on their quarterly accounts.
- Coliban Water website has information for each town, and advises water is non-potable.

Table 63: Regulated Water Systems in 2021/22

Area where regulated water is supplied	Source water	Date of publication of gazette notice	Estimated population supplied with regulated water
Borong	Grampians Wimmera Mallee Water (GWMW) Pipeline	19/01/2006	50
Dingee	Goulburn-Murray Water (GMW) Channel	19/01/2006	60
Jarklin	GMW Pipeline	19/01/2006	20
Macorna	GMW Channel	19/01/2006	20
Mitiamo	GMW Channel	19/01/2006	90
Mysia	GMW Pipeline	19/01/2006	20
Wychitella	GWMW Pipeline	19/01/2006	30

8 Further Information

Section 23 of the Act requires Coliban Water to make available for inspection by the public the results of any water quality monitoring program conducted by Coliban Water on any of the drinking water supplied by Coliban Water. Customers and members of the public may access drinking water quality data by contacting Coliban Water on the details provided below:

Telephone: 1300 363 200

Website: www.coliban.com.au

A list of glossary and terms is attached in Appendix A.

Appendix A - Glossary of Terms

Australian Drinking Water Guidelines (2011) (ADWG)

A publication by National Health and Medical Research Council that details a framework for the management of drinking water supply systems and provides information on a range of potential contaminants of water systems.

BAC Filtration

Biological activated carbon filtration is a unit process, similar to GAC filtration, which has the additional capability of removing dissolved organics by microorganisms that develop on the surface of the carbon granules.

Critical Control Point (CCP)

A point, step or procedure at which control can be applied and which is essential to prevent or eliminate a hazard or reduce it to an acceptable level.

Chloramination

The addition of chlorine compounds (e.g. chlorine gas and sodium hypochlorite) to aid the breakdown of organic matters and the inactivation harmful microorganisms -: the process is modified with the addition of ammonia gas to improve total chlorine residual in the distribution network.

Chlorination

The addition of chlorine compounds (e.g. chlorine gas and sodium hypochlorite) to aid the breakdown of organic matter and the inactivation harmful microorganisms.

Clarification

A unit operation where seeds of floc are allowed to grow and settle. Clarification is usually enhanced with the addition of polymer (e.g. polyelectrolyte) to increase the size of floc and increase their settling velocities.

Coagulation/flocculation

A unit process involves addition of positively charged coagulant (e.g. aluminium chlorohydrate or aluminium sulphate) and rapid mixing, causing coalescing of suspended particles, or seeds of flocs to form and settle out of suspension.

DELWP

Department of Environment, Land, Water and Planning.

Dissolved Air Flotation & Filtration (DAFF)

A combination of dissolved air flotation and sand filtration. Dissolved air flotation is a unit operation where fine suspended particles and floc are removed by rising bubbles in the treatment vessel.

Desalination

A unit operation where virtually all dissolved substances and suspended materials are removed by reverse osmosis and only water molecules are allowed to pass through the membranes.

Dual-media filtration

A unit operation using both anthracite coal and sand to retain floc by both adhesion and physical sieving.

Drinking Water Quality Management System (DWQMS)

A term used interchangeably with Drinking Water Quality Risk Management Plan.

Drinking Water Quality Risk Management Plan (DWQRMP)

A risk management plan relating to water supply is a document that:

- contains a detailed description of the water system
- identifies the risks to the quality of the water and the risks posed by the quality of water
- assess those risks
- set out the steps required to manage those risks, including the development and implementation of preventative strategies
- contains other matters as required by the Safe Drinking Water Regulations 2015

Fluoridation

The addition of fluorine compounds (e.g. Hydrofluorosilicic Acid) into drinking water to improve the dental health of consumers.

GAC Filtration

A unit operation where floc is removed by granular activated carbon (GAC) by adhesion. GAC is fabricated to have a high surface area and hence improved efficiency for adhesion.

GMW

Goulburn-Murray Water Corporation.

GMMW

Grampians Wimmera Mallee Water Corporation.

Microfiltration/Ultrafiltration

A unit operation where fine suspended solid particles are retained by the pores of a filter membrane.

MIEX

Magnetic Ions Exchange is a unit operation where organic matter is attracted to, and removed by a MIEX resin. MIEX reduces the requirements for chemical dosage during the coagulation process, improves the efficiency of disinfection and improves the aesthetic properties of drinking water.

Minor Non-Conformance

A minor non-conformance is defined as a non-compliance with one or more auditable elements, legislative requirements or risk management activities where the potential impact of the non-conformance is not likely to be a serious or imminent risk to public health.

MoU

Memorandum of Understanding.

Opportunity for Improvement (OFI)

A conforming or non-conforming clause of the RMP or DWQMS system that does not contravene a legislative requirement. It is not itself a non-conformance. It may include opportunities for improvement, comments that may be relevant to the next audit or against best practice considerations, or incidental or isolated discrepancies.

Ozonation

A unit process that uses ozone to aid the breakdown of organic matter and the inactivation harmful microorganisms.

pH Correction

The adjustment of the pH of drinking water to get it into the recommended range, by the addition of carbon dioxide, sulphuric acid, lime, soda ash or caustic soda.

Sand Filtration

A unit operation where suspended solid particles are retained by the pores of a filter media (in this case, sand).

Supervisory Control and Data Acquisition (SCADA)

A SCADA system consists of human-machine interface, computerised logics, telemetry communication system, electronically actuated instruments and sensors. SCADA allows remote control and monitor of all key process parameters.

UV Disinfection

A unit operation where ultra violet light is impinged onto drinking water to inactive harmful microorganisms.

Water Treatment Plant (WTP)

A facility where raw water is directed through various treatment processes and produces treated water fit for human consumption.

Appendix B - List of Raw Water Organic (Fungicides/Herbicides/Insecticides) parameters

The following table is a comprehensive list of the organic parameters that are tested for in the raw water.

Fungicides	Herbicides	Insecticides
Azoxystrobin	2,4 D Acid	1, 3-dichloropropene
Boscalid	2,4 D B	Alpha cypermethrin
Captan	Atrazine	Azamethiphos
Carbendazim	Diquat	Azinphos-methyl
Chlorothalonil	Diuron	Bendiocarb
Cyprodinil	Glufosinate	Bifenthrin
Didecyl dimethyl ammonium chloride	Glyphosate	Carbaryl
Difenoconazole	Halosulfuron methyl	Chlorantraniliprole
Flutriafol	Haxazinone	Chloropicrin
Imazalil	Imazethapyr	Chlorpyrifos
Iprodione	Isoxaflutole	Cypermethrin
Mancozeb	Linuron	Cyromazine
Metalaxyl-M	MCPA	Deltamethrin
Myclobutanil	Metribuzin	Dichlorvos
Penconazole	Metsulfuron methyl	Dimethoate
Prochloraz	Molinate	Dinotefuran
Prothioconazole	Paraquat dichloride	Esfenvalerate
Pyraclostrobin	Pendimethalin	Hydramethylnon
Pyrimethanil	Prometryn	Imidacloprid
Tebuconazole	Simazine	Lambda-cyhalothrin
Thiabendazole	Triclopyr	Malathion
Thiram	Sulfosulfuron	Methomyl
Trifloxystrobin	Tebuthiuron	Omethoate
Ziram	Thiobencarb	Permethrin
	Trifluralin	Phorate
	S-metolachlor	Phosmet
	Propyzamide	Pirimicarb
		Sulfoxaflor
		Thiacloprid
		Thiodicarb

Appendix C - List of Treatment Processes and Added Substances

Water Treatment Plant	Water Sampling Locality	Coagulation & Flocculation	Treatment Process													Added Substances							
			Clarification		Filtration		Disinfection and or Oxidation					Other			Sludge Thickening / Dewatering	Lime / Soda Ash / Caustic Soda / Carbon Dioxide / Sulphuric Acid /	Aluminium-based Coagulants	Iron-based Coagulants	Polymers	Chlorine	Ammonia	Fluoride Compound	
			Sedimentation / Clarification	Dissolved Air Floatation	Granular Media Filtration	Membrane Filtration	Chlorine Gas	Chlorine Dioxide	Sodium Hypochlorite	Calcium Hypochlorite	Ultraviolet (UV)	Ozone	Activated Carbon (PAC/GAC/BAC)	Ion Exchange									Reverse Osmosis
Bendigo	Axedale	x				x	x					x	x			x	x	x		x	x	x	x
	Bendigo Northern																						
	Bendigo Southern																						
	Bendigo Spring Gully																						
	Big Hill																						
	Epsom - Huntly																						
	Junortoun																						
	Maiden Gully - Marong																						
	Raywood																						
	Sebastian																						
Strathfieldsaye																							
Boort	Boort	x	x		x		x					x					x	x		x	x		
Bridgewater	Bridgewater - Inglewood	x	x		x		x				x		x					x		x	x	x	
Castlemaine	Castlemaine	x				x	x					x	x			x	x	x		x	x		x
	Fryerstown																						
	Guildford																						
	Harcourt																						
	Maldon																						
	Newstead																						
	Taradale - Elphinstone																						
Cohuna	Cohuna	x	x		x		x			x			x				x	x		x	x		x
Echuca	Echuca	x	x		x		x			x			x				x	x		x	x		x
Elmore	Elmore											x					x						
Goorong	Goorong	x	x		x					x			x				x	x					

Water Treatment Plant	Water Sampling Locality	Coagulation & Flocculation	Treatment Process													Added Substances							
			Clarification		Filtration		Disinfection and or Oxidation						Other			Sludge Thickening / Dewatering	Lime / Soda Ash / Caustic Soda / Carbon Dioxide / Sulphuric Acid /	Aluminium-based Coagulants	Iron-based Coagulants	Polymers	Chlorine	Ammonia	Fluoride Compound
			Sedimentation / Clarification	Dissolved Air Floatation	Granular Media Filtration	Membrane Filtration	Chlorine Gas	Chlorine Dioxide	Sodium Hypochlorite	Calcium Hypochlorite	Ultraviolet (UV)	Ozone	Activated Carbon (PAC/GAC/BAC)	Ion Exchange	Reverse Osmosis								
Gunbower	Gunbower	x	x			x	x				x		x	x			x	x			x		
Heathcote	Heathcote	x	x			x		x		x		x			x		x	x		x	x	x	
	Tooborac																						
Korong Vale	Korong Vale	x	x			x		x					x			x	x	x		x	x	x	
	Wedderburn																						
Kyneton	Kyneton	x				x	x					x	x			x	x	x		x	x		x
	Malmsbury																						
	Tylden																						
Laanecoorie	Bealiba	x	x			x		x		x			x				x	x		x	x	x	
	Dunolly																						
	Laanecoorie																						
	Tarnagulla																						
Leitchville	Leitchville	x	x			x	x				x		x				x	x		x	x		
Lockington	Lockington	x		x	x						x						x	x		x	x		
Pyramid Hill	Pyramid Hill	x	x		x		x						x			x	x	x		x	x		
Rochester	Rochester	x	x			x	x						x				x	x		x	x		
Serpentine	Serpentine	x	x		x		x						x			x	x	x		x	x		
Trentham	Trentham					x	x						x			x				x	x		