



Water Quality Annual Report

2018-19

Melbourne Water

Doc ID. 51900842



Melbourne Water is owned by the Victorian Government. We manage Melbourne's water supply catchments, remove and treat most of Melbourne's sewage, and manage rivers and creeks and major drainage systems throughout the Port Phillip and Westernport region.





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This report is provided to the Secretary to the Department of Health and Human Services (DHHS) in accordance with Section 26 of the *Safe Drinking Water Act 2003* (Vic) for the 2018-19 financial year.

Melbourne Water makes a vital contribution to the famous Melbourne lifestyle by underpinning human health, enhancing community well-being, supporting economic growth and balancing the natural and man-made environment.

The organisation is responsible for the supply of affordable, high-quality water, reliable sewerage, healthy waterways, integrated drainage and flood management services and cooler greener spaces, helping make greater Melbourne a fantastic place to live.

Today, the organisation employs a passionate, truly diverse, future-focused team of experts, who collaborate with a wide range of partners to skilfully balance the social, economic and liveability needs of the community with the long-term benefit of the environment.

Melbourne Water has a solid history of foresight, ingenuity and best practice. Today, with a strong commitment to understanding and delivering to the needs of customers and the community, we are a leader in the delivery of an outstanding integrated system that is secure, efficient, affordable and sustainable.

Our key stakeholders are customers, government, regulators, other water businesses, land developers, the community and suppliers. These stakeholders and our other strategic partners, including our construction and maintenance partners and research organisations, help us achieve our objectives. We consider social, environmental and financial effects and short-term and long-term implications in all our business decisions.

We are owned by the Victorian Government, with an independent Board of Directors responsible for governance. The responsible Minister is the Minister for Water.

EPA Victoria and the Department of Health and Human Services regulate the environmental and public health aspects of our business. The Essential Services Commission regulates prices and monitors service performance. We work across several arms of the Victorian Government, including the Department of Environment, Land, Water and Planning (DELWP) and the Department of Treasury and Finance.

Our customers include Melbourne's retail water corporations (City West Water, South East Water and Yarra Valley Water), regional water authorities (South Gippsland Water, Gippsland Water, Westernport Water, Western Water and Barwon Water), local councils, land developers and businesses that divert river water.

We are committed to providing high quality and reliable drinking water that meets or exceeds regulatory and customer service standards.

Melbourne Water and the retail water corporations have developed risk management systems for drinking water quality using the principles of HACCP (Hazard Analysis and Critical Control Point) and the quality management system standard ISO 9001. The HACCP process systematically analyses hazards and establishes measures for their control in order to ensure product quality and safety.

Water supply system

We manage the harvesting of water from catchments, the major transfer, storage and treatment of water, and the delivery of treated water to numerous interface points with City West Water, South East Water, Yarra Valley Water, Western Water, Barwon Water and South Gippsland Water (SGW receives water via the Victorian Desalination Pipeline). Gippsland Water receives untreated water. Westernport Water will begin to receive water in the 2019-20 financial year. In total, we supplied 461 billion litres of water in 2018-19, which is 3 per cent more than last year. This volume included directly connected customers supplied by Melbourne's retail water corporations from our aqueducts (untreated water).

Source water

The drinking water we supply is sourced from a combination of protected surface water catchments, unprotected surface water catchments, and seawater. Each of these source waters requires a different type of treatment to ensure that the treated water is appropriate for human consumption.

The majority of Melbourne's water is sourced from forested, protected catchments. The catchment system consists of 11 water supply catchments and five water holding storages. The catchments located within National Parks are co-managed with Parks Victoria, with management arrangements outlined in a National Parks Agreement. The catchments located within State Forest are co-managed with DELWP. A Memorandum of Understanding details the arrangements to effectively manage human activity and land use for the purposes of protecting water resources in State Forest. The five water holding storages are solely managed by Melbourne Water. Most of Melbourne's water is supplied via Silvan Reservoir which receives inflows from Thomson Reservoir, Upper Yarra Reservoir, O'Shannassy Reservoir and other small tributaries to the Yarra River. Cardinia and Greenvale Reservoirs are supplied by the Silvan system. These sources are supplied to Melbourne's retail water corporations unfiltered because of the high quality of water drawn from the protected catchments and large storages.

A smaller proportion of Melbourne's source water comes from open catchments. These areas contain farmland, rural properties and state forests that are open to activities such as camping, four-wheel driving and small amounts of timber harvesting, and as such require additional treatment barriers to ensure the safety of the drinking water supply.

The Tarago water supply catchment contains land that is privately owned, with a variety of agricultural uses. We have an interest in the protection and improvement of water quality on this private land and have worked with stakeholders including the Baw Baw Shire Council and the Neerim District Landcare Group to develop a Tarago Catchment Management Plan.

The open mid-Yarra River catchment feeds into Sugarloaf reservoir, where it mixes with water from the protected Maroondah catchment before being treated at the Winneke treatment plant. The Yarra Glen supply is also fed from the Maroondah catchment, however the transfer aqueduct is not protected, meaning that a greater degree of treatment is required prior to supply.

Yan Yean and Healesville supplies are nominally from protected catchments, however have some weaknesses relating to transfer aqueduct protection. These sites also have additional treatment barriers, which remove colour and turbidity as well as potential pathogens.

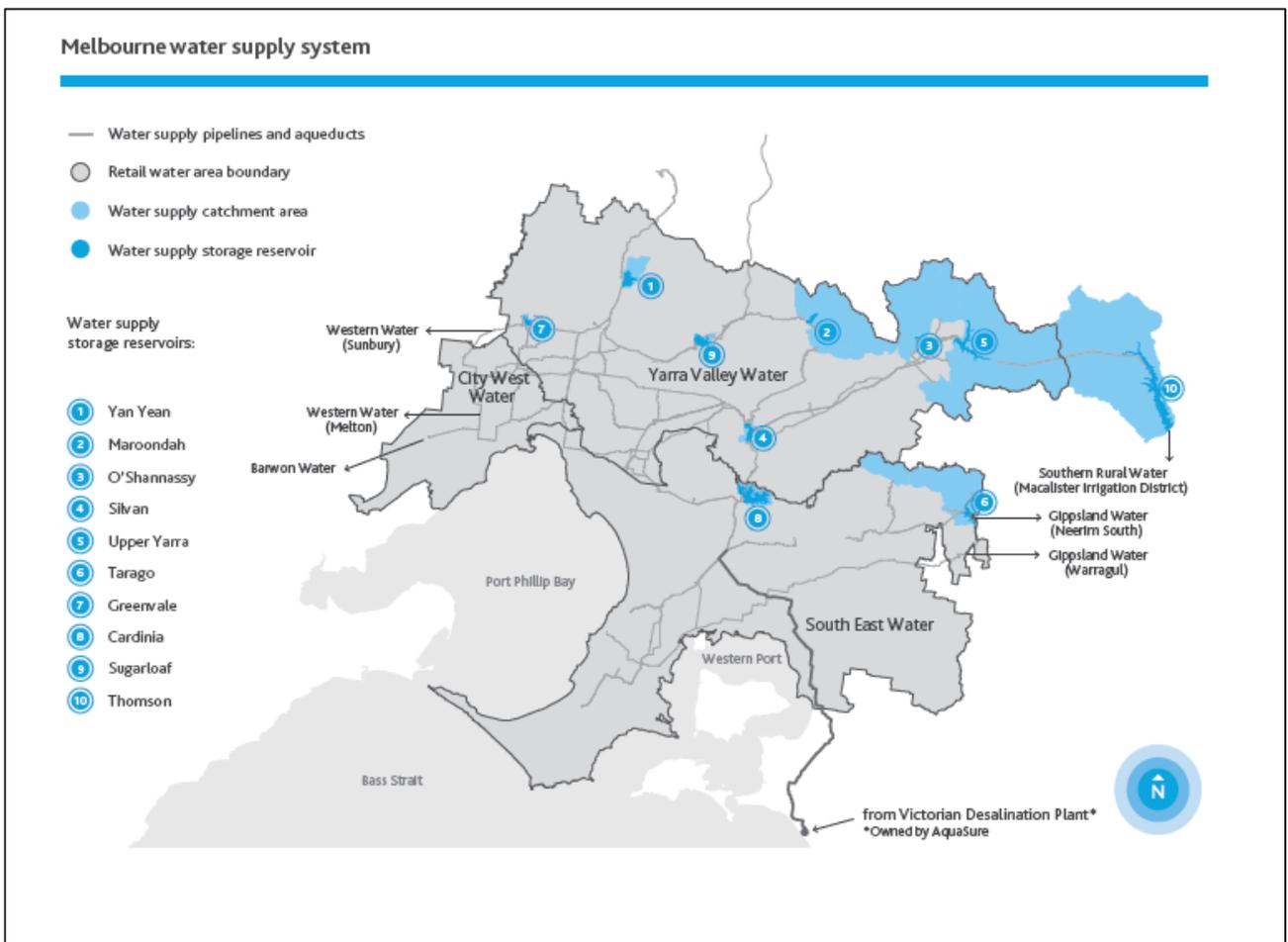
Depending on the volume of water stored in Melbourne's reservoirs, Cardinia Reservoir can also receive desalinated water. The Victorian Desalination Project consists of a 150 gigalitre reverse osmosis plant at Wonthaggi, an 84 kilometre underground two-way transfer pipeline to

Berwick, and an 87 kilometre underground dedicated power supply from Cranbourne. The plant extracts seawater from Bass Strait near Wonthaggi. Water is fully treated via a series of processes (refer to Table 1 and Table 2 for further details). Water enters an underground transfer pipeline which connects the plant to our existing water supply network, enabling supply to Cardinia Reservoir, directly into the water network at Berwick and to offtakes along the pipeline. The pipeline is two-way, so when the plant is not in use, the pipeline can transfer water from our distribution network to connected regional water businesses, thereby ensuring security of supply. For some regional water businesses, this is the first time they have been directly connected to our distribution network. Supply to South Gippsland Water commenced in June 2018 for the first time.

Treatment processes are described in Table 1.

Figure 1 shows our supply area. Twenty-two gigalitres were supplied from the Victorian Desalination Plant this year. There were no major changes in the arrangements for water supply compared to last year. The relative contribution from each source was similar to the previous year. We continue to optimise which sources we harvest from throughout the year to meet forecast demand and climate variability, as per regularly updated plans.

Figure 1 - Melbourne's water supply system



We manage the catchments and source water storages used for the supply of drinking water to the Melbourne metropolitan area. Untreated and treated drinking water is supplied to consumers by Melbourne's retail water corporations. The water is monitored from catchments, through major storages and treatment plants to the interface points with the retail companies to ensure that it meets the requirements of relevant drinking water quality guidelines and agreements with these companies.

We prioritise our actions to protect source water from contamination using our drinking water quality risk assessment. The risk assessment covers catchments, storage reservoirs, treatment and bulk transfer to the interface with the retail water corporations. Operational monitoring is used to provide early warning of issues which could affect drinking water quality, before critical limits are reached. Examples of this monitoring include catchment inspections, manual water quality sampling and online monitoring.

We routinely monitor the water quality within the catchments and distribution system through regular sampling and analysis according to a risk-based laboratory monitoring program. The sampling and analysis is contracted out to external National Association of Testing Authorities (NATA) accredited Laboratories. The level of monitoring is designed to complement risk management and HACCP systems, meet the requirements of the Bulk Water Supply Agreements, monitor treatment processes and assist Melbourne's retail water corporations and regional water authorities' needs in meeting the Safe Drinking Regulations 2015.

We maintain a certified management system, Hazards Analysis and Critical Control Points (HACCP), for operation of the water treatment plants and supply system to ensure the delivery of safe drinking water. This risk-based management system verifies that treatment processes are operating in accordance with design intent, and are achieving the required level of pathogen reduction.

The supply areas of Melbourne's retail water corporations are divided into water quality zones and these zones can have one or more water sources during the day or year due to the demand, seasonal variation and complexity of the our water supply system. The retail water corporations must comply with the health aspects of the Safe Drinking Water Regulations at their customer's taps in these zones as part of their licence agreement with the Essential Services Commission.

Improvement initiatives

Improving our Investment Decisions

Further to the water safety assessment that formed part of the sanitary survey work, in 18/19 a suite of catchment management activities and treatment barriers were analysed to identify optimal approaches to achieving the health based target of 1 microDALY. The outputs of this analysis are now being used to direct investment in catchment management activities and treatment barriers as required.

Melbourne Water continues to work with Parks Victoria, DELWP and DHHS to deliver the Catchment Management Optimisation Program (CMOP). The CMOP program commenced in 2017-18 and addresses an Opportunity for Improvement from the 2017-18 audit outcomes. The program determines catchment condition targets and management regimes that will deliver the microbial health based targets (HBTs) and Drinking Water Quality Strategy outcomes from our water supply catchments. This program uses prioritisation tools to help decide where to focus future effort and effective investment to maintain the quality of our world-class drinking water.

The program builds on the learnings from the sanitary surveys completed for our drinking water catchments. It will lead to clear strategic objectives and associated joint management plans to optimise the quality and quantity of water that can be harvested from these catchments and maximise the value of these protected, forested catchments for our community.

Using a participatory approach, the program works with the land managers (Melbourne Water, Parks Victoria and DELWP) to build an a better understanding of the drinking water catchments and their land management requirements. Work to date has seen the investment analysis completed for the water supply catchments including Greenvale reservoir, Tarago catchment, the Silvan system (includes Upper Yarra and Thomson catchments), the Wallaby Creek system (includes Yan Yean reservoir), Cardinia reservoir and Maroondah system (includes Sugarloaf reservoir). Next steps will be to review the current management programs in the light of the CMOP findings. This will include working with Parks Victoria and DELWP to continue to manage our catchments to the highest of standards.

Implementing Upgrades and Renewals

There have also been a number of significant plant upgrades and renewal works. A major project completed in 2018-19 was the construction of a new fluoridation plant at the Kallista water treatment plant. The plant was designed to comply with the newly updated *Code of Practice for Fluoridation of Drinking Water Supplies (Vic)*, and incorporates a number of reliability, control and safety improvements and innovations.

A program to upgrade all of the membrane treatment plants in our network also continued in 2018-19. Yarra Glen water treatment plant was completed in 2019. Frogley water treatment plant works commenced in 2019 and is scheduled for completion in late 2019.

A new sodium hypochlorite plant was constructed at Winneke treatment plant to replace the bulk liquefied chlorine gas chlorination system as part of Melbourne Water's Chlorine Risk Reduction Program. The plant is currently operational and the chlorine gas system was decommissioned in 2019 and Worksafe has removed Winneke's Major Hazard Facility status.

Drinking water treatment processes

The water we supply to retail water corporations is treated, with the exception of:

- Gippsland Water - Untreated water from our Tarago source is fed into Gippsland Water's treatment plants and then into supply for consumption by the customers.
- South Gippsland Water – Treated water from the Victorian Desalination Pipeline where quality may deteriorate in the pipeline. This water is treated in South Gippsland Water's treatment plants prior to being supplied to customers.
- Supply by Agreement Customers – some customers directly connect to our untreated water assets. The retail water corporations have processes to ensure these customers are informed that their water is not suitable for drinking.

Water treatment plants are located where water from open storages first enters the distribution system. Whilst long retention times in storage reservoirs and primary disinfection plants help inactivate microorganisms such as pathogenic bacteria, protozoa and viruses in the untreated water, additional treatment barriers are required depending on the risk level of the water. Chlorination and ultraviolet (UV) irradiation are the methods we use to disinfect the water. Chlorination is the most common form of disinfection used to treat Melbourne's water supply, with chlorination plants located at all of the major water treatment plants. Chlorination primary disinfection is effective against viruses and bacteria, and also provides a residual to control biofilm growth in the downstream network. We also operate six UV

irradiation disinfection plants, which provide effective initial disinfection, but do not provide a disinfection residual for protection against downstream biofilm growth. At Warburton (Martyr Road), Woori Yallock and Launching Place (Lusatia Park), East Warburton (Brahams Road and Lyrebird Avenue) and Yarra Junction, UV disinfection at each site provides primary disinfection, and sodium hypochlorite addition provides secondary disinfection to control biofilm growth.

Water from unprotected catchments is treated by filtration in addition to chlorine disinfection, to ensure protozoa removal. We operate two large filtration plants. Winneke water treatment plant is a sand filtration plant that treats water at the outlet of Sugarloaf Reservoir. The Winneke water treatment plant incorporates processes including coagulation, clarification, filtration and chemical addition for fluoridation, chlorination and pH correction. The Tarago water treatment plant at Drouin West is gravity fed from Tarago Reservoir, and incorporates processes including permanganate pre-dosing, coagulation, Dissolved Air Flotation and Filtration (DAFF), UV irradiation and chemical addition for pH correction, fluoridation and chlorination. At the Tarago water treatment plant, UV irradiation is used as an additional barrier downstream of filtration to ensure the inactivation of protozoa.

There are three relatively small membrane filtration plants; two that supply Healesville (Frogley and Cresswell water treatment plants) and one that supplies Yarra Glen. These plants remove particles in the untreated water from their respective aqueduct sources to ensure that parameters such as turbidity and colour are reduced to acceptable levels, particularly during storm events. In addition, pathogens attached to the filtered particles are removed. Reducing the turbidity to below 1 nephelometric turbidity unit (NTU) also ensures more effective chlorine disinfection of the filtered water.

Water from the Victorian Desalination Plant is treated via a series of processes which include filtration, reverse osmosis, disinfection and fluoridation.

The Yan Yean water treatment plant is privately owned and operated and can supply treated water into the water supply system under our direction. This plant did not supply treated water for consumption during the year.

Eleven fluoridation plants are operated at the direction of the Department of Health and Human Services to protect the dental health of our community. The operation of the fluoridation plants is a statutory requirement under the *Health (Fluoridation) Act 1973* (Vic). The eleven plants are comprised of:

- Seven fluorosilicic acid plants operating at: Silvan (three plants), Cardinia (two plants), Winneke (one plant) and Tarago (one plant)
- Two sodium fluoride solution plants operating at Monbulk and Kallista
- The Yan Yean fluorosilicic acid plant which was privately owned and operated on our behalf by Trility Pty Ltd.
- The Victorian Desalination Plant which uses fluorosilicic acid. AquaSure operates the Victorian Desalination Plant under a public private partnership project managed by DELWP.

Secondary disinfection chlorination plants are also located at a number of points within the treated water network. The purpose of secondary disinfection is to prevent taste and odour problems, and to control biofilm growth within the closed distribution system where the water has already been treated by primary disinfection. Chlorine residual limits are also set to ensure that disinfection by-products do not exceed health limits specified in the *Australian Drinking Water Guidelines*.

Tables 1 – 2 describe the water treatment sources, treatment processes and substances added at each treatment plant.

Table 1: Summary of water supply systems and areas serviced

Water Supply System	Source Water / Catchment	Storage	Treatment Plant	Treatment Storages	Area Supplied <i>(Retail water corporation supplied)</i>
Cardinia	Transfer from Silvan Reservoir without being treated at Silvan water treatment plant	Cardinia Reservoir	Cardinia Treatment Plant	N/A	Mornington Peninsula and south eastern suburbs. Note: pump station at Cardinia can also pump water back to Silvan Reservoir <i>(South East Water, Yarra Valley Water, South Gippsland Water)</i>
Victorian Desalination Plant	Desalination plant offtake from Bass Strait	Direct to supply or Cardinia Reservoir	Wonthaggi Desalination Plan	Cardinia Reservoir / direct supply to townships	Capable of supplying primarily Mornington Peninsula, south eastern suburbs and South Gippsland area through direct delivery points and contributing to water businesses connected to the Melbourne Water supply through Cardinia Reservoir which is blended with catchment supplies. <i>(South East Water, Yarra Valley Water, South Gippsland Water)</i>
Greenvale	Transfer from Silvan Reservoir (after treated at Silvan), or from Winneke water treatment plant. See Silvan and Winneke water supply systems	Greenvale Reservoir	Greenvale St Albans	N/A	Western suburbs and Sunbury/Melton <i>(City West Water, Yarra Valley Water, Western Water, Barwon Water)</i>
			Greenvale-Yuroke	N/A	
Lower Yarra Valley Townships	Maroondah Catchment	Maroondah Reservoir	Yarra Glen	Yarra Glen Service Reservoir	Yarra Glen <i>(Yarra Valley Water)</i>
Lower Yarra Valley Townships	Coranderrk and Graceburn Catchments		Cresswell	Cresswell Service Reservoir	Healesville <i>(Yarra Valley Water)</i>
			Frogley	Frogley Service Reservoir	

Water Supply System	Source Water / Catchment	Storage	Treatment Plant	Treatment Storages	Area Supplied (Retail water corporation supplied)
Silvan	Thomson Catchment Upper Yarra Catchment O'Shannassy Catchment Armstrong Catchment McMahons Catchment Starvation Catchment Coranderrk Catchment	Silvan Reservoir	Silvan-Olinda Silvan-Preston Silvan-Waverley	N/A	Eastern, central, northern & western suburbs, including Seville and Wandin (City West Water, South East Water, Yarra Valley Water)
			Monbulk	Monbulk Service Reservoir 1 & 2	Monbulk, Silvan, Sherbrooke, Sassafras, Ferny Creek, Olinda, Mount Dandenong (Yarra Valley Water)
			Kallista	Johns Hill Service Reservoir	Emerald, Kallista, Menzies Creek, Cockatoo (Yarra Valley Water)
Tarago	Tarago Catchment	Tarago Reservoir	Tarago	Tarago Clearwater Storage	Neerim South, Drouin/Warragul (Gippsland Water) Mornington Peninsula, West Gippsland townships, southern suburbs (South East Water)
Upper Yarra Valley Townships	Thomson Catchment Upper Yarra Catchment	Thomson Reservoir Upper Yarra Reservoir	Brahams Rd Lusatia Park Lyrebird Martyr Rd Yarra Junction	N/A	Woori Yallock, Launching Place, Yarra Junction, Warburton, East Warburton (Yarra Valley Water)
Winneke	Transfer from Maroondah Reservoir, Yarra River, Goulburn River ¹	Sugarloaf Reservoir	Winneke Treatment Plant	Winneke Clearwater Reservoir	Northern, eastern, central & western suburbs (City West Water, South East Water, Yarra Valley Water)
Yan Yean ²	Wallaby Creek Catchment Toorourrong Catchment Yan Yean Catchment Transfer from Silvan Reservoir	Yan Yean Reservoir	Yan Yean	Yan Yean Service Reservoir	Northern suburbs (Yarra Valley Water)

¹ This source is only used when the relevant conditions specified in the Statement of Obligations (System Management) are met, and was not used this year.

² No water was supplied from the Yan Yean WTP this year.

Table 2: Water treatment processes and added substances at each drinking water treatment plant

Water Supply System	Treatment Plant	Treatment Process	Added Substances	Role of Each Process
Cardinia	Cardinia 1400 Cardinia 1700	Chlorination	Chlorine gas	Disinfection
		Fluoridation	Fluorosilicic acid	Provide dental health benefit
		pH Correction	Lime	pH correction
Victorian Desalination Plant	Wonthaggi Desalination Plant	Coagulation /Flocculation	Ferric sulphate / Sulphuric acid / Polydadmec	Improve performance of filtration
		Filtration (Drum screens, dual media pressure filters, cartridge filters)	-	Protect RO membranes
		Reverse Osmosis	Antiscalant / Sodium hydroxide/ Sodium bisulfite	Removal of salts from the water
		Reverse Osmosis Cleaning	Membrane cleaning chemicals (caustic, detergent, acid)	Maximise performance of RO
		Chlorination	Chlorine gas	Disinfection
		Fluoridation	Fluorosilicic acid	Provide dental health benefit
		Remineralisation	Hydrated lime / Carbon dioxide	Stabilise water and pH correction
		Membrane preservation	Sodium bisulfite	Protect membranes when not in use
Sludge thickening/dewatering	Polymer	Washwater recovery		
Greenvale	Greenvale St Albans Greenvale Yuroke	Chlorination	Sodium hypochlorite	Disinfection
Lower Yarra Valley Townships	Cresswell Frogley Yarra Glen	Coagulation / flocculation	Aluminium chlorohydrate	Colour & organics removal
		Membrane ultrafiltration	-	Remove pathogens/turbidity
		Membrane cleaning	Citric acid / Sodium hypochlorite	Optimise membrane performance
		Chlorination	Sodium hypochlorite	Disinfection
		pH correction	Sodium carbonate	pH correction
Silvan	Silvan-Olinda Silvan-Preston Silvan-Waverley	Chlorination	Chlorine gas	Disinfection
		Fluoridation	Fluorosilicic acid	Provide dental health benefit
		pH correction	Lime	pH correction
	Monbulk Kallista	Chlorination	Sodium hypochlorite	Disinfection
Fluoridation		Sodium fluoride	Provide dental health benefit	
Tarago	Tarago	Pre-treatment chemical dosing	Powdered activated carbon / lime / carbon dioxide	Optimise treatment plant performance
		Coagulation/flocculation	Aluminium chlorohydrate / PolyDADMAC / Polyacrylamide	Improve filter performance
		Dissolved air flotation filtration (DAFF)	-	Removal of pathogens/turbidity
		Chlorination	Chlorine gas	Disinfection

Water Supply System	Treatment Plant	Treatment Process	Added Substances	Role of Each Process
		Ultraviolet (UV) irradiation	-	Disinfection
		Fluoridation	Fluorosilic acid	Provide dental health benefit
		pH correction	Lime / Carbon dioxide	pH correction
		Sludge thickening / dewatering	Polyacrylamide	Washwater recovery
		Iron / manganese removal	Potassium permanganate	Removal of iron and manganese
Upper Yarra Valley Townships	Brahams Rd Lusatia Park Lyrebird Martyr Rd Yarra Junction	Ultraviolet (UV) irradiation	-	Disinfection
		Chlorination	Sodium hypochlorite	Secondary disinfection to provide a chlorine residual to customer tap
Winneke	Winneke Treatment Plant	Coagulation / flocculation	Aluminium sulphate / Polymer	Colour & organics removal
		Clarification	-	Remove pathogens / turbidity
		Rapid media filtration	-	Remove pathogens / turbidity
		Chlorination	Chlorine gas ³	Disinfection
		Fluoridation	Fluorosilic acid	Provide dental health benefit
		pH correction	Lime	Optimise disinfection, and pH correction
		Sludge thickening / dewatering	Polyacrylamide	Washwater recovery
Yan Yean ⁴	Yan Yean	Coagulation/floculation	Aluminium sulphate / PolyDADMAC / Polyacrylamide	Colour & organics removal / Filtration aid
		Rapid media filtration	-	Remove pathogens / turbidity
		Chlorination	Chlorine gas / Sodium hypochlorite	Disinfection
		Fluoridation	Fluorosilic acid	Provide dental health benefit
		pH correction	Lime	pH correction

³ Winneke had a new sodium hypochlorite plant constructed in 2019 however chlorine gas was supplied through the 2018-19 financial year

⁴ No water was supplied from the Yan Yean WTP this year.

Issues

Wide Spread Customer Complaints

- In February 19 discoloured water from Melbourne Water's Greenvale Reservoir led to customer complaints within certain zones of Western Water, City West Water and Yarra Valley Water. The flows were contained and at no time was there any risk to public health.
- Upon investigation it was determined that a small volume of discoloured water from below the reservoir thermocline containing iron and manganese inadvertently bypassed a lower gate valve. The gate was in the shut position however was found not to be fully closed. Subsequently works were completed to close the gate fully. Position sensors have also been installed on the gate valves at Greenvale to verify that gates are fully shut when showing in the shut position. A review is underway to ensure that this risk is managed at all Melbourne Water reservoirs with variable offtakes. A Section 22 Notification was submitted to DHHS relating to this incident due to the potential for widespread public complaint and is discussed in Emergency Incident and Event Management below.

Fluoride Outage Notifications

We notified DHHS and the retail water corporations of 3 occasions when the concentration of fluoride supplied was less than 0.6 mg/L for longer than 72 hours, and therefore notification was required under the *Code of Practice for Fluoridation of Drinking Water Supplies* (Vic). These occasions occurred when fluoridation was turned off as a precautionary measure while we confirmed potential irregularities with plant processes or undertook urgent maintenance.

We notified DHHS and the retail water companies of 4 events where online monitoring detected an elevated fluoride concentration for a short time (up to 4 minutes) and subsequently the fluoride plants shut down automatically. We also notified DHHS of 1 occasion where water with a high fluoride concentration was supplied for 25 minutes due to a controlling flow meter fault. There was deemed to have been no impact on public health.

Root causes were identified and learnings were applied across all fluoridation plants (e.g. improved spares inventory, modified maintenance regimes, additional PLC controls etc).

Emergency, incident and event management

Issues with known or suspected water contamination

We had 3 instances of known or suspected contamination to report under Section 22 of the *Safe Drinking Water Act*:

A Section 22 Notification was submitted for a fluoride residual incident at the Silvan-Waverley fluoride plant on 1 August 2018. The operator shut down that plant as soon as they were notified. This incident was deemed to have no impact on public health. Code changes were made to the control system to add a new alarm in the event of a rapid increase in dosing to prevent any recurrence. Changes were also made to the instrument calibration methodology.

A Section 22 was submitted in response to an *E. coli* detection at the inlet to Greenvale reservoir. On the morning Saturday 12 October 2018 our external laboratory services provider, ALS, detected *E. coli* in a routine sample collected at Greenvale reservoir inlet on 11/10/2019,

and notified us immediately. We reviewed the chlorine residual in the water on the Friday afternoon, the upstream sample results from the same day and the performance of the Silvan treatment plant which had treated the water supplied at the time of sampling, all of which were normal. A thorough follow up investigation demonstrated that this result was a false positive, and no further action was required.

A Section 22 Notification was submitted for the Greenvale coloured water event on 7 March 2019. While the impact on the water was of an aesthetic nature rather than health-related, this incident was one which could cause widespread complaint. This incident impacted on City West Water, Yarra Valley Water and Western Water causing a s number of complaints. MW maintained ongoing consultation with the affected Retail Water Corporations throughout and after the incident which lasted approximately 20 days. A number of actions have been undertaken to reduce the risk of recurrence at Greenvale and all of our other reservoirs with variable offtakes.

Issues with potential to impact water supply

In early 2019 bushfires in the Thomson and Upper Yarra catchments had the potential to impact the drinking water supply. Bushfire Events in our water supply catchments are managed and planned for to ensure there are no interruptions to Melbourne's water supply.

The water supply system has flexibility that allows the movement of water to where it is required to meet Melbourne's needs. There are a variety of water sources, including the desalination plant, that supply greater Melbourne.

Melbourne Water managed these incidents under a General Emergency Management Structure. Extensive water quality monitoring and modelling underpin the contingency plans. During these specific incidents both on-water as well as on-ground remediation works were conducted to reduce the likelihood and impact of a turbidity event. These fires have not had any impact on water quality.

Risk management plan audit results

There was no requirement for an audit in 2018-19 under the *Safe Drinking Water Act*. A copy of the 2017-18 audit certificate is included as an Appendix. Actions were completed from the 2017-18 audit relating to audit findings:

An assurance action was created for the following Opportunity for Improvement relating to "Consider formalising source protection targets". The CMOP work described above will outline the targets and management regimes required between Melbourne Water, Parks Victoria and DELWP. A final report for CMOP was delivered in September 2019.

We also continued our third-party HACCP certification, with the certificate shown in the appendix.

Exemptions under Section 8 of the Act

No exemptions were in place during the year.

Undertakings under Section 30 of the Act

No undertakings were entered into or completed during the year and there were none in place from previous years.

Further information

This report and further information regarding drinking water quality is available on our website at www.melbournewater.com.au or by contacting the customer service team:

Telephone: 131 722
Translation Service: 131 450
Speak and Listen: 1300 555 727
Fax: (03) 9679 7099
Mail: Melbourne Water
PO Box 4342
Melbourne, Victoria 3001

Appendix

Risk management plan audit certificate

Safe Drinking Water Regulations 2015 - Regulation 10

Certificate Number: 146

Audit period: 6 May 2016 to 31 March 2018

To: Nigel Garson, Drinking Water Quality Management System Coordinator

Melbourne Water, 990 La Trobe Street, Docklands, Melbourne 3008

Australian Business Number (ABN): 81 945 386 953

I, Dr Daniel Deere, after conducting a risk management plan audit of the water supplied by Melbourne Water am of the opinion that -

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

Signature of approved auditor: *D Deere* Date: 21 April 2018



CERTIFICATE OF APPROVAL

This is to certify that the HACCP System of:

**Melbourne Water Corporation
990 Latrobe Street
Melbourne, Victoria
Australia**

has been approved by Lloyd's Register Quality Assurance to the following standard:

HACCP Codex Alimentarius Annex to CAC/RCP 1-1969 (2009)

The HACCP system is applicable to:

Management of catchments, reservoirs, treatment facilities and transfer networks for the wholesale supply of drinking water and treatment facilities for the supply of Class A recycled water.

This certificate forms part of the approval identified by certificate number MEL1300023/A-B

Approval
Certificate No: MEL1300023/B

Original Approval: 19 September 2014
Current Certificate: 19 September 2017
Certificate Expiry: 18 September 2020

A handwritten signature in black ink, appearing to read 'M. J. Leavelle', written over a horizontal line.

Issued by: Lloyd's Register Quality Assurance Limited

Level 16, 461 Bourke Street, Melbourne, Vic, 3000
This approval is carried out in accordance with the LRQA assessment and certification procedures and monitored by LRQA.
Version Number 12

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