2020–21

DRINKING WATER QUALITY REPORT

icon WATER

CONTENTS

SUMMARY

SUMMARY

At Icon Water we support and protect the community and the environment by providing safe, clean drinking water.

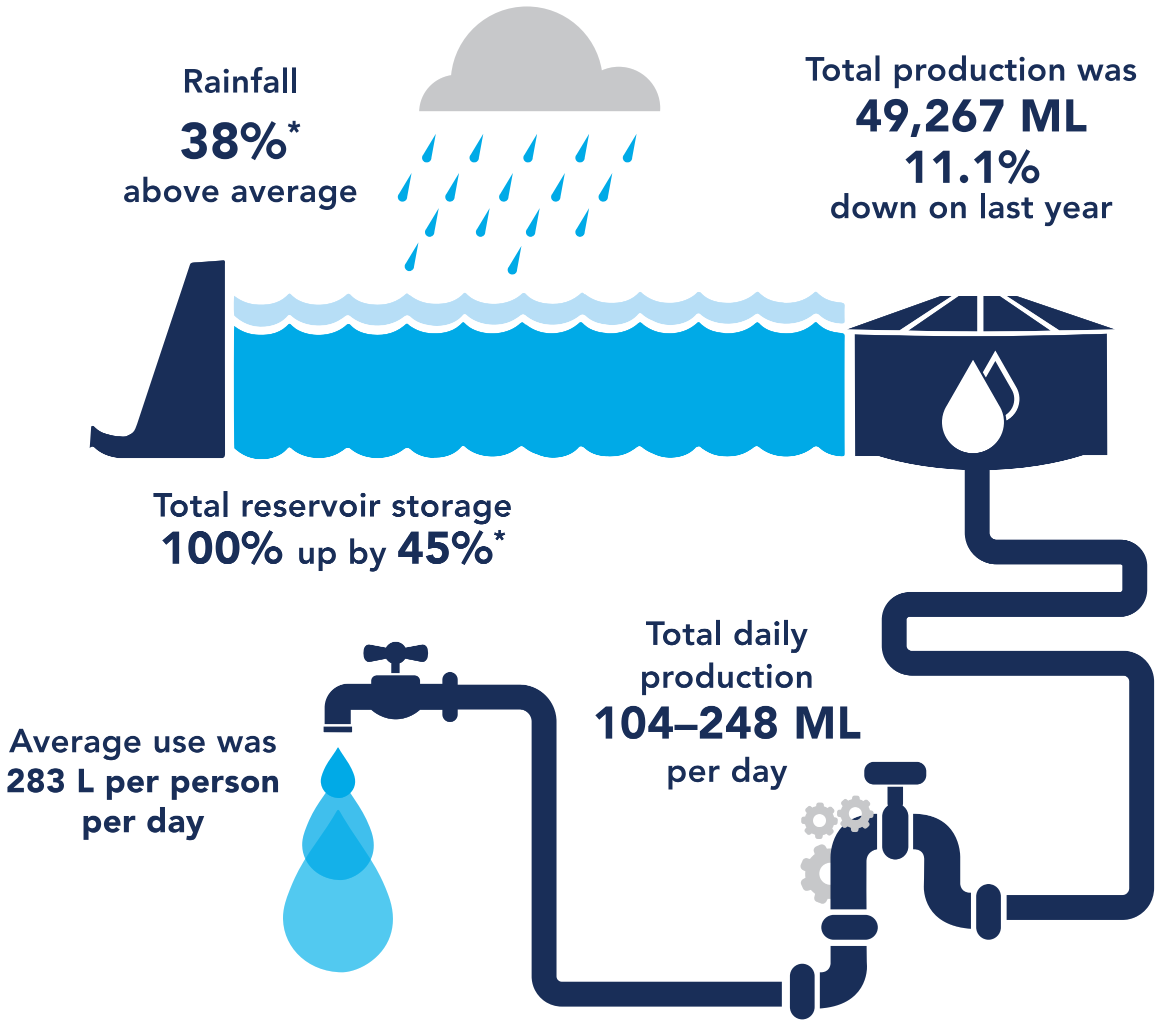
We apply a rigorous water quality management framework that includes the catchments, our storage reservoirs, water treatment plants, service reservoirs and the reticulation system all the way to our customers' connection. A core component of this is our monitoring program that assesses water quality across the entire drinking water production sequence.

The information generated within this framework monitoring program ensures high quality water is delivered to Canberra as well as the Queanbeyan-Palerang Regional Council.

At the end of June 2021, Canberra's four water storage reservoirs held 100 per cent of their total accessible capacity. This is significantly higher than the previous year of only 55 per cent.

Overall daily production of drinking water throughout 2020–21 ranged between 104 to 248 megalitres (ML), with a total of 49,267 ML of drinking water supplied across the year. Customers consumed 11.1 per cent less water than the previous year.

Figure 1. Summary of total storage, production and consumption



*Compared to 2019–2020

WHO ARE OUR CUSTOMERS?

In 2020–21 we supplied drinking water to 191,584 residential and commercial customers in the ACT.

We also supplied bulk water to Queanbeyan-Palerang Regional Council, which was distributed to the city of Queanbeyan including the Googong Township.

In 2020-21 we supplied 49,267 ML of drinking water to Canberra and Queanbeyan, an average of 283 litres per day. This was 11 per cent lower than 2019–20, and also 6.5 per cent lower than 2018–19.

As expected, water use fluctuated with the weather and the seasons; we produced between 104 ML and 248 ML per day throughout the year, a reduction of 21 per cent of the summer peak water demand of the previous year.

Canberra's population is estimated at 431,484[1] and Queanbeyan at 43,620[2] representing an annual population growth of 0.8 per cent. This growth predictably meant more customer connections to the water supply network.

1 https://www.abs.gov.au/statistics/people/population/national-state-and-territory-population/dec-2020
2 https://www.abs.gov.au/statistics/people/population/regional-population/latest-release

OUR SUPPLY SYSTEM

The process of providing water to our customers starts by withdrawing water from the dams.

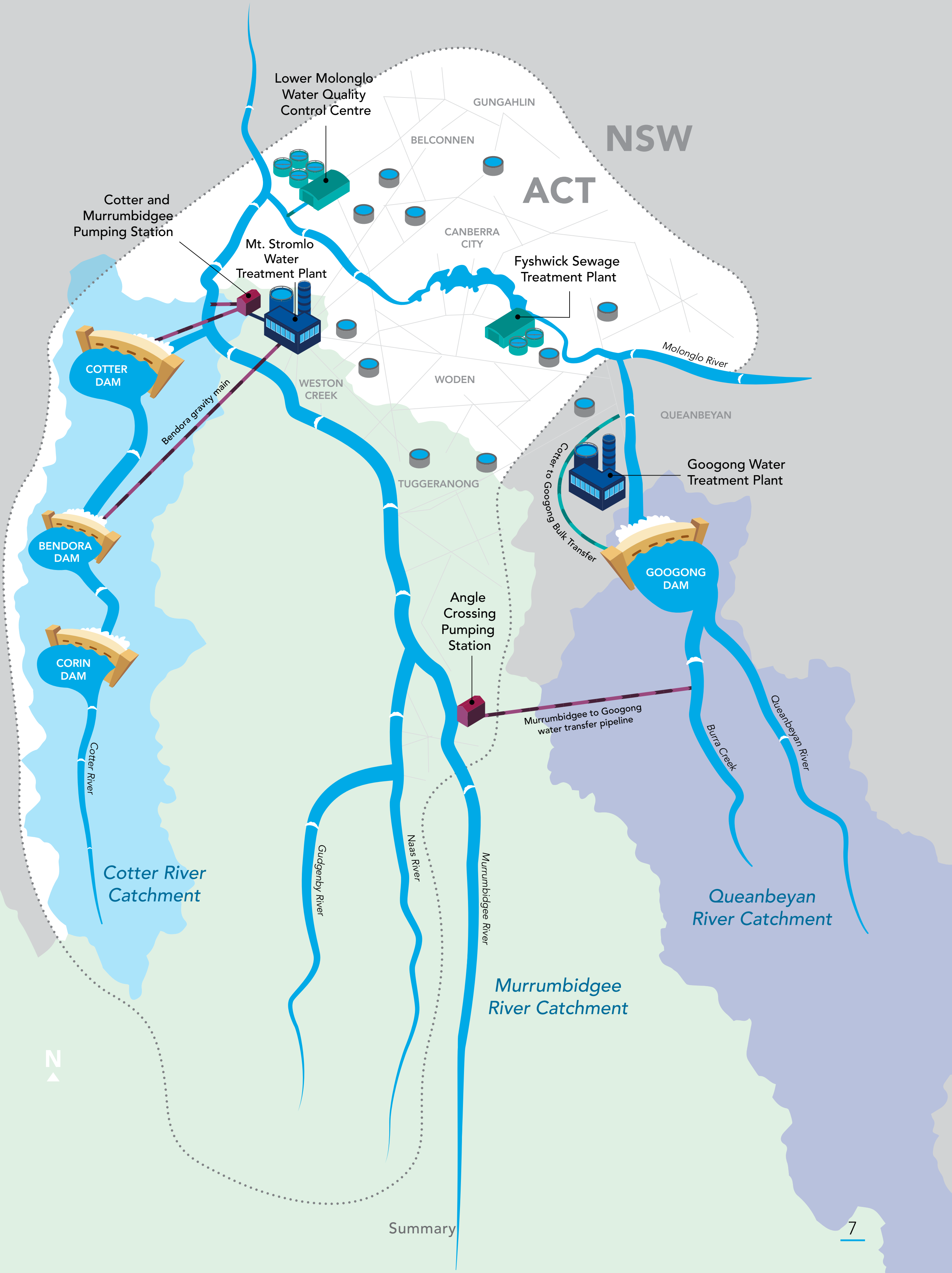
These dams are fed by three catchments and three rivers, and this diversity makes our water supply more secure in drier times or if a major event (like a bushfire) means the water in one catchment is compromised.

We then treat the water so it meets health guidelines and also looks, smells and tastes great; this work can be carried out at either of our two water treatment plants. Following treatment, the drinking water is fed into tanks across the region, then into water mains which connect to local service lines and finally to customers' properties.

At all of these points we apply a rigorous management framework underpinned by an extensive water quality monitoring program. Information about the status of water quality at each point of the supply system comprises the bulk of this publication.

OUR NETWORK

(WATER & SEWERAGE)



HOW DOES ICON WATER MANAGE THE SUPPLY OF MY WATER?

WHAT STANDARDS APPLY TO CANBERRA'S DRINKING WATER?

Icon Water holds licences which allow us to operate our drinking water distribution and supply service. These are:

- Utility Services Licence, issued by the Independent Competition and Regulatory Commission (ICRC) under the Utilities Act 2000
- Drinking Water Utility Licence, issued by the ACT Health Directorate (ACT Health) under the Public Health Act 1997

We manage quality in accordance with the requirements of the Public Health (Drinking Water) Code of Practice (2007) (the Code), issued by ACT Health. Copies of the Code are available from the ACT Health website at health.act.gov.au.

The Code sets out quality standards and operational, communication, reporting and response requirements for Icon Water and ACT Health to ensure the supply of safe drinking water. The Code also sets out specific events or incidents where Icon Water must notify ACT Health.

Under the operating licences and the Code, Icon Water is required to comply with the current National Health and Medical Research Council (NHMRC) Australian Drinking Water Guidelines (ADWG). The guidelines provide a basis for determining the quality of water in all parts of Australia and are regularly revised to ensure they represent the latest scientific evidence. The guidelines are available from the NHMRC website at nhmrc.gov.au/about-us/publications/australian-drinking-water-guidelines.

Control of the water supply system incorporates an Integrated Management System to meet quality, environmental, regulatory and workplace health and safety requirements. For 2020–21 Icon Water maintained certification and complies with the following Australian and international standards:

- ISO 9001:2015. Quality management systems
- ISO 14001:2015. Environmental management systems
- AS/NZS 4801:2001. Occupational health and safety management systems
- HACCP and Good Manufacturing Practice (GMP) – Codex Alimentarius Alinorm 2003/13A.

MULTIPLE BARRIER APPROACH

Providing safe drinking water to customers is our priority.

We achieve this through a 'multi-barrier approach' to make sure we aren't relying upon a single approach or tool to protect public health.

This starts with preventative risk management in the source water catchment and continues right through to the point when the water flows through to a customer's property. At every point we apply control measures to eliminate or minimise real or potential risks to water quality.

Our multi-barrier approach includes:

- a source water protection program
- selective abstraction of source water
- multiple water treatment processes monitored by real-time online analysers and internal testing
- an enclosed distribution system with limited access
- a routine 'catchment-to-customer' verification sampling program conducted by an independent, National Association of Testing Authorities (NATA)-accredited laboratory

We manage water quality through a framework that integrates the Australian Drinking Water Guidelines (ADWG) Framework and the internationally recognised Hazard Analysis and Critical Control Point (HACCP) principles. Both systems apply a preventative risk management approach to ensure the risks to water quality are effectively controlled. The performance of these barriers are actively monitored and managed to protect Canberra's water supply against potential risks to public health.

What is Icon Water's HACCP system certification?

The externally-certified HACCP system was designed to address risks to food production, and has widely been adapted to suit a drinking water supply process. Certification enhances our ability to manage drinking water quality and ensures continuous evaluation and improvement across barriers and control points. In 2020–21 we maintained third-party certification of our HACCP– based risk management system.

What is the ADWG management Framework?

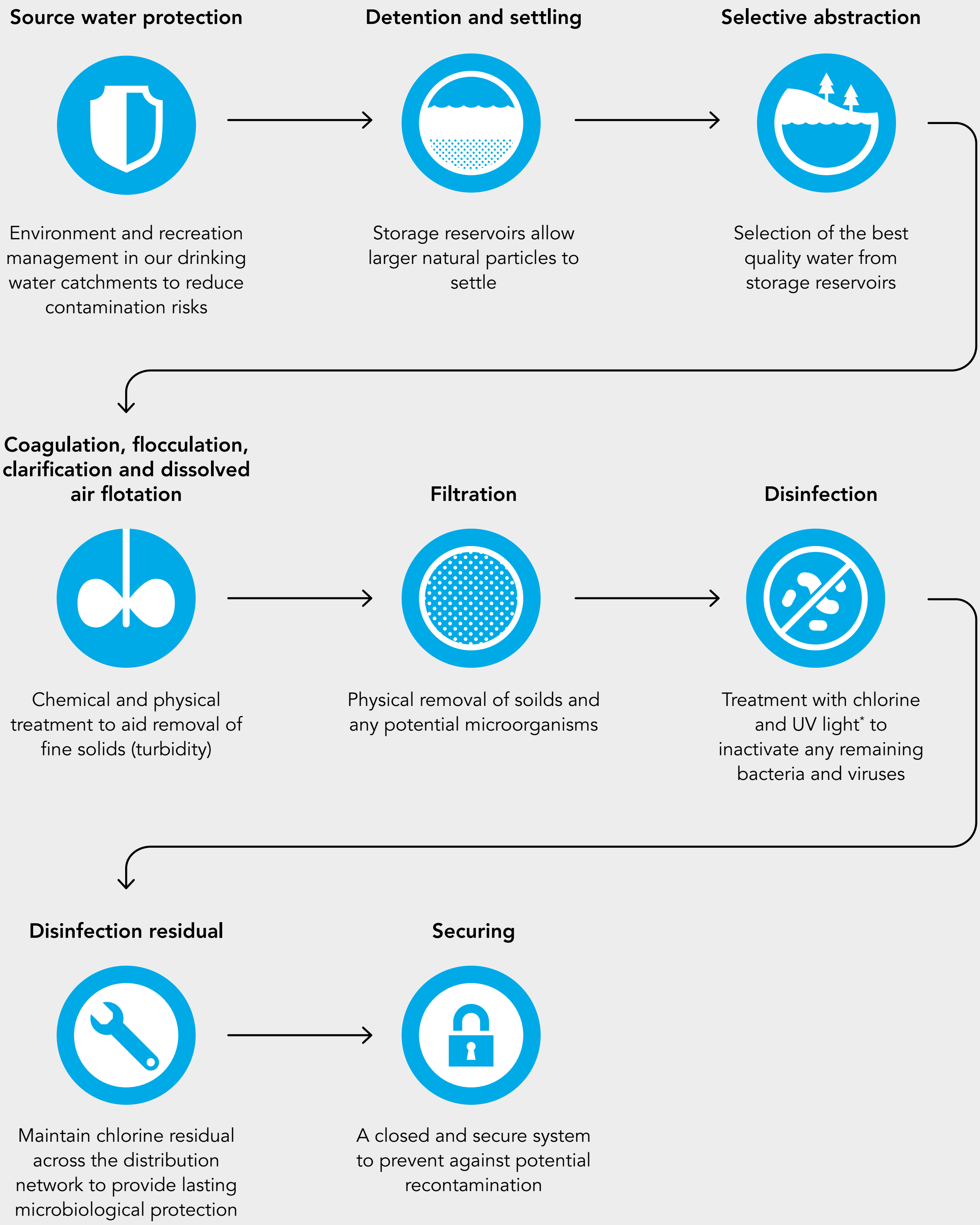
The ADWG provide a basis for determining the health and aesthetic quality of water supplied to consumers across Australia. The Guidelines also provide a framework to help utilities design a structured and systematic approach to preventative risk management of drinking water quality.

Icon Water's verification program operates via an external laboratory that measures the physical, chemical and microbiological parameters of the water we supply to customers. The results of the program inform decisions to manage water quality, and verify our compliance with the ADWG.

The ADWG include two types of criteria to measure and manage the performance of the water supply system. They are:

- a health guideline value; defined as the concentration or measure of a water quality characteristic that, based on present knowledge, does not result in any significant risk to the health of the consumer over a lifetime of consumption
- an aesthetic guideline value; defined as the concentration or measure of a water quality characteristic that is associated with acceptability of water to the consumer; for example, appearance, taste and odour.

Figure 2. Drinking water supply barriers



*UV light treatment at Mount Stromlo WTP only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CANBERRA'S SOURCE WATER CATCHMENTS

WHERE DOES MY WATER COME FROM?

In the Canberra region our source water catchments are able to store 277.8 GL of available water. This is split across our three Cotter River storage reservoirs of Corin (70.8 GL), Bendora (11.4 GL) and Cotter (76.2 GL); the Googong (119.4 GL) storage reservoir on the Queanbeyan River.

Icon Water has the option to abstract water from three river systems, which provides source diversity to ensure water supply under varying climatic and catchment conditions.

The Cotter River catchment is predominantly within the ACT and contains the Corin, Bendora and Cotter storage reservoirs. These reservoirs have an available combined full capacity of 158.4 GL and were 100 per cent full at the end of June 2021.

The Queanbeyan River catchment lies within NSW and has a single reservoir, Googong, with a storage capacity of 119 GL. We can also abstract water from two locations on the Murrumbidgee River.

We work closely with the ACT and NSW governments and the community to ensure these catchments are responsibly managed to protect the integrity of the region's drinking water supply.

The majority of the Cotter River catchment is within the Namadgi National Park and is largely protected from pollutants (faecal matter, pesticides etc) usually associated with agricultural, residential and recreational activities. The Lower Cotter Catchment is undergoing restoration following a history of forestry practice and the impact of bushfires in 2003.

A bushfire in early 2020 damaged portions of the Corin and Bendora catchments, and was followed by flood events in 2021. Fortunately there was no lasting impact to water quality within these storage reservoirs. Although there is still a long road to recovery, the fire-impacted areas have developed good ground coverage and diversity of grasses, shrubs and tree re-growth. The waterways and steep slopes within severely impacted areas have also remained stable.

During 2020–21, the Cotter River reservoirs provided 88 per cent of the water supplied to customers, of which the majority came from Bendora reservoir.

The Queanbeyan River catchment, located to the southeast of Canberra, contains a mix of developed and impacted land, including nature reserves, farm grazing and rural residential properties.

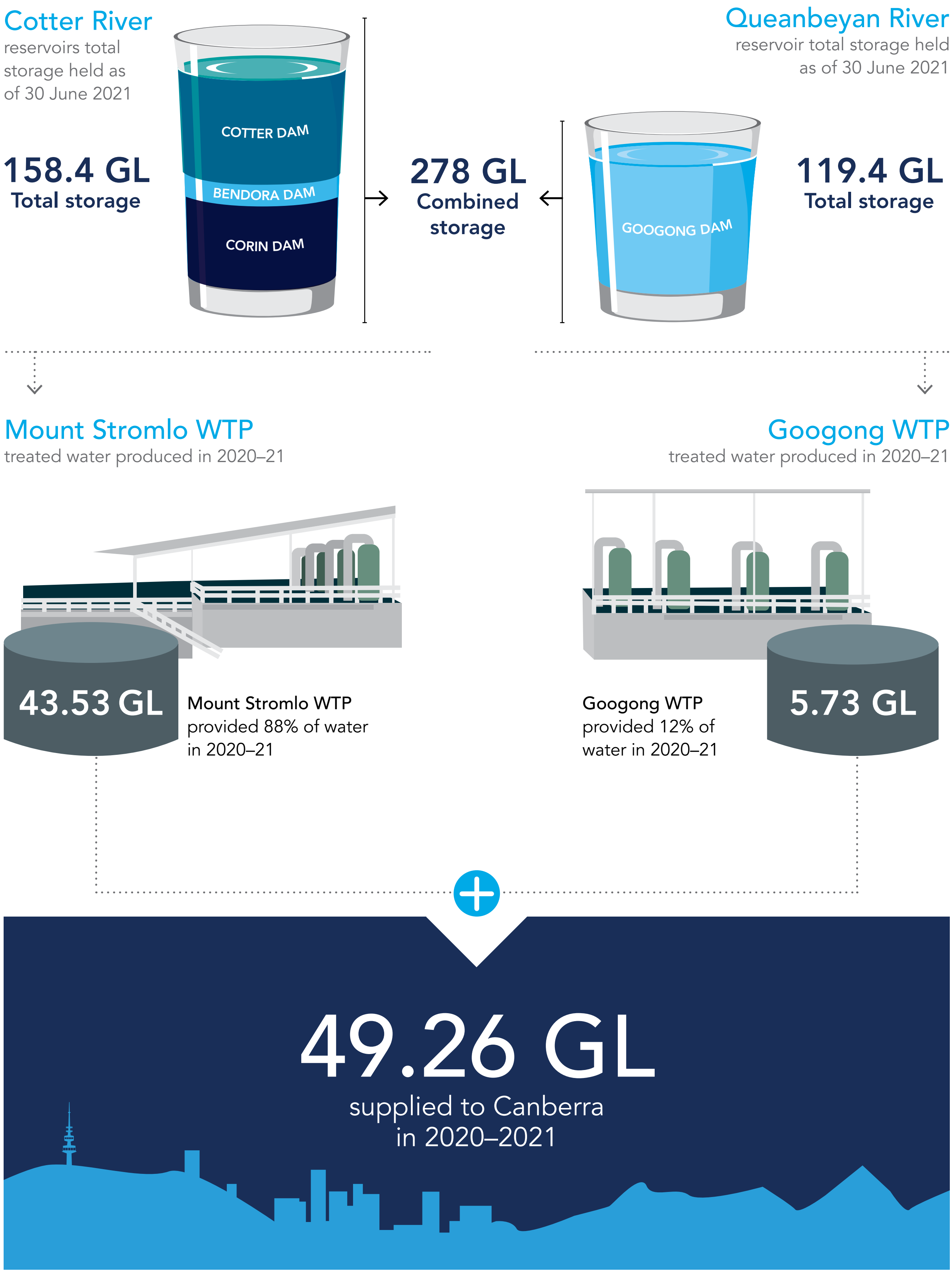
NSW state agencies and local government councils regulate land-use planning and manage activities in this catchment. ACT Parks and Conservation Service manage the immediate area around the Googong reservoir and recreational access to the water body and foreshore. The Googong reservoir on the Queanbeyan River is the largest of our four water supply reservoirs and represents 43.0 per cent of Canberra's storage capacity. At the end of June 2021, Googong reservoir was at 100 per cent full and we had extracted 5.7GL from this reservoir in the previous 12 months.

The Murrumbidgee River has no storage reservoir for our supply. The catchment contains a wide variety of agricultural land uses, as well as the towns of Cooma, Numeralla, Bredbo and the Canberra district of Tuggeranong. During 2020–21, 1731 ML was transferred from the Murrumbidgee River into the Googong storage reservoir.

For most of 2020–21 the ENSO climate driver was in a La Nina state bringing about higher than average rainfall. Winter rainfall was above average, March experienced a large rainfall event and contributed large inflow into our storage reservoirs. The rainfall at Canberra Airport was 38 per cent above the long term average and total evaporation was five per cent below the long term average.

Inflows to our four storage reservoirs totaled 375 GL, which is 150 per cent above the average of the last 15 years. As a result, Icon Water's storage reservoirs finished the year at 100 per cent full, an increase on the 55 per cent storage of 12 months earlier.

Figure 3. Total storage level capacity of each reservoir and drinking water production for 2020–21



How much drinking water do we have in storage?

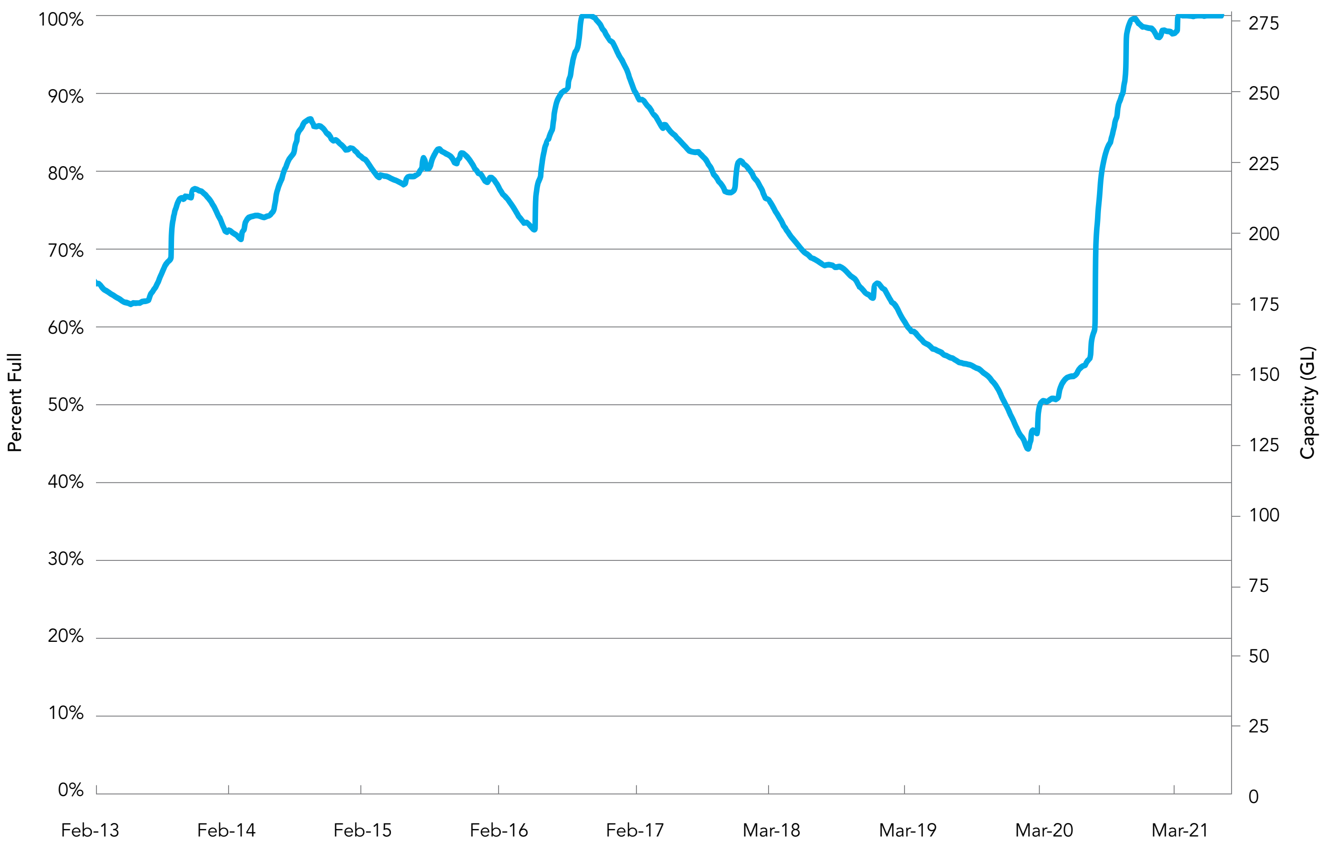


Figure 4. Combined storage levels of Corin, Bendora, Cotter and Googong reservoirs in years post enlargement of Cotter Dam

SOURCE WATER PROTECTION

Catchment Protection Activities

Icon Water operates a Source Water Protection Strategy (the Strategy) which protects drinking water supply within the catchments.

The strategy uses an integrated approach to:

- Maintain and communicate awareness of catchment condition by collating data, information, and analysis
- Identify and assess risks to catchment health and then mitigate and manage these appropriately
- Build partnerships with stakeholders and land managers so any activities effecting water quality are planned for and managed

In 2020–21 we continued to work with relevant land management agencies and regional catchment groups to identify and mitigate potential contamination hazards within the catchments. Keeping the water clean at its source is the first layer of protection (barrier) we apply, as defined in the Code and the ADWG.

To protect the quality of our source water, we undertook the following key activities in 2020–21:

- policy and legal protections and enhancements
- community engagement and education activities and campaigns
- supporting catchment land managers with on-ground works and monitoring of ecological conditions.

Policy and legal protections

Icon Water has limited direct legislative power in the management of land in the water supply catchments. Instead, our key objective is to work closely with the NSW and ACT regulators and policy makers which govern the water supply catchments.

In 2020–21, we liaised with regulators about the potential risks to water quality, and appropriate controls for proposed development and commercial applications within the supply catchments.

We also contributed to inter-agency groups and inter- jurisdictional regional catchment groups, including the ACT and Region Catchment Management Group and Upper Murrumbidgee Catchment Network.

Community engagement and education

We undertook a range of land management engagement and community education activities in 2020–21 to influence land use and recreation and build community knowledge, including:

- New digital education sessions and a suite of online resources to build water literacy in the community, due to COVID-19 restrictions on in-person education sessions.
- When restrictions eased, we recommenced tours of Cotter and Googong dams, and ran other education and community sessions, which incorporated key messages about source water and catchment protection.
- We continued to deliver our Googong Dam and Foreshores Community Engagement Strategy, where we emphasise the important role developers, local community groups, schools and ACT Parks and Conservation Service play in the protection of source water.
- We continued our direct engagement with Queanbeyan-Palerang Regional Council to develop regulation and policy to protect the quality of water entering the Googong Reservoir.

We also provided financial support that allowed Waterwatch programs to continue in the Cooma-Monaro upper Murrumbidgee catchment.

On-ground works and monitoring

In the catchments, on-ground works can be an effective way of controlling localised issues and risks to source water quality. These opportunities usually include partnerships with other projects or organisations.

To this end, we have continued a strong partnership with ACT Government catchment research programs which improve the quality of water entering source water reservoirs.

Event Monitoring

Hazards affecting our drinking water supply are rare, but have significant consequences.

The Orroral Valley fire in January and February 2020 impacted the Namadgi National Park (comprising the southern region of the Cotter catchment including Corin and Bendora water supply reservoirs). The fire severely impacted 1,951 hectares of Corin catchment and 137 hectares of Bendora catchment.

This was followed by high intensity rainfall events. March 2021 was the wettest month in a decade. Heavy rain fell across the ACT from 21 to 24 March, particularly on the 23rd and 24th, with two-day falls of 50 to 90 mm at most locations.

Post-fire rainfall can significantly impact water quality because it increases erosion which carries higher levels of sediments and turbidity into the water.

It also releases inorganic nutrients from burnt plant material such as phosphorus and other nutrients into waterways which can lead to algae blooms. Outbreaks of bacteria and blue-green algae were detected at Googong reservoir and caused many of Canberra's waterways and lakes to close.

The potential water quality risks that arise from these events have been integrated into our drinking water quality management system. For example, we modified how we monitor source water by prioritising sampling following significant post-fire rainfall events and can change our abstraction source.

Detention and selective abstraction

We apply selective abstraction across the three source water catchments as part of the multiple barrier approach to protecting water quality.

When we abstract from the Murrumbidgee River, we can transfer the water directly to Mt Stromlo WTP for treatment, or to Googong Reservoir to provide long-term water security.

When we abstract water from our dams, we are able to vary the depth we draw from, which means we always send the best quality water available to Googong or Stromlo WTPs.

Water storage reservoirs are a fundamental part of the drinking water supply system. They store water during low rainfall periods and help to stabilise water quality through detention and settling of contaminants. This is particularly important after large rain events when inflows can transport high amounts of sediment and organic material into the reservoir.

Stratification control measures

We operate mechanical mixers in the Cotter and Googong reservoirs to keep water circulating and reduce the degree of thermal stratification (where a water column is divided into distinct layers) due to changes in temperature, oxygen and density (Figure 5).

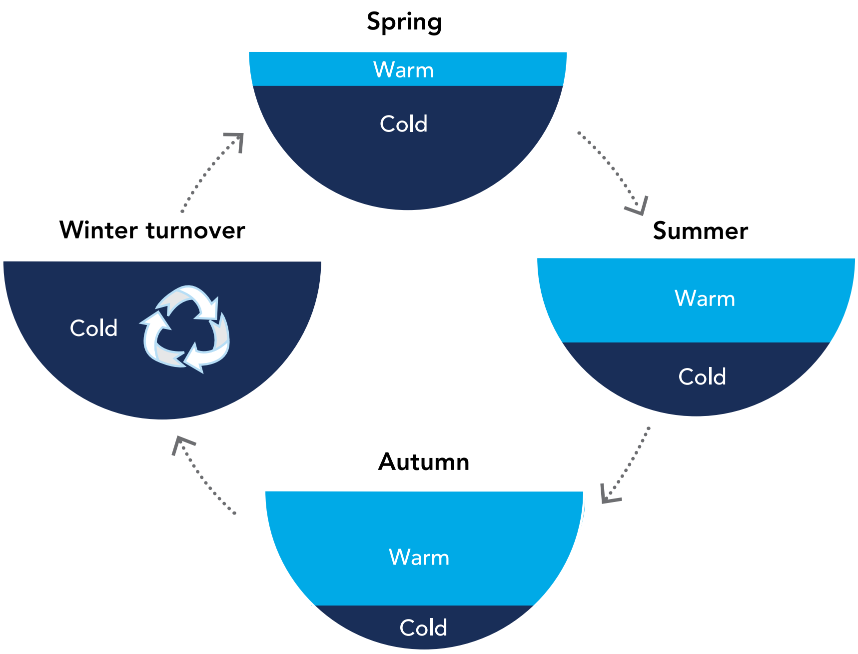


Figure 5. Cycle of reservoir thermal stratification

By actively managing stratification, we can increase the amount of oxygen within each reservoir, and thus reduce metal and nutrient concentrations in the abstraction zone. This makes a greater volume of water available for selective abstraction that is more efficiently treated. In the case of Cotter Reservoir, increasing the volume of water with favourable oxygen conditions also helps to protect the population of the endangered Macquarie Perch from predatory bird species.

Water quality in the raw water source

We undertake an extensive sampling and analysis program to monitor water quality in storage reservoirs and the Murrumbidgee River. Our program is adaptively managed to ensure it adequately assesses the quality of source waters and identifies emerging issues that could affect the drinking water supply, including those identified through Catchment Sanitary Surveys.

The parameters routinely monitored within the raw water sources are detailed in Table 1.

Table 1. Parameters routinely monitored in raw water sources

Microbiological	Physical	Chemical
Cryptosporidium and *Giardia*	True colour	Alkalinity
Escherichia coli (E. coli)	Conductivity	Chlorophyll-a
Total coliforms	Dissolved oxygen	Nutrients (eg nitrogen and phosphorous)
Enterococci	pH	Synthetic organic compounds (including herbicides, pesticides, fungicides, insecticides and industrial chemicals such as PFAS)
Phytoplankton including cyanobacteria (blue-green algae	Temperature	Radionuclides
	Turbidity	Total and dissolved metals
	UV absorbance	Total and dissolved organic carbon

Cyanobacteria (blue-green algae)

Cyanobacteria are true bacteria, but are often referred to as 'blue-green algae' because they resemble green algae in appearance, habitat and photosynthetic abilities.

Cyanobacteria occur naturally in water bodies, but when the water is warm, calm and nutrient rich the conditions are highly favourable and they can grow in excessive numbers, called 'blooms'.

Icon Water's storage reservoirs, predominantly Googong Reservoir, occasionally experience blue-green algae blooms. These are typically of the Dolichospermum and Microcystis genus, which can produce taste and odour compounds as well as toxins that can be harmful to humans and animals.

We carry out regular monitoring of cyanobacteria in all our raw water sources. The frequency varies with the season, but we generally monitor most often in warmer months when algal blooms are more likely.

As well as environmental conditions such as drought and bushfire, the agricultural activities and other development prevalent in the Googong and Murrumbidgee catchments can increase the nutrient levels in the waterways, making these raw water sources more susceptible to algal blooms.

Icon Water's cyanobacteria response plan, once activated, can direct an increase in monitoring within the reservoir and at the associated WTP, and additional operational actions to protect drinking water from harmful cyanobacteria and reduce aesthetic impacts. Under the Code, ACT Health is consulted if elevated levels of cyanobacteria are detected. Details of the notifications provided to ACT Health are provided on *page 36* of this report.

2020–21 events

Concentrations of cyanobacteria in Googong Reservoir were higher in 2020–21 compared to 2019–20. This is due to flood waters entering the reservoir which contributed to a more extensive algal bloom than in the previous year.

This bloom caused the production of Geosmin, a natural compound that is safe to drink and meets the health parameters set by the Australian Drinking Water Guidelines, but that causes water to take on an earthy, musty taste and smell.

Some people can detect Geosmin at very low concentrations, as low as 10 parts-per-trillion (10 ng/L). Unfortunately at times not all of the compound could be removed via the treatment process. This year, this was noticed and reported by some customers.

In 2020–21, there was one notifiable cyanobacteria detection in the Cotter catchment (within Cotter Reservoir) and no notifiable cyanobacteria detections within the Murrumbidgee catchment.

Microorganisms

Cryptosporidium and *Giardia* are microorganisms (parasitic protozoan) that can cause gastroenteritis. Infected people show either no symptoms or may experience diarrhea, vomiting and fever. Healthy people usually recover fully.

These naturally occurring organisms are usually spread through contact with pets, farm animals or people who are already infected. There is a background level of infection by *Cryptosporidium* and *Giardia* in the general community.

Testing methods for *Cryptosporidium* and *Giardia* are complex and if detected, it is difficult to confirm whether they are infectious to humans. Icon Water undertakes routine monitoring for *Cryptosporidium* and *Giardia* in the storage reservoirs and the Murrumbidgee River, as well as at our WTPs.

During 2020–21, there were no detections of either protozoa in the routine monitoring of the storage reservoirs, nor in the treated water leaving both treatment plants.

Due to the lower levels of catchment protection and brief detention time, the Murrumbidgee River typically contains *Cryptosporidium* and *Giardia* more often than our storage reservoirs. This risk increases further during rainfall events with additional runoff carrying livestock faeces, therefore, in addition to routine testing, extra monitoring may be conducted if abstracting from this source.

Synthetic compound monitoring

Specific monitoring for synthetic compounds (including pesticides, herbicides, fungicides, insecticides and industrial chemicals such as Per- and Poly-fluoroalkyl substances, or PFAS) is undertaken in all drinking water catchment sources using a risk-based approach.

During 2020–21, there were no detections of synthetic compounds above ADWG health values in any of the four storage reservoirs or the Murrumbidgee River.

WATER TREATMENT OPERATIONS

HOW IS WATER TREATED?

Icon Water operates the Mount Stromlo Water Treatment Plant and the Googong Water Treatment Plant.

We abstract raw water from our storage reservoirs and treat it at one of our water treatment plants (WTPs) before we send it through to the community.

The Mount Stromlo WTP has operated since 1967 and can treat water from the Cotter catchment and the Murrumbidgee River.

The Googong WTP has operated since 1979 and can treat water from the Queanbeyan River catchment and indirectly from the Murrumbidgee River (via the Murrumbidgee to Googong Transfer Pipeline). The two water treatment plants can be operated independently or in conjunction with each other to meet the community's water supply demand.

Mount Stromlo WTP can treat 250 ML of water per day and is the preferred WTP as water can be supplied by gravity from Bendora Reservoir, which is more sustainable. The surrounding land use of the Cotter River also has a lesser impact on water quality than the Googong Reservoir.

Our Googong WTP operated between October and December 2020, producing 5,734 ML (12 per cent of total production), with our Stromlo WTP operating for the remainder of the period, producing 43,533 ML (88 per cent of total production). The two plants did not run concurrently over the summer period; customers used less water overall because we had higher than average rainfall which reduced the need for garden watering. In total the two WTPs produced 49,267 ML of water, down 6,065 ML from the previous year.

There are various treatment steps within the plants. Due to their age, the plants have differences in the way they operate and the water quality barriers in place. Stromlo WTP can operate in two treatment process modes; direct filtration or dissolved air flotation and filtration. Dissolved air flotation is an optional treatment step that gives us extra treatment capabilities if the raw water is of poorer quality. It also has an additional barrier, utilising UV to disinfect any remnant microbiological organisms. Figure 6 shows the treatment barriers for Mount Stromlo WTP and Googong WTP.

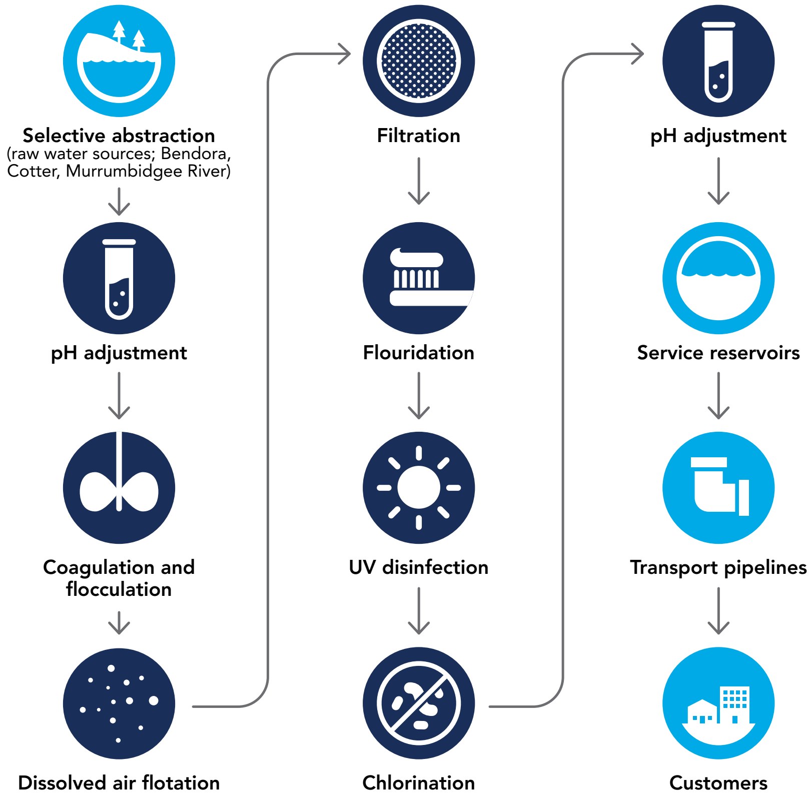
The treatment process for Mount Stromlo WTP involves:

- selective abstraction (raw water sources: Bendora, Cotter, Murrumbidgee river)
- optional potassium permanganate for oxidation and removal of metals and organics
- pre-treatment for pH adjustment and stabilisation with lime and carbon dioxide
- coagulation by polyaluminium chloride and/or aluminium sulphate
- flocculation aided by polyelectrolyte
- optional dissolved air flotation
- filtration
- fluoridation by sodium fluorosilicate
- disinfection by ultraviolet (UV) light
- disinfection by chlorination
- pH adjustment and stabilisation with lime
- distribution to the network

The treatment process for Googong WTP involves:

- selective abstraction (raw water source: Googong)
- optional powdered activated carbon for cyanobacteria and taste and odour compound removal
- optional potassium permanganate for oxidation and removal of metals and organics
- coagulation by aluminium sulphate
- flocculation aided by polyelectrolyte
- dissolved air flotation and filtration; or clarification and filtration, depending on operational mode
- fluoridation by sodium fluorosilicate
- disinfection by chlorination
- pH adjustment and stabilisation with lime
- distribution to the network

Mount Stromlo WTP



Googong WTP

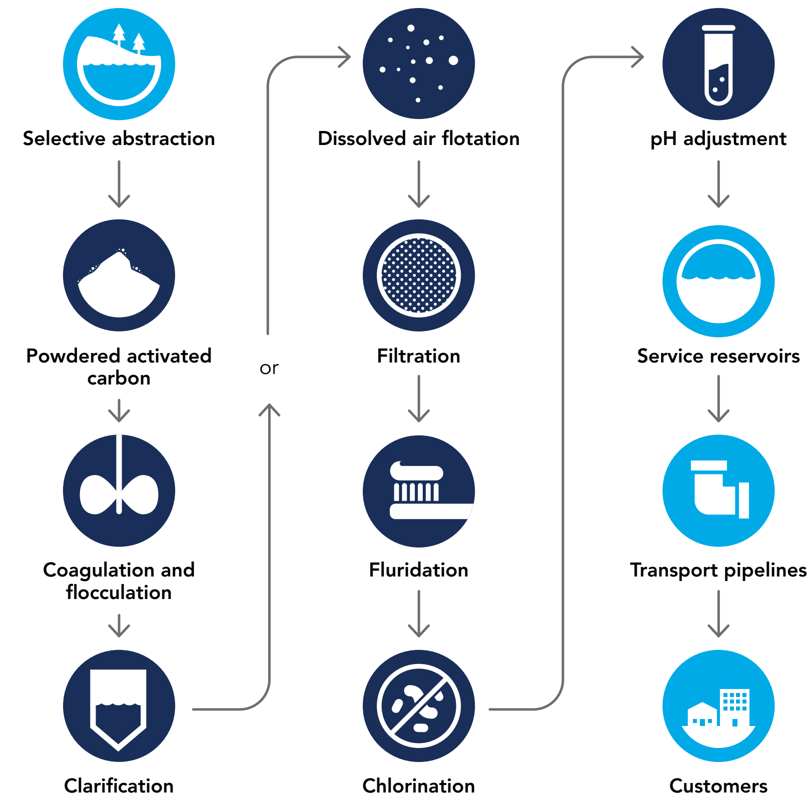


Figure 6. Water treatment steps of water supplied from WTPs to customers taps

WATER TREATMENT PLANT PERFORMANCE

It's critical that we extensively monitor operations at our WTPs to ensure each treatment barrier is functioning optimally.

Under our HACCP-based water quality management system, five critical control points are applied in the drinking water supply system. Four of these exist within the WTPs, highlighting the importance of the water treatment operations in the delivery of safe drinking water.

Both WTPs contain online analysers so we can continuously monitor key water quality parameters, and address changes in the raw or process water quality quickly. In addition, regular verification monitoring is performed and involves analysis for a range of parameters including, but not limited to, colour, turbidity, chlorine, pH, *Escherichia coli (E. coli)*, *Cryptosporidium* and *Giardia*. We rely on these online and laboratory monitoring results to ensure our treatment processes are operating correctly and producing high quality water within specification.

Under the Public Health (Drinking Water) Code of Practice (2007) (the Code), Icon Water notifies ACT Health of any events identified at the WTPs that have the potential to impact public health. In 2020-21 WTP operations met all their criteria with no notifications submitted.

The parameters routinely monitored at the water treatment plants are detailed in Table 2.

Table 2. Parameters routinely monitored at the water treatment plants

Microbiological	Physical	Chemical
Cryptosporidium and *Giardia*	True colour	Chlorine
Escherichia coli (E. coli)	Conductivity	Fluoride
Total coliforms	Turbidity	Alkalinity
Heterotrophic plate counts	pH	Total and dissolved metals
	UV absorbance	Total and dissolved organic carbon
	Total and individual dissolved solids	Cyanide
		Hardness
		Synthetic organic compounds (including herbicides, pesticides, fungicides, insecticides and industrial chemicals)
		Trihalomethanes
		Haloacetic acids

Turbidity

Turbidity is a measurement of the light-scattering property of water caused by suspended and dissolved particulates. These include suspended colloidal particles, clay and silt. Water with high turbidity often has a muddy or milky appearance.

The filters at our water treatment plants are designed to remove pathogens and maintain the high aesthetic quality of water. We use turbidity as a key indicator of filter performance, with critical control points in place to ensure the filters are performing as effective barriers.

During 2020–21 the turbidity of the combined water produced by the filters at Mount Stromlo and Googong WTPs was below 0.2 nephelometric turbidity units (NTU) 99 per cent of the time.

Chlorine

All drinking water processed by the WTPs is disinfected using chlorine. Chlorine is widely used in treatment plants throughout the world to control microbiological contaminants, such as bacteria and viruses. Chlorine gas is added to Canberra's water at a concentration sufficient to disinfect the water and to provide a chlorine residual for lasting protection against contamination in the distribution system.

We ensure the water is safe to drink by conducting operational testing and continuous online monitoring at our water treatment plants according to our regulatory requirements.

Critical control points are in place to ensure the level of chlorine in the water is safe to drink and performing as an effective barrier. We also undertake an extensive water quality monitoring program throughout the drinking water network to ensure chlorine in the water supply is within specification. This is conducted by a NATA-accredited, independent laboratory.

The ADWG health guideline for chlorine is 5 mg/L and the aesthetic guideline is 0.6 mg/L, which is based on an odour threshold. Some customers may be sensitive to the taste or smell of chlorine at or below this aesthetic guideline level.

Chlorine dissipates as the water travels through the distribution network. To minimise the aesthetic detection of chlorine we use transit time to manage the dose rate (while maintaining the levels to assure protection of public health). Transit time depends on how much water the community is using.

During 2020–21 the free chlorine concentration in the treated water leaving Mount Stromlo WTP was maintained at an average of 1.45 mg/L. Due to its different raw water characteristics and longer transit time within the distribution system, Googong WTP generally produces final treated water with a higher free chlorine concentration (average of 1.92 mg/L in 2020-21).

Chloramine is not used within Canberra's drinking water system.

Fluoride

The Drinking Water Utility Licence, issued by ACT Health, requires fluoride to be added to the ACT's drinking water system at a concentration between 0.6 and 1.1 mg/L.

The aim of water fluoridation is 'the adjustment of the natural fluoride concentration in fluoride-deficient water to that recommended for optimal dental health' (NHMRC, 2007). To achieve compliance with our licence, Icon Water adds sodium fluorosilicate to the drinking water at our WTPs.

Fluoride is monitored as a critical control point to ensure the concentration in the water is safe to drink and meets the requirements of our licence.

In 2020–21 fluoride concentrations were maintained in final treated water at Mount Stromlo and Googong WTPs at an average of 0.74 mg/L and 0.63 mg/L respectively.

Ultraviolet disinfection

UV disinfection is used at the Mount Stromlo WTP to further reduce the risk of pathogens entering the drinking water supply.

The quality of filtered water passing through the UV reactor is monitored via online sensors to measure the UV irradiance in the water. The power of each UV lamp is regulated to ensure the required dose is maintained based on flow rate.

The UV system should provide a dose of greater than 27 mJ/cm^2 for at least 95 per cent of the treated water and is considered a critical control point in our multi-barrier approach.

The system continued to exceed this performance objective and in 2020-21, 100 per cent of the water produced received a dose greater than 27 mJ/cm^2.

pH

The pH of drinking water is considered a control point within our WTPs and is adjusted at the beginning of the treatment process and again before leaving the WTP.

Reducing the pH of raw water entering our treatment plant means the coagulation and flocculation treatment steps are more effective.

Adjusting the pH of treated water before it leaves the WTPs ensures effective disinfection potential while also preventing corrosion of the distribution pipelines. The pH range targeted by Icon Water at the customer supply point is between 6.5 and 8.5. The average pH of the final treated water at Mount Stromlo was 7.38 and for Googong WTP was 7.17 during 2020–21.

HOW DOES WATER GET TO MY HOUSE?

THE DISTRIBUTION SYSTEM

Icon Water distributes water throughout Canberra using an extensive network of pipelines and service reservoirs. We also supply bulk water to Queanbeyan- Palerang Regional Council, which distributes the water to Queanbeyan city including the Googong Township.

We operate and maintain 50 service reservoir sites, 25 pump stations and approximately 3,372 km of drinking water pipelines. This infrastructure is maintained and closely monitored to ensure the community receives high quality drinking water. The drinking water distribution system is operated with a number of physical and chemical disinfection barriers to protect against potential contamination.

Some of the physical barriers include:

- The water distribution system is a closed network from the WTPs to the customers' points of supply which prevents external contamination
- Water mains are operated under positive pressure to prevent contaminants entering the system
- Backflow prevention devices are installed at customer supply points to protect against contaminants
- Sewerage mains are generally located deeper than the water distribution system, minimising the risk of contamination through groundwater.
- As well as physical barriers, a free chlorine concentration is maintained within the water distribution system to protect against microbiological contamination of the water during its journey from the WTP via the service reservoirs to our customers' points of connection.

The Canberra distribution system is divided into four water quality supply zones based on population, hydraulic characteristics and geography. These zones also ensure the statistical representation of samples collected from the taps of participants in our voluntary water quality monitoring program.

Service reservoirs

Drinking water from our water treatment plants is fed into service reservoirs (tanks) that are spread out across the city. These reservoirs provide temporary storage to manage the variation in Canberra's demand for water across 24 hours, as well as emergency storage for fire fighting and to create water pressure when customers turn on the tap. From these tanks, water mains carry the drinking water to each customer's connection.

In 2020–21 Icon Water demolished Oakey Reservoir and introduced two new reservoirs into the supply system in response to population growth and urban development. These new reservoirs will service customers in the newly establishing suburb of Taylor and the growing suburbs of Wright, Coombs and Denman Prospect.

During 2020–21 the reservoirs stored between 465.6 ML and 658.8 ML of water at any given time.

All Canberra service reservoirs are secure structures to ensure the integrity of the distribution system is maintained and to prevent contamination. We inspect them regularly to assess the security of the sites and their external condition. Reservoir cleaning is also routinely undertaken with each reservoir being cleaned, on average, once every five years. When this happens, we empty the reservoir, assess its condition, clean it, inspect it internally and perform maintenance as required. We then disinfect the reservoir and test the water before returning the asset to service.

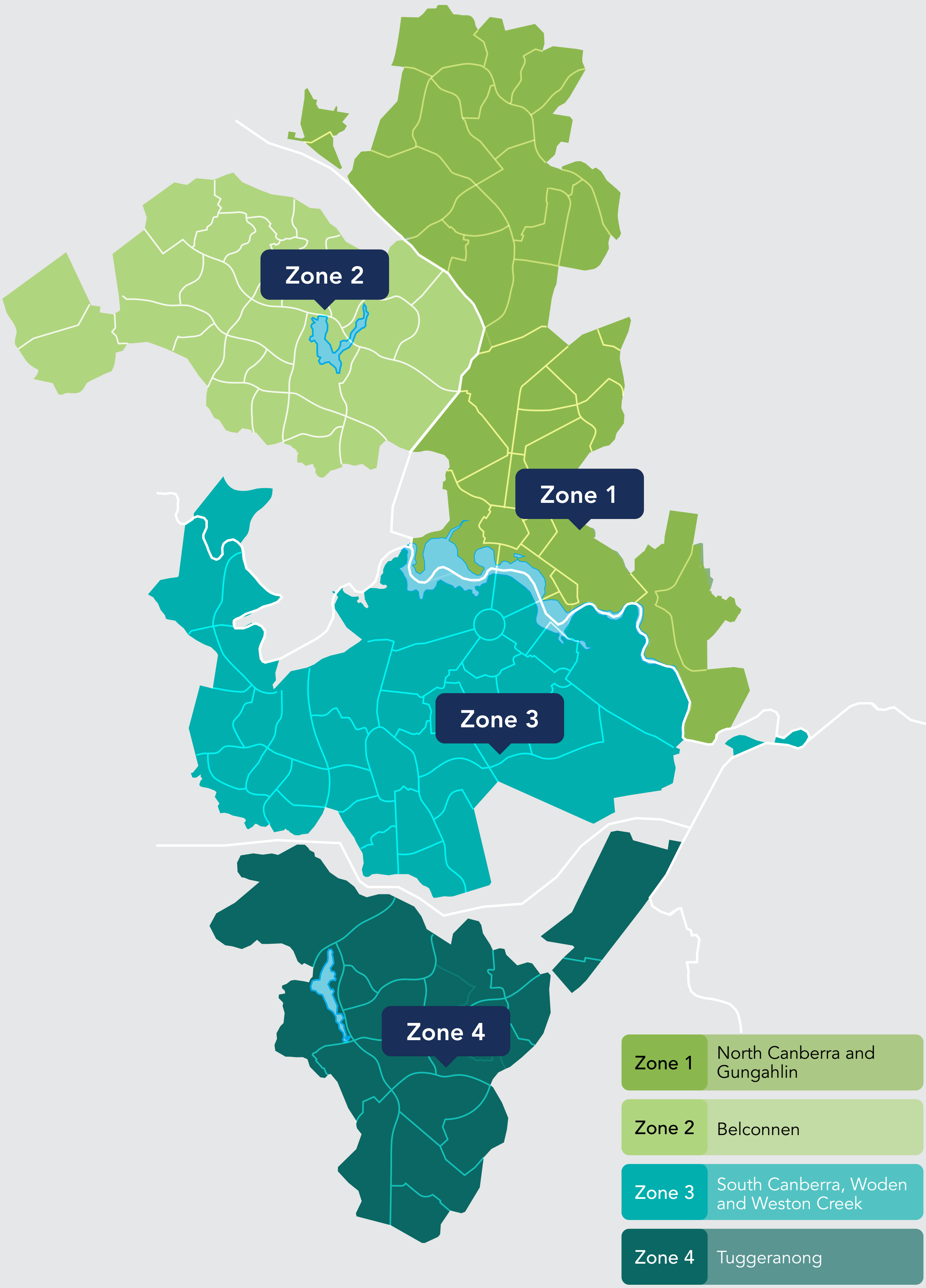
We monitor water quality routinely at each reservoir to verify that the water quality complies with the ADWG and to optimise system operations.

The parameters routinely monitored at the service reservoirs are detailed in Table 3.

Table 3. Parameters routinely monitored at service reservoirs

Microbiological	Physical	Chemical
Escherichia coli (E. coli)	Temperature	Chlorine
Total coliforms	pH	
Heterotrophic plate counts		

Figure 7. Water quality monitoring zone map



Supply to customers' point of connection

Our reticulation network consists of around 3,372 km of water mains (pipes). Last year new urban development added 42 km of new reticulation pipework. New suburbs under development such as Taylor in the city's north and Whitlam in the Molonglo district are examples of extensions to the water supply network.

The network varies by materials, construction methodology and age, and we have factored these variables in to our predictive modelling to determine which parts of the network will require replacing in a given year.

One group of replacements are the cast iron unlined water mains, which remain in place from our city's early establishment period and are likely to contain deposits of rust.

Replacing these unlined water mains improves water quality issues (turbidity and staining) that can occur when the rust is disturbed during high demand such as when a pipe breaks or when a large amount of water is used for fire suppression.

Another suite of scheduled pipe replacements are water mains installed between 1965 and 1978. This group of mains account for 73 per cent of structural failures in the reticulation network.

As part of our commitment to high quality water, we undertake a comprehensive routine drinking water quality monitoring program based on the ADWG to verify water quality throughout the distribution system. To ensure a statistical representation of the water received by customers, a selection of customers participate in a voluntary program where their garden tap water is sampled.

During 2020–21 approximately 100 customer garden taps were monitored each month from up to 400 locations around Canberra. This allows us to verify the quality of the actual water received by customers. A range of microbiological, chemical and physical parameters are tested and these are summarised in *Laboratory analysis (see page 42).*

Disinfection in the distribution system

Chlorine is added to water in the final stages of treatment at Mount Stromlo and Googong WTPs. Water entering the distribution system needs to contain an appropriate free chlorine concentration, termed disinfection residual, when delivered to our customers. This ensures chlorine continues to provide protection against microbiological contamination throughout the distribution system.

Chlorine and bacterial levels are frequently monitored so we can optimise and act on any results that indicate a loss of disinfection residual.

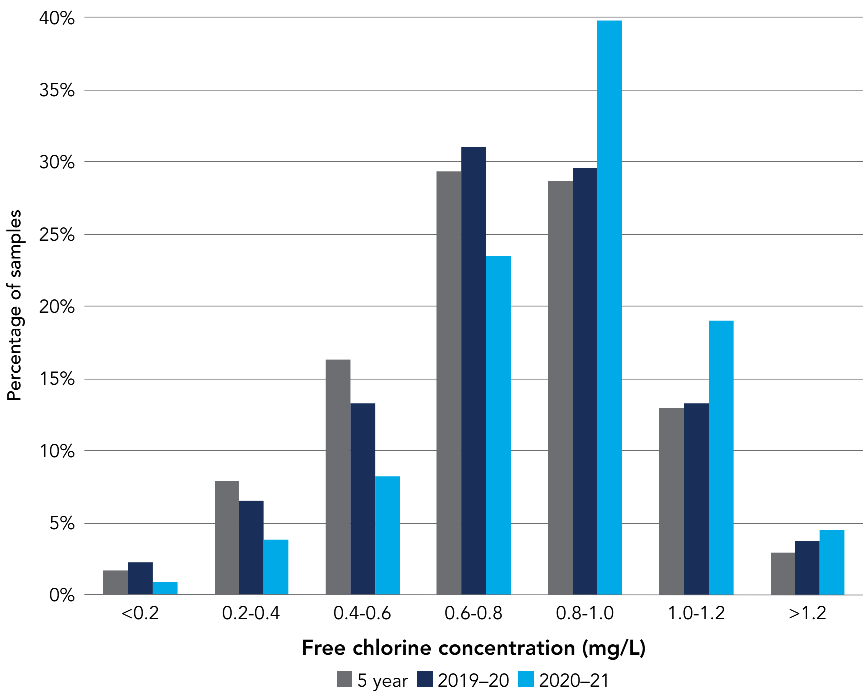
Chlorine naturally dissipates from water over time, and as such, on occasion we boost chlorine levels at service reservoirs using sodium hypochlorite.

We do factor in aesthetic considerations when optimising chlorine concentration, however protection of public health for the entire network is our highest priority.

In 2020-21, the concentrations of chlorine measured at customer taps participating in our voluntary monitoring program were within the ADWG health guideline level (5 mg/L) across all four water quality supply zones.

The average free chlorine concentration was 0.85 mg/L. The distribution of chlorine results for customer taps across all four water supply zones is shown in Figure 8.

Figure 8. Free chlorine concentration at customers' taps



Microbiological monitoring

The WTPs are designed to remove any microbiological contaminants before distribution to customers, however, as the water moves through the water distribution system there remains a small potential for re-contamination. Therefore, we conduct verification monitoring of *E. coli* (faecal indicator) at customers' connections to ensure the water supplied is free from microbiological contamination.

The ADWG suggests that *E. coli* should not be detected in a minimum 100 mL sample of drinking water.

During 2020–21, two detections of *E. coli* occurred within water samples collected in the network. Further investigation showed that the water quality did meet the public health requirements. See the explanation on *page 36*.

Physical and chemical monitoring

Icon Water monitors a wide range of physical and chemical parameters as part of the voluntary customer tap water quality monitoring program. Detailed information for a selection of these parameters is provided below. Results for all parameters monitored are presented in *Laboratory analysis (see page 42)*.

Turbidity

Turbidity is a measurement of the suspended and dissolved particulates in water. The ADWG does not outline a health guideline, however the aesthetic value is five nephelometric turbidity units (NTU) – a level that is just noticeable in a glass of water.

Turbidity can increase as water passes through the distribution system, usually as a result of the resuspension of fine sediments of natural minerals that have settled over a long period of time. This normally happens when flow changes suddenly, like when a water main bursts or when sudden demand is placed on the network.

During 2020–21 the average turbidity at participating customers' taps was 0.2 NTU. The distribution of turbidity results for customer taps across all four water supply zones is shown in Figure 9 and a summary of the results are in *Laboratory analysis (see page 42)*.

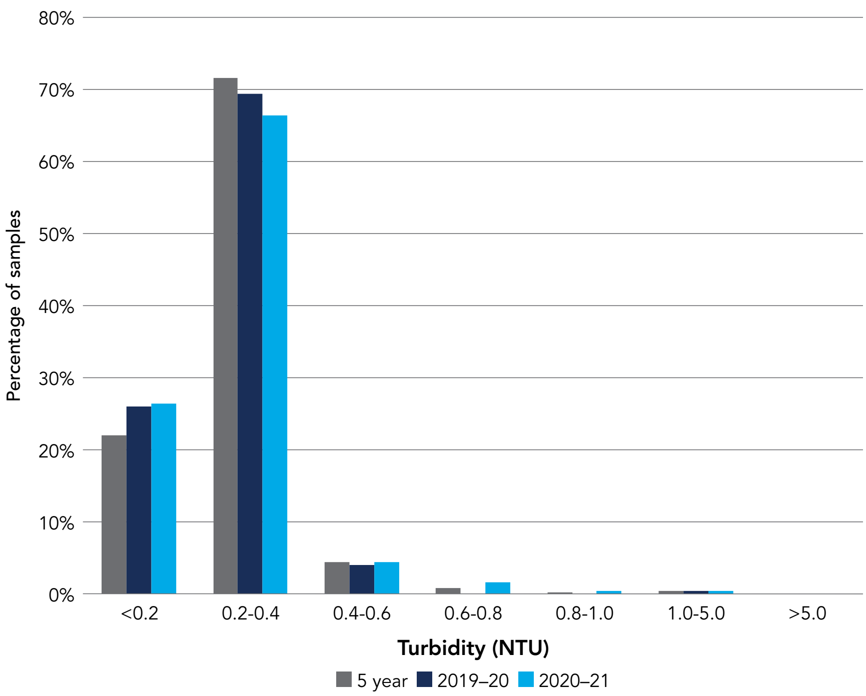
True colour

Colour is mainly present in the raw water due to natural organic compounds, from small hydrophilic acids, proteins and amino acids to larger humic and fulvic acids. These compounds originate from organic matter through or over which the water has passed in the catchment. The majority of natural organic matter is removed by coagulation in the water treatment process.

The ADWG does not outline a health value, however the aesthetic guideline for true colour is based on what is just noticeable in a glass of water. Results are reported in platinum-cobalt units (Pt-Co) and the aesthetic guideline is 15 Pt-Co.

During 2020–21 the average true colour measured at participating customers' taps was <1 Pt-Co. A summary of the results are in *Laboratory analysis (see page 42)*.

Figure 9. Turbidity at customers' taps



Metals

Iron

Iron occurs naturally in raw water and can also be present in the water supply from the corrosion of iron or steel pipes, or other components of a plumbing system. We undertake a planned program of works to replace sections of corroded pipe, which helps lower metal concentrations.

The ADWG states that 'insufficient data are available to determine a health-based guideline value for iron in drinking water'. The ADWG aesthetic guideline value for iron is 0.3 mg/L, which is based on the taste threshold in water. Iron can also contribute to the formation of mineral deposits on the inside of pipes, which may detach during high flows and appear as temporary discolouration.

In 2020–21 the average concentration of iron measured at participating customers' taps was 0.01 mg/L. A summary of the results are in *Laboratory analysis (see page 42)*.

Manganese

Water percolating through soil and rocks can dissolve minerals that contain manganese. The ADWG health guideline value for manganese is 0.5 mg/L. Levels above the ADWG aesthetic guideline level of 0.1 mg/L can cause an undesirable taste and stain clothes during washing.

Like iron, manganese can also contribute to the formation of deposits on the inside of pipes, which may temporarily discolour water during events when flows are disturbed.

During 2020–21 the average concentration of manganese measured at participating customers' taps was 0.009 mg/L. A summary of the results are in *Laboratory analysis (see page 42)*.

Copper

Copper is found naturally in raw water, generally in low concentrations. Drinking water from customers' taps may contain higher levels of copper if the water has been in contact with copper plumbing and fixtures. Copper levels may increase if water stagnates in the plumbing system for long periods; for example, during holidays when residents may be away from home for an extended time. Water which contains a high level of copper often has a blue-green appearance.

During 2020–21 the average concentration of copper measured at participating customers' taps was 0.012 mg/L. A summary of the results are in *Laboratory analysis (see page 42)*.

Lead

Lead is a naturally occurring metal and can enter drinking water from catchment sources or from household plumbing systems containing lead. Lead is used in the manufacture of a range of plumbing products such as brass fittings. Lead can dissolve into drinking water if it has been sitting in contact with these brass fittings for a long time.

The ADWG sets a health limit for lead of 0.01 mg/L.

The Australian Government Department of Health recommends flushing cold water taps used for drinking and cooking for about 30 seconds first thing in the morning and for at least two to three minutes after periods of absence. This draws fresh water from the network into the tap and reduces potential exposure to lead and other metals such as copper and nickel that may have stagnated within household pipes.

During 2020–21 the average concentration of lead measured at participating customers' taps was 0.0003 mg/L. A summary of the results are in *Laboratory analysis (see page 42)*.

Other compounds

We also monitor other substances in the distribution system including a range of semi volatile organic compounds (SVOCs), in line with the ADWG. SVOCs include chemicals such as plasticisers and hydrocarbons. Plasticisers are used in a broad range of products including some pipework, while hydrocarbons can be used as an indicator of contamination.

All routine monitoring results for these compounds were below the limit of reporting (ie not detected) during 2020-21. Full results are presented in *Laboratory analysis (see page 42)*.

HOW DO WE TALK TO OUR CUSTOMERS ABOUT WATER QUALITY?

CUSTOMER AND COMMUNITY INTERACTIONS

Common water quality enquiries

At Icon Water we manage approximately 186,047 connections to the water network in the ACT. A survey of 300 residential households and 200 businesses indicated that 91 per cent of our customers are satisfied with our services. Our drinking water continues to be even more highly regarded with 94 per cent of our customers satisfied with the quality.

Our efforts were recognised with a high commendation in the Customer Experience Category at the Australian Water Association's national awards for our ongoing focus on building our connection with the community and improving our customer experience.

Occasionally customers experience problems with the quality of their water supply and contact us for advice. Concerns expressed by the community may be investigated to determine the likely cause and, if required, corrective actions are taken. During 2020–21 we received over 60,000 customer calls (including faults and emergencies, account and general enquiries). Of those calls, 43 were water quality enquiries, an 83 per cent reduction compared with 2019–20.

Often issues related to water quality are short-term and may be associated with water main bursts, network renewal or expansion, maintenance work or a change in usage patterns within the water supply system.

Valve operations required for maintenance work may reverse the direction of flow of water, causing scraping of the internal pipe wall, which may result in discoloured water for a short time. Where customers are likely to be affected by planned maintenance activities, we make every effort to notify them in advance.

Of the 43 enquiries in 2020–21, 15 were confirmed through investigation to be attributed to the Icon Water network and supply. A summary of the types of complaints received are detailed in Figure 11. In Figure 10 the total number of customer enquiries about water quality are shown. The navy blue portion of the graph represents the enquires that were determined to be attributed to the customer's private plumbing issues. The light blue portion represents the number of complaints where Icon Water's supply was determined to be the underlying cause.

Figure 10. Shows total number of customer enquiries about water quality.

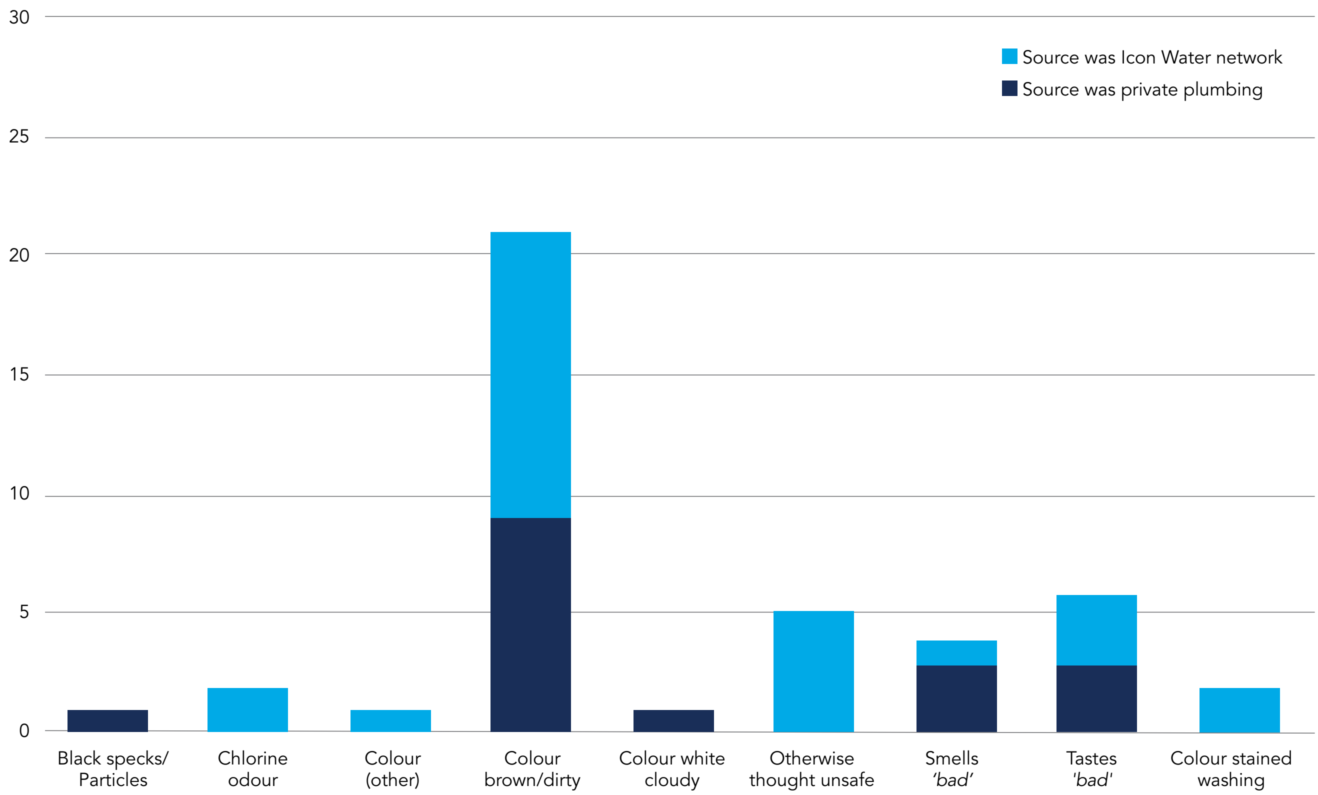


Figure 11. A summary of the types of complaints received

Discoloured

Discoloured water is often associated with maintenance work or a change in usage patterns but may also be associated with internal plumbing. Usually clears within a short time.

White/cloudy

Usually presents as cloudy water resulting from air bubbles generated by flushing of the mains, hot water units or aerators on taps.

Blue/green

Blue or green water can often be associated with the corrosion of copper pipes.

Usually addressed through changes to internal plumbing.

Chlorine odour

Usually these enquiries relate to a change (increase) in the level of chlorine that a customer is receiving. These problems are usually aesthetic and short-term.

Disagreeable odour – other

Odours can be various descriptions. Odours often require investigation of private plumbing materials and/or flushing of stagnant water within the home.

Disagreeable taste

Such as musty, earthy, bitter and metallic tastes. Sometimes resolved by flushing water in the network or addressing internal plumbing issues.

Staining

Deposits dislodged from domestic plumbing or from the water main can cause staining of washing.

Usually temporary.

Other

Issues not otherwise categorised.

ICON WATER AND ACT HEALTH

Notifications to ACT Health

Icon Water complies with the Public Health (Drinking Water) Code of Practice (2007) (the Code) issued by ACT Health. Copies of the Code are available from the ACT Health website at health.act.gov.au.

The Code sets out operational, communication, reporting and response requirements for Icon Water and ACT Health to ensure the supply of safe drinking water. The Code also sets out specific water quality events or incidents that Icon Water must notify to ACT Health.

During 2020–21, a number of notifications to ACT Health were issued; all but one were identified from the results of our routine monitoring program. One was in response to a customer enquiry of discoloured water.

The details of each of these are below in Table 4:

- Two in the source water reservoirs relating to a Cyanobacteria bloom
- Zero notifications in treatment plants
- Four in the distribution network (two of these determined to be false positives in the laboratory results)

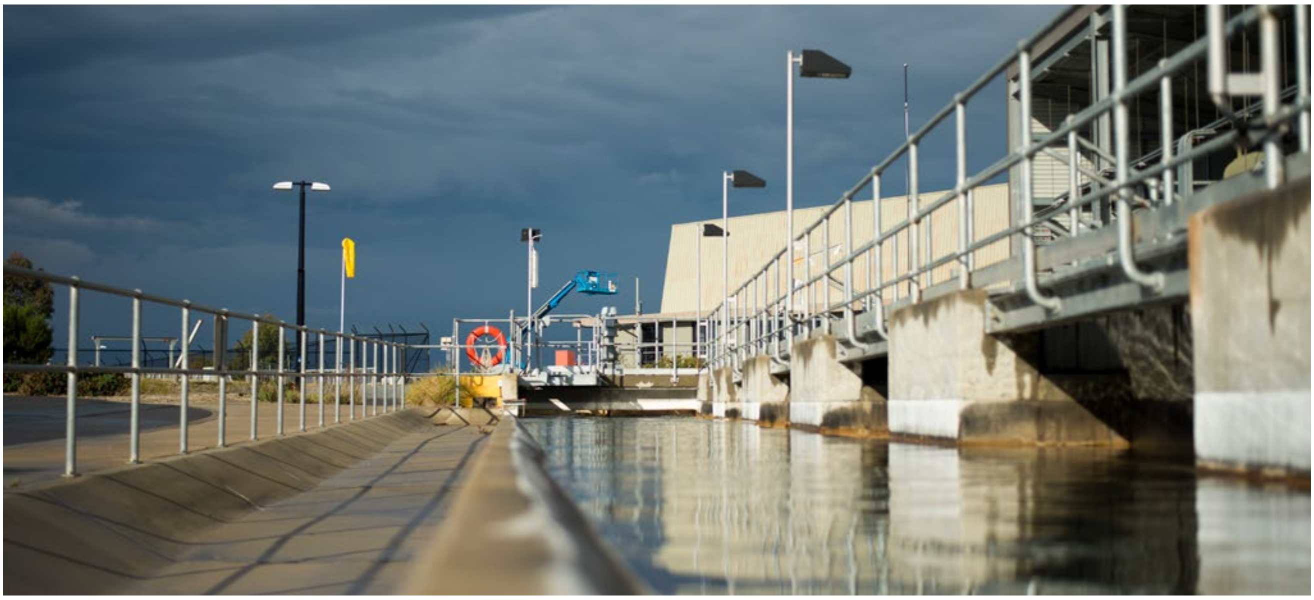
Table 4. Notifications to ACT Health under the Drinking Water Code of Practice

Water in the Storage Reservoirs	
13/11/2020	Cyanobacteria – Cotter Reservoir One high risk species of Blue Green Algae was recorded at notifiable levels at a depth of three meters. The reservoir was not in use at the time and the bloom had dissipated by next sampling occasion.
3/12/2020 23/11/2020 10/11/2020 6/11/2020 14/10/2020	Cyanobacteria – Googong Reservoir A single bloom resulted in two notifications and five updates as the bloom expanded over the warming season. From initial notification in early October the algae levels remained elevated until May 2021. Icon Water confirmed through sampling that the algae were not releasing toxins and not harmful to health.

Water in the Treatment Plants	
Nil	Nil

Water in the distribution System	
12/09/2020	Manganese – Stromlo District A result from the routine monitoring program, an elevated level of manganese was detected at a commercial property. From various checks it was determined that the lack of water use during the COVID-19 period had allowed the metal to accumulate. The levels were resolved through flushing water through the service pipes.
13/08/2020	Manganese – Nicholls In response to a customer enquiry of discoloured water, sampling results returned an elevated level of manganese from a nearby hydrant. Samples were also taken at the customer's front garden tap and an additional upstream hydrant at the same time. Both these samples returned low total manganese levels, well within the health guideline limit. Icon Water resolved the level through flushing water from the main.
24/10/2020 9/10/2020	*E.Coli* – Farrer and Hughes A result from a reticulation sample monitoring point, returned a result of 1 MPN/100ml at two locations in October. Chlorine levels in both samples were within target operational ranges. Follow-up testing found no further *E.Coli*, indicating a false positive detection and we reached the conclusion that original detection did not reflect genuine contamination of the drinking water supply in either occasion.

MANAGING WATER QUALITY INTO THE FUTURE



MANAGING WATER QUALITY INTO THE FUTURE

Research & Development

To ensure we operate in the most efficient way possible, we are committed to keeping abreast of the latest developments and technologies. We do this by contributing funds, providing in-kind support, collaborating on a range of research and development projects, and partnering with other 'can do' business partners.

We are a member of several water industry bodies and participate in network groups and on joint collaborative research projects. This enables us to learn from a rich body of expertise across Australia and internationally, and benefit from shared knowledge, expertise, partnerships and funding.

We work in partnership with universities and industry through Water Services Association of Australia (WSAA) and Water Research Australia (WaterRA). These relationships provide access to research organisations such as Cooperative Research Centres (CRC), the Water Environment Research Foundation, the Smart Water Fund and the Australian Research Council. In 2020–21 we joined WSAA's W-lab to access international water utility technology capability.

In 2020–21, we were involved in the following research and technology projects:

- Recreational impacts in drinking water catchments. The aim of this project is to understand how facilitating recreation in catchment areas impacts on the ability to provide safe and reliable drinking water. Current knowledge is being reviewed and will build upon the work published by the CRC for Water Quality and Treatment. This project was delayed due to COVID research reprioritisation in 2020.
- Emerging contaminants of concern. This project developed a tool for determining key contaminants of concern from the ~80,000 chemicals in use, such as Per- and Poly-fluoroalkyl substances (PFAS), to prioritise research needs and proactively manage risks.

Strategic Planning

At Icon Water we are committed to the continuous improvement of water quality management practices.

As such we are updating our Water System Strategy. The strategy will set long term directions, guide future investments and inform our decision making. Safety is the overarching objective for our water system. Our asset management plans and future works program will be developed in line with the principles set out in this strategy.

Climate Change Adaption Plan

Climate change-driven impacts have been recognised as a risk to source water quality and drinking water treatment. We developed a Climate Change Adaptation Plan in 2020 which identified water quality and other associated risks and adaptation actions. These include activities such as ensuring the water quality monitoring program considers the predicted increase in bushfires, algal blooms and invasive aquatic species. Also considered is the treatment capability to respond to the increase in contaminants exported from source water catchments in response to severe weather events linked to climate change.

During the first year of implementation, approximately a third of actions have been completed including the delivery of a Drought Management Plan, publication of the Actions for Clean Water Plan for Cotter, and an update of the water quality monitoring program with the revision of the Blue Green Algae Response Plan that allows for projected climate variability.

These and other actions are helping prepare for and adapt to climate driven changes and position Icon Water to take advantage of opportunities that contribute to community resilience.

We also produce an annual plan for Strategic Water Quality Improvement. This plan summarises the drinking water quality improvement activities proposed or underway that address identified strategic risks associated with drinking water supply. There are no systemic issues that result in poor quality treated water within our supply system and as such the majority of projects relate to maintenance, asset renewal, or continual improvement. Many of these are longer term projects. Updates on the status of these projects along with any new projects are outlined in this plan. A selection of projects from the 2020–21 plan are detailed in the following sections.

Catchment Protection Improvements

A continuation of Icon Water's Source Water Protection Strategy is important to maintain a watching brief on emerging issues and changes to policy which could introduce new risks into the source water catchments. Communication and liaison with stakeholders is key to monitoring and responding to changes in the source catchments.

Icon Water developed catchment Actions for Clean Water (ACWA) plans, for each of the source water catchments. These plans identify strategies to improve surface water quality and prioritise locations requiring soil stabilisation.

Preparations have commenced for the 2019–2021 Catchment Sanitary Survey. This triennial survey determines the nature and extent of likely contaminants entering the catchments and scheduled for completion in December 2021.

Water treatment plant improvements

Strategic Reviews and Planning

We are currently finalising our Water System Strategy which will set long term directions, guide future investments and inform decision making in the development of asset management plans and future works programs. The strategy will ensure plant and network assets continue to meet water quality requirements far into the future by establishing specific external factors to monitor and the actions that can be taken if these factors reach a threshold level of risk to water quality.

Feeding in to the Water System Strategy and also the Asset Management Plans are review activities such as in our Water Treatment Plants Masterplan. These reviews identify the changes and major events since the publication of the 2010 Masterplan. The review of the Stromlo Water Treatment Plant was completed in this reporting period and the Googong Plant is due for completion in 2021.

Googong WTP clarifier system asset renewal

Clarification is an important step of the water treatment process and is recognised as a control point under our HACCP-based drinking water quality management system.

The four clarifiers at Googong WTP have been in service for many years and much of the equipment has reached the end of its service life. In this reporting period two of these clarifiers were renewed and utilised in the plant operation of 2020–21. The remaining two clarifiers are undergoing renewal in 2021–22.

Stromlo WTP DAF design review and modifications

Stromlo WTP can be operated with an additional treatment option called dissolved air flotation (DAF) when the quality of the water entering the plant is poor and turbidity is elevated.

A project is underway to undertake design modifications to ensure the system can be operated more safely. This will ensure Stromlo WTP can effectively treat a more variable water quality from sources such as the dams of Cotter catchment, and the Murrumbidgee River.

Distribution system improvements

Water mains replacement program

Our current program to renew water mains has been operating since 2018. Construction works and detailed design were split into three stages. The first two stages are complete with a total of 19.4km of mains renewed. Stage three renewals with a total of 7.15km of mains, was to be completed in June 2021. This completes the planned program of renewals for this regulatory period. In 2021–22 no planned replacements will occur, although reactive replacement in response to pipe bursts or damage will occur.

Reservoir roof replacements and repairs

With 50 reservoirs of varying ages within our network, maintaining their structural integrity is a routine program; the roof integrity of reservoirs is an essential control to prevent contamination from entering the drinking water. During this reporting period renewal and maintenance works were completed on Mugga Reservoir. The program has scheduled other reservoirs for works in the coming years.

LABORATORY ANALYSIS

LABORATORY ANALYSIS

Icon Water contracts ALS Global to collect and analyse drinking water samples. The monitoring program is defined by a Service Level Agreement, which is revised annually to reflect Icon Water's changing needs and priorities.

ALS Global operates a NATA-registered laboratory. NATA provides specific technical evaluation combined with international recognition by its overseas counterparts, enabling laboratories accredited by NATA to be recognised worldwide.

As part of its NATA registration, ALS Global participates in regular audits and proficiency testing whereby results for identical samples are compared with other NATA-registered laboratories. The most recent NATA audits were carried out in the chemistry area in October 2020 and in the biological area in April 2021. The facility complies with the criteria of NATA Policy Circular 1 – Corporate Accreditation.

A summary of the laboratory analysis completed for the customer tap water quality monitoring program is presented in the following tables:

- Table 5: Summary data for all water quality zones
- Table 6: Summary data for water quality zone 1 – North Canberra and Gungahlin
- Table 7: Summary data for water quality zone 2 – Belconnen
- Table 8: Summary data for water quality zone 3 – South Canberra, Woden and Weston Creek
- Table 9: Summary data for water quality zone 4 – Tuggeranong

Table 5. Summary data for all water quality zones

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th percentile
Microbiological									
E.coli	AS 4276.21	MPN/100mL	<1	<1	1203	<1	1*	<1	<1
Total coliforms	AS 4276.21	MPN/100mL	-	<1	1203	<1	63	<1	<1
Heterotrophic plate count	APHA 9215 B	CFU/mL	-	<1	1203	<1	>5900	10	9
Physical									
Conductivity	APHA 2510 B	µS/cm	-	<2	120	84	208	113	176
pH	APHA 4500-H B	pH units	-	<0.01	1203	6.67	8.94	7.52	7.90
Temperature	APHA 4500-H B	deg.C	-	<0.1	241	8.4	25.5	16.3	23.4
Total dissolved solids	APHA 2540 C	mg/L	-	<10	120	29	133	70	118
True colour	APHA 2120 B	Pt-Co	-	<1	240	<1	3	<1	2
Turbidity	APHA 2130 B	NTU	-	<0.1	241	0.1	1.4	0.2	0.5
Inorganic									
Alkalinity bicarb	APHA 2320 A/B	mg/L	-	<0.1	240	36.8	128.0	51.4	63.6
Alkalinity carb	APHA 2320 A/B	mg/L	-	<0.1	240	<0.1	<0.1	<0.1	<0.1
Alkalinity hydrox	APHA 2320 A/B	mg/L	-	<0.1	240	<0.1	<0.1	<0.1	<0.1
Alkalinity total	APHA 2320 A/B	mg/L	-	<1	240	37	128	51	64
Aluminium acid soluble	USEPA 200.8	µg/L	-	<5	120	15	83	40	61
Asbestos	AS4964-2000	Present/Absent	-	Absent	48	Absent	Absent	Absent	Absent
Calcium dissolved	USEPA 200.7	mg/L	-	<0.05	120	10.2	19.8	13.9	17.7
Chloride	APHA 21st Ed. 2005, Part 4110 B	mg/L	-	<0.1	48	4.8	8.9	5.7	8.2
Chlorine combined	APHA 4500 -CL G	mg/L	-	<0.03	1203	<0.03	0.33	0.06	0.13
Chlorine free	APHA 4500 -CL G	mg/L	-	<0.03	1203	<0.03	1.66	0.85	1.19
Chlorine total	APHA 4500 -CL G	mg/L	5	<0.03	1203	0.05	1.67	0.91	1.25
Cyanide	APHA 4500_CN	mg/L	0.08	<0.004	48	<0.004	0.023	<0.004	<0.004
Fluoride	APHA 21st Ed. 2005, Part 4110 B	mg/L	1.5	<0.05	120	0.23	0.88	0.73	0.83
Hardness total	APHA 2340 B	mg/L	-	<1	120	29	64	41	59
Iodide	VIC-CM078	mg/L	0.5	<0.01	48	<0.01	<0.01	<0.01	<0.01
Magnesium dissolved	USEPA 200.7	mg/L	-	<0.05	120	0.94	3.89	1.46	3.52
Nitrate	APHA 21st Ed. 2005, Part 4110 B	mg/L	50	<0.1	48	<0.1	0.4	0.3	0.4
Potassium dissolved	USEPA 200.7	mg/L	-	<0.1	48	0.6	2.0	0.8	1.6
Sodium dissolved	USEPA 200.7	mg/L	-	<0.1	48	2.5	7.9	3.4	6.9
Sulphate	APHA 21st Ed. 2005, Part 4110 B	mg/L	-	<0.4	48	3.2	21.9	5.5	18.8
Total Metals									
Aluminium total	USEPA 200.8	µg/L	-	<9	120	24	229	46	75
Antimony total	USEPA 200.8	µg/L	3	<3	120	<3	<3	<3	<3
Arsenic total	USEPA 200.8	µg/L	10	<1	120	<1	<1	<1	<1
Barium total	USEPA 200.8	µg/L	2000	<0.5	120	3.1	9.6	4.5	7.6
Beryllium total	USEPA 200.8	µg/L	60	<0.1	120	<0.1	0.1	<0.1	<0.1
Boron total	USEPA 200.7	mg/L	4	<0.01	48	<0.01	0.02	<0.01	0.02
Cadmium total	USEPA 200.8	µg/L	2	<0.05	120	<0.05	0.11	<0.05	<0.05
Chromium total	USEPA 200.8	µg/L	-	<2	120	<2	<2	<2	<2
Cobalt total	USEPA 200.8	µg/L	-	<0.2	120	<0.2	<0.2	<0.2	<0.2
Copper total	USEPA 200.8	µg/L	2000	<1	240	1	69	12	32
Iron total	USEPA 200.7	mg/L	-	<0.01	240	<0.01	0.08	0.01	0.03
Lead total	USEPA 200.8	µg/L	10	<0.2	240	<0.2	4.1	0.3	0.8

Table 5. Summary data for all water quality zones

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th percentile
Manganese total	USEPA 200.7	mg/L	0.5	<0.001	240	<0.001	0.118	0.009	0.027
Mercury total	USEPA 200.8	µg/L	1	<0.1	48	<0.1	<0.1	<0.1	<0.1
Molybdenium total	USEPA 200.8	µg/L	50	<1	120	<1	2	<1	<1
Nickel total	USEPA 200.8	µg/L	20	<1	120	<1	2	<1	<1
Selenium total	USEPA 200.8	µg/L	10	<1	120	<1	<1	<1	<1
Silver total	USEPA 200.8	µg/L	100	<1	120	<1	<1	<1	<1
Zinc total	USEPA 200.8	µg/L	-	<5	120	<5	170	<5	7
Haloacetic Acids									
Bromoacetic acid	ALS: Headspace GCMS	µg/L	-	<5	120	<5	<5	<5	<5
Bromochloroacetic acid	ALS: Headspace GCMS	µg/L	-	<1	120	<1	6	2	5
Bromodichloroacetic acid	ALS: Headspace GCMS	µg/L	-	<1	120	<1	9	2	7
Dibromoacetic acid	ALS: Headspace GCMS	µg/L	-	<1	120	<1	1	<1	<1
Dibromochloroacetic acid	ALS: Headspace GCMS	µg/L	-	<10	120	<10	<10	<10	<10
Dichloroacetic acid	ALS: Headspace GCMS	µg/L	100	<1	120	6	54	19	46
Monochloroacetic acid	ALS: Headspace GCMS	µg/L	150	<1	120	<1	5	1	4
Tribromoacetic acid	ALS: Headspace GCMS	µg/L	-	<10	120	<10	<10	<10	<10
Trichloroacetic acid	ALS: Headspace GCMS	µg/L	100	<1	120	11	75	26	66
Sum of Haloacetic acid	ALS: Headspace GCMS	µg/L	-	<1	120	23	139	51	130
Trihalomethanes									
Bromoform	VIC-CM047	mg/L	-	<0.001	120	<0.001	<0.001	<0.001	<0.001
Chloroform	VIC-CM047	mg/L	-	<0.001	120	0.014	0.099	0.034	0.071
Dibromochloromethane	VIC-CM047	mg/L	-	<0.001	120	<0.001	<0.001	<0.001	<0.001
Dichlorobromomethane	VIC-CM047	mg/L	-	<0.001	120	<0.001	0.012	0.003	0.008
Trihalomethanes total	VIC-CM047	mg/L	0.25	<0.001	120	0.014	0.110	0.037	0.079
Semi Volatile Organic Compounds (SVOC) Anilines and Benzidines									
2-Nitroaniline	US EPA 3510/8270	µg/L	-	<4	120	<4	<4	<4	<4
3-Nitroaniline	US EPA 3510/8270	µg/L	-	<4	120	<4	<4	<4	<4
3,3`-Dichlorobenzidine	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
4-Chloroaniline	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
4-Nitroaniline	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Aniline	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Carbazole	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Dibenzofuran	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Chlorinated Hydrocarbons									
1,2-Dichlorobenzene	US EPA 3510/8270	µg/L	1500	<2	120	<2	<2	<2	<2
1,2,4-Trichlorobenzene	US EPA 3510/8270	µg/L	30	<2	120	<2	<2	<2	<2
1,3-Dichlorobenzene	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
1,4-Dichlorobenzene	US EPA 3510/8270	µg/L	40	<2	120	<2	<2	<2	<2
Hexachlorobenzene	US EPA 3510/8270	µg/L	-	<4	120	<4	<4	<4	<4
Hexachlorobutadiene	US EPA 3510/8270	µg/L	0.7	<2	120	<2	<2	<2	<2
Hexachlorocyclopentadiene	US EPA 3510/8270	µg/L	-	<10	120	<10	<10	<10	<10
Hexachloroethane	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Hexachloropropylene	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Pentachlorobenzene	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Haloethers									
4-Bromophenyl phenyl ether	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
4-Chlorophenyl phenyl ether	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2

Table 5. Summary data for all water quality zones

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th percentile
Bis(2-chloroethoxy) methane	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Bis(2-chloroethyl) ether	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Nitroaromatics and Ketones									
1-Naphthylamine	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
1,3,5-Trinitrobenzene	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
2-Picoline	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
2,4-Dinitrotoluene	US EPA 3510/8270	µg/L	-	<4	120	<4	<4	<4	<4
2,6-Dinitrotoluene	US EPA 3510/8270	µg/L	-	<4	120	<4	<4	<4	<4
4-Aminobiphenyl	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
4-Nitroquinoline-N-oxide	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
5-Nitro-o-toluidine	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Acetophenone	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Azobenzene	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Chlorobenzilate	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Dimethylaminoazobenzene	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Isophorone	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Nitrobenzene	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Pentachloronitrobenzene	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Phenacetin	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Pronamide	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Nitrosamines									
Methapyrilene	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
N-Nitrosodibutylamine	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
N-Nitrosodiethylamine	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
N-Nitrosodi-n-propylamine	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
N-Nitrosodiphenyl & Diphenylamine	US EPA 3510/8270	µg/L	-	<4	120	<4	<4	<4	<4
N-Nitrosomethylethylamine	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
N-Nitrosomorpholine	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
N-Nitrosopiperidine	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
N-Nitrosopyrrolidine	US EPA 3510/8270	µg/L	-	<4	120	<4	<4	<4	<4
Organochlorine Pesticides									
4,4′-DDD	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
4,4′-DDE	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
4,4′-DDT	US EPA 3510/8270	µg/L	9	<4	120	<4	<4	<4	<4
Aldrin	US EPA 3510/8270	µg/L	0.3	<2	120	<2	<2	<2	<2
alpha-BHC	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
alpha-Endosulfan	US EPA 3510/8270	µg/L	20	<2	120	<2	<2	<2	<2
beta-BHC	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
beta-Endosulfan	US EPA 3510/8270	µg/L	20	<2	120	<2	<2	<2	<2
delta-BHC	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Dieldrin	US EPA 3510/8270	µg/L	0.3	<2	120	<2	<2	<2	<2
Endrin	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Endosulfan sulfate	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
gamma-BHC	US EPA 3510/8270	µg/L	10	<2	120	<2	<2	<2	<2
Heptachlor	US EPA 3510/8270	µg/L	0.3	<2	120	<2	<2	<2	<2
Heptachlor epoxide	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2

Table 5. Summary data for all water quality zones

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th percentile
Organophosphorous Pesticides									
Chlorfenvinphos	US EPA 3510/8270	µg/L	2	<2	120	<2	<2	<2	<2
Chlorpyrifos	US EPA 3510/8270	µg/L	10	<2	120	<2	<2	<2	<2
Chlorpyrifos-methyl	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Diazinon	US EPA 3510/8270	µg/L	4	<2	120	<2	<2	<2	<2
Dichlorvos	US EPA 3510/8270	µg/L	5	<2	120	<2	<2	<2	<2
Dimethoate	US EPA 3510/8270	µg/L	7	<2	120	<2	<2	<2	<2
Ethion	US EPA 3510/8270	µg/L	4	<2	120	<2	<2	<2	<2
Fenthion	US EPA 3510/8270	µg/L	7	<2	120	<2	<2	<2	<2
Malathion	US EPA 3510/8270	µg/L	70	<2	120	<2	<2	<2	<2
Pirimiphos-ethyl	US EPA 3510/8270	µg/L	0.5	<2	120	<2	<2	<2	<2
Prothiofos	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Phenolic Compounds									
2,3,4,6-Tetrachlorophenol	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
2,4-Dichlorophenol	US EPA 3510/8270	µg/L	200	<2	120	<2	<2	<2	<2
2,4-Dimethylphenol	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
2,4,5-Trichlorophenol	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
2,4,6-Trichlorophenol	US EPA 3510/8270	µg/L	20	<2	120	<2	<2	<2	<2
2,6-Dichlorophenol	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
2-Chlorophenol	US EPA 3510/8270	µg/L	300	<2	120	<2	<2	<2	<2
2-Methylphenol	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
2-Nitrophenol	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
3- & 4-Methylphenol	US EPA 3510/8270	µg/L	-	<4	120	<4	<4	<4	<4
4-Chloro-3-Methylphenol	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Pentachlorophenol	US EPA 3510/8270	µg/L	10	<4	120	<4	<4	<4	<4
Phenol	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Phthalates									
Bis(2-ethylhexyl) phthalate	US EPA 3510/8270	µg/L	10	<10	120	<10	<10	<10	<10
Bis(2-ethylhexyl) phthalate	US EPA 8270D	µg/L	10	<10	120	<10	<10	<10	<10
Butyl benzyl phthalate	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Butyl benzyl phthalate	US EPA 8270D	µg/L	-	<2	120	<2	<2	<2	<2
Diethyl phthalate	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Diethyl phthalate	US EPA 8270D	µg/L	-	<2	120	<2	<2	<2	<2
Dimethyl phthalate	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Dimethyl phthalate	US EPA 8270D	µg/L	-	<2	120	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 8270D	µg/L	-	<2	120	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 8270D	µg/L	-	<2	120	<2	<2	<2	<2
Polycyclic Aromatic Hydrocarbons									
2-Chloronaphthalene	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
2-Methylnaphthalene	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
3-Methylcholanthrene	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
7,12-Dimethylbenz(a)anthracene	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Acenaphthene	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Acenaphthene	US EPA 3510/8270	µg/L	-	<1	120	<1	<1	<1	<1
Acenaphthylene	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2

Table 5. Summary data for all water quality zones

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th percentile
Acenaphthylene	US EPA 3510/8270	µg/L	-	<1	120	<1	<1	<1	<1
Anthracene	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Anthracene	US EPA 3510/8270	µg/L	-	<1	120	<1	<1	<1	<1
Benz(a)anthracene	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Benz(a)anthracene	US EPA 3510/8270	µg/L	-	<1	120	<1	<1	<1	<1
Benzo(a)pyrene	US EPA 3510/8270	µg/L	0.01	<2	120	<2	<2	<2	<2
Benzo(a)pyrene	US EPA 3510/8270	µg/L	0.01	<0.5	120	<0.5	<0.5	<0.5	<0.5
Benzo(b) fluoranthene	US EPA 3510/8270	µg/L	-	<1	120	<1	<1	<1	<1
Benzo(k) fluoranthene	US EPA 3510/8270	µg/L	-	<1	120	<1	<1	<1	<1
Benzo(b) & Benzo(k)fluoranthene	US EPA 3510/8270	µg/L	-	<4	120	<4	<4	<4	<4
Benzo(g,h,i)perylene	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Benzo(g,h,i)perylene	US EPA 3510/8270	µg/L	-	<1	120	<1	<1	<1	<1
Chrysene	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Chrysene	US EPA 3510/8270	µg/L	-	<1	120	<1	<1	<1	<1
Dibenz(a,h)anthracene	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Dibenz(a,h)anthracene	US EPA 3510/8270	µg/L	-	<1	120	<1	<1	<1	<1
Fluoranthene	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Fluoranthene	US EPA 3510/8270	µg/L	-	<1	120	<1	<1	<1	<1
Fluorene	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Fluorene	US EPA 3510/8270	µg/L	-	<1	120	<1	<1	<1	<1
Indeno(1,2,3-cd)pyrene	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Indeno(1,2,3-cd)pyrene	US EPA 3510/8270	µg/L	-	<1	120	<1	<1	<1	<1
N-2-Fluorenyl Acetamide	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	µg/L	-	<1	120	<1	<1	<1	<1
Phenanthrene	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Phenanthrene	US EPA 3510/8270	µg/L	-	<1	120	<1	<1	<1	<1
Pyrene	US EPA 3510/8270	µg/L	-	<2	120	<2	<2	<2	<2
Pyrene	US EPA 3510/8270	µg/L	-	<1	120	<1	<1	<1	<1
PAHs (total)	US EPA 3510/8270	µg/L	-	<0.5	120	<0.5	<0.5	<0.5	<0.5

Table notes:

ADWG	(Health) Australian Drinking Water Guidelines – Health Guideline Value
CFU/mL	colony forming units per millilitre
deg. C	degrees Celsius
LOR	limit of reporting
µg/L	micrograms per litre
µS/cm	micro siemens per centimetre
mg/L	milligrams per litre
MPN/100ml	most probable number per 100 millilitres
NTU	nephelometric units
Pt-Co	platinum-cobalt units

The 95th percentile is a statistical calculation based on 'normal' distribution. In the context of this report, it estimates the value for which 95 per cent of all the water that passes through the distribution system in this 12 month period falls below.

Where the table lists two distinct data sets for the same analyte, the analyte has been measured in two different suites of screens conducted by the laboratory: semi volatile organic compounds screen and phthalates screen.

*Exceedance of health value reported to ACT Health. The *E.coli* detection was investigated and found to be not indicative of water quality within the reticulation. See *page 36* for further information.

Table 6. Summary data for water quality zone 1: North Canberra and Gungahlin

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th percentile
Microbiological									
E.coli	AS 4276.21	MPN/100mL	<1	<1	349	<1	<1	<1	<1
Total coliforms	AS 4276.21	MPN/100mL	-	<1	349	<1	63	<1	<1
Heterotrophic plate count	APHA 9215 B	CFU/mL	-	<1	349	<1	937	5	9
Physical									
Conductivity	APHA 2510 B	µS/cm	-	<2	36	86	208	115	172
pH	APHA 4500-H B	pH units	-	<0.01	349	6.67	7.96	7.49	7.83
Temperature	APHA 4500-H B	deg.C	-	<0.1	72	9.4	24.9	15.9	21.7
Total dissolved solids	APHA 2540 C	mg/L	-	<10	36	40	133	72	116
True colour	APHA 2120 B	Pt-Co	-	<1	72	<1	3	<1	2
Turbidity	APHA 2130 B	NTU	-	<0.1	72	0.1	1.4	0.3	0.6
Inorganic									
Alkalinity bicarb	APHA 2320 A/B	mg/L	-	<0.1	72	36.8	128.0	52.6	65.8
Alkalinity carb	APHA 2320 A/B	mg/L	-	<0.1	72	<0.1	<0.1	<0.1	<0.1
Alkalinity hydrox	APHA 2320 A/B	mg/L	-	<0.1	72	<0.1	<0.1	<0.1	<0.1
Alkalinity total	APHA 2320 A/B	mg/L	-	<1	72	37	128	53	66
Aluminium acid soluble	USEPA 200.8	µg/L	-	<5	36	16	66	38	55
Asbestos	AS4964-2000	Present/Absent	-	Absent	12	Absent	Absent	Absent	Absent
Calcium dissolved	USEPA 200.7	mg/L	-	<0.05	36	10.6	19.0	13.9	17.6
Chloride	APHA 21st Ed. 2005, Part 4110 B	mg/L	-	<0.1	12	5.1	8.9	5.8	7.2
Chlorine combined	APHA 4500 -CL G	mg/L	-	<0.03	349	<0.03	0.22	0.06	0.13
Chlorine free	APHA 4500 -CL G	mg/L	-	<0.03	349	0.20	1.66	0.91	1.26
Chlorine total	APHA 4500 -CL G	mg/L	5	<0.03	349	0.31	1.67	0.97	1.32
Cyanide	APHA 4500_CN	mg/L	0.08	<0.004	12	<0.004	<0.004	<0.004	<0.004
Fluoride	APHA 21st Ed. 2005, Part 4110 B	mg/L	1.5	<0.05	36	0.23	0.88	0.73	0.84
Hardness total	APHA 2340 B	mg/L	-	<1	36	32	64	41	58
Iodide	VIC-CM078	mg/L	0.5	<0.01	12	<0.01	<0.01	<0.01	<0.01
Magnesium dissolved	USEPA 200.7	mg/L	-	<0.05	36	1.02	3.89	1.47	3.57
Nitrate	APHA 21st Ed. 2005, Part 4110 B	mg/L	50	<0.1	12	0.3	0.4	0.3	0.3
Potassium dissolved	USEPA 200.7	mg/L	-	<0.1	12	0.7	1.7	0.8	1.2
Sodium dissolved	USEPA 200.7	mg/L	-	<0.1	12	2.5	7.6	3.4	5.3
Sulphate	APHA 21st Ed. 2005, Part 4110 B	mg/L	-	<0.4	12	3.4	21.9	5.6	12.8
Total Metals									
Aluminium total	USEPA 200.8	µg/L	-	<9	36	24	229	51	101
Antimony total	USEPA 200.8	µg/L	3	<3	36	<3	<3	<3	<3
Arsenic total	USEPA 200.8	µg/L	10	<1	36	<1	<1	<1	<1
Barium total	USEPA 200.8	µg/L	2000	<0.5	36	3.1	9.6	4.7	7.8
Beryllium total	USEPA 200.8	µg/L	60	<0.1	36	<0.1	0.1	<0.1	<0.1
Boron total	USEPA 200.7	mg/L	4	<0.01	12	<0.01	0.02	0.01	0.02
Cadmium total	USEPA 200.8	µg/L	2	<0.05	36	<0.05	0.11	<0.05	<0.05
Chromium total	USEPA 200.8	µg/L	-	<2	36	<2	<2	<2	<2
Cobalt total	USEPA 200.8	µg/L	-	<0.2	36	<0.2	<0.2	<0.2	<0.2
Copper total	USEPA 200.8	µg/L	2000	<1	72	1	61	12	38
Iron total	USEPA 200.7	mg/L	-	<0.01	72	<0.01	0.08	0.02	0.03
Lead total	USEPA 200.8	µg/L	10	<0.2	72	<0.2	4.1	0.4	1.0

Table 6. Summary data for water quality zone 1: North Canberra and Gungahlin

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th percentile
Manganese total	USEPA 200.7	mg/L	0.5	<0.001	72	<0.001	0.118	0.012	0.042
Mercury total	USEPA 200.8	µg/L	1	<0.1	12	<0.1	<0.1	<0.1	<0.1
Molybdenium total	USEPA 200.8	µg/L	50	<1	36	<1	2	<1	<1
Nickel total	USEPA 200.8	µg/L	20	<1	36	<1	2	<1	<1
Selenium total	USEPA 200.8	µg/L	10	<1	36	<1	<1	<1	<1
Silver total	USEPA 200.8	µg/L	100	<1	36	<1	<1	<1	<1
Zinc total	USEPA 200.8	µg/L	-	<5	36	<5	28	<5	10
Haloacetic Acids									
Bromoacetic acid	ALS: Headspace GCMS	µg/L	-	<5	36	<5	<5	<5	<5
Bromochloroacetic acid	ALS: Headspace GCMS	µg/L	-	<1	36	<1	5	2	4
Bromodichloroacetic acid	ALS: Headspace GCMS	µg/L	-	<1	36	<1	9	2	7
Dibromoacetic acid	ALS: Headspace GCMS	µg/L	-	<1	36	<1	<1	<1	<1
Dibromochloroacetic acid	ALS: Headspace GCMS	µg/L	-	<10	36	<10	<10	<10	<10
Dichloroacetic acid	ALS: Headspace GCMS	µg/L	100	<1	36	10	50	20	47
Monochloroacetic acid	ALS: Headspace GCMS	µg/L	150	<1	36	<1	5	2	4
Tribromoacetic acid	ALS: Headspace GCMS	µg/L	-	<10	36	<10	<10	<10	<10
Trichloroacetic acid	ALS: Headspace GCMS	µg/L	100	<1	36	12	69	26	67
Sum of Haloacetic acid	ALS: Headspace GCMS	µg/L	-	<1	36	23	136	51	131
Trihalomethanes									
Bromoform	VIC-CM047	mg/L	-	<0.001	36	<0.001	<0.001	<0.001	<0.001
Chloroform	VIC-CM047	mg/L	-	<0.001	36	0.014	0.099	0.035	0.076
Dibromochloromethane	VIC-CM047	mg/L	-	<0.001	36	<0.001	<0.001	<0.001	<0.001
Dichlorobromomethane	VIC-CM047	mg/L	-	<0.001	36	<0.001	0.012	0.003	0.009
Trihalomethanes total	VIC-CM047	mg/L	0.25	<0.001	36	0.014	0.110	0.038	0.084
Semi Volatile Organic Compounds (SVOC) Anilines and Benzidines									
2-Nitroaniline	US EPA 3510/8270	µg/L	-	<4	36	<4	<4	<4	<4
3-Nitroaniline	US EPA 3510/8270	µg/L	-	<4	36	<4	<4	<4	<4
3,3`-Dichlorobenzidine	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
4-Chloroaniline	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
4-Nitroaniline	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Aniline	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Carbazole	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Dibenzofuran	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Chlorinated Hydrocarbons									
1,2-Dichlorobenzene	US EPA 3510/8270	µg/L	1500	<2	36	<2	<2	<2	<2
1,2,4-Trichlorobenzene	US EPA 3510/8270	µg/L	30	<2	36	<2	<2	<2	<2
1,3-Dichlorobenzene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
1,4-Dichlorobenzene	US EPA 3510/8270	µg/L	40	<2	36	<2	<2	<2	<2
Hexachlorobenzene	US EPA 3510/8270	µg/L	-	<4	36	<4	<4	<4	<4
Hexachlorobutadiene	US EPA 3510/8270	µg/L	0.7	<2	36	<2	<2	<2	<2
Hexachlorocyclopentadiene	US EPA 3510/8270	µg/L	-	<10	36	<10	<10	<10	<10
Hexachloroethane	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Hexachloropropylene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Pentachlorobenzene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Haloethers									
4-Bromophenyl phenyl ether	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
4-Chlorophenyl phenyl ether	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2

Table 6. Summary data for water quality zone 1: North Canberra and Gungahlin

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th percentile
Bis(2-chloroethoxy) methane	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Bis(2-chloroethyl) ether	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Nitroaromatics and Ketones									
1-Naphthylamine	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
1,3,5-Trinitrobenzene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
2-Picoline	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
2,4-Dinitrotoluene	US EPA 3510/8270	µg/L	-	<4	36	<4	<4	<4	<4
2,6-Dinitrotoluene	US EPA 3510/8270	µg/L	-	<4	36	<4	<4	<4	<4
4-Aminobiphenyl	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
4-Nitroquinoline-N-oxide	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
5-Nitro-o-toluidine	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Acetophenone	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Azobenzene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Chlorobenzilate	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Dimethylaminoazobenzene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Isophorone	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Nitrobenzene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Pentachloronitrobenzene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Phenacetin	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Pronamide	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Nitrosamines									
Methapyrilene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
N-Nitrosodibutylamine	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
N-Nitrosodiethylamine	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
N-Nitrosodi-n-propylamine	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
N-Nitrosodiphenyl & Diphenylamine	US EPA 3510/8270	µg/L	-	<4	36	<4	<4	<4	<4
N-Nitrosomethylethylamine	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
N-Nitrosomorpholine	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
N-Nitrosopiperidine	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
N-Nitrosopyrrolidine	US EPA 3510/8270	µg/L	-	<4	36	<4	<4	<4	<4
Organochlorine Pesticides									
4,4′-DDD	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
4,4′-DDE	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
4,4′-DDT	US EPA 3510/8270	µg/L	9	<4	36	<4	<4	<4	<4
Aldrin	US EPA 3510/8270	µg/L	0.3	<2	36	<2	<2	<2	<2
alpha-BHC	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
alpha-Endosulfan	US EPA 3510/8270	µg/L	20	<2	36	<2	<2	<2	<2
beta-BHC	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
beta-Endosulfan	US EPA 3510/8270	µg/L	20	<2	36	<2	<2	<2	<2
delta-BHC	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Dieldrin	US EPA 3510/8270	µg/L	0.3	<2	36	<2	<2	<2	<2
Endrin	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Endosulfan sulfate	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
gamma-BHC	US EPA 3510/8270	µg/L	10	<2	36	<2	<2	<2	<2
Heptachlor	US EPA 3510/8270	µg/L	0.3	<2	36	<2	<2	<2	<2
Heptachlor epoxide	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2

Table 6. Summary data for water quality zone 1: North Canberra and Gungahlin

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th percentile
Organophosphorous Pesticides									
Chlorfenvinphos	US EPA 3510/8270	µg/L	2	<2	36	<2	<2	<2	<2
Chlorpyrifos	US EPA 3510/8270	µg/L	10	<2	36	<2	<2	<2	<2
Chlorpyrifos-methyl	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Diazinon	US EPA 3510/8270	µg/L	4	<2	36	<2	<2	<2	<2
Dichlorvos	US EPA 3510/8270	µg/L	5	<2	36	<2	<2	<2	<2
Dimethoate	US EPA 3510/8270	µg/L	7	<2	36	<2	<2	<2	<2
Ethion	US EPA 3510/8270	µg/L	4	<2	36	<2	<2	<2	<2
Fenthion	US EPA 3510/8270	µg/L	7	<2	36	<2	<2	<2	<2
Malathion	US EPA 3510/8270	µg/L	70	<2	36	<2	<2	<2	<2
Pirimiphos-ethyl	US EPA 3510/8270	µg/L	0.5	<2	36	<2	<2	<2	<2
Prothiofos	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Phenolic Compounds									
2,3,4,6-Tetrachlorophenol	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
2,4-Dichlorophenol	US EPA 3510/8270	µg/L	200	<2	36	<2	<2	<2	<2
2,4-Dimethylphenol	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
2,4,5-Trichlorophenol	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
2,4,6-Trichlorophenol	US EPA 3510/8270	µg/L	20	<2	36	<2	<2	<2	<2
2,6-Dichlorophenol	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
2-Chlorophenol	US EPA 3510/8270	µg/L	300	<2	36	<2	<2	<2	<2
2-Methylphenol	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
2-Nitrophenol	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
3- & 4-Methylphenol	US EPA 3510/8270	µg/L	-	<4	36	<4	<4	<4	<4
4-Chloro-3-Methylphenol	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Pentachlorophenol	US EPA 3510/8270	µg/L	10	<4	36	<4	<4	<4	<4
Phenol	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Phthalates									
Bis(2-ethylhexyl) phthalate	US EPA 3510/8270	µg/L	10	<10	36	<10	<10	<10	<10
Bis(2-ethylhexyl) phthalate	US EPA 8270D	µg/L	10	<10	36	<10	<10	<10	<10
Butyl benzyl phthalate	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Butyl benzyl phthalate	US EPA 8270D	µg/L	-	<2	36	<2	<2	<2	<2
Diethyl phthalate	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Diethyl phthalate	US EPA 8270D	µg/L	-	<2	36	<2	<2	<2	<2
Dimethyl phthalate	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Dimethyl phthalate	US EPA 8270D	µg/L	-	<2	36	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 8270D	µg/L	-	<2	36	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 8270D	µg/L	-	<2	36	<2	<2	<2	<2
Polycyclic Aromatic Hydrocarbons									
2-Chloronaphthalene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
2-Methylnaphthalene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
3-Methylcholanthrene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
7,12-Dimethylbenz(a)anthracene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Acenaphthene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Acenaphthene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Acenaphthylene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2

Table 6. Summary data for water quality zone 1: North Canberra and Gungahlin

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th percentile
Acenaphthylene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Anthracene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Anthracene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Benz(a)anthracene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Benz(a)anthracene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Benzo(a)pyrene	US EPA 3510/8270	µg/L	0.01	<2	36	<2	<2	<2	<2
Benzo(a)pyrene	US EPA 3510/8270	µg/L	0.01	<0.5	36	<0.5	<0.5	<0.5	<0.5
Benzo(b) fluoranthene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Benzo(k) fluoranthene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Benzo(b) & Benzo(k)fluoranthene	US EPA 3510/8270	µg/L	-	<4	36	<4	<4	<4	<4
Benzo(g,h,i)perylene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Benzo(g,h,i)perylene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Chrysene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Chrysene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Dibenz(a,h)anthracene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Dibenz(a,h)anthracene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Fluoranthene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Fluoranthene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Fluorene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Fluorene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Indeno(1,2,3-cd)pyrene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Indeno(1,2,3-cd)pyrene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
N-2-Fluorenyl Acetamide	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Phenanthrene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Phenanthrene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Pyrene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Pyrene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
PAHs (total)	US EPA 3510/8270	µg/L	-	<0.5	36	<0.5	<0.5	<0.5	<0.5

Table notes:

ADWG	(Health) Australian Drinking Water Guidelines – Health Guideline Value
CFU/mL	colony forming units per millilitre
deg. C	degrees Celsius
LOR	limit of reporting
µg/L	micrograms per litre
µS/cm	micro siemens per centimetre
mg/L	milligrams per litre
MPN/100ml	most probable number per 100 millilitres
NTU	nephelometric units
Pt-Co	platinum-cobalt units

The 95th percentile is a statistical calculation based on 'normal' distribution. In the context of this report, it estimates the value for which 95 per cent of all the water that passes through the distribution system in this 12 month period falls below.

Where the table lists two distinct data sets for the same analyte, the analyte has been measured in two different suites of screens conducted by the laboratory: semi volatile organic compounds screen and phthalates screen.

Table 7. Summary data for water quality zone 2: Belconnen

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th percentile
Microbiological									
E.coli	AS 4276.21	MPN/100mL	<1	<1	325	<1	<1	<1	<1
Total coliforms	AS 4276.21	MPN/100mL	-	<1	325	<1	3	<1	<1
Heterotrophic plate count	APHA 9215 B	CFU/mL	-	<1	325	<1	218	3	10
Physical									
Conductivity	APHA 2510 B	µS/cm	-	<2	36	90	193	110	140
pH	APHA 4500-H B	pH units	-	<0.01	325	6.75	8.62	7.50	7.89
Temperature	APHA 4500-H B	deg.C	-	<0.1	72	8.4	25.5	16.2	22.9
Total dissolved solids	APHA 2540 C	mg/L	-	<10	36	29	132	67	102
True colour	APHA 2120 B	Pt-Co	-	<1	72	<1	2	<1	1
Turbidity	APHA 2130 B	NTU	-	<0.1	72	0.1	0.8	0.2	0.4
Inorganic									
Alkalinity bicarb	APHA 2320 A/B	mg/L	-	<0.1	72	37.4	65.1	49.9	61.3
Alkalinity carb	APHA 2320 A/B	mg/L	-	<0.1	72	<0.1	<0.1	<0.1	<0.1
Alkalinity hydrox	APHA 2320 A/B	mg/L	-	<0.1	72	<0.1	<0.1	<0.1	<0.1
Alkalinity total	APHA 2320 A/B	mg/L	-	<1	72	37	65	50	61
Aluminium acid soluble	USEPA 200.8	µg/L	-	<5	36	23	83	40	63
Asbestos	AS4964-2000	Present/Absent	-	Absent	12	Absent	Absent	Absent	Absent
Calcium dissolved	USEPA 200.7	mg/L	-	<0.05	36	10.2	19.0	13.9	16.1
Chloride	APHA 21st Ed. 2005, Part 4110 B	mg/L	-	<0.1	12	5.0	8.5	5.7	7.0
Chlorine combined	APHA 4500 -CL G	mg/L	-	<0.03	325	<0.03	0.33	0.06	0.12
Chlorine free	APHA 4500 -CL G	mg/L	-	<0.03	325	0.16	1.28	0.84	1.15
Chlorine total	APHA 4500 -CL G	mg/L	5	<0.03	325	0.28	1.34	0.90	1.21
Cyanide	APHA 4500_CN	mg/L	0.08	<0.004	12	<0.004	<0.004	<0.004	<0.004
Fluoride	APHA 21st Ed. 2005, Part 4110 B	mg/L	1.5	<0.05	36	0.47	0.84	0.72	0.83
Hardness total	APHA 2340 B	mg/L	-	<1	36	29	63	40	50
Iodide	VIC-CM078	mg/L	0.5	<0.01	12	<0.01	<0.01	<0.01	<0.01
Magnesium dissolved	USEPA 200.7	mg/L	-	<0.05	36	0.97	3.84	1.44	2.46
Nitrate	APHA 21st Ed. 2005, Part 4110 B	mg/L	50	<0.1	12	<0.1	0.4	0.3	0.3
Potassium dissolved	USEPA 200.7	mg/L	-	<0.1	12	0.6	1.9	0.8	1.3
Sodium dissolved	USEPA 200.7	mg/L	-	<0.1	12	2.6	7.5	3.4	5.3
Sulphate	APHA 21st Ed. 2005, Part 4110 B	mg/L	-	<0.4	12	3.4	20.8	5.6	12.4
Total Metals									
Aluminium total	USEPA 200.8	µg/L	-	<9	36	27	102	44	77
Antimony total	USEPA 200.8	µg/L	3	<3	36	<3	<3	<3	<3
Arsenic total	USEPA 200.8	µg/L	10	<1	36	<1	<1	<1	<1
Barium total	USEPA 200.8	µg/L	2000	<0.5	36	3.1	9.1	4.2	5.9
Beryllium total	USEPA 200.8	µg/L	60	<0.1	36	<0.1	<0.1	<0.1	<0.1
Boron total	USEPA 200.7	mg/L	4	<0.01	12	<0.01	0.02	0.01	0.02
Cadmium total	USEPA 200.8	µg/L	2	<0.05	36	<0.05	0.05	<0.05	<0.05
Chromium total	USEPA 200.8	µg/L	-	<2	36	<2	<2	<2	<2
Cobalt total	USEPA 200.8	µg/L	-	<0.2	36	<0.2	<0.2	<0.2	<0.2
Copper total	USEPA 200.8	µg/L	2000	<1	72	1	69	12	30
Iron total	USEPA 200.7	mg/L	-	<0.01	72	<0.01	0.04	0.01	0.02
Lead total	USEPA 200.8	µg/L	10	<0.2	72	<0.2	1.3	0.2	0.6

Table 7. Summary data for water quality zone 2: Belconnen

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th percentile
Manganese total	USEPA 200.7	mg/L	0.5	<0.001	72	<0.001	0.044	0.007	0.021
Mercury total	USEPA 200.8	µg/L	1	<0.1	12	<0.1	<0.1	<0.1	<0.1
Molybdenium total	USEPA 200.8	µg/L	50	<1	36	<1	<1	<1	<1
Nickel total	USEPA 200.8	µg/L	20	<1	36	<1	2	<1	<1
Selenium total	USEPA 200.8	µg/L	10	<1	36	<1	<1	<1	<1
Silver total	USEPA 200.8	µg/L	100	<1	36	<1	<1	<1	<1
Zinc total	USEPA 200.8	µg/L	-	<5	36	<5	8	<5	<5
Haloacetic Acids									
Bromoacetic acid	ALS: Headspace GCMS	µg/L	-	<5	36	<5	<5	<5	<5
Bromochloroacetic acid	ALS: Headspace GCMS	µg/L	-	<1	36	<1	5	2	4
Bromodichloroacetic acid	ALS: Headspace GCMS	µg/L	-	<1	36	1	8	2	6
Dibromoacetic acid	ALS: Headspace GCMS	µg/L	-	<1	36	<1	<1	<1	<1
Dibromochloroacetic acid	ALS: Headspace GCMS	µg/L	-	<10	36	<10	<10	<10	<10
Dichloroacetic acid	ALS: Headspace GCMS	µg/L	100	<1	36	6	52	20	39
Monochloroacetic acid	ALS: Headspace GCMS	µg/L	150	<1	36	<1	4	1	3
Tribromoacetic acid	ALS: Headspace GCMS	µg/L	-	<10	36	<10	<10	<10	<10
Trichloroacetic acid	ALS: Headspace GCMS	µg/L	100	<1	36	11	75	25	43
Sum of Haloacetic acid	ALS: Headspace GCMS	µg/L	-	<1	36	23	138	50	95
Trihalomethanes									
Bromoform	VIC-CM047	mg/L	-	<0.001	36	<0.001	<0.001	<0.001	<0.001
Chloroform	VIC-CM047	mg/L	-	<0.001	36	0.018	0.080	0.033	0.053
Dibromochloromethane	VIC-CM047	mg/L	-	<0.001	36	<0.001	<0.001	<0.001	<0.001
Dichlorobromomethane	VIC-CM047	mg/L	-	<0.001	36	0.001	0.009	0.003	0.005
Trihalomethanes total	VIC-CM047	mg/L	0.25	<0.001	36	0.019	0.089	0.036	0.058
Semi Volatile Organic Compounds (SVOC) Anilines and Benzidines									
2-Nitroaniline	US EPA 3510/8270	µg/L	-	<4	36	<4	<4	<4	<4
3-Nitroaniline	US EPA 3510/8270	µg/L	-	<4	36	<4	<4	<4	<4
3,3`-Dichlorobenzidine	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
4-Chloroaniline	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
4-Nitroaniline	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Aniline	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Carbazole	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Dibenzofuran	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Chlorinated Hydrocarbons									
1,2-Dichlorobenzene	US EPA 3510/8270	µg/L	1500	<2	36	<2	<2	<2	<2
1,2,4-Trichlorobenzene	US EPA 3510/8270	µg/L	30	<2	36	<2	<2	<2	<2
1,3-Dichlorobenzene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
1,4-Dichlorobenzene	US EPA 3510/8270	µg/L	40	<2	36	<2	<2	<2	<2
Hexachlorobenzene	US EPA 3510/8270	µg/L	-	<4	36	<4	<4	<4	<4
Hexachlorobutadiene	US EPA 3510/8270	µg/L	0.7	<2	36	<2	<2	<2	<2
Hexachlorocyclopentadiene	US EPA 3510/8270	µg/L	-	<10	36	<10	<10	<10	<10
Hexachloroethane	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Hexachloropropylene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Pentachlorobenzene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Haloethers									
4-Bromophenyl phenyl ether	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
4-Chlorophenyl phenyl ether	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2

Table 7. Summary data for water quality zone 2: Belconnen

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th percentile
Bis(2-chloroethoxy) methane	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Bis(2-chloroethyl) ether	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Nitroaromatics and Ketones									
1-Naphthylamine	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
1,3,5-Trinitrobenzene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
2-Picoline	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
2,4-Dinitrotoluene	US EPA 3510/8270	µg/L	-	<4	36	<4	<4	<4	<4
2,6-Dinitrotoluene	US EPA 3510/8270	µg/L	-	<4	36	<4	<4	<4	<4
4-Aminobiphenyl	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
4-Nitroquinoline-N-oxide	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
5-Nitro-o-toluidine	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Acetophenone	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Azobenzene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Chlorobenzilate	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Dimethylaminoazobenzene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Isophorone	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Nitrobenzene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Pentachloronitrobenzene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Phenacetin	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Pronamide	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Nitrosamines									
Methapyrilene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
N-Nitrosodibutylamine	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
N-Nitrosodiethylamine	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
N-Nitrosodi-n-propylamine	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
N-Nitrosodiphenyl & Diphenylamine	US EPA 3510/8270	µg/L	-	<4	36	<4	<4	<4	<4
N-Nitrosomethylethylamine	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
N-Nitrosomorpholine	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
N-Nitrosopiperidine	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
N-Nitrosopyrrolidine	US EPA 3510/8270	µg/L	-	<4	36	<4	<4	<4	<4
Organochlorine Pesticides									
4,4'-DDD	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
4,4'-DDE	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
4,4'-DDT	US EPA 3510/8270	µg/L	9	<4	36	<4	<4	<4	<4
Aldrin	US EPA 3510/8270	µg/L	0.3	<2	36	<2	<2	<2	<2
alpha-BHC	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
alpha-Endosulfan	US EPA 3510/8270	µg/L	20	<2	36	<2	<2	<2	<2
beta-BHC	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
beta-Endosulfan	US EPA 3510/8270	µg/L	20	<2	36	<2	<2	<2	<2
delta-BHC	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Dieldrin	US EPA 3510/8270	µg/L	0.3	<2	36	<2	<2	<2	<2
Endrin	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Endosulfan sulfate	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
gamma-BHC	US EPA 3510/8270	µg/L	10	<2	36	<2	<2	<2	<2
Heptachlor	US EPA 3510/8270	µg/L	0.3	<2	36	<2	<2	<2	<2
Heptachlor epoxide	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2

Table 7. Summary data for water quality zone 2: Belconnen

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th percentile
Organophosphorous Pesticides									
Chlorfenvinphos	US EPA 3510/8270	µg/L	2	<2	36	<2	<2	<2	<2
Chlorpyrifos	US EPA 3510/8270	µg/L	10	<2	36	<2	<2	<2	<2
Chlorpyrifos-methyl	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Diazinon	US EPA 3510/8270	µg/L	4	<2	36	<2	<2	<2	<2
Dichlorvos	US EPA 3510/8270	µg/L	5	<2	36	<2	<2	<2	<2
Dimethoate	US EPA 3510/8270	µg/L	7	<2	36	<2	<2	<2	<2
Ethion	US EPA 3510/8270	µg/L	4	<2	36	<2	<2	<2	<2
Fenthion	US EPA 3510/8270	µg/L	7	<2	36	<2	<2	<2	<2
Malathion	US EPA 3510/8270	µg/L	70	<2	36	<2	<2	<2	<2
Pirimiphos-ethyl	US EPA 3510/8270	µg/L	0.5	<2	36	<2	<2	<2	<2
Prothiofos	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Phenolic Compounds									
2,3,4,6-Tetrachlorophenol	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
2,4-Dichlorophenol	US EPA 3510/8270	µg/L	200	<2	36	<2	<2	<2	<2
2,4-Dimethylphenol	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
2,4,5-Trichlorophenol	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
2,4,6-Trichlorophenol	US EPA 3510/8270	µg/L	20	<2	36	<2	<2	<2	<2
2,6-Dichlorophenol	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
2-Chlorophenol	US EPA 3510/8270	µg/L	300	<2	36	<2	<2	<2	<2
2-Methylphenol	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
2-Nitrophenol	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
3- & 4-Methylphenol	US EPA 3510/8270	µg/L	-	<4	36	<4	<4	<4	<4
4-Chloro-3-Methylphenol	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Pentachlorophenol	US EPA 3510/8270	µg/L	10	<4	36	<4	<4	<4	<4
Phenol	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Phthalates									
Bis(2-ethylhexyl) phthalate	US EPA 3510/8270	µg/L	10	<10	36	<10	<10	<10	<10
Bis(2-ethylhexyl) phthalate	US EPA 8270D	µg/L	10	<10	36	<10	<10	<10	<10
Butyl benzyl phthalate	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Butyl benzyl phthalate	US EPA 8270D	µg/L	-	<2	36	<2	<2	<2	<2
Diethyl phthalate	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Diethyl phthalate	US EPA 8270D	µg/L	-	<2	36	<2	<2	<2	<2
Dimethyl phthalate	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Dimethyl phthalate	US EPA 8270D	µg/L	-	<2	36	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 8270D	µg/L	-	<2	36	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 8270D	µg/L	-	<2	36	<2	<2	<2	<2
Polycyclic Aromatic Hydrocarbons									
2-Chloronaphthalene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
2-Methylnaphthalene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
3-Methylcholanthrene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
7,12-Dimethylbenz(a)anthracene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Acenaphthene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Acenaphthene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Acenaphthylene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2

Table 7. Summary data for water quality zone 2: Belconnen

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th percentile
Acenaphthylene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Anthracene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Anthracene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Benz(a)anthracene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Benz(a)anthracene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Benzo(a)pyrene	US EPA 3510/8270	µg/L	0.01	<2	36	<2	<2	<2	<2
Benzo(a)pyrene	US EPA 3510/8270	µg/L	0.01	<0.5	36	<0.5	<0.5	<0.5	<0.5
Benzo(b) fluoranthene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Benzo(k) fluoranthene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Benzo(b) & Benzo(k)fluoranthene	US EPA 3510/8270	µg/L	-	<4	36	<4	<4	<4	<4
Benzo(g,h,i)perylene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Benzo(g,h,i)perylene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Chrysene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Chrysene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Dibenz(a,h)anthracene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Dibenz(a,h)anthracene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Fluoranthene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Fluoranthene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Fluorene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Fluorene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Indeno(1,2,3-cd)pyrene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Indeno(1,2,3-cd)pyrene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
N-2-Fluorenyl Acetamide	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Phenanthrene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Phenanthrene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Pyrene	US EPA 3510/8270	µg/L	-	<2	36	<2	<2	<2	<2
Pyrene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
PAHs (total)	US EPA 3510/8270	µg/L	-	<0.5	36	<0.5	<0.5	<0.5	<0.5

Table notes:

ADWG	(Health) Australian Drinking Water Guidelines – Health Guideline Value
CFU/mL	colony forming units per millilitre
deg. C	degrees Celsius
LOR	limit of reporting
µg/L	micrograms per litre
µS/cm	micro siemens per centimetre
mg/L	milligrams per litre
MPN/100ml	most probable number per 100 millilitres
NTU	nephelometric units
Pt-Co	platinum-cobalt units

The 95th percentile is a statistical calculation based on 'normal' distribution. In the context of this report, it estimates the value for which 95 per cent of all the water that passes through the distribution system in this 12 month period falls below.

Where the table lists two distinct data sets for the same analyte, the analyte has been measured in two different suites of screens conducted by the laboratory: semi volatile organic compounds screen and phthalates screen.

Table 8. Summary data for water quality zone 3: South Canberra, Woden and Weston Creek

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th percentile
Microbiological									
E.coli	AS 4276.21	MPN/100mL	<1	<1	266	<1	1*	<1	<1
Total coliforms	AS 4276.21	MPN/100mL	-	<1	266	<1	16	<1	<1
Heterotrophic plate count	APHA 9215 B	CFU/mL	-	<1	266	<1	>5900	30	6
Physical									
Conductivity	APHA 2510 B	µS/cm	-	<2	24	91	180	113	143
pH	APHA 4500-H B	pH units	-	<0.01	266	6.81	8.30	7.47	7.83
Temperature	APHA 4500-H B	deg.C	-	<0.1	49	8.9	24.5	16.4	23.4
Total dissolved solids	APHA 2540 C	mg/L	-	<10	24	44	126	69	118
True colour	APHA 2120 B	Pt-Co	-	<1	48	<1	2	<1	2
Turbidity	APHA 2130 B	NTU	-	<0.1	49	0.1	0.8	0.2	0.6
Inorganic									
Alkalinity bicarb	APHA 2320 A/B	mg/L	-	<0.1	48	37.2	68.1	49.8	62.3
Alkalinity carb	APHA 2320 A/B	mg/L	-	<0.1	48	<0.1	<0.1	<0.1	<0.1
Alkalinity hydrox	APHA 2320 A/B	mg/L	-	<0.1	48	<0.1	<0.1	<0.1	<0.1
Alkalinity total	APHA 2320 A/B	mg/L	-	<1	48	37	68	50	62
Aluminium acid soluble	USEPA 200.8	µg/L	-	<5	24	30	82	44	66
Asbestos	AS4964-2000	Present/Absent	-	Absent	12	Absent	Absent	Absent	Absent
Calcium dissolved	USEPA 200.7	mg/L	-	<0.05	24	11.2	18.5	13.5	16.5
Chloride	APHA 21st Ed. 2005, Part 4110 B	mg/L	-	<0.1	12	5.0	7.5	5.7	6.6
Chlorine combined	APHA 4500 -CL G	mg/L	-	<0.03	266	<0.03	0.23	0.06	0.14
Chlorine free	APHA 4500 -CL G	mg/L	-	<0.03	266	<0.03	1.50	0.87	1.18
Chlorine total	APHA 4500 -CL G	mg/L	5	<0.03	266	0.05	1.55	0.93	1.24
Cyanide	APHA 4500_CN	mg/L	0.08	<0.004	12	<0.004	<0.004	<0.004	<0.004
Fluoride	APHA 21st Ed. 2005, Part 4110 B	mg/L	1.5	<0.05	24	0.48	0.86	0.74	0.83
Hardness total	APHA 2340 B	mg/L	-	<1	24	33	59	40	50
Iodide	VIC-CM078	mg/L	0.5	<0.01	12	<0.01	<0.01	<0.01	<0.01
Magnesium dissolved	USEPA 200.7	mg/L	-	<0.05	24	1.02	3.06	1.50	2.71
Nitrate	APHA 21st Ed. 2005, Part 4110 B	mg/L	50	<0.1	12	0.2	0.4	0.3	0.3
Potassium dissolved	USEPA 200.7	mg/L	-	<0.1	12	0.6	1.4	0.8	1.1
Sodium dissolved	USEPA 200.7	mg/L	-	<0.1	12	2.6	5.9	3.2	4.6
Sulphate	APHA 21st Ed. 2005, Part 4110 B	mg/L	-	<0.4	12	3.4	15.2	5.0	9.8
Total Metals									
Aluminium total	USEPA 200.8	µg/L	-	<9	24	28	81	45	65
Antimony total	USEPA 200.8	µg/L	3	<3	24	<3	<3	<3	<3
Arsenic total	USEPA 200.8	µg/L	10	<1	24	<1	<1	<1	<1
Barium total	USEPA 200.8	µg/L	2000	<0.5	24	3.1	7.1	4.4	6.3
Beryllium total	USEPA 200.8	µg/L	60	<0.1	24	<0.1	<0.1	<0.1	<0.1
Boron total	USEPA 200.7	mg/L	4	<0.01	12	<0.01	0.02	<0.01	0.01
Cadmium total	USEPA 200.8	µg/L	2	<0.05	24	<0.05	0.08	<0.05	<0.05
Chromium total	USEPA 200.8	µg/L	-	<2	24	<2	<2	<2	<2
Cobalt total	USEPA 200.8	µg/L	-	<0.2	24	<0.2	<0.2	<0.2	<0.2
Copper total	USEPA 200.8	µg/L	2000	<1	48	3	42	12	28
Iron total	USEPA 200.7	mg/L	-	<0.01	48	<0.01	0.06	0.01	0.02
Lead total	USEPA 200.8	µg/L	10	<0.2	48	<0.2	1.1	0.2	0.7

Table 8. Summary data for water quality zone 3: South Canberra, Woden and Weston Creek

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th percentile
Manganese total	USEPA 200.7	mg/L	0.5	<0.001	48	0.001	0.085	0.010	0.037
Mercury total	USEPA 200.8	µg/L	1	<0.1	12	<0.1	<0.1	<0.1	<0.1
Molybdenium total	USEPA 200.8	µg/L	50	<1	24	<1	<1	<1	<1
Nickel total	USEPA 200.8	µg/L	20	<1	24	<1	1	<1	<1
Selenium total	USEPA 200.8	µg/L	10	<1	24	<1	<1	<1	<1
Silver total	USEPA 200.8	µg/L	100	<1	24	<1	<1	<1	<1
Zinc total	USEPA 200.8	µg/L	-	<5	24	<5	170	10	6
Haloacetic Acids									
Bromoacetic acid	ALS: Headspace GCMS	µg/L	-	<5	24	<5	<5	<5	<5
Bromochloroacetic acid	ALS: Headspace GCMS	µg/L	-	<1	24	<1	5	1	4
Bromodichloroacetic acid	ALS: Headspace GCMS	µg/L	-	<1	24	<1	8	3	6
Dibromoacetic acid	ALS: Headspace GCMS	µg/L	-	<1	24	<1	<1	<1	<1
Dibromochloroacetic acid	ALS: Headspace GCMS	µg/L	-	<10	24	<10	<10	<10	<10
Dichloroacetic acid	ALS: Headspace GCMS	µg/L	100	<1	24	6	54	20	44
Monochloroacetic acid	ALS: Headspace GCMS	µg/L	150	<1	24	<1	4	1	4
Tribromoacetic acid	ALS: Headspace GCMS	µg/L	-	<10	24	<10	<10	<10	<10
Trichloroacetic acid	ALS: Headspace GCMS	µg/L	100	<1	24	14	68	27	57
Sum of Haloacetic acid	ALS: Headspace GCMS	µg/L	-	<1	24	29	139	52	114
Trihalomethanes									
Bromoform	VIC-CM047	mg/L	-	<0.001	24	<0.001	<0.001	<0.001	<0.001
Chloroform	VIC-CM047	mg/L	-	<0.001	24	0.019	0.090	0.034	0.061
Dibromochloromethane	VIC-CM047	mg/L	-	<0.001	24	<0.001	<0.001	<0.001	<0.001
Dichlorobromomethane	VIC-CM047	mg/L	-	<0.001	24	0.002	0.011	0.003	0.006
Trihalomethanes total	VIC-CM047	mg/L	0.25	<0.001	24	0.021	0.100	0.037	0.066
Semi Volatile Organic Compounds (SVOC) Anilines and Benzidines									
2-Nitroaniline	US EPA 3510/8270	µg/L	-	<4	24	<4	<4	<4	<4
3-Nitroaniline	US EPA 3510/8270	µg/L	-	<4	24	<4	<4	<4	<4
3,3`-Dichlorobenzidine	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
4-Chloroaniline	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
4-Nitroaniline	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Aniline	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Carbazole	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Dibenzofuran	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Chlorinated Hydrocarbons									
1,2-Dichlorobenzene	US EPA 3510/8270	µg/L	1500	<2	24	<2	<2	<2	<2
1,2,4-Trichlorobenzene	US EPA 3510/8270	µg/L	30	<2	24	<2	<2	<2	<2
1,3-Dichlorobenzene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
1,4-Dichlorobenzene	US EPA 3510/8270	µg/L	40	<2	24	<2	<2	<2	<2
Hexachlorobenzene	US EPA 3510/8270	µg/L	-	<4	24	<4	<4	<4	<4
Hexachlorobutadiene	US EPA 3510/8270	µg/L	0.7	<2	24	<2	<2	<2	<2
Hexachlorocyclopentadiene	US EPA 3510/8270	µg/L	-	<10	24	<10	<10	<10	<10
Hexachloroethane	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Hexachloropropylene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Pentachlorobenzene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Haloethers									
4-Bromophenyl phenyl ether	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
4-Chlorophenyl phenyl ether	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2

Table 8. Summary data for water quality zone 3: South Canberra, Woden and Weston Creek

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th percentile
Bis(2-chloroethoxy) methane	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Bis(2-chloroethyl) ether	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Nitroaromatics and Ketones									
1-Naphthylamine	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
1,3,5-Trinitrobenzene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
2-Picoline	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
2,4-Dinitrotoluene	US EPA 3510/8270	µg/L	-	<4	24	<4	<4	<4	<4
2,6-Dinitrotoluene	US EPA 3510/8270	µg/L	-	<4	24	<4	<4	<4	<4
4-Aminobiphenyl	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
4-Nitroquinoline-N-oxide	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
5-Nitro-o-toluidine	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Acetophenone	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Azobenzene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Chlorobenzilate	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Dimethylaminoazobenzene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Isophorone	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Nitrobenzene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Pentachloronitrobenzene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Phenacetin	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Pronamide	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Nitrosamines									
Methapyrilene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
N-Nitrosodibutylamine	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
N-Nitrosodiethylamine	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
N-Nitrosodi-n-propylamine	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
N-Nitrosodiphenyl & Diphenylamine	US EPA 3510/8270	µg/L	-	<4	24	<4	<4	<4	<4
N-Nitrosomethylethylamine	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
N-Nitrosomorpholine	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
N-Nitrosopiperidine	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
N-Nitrosopyrrolidine	US EPA 3510/8270	µg/L	-	<4	24	<4	<4	<4	<4
Organochlorine Pesticides									
4,4′-DDD	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
4,4′-DDE	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
4,4′-DDT	US EPA 3510/8270	µg/L	9	<4	24	<4	<4	<4	<4
Aldrin	US EPA 3510/8270	µg/L	0.3	<2	24	<2	<2	<2	<2
alpha-BHC	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
alpha-Endosulfan	US EPA 3510/8270	µg/L	20	<2	24	<2	<2	<2	<2
beta-BHC	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
beta-Endosulfan	US EPA 3510/8270	µg/L	20	<2	24	<2	<2	<2	<2
delta-BHC	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Dieldrin	US EPA 3510/8270	µg/L	0.3	<2	24	<2	<2	<2	<2
Endrin	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Endosulfan sulfate	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
gamma-BHC	US EPA 3510/8270	µg/L	10	<2	24	<2	<2	<2	<2
Heptachlor	US EPA 3510/8270	µg/L	0.3	<2	24	<2	<2	<2	<2
Heptachlor epoxide	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2

Table 8. Summary data for water quality zone 3: South Canberra, Woden and Weston Creek

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th percentile
Organophosphorous Pesticides									
Chlorfenvinphos	US EPA 3510/8270	µg/L	2	<2	24	<2	<2	<2	<2
Chlorpyrifos	US EPA 3510/8270	µg/L	10	<2	24	<2	<2	<2	<2
Chlorpyrifos-methyl	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Diazinon	US EPA 3510/8270	µg/L	4	<2	24	<2	<2	<2	<2
Dichlorvos	US EPA 3510/8270	µg/L	5	<2	24	<2	<2	<2	<2
Dimethoate	US EPA 3510/8270	µg/L	7	<2	24	<2	<2	<2	<2
Ethion	US EPA 3510/8270	µg/L	4	<2	24	<2	<2	<2	<2
Fenthion	US EPA 3510/8270	µg/L	7	<2	24	<2	<2	<2	<2
Malathion	US EPA 3510/8270	µg/L	70	<2	24	<2	<2	<2	<2
Pirimiphos-ethyl	US EPA 3510/8270	µg/L	0.5	<2	24	<2	<2	<2	<2
Prothiofos	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Phenolic Compounds									
2,3,4,6-Tetrachlorophenol	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
2,4-Dichlorophenol	US EPA 3510/8270	µg/L	200	<2	24	<2	<2	<2	<2
2,4-Dimethylphenol	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
2,4,5-Trichlorophenol	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
2,4,6-Trichlorophenol	US EPA 3510/8270	µg/L	20	<2	24	<2	<2	<2	<2
2,6-Dichlorophenol	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
2-Chlorophenol	US EPA 3510/8270	µg/L	300	<2	24	<2	<2	<2	<2
2-Methylphenol	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
2-Nitrophenol	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
3- & 4-Methylphenol	US EPA 3510/8270	µg/L	-	<4	24	<4	<4	<4	<4
4-Chloro-3-Methylphenol	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Pentachlorophenol	US EPA 3510/8270	µg/L	10	<4	24	<4	<4	<4	<4
Phenol	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Phthalates									
Bis(2-ethylhexyl) phthalate	US EPA 3510/8270	µg/L	10	<10	24	<10	<10	<10	<10
Bis(2-ethylhexyl) phthalate	US EPA 8270D	µg/L	10	<10	24	<10	<10	<10	<10
Butyl benzyl phthalate	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Butyl benzyl phthalate	US EPA 8270D	µg/L	-	<2	24	<2	<2	<2	<2
Diethyl phthalate	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Diethyl phthalate	US EPA 8270D	µg/L	-	<2	24	<2	<2	<2	<2
Dimethyl phthalate	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Dimethyl phthalate	US EPA 8270D	µg/L	-	<2	24	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 8270D	µg/L	-	<2	24	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 8270D	µg/L	-	<2	24	<2	<2	<2	<2
Polycyclic Aromatic Hydrocarbons									
2-Chloronaphthalene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
2-Methylnaphthalene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
3-Methylcholanthrene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
7,12-Dimethylbenz(a)anthracene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Acenaphthene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Acenaphthene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Acenaphthylene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2

Table 8. Summary data for water quality zone 3: South Canberra, Woden and Weston Creek

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th percentile
Acenaphthylene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Anthracene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Anthracene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Benz(a)anthracene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Benz(a)anthracene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Benzo(a)pyrene	US EPA 3510/8270	µg/L	0.01	<2	24	<2	<2	<2	<2
Benzo(a)pyrene	US EPA 3510/8270	µg/L	0.01	<0.5	24	<0.5	<0.5	<0.5	<0.5
Benzo(b) fluoranthene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Benzo(k) fluoranthene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Benzo(b) & Benzo(k)fluoranthene	US EPA 3510/8270	µg/L	-	<4	24	<4	<4	<4	<4
Benzo(g,h,i)perylene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Benzo(g,h,i)perylene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Chrysene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Chrysene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Dibenz(a,h)anthracene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Dibenz(a,h)anthracene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Fluoranthene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Fluoranthene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Fluorene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Fluorene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Indeno(1,2,3-cd)pyrene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Indeno(1,2,3-cd)pyrene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
N-2-Fluorenyl Acetamide	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Phenanthrene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Phenanthrene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Pyrene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Pyrene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
PAHs (total)	US EPA 3510/8270	µg/L	-	<0.5	24	<0.5	<0.5	<0.5	<0.5

Table notes:

ADWG	(Health) Australian Drinking Water Guidelines – Health Guideline Value
CFU/mL	colony forming units per millilitre
deg. C	degrees Celsius
LOR	limit of reporting
µg/L	micrograms per litre
µS/cm	micro siemens per centimetre
mg/L	milligrams per litre
MPN/100ml	most probable number per 100 millilitres
NTU	nephelometric units
Pt-Co	platinum-cobalt units

The 95th percentile is a statistical calculation based on 'normal' distribution. In the context of this report, it estimates the value for which 95 per cent of all the water that passes through the distribution system in this 12 month period falls below.

Where the table lists two distinct data sets for the same analyte, the analyte has been measured in two different suites of screens conducted by the laboratory: semi volatile organic compounds screen and phthalates screen.

*Exceedance of health value reported to ACT Health. The E.coli detection was investigated and found to be not indicative of water quality within the reticulation. See *page 36* for further information.

Table 9. Summary data for water quality zone 4: Tuggeranong

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th percentile
Microbiological									
E.coli	AS 4276.21	MPN/100mL	<1	<1	263	<1	<1	<1	<1
Total coliforms	AS 4276.21	MPN/100mL	-	<1	263	<1	<1	<1	<1
Heterotrophic plate count	APHA 9215 B	CFU/mL	-	<1	263	<1	62	2	9
Physical									
Conductivity	APHA 2510 B	µS/cm	-	<2	24	84	182	113	169
pH	APHA 4500-H B	pH units	-	<0.01	263	6.82	8.94	7.65	8.02
Temperature	APHA 4500-H B	deg.C	-	<0.1	48	9.9	24.8	17.0	24.2
Total dissolved solids	APHA 2540 C	mg/L	-	<10	24	49	124	73	118
True colour	APHA 2120 B	Pt-Co	-	<1	48	<1	3	<1	3
Turbidity	APHA 2130 B	NTU	-	<0.1	48	0.1	0.6	0.2	0.4
Inorganic									
Alkalinity bicarb	APHA 2320 A/B	mg/L	-	<0.1	48	42.6	68.4	53.5	63.9
Alkalinity carb	APHA 2320 A/B	mg/L	-	<0.1	48	<0.1	<0.1	<0.1	<0.1
Alkalinity hydrox	APHA 2320 A/B	mg/L	-	<0.1	48	<0.1	<0.1	<0.1	<0.1
Alkalinity total	APHA 2320 A/B	mg/L	-	<1	48	42	68	53	64
Aluminium acid soluble	USEPA 200.8	µg/L	-	<5	24	15	80	40	61
Asbestos	AS4964-2000	Present/Absent	-	Absent	12	Absent	Absent	Absent	Absent
Calcium dissolved	USEPA 200.7	mg/L	-	<0.05	24	11.5	19.8	14.5	17.8
Chloride	APHA 21st Ed. 2005, Part 4110 B	mg/L	-	<0.1	12	4.8	8.7	5.8	7.3
Chlorine combined	APHA 4500 -CL G	mg/L	-	<0.03	263	<0.03	0.26	0.06	0.11
Chlorine free	APHA 4500 -CL G	mg/L	-	<0.03	263	0.09	1.40	0.77	1.15
Chlorine total	APHA 4500 -CL G	mg/L	5	<0.03	263	0.17	1.44	0.83	1.24
Cyanide	APHA 4500_CN	mg/L	0.08	<0.004	12	<0.004	0.023	<0.004	0.011
Fluoride	APHA 21st Ed. 2005, Part 4110 B	mg/L	1.5	<0.05	24	0.37	0.84	0.72	0.80
Hardness total	APHA 2340 B	mg/L	-	<1	24	34	64	42	57
Iodide	VIC-CM078	mg/L	0.5	<0.01	12	<0.01	<0.01	<0.01	<0.01
Magnesium dissolved	USEPA 200.7	mg/L	-	<0.05	24	0.94	3.54	1.45	3.27
Nitrate	APHA 21st Ed. 2005, Part 4110 B	mg/L	50	<0.1	12	0.3	0.4	0.3	0.3
Potassium dissolved	USEPA 200.7	mg/L	-	<0.1	12	0.6	2.0	0.8	1.4
Sodium dissolved	USEPA 200.7	mg/L	-	<0.1	12	2.5	7.9	3.5	5.8
Sulphate	APHA 21st Ed. 2005, Part 4110 B	mg/L	-	<0.4	12	3.2	21.2	5.6	12.6
Total Metals									
Aluminium total	USEPA 200.8	µg/L	-	<9	24	26	75	41	57
Antimony total	USEPA 200.8	µg/L	3	<3	24	<3	<3	<3	<3
Arsenic total	USEPA 200.8	µg/L	10	<1	24	<1	<1	<1	<1
Barium total	USEPA 200.8	µg/L	2000	<0.5	24	3.3	8.3	4.5	7.6
Beryllium total	USEPA 200.8	µg/L	60	<0.1	24	<0.1	<0.1	<0.1	<0.1
Boron total	USEPA 200.7	mg/L	4	<0.01	12	<0.01	0.02	<0.01	0.02
Cadmium total	USEPA 200.8	µg/L	2	<0.05	24	<0.05	0.09	<0.05	0.07
Chromium total	USEPA 200.8	µg/L	-	<2	24	<2	<2	<2	<2
Cobalt total	USEPA 200.8	µg/L	-	<0.2	24	<0.2	<0.2	<0.2	<0.2
Copper total	USEPA 200.8	µg/L	2000	<1	48	2	31	10	23
Iron total	USEPA 200.7	mg/L	-	<0.01	48	<0.01	0.03	<0.01	0.02
Lead total	USEPA 200.8	µg/L	10	<0.2	48	<0.2	1.0	<0.2	0.8

Table 9. Summary data for water quality zone 4: Tuggeranong

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th percentile
Manganese total	USEPA 200.7	mg/L	0.5	<0.001	48	<0.001	0.028	0.006	0.019
Mercury total	USEPA 200.8	µg/L	1	<0.1	12	<0.1	<0.1	<0.1	<0.1
Molybdenium total	USEPA 200.8	µg/L	50	<1	24	<1	<1	<1	<1
Nickel total	USEPA 200.8	µg/L	20	<1	24	<1	<1	<1	<1
Selenium total	USEPA 200.8	µg/L	10	<1	24	<1	<1	<1	<1
Silver total	USEPA 200.8	µg/L	100	<1	24	<1	<1	<1	<1
Zinc total	USEPA 200.8	µg/L	-	<5	24	<5	7	<5	5
Haloacetic Acids									
Bromoacetic acid	ALS: Headspace GCMS	µg/L	-	<5	24	<5	<5	<5	<5
Bromochloroacetic acid	ALS: Headspace GCMS	µg/L	-	<1	24	<1	6	1	5
Bromodichloroacetic acid	ALS: Headspace GCMS	µg/L	-	<1	24	<1	8	2	7
Dibromoacetic acid	ALS: Headspace GCMS	µg/L	-	<1	24	<1	1	<1	<1
Dibromochloroacetic acid	ALS: Headspace GCMS	µg/L	-	<10	24	<10	<10	<10	<10
Dichloroacetic acid	ALS: Headspace GCMS	µg/L	100	<1	24	8	54	19	43
Monochloroacetic acid	ALS: Headspace GCMS	µg/L	150	<1	24	<1	4	1	4
Tribromoacetic acid	ALS: Headspace GCMS	µg/L	-	<10	24	<10	<10	<10	<10
Trichloroacetic acid	ALS: Headspace GCMS	µg/L	100	<1	24	13	67	26	61
Sum of Haloacetic acid	ALS: Headspace GCMS	µg/L	-	<1	24	25	138	50	119
Trihalomethanes									
Bromoform	VIC-CM047	mg/L	-	<0.001	24	<0.001	<0.001	<0.001	<0.001
Chloroform	VIC-CM047	mg/L	-	<0.001	24	0.019	0.088	0.034	0.063
Dibromochloromethane	VIC-CM047	mg/L	-	<0.001	24	<0.001	<0.001	<0.001	<0.001
Dichlorobromomethane	VIC-CM047	mg/L	-	<0.001	24	0.001	0.011	0.003	0.007
Trihalomethanes total	VIC-CM047	mg/L	0.25	<0.001	24	0.021	0.099	0.037	0.069
Semi Volatile Organic Compounds (SVOC) Anilines and Benzidines									
2-Nitroaniline	US EPA 3510/8270	µg/L	-	<4	24	<4	<4	<4	<4
3-Nitroaniline	US EPA 3510/8270	µg/L	-	<4	24	<4	<4	<4	<4
3,3`-Dichlorobenzidine	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
4-Chloroaniline	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
4-Nitroaniline	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Aniline	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Carbazole	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Dibenzofuran	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Chlorinated Hydrocarbons									
1,2-Dichlorobenzene	US EPA 3510/8270	µg/L	1500	<2	24	<2	<2	<2	<2
1,2,4-Trichlorobenzene	US EPA 3510/8270	µg/L	30	<2	24	<2	<2	<2	<2
1,3-Dichlorobenzene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
1,4-Dichlorobenzene	US EPA 3510/8270	µg/L	40	<2	24	<2	<2	<2	<2
Hexachlorobenzene	US EPA 3510/8270	µg/L	-	<4	24	<4	<4	<4	<4
Hexachlorobutadiene	US EPA 3510/8270	µg/L	0.7	<2	24	<2	<2	<2	<2
Hexachlorocyclopentadiene	US EPA 3510/8270	µg/L	-	<10	24	<10	<10	<10	<10
Hexachloroethane	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Hexachloropropylene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Pentachlorobenzene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Haloethers									
4-Bromophenyl phenyl ether	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
4-Chlorophenyl phenyl ether	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2

Table 9. Summary data for water quality zone 4: Tuggeranong

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th percentile
Bis(2-chloroethoxy) methane	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Bis(2-chloroethyl) ether	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Nitroaromatics and Ketones									
1-Naphthylamine	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
1,3,5-Trinitrobenzene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
2-Picoline	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
2,4-Dinitrotoluene	US EPA 3510/8270	µg/L	-	<4	24	<4	<4	<4	<4
2,6-Dinitrotoluene	US EPA 3510/8270	µg/L	-	<4	24	<4	<4	<4	<4
4-Aminobiphenyl	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
4-Nitroquinoline-N-oxide	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
5-Nitro-o-toluidine	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Acetophenone	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Azobenzene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Chlorobenzilate	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Dimethylaminoazobenzene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Isophorone	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Nitrobenzene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Pentachloronitrobenzene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Phenacetin	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Pronamide	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Nitrosamines									
Methapyrilene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
N-Nitrosodibutylamine	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
N-Nitrosodiethylamine	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
N-Nitrosodi-n-propylamine	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
N-Nitrosodiphenyl & Diphenylamine	US EPA 3510/8270	µg/L	-	<4	24	<4	<4	<4	<4
N-Nitrosomethylethylamine	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
N-Nitrosomorpholine	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
N-Nitrosopiperidine	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
N-Nitrosopyrrolidine	US EPA 3510/8270	µg/L	-	<4	24	<4	<4	<4	<4
Organochlorine Pesticides									
4,4′-DDD	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
4,4′-DDE	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
4,4′-DDT	US EPA 3510/8270	µg/L	9	<4	24	<4	<4	<4	<4
Aldrin	US EPA 3510/8270	µg/L	0.3	<2	24	<2	<2	<2	<2
alpha-BHC	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
alpha-Endosulfan	US EPA 3510/8270	µg/L	20	<2	24	<2	<2	<2	<2
beta-BHC	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
beta-Endosulfan	US EPA 3510/8270	µg/L	20	<2	24	<2	<2	<2	<2
delta-BHC	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Dieldrin	US EPA 3510/8270	µg/L	0.3	<2	24	<2	<2	<2	<2
Endrin	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Endosulfan sulfate	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
gamma-BHC	US EPA 3510/8270	µg/L	10	<2	24	<2	<2	<2	<2
Heptachlor	US EPA 3510/8270	µg/L	0.3	<2	24	<2	<2	<2	<2
Heptachlor epoxide	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2

Table 9. Summary data for water quality zone 4: Tuggeranong

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th percentile
Organophosphorous Pesticides									
Chlorfenvinphos	US EPA 3510/8270	µg/L	2	<2	24	<2	<2	<2	<2
Chlorpyrifos	US EPA 3510/8270	µg/L	10	<2	24	<2	<2	<2	<2
Chlorpyrifos-methyl	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Diazinon	US EPA 3510/8270	µg/L	4	<2	24	<2	<2	<2	<2
Dichlorvos	US EPA 3510/8270	µg/L	5	<2	24	<2	<2	<2	<2
Dimethoate	US EPA 3510/8270	µg/L	7	<2	24	<2	<2	<2	<2
Ethion	US EPA 3510/8270	µg/L	4	<2	24	<2	<2	<2	<2
Fenthion	US EPA 3510/8270	µg/L	7	<2	24	<2	<2	<2	<2
Malathion	US EPA 3510/8270	µg/L	70	<2	24	<2	<2	<2	<2
Pirimiphos-ethyl	US EPA 3510/8270	µg/L	0.5	<2	24	<2	<2	<2	<2
Prothiofos	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Phenolic Compounds									
2,3,4,6-Tetrachlorophenol	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
2,4-Dichlorophenol	US EPA 3510/8270	µg/L	200	<2	24	<2	<2	<2	<2
2,4-Dimethylphenol	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
2,4,5-Trichlorophenol	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
2,4,6-Trichlorophenol	US EPA 3510/8270	µg/L	20	<2	24	<2	<2	<2	<2
2,6-Dichlorophenol	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
2-Chlorophenol	US EPA 3510/8270	µg/L	300	<2	24	<2	<2	<2	<2
2-Methylphenol	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
2-Nitrophenol	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
3- & 4-Methylphenol	US EPA 3510/8270	µg/L	-	<4	24	<4	<4	<4	<4
4-Chloro-3-Methylphenol	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Pentachlorophenol	US EPA 3510/8270	µg/L	10	<4	24	<4	<4	<4	<4
Phenol	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Phthalates									
Bis(2-ethylhexyl) phthalate	US EPA 3510/8270	µg/L	10	<10	24	<10	<10	<10	<10
Bis(2-ethylhexyl) phthalate	US EPA 8270D	µg/L	10	<10	24	<10	<10	<10	<10
Butyl benzyl phthalate	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Butyl benzyl phthalate	US EPA 8270D	µg/L	-	<2	24	<2	<2	<2	<2
Diethyl phthalate	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Diethyl phthalate	US EPA 8270D	µg/L	-	<2	24	<2	<2	<2	<2
Dimethyl phthalate	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Dimethyl phthalate	US EPA 8270D	µg/L	-	<2	24	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 8270D	µg/L	-	<2	24	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 8270D	µg/L	-	<2	24	<2	<2	<2	<2
Polycyclic Aromatic Hydrocarbons									
2-Chloronaphthalene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
2-Methylnaphthalene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
3-Methylcholanthrene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
7,12-Dimethylbenz(a)anthracene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Acenaphthene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Acenaphthene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Acenaphthylene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2

Table 9. Summary data for water quality zone 4: Tuggeranong

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th percentile
Acenaphthylene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Anthracene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Anthracene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Benz(a)anthracene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Benz(a)anthracene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Benzo(a)pyrene	US EPA 3510/8270	µg/L	0.01	<2	24	<2	<2	<2	<2
Benzo(a)pyrene	US EPA 3510/8270	µg/L	0.01	<0.5	24	<0.5	<0.5	<0.5	<0.5
Benzo(b) fluoranthene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Benzo(k) fluoranthene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Benzo(b) & Benzo(k)fluoranthene	US EPA 3510/8270	µg/L	-	<4	24	<4	<4	<4	<4
Benzo(g,h,i)perylene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Benzo(g,h,i)perylene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Chrysene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Chrysene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Dibenz(a,h)anthracene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Dibenz(a,h)anthracene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Fluoranthene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Fluoranthene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Fluorene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Fluorene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Indeno(1,2,3-cd)pyrene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Indeno(1,2,3-cd)pyrene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
N-2-Fluorenyl Acetamide	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Phenanthrene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Phenanthrene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Pyrene	US EPA 3510/8270	µg/L	-	<2	24	<2	<2	<2	<2
Pyrene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
PAHs (total)	US EPA 3510/8270	µg/L	-	<0.5	24	<0.5	<0.5	<0.5	<0.5

Table notes:

ADWG	(Health) Australian Drinking Water Guidelines – Health Guideline Value
CFU/mL	colony forming units per millilitre
deg. C	degrees Celsius
LOR	limit of reporting
µg/L	micrograms per litre
µS/cm	micro siemens per centimetre
mg/L	milligrams per litre
MPN/100ml	most probable number per 100 millilitres
NTU	nephelometric units
Pt-Co	platinum-cobalt units

The 95th percentile is a statistical calculation based on 'normal' distribution. In the context of this report, it estimates the value for which 95 per cent of all the water that passes through the distribution system in this 12 month period falls below.

Where the table lists two distinct data sets for the same analyte, the analyte has been measured in two different suites of screens conducted by the laboratory: semi volatile organic compounds screen and phthalates screen.

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ABBREVIATIONS

ACT	Australian Capital Territory
ACT Heath	ACT Health Directorate
ADWG	*Australian Drinking Water Guidelines (2011)*
ADWG (Health)	*Australian Drinking Water Guidelines – health guideline value*
AS/NZS	Australian Standards/New Zealand Standards
CFU	colony forming units
cm	centimetre
cm^2	centimetre squared
deg. C	degrees Celsius
E. coli	*Escherichia coli*
GL	gigalitre
GMP	good manufacturing process
HACCP	hazard analysis and critical control point
HBTs	health based targets
ICRC	Independent Competition and Regulatory Commission
ISO	International Standards Organisation
km	kilometre
L	litre
LOR	limit of reporting
mg	milligram
mJ	megajoule
ML	megalitre
mL	millilitre
mm	millimetre
mm^3	millimetres cubed
MPN	most probable number
µg	micrograms
µS	microsiemens
NATA	National Association of Testing Authorities
NHMRC	National Health and Medical Research Council
NSW	New South Wales
NTU	nephelometric turbidity units
Pt-Co	platinum-cobalt units
SVOC	semi volatile organic compound
The Code	Public Health (Drinking Water) Code of Practice (2007)
The Strategy	Source Water Protection Strategy
THM	trihalomethanes
UV	ultraviolet light
WSAA	Water Services Association of Australia
WTP	water treatment plant

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