2022–23

DRINKING WATER QUALITY REPORT

icon WATER

Three Rivers by Lynnice Church

Acknowledgement of Country

Icon Water acknowledges the Ngunnawal people as traditional custodians of the ACT and recognise any other people or families with connection to the lands of the ACT and region. We acknowledge and respect their continuing culture and the contribution they make to the life of this city and this region.

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SUMMARY

EXECUTIVE SUMMARY

At Icon Water our mission is 'to sustain and enhance quality of life'. A big part of this is the way we support and protect the community and the environment by providing safe, clean drinking water.

To do this, we apply a rigorous management framework that includes the catchments, our storage reservoirs, water treatment plants, service reservoirs and the reticulation system all the way to customers' properties. This includes a monitoring program that assesses water quality across the entire potable (drinking quality) water production sequence. Through this framework, we ensure safe and clean water is delivered to Canberra, as well as the Queanbeyan-Palerang Regional Council.

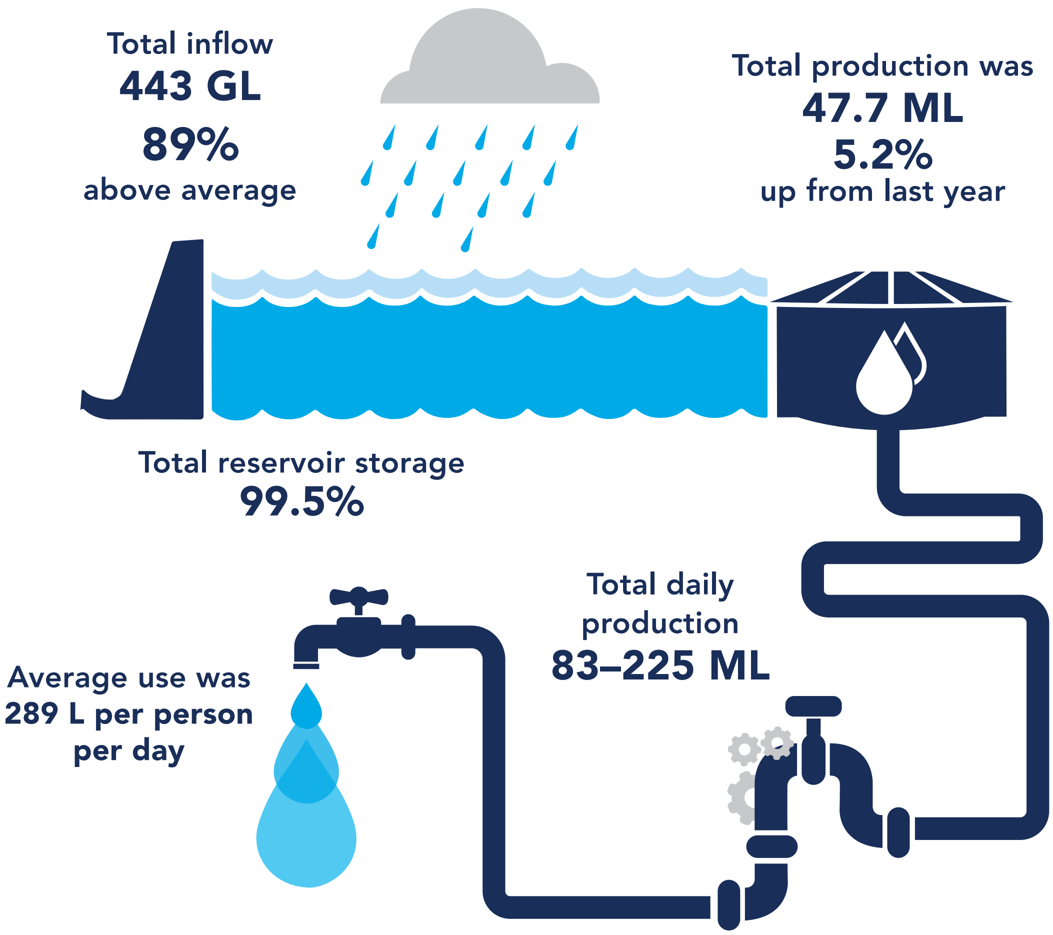
At the end of June 2023, Canberra's four water storage reservoirs held 99.5 per cent of their total accessible capacity.

High rainfall coupled with high storage from last year kept our water storage reservoirs above 98 per cent capacity throughout the year.

Throughout 2022–23 we produced between 83 and 225 megalitres (ML) per day of drinking water for our ACT and Queanbeyan-Palerang customers, to a total of 47.7 GL throughout the year. This is 5.2 per cent more than the previous year.

Over the last twelve months we have maintained our external certification of the quality management systems we use to assure the production of high-quality water.

Figure 1. Summary of total storage, production and consumption



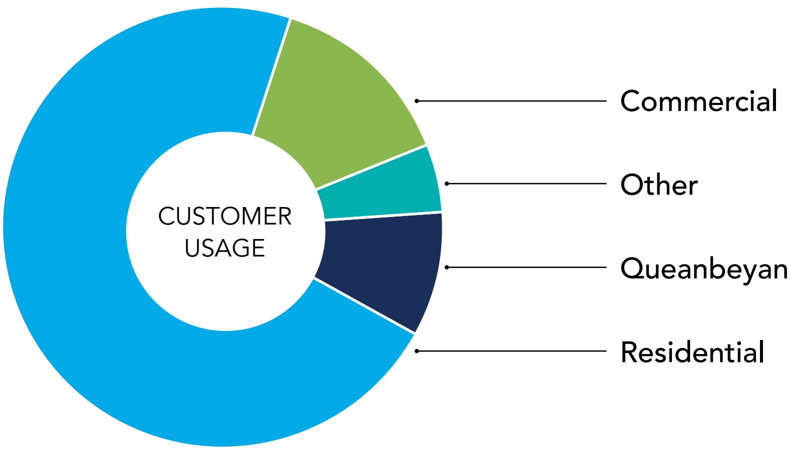
OUR CUSTOMERS

In 2022–23 we supplied potable water to 200,267 residential and commercial customer connections, and other site types within the ACT.

A connection to a household is counted as one customer, even if the household has more than one water user. Other site types include public and non-commercial premises such as schools and community facilities. We also supplied bulk water to Queanbeyan-Palerang Regional Council (QPRC), which was distributed to the city of Queanbeyan, including the Googong Township.

In 2022–23 we supplied 47.7 GL of drinking water to Canberra and Queanbeyan. This was 5.2 per cent higher than 2021–22, but three per cent lower than 2020–21. Data from the 2021 Census lists Canberra's population at 454,499 and Queanbeyan and Googong at 48,254, representing an annual population growth of 0.4 per cent. This growth meant more customer connections to the water supply network.

Figure 2. The proportion of drinking water utilised by customer type



OUR SUPPLY SYSTEM

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

Our dams (storage reservoirs) impound water from the Cotter and Queanbeyan rivers, and we can additionally abstract from two locations on the Murrumbidgee River. This ability to abstract from three diverse catchments containing different rivers and tributaries strengthens Canberra's water security in times of drought or if major events like bushfires compromise the source water quality in one catchment. Refer to page 14 for more information about our source water supply.

During 2022–23, the three Cotter River storage reservoirs (Corin, Bendora and Cotter) provided 90 per cent of the water we supplied to customers, of which the majority came from Bendora reservoir. Googong reservoir made up the balance of supply. No water was transferred from the Murrumbidgee River into the Googong reservoir during 2022–23.

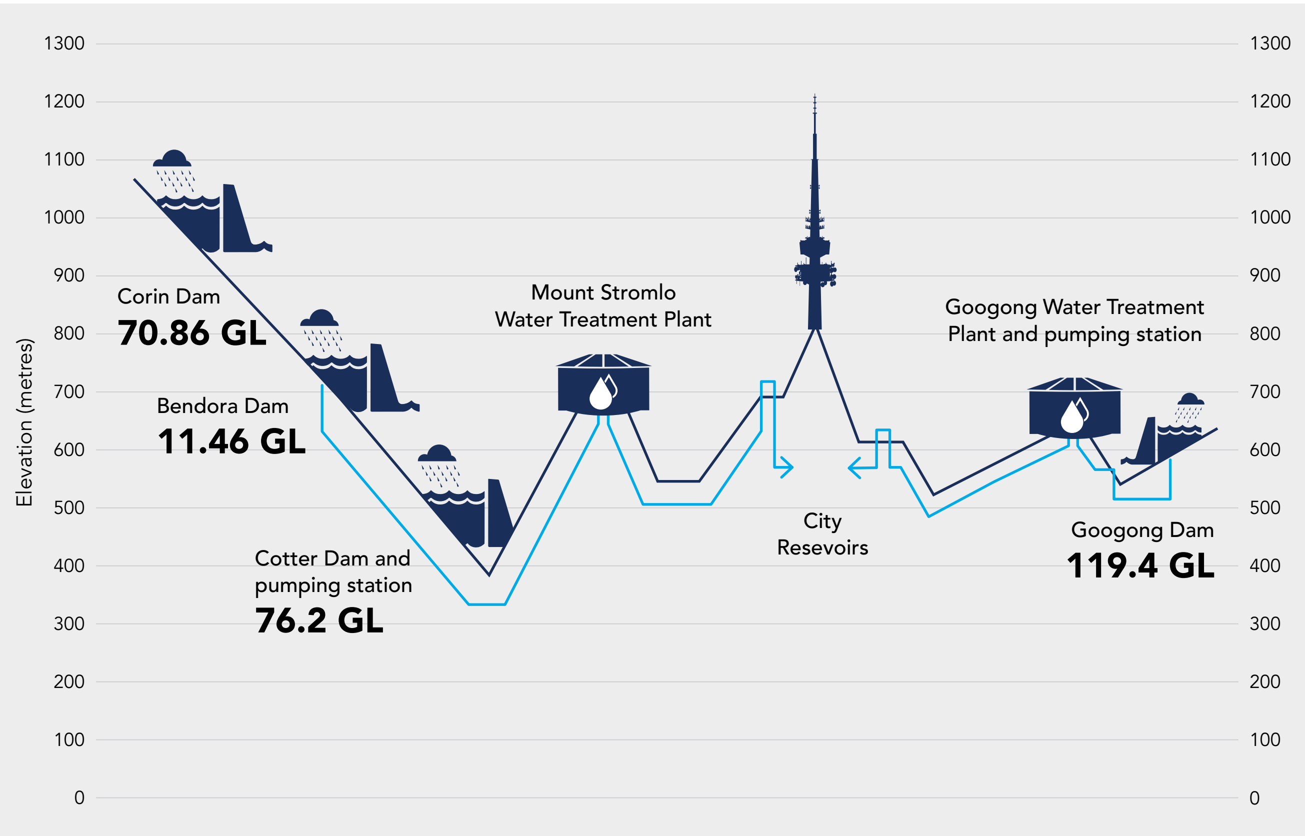
After abstraction, we treat the water to a standard that meets local and Australian health guidelines.

We can treat water at either of our two water treatment plants at Googong and Mount Stromlo. During 2022–23 we produced a total of 47.7 GL of treated drinking water – 43.1 GL from Stromlo and 4.7 GL from Googong WTP. Refer to page 23 for more information about our water treatment plants.

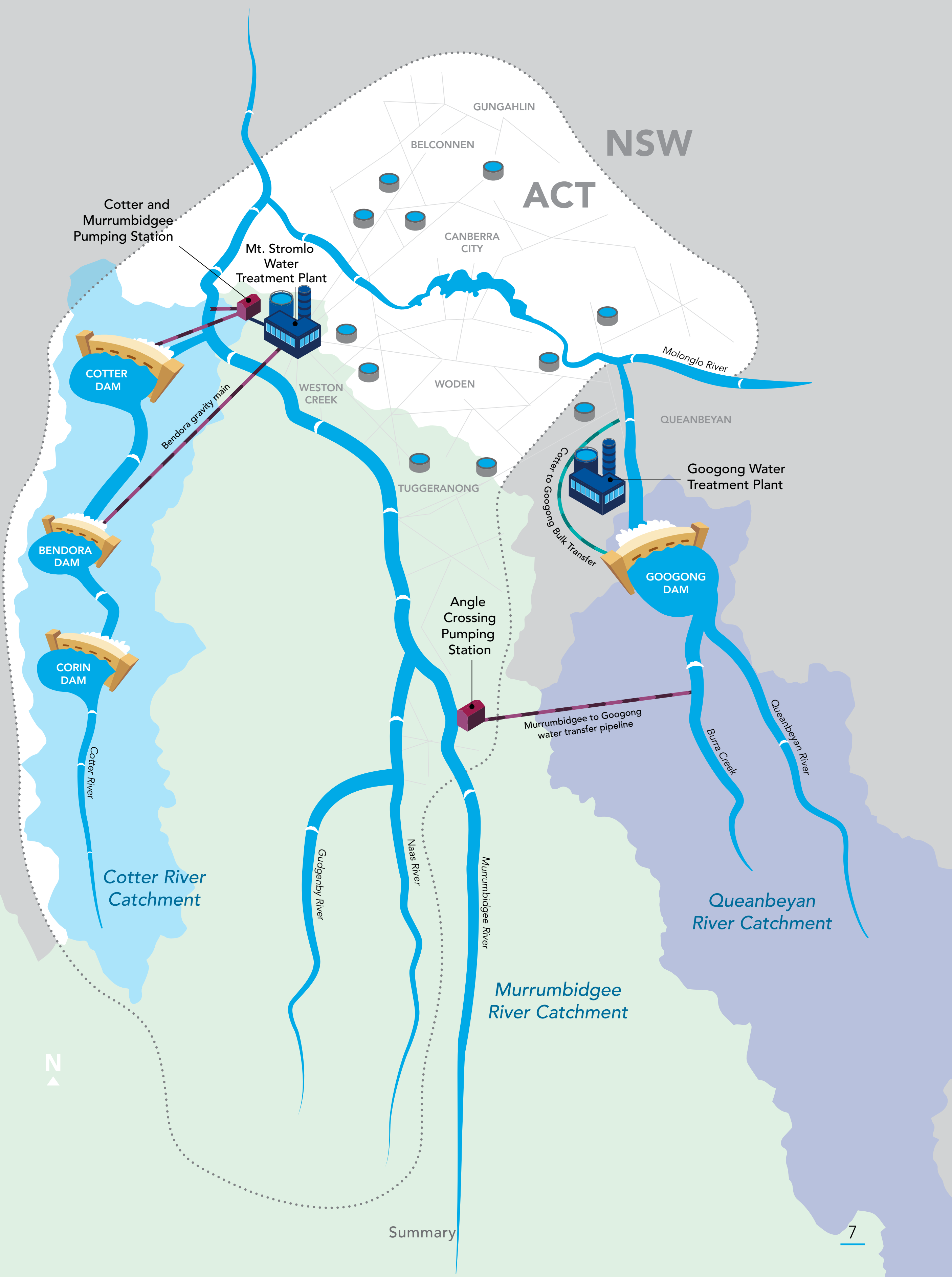
After treatment, the drinking water is fed into 50 service reservoirs (tanks) across the region, then into water mains (pipes) which connect to local service lines and finally, to customers' properties. In 2022–23 the average water used was 289L per person per day. Refer to page 29 for more information about how water gets to customers.

At each of these points we apply a rigorous management framework underpinned by an extensive water quality monitoring program using a combination of online monitoring and sampling undertaken by an external NATA-accredited laboratory. Information about the status of water quality at each point of the supply system comprises the foundation of this publication.

Figure 3. Total storage level capacity (volume) of each reservoir



OUR NETWORK



GUNGAHLIN
BELCONNEN
NSW
ACT
CANBERRA CITY
Cotter and Murrumbidgee Pumping Station
Mt. Stromlo Water Treatment Plant
COTTER DAM
WESTON CREEK
WODEN
Molonglo River
QUEANBEYAN
Bendora gravity main
TUGGERANONG
Cotter to Googong Bulk Transfer
Googong Water Treatment Plant
BENDORA DAM
GOOGONG DAM
Angle Crossing Pumping Station
CORIN DAM
Murrumbidgee to Googong water transfer pipeline
Burra Creek
Queanbeyan River
Cotter River
Gudgenby River
Naas River
Murrumbidgee River
Cotter River Catchment
Queanbeyan River Catchment
Murrumbidgee River Catchment
N

HOW WE MANAGE YOUR WATER SUPPLY

STANDARDS WE APPLY TO CANBERRA'S DRINKING WATER

Licences

Icon Water holds the following licences which allow us to operate our drinking water distribution and supply service:

- 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 apply quality standards in accordance with the requirements of the *Public Health (Drinking Water) Code of Practice (2007)* (the Code), regulated by ACT Health. Copies of the Code are available from the *ACT Legislation Register*. 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 2011* (ADWG). The guidelines provide a basis for determining the minimum quality requirements of water in all parts of Australia and are regularly revised to ensure they represent the latest scientific evidence. The most recent update in September 2022.

We apply an Integrated Management System to meet quality, environmental, regulatory and workplace health and safety requirements. We maintain annual certification and comply 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 2020/13A.

THE ADWG MANAGEMENT FRAMEWORK

The ADWG, published by the NHMRC, determine the minimum health and aesthetic quality requirements of water supplied to consumers across Australia.

In addition, the ADWG provide a framework to help utilities design a structured and systematic approach to preventative risk management of drinking water quality. The guidelines inform the holistic management of water supply systems including policy, education, customer engagement, system operation, continuous improvement, verification and assurance activities. In all, the guidelines establish management under 12 elements, 32 components and 76 actions.

Icon Water's drinking water monitoring program operates via an external NATA (National Association of Testing Authorities)-accredited laboratory that measures the physical, chemical and microbiological parameters of the water we supply to our customers. The results of the program inform how we 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:

- a health guideline value, defined as the concentration or measure of a water quality characteristic that, based on present scientific 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, such as appearance, taste and odour.

Providing safe drinking water to customers is our priority.

We achieve this by applying a multiple-barrier approach through a framework that integrates the principles of the ADWG and the internationally-recognised HACCP (Hazard Analysis and Critical Control Point) methodology. Both systems use a preventative risk management approach to ensure the risks to water quality are effectively controlled across the whole supply system.

Our barrier approach starts by applying controls in the source water catchments and continues through each step of the plant treatment process, all the way to the point at which water flows through to a customer's connection. Our barrier control measures include activities that can protect water quality directly (e.g. physical barriers to a water asset) and indirectly (e.g. promotion of safe activities around a water catchment).

A control may remove a hazard from the supply (e.g. removing particles during water treatment), or include measures that monitor and facilitate early intervention (e.g. sampling and analysis). We don't rely on any single tool or measure to protect public health, and we continuously assess the performance of protection barriers for non-conformance and areas of improvement.

Our barrier measures are designed to eliminate or minimise real or potential risks to drinking water. To implement this, we set higher targets for product quality than required to meet the ADWG standards (refer to page 9 for more information about the standards that apply to Canberra's drinking water).

Our multiple-barrier approach includes:

- a source water protection program
- selective abstraction of source water for treatment
- multiple water treatment processes monitored by real-time online analysers, verified with on and offsite testing
- an enclosed distribution system with strictly limited access for maintenance and inspection
- maintaining residual disinfectant to provide lasting protection in the network
- a routine 'catchment-to-customer' verification sampling program conducted by an independent NATA-accredited laboratory (refer to page 42 to see the results of laboratory analysis).

Figure 4. Drinking water supply barriers

Multiple barrier approach

Source water protection

Environment and recreation management in our drinking water catchments to reduce contamination risks

Detention and settling

Storage reservoirs allow larger natural particles to settle

Selective abstraction

Selection of the best quality water from storage reservoirs

Coagulation, flocculation, clarification and dissolve air flotation

Chemical and physical treatment to aid removal of fine solids (turbidity)

Filtration

Physical removal of soilds and any potential microorganisms

Disinfection

Treatment with chlorine and UV light* to inactivate any remaining bacteria and viruses

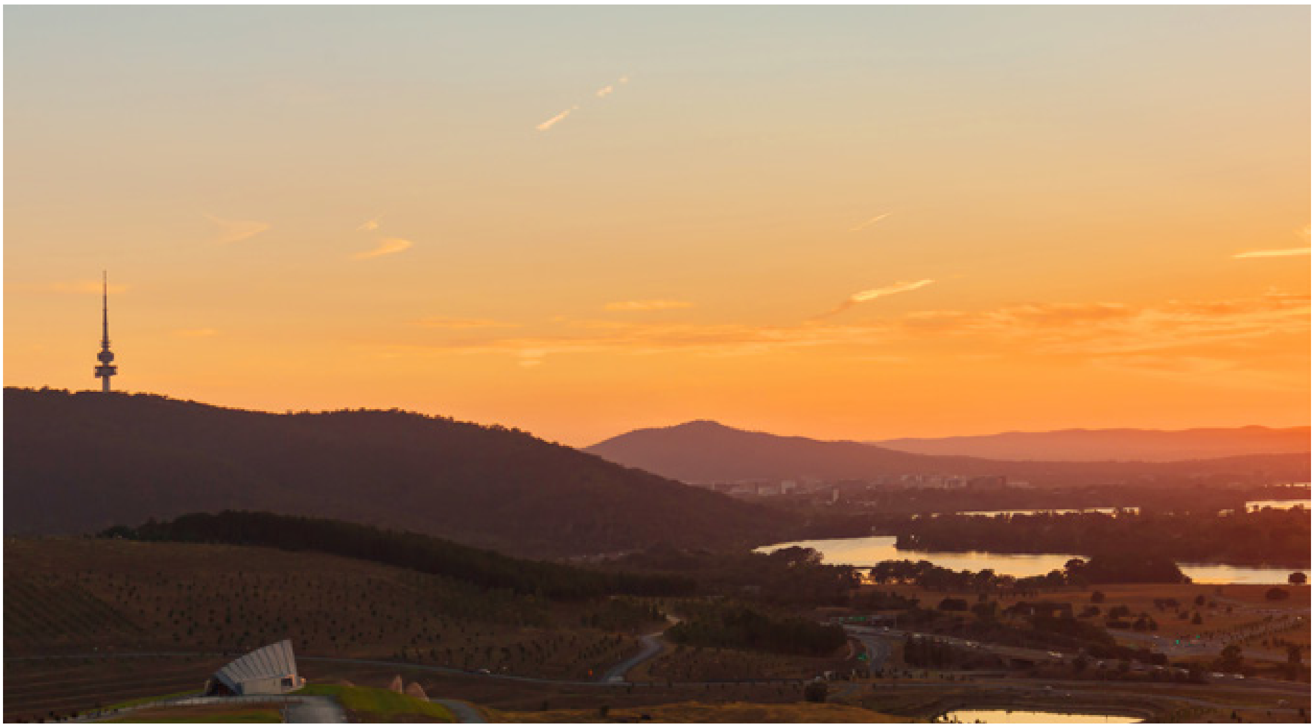
Disinfection residual

Maintain chlorine residual across the distribution network to provide lasting microbiological protection

Securing

A closed and secure system to prevent against potential recontamination

*UV light treatment at Mount Stromlo WTP only



HOW WE CERTIFY AND AUDIT THE MANAGEMENT OF WATER PRODUCTION

The HACCP system was designed to address risks to food production, and has been widely adapted by the water industry to suit potable water supply processes.

Certification of our HACCP program is conducted via external auditors. These audit processes strengthen our continuous evaluation and improvement responses across all the barriers in our supply system. In 2022–23 we maintained third-party certification of our HACCP-based risk management system.

In addition to our HACCP certification each year we conduct an internal audit focusing on one aspect of the management system. In 2022–23 the audit turned its attention to the assurance of barrier controls which protect the integrity of the treated water supply in our distribution system.

WHERE YOUR WATER COMES FROM

SOURCE WATER SUPPLY

The catchments feeding our storage reservoirs

In the Canberra region our source water catchments can store a total of 277.8 GL of available water. The Cotter River holds three storage reservoirs (dams) – Corin (70.8 GL), Bendora (11.4 GL) and Cotter (76.2 GL). Fed by the Queanbeyan River and tributaries we also hold storage in the Googong reservoir of 119.4 GL. The final accessible catchment is the Murrumbidgee River, where we have no storage but can abstract directly from the flowing river.

Most of the Cotter River catchment lies within the Namadgi National Park. This largely protects Corin and Bendora reservoirs from human-generated pollutants (for example faecal matter and pesticides) usually associated with agricultural, residential and recreational activities. The Lower Cotter Catchment, the watershed of the Cotter reservoir, is undergoing large-scale restoration following a history of commercial forestry and severe land degradation.

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 regulate approved 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 per cent of Canberra's storage capacity.

The Murrumbidgee River has no storage reservoir for our supply, but water can be abstracted from two points along the river. Water can be directly abstracted from the Murrumbidgee River to Stromlo Water Treatment Plant at the Cotter Pump Station, or transferred from the Murrumbidgee River at Angle Crossing for storage in the Googong reservoir.

The Murrumbidgee River catchment contains a wide variety of agricultural land uses, as well as the towns of Cooma, Numeralla, Bredbo and the Canberra district of Tuggeranong. No water was transferred from the Murrumbidgee River into the Googong reservoir during 2022–23, and no water from the Murrumbidgee River was treated at Stromlo WTP in 2022–23.

The Orroral Valley bushfire in early 2020 caused significant damage to the Corin sub-catchment. Despite improvements in overall water quality since then, the sub-catchment is still recovering, and we expect that water quality in the storage reservoirs may continue to fluctuate. Significant rainfall after the bushfires has also affected roads that were already damaged by the fires. This meant heavy machinery could not access the catchment for road repairs, resulting in degraded road conditions. In early 2023, subsequent rain caused washouts, landslips, and erosion, making all access roads to the upper Cotter inaccessible for several months. The steep slopes within severely impacted areas have remained relatively stable post-fire and have continued to develop good ground coverage of vegetation regrowth, helping to stabilise the soils and mitigate erosion.

Corin Dam

The Cotter Dam

Googong Dam

Bendora Dam

CATCHMENT PROTECTION ACTIVITIES

Icon Water operates a Source Water Protection Strategy which supports the regulatory protections of drinking water supply catchments from development and land-use pressures. The strategy uses a three-tiered approach to:

- maintain an awareness of the condition of the catchments by collating data, information, and analysis
- identify and assess catchment risks to inform our multiple barrier approach for safe drinking water
- build partnerships with stakeholders and land managers so any activities with potential to affect water quality are planned for and managed.

In 2022–23 we collaborated with land management agencies and regional catchment groups to address possible contamination risks within the catchments.

Our goal was to safeguard the quality of our source water, and we achieved this through the following activities. We engaged with the community and partnered with industry stakeholders. We monitored reservoirs and catchments and utilised the media to promote source water protection principles. We assisted catchment land managers with on-site projects and monitoring of ecological conditions

Policy and legal protections

Icon Water does not have the authority to govern land in the water supply catchments, so our primary focus is collaborating with the NSW and ACT regulators and policymakers. Throughout 2022–23, we maintained communication with these regulators regarding potential threats to water quality and the necessary measures to control proposed developments and commercial applications in the supply catchments. Additionally, we participated in inter-agency and inter-jurisdictional catchment groups such as the ACT and Region Catchment Management Group and the Upper Murrumbidgee Catchment Network.

On-ground works and monitoring

To ensure the quality of source water we carried out on-ground monitoring in the catchments, and then collaborated with other organisations to control local hazards and risks effectively. For example, the ACT Government is undertaking catchment remediation projects funded by the Commonwealth to address the impacts of fire and flood-induced erosion and sedimentation.

Specifically, erosion control programs are being implemented in the Lower Cotter Catchment, focusing on reducing slope length and extensive revegetation on the upper slopes of the Pierces Creek catchment.

We provided an ongoing financial co-contribution (together with the ACT Government) for the Waterwatch program, which funds the Cooma Waterwatch role to assist with keeping track of the Murrumbidgee and Googong catchment conditions, and achieves goals outlined in the Actions for Clean Water reports.

Erosion control protection of a gully.

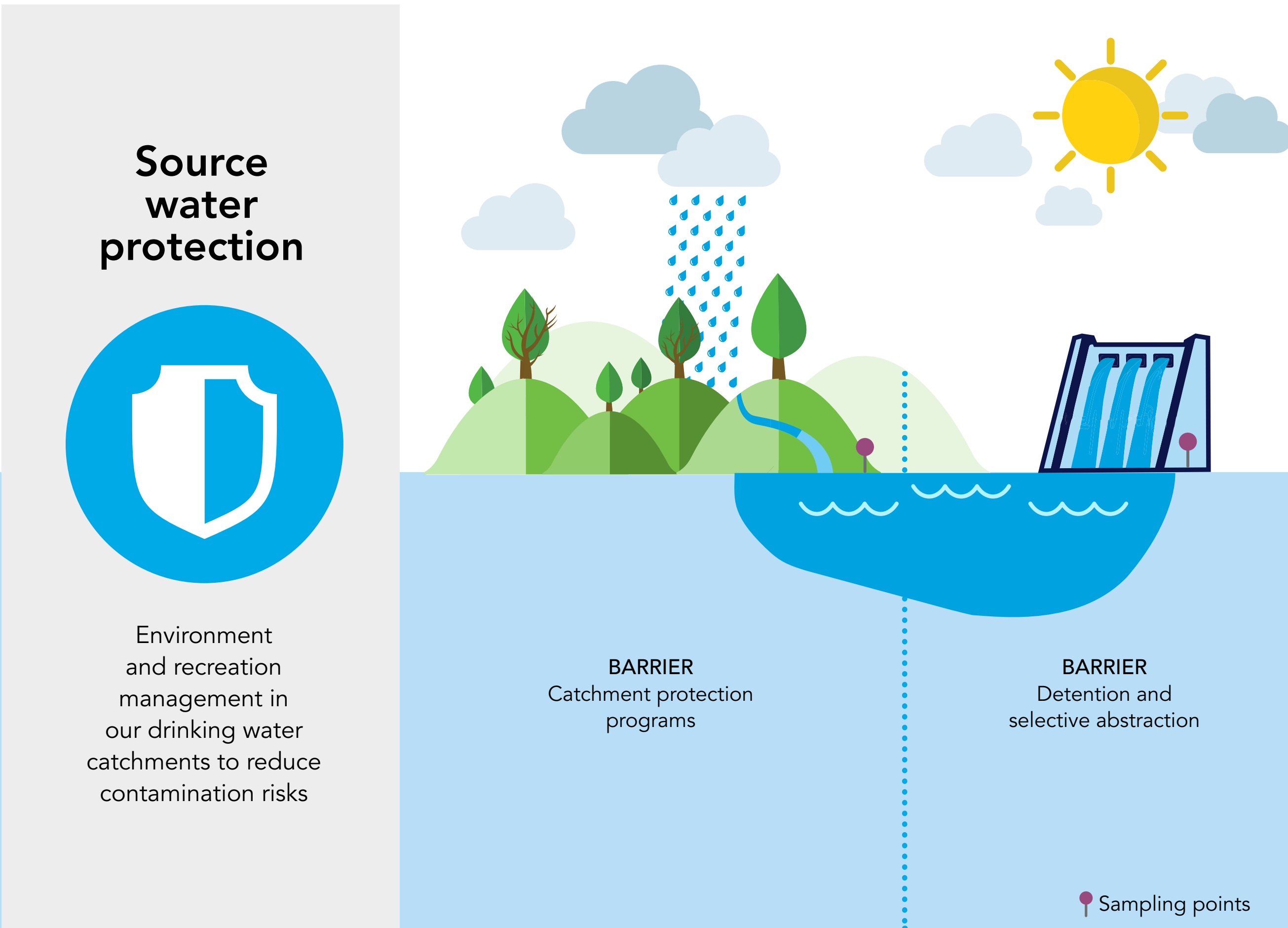
SOURCE WATER BARRIERS

Our multiple-barrier approach to managing water quality starts with control measures to protect the quality of our source water.

This includes activities to protect our water supply catchments from microbial pathogens, chemical contaminants and excess nutrients, as well as passive and active controls within the storage reservoir and dam structure. The controls include:

- a long detention time in storage reservoirs which allows particles to settle and some natural microbiological disinfection to occur
- sampling upstream of our abstraction sites to anticipate potential impacts at the treatment plants
- online monitoring of source water
- avoiding transferring poor quality source water between catchments and source water storage reservoirs
- selectively abstracting water from the appropriate depth at our dam intake towers to deliver the best available quality to our water treatment plants
- deploying booms and erosion controls in response to major events (such as bushfire or emergency incidents)
- stratification control in the reservoirs.

Figure 5. Our source water protection barriers



Detention and selective abstraction control

Water storage reservoirs are a fundamental part of the quality and security of our drinking water supply system. They store water for use 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 concentrations of sediment and organic material into the reservoir.

We monitor the quality of the water in our catchments via online analysers at our source water sites, and we maintain a routine verification program via a NATA-accredited laboratory, which conducts sampling at the pump stations and dam intake towers where we abstract water to send to our water treatment plants. This sampling also extends to upstream sites so we can respond quickly to source water quality changes and optimise our treatment processes (see 'Source water monitoring' on page 19 for more detail).

When we abstract from the Murrumbidgee River, we can transfer the water directly to Stromlo WTP for treatment, or to Googong reservoir to provide long-term water security. Alternately, when we abstract water from our dam intake towers, we can vary the depth we draw from, which means we always send the best available water to Googong or Stromlo WTPs.

Stratification control measures

Thermal stratification occurs because of seasonal weather conditions and is where a water column is divided into distinct layers due to changes in temperature, oxygen and density. When these layers develop within a water body, they each form their own individual water quality zones with different properties that have implications for control of water treatment barriers. We operate mechanical mixers in the Cotter and Googong reservoirs to keep water circulating and reduce thermal stratification.

By actively managing stratification and minimising the formation of these layers, we can increase the amount of oxygen within a reservoir, and thus reduce dissolved metal and nutrient concentrations in the abstraction zone. Mixing also promotes environments less favourable for cyanobacteria (blue-green algae) growth. This makes more water available for selective abstraction for effective and efficient treatment.

Figure 6. Selective abstraction

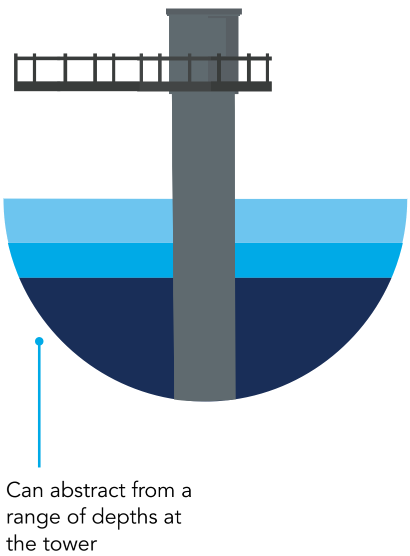
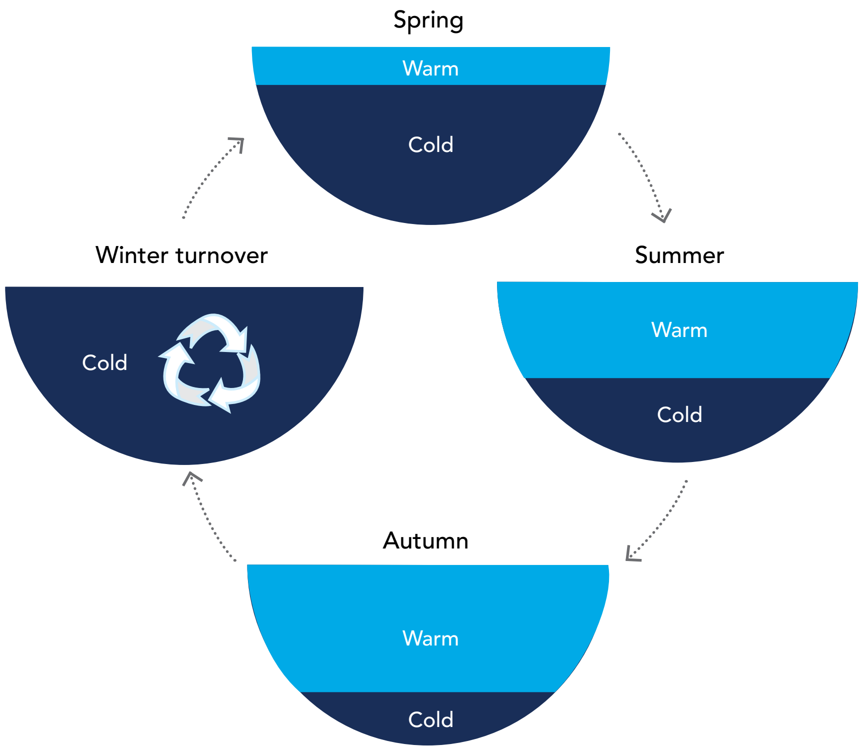


Figure 7. Water stratification process



SOURCE WATER MONITORING

Overview of source water conditions in 2022–23

We continued to be challenged by water quality of Googong reservoir; the 2020 rapid filling of the dam meant large amounts of dissolved metals and natural organic matter in stormwater runoff from the landscape entered the dam.

The impacted water quality has meant challenges for treatment and network operations to maintain enough residual protective chlorine disinfection in the network. As a result, some customers temporarily received safe, but higher-than-usual chlorine residuals at their connection point in 2022. This was necessary so those located at the furthest ends of our network still received a minimum level of protection.

For several weeks in the winter of 2022, a taste and odour problem was reported by some customers. Following investigation, we discovered that 2-Methylisoborneol (MIB), which are naturally occurring compounds produced by algae in our source waters, were the cause of the problem arising in Bendora reservoir. MIB is a taste and odour compound that some customers identified as an 'earthy' taste in their water. There are no health concerns associated with MIB, and the issue subsided in spring.

We see MIB more commonly in the Googong reservoir, and they typically occur during the warmer months or when there are disturbances within the catchment or reservoir. We have continued to monitor for MIB in the Cotter Catchment, with no detections above the ADWG's aesthetic guideline since August 2022.

Table 1. Parameters routinely monitored in raw water sources

Microbiological	▪ *Cryptosporidium* and *Giardia* ▪ *Escherichia coli (E. coli)* ▪ Total coliforms	▪ Enterococci ▪ Phytoplankton (e.g. Algae cyanobacteria (blue-green algae) and associated pigments (chlorophyll-*aa*)
Physical	▪ Turbidity ▪ Conductivity ▪ Dissolved oxygen ▪ pH	▪ Temperature ▪ UV absorbance ▪ True colour
Chemical	▪ Alkalinity ▪ Nutrients (e.g. nitrogen and phosphorous) ▪ Synthetic organic compounds (including herbicides, pesticides, fungicides, insecticides and industrial chemicals such as PFAS)	▪ Total and dissolved metals e.g. Iron and manganese ▪ Total and dissolved organic carbon ▪ Taste and odour compounds associated with cyanobacteria (Geosmin and MIB)
Radiological	▪ Radionuclides	

We undertake extensive sampling and analysis to monitor water quality in the source water storage reservoirs and the Murrumbidgee River. Our program is adaptively managed to ensure it adequately assesses the quality of source water and identifies emerging issues that could impact the effectiveness of treatment and the safety or aesthetic quality of the drinking water supply, including those identified through catchment sanitary surveys.

The NHMRC specify criteria in the ADWG for a wide range of measurable water quality characteristics that can be found in water and may affect its safety or aesthetic quality. They fall into several categories; within these categories the key parameters we routinely monitor in the raw water sources are detailed in Table 1.

The following summaries help our customers understand more about the key source water quality components that we monitor to maintain and assess the performance of our source water barriers.

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'.

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. Our storage reservoirs (predominantly Googong) occasionally experience blue-green algae blooms.

The blooms experienced in our catchments are typically of the *Dolichospermum* and *Microcystis* genera, which can at times produce toxins harmful to humans and animals. Blooms can also produce natural compounds, that while harmless, can affect the aesthetic quality of drinking water by imparting earthy, musty tastes and odours. These compounds are called Geosmin and MIB and some people can detect these compounds at very low concentrations, as low as less than 10 parts-per-trillion (10 ng/L). There is no evidence that cyanobacteria were linked to the MIB levels experienced in Bendora during the winter of 2022.

We carry out regular monitoring of cyanobacteria, generally most often in warmer months when blooms are more likely. Our cyanobacteria response plan, once activated, can direct an increase in monitoring within the reservoir and at the associated WTP, and additional operational actions including further treatment to protect the drinking water from harmful cyanobacteria and cyanotoxins, and to reduce aesthetic impacts. Under the *Public Health (Drinking Water) Code of Practice (2007)*, ACT Health is consulted if elevated levels of cyanobacteria are detected (details of the notifications provided to ACT Health are provided on page 37 of this report).

Concentrations of cyanobacteria in all our catchments, including Googong reservoir, were higher in 2022–23 compared to the previous year. This was due to a warmer summer compared to the previous La Niña year, which provided favourable conditions for algal growth. In 2022–23, the cyanobacteria detections in the Queanbeyan catchment (within Googong reservoir) were related to one algal bloom in summer that persisted throughout autumn and winter. There were no notifiable cyanobacteria detections within the Cotter or Murrumbidgee catchments.

Microorganisms

Cryptosporidium and *Giardia* are microorganisms (parasitic protozoan) that can cause gastroenteritis. There is a background level of infection of *Cryptosporidium* and *Giardia* in the general community, and the organisms are usually spread through contact with pets, farm animals or people who are already infected. Infected people show either no symptoms or may experience diarrhoea, vomiting and fever. Healthy people usually recover fully.

If found in the source water supply these organisms indicate faecal contamination of the waterway (from either human or animal sources). Beyond testing for presence or absence of these organisms, more investigatory testing methods, used to confirm if the sample contained species which are human infectious, are complex and are utilised when required. We undertake routine monitoring for *Cryptosporidium* and *Giardia* in the storage reservoirs and the Murrumbidgee River, as well as at our WTPs. We also sample for other faecal indictors like Enterococci and *E. coli* (which can have both environmental and human/animal source pathways).

Monitoring for microorganisms in the source water is important to the design and operation of our treatment plant barrier performance and to emphasise catchment protection mechanisms.

Due to the lower levels of catchment protection and brief detention time, the Murrumbidgee River typically contains more *Cryptosporidium* and *Giardia* than our storage reservoirs. The risk increases across all catchments during rainfall events with additional runoff carrying faecal contaminants into the waterways. Therefore, in addition to routine testing, additional monitoring may be conducted if abstracting after high flow events or abstracting from the Murrumbidgee River.

During 2022–23, monitoring confirmed one detection of a protozoan organism in Googong reservoir and two in Bendora reservoir. In addition, protozoan detections occurred once in the raw water entering Googong WTP. There were no detections for these microorganisms in the treated water leaving either treatment plant, and treatment barriers were confirmed to be operating as intended (see ACT Health notifications on page 37 for more detail).

Synthetic compound monitoring

Synthetic compounds include items such as pesticides, herbicides, fungicides, insecticides and industrial chemicals such as Per- and Polyfluoroalkyl substances (PFAS). We conduct specific monitoring in all drinking water catchment sources for these groups of parameters using a risk-based approach. We also maintain relationships with land managers and the community in proximity to the drinking water supply to protect the source water from these types of contaminants. During 2022–23, there were no detections of synthetic compounds above ADWG health values in any of the four storage reservoirs or the Murrumbidgee River.

HOW YOUR WATER IS TREATED

WATER TREATMENT PLANTS

Icon Water operates two water treatment plants (WTPs), one located on Mount Stromlo (ACT) and the second adjacent to Googong Dam (NSW).

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

The Stromlo WTP has operated since 1967 and can treat water from the Cotter catchment and the Murrumbidgee River. Googong WTP has been augmented to increase capacity to 270 ML of water per day and improve treatment capability. 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 and economical.

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). Stromlo WTP was rebuilt in 2004 and has been augmented to improve treatment capability. The two water treatment plants can be operated independently or in conjunction with each other to meet the community's water supply demand.

Our Googong WTP operated between September and November 2022, producing 4,652 ML (10 per cent of annual total production), with Stromlo WTP operating for the remainder of the period, producing 43,050 ML (90 per cent of total annual production, see Figure 8).

The two plants did not run concurrently over the year. The amount we produce varies to meet customer demand throughout the year and seasons. Production over the period ranged between 83 ML and 225 ML per day, an increase of nine per cent of the summer peak water demand of the previous year.

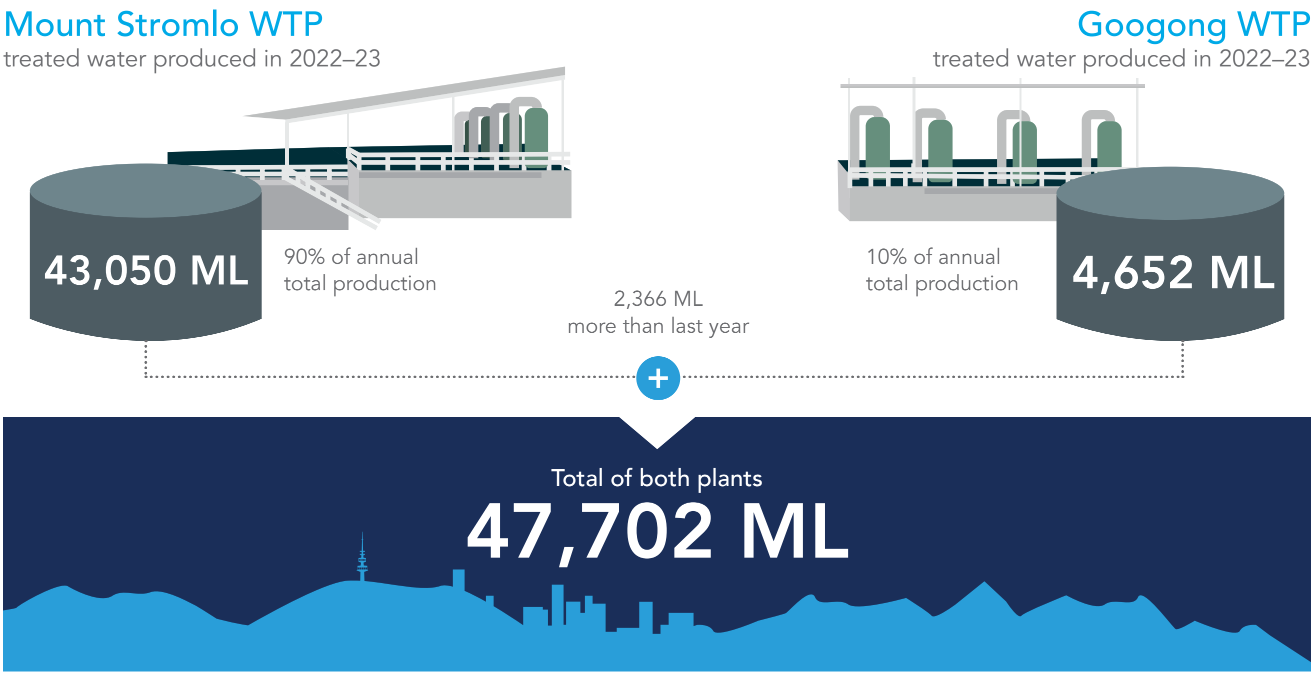
Summary of our treatment process

Due to their age and the difference in the quality of source water they treat, the plants operate slightly differently, including the treatment barriers in place.

Stromlo WTP can operate in two process modes – direct filtration or dissolved air flotation and filtration. Dissolved air flotation is an optional treatment step that gives us extra capabilities when raw water is of poorer quality. For disinfection, Stromlo WTP has both Chlorination and UV which deactivates microbiological organisms remaining after filtration. Figure 9 shows the treatment barriers for Stromlo WTP.

Googong WTP has an optional treatment step utilising powdered activated carbon (PAC), which may be used to remove some of the taste and odour compounds prevailing in the Queanbeyan River catchment. This plant does not have UV disinfection. The treatment process is shown in Figure 9.

Figure 8. Water treatment plant drinking water production volumes



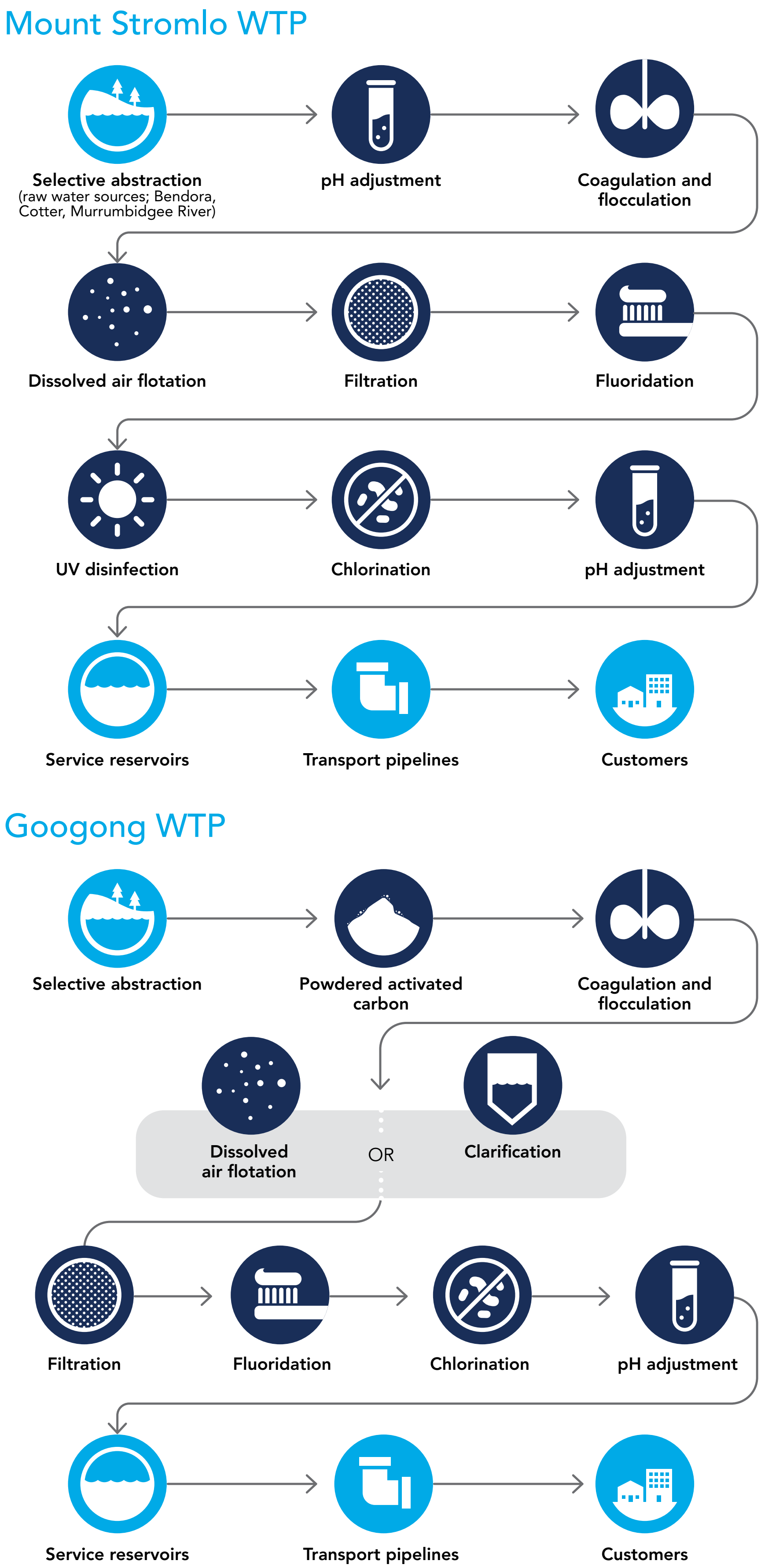
Treatment steps at Mount Stromlo WTP

- selective abstraction (raw water sources: Bendora, Cotter, Murrumbidgee River)
- 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.

Treatment steps at Googong WTP

- selective abstraction (raw water source: Googong)
- optional powdered activated carbon for cyanobacteria and taste and odour compound removal
- optional pre-treatment for pH adjustment with lime
- coagulations 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.

Figure 9. Water treatment steps of water supplied from WTPs to customers



MONITORING AND MAINTAINING OUR TREATMENT OPERATIONS

It's critical that we extensively monitor to control 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 analysers to continuously monitor key water quality parameters, so we can rapidly respond to changes in the raw or processed water quality. Our dedicated treatment operators run and monitor plant processes, to ensure the supply is not compromised by any single point of failure.

Electrical, instrumentation and automation teams calibrate and maintain these control systems, along with the maintenance team, who support this with a scheduled service and repair program.

Together, these teams ensure control systems are performing effectively and are producing high quality water within our specifications.

In addition to continuous operational monitoring performed by operators onsite, our external NATA-accredited laboratory verifies our treatment barrier performance by analysing a range of parameters.

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

The following summaries are provided to assist our customers to understand more about the key parameters continuously monitored at the water treatment plants to manage our critical treatment steps: filtration, fluoride management, UV disinfection and chlorination.

Table 2. Parameters routinely monitored at the water treatment plants.

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

Controlling physical water quality parameters

Turbidity

Turbidity is a measurement of the light-scattering property of water caused by suspended particulates. These include suspended colloidal particles, clay and silt. Water treatment plants are designed to convert dissolved components into a solid form that can be coagulated and flocculated with other particles and any pathogens present in the raw water. Aggregates (flocculant) are formed and removed from the raw water via filtration. The filters at our water treatment plants are a water safety barrier and are considered a critical control point where performance is paramount. We use turbidity as a key indicator of filter performance.

The ADWG recommends a filtered water target of 0.2 nephelometric turbidity units (NTU). During 2022–23 the turbidity leaving the treatment barrier, the filters at Stromlo WTP, was below 0.05 NTU for 99 per cent of the time.

At Googong WTP turbidity was below 0.21 NTU for 99 per cent of the time.

pH

While not considered a direct barrier to the safety of supplied drinking water, the pH of the water plays an important role in maximising the effectiveness of other treatment controls. We use lime to adjust pH at the beginning of the treatment process and again before leaving the WTP. We control the pH of raw water entering our plant to optimise the coagulation and flocculation treatment steps which remove solid particles.

Adjusting the pH of treated water before it leaves the WTPs ensures effective disinfection potential while drinking water travels through our distribution pipelines. Consistent with the ADWG the pH range we target for drinking water when it arrives at the customer supply point is between 6.5 and 8.5. The average pH of the final treated water at Stromlo was 7.33 and for Googong WTP was 7.36 during 2022–23.

Controlling microbiological water quality parameters

We have two barriers for the control of microbial contaminants in the raw water. Our primary barrier is filtration to remove microbiological organisms attached to solid particles. This is followed by a disinfection treatment step to deactivate or kill any remaining organisms. The two disinfection treatment options we have are chlorine and UV. UV has an immediate but no residual effect for disinfection and is only available at the Stromlo WTP, whereas chlorine is used at both plants to provide a residual effect in water travelling to customers' connections.

Chlorine

Chlorine is widely used in treatment plants throughout the world. We add chlorine gas to the water at a concentration sufficient to provide a chlorine residual for lasting protection against contamination in the distribution system. Critical controls are in place to ensure the level of chlorine in the water is safe to drink and performing as an effective barrier.

The ADWG has a health limit of 5 mg/L of free chlorine. During 2022–23 the free chlorine concentration in the drinking water leaving Stromlo WTP was maintained at an average of 1.51 mg/L. Due to its different raw water characteristics and longer transit time within the distribution system, Googong WTP generally operates with final treated water of a higher free chlorine concentration (an average of 2.12 mg/L in 2022–23).

As all drinking water processed by our WTPs is disinfected using chlorine, customers who choose to adjust the water to a different standard (brewers, aquarium owners etc.) should be mindful that chloramine is not used within Canberra's drinking water system.

Ultraviolet light

UV disinfection is used at the Stromlo WTP to further reduce the risk of pathogens entering the drinking water supply. UV lamps provide a 'UV dose' to the water to irradiate and inactivate microorganisms by damaging the nucleic acids that form their DNA.

The quality of filtered water passing through the UV reactor can influence the effectiveness of the dose to penetrate the water. We monitor the quality of water entering the reactor via online sensors. The power of each UV lamp is optimised to ensure the required dose is maintained based on flow rate. ACT Health set the benchmarks for the irradiance dose.

The treatment step continued to meet the ACT Health performance objectives, and in 2022–23, 99.68 per cent of the treated water received a dose greater than the target value.

Additional treatment: Fluoride

Our 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, 2017). To achieve compliance with our licence, we add 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 2022–23 fluoride concentrations in the treated water at Stromlo and Googong WTPs averaged 0.73 mg/L and 0.68 mg/L respectively.

HOW WATER GETS TO YOUR HOUSE

DELIVERING WATER TO YOUR DOOR – PIPES, PUMPS AND TANKS

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 3,400km of water pipelines. This infrastructure is maintained and closely monitored and includes physical and chemical control measures to protect against potential contamination.

These measures include:

- The water distribution system is a closed network from the WTPs to customers' points of supply which prevents external contaminants from entering the treated water.
- Water mains are operated under positive pressure to prevent contaminants infiltrating pipes.
- Backflow prevention devices are installed at customer supply points to protect against contaminants.
- A disinfection residual, free chlorine concentration, is maintained within the water distribution system to protect against microbiological growth or establishment during its journey from the WTP to our customers' points of connection.

Service reservoirs

Potable (drinking quality) 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 firefighting. Tanks also provide water pressure when customers turn on the tap. From these tanks, water mains carry the drinking water to each customer's connection.

We have 50 reservoirs currently in service to supply potable water in the distribution network. They range in age from 108 to two years old. Reflective of the era in which they were built our reservoirs comprise five categories of construction types and material composition. Our reservoirs stored up to a maximum of 627.4 ML of potable water at any given time in 2022–23.

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

Supply to customers' points of connection

Our distribution network consists of more than 3,400 km of water mains (pipes). On average, new urban development adds 40 km of new distribution pipework each year. 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 into our predictive modelling to determine which parts of the network to schedule for inspection, maintenance or replacement. We have a rolling replacement program for pipes which are approaching their end of life or susceptible to failure (bursts).

One group identified for replacement are the cast iron unlined water mains, which remain in place from our city's early establishment and are likely to contain deposits of rust. Replacing these unlined water mains makes water quality more consistent, because turbidity and staining can occur when the rust is disturbed during high demand like when a pipe breaks or during firefighting.

Another suite of scheduled pipe replacements are water mains installed between 1965 and 1978. This group of mains account for approximately three quarters of structural failures in the distribution network.

MONITORING THE DISTRIBUTION SYSTEM

As part of our commitment to high water quality, we undertake a comprehensive routine drinking water quality monitoring program based on criteria set by the ADWG to verify water quality throughout the distribution system.

We monitor water quality routinely at each reservoir (tank) to verify that the water quality complies with the ADWG and to optimise system operations. The quality of water travelling through the pipework can be monitored at approximately 400 identified locations across the city. 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 sporadically throughout the year.

During 2022–23 an average of 100 customer garden taps were monitored each month from the 400 locations around Canberra.

The monitoring includes a variety of physical, microbial and chemical parameters. We compare the results to criteria set by the NHMRC within the ADWG. The key parameters routinely monitored are summarised on pages 31–32.

Disinfection in the distribution system

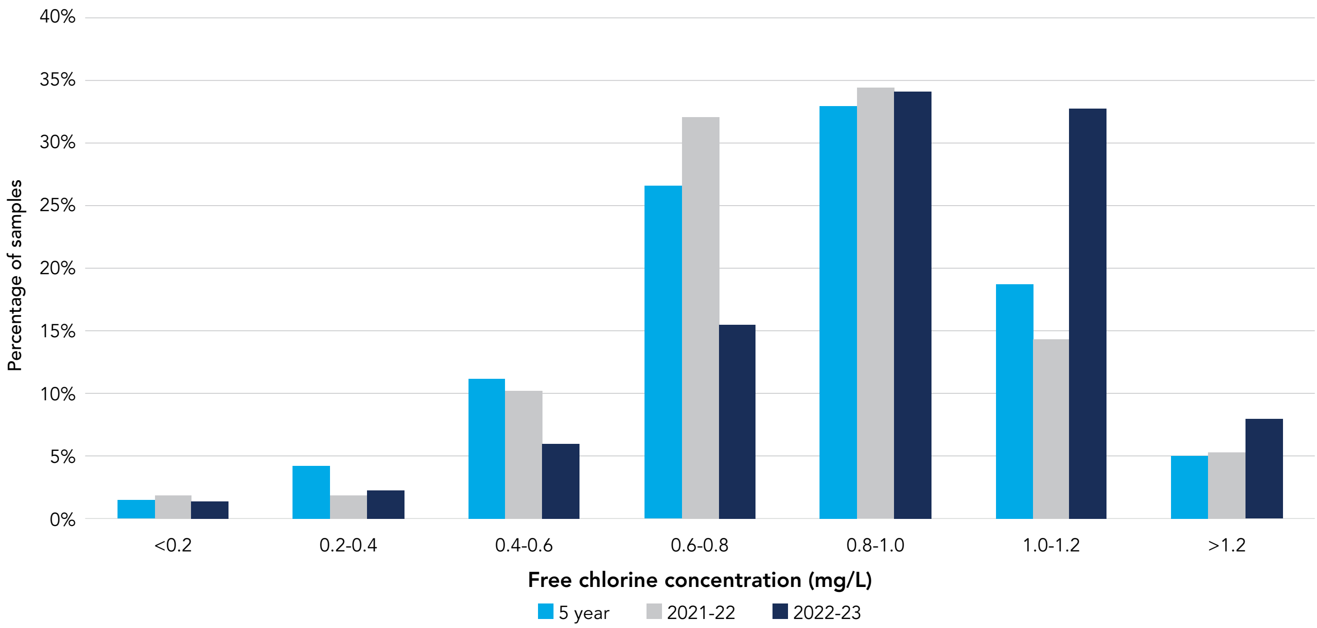
Chlorine is added to water in the final stages of treatment at Mount Stromlo and Googong WTPs. This process is detailed on page 26. Sometimes customers in one location can taste a different amount of chlorine than another location. This is because chlorine dissipates as the water travels through the distribution network and in different temperature conditions. When making decisions about the chlorine concentration leaving our water treatment plants, we factor in transit times and seasonal temperature to minimise aesthetic impacts for our customers. However, given water transit times can vary depending on how much water the community is using and seasonal factors, sometimes we need to increase the concentration at our plant or boost the concentration in an area of our network. We always prioritise protection of public health for the entire network over aesthetic considerations relating to chlorine.

Chlorine is monitored frequently so we can optimise and act on any variations. When chlorine levels drop during transit we are able to boost those disinfection levels at service reservoirs using sodium hypochlorite.

The ADWG has set an aesthetic guideline for chlorine of 0.6 mg/L and a health guideline of 5 mg/L. In 2022–23, the average free chlorine concentration was 0.93 mg/L across the customer tap sampling program and the highest was 1.65 mg/L.

The distribution of chlorine results for customer taps across all the network is shown in Figure 10.

Figure 10. The distribution of chlorine concentration in monthly network monitoring samples



Microbial monitoring

The WTPs are designed to deactivate and remove microbial contaminants before distribution to customers, but 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 potable water is free from harmful microbiological contamination.

The ADWG suggests that *E. coli* should not be detected in a minimum 100 mL sample of drinking water. The Code requires Icon Water to notify ACT Health of any *E. coli* detections in the treated water. A summary of the results are on pages 42-70 (Laboratory Analysis section).

Monitoring physical parameters

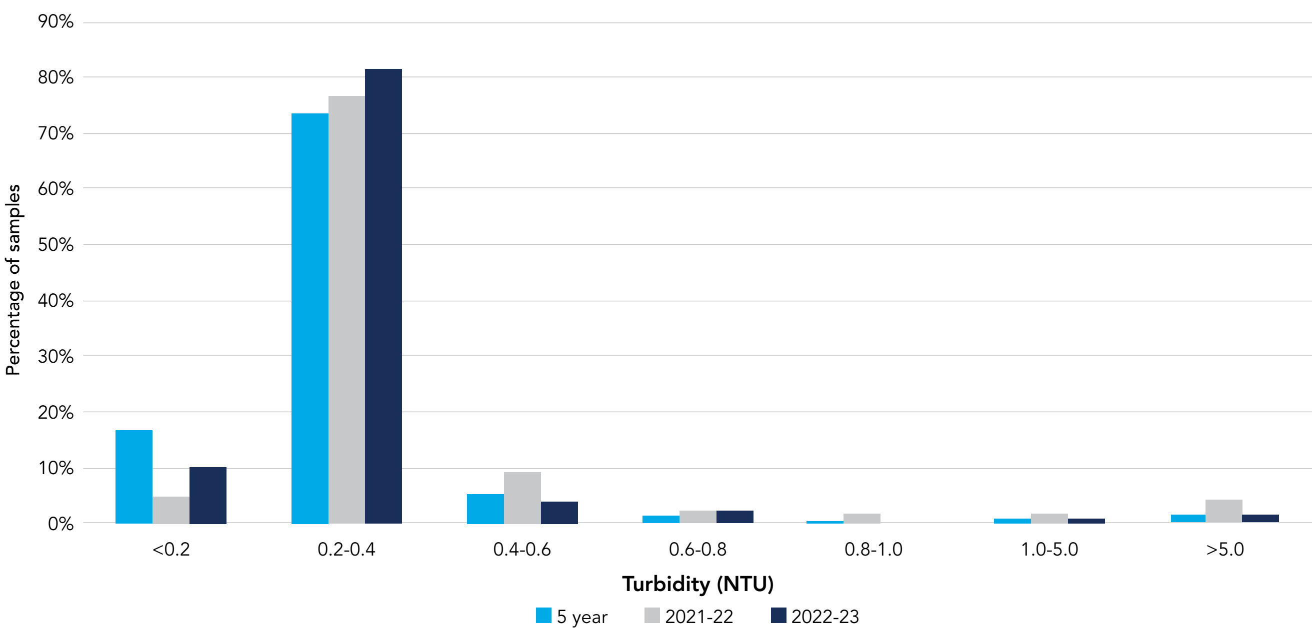
Turbidity is a physical parameter that is a measurement of the suspended and dissolved particulates in water. Turbidity can increase as water passes through the distribution system, usually because of resuspension of natural minerals that have settled over a long period of time. Elevated turbidity levels may be temporary, associated with a water main burst or when sudden demand is placed on the network.

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. During 2022–23 the average turbidity at participating customers' taps was 0.5 NTU. A summary of the results are on pages 42-70 (Laboratory Analysis section).

Colour is mainly present in the raw water due to natural organic compounds, from small hydrophilic acids, proteins and amino acids to humic and fulvic acids. These compounds originate from organic matter in the catchment. Most natural organic matter is removed by coagulation in the water treatment plants.

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 2022–23 the average true colour measured at participating customers' taps was <1 Pt-Co. A summary of the results are on pages 42-70 (Laboratory Analysis section).

Figure 11. The distribution of turbidity values across monthly network monitoring samples



Metals

Iron

Iron in the soil of the catchment dissolves into raw water (within our dams) but can also arise in the distribution system from the corrosion of iron or steel pipes, including components of a plumbing system. Iron can contribute to the formation of mineral deposits on the inside of pipes, which may detach during high flows and appear as temporary discolouration. It can also affect the taste of the water. We undertake a planned program of works to replace sections of corroded pipe, which helps lower metal concentrations.

The ADWG does not outline a health value, however the aesthetic guideline value for iron is 0.3 mg/L, which is based on the taste threshold in water. In 2022–23 the average concentration of iron measured at participating customers' taps was 0.03 mg/L. A summary of the results are on pages 42-70 (Laboratory Analysis section)

Manganese

Manganese is commonly present in water sources in low concentrations, and is detected in higher concentration when under anoxic conditions, like at the bottom of deep reservoirs. Like iron, manganese can also contribute to the formation of deposits on the inside of pipes, which may temporarily discolour water when flows are disturbed.

The ADWG provide both a health and an aesthetic value for manganese. The health guideline value 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. During 2022–23 the average concentration of manganese measured at participating customers' taps was 0.004 mg/L. A summary of the results are on pages 42-70 (Laboratory Analysis section).

Copper

Copper is found naturally in raw water, generally in low concentrations. Water from customers' taps may contain higher levels of copper if the water has been in contact with copper plumbing and fixtures such as hot water systems. Copper levels increase when water stagnates in the plumbing system for long periods, for example if residents are away on holiday. Water with a high level of copper often has a blue-green appearance.

The ADWG health guideline value for copper is 2 mg/L. The ADWG aesthetic guideline value for copper is 1 mg/L which can contribute to staining on plumbing fixtures such as taps. During 2022–23 the average concentration of copper measured at participating customers' taps was 0.015 mg/L. A summary of the results are on pages 42-70 (Laboratory Analysis section).

Lead

Lead is found in the catchments as a naturally occurring metal, and household plumbing systems are another source. Lead is used to manufacture 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 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.

The ADWG sets a health limit for lead of 0.01 mg/L. During 2022–23 the average concentration of lead measured at participating customers' taps was 0.0003 mg/L. A summary of the results are on pages 42-70 (Laboratory Analysis section).

Other compounds

We monitor various other substances in the distribution system including a range of semi-volatile organic compounds (SVOCs) and disinfection by-products in line with the ADWG. Plasticisers and hydrocarbons are common sources of SVOCs. Plasticisers are used in a broad range of products including some pipework, while hydrocarbons can be used as an indicator of contamination permeating the wall of some pipe materials and fittings.

Disinfection by-products are chemicals with health values in the ADWG. Under suitable conditions these chemicals can form as a result of the water treatment process. We monitor for these compounds at the WTP and across the distribution network.

All routine monitoring results are presented in the Laboratory analysis section.

HOW WE ENGAGE WITH OUR CUSTOMERS

COMMUNITY ENGAGEMENT AND EDUCATION

Our education program provides engaging water and wastewater literacy opportunities to local students (primary, secondary and tertiary) along with industry and community groups.

The aim is to build knowledge of the ACT and Queanbeyan urban water network including information about source water protection, water quality, water and wastewater treatment process, catchment management, permanent water conservation measures (PWCMs), and the urban water cycle. Even though our dams have been full this year, we are committed to building ongoing knowledge around PWCMs and long-term, sustainable water use.

Every five years the independent regulator (ICRC) undertakes a review and makes a determination on water tariffs. As part of this process, Icon Water undertook a major community consultation about expectations of service levels, pricing, drinking water security and environmental impact. Over 17,500 engagements produced a comprehensive picture of Canberrans views towards water services which was incorporated into planning decisions and submitted to the regulator as part of the price review.

In 2022–23 we also undertook a range of land manager engagement and community education activities to influence land use and recreation and to build community knowledge of our regional water supply.
This year we educated through a flexible hybrid education program, incorporating digital webinars and face-to-face sessions, in the classroom along with external tours across our major water and wastewater assets. Tours to water and sewage treatment plants for secondary and tertiary students and industry stakeholders proved popular this year, with 102 site tours delivered to over 2,056. participants from the Canberra and Queanbeyan communities. Participants learned about the ACT urban water cycle as well as Icon Water's water network and wastewater services.

Our education program delivered water literacy and source water messages across 11 events focusing on STEM in our community with over 63,700 participants. We also worked with the ACT Government H20K Healthy Waterways; Upper Murrumbidgee Waterwatch program; ACT Education Directorate Academy of Future Skills; and delivered water literacy to support the ACT sustainable schools program. We also provided 10 presentations to Master Plumbers ACT and Canberra Institute of Technology Industry Forums.
These sessions highlight industry partnerships and support our water network awareness training requirements for first year plumbing students and plumbers in the ACT.

We continued our focus on developing relevant and informative digital materials to further build our online water and wastewater literacy program. These resources include a growing series of downloadable factsheets and engaging activities to support learning for primary (K-2, 3-6) and secondary (7-12) students. Over 43,278 unique visitors explored the education section of our website this year.

We continued our direct engagement with Googong township and Queanbeyan-Palerang Regional Council to develop regulation and policy to protect the quality of water entering Googong Dam. We also provided financial support that allowed Waterwatch programs to continue in the Cooma-Monaro upper Murrumbidgee catchment.

Other communication activities to build literacy around source water protection included social media and key messages in community newsletters.

COMMON WATER QUALITY ENQUIRIES

We manage approximately 200,000 connections to the water network in the ACT.

A survey of 300 residential households and 200 businesses indicated that 96 per cent of our customers are satisfied with our services. Our drinking water continued to be highly regarded with 91 per cent of our customers satisfied with the quality.

Occasionally customers experience problems with the quality of their water supply and contact us for advice. Concerns by the community may be investigated to determine the likely cause and, if required, corrective actions are taken.

Often changes related to water quality are short-term and may be associated with:

- seasonal changes to quality
- a switch between water treatment plants (each source water catchment has a different natural quality signature – for instance organic content changes in each catchment)
- water main bursts, network renewal or expansion, maintenance work or a change in usage patterns within the water supply system.

Sudden changes in network demand caused by hot weather, fire hydrant use, or network valve operations required for maintenance work, can reverse the direction of flow of water in our pipes. This causes a shearing force on internal pipe surfaces and disturbs the natural mineral sediment that settles at the bottom of pipes, and 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.

It is also common for customers to notice a change to the appearance, taste or smell of their water because of something associated with their own internal pipework or the way they are storing water (see Figure 13). The easiest way to determine if something might be originating in Icon Water's network or within a customer's home is to check the water at the front garden tap, or talk with neighbours.

During 2022–23 we received over 80,000 customer calls (including faults and emergencies, account and general enquiries). Of those calls, 96 were about water quality concerns – a substantial increase compared with 2021–22. Most of these water quality concerns were related to the MIB taste and odour event across the winter of 2022. Thirty-one were general water quality complaints, a reduction of six per cent from 2021–22.

Of the 31 non-MIB enquiries in 2022–23, three were confirmed through investigation to be attributed to the Icon Water network and supply. A summary of the types of water quality complaints received are detailed in Figure 12. The graph represents the number of enquiries which were attributed to the customer's private plumbing issues or remained within ADWG limits as well as the number of complaints where Icon Water's supply was determined to be the underlying cause.

Figure 12. Total number of customer enquiries about water quality.

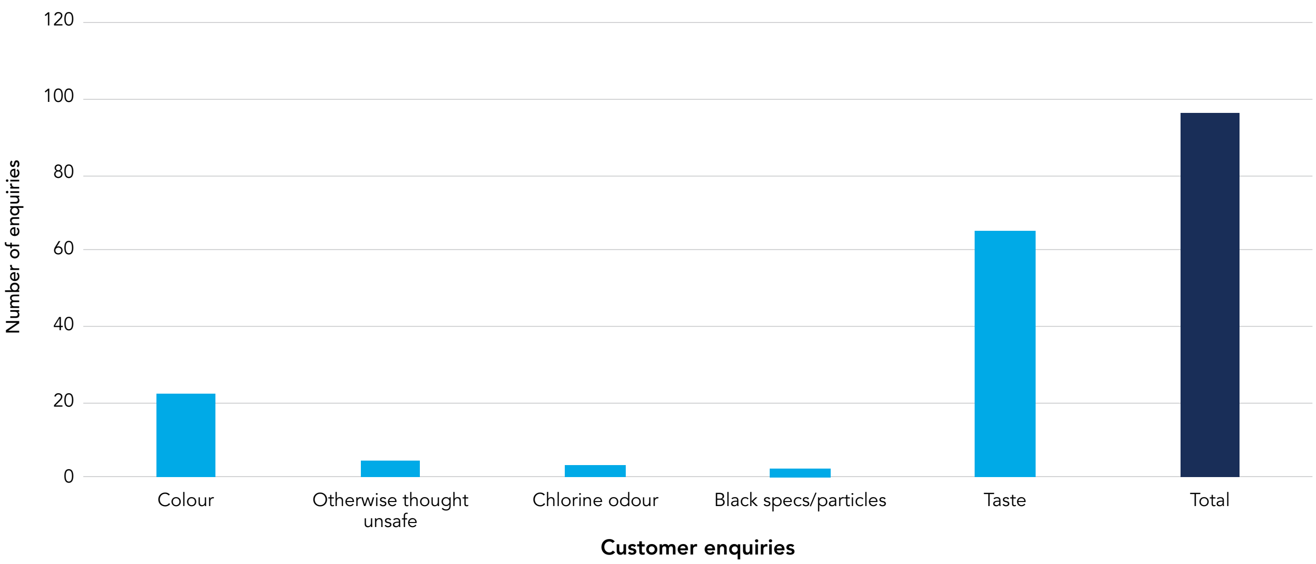


Figure 13. A summary of common enquiries received

Discoloured

Discoloured water is often associated with planned and reactive maintenance work or a change in network usage patterns, but may also be associated with internal plumbing (particularly within deteriorated pipework and hot water services).

Usually clears within a short time, after flushing or upon inspection of internal pipework.

White/cloudy

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

Air is harmless, and will clear from the glass (from the bottom-upwards) if left to sit.

Blue/green

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

Usually addressed through changes to internal plumbing.

Staining

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

Usually temporary or cleared through investigation of internal fittings/pipework.

Chlorine odour

Usually these enquiries relate to a change (increase) in the level of chlorine perceived by a customer.

These problems are aesthetic, usually short-term and can be reduced by:

- leaving water to stand on a bench or in a fridge for a short time, which will allow the chlorine to dissipate
- adding freshly squeezed citrus e.g. lemon juice to the water; this contains ascorbic acid which can neutralise chlorine.

Disagreeable taste

Disagreeable tastes including musty, earthy, bitter and metallic tastes. Like odour, taste can vary and is subjective.

Can sometimes be resolved by flushing water in the network, often addressed by investigating internal plumbing issues.

Other

Issues not otherwise categorised.

NOTIFICATIONS TO ACT HEALTH

Icon Water complies with the *Public Health (Drinking Water) Code of Practice (2007)* (the Code) issued by ACT Health (as referenced in Section 2 of this report).

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 2022–23, eight notifications to ACT Health were issued; all were identified from the results of our routine monitoring program. Of the eight notifications:

- three were in the source water reservoirs.
- one was in the treatment plants.
- four were in the distribution network.

The details of each of these are below in Table 3:

Table 3. Notifications to ACT Health under the Drinking Water Code of Practice

Water in the Storage Reservoirs	
21/10/2022	*Cryptosporidium* – Bendora reservoir *Cryptosporidium* was detected in Bendora reservoir. The reservoir was not in use at the time and was not detected in the next monitoring occasion.
16/12/2022	Cyanobacteria – Googong reservoir A bloom of blue green algae was recorded at notifiable levels within Googong reservoir. The bloom persisted throughout autumn, with six subsequent detections through to June. The reservoir was not in use during the bloom.
6/06/2023	*Cryptosporidium* – Bendora reservoir *Cryptosporidium* was detected in Bendora reservoir. The reservoir was in use at the time and all treatment barriers were operating at Mount Stromlo Water Treatment Plant. *Cryptosporidium* was not detected in the raw water entering the plant, or in the final treated water. It was not detected in Bendora reservoir on the next monitoring occasion.

Water in the Treatment Plants	
21/11/2022	*Giardia* – Googong Water Treatment Plant One positive detection of *Giardia* occurred in the raw water entering Googong Water Treatment Plant (GWTP). *Giardia* was also detected in Googong reservoir at the intake tower. All treatment barriers were operating at the time of detection and Giardia was not detected in the final treated water.

Water in the distribution System	
5/10/2022	*E. coli* – Googong district An *E. coli* detection of 5 MPN/100ml was observed at a site as part of our routine monitoring program. Follow up samples of the same site as well as a nearby location with the same supply found no detections of *E. coli*. The cause of the original detection was determined to be the result of low turnover of a service line, and not representative of Icon Water's supply. An administrative solution was reached with the site owner.
11/10/2022	Manganese – Cotter district An elevated level of manganese above the ADWG health value was detected from a non-residential site as part of our routine monitoring program. Three other sites in the area sampled on the same day had acceptable levels. The sample location was 100 metres downstream of the customer service line, and it was determined that low water use and internal pipework were the cause, and the site owner was contacted with advice to flush their internal taps to improve water quality.
11/10/2022	Lead – Chisholm As part of an investigation into some non-conforming results at a routine site, a nearby hydrant was sampled. This hydrant sample returned a result with an ADWG health guideline value exceedance for lead. All other sites sampled in the area were below ADWG health values for all metals. The hydrant was resampled on 12/10/2022 and was within specification. The original lead exceedance was assessed to be isolated to the flushing activity at the hydrant, and not representative of the water quality in that area of the network.
29/06/2023	*E. coli* – Duffy An *E. coli* detection of 1 MPN/100ml was observed through a resample of a routine site in Duffy. An investigation into this site found that the tap was supplied by a rainwater tank, and was not representative of the water quality in that area of the network.

MANAGING WATER QUALITY INTO THE FUTURE

LOOKING AHEAD

Part of ensuring we are operating in the most efficient way involves 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 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 the 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 (WERF), the Smart Water Fund and the Australian Research Council.

We contribute to industry associations such as the Research Managers Network, WaterRA forums and W-Lab (a platform for showcasing the latest advances, innovations and international water utility technologies).

In 2022–23, we continued our involvement in the Perpetual Endowment Fund – a collaboration between the Australian National University (ANU), Icon Water and ActewAGL that has been running since 2008 to support PhD scholarships and research projects. We continued our support of a research project awarded in 2021–22, to improve understanding and incorporation of runoff non-recovery in source water models for improved water security.

We also shared our knowledge and expertise through a conference presentation on Canberra's water security in a climate change future, at the ACT Water Matters Conference.

MANAGING ASSETS TO MEET CURRENT AND FUTURE NEEDS

Climate change Adaptation Plan

To prepare for climate change-driven impacts to source water quality and drinking water treatment, in 2020 we developed a *Climate Change Adaptation Plan*. The plan includes ensuring our water quality monitoring can adequately inform treatment capability to respond to impacts of climate change. During the third year of implementation, a majority of the actions have been completed, including:

- delivery of a Drought Management Plan
- publication of the Actions for Clean Water Plan for Cotter catchment
- an update of our water quality monitoring program and Source Water Strategy modelling assumptions, and revision of the Blue Green Algae Response Plan, allowing for projected climate variability
- consultation with the ACT Emergency Services Agency (ESA) for our water and wastewater assets to be included in their fire protection zones.

An updated Climate Change Adaption Plan for 2023–28 is due to be released later this year.

Water System Strategy

We are committed to the continuous improvement of water quality management practices, and part of this will come from work to update our Water System Strategy.

The updated strategy (2022) will refine the long-term direction, guide future investments and inform our decision making. The strategy will ensure plant and network assets continue to meet water quality requirements far into the future, with safety 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.

Strategic Water Quality Improvement Plan

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. Most projects relate to maintenance, asset renewal, or continual improvement, many of which are longer term projects. Status updates on these projects along with any new projects are outlined in this plan.

A selection of projects from the 2022–23 plan include:

- The notable downward trend in raw water quality in the Googong reservoir means the ability of the Googong WTP to meet drinking water quality requirements may be at risk in the future. Investigations are underway to determine process improvements to treat the predicted lower raw water quality. This has the potential to include new process trains to help remove higher concentrations of contaminants from the water. This work is currently in an evaluation stage of our project life cycle with engineering options to be developed. Together with financial analysis, a business case proposing upgrade improvements is in progress.
- With 50 reservoirs of varying ages within our network, we run a routine program to assess and maintain reservoir structural integrity; in particular, 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 for O'Connor Reservoir were completed. The program has scheduled other reservoirs for works in the coming years.
- To ensure we maintain the required chlorine residual for safe drinking water across the network, a project is currently in evaluation for online chlorine monitoring at five of our service reservoirs. This project will also improve our understanding of the effectiveness of our current re-chlorination approach.

LABORATORY ANALYSIS

LABORATORY ANALYSIS

Quality control and assurance

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 by Icon Water annually to reflect our changing needs and priorities. ALS Global operates a NATA-registered laboratory. NATA provides specific technical evaluation combined with international recognition by its overseas counterparts, which allow for NATA-accredited laboratories 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. A NATA audit of the entire laboratory was conducted in October 2022. The facility complies with the criteria of NATA Policy Circular 1 – Corporate Accreditation.

How to read the result for water quality in your area

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.

A summary of the laboratory analysis completed for the customer tap water quality monitoring program is presented in the following tables. You can search by suburb and by the water quality parameter of interest. Parameters are grouped into categories to simplify navigating the tables. Each summary table includes the total number of samples analysed for each parameter, the range of those values being the minimum, maximum, mean and the 95th percentile. Also included are the ADWG health values for a ready comparison of our results demonstrating how we are meeting public health requirements.

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

Figure 14. Water quality monitoring zone map

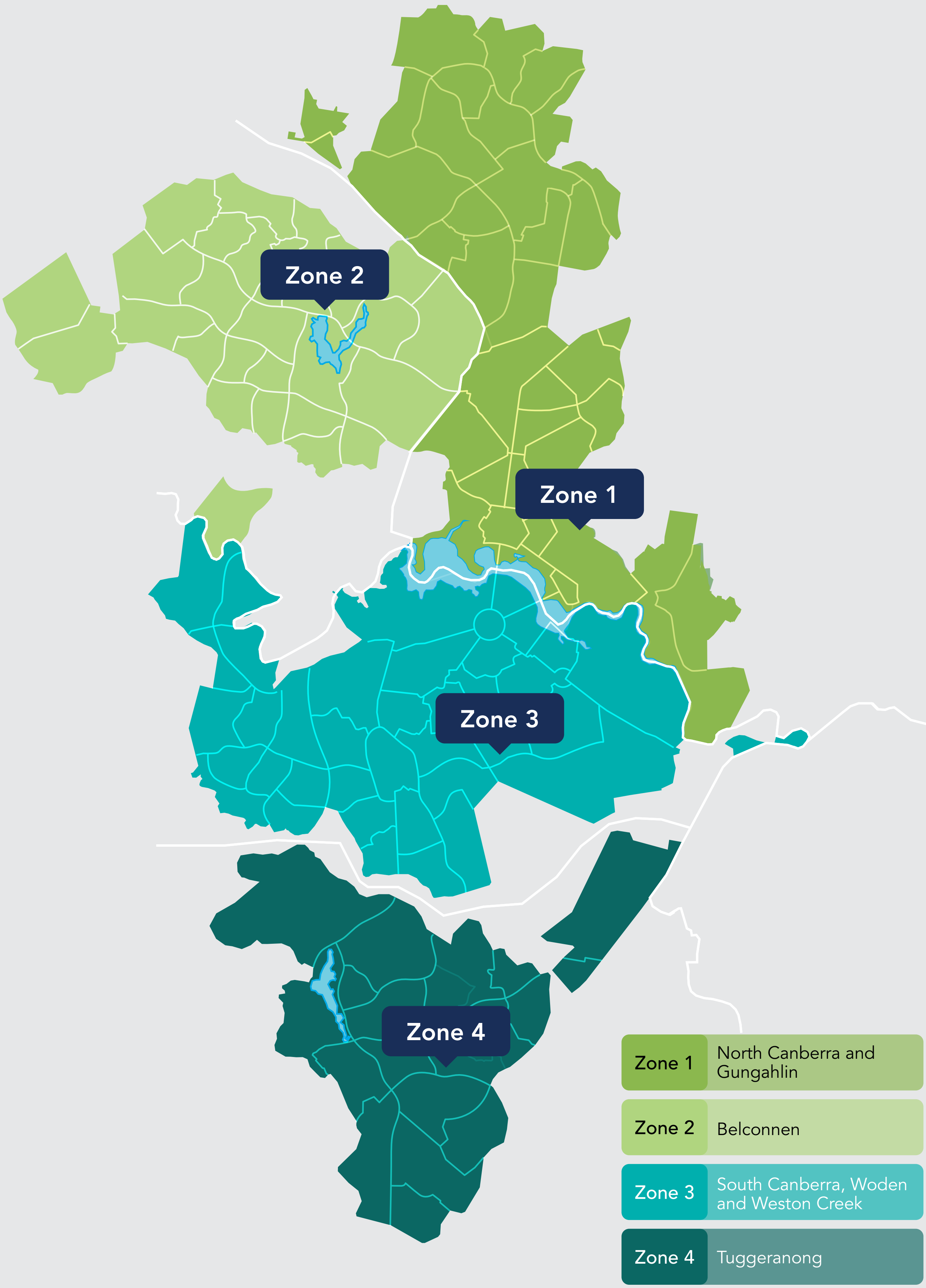


Table 4. Summary data for all water quality zones

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	1284	<1	1*	<1	<1
Total coliforms	AS 4276.21	MPN/100mL	-	<1	1284	<1	620	1	<1
Heterotrophic plate count	APHA 9215 B	CFU/mL	-	<1	1282	<1	>5900	33	10
Physical									
Conductivity	APHA 2510 B	uS/cm	-	<2	120	88	253	124	182
pH	APHA 4500-H B	pH units	-	<0.01	1284	5.06	9.55	7.65	8.04
Temperature	APHA 4500-H B	deg. C	-	<0.1	320	8.4	25.3	15.8	22.9
Total dissolved solids	APHA 2540 C	mg/L	-	<10	120	31	130	72	117
True colour	APHA 2120 B	Pt/Co	-	<1	240	<1	12	<1	1
Turbidity	APHA 2130 B	NTU	-	<0.1	290	0.1	26.8	0.5	0.6
Inorganic									
Alkalinity bicarb	APHA 2320 A/B	mg/L	-	<0.1	240	19.9	58.4	43.7	50.9
Alkalinity carb	APHA 2320 A/B	mg/L	-	<0.1	240	<0.1	47.5	0.3	<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	34	58	44	51
Aluminium acid soluble	USEPA 200.8	ug/L	-	<5	121	17	832	50	66
Asbestos	AS4964-2000	g/kg	-	Absent	48	Absent	Absent	Absent	Absent
Calcium dissolved	USEPA 200.7	mg/L	-	<0.05	120	9.4	20.4	14.4	18.9
Chloride	APHA 21st Ed. 2005, Part 4110 B	mg/L	-	<0.1	48	4.3	8.5	5.2	7.8
Chlorine combined	APHA 4500 -CL G	mg/L	-	<0.03	1284	<0.03	0.30	0.05	0.14
Chlorine free	APHA 4500 -CL G	mg/L	-	<0.03	1284	<0.03	1.65	0.93	1.25
Chlorine total	APHA 4500 -CL G	mg/L	5	<0.03	1284	<0.03	1.70	0.98	1.29
Cyanide	APHA 4500_CN	mg/L	0.08	<0.004	48	<0.004	<0.004	<0.004	<0.004
Fluoride	APHA 21st Ed. 2005, Part 4110 B	mg/L	1.5	<0.05	120	0.61	0.91	0.76	0.84
Hardness total	APHA 2340 B	mg/L	-	<1	120	26	64	41	61
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	0.68	3.80	1.28	3.50
Nitrate	APHA 21st Ed. 2005, Part 4110 B	mg/L N	50	<0.1	48	<0.1	0.4	0.3	0.4
Potassium dissolved	USEPA 200.7	mg/L	-	<0.1	48	0.4	1.5	0.6	1.4
Sodium dissolved	USEPA 200.7	mg/L	-	<0.1	48	2.7	7.6	3.7	7.2
Sulphate	APHA 21st Ed. 2005, Part 4110 B	mg/L SO4	-	<0.4	48	0.7	25.7	5.1	21.9
Total metals									
Aluminium total	USEPA 200.8	ug/L	-	<9	121	<9	186	44	68
Antimony total	USEPA 200.8	ug/L	3	<3	121	<3	<3	<3	<3
Arsenic total	USEPA 200.8	ug/L	10	<1	121	<1	<1	<1	<1
Barium total	USEPA 200.8	ug/L	2000	<0.5	121	3.3	9.9	4.8	8.4
Beryllium total	USEPA 200.8	ug/L	60	<0.1	121	<0.1	<0.1	<0.1	<0.1
Boron total	USEPA 200.7	mg/L	4	<0.01	48	<0.01	<0.01	<0.01	<0.01
Cadmium total	USEPA 200.8	ug/L	2	<0.05	121	<0.05	0.10	<0.05	<0.05
Chromium total	USEPA 200.8	ug/L	-	<2	121	<2	<2	<2	<2
Cobalt total	USEPA 200.8	ug/L	-	<0.2	121	<0.2	<0.2	<0.2	<0.2
Copper total	USEPA 200.8	ug/L	2000	<1	241	1	507	15	45
Iron total	USEPA 200.7	mg/L	-	<0.01	243	<0.01	3.18	0.03	0.02
Lead total	USEPA 200.8	ug/L	10	<0.2	241	<0.2	8.4	0.3	0.8

Table 4. 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	241	<0.001	0.183	0.004	0.012
Mercury total	USEPA 200.8	ug/L	1	<0.1	123	<0.1	0.2	<0.1	<0.1
Molybdenium total	USEPA 200.8	ug/L	50	<1	121	<1	<1	<1	<1
Nickel total	USEPA 200.8	ug/L	20	<1	121	<1	19	<1	<1
Selenium total	USEPA 200.8	ug/L	10	<1	121	<1	<1	<1	<1
Silver total	USEPA 200.8	ug/L	100	<1	121	<1	<1	<1	<1
Zinc total	USEPA 200.8	ug/L	-	<5	121	<5	1310	16	10
Haloacetic acids									
Bromoacetic acid	ALS: Headspace GCMS	ug/L	-	<5	342	<5	<5	<5	<5
Bromochloroacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	342	<1	6	2	5
Bromodichloroacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	342	<1	11	4	10
Chloroacetic acid	ALS: Headspace GCMS	ug/L	150	<1	342	<1	7	3	6
Dibromoacetic Acid	ALS: Headspace GCMS	ug/L	-	<10	342	<10	<10	<10	<10
Dibromochloroacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	342	5	5	5	5
Dichloroacetic Acid	ALS: Headspace GCMS	ug/L	100	<1	340**	<1	64	27	58
Tribromoacetic Acid	ALS: Headspace GCMS	ug/L	-	<10	342	<10	10	<10	10
Trichloroacetic Acid	ALS: Headspace GCMS	ug/L	100	<1	342	<1	85	37	78
Sum of Haloacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	342	<1	169	74	155
Trihalomethanes									
Bromoform	VIC-CM047	mg/L	-	<0.001	342	<0.001	0.019	<0.001	<0.001
Chloroform	VIC-CM047	mg/L	-	<0.001	342	<0.001	0.150	0.050	0.110
Dibromochloromethane	VIC-CM047	mg/L	-	<0.001	342	<0.001	0.002	<0.001	<0.001
Bromodichloromethane	VIC-CM047	mg/L	-	<0.001	342	<0.001	0.020	0.004	0.010
Trihalomethanes total	VIC-CM047	mg/L	0.25	<0.001	342	<0.001	0.160	0.055	0.120
Semi volatile organic compounds (SVOC) Anilines and benzidines									
2-Nitroaniline	US EPA 3510/8270	ug/L	-	<4	120	<4	<4	<4	<4
3-Nitroaniline	US EPA 3510/8270	ug/L	-	<4	120	<4	<4	<4	<4
3,3′-Dichlorobenzidine	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
4-Chloroaniline	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
4-Nitroaniline	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Aniline	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Carbazole	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Dibenzofuran	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Chlorinated hydrocarbons									
1,2-Dichlorobenzene	ALS Headspace GCMS	ug/L	1500	<0.25	120	<0.25	<0.25	<0.25	<0.25
1,2-Dichlorobenzene	US EPA 3510/8270	ug/L	1500	<2	48	<2	<2	<2	<2
1,2,4-Trichlorobenzene	US EPA 3510/8270	ug/L	30	<2	120	<2	<2	<2	<2
1,3-Dichlorobenzene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
1,4-Dichlorobenzene	ALS Headspace GCMS	ug/L	40	<0.25	120	<0.25	<0.25	<0.25	<0.25
Hexachlorobenzene	US EPA 3510/8270	ug/L	-	<4	120	<4	<4	<4	<4
Hexachlorobutadiene	ALS Headspace GCMS	ug/L	0.7	<0.25	120	<0.25	<0.25	<0.25	<0.25
Hexachlorocyclopentadiene	US EPA 3510/8270	ug/L	-	<10	120	<10	<10	<10	<10
Hexachloroethane	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Hexachloropropylene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Pentachlorobenzene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Haloethers									
4-Bromophenyl phenyl ether	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2

Table 4. Summary data for all water quality zones

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th Percentile
4-Chlorophenyl phenyl ether	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Bis(2-chloroethoxy) methane	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Bis(2-chloroethyl) ether	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Nitroaromatics and ketones									
1-Naphthylamine	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
1,3,5-Trinitrobenzene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
2-Picoline	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
2,4-Dinitrotoluene	US EPA 3510/8270	ug/L	-	<4	120	<4	<4	<4	<4
2,6-Dinitrotoluene	US EPA 3510/8270	ug/L	-	<4	120	<4	<4	<4	<4
4-Aminobiphenyl	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
4-Nitroquinoline-N-oxide	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
5-Nitro-o-toluidine	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Acetophenone	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Azobenzene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Chlorobenzilate	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Dimethylaminoazobenzene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Isophorone	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Nitrobenzene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Pentachloronitrobenzene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Phenacetin	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Pronamide	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Nitrosamines									
Methapyrilene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
N-Nitrosodibutylamine	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
N-Nitrosodiethylamine	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
N-Nitrosodi-n-propylamine	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
N-Nitrosodiphenyl & Diphenylamine	US EPA 3510/8270	ug/L	-	<4	120	<4	<4	<4	<4
N-Nitrosomethylethylamine	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
N-Nitrosomorpholine	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
N-Nitrosopiperidine	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
N-Nitrosopyrrolidine	US EPA 3510/8270	ug/L	-	<4	120	<4	<4	<4	<4
Organochlorine pesticides									
4,4′-DDD	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
4,4′-DDE	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
4,4′-DDT	US EPA 3510/8270	ug/L	9	<4	120	<4	<4	<4	<4
Aldrin	US EPA 8081/8082	ug/L	0.3	<0.25	120	<0.25	<0.25	<0.25	<0.25
alpha-BHC	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
alpha-Endosulfan	US EPA 3510/8270	ug/L	20	<2	120	<2	<2	<2	<2
beta-BHC	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
beta-Endosulfan	US EPA 3510/8270	ug/L	20	<2	120	<2	<2	<2	<2
delta-BHC	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Dieldrin	US EPA 8081/8082	ug/L	0.3	<0.25	120	<0.25	<0.25	<0.25	<0.25
Endrin	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Endosulfan sulfate	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
gamma-BHC	US EPA 3510/8270	ug/L	10	<2	120	<2	<2	<2	<2
Heptachlor	US EPA 8081/8082	ug/L	0.3	<0.25	120	<0.25	<0.25	<0.25	<0.25
Heptachlor epoxide	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2

Table 4. 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	ug/L	2	<2	120	<2	<2	<2	<2
Chlorpyrifos	US EPA 3510/8270	ug/L	10	<2	120	<2	<2	<2	<2
Chlorpyrifos-methyl	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Diazinon	US EPA 3510/8270	ug/L	4	<2	120	<2	<2	<2	<2
Dichlorvos	US EPA 3510/8270	ug/L	5	<2	120	<2	<2	<2	<2
Dimethoate	US EPA 3510/8270	ug/L	7	<2	120	<2	<2	<2	<2
Ethion	US EPA 3510/8270	ug/L	4	<2	120	<2	<2	<2	<2
Fenthion	US EPA 3510/8270	ug/L	7	<2	120	<2	<2	<2	<2
Malathion	US EPA 3510/8270	ug/L	70	<2	120	<2	<2	<2	<2
Pirimiphos-ethyl	ALS LC-MSMS	ug/L	0.5	<0.01	120	<0.01	<0.01	<0.01	<0.01
Prothiofos	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Phenolic compounds									
2,3,4,6-Tetrachlorophenol	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
2,4-Dichlorophenol	US EPA 8270	ug/L	200	<0.1	120	<0.1	<0.1	<0.1	<0.1
2,4-Dimethylphenol	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
2,4,5-Trichlorophenol	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
2,4,6-Trichlorophenol	US EPA 3510/8270	ug/L	20	<2	120	<2	<2	<2	<2
2,6-Dichlorophenol	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
2-Chlorophenol	US EPA 8270	ug/L	300	<0.05	120	<0.05	<0.05	<0.05	<0.05
2-Methylphenol	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
2-Nitrophenol	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
3- & 4-Methylphenol	US EPA 3510/8270	ug/L	-	<4	120	<4	<4	<4	<4
4-Chloro-3-Methylphenol	US EPA 3510/8270	ug/L		<2	120	<2	<2	<2	<2
Pentachlorophenol	US EPA 3510/8270	ug/L	10	<4	120	<4	<4	<4	<4
Phenol	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Phthalates									
Bis(2-ethylhexyl) phthalate	US EPA 3510/8270	ug/L	10	<10	120	<10	<10	<10	<10
Bis(2-ethylhexyl) phthalate	US EPA 8270D	ug/L	10	<10	120	<10	<10	<10	<10
Butyl benzyl phthalate	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Butyl benzyl phthalate	US EPA 8270D	ug/L	-	<2	120	<2	<2	<2	<2
Diethyl phthalate	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Diethyl phthalate	US EPA 8270D	ug/L	-	<2	120	<2	<2	<2	<2
Dimethyl phthalate	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Dimethyl phthalate	US EPA 8270D	ug/L	-	<2	120	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 8270D	ug/L	-	<2	120	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 8270D	ug/L	-	<2	120	<2	<2	<2	<2
Polycyclic aromatic hydrocarbons									
2-Chloronaphthalene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
2-Methylnaphthalene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
3-Methylcholanthrene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
7,12-Dimethylbenz(a) anthracene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Acenaphthene	US EPA 3510/8270	ug/L	-	<1	120	<1	<1	<1	<1
Acenaphthene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2

Table 4. 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	ug/L	-	<1	120	<1	<1	<1	<1
Acenaphthylene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Anthracene	US EPA 3510/8270	ug/L	-	<1	120	<1	<1	<1	<1
Anthracene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Benz(a)anthracene	US EPA 3510/8270	ug/L	-	<1	120	<1	<1	<1	<1
Benz(a)anthracene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Benzo(a)pyrene	ALS GCMS-SIM	ug/L	0.01	<0.005	240	<0.005	<0.005	<0.005	<0.005
Benzo(b) fluoranthene	US EPA 3510/8270	ug/L	-	<1	120	<1	<1	<1	<1
Benzo(k) fluoranthene	US EPA 3510/8270	ug/L	-	<1	120	<1	<1	<1	<1
Benzo(b) & Benzo(k) fluoranthene	US EPA 3510/8270	ug/L	-	<4	120	<4	<4	<4	<4
Benzo(g.h.i)perylene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Benzo(g.h.i)perylene	US EPA 3510/8270	ug/L	-	<1	120	<1	<1	<1	<1
Chrysene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Chrysene	US EPA 3510/8270	ug/L	-	<1	120	<1	<1	<1	<1
Dibenz(a.h)anthracene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Dibenz(a.h)anthracene	US EPA 3510/8270	ug/L	-	<1	120	<1	<1	<1	<1
Fluoranthene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Fluoranthene	US EPA 3510/8270	ug/L	-	<1	120	<1	<1	<1	<1
Fluorene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Fluorene	US EPA 3510/8270	ug/L	-	<1	120	<1	<1	<1	<1
Indeno(1.2.3.cd)pyrene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Indeno(1.2.3-cd)pyrene	US EPA 3510/8270	ug/L	-	<1	120	<1	<1	<1	<1
N-2-Fluorenyl Acetamide	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	ug/L	-	<1	120	<1	<1	<1	<1
Phenanthrene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Phenanthrene	US EPA 3510/8270	ug/L	-	<1	120	<1	<1	<1	<1
Pyrene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Pyrene	US EPA 3510/8270	ug/L	-	<1	120	<1	<1	<1	<1
PAHs (total)	US EPA 3510/8270	ug/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.

* Exceedence of health value was reported to ACT Health. The site was investigated and found to not be representative of Icon's supply.

** Two samples for Dichloroacetic Acid had unverifiable results and were exlcuded from this data set.

Table 5. 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	368	<1	<1	<1	<1
Total coliforms	AS 4276.21	MPN/100mL	-	<1	368	<1	3	<1	<1
Heterotrophic plate count	APHA 9215 B	CFU/mL	-	<1	368	<1	>5900	34	7
Physical									
Conductivity	APHA 2510 B	uS/cm	-	<2	36	88	253	122	178
pH	APHA 4500-H B	pH units	-	<0.01	368	7.1	8.15	7.56	7.82
Temperature	APHA 4500-H B	deg. C	-	<0.1	92	8.6	24.7	15.8	22.8
Total dissolved solids	APHA 2540 C	mg/L	-	<10	36	44	122	73	103
True colour	APHA 2120 B	Pt/Co	-	<1	72	<1	9	<1	1
Turbidity	APHA 2130 B	NTU	-	<0.1	91	0.1	26.8	0.5	0.4
Inorganic									
Alkalinity bicarb	APHA 2320 A/B	mg/L	-	<0.1	72	33.7	57.6	43.7	51.2
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	34	58	44	51
Aluminium acid soluble	USEPA 200.8	ug/L	-	<5	37	25	832	64	65
Asbestos	AS4964-2000	g/kg	-	Absent	12	Absent	Absent	Absent	Absent
Calcium dissolved	USEPA 200.7	mg/L	-	<0.05	36	9.4	19.9	14.2	19.3
Chloride	APHA 21st Ed. 2005, Part 4110 B	mg/L	-	<0.1	12	4.3	8.5	5.3	6.7
Chlorine combined	APHA 4500 -CL G	mg/L	-	<0.03	368	<0.03	0.23	0.05	0.14
Chlorine free	APHA 4500 -CL G	mg/L	-	<0.03	368	0.08	1.56	0.98	1.28
Chlorine total	APHA 4500 -CL G	mg/L	5	<0.03	368	0.15	1.60	1.03	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	0.65	0.89	0.77	0.85
Hardness total	APHA 2340 B	mg/L	-	<1	36	26	64	41	62
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	0.68	3.64	1.24	3.17
Nitrate	APHA 21st Ed. 2005, Part 4110 B	mg/L N	50	<0.1	12	0.2	0.4	0.3	0.3
Potassium dissolved	USEPA 200.7	mg/L	-	<0.1	12	0.4	1.5	0.6	1.1
Sodium dissolved	USEPA 200.7	mg/L	-	<0.1	12	2.8	7.6	3.8	6.5
Sulphate	APHA 21st Ed. 2005, Part 4110 B	mg/L SO4	-	<0.4	12	3.1	25.4	5.3	14.0
Total metals									
Aluminium total	USEPA 200.8	ug/L	-	<9	36	24	74	43	58
Antimony total	USEPA 200.8	ug/L	3	<3	36	<3	<3	<3	<3
Arsenic total	USEPA 200.8	ug/L	10	<1	36	<1	<1	<1	<1
Barium total	USEPA 200.8	ug/L	2000	<0.5	36	3.5	8.6	4.8	8.4
Beryllium total	USEPA 200.8	ug/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	<0.01	<0.01	<0.01
Cadmium total	USEPA 200.8	ug/L	2	<0.05	36	<0.05	<0.05	<0.05	<0.05
Chromium total	USEPA 200.8	ug/L	-	<2	36	<2	<2	<2	<2
Cobalt total	USEPA 200.8	ug/L	-	<0.2	36	<0.2	<0.2	<0.2	<0.2
Copper total	USEPA 200.8	ug/L	2000	<1	72	1	507	20	62
Iron total	USEPA 200.7	mg/L	-	<0.01	72	<0.01	3.18	0.06	0.02
Lead total	USEPA 200.8	ug/L	10	<0.2	72	<0.2	8.4	0.4	0.6

Table 5. 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	0.183	0.006	0.012
Mercury total	USEPA 200.8	ug/L	1	<0.1	36	<0.1	0.2	<0.1	<0.1
Molybdenium total	USEPA 200.8	ug/L	50	<1	36	<1	<1	<1	<1
Nickel total	USEPA 200.8	ug/L	20	<1	36	<1	1	<1	<1
Selenium total	USEPA 200.8	ug/L	10	<1	36	<1	<1	<1	<1
Silver total	USEPA 200.8	ug/L	100	<1	36	<1	<1	<1	<1
Zinc total	USEPA 200.8	ug/L	-	<5	36	<5	15	<5	9
Haloacetic acids									
Bromoacetic acid	ALS: Headspace GCMS	ug/L	-	<5	102	<5	<5	<5	<5
Bromochloroacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	102	<1	5	2	5
Bromodichloroacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	102	<1	10	4	10
Chloroacetic acid	ALS: Headspace GCMS	ug/L	150	<1	102	<1	7	3	6
Dibromoacetic Acid	ALS: Headspace GCMS	ug/L	-	<10	102	<10	<10	<10	<10
Dibromochloroacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	102	5	5	5	5
Dichloroacetic Acid	ALS: Headspace GCMS	ug/L	100	<1	101*	4	58	25	56
Tribromoacetic Acid	ALS: Headspace GCMS	ug/L	-	<10	102	<10	10	<10	10
Trichloroacetic Acid	ALS: Headspace GCMS	ug/L	100	<1	102	7	80	35	77
Sum of Haloacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	102	12	159	68	152
Trihalomethanes									
Bromoform	VIC-CM047	mg/L	-	<0.001	102	<0.001	0.019	<0.001	<0.001
Chloroform	VIC-CM047	mg/L	-	<0.001	102	<0.001	0.120	0.047	0.100
Dibromochloromethane	VIC-CM047	mg/L	-	<0.001	102	<0.001	0.002	<0.001	<0.001
Bromodichloromethane	VIC-CM047	mg/L	-	<0.001	102	<0.001	0.011	0.004	0.010
Trihalomethanes total	VIC-CM047	mg/L	0.25	<0.001	102	0.01	0.130	0.050	0.110
Semi volatile organic compounds (SVOC) Anilines and benzidines									
2-Nitroaniline	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
3-Nitroaniline	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
3,3'-Dichlorobenzidine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
4-Chloroaniline	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
4-Nitroaniline	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Aniline	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Carbazole	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Dibenzofuran	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Chlorinated hydrocarbons									
1,2-Dichlorobenzene	ALS Headspace GCMS	ug/L	1500	<0.25	36	<0.25	<0.25	<0.25	<0.25
1,2-Dichlorobenzene	US EPA 3510/8270	ug/L	1500	<2	12	<2	<2	<2	<2
1,2,4-Trichlorobenzene	US EPA 3510/8270	ug/L	30	<2	36	<2	<2	<2	<2
1,3-Dichlorobenzene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
1,4-Dichlorobenzene	ALS Headspace GCMS	ug/L	40	<0.25	36	<0.25	<0.25	<0.25	<0.25
Hexachlorobenzene	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
Hexachlorobutadiene	ALS Headspace GCMS	ug/L	0.7	<0.25	36	<0.25	<0.25	<0.25	<0.25
Hexachlorocyclopentadiene	US EPA 3510/8270	ug/L	-	<10	36	<10	<10	<10	<10
Hexachloroethane	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Hexachloropropylene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Pentachlorobenzene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Haloethers									
4-Bromophenyl phenyl ether	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2

Table 5. 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
4-Chlorophenyl phenyl ether	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Bis(2-chloroethoxy) methane	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Bis(2-chloroethyl) ether	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Nitroaromatics and ketones									
1-Naphthylamine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
1,3,5-Trinitrobenzene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2-Picoline	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2,4-Dinitrotoluene	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
2,6-Dinitrotoluene	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
4-Aminobiphenyl	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
4-Nitroquinoline-N-oxide	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
5-Nitro-o-toluidine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Acetophenone	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Azobenzene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Chlorobenzilate	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Dimethylaminoazobenzene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Isophorone	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Nitrobenzene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Pentachloronitrobenzene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Phenacetin	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Pronamide	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Nitrosamines									
Methapyrilene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
N-Nitrosodibutylamine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
N-Nitrosodiethylamine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
N-Nitrosodi-n-propylamine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
N-Nitrosodiphenyl & Diphenylamine	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
N-Nitrosomethylethylamine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
N-Nitrosomorpholine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
N-Nitrosopiperidine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
N-Nitrosopyrrolidine	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
Organochlorine pesticides									
4,4′-DDD	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
4,4′-DDE	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
4,4′-DDT	US EPA 3510/8270	ug/L	9	<4	36	<4	<4	<4	<4
Aldrin	US EPA 8081/8082	ug/L	0.3	<0.25	36	<0.25	<0.25	<0.25	<0.25
alpha-BHC	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
alpha-Endosulfan	US EPA 3510/8270	ug/L	20	<2	36	<2	<2	<2	<2
beta-BHC	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
beta-Endosulfan	US EPA 3510/8270	ug/L	20	<2	36	<2	<2	<2	<2
delta-BHC	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Dieldrin	US EPA 8081/8082	ug/L	0.3	<0.25	36	<0.25	<0.25	<0.25	<0.25
Endrin	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Endosulfan sulfate	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
gamma-BHC	US EPA 3510/8270	ug/L	10	<2	36	<2	<2	<2	<2
Heptachlor	US EPA 8081/8082	ug/L	0.3	<0.25	36	<0.25	<0.25	<0.25	<0.25
Heptachlor epoxide	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2

Table 5. 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	ug/L	2	<2	36	<2	<2	<2	<2
Chlorpyrifos	US EPA 3510/8270	ug/L	10	<2	36	<2	<2	<2	<2
Chlorpyrifos-methyl	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Diazinon	US EPA 3510/8270	ug/L	4	<2	36	<2	<2	<2	<2
Dichlorvos	US EPA 3510/8270	ug/L	5	<2	36	<2	<2	<2	<2
Dimethoate	US EPA 3510/8270	ug/L	7	<2	36	<2	<2	<2	<2
Ethion	US EPA 3510/8270	ug/L	4	<2	36	<2	<2	<2	<2
Fenthion	US EPA 3510/8270	ug/L	7	<2	36	<2	<2	<2	<2
Malathion	US EPA 3510/8270	ug/L	70	<2	36	<2	<2	<2	<2
Pirimiphos-ethyl	ALS LC-MSMS	ug/L	0.5	<0.01	36	<0.01	<0.01	<0.01	<0.01
Prothiofos	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Phenolic compounds									
2,3,4,6-Tetrachlorophenol	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2,4-Dichlorophenol	US EPA 8270	ug/L	200	<0.1	36	<0.1	<0.1	<0.1	<0.1
2,4-Dimethylphenol	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2,4,5-Trichlorophenol	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2,4,6-Trichlorophenol	US EPA 3510/8270	ug/L	20	<2	36	<2	<2	<2	<2
2,6-Dichlorophenol	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2-Chlorophenol	US EPA 8270	ug/L	300	<0.05	36	<0.05	<0.05	<0.05	<0.05
2-Methylphenol	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2-Nitrophenol	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
3- & 4-Methylphenol	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
4-Chloro-3-Methylphenol	US EPA 3510/8270	ug/L		<2	36	<2	<2	<2	<2
Pentachlorophenol	US EPA 3510/8270	ug/L	10	<4	36	<4	<4	<4	<4
Phenol	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Phthalates									
Bis(2-ethylhexyl) phthalate	US EPA 3510/8270	ug/L	10	<10	36	<10	<10	<10	<10
Bis(2-ethylhexyl) phthalate	US EPA 8270D	ug/L	10	<10	36	<10	<10	<10	<10
Butyl benzyl phthalate	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Butyl benzyl phthalate	US EPA 8270D	ug/L	-	<2	36	<2	<2	<2	<2
Diethyl phthalate	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Diethyl phthalate	US EPA 8270D	ug/L	-	<2	36	<2	<2	<2	<2
Dimethyl phthalate	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Dimethyl phthalate	US EPA 8270D	ug/L	-	<2	36	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 8270D	ug/L	-	<2	36	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 8270D	ug/L	-	<2	36	<2	<2	<2	<2
Polycyclic aromatic hydrocarbons									
2-Chloronaphthalene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2-Methylnaphthalene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
3-Methylcholanthrene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
7,12-Dimethylbenz(a) anthracene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Acenaphthene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Acenaphthene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2

Table 5. 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	ug/L	-	<1	36	<1	<1	<1	<1
Acenaphthylene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Anthracene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Anthracene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Benz(a)anthracene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Benz(a)anthracene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Benzo(a)pyrene	ALS GCMS-SIM	ug/L	0.01	<0.005	72	<0.005	<0.005	<0.005	<0.005
Benzo(b) fluoranthene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Benzo(k) fluoranthene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Benzo(b) & Benzo(k) fluoranthene	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
Benzo(g.h.i)perylene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Benzo(g.h.i)perylene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Chrysene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Chrysene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Dibenz(a.h)anthracene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Dibenz(a.h)anthracene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Fluoranthene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Fluoranthene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Fluorene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Fluorene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Indeno(1.2.3.cd)pyrene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Indeno(1.2.3-cd)pyrene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
N-2-Fluorenyl Acetamide	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Phenanthrene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Phenanthrene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Pyrene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Pyrene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
PAHs (total)	US EPA 3510/8270	ug/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.

*One sample for Dichloroacetic Acid had an unverifiable result and was exlcuded from this data set.

Table 6. 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	343	<1	<1	<1	<1
Total coliforms	AS 4276.21	MPN/100mL	-	<1	343	<1	1	<1	<1
Heterotrophic plate count	APHA 9215 B	CFU/mL	-	<1	343	<1	>5900	20	8
Physical									
Conductivity	APHA 2510 B	uS/cm	-	<2	36	88	246	125	190
pH	APHA 4500-H B	pH units	-	<0.01	343	7.08	8.32	7.67	7.97
Temperature	APHA 4500-H B	deg. C	-	<0.1	91	9.5	25.3	15.8	22.9
Total dissolved solids	APHA 2540 C	mg/L	-	<10	36	38	129	73	109
True colour	APHA 2120 B	Pt/Co	-	<1	72	<1	2	<1	1
Turbidity	APHA 2130 B	NTU	-	<0.1	91	0.1	1.4	0.3	0.5
Inorganic									
Alkalinity bicarb	APHA 2320 A/B	mg/L	-	<0.1	72	36.8	56.1	43.8	50.4
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	56	44	50
Aluminium acid soluble	USEPA 200.8	ug/L	-	<5	36	21	85	41	61
Asbestos	AS4964-2000	g/kg	-	Absent	12	Absent	Absent	Absent	Absent
Calcium dissolved	USEPA 200.7	mg/L	-	<0.05	36	11.1	20.4	14.4	19.1
Chloride	APHA 21st Ed. 2005, Part 4110 B	mg/L	-	<0.1	12	4.3	8.4	5.3	6.7
Chlorine combined	APHA 4500 -CL G	mg/L	-	<0.03	343	<0.03	0.23	0.05	0.14
Chlorine free	APHA 4500 -CL G	mg/L	-	<0.03	343	0.03	1.40	0.89	1.20
Chlorine total	APHA 4500 -CL G	mg/L	5	<0.03	343	0.1	1.46	0.94	1.26
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	0.66	0.91	0.77	0.87
Hardness total	APHA 2340 B	mg/L	-	<1	36	31	63	41	61
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	0.88	3.36	1.26	2.86
Nitrate	APHA 21st Ed. 2005, Part 4110 B	mg/L N	50	<0.1	12	<0.1	0.4	0.3	0.3
Potassium dissolved	USEPA 200.7	mg/L	-	<0.1	12	0.5	1.4	0.6	1.2
Sodium dissolved	USEPA 200.7	mg/L	-	<0.1	12	2.7	7.4	3.7	5.4
Sulphate	APHA 21st Ed. 2005, Part 4110 B	mg/L SO4	-	<0.4	12	0.7	24.9	5.3	15.2
Total metals									
Aluminium total	USEPA 200.8	ug/L	-	<9	36	24	84	42	66
Antimony total	USEPA 200.8	ug/L	3	<3	36	<3	<3	<3	<3
Arsenic total	USEPA 200.8	ug/L	10	<1	36	<1	<1	<1	<1
Barium total	USEPA 200.8	ug/L	2000	<0.5	36	3.3	8	4.6	6.95
Beryllium total	USEPA 200.8	ug/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	<0.01	<0.01	<0.01
Cadmium total	USEPA 200.8	ug/L	2	<0.05	36	<0.05	<0.05	<0.05	<0.05
Chromium total	USEPA 200.8	ug/L	-	<2	36	<2	<2	<2	<2
Cobalt total	USEPA 200.8	ug/L	-	<0.2	36	<0.2	<0.2	<0.2	<0.2
Copper total	USEPA 200.8	ug/L	2000	<1	72	2	60	13	33
Iron total	USEPA 200.7	mg/L	-	<0.01	72	<0.01	0.13	<0.01	<0.01
Lead total	USEPA 200.8	ug/L	10	<0.2	72	<0.2	0.7	<0.2	0.4

Table 6. 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	0.017	0.003	0.008
Mercury total	USEPA 200.8	ug/L	1	<0.1	36	<0.1	0.1	<0.1	<0.1
Molybdenium total	USEPA 200.8	ug/L	50	<1	36	<1	<1	<1	<1
Nickel total	USEPA 200.8	ug/L	20	<1	36	<1	<1	<1	<1
Selenium total	USEPA 200.8	ug/L	10	<1	36	<1	<1	<1	<1
Silver total	USEPA 200.8	ug/L	100	<1	36	<1	<1	<1	<1
Zinc total	USEPA 200.8	ug/L	-	<5	36	<5	33	<5	9
Haloacetic acids									
Bromoacetic acid	ALS: Headspace GCMS	ug/L	-	<5	94	<5	<5	<5	<5
Bromochloroacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	94	<1	6	2	6
Bromodichloroacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	94	<1	10	4	9
Chloroacetic acid	ALS: Headspace GCMS	ug/L	150	<1	94	<1	6	3	6
Dibromoacetic Acid	ALS: Headspace GCMS	ug/L	-	<10	94	<10	<10	<10	<10
Dibromochloroacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	94	5	5	5	5
Dichloroacetic Acid	ALS: Headspace GCMS	ug/L	100	<1	93*	<1	64	26	63
Tribromoacetic Acid	ALS: Headspace GCMS	ug/L	-	<10	94	<10	10	<10	10
Trichloroacetic Acid	ALS: Headspace GCMS	ug/L	100	<1	94	<1	85	36	84
Sum of Haloacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	94	<1	169	71	166
Trihalomethanes									
Bromoform	VIC-CM047	mg/L	-	<0.001	94	<0.001	<0.001	<0.001	<0.001
Chloroform	VIC-CM047	mg/L	-	<0.001	94	0.013	0.110	0.043	0.100
Dibromochloromethane	VIC-CM047	mg/L	-	<0.001	94	<0.001	<0.001	<0.001	<0.001
Bromodichloromethane	VIC-CM047	mg/L	-	<0.001	94	0.001	0.020	0.004	0.009
Trihalomethanes total	VIC-CM047	mg/L	0.25	<0.001	94	0.014	0.120	0.047	0.110
Semi volatile organic compounds (SVOC) Anilines and benzidines									
2-Nitroaniline	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
3-Nitroaniline	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
3,3′-Dichlorobenzidine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
4-Chloroaniline	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
4-Nitroaniline	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Aniline	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Carbazole	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Dibenzofuran	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Chlorinated hydrocarbons									
1,2-Dichlorobenzene	ALS Headspace GCMS	ug/L	1500	<0.25	36	<0.25	<0.25	<0.25	<0.25
1,2-Dichlorobenzene	US EPA 3510/8270	ug/L	1500	<2	12	<2	<2	<2	<2
1,2,4-Trichlorobenzene	US EPA 3510/8270	ug/L	30	<2	36	<2	<2	<2	<2
1,3-Dichlorobenzene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
1,4-Dichlorobenzene	ALS Headspace GCMS	ug/L	40	<0.25	36	<0.25	<0.25	<0.25	<0.25
Hexachlorobenzene	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
Hexachlorobutadiene	ALS Headspace GCMS	ug/L	0.7	<0.25	36	<0.25	<0.25	<0.25	<0.25
Hexachlorocyclopentadiene	US EPA 3510/8270	ug/L	-	<10	36	<10	<10	<10	<10
Hexachloroethane	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Hexachloropropylene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Pentachlorobenzene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Haloethers									
4-Bromophenyl phenyl ether	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2

Table 6. 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
4-Chlorophenyl phenyl ether	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Bis(2-chloroethoxy) methane	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Bis(2-chloroethyl) ether	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Nitroaromatics and ketones									
1-Naphthylamine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
1,3,5-Trinitrobenzene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2-Picoline	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2,4-Dinitrotoluene	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
2,6-Dinitrotoluene	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
4-Aminobiphenyl	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
4-Nitroquinoline-N-oxide	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
5-Nitro-o-toluidine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Acetophenone	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Azobenzene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Chlorobenzilate	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Dimethylaminoazobenzene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Isophorone	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Nitrobenzene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Pentachloronitrobenzene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Phenacetin	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Pronamide	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Nitrosamines									
Methapyrilene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
N-Nitrosodibutylamine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
N-Nitrosodiethylamine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
N-Nitrosodi-n-propylamine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
N-Nitrosodiphenyl & Diphenylamine	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
N-Nitrosomethylethylamine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
N-Nitrosomorpholine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
N-Nitrosopiperidine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
N-Nitrosopyrrolidine	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
Organochlorine pesticides									
4,4′-DDD	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
4,4′-DDE	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
4,4′-DDT	US EPA 3510/8270	ug/L	9	<4	36	<4	<4	<4	<4
Aldrin	US EPA 8081/8082	ug/L	0.3	<0.25	36	<0.25	<0.25	<0.25	<0.25
alpha-BHC	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
alpha-Endosulfan	US EPA 3510/8270	ug/L	20	<2	36	<2	<2	<2	<2
beta-BHC	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
beta-Endosulfan	US EPA 3510/8270	ug/L	20	<2	36	<2	<2	<2	<2
delta-BHC	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Dieldrin	US EPA 8081/8082	ug/L	0.3	<0.25	36	<0.25	<0.25	<0.25	<0.25
Endrin	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Endosulfan sulfate	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
gamma-BHC	US EPA 3510/8270	ug/L	10	<2	36	<2	<2	<2	<2
Heptachlor	US EPA 8081/8082	ug/L	0.3	<0.25	36	<0.25	<0.25	<0.25	<0.25
Heptachlor epoxide	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2

Table 6. 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	ug/L	2	<2	36	<2	<2	<2	<2
Chlorpyrifos	US EPA 3510/8270	ug/L	10	<2	36	<2	<2	<2	<2
Chlorpyrifos-methyl	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Diazinon	US EPA 3510/8270	ug/L	4	<2	36	<2	<2	<2	<2
Dichlorvos	US EPA 3510/8270	ug/L	5	<2	36	<2	<2	<2	<2
Dimethoate	US EPA 3510/8270	ug/L	7	<2	36	<2	<2	<2	<2
Ethion	US EPA 3510/8270	ug/L	4	<2	36	<2	<2	<2	<2
Fenthion	US EPA 3510/8270	ug/L	7	<2	36	<2	<2	<2	<2
Malathion	US EPA 3510/8270	ug/L	70	<2	36	<2	<2	<2	<2
Pirimiphos-ethyl	ALS LC-MSMS	ug/L	0.5	<0.01	36	<0.01	<0.01	<0.01	<0.01
Prothiofos	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Phenolic compounds									
2,3,4,6-Tetrachlorophenol	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2,4-Dichlorophenol	US EPA 8270	ug/L	200	<0.1	36	<0.1	<0.1	<0.1	<0.1
2,4-Dimethylphenol	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2,4,5-Trichlorophenol	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2,4,6-Trichlorophenol	US EPA 3510/8270	ug/L	20	<2	36	<2	<2	<2	<2
2,6-Dichlorophenol	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2-Chlorophenol	US EPA 8270	ug/L	300	<0.05	36	<0.05	<0.05	<0.05	<0.05
2-Methylphenol	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2-Nitrophenol	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
3- & 4-Methylphenol	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
4-Chloro-3-Methylphenol	US EPA 3510/8270	ug/L		<2	36	<2	<2	<2	<2
Pentachlorophenol	US EPA 3510/8270	ug/L	10	<4	36	<4	<4	<4	<4
Phenol	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Phthalates									
Bis(2-ethylhexyl) phthalate	US EPA 3510/8270	ug/L	10	<10	36	<10	<10	<10	<10
Bis(2-ethylhexyl) phthalate	US EPA 8270D	ug/L	10	<10	36	<10	<10	<10	<10
Butyl benzyl phthalate	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Butyl benzyl phthalate	US EPA 8270D	ug/L	-	<2	36	<2	<2	<2	<2
Diethyl phthalate	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Diethyl phthalate	US EPA 8270D	ug/L	-	<2	36	<2	<2	<2	<2
Dimethyl phthalate	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Dimethyl phthalate	US EPA 8270D	ug/L	-	<2	36	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 8270D	ug/L	-	<2	36	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 8270D	ug/L	-	<2	36	<2	<2	<2	<2
Polycyclic aromatic hydrocarbons									
2-Chloronaphthalene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2-Methylnaphthalene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
3-Methylcholanthrene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
7,12-Dimethylbenz(a) anthracene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Acenaphthene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Acenaphthene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2

Table 6. 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	ug/L	-	<1	36	<1	<1	<1	<1
Acenaphthylene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Anthracene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Anthracene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Benz(a)anthracene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Benz(a)anthracene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Benzo(a)pyrene	ALS GCMS-SIM	ug/L	0.01	<0.005	72	<0.005	<0.005	<0.005	<0.005
Benzo(b) fluoranthene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Benzo(k) fluoranthene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Benzo(b) & Benzo(k) fluoranthene	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
Benzo(g.h.i)perylene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Benzo(g.h.i)perylene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Chrysene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Chrysene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Dibenz(a.h)anthracene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Dibenz(a.h)anthracene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Fluoranthene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Fluoranthene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Fluorene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Fluorene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Indeno(1.2.3.cd)pyrene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Indeno(1.2.3-cd)pyrene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
N-2-Fluorenyl Acetamide	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Phenanthrene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Phenanthrene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Pyrene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Pyrene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
PAHs (total)	US EPA 3510/8270	ug/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.

*One sample for Dichloroacetic Acid had an unverifiable result and was exlcuded from this data set.

Table 7. 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	302	<1	1*	<1	<1
Total coliforms	AS 4276.21	MPN/100mL	-	<1	302	<1	620	4	<1
Heterotrophic plate count	APHA 9215 B	CFU/mL	-	<1	300	<1	>5900	72	6
Physical									
Conductivity	APHA 2510 B	uS/cm	-	<2	24	94	247	130	183
pH	APHA 4500-H B	pH units	-	<0.01	302	5.06	9.55	7.60	7.87
Temperature	APHA 4500-H B	deg. C	-	<0.1	86	8.4	23.7	15.5	22.3
Total dissolved solids	APHA 2540 C	mg/L	-	<10	24	31	120	70	115
True colour	APHA 2120 B	Pt/Co	-	<1	48	<1	12	<1	1
Turbidity	APHA 2130 B	NTU	-	<0.1	56	0.1	15.3	1.0	3
Inorganic									
Alkalinity bicarb	APHA 2320 A/B	mg/L	-	<0.1	48	19.9	58.4	43.1	48.2
Alkalinity carb	APHA 2320 A/B	mg/L	-	<0.1	48	<0.1	15.9	0.4	<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	36	58	44	48
Aluminium acid soluble	USEPA 200.8	ug/L	-	<5	24	25	130	47	77
Asbestos	AS4964-2000	g/kg	-	Absent	12	Absent	Absent	Absent	Absent
Calcium dissolved	USEPA 200.7	mg/L	-	<0.05	24	12.4	18.6	14.5	17.5
Chloride	APHA 21st Ed. 2005, Part 4110 B	mg/L	-	<0.1	12	4.6	8.3	5.3	6.6
Chlorine combined	APHA 4500 -CL G	mg/L	-	<0.03	302	<0.03	0.30	0.06	0.14
Chlorine free	APHA 4500 -CL G	mg/L	-	<0.03	302	<0.03	1.5	0.94	1.22
Chlorine total	APHA 4500 -CL G	mg/L	5	<0.03	302	<0.03	1.59	1.00	1.28
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	0.61	0.83	0.76	0.82
Hardness total	APHA 2340 B	mg/L	-	<1	24	35	61	42	59
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	1.00	3.72	1.41	3.70
Nitrate	APHA 21st Ed. 2005, Part 4110 B	mg/L N	50	<0.1	12	<0.1	0.4	0.3	0.3
Potassium dissolved	USEPA 200.7	mg/L	-	<0.1	12	0.5	1.4	0.6	1.0
Sodium dissolved	USEPA 200.7	mg/L	-	<0.1	12	2.9	7.2	3.6	5.4
Sulphate	APHA 21st Ed. 2005, Part 4110 B	mg/L SO4	-	<0.4	12	3.0	25.7	5.4	14.9
Total metals									
Aluminium total	USEPA 200.8	ug/L	-	<9	25	<9	156	46	76
Antimony total	USEPA 200.8	ug/L	3	<3	25	<3	<3	<3	<3
Arsenic total	USEPA 200.8	ug/L	10	<1	25	<1	<1	<1	<1
Barium total	USEPA 200.8	ug/L	2000	<0.5	25	3.8	9.9	5.0	8.8
Beryllium total	USEPA 200.8	ug/L	60	<0.1	25	<0.1	<0.1	<0.1	<0.1
Boron total	USEPA 200.7	mg/L	4	<0.01	12	<0.01	<0.01	<0.01	<0.01
Cadmium total	USEPA 200.8	ug/L	2	<0.05	25	<0.05	0.10	<0.05	<0.05
Chromium total	USEPA 200.8	ug/L	-	<2	25	<2	<2	<2	<2
Cobalt total	USEPA 200.8	ug/L	-	<0.2	25	<0.2	<0.2	<0.2	<0.2
Copper total	USEPA 200.8	ug/L	2000	<1	49	3	85	16	47
Iron total	USEPA 200.7	mg/L	-	<0.01	49	<0.01	0.06	<0.01	0.02
Lead total	USEPA 200.8	ug/L	10	<0.2	49	<0.2	6.0	0.6	2.4

Table 7. 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	49	<0.001	0.038	0.004	0.011
Mercury total	USEPA 200.8	ug/L	1	<0.1	25	<0.1	0.2	<0.1	<0.1
Molybdenium total	USEPA 200.8	ug/L	50	<1	25	<1	<1	<1	<1
Nickel total	USEPA 200.8	ug/L	20	<1	25	<1	1	<1	<1
Selenium total	USEPA 200.8	ug/L	10	<1	25	<1	<1	<1	<1
Silver total	USEPA 200.8	ug/L	100	<1	25	<1	<1	<1	<1
Zinc total	USEPA 200.8	ug/L	-	<5	25	<5	127	8	13
Haloacetic acids									
Bromoacetic acid	ALS: Headspace GCMS	ug/L	-	<5	68	<5	<5	<5	<5
Bromochloroacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	68	<1	5	2	5
Bromodichloroacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	68	<1	11	4	10
Chloroacetic acid	ALS: Headspace GCMS	ug/L	150	<1	68	<1	7	3	6
Dibromoacetic Acid	ALS: Headspace GCMS	ug/L	-	<10	68	<10	<10	<10	<10
Dibromochloroacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	68	5	5	5	5
Dichloroacetic Acid	ALS: Headspace GCMS	ug/L	100	<1	68	4	54	27	52
Tribromoacetic Acid	ALS: Headspace GCMS	ug/L	-	<10	68	<10	10	<10	10
Trichloroacetic Acid	ALS: Headspace GCMS	ug/L	100	<1	68	5	74	36	69
Sum of Haloacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	68	9	146	73	140
Trihalomethanes									
Bromoform	VIC-CM047	mg/L	-	<0.001	68	<0.001	0.014	<0.001	<0.001
Chloroform	VIC-CM047	mg/L	-	<0.001	68	<0.001	0.120	0.051	0.099
Dibromochloromethane	VIC-CM047	mg/L	-	<0.001	68	<0.001	0.001	<0.001	<0.001
Bromodichloromethane	VIC-CM047	mg/L	-	<0.001	68	<0.001	0.011	0.005	0.010
Trihalomethanes total	VIC-CM047	mg/L	0.25	<0.001	68	0.014	0.130	0.056	0.110
Semi volatile organic compounds (SVOC) Anilines and benzidines									
2-Nitroaniline	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
3-Nitroaniline	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
3,3'-Dichlorobenzidine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
4-Chloroaniline	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
4-Nitroaniline	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Aniline	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Carbazole	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Dibenzofuran	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Chlorinated hydrocarbons									
1,2-Dichlorobenzene	ALS Headspace GCMS	ug/L	1500	<0.25	24	<0.25	<0.25	<0.25	<0.25
1,2-Dichlorobenzene	US EPA 3510/8270	ug/L	1500	<2	12	<2	<2	<2	<2
1,2,4-Trichlorobenzene	US EPA 3510/8270	ug/L	30	<2	24	<2	<2	<2	<2
1,3-Dichlorobenzene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
1,4-Dichlorobenzene	ALS Headspace GCMS	ug/L	40	<0.25	24	<0.25	<0.25	<0.25	<0.25
Hexachlorobenzene	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
Hexachlorobutadiene	ALS Headspace GCMS	ug/L	0.7	<0.25	24	<0.25	<0.25	<0.25	<0.25
Hexachlorocyclopentadiene	US EPA 3510/8270	ug/L	-	<10	24	<10	<10	<10	<10
Hexachloroethane	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Hexachloropropylene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Pentachlorobenzene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Haloethers									
4-Bromophenyl phenyl ether	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2

Table 7. 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
4-Chlorophenyl phenyl ether	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Bis(2-chloroethoxy) methane	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Bis(2-chloroethyl) ether	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Nitroaromatics and ketones									
1-Naphthylamine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
1,3,5-Trinitrobenzene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2-Picoline	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2,4-Dinitrotoluene	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
2,6-Dinitrotoluene	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
4-Aminobiphenyl	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
4-Nitroquinoline-N-oxide	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
5-Nitro-o-toluidine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Acetophenone	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Azobenzene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Chlorobenzilate	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Dimethylaminoazobenzene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Isophorone	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Nitrobenzene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Pentachloronitrobenzene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Phenacetin	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Pronamide	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Nitrosamines									
Methapyrilene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
N-Nitrosodibutylamine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
N-Nitrosodiethylamine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
N-Nitrosodi-n-propylamine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
N-Nitrosodiphenyl & Diphenylamine	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
N-Nitrosomethylethylamine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
N-Nitrosomorpholine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
N-Nitrosopiperidine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
N-Nitrosopyrrolidine	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
Organochlorine pesticides									
4,4′-DDD	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
4,4′-DDE	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
4,4′-DDT	US EPA 3510/8270	ug/L	9	<4	24	<4	<4	<4	<4
Aldrin	US EPA 8081/8082	ug/L	0.3	<0.25	24	<0.25	<0.25	<0.25	<0.25
alpha-BHC	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
alpha-Endosulfan	US EPA 3510/8270	ug/L	20	<2	24	<2	<2	<2	<2
beta-BHC	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
beta-Endosulfan	US EPA 3510/8270	ug/L	20	<2	24	<2	<2	<2	<2
delta-BHC	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Dieldrin	US EPA 8081/8082	ug/L	0.3	<0.25	24	<0.25	<0.25	<0.25	<0.25
Endrin	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Endosulfan sulfate	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
gamma-BHC	US EPA 3510/8270	ug/L	10	<2	24	<2	<2	<2	<2
Heptachlor	US EPA 8081/8082	ug/L	0.3	<0.25	24	<0.25	<0.25	<0.25	<0.25
Heptachlor epoxide	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2

Table 7. 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	ug/L	2	<2	24	<2	<2	<2	<2
Chlorpyrifos	US EPA 3510/8270	ug/L	10	<2	24	<2	<2	<2	<2
Chlorpyrifos-methyl	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Diazinon	US EPA 3510/8270	ug/L	4	<2	24	<2	<2	<2	<2
Dichlorvos	US EPA 3510/8270	ug/L	5	<2	24	<2	<2	<2	<2
Dimethoate	US EPA 3510/8270	ug/L	7	<2	24	<2	<2	<2	<2
Ethion	US EPA 3510/8270	ug/L	4	<2	24	<2	<2	<2	<2
Fenthion	US EPA 3510/8270	ug/L	7	<2	24	<2	<2	<2	<2
Malathion	US EPA 3510/8270	ug/L	70	<2	24	<2	<2	<2	<2
Pirimiphos-ethyl	ALS LC-MSMS	ug/L	0.5	<0.01	24	<0.01	<0.01	<0.01	<0.01
Prothiofos	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Phenolic compounds									
2,3,4,6-Tetrachlorophenol	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2,4-Dichlorophenol	US EPA 8270	ug/L	200	<0.1	24	<0.1	<0.1	<0.1	<0.1
2,4-Dimethylphenol	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2,4,5-Trichlorophenol	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2,4,6-Trichlorophenol	US EPA 3510/8270	ug/L	20	<2	24	<2	<2	<2	<2
2,6-Dichlorophenol	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2-Chlorophenol	US EPA 8270	ug/L	300	<0.05	24	<0.05	<0.05	<0.05	<0.05
2-Methylphenol	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2-Nitrophenol	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
3- & 4-Methylphenol	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
4-Chloro-3-Methylphenol	US EPA 3510/8270	ug/L		<2	24	<2	<2	<2	<2
Pentachlorophenol	US EPA 3510/8270	ug/L	10	<4	24	<4	<4	<4	<4
Phenol	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Phthalates									
Bis(2-ethylhexyl) phthalate	US EPA 3510/8270	ug/L	10	<10	24	<10	<10	<10	<10
Bis(2-ethylhexyl) phthalate	US EPA 8270D	ug/L	10	<10	24	<10	<10	<10	<10
Butyl benzyl phthalate	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Butyl benzyl phthalate	US EPA 8270D	ug/L	-	<2	24	<2	<2	<2	<2
Diethyl phthalate	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Diethyl phthalate	US EPA 8270D	ug/L	-	<2	24	<2	<2	<2	<2
Dimethyl phthalate	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Dimethyl phthalate	US EPA 8270D	ug/L	-	<2	24	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 8270D	ug/L	-	<2	24	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 8270D	ug/L	-	<2	24	<2	<2	<2	<2
Polycyclic aromatic hydrocarbons									
2-Chloronaphthalene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2-Methylnaphthalene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
3-Methylcholanthrene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
7,12-Dimethylbenz(a) anthracene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Acenaphthene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Acenaphthene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2

Table 7. 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	ug/L	-	<1	24	<1	<1	<1	<1
Acenaphthylene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Anthracene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Anthracene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Benz(a)anthracene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Benz(a)anthracene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Benzo(a)pyrene	ALS GCMS-SIM	ug/L	0.01	<0.005	48	<0.005	<0.005	<0.005	<0.005
Benzo(b) fluoranthene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Benzo(k) fluoranthene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Benzo(b) & Benzo(k) fluoranthene	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
Benzo(g.h.i)perylene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Benzo(g.h.i)perylene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Chrysene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Chrysene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Dibenz(a.h)anthracene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Dibenz(a.h)anthracene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Fluoranthene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Fluoranthene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Fluorene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Fluorene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Indeno(1.2.3.cd)pyrene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Indeno(1.2.3-cd)pyrene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
N-2-Fluorenyl Acetamide	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Phenanthrene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Phenanthrene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Pyrene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Pyrene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
PAHs (total)	US EPA 3510/8270	ug/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.

* Exceedence of health value was reported to ACT Health. The site was investigated and found to not be representative of Icon's supply.

Table 8. 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	271	<1	<1	<1	<1
Total coliforms	AS 4276.21	MPN/100mL	-	<1	271	<1	37	<1	<1
Heterotrophic plate count	APHA 9215 B	CFU/mL	-	<1	271	<1	137	4	12
Physical									
Conductivity	APHA 2510 B	uS/cm	-	<2	24	92	183	121	176
pH	APHA 4500-H B	pH units	-	<0.01	271	7.14	8.77	7.78	8.34
Temperature	APHA 4500-H B	deg. C	-	<0.1	51	8.9	23.9	16.6	23.1
Total dissolved solids	APHA 2540 C	mg/L	-	<10	24	51	130	74	114
True colour	APHA 2120 B	Pt/Co	-	<1	48	<1	2	<1	2
Turbidity	APHA 2130 B	NTU	-	<0.1	52	0.1	1.8	0.3	0.6
Inorganic									
Alkalinity bicarb	APHA 2320 A/B	mg/L	-	<0.1	48	37.5	54.6	44.4	51.8
Alkalinity carb	APHA 2320 A/B	mg/L	-	<0.1	48	<0.1	47.5	1.1	<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	38	55	45	52
Aluminium acid soluble	USEPA 200.8	ug/L	-	<5	24	17	70	43	65
Asbestos	AS4964-2000	g/kg	-	Absent	12	Absent	Absent	Absent	Absent
Calcium dissolved	USEPA 200.7	mg/L	-	<0.05	24	12.3	19.3	14.6	18.4
Chloride	APHA 21st Ed. 2005, Part 4110 B	mg/L	-	<0.1	12	4.4	6.8	5.0	6.0
Chlorine combined	APHA 4500 -CL G	mg/L	-	<0.03	271	<0.03	0.19	0.05	0.14
Chlorine free	APHA 4500 -CL G	mg/L	-	<0.03	271	0.07	1.65	0.89	1.26
Chlorine total	APHA 4500 -CL G	mg/L	5	<0.03	271	0.13	1.70	0.94	1.29
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	0.64	0.85	0.76	0.83
Hardness total	APHA 2340 B	mg/L	-	<1	24	34	64	42	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	24	0.83	3.80	1.26	3.23
Nitrate	APHA 21st Ed. 2005, Part 4110 B	mg/L N	50	<0.1	12	0.2	0.4	0.3	0.3
Potassium dissolved	USEPA 200.7	mg/L	-	<0.1	12	0.5	1.4	0.7	1.3
Sodium dissolved	USEPA 200.7	mg/L	-	<0.1	12	2.7	7.1	3.5	5.4
Sulphate	APHA 21st Ed. 2005, Part 4110 B	mg/L SO4	-	<0.4	12	3.0	16.2	4.5	10.0
Total metals									
Aluminium total	USEPA 200.8	ug/L	-	<9	24	26	186	50	65
Antimony total	USEPA 200.8	ug/L	3	<3	24	<3	<3	<3	<3
Arsenic total	USEPA 200.8	ug/L	10	<1	24	<1	<1	<1	<1
Barium total	USEPA 200.8	ug/L	2000	<0.5	24	3.4	8.8	4.7	8.2
Beryllium total	USEPA 200.8	ug/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	<0.01	<0.01	<0.01
Cadmium total	USEPA 200.8	ug/L	2	<0.05	24	<0.05	<0.05	<0.05	<0.05
Chromium total	USEPA 200.8	ug/L	-	<2	24	<2	<2	<2	<2
Cobalt total	USEPA 200.8	ug/L	-	<0.2	24	<0.2	<0.2	<0.2	<0.2
Copper total	USEPA 200.8	ug/L	2000	<1	48	1	48	12	35
Iron total	USEPA 200.7	mg/L	-	<0.01	50	<0.01	0.12	<0.01	0.02
Lead total	USEPA 200.8	ug/L	10	<0.2	48	<0.2	1.2	<0.2	0.3

Table 8. 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	0.041	0.004	0.017
Mercury total	USEPA 200.8	ug/L	1	<0.1	26	<0.1	<0.1	<0.1	<0.1
Molybdenium total	USEPA 200.8	ug/L	50	<1	24	<1	<1	<1	<1
Nickel total	USEPA 200.8	ug/L	20	<1	24	<1	19	1	<1
Selenium total	USEPA 200.8	ug/L	10	<1	24	<1	<1	<1	<1
Silver total	USEPA 200.8	ug/L	100	<1	24	<1	<1	<1	<1
Zinc total	USEPA 200.8	ug/L	-	<5	24	<5	1310	57	<5
Haloacetic acids									
Bromoacetic acid	ALS: Headspace GCMS	ug/L	-	<5	78	<5	<5	<5	<5
Bromochloroacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	78	<1	5	3	5
Bromodichloroacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	78	<1	11	5	10
Chloroacetic acid	ALS: Headspace GCMS	ug/L	150	<1	78	<1	7	4	7
Dibromoacetic Acid	ALS: Headspace GCMS	ug/L	-	<10	78	<10	<10	<10	<10
Dibromochloroacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	78	5	5	5	5
Dichloroacetic Acid	ALS: Headspace GCMS	ug/L	100	<1	78	5	59	31	55
Tribromoacetic Acid	ALS: Headspace GCMS	ug/L	-	<10	78	<10	10	<10	10
Trichloroacetic Acid	ALS: Headspace GCMS	ug/L	100	<1	78	8	82	43	76
Sum of Haloacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	78	13	159	85	150
Trihalomethanes									
Bromoform	VIC-CM047	mg/L	-	<0.001	78	<0.001	<0.001	<0.001	<0.001
Chloroform	VIC-CM047	mg/L	-	<0.001	78	<0.001	0.150	0.064	0.130
Dibromochloromethane	VIC-CM047	mg/L	-	<0.001	78	<0.001	<0.001	<0.001	<0.001
Bromodichloromethane	VIC-CM047	mg/L	-	<0.001	78	<0.001	0.012	0.005	0.011
Trihalomethanes total	VIC-CM047	mg/L	0.25	<0.001	78	<0.001	0.160	0.070	0.140
Semi volatile organic compounds (SVOC) Anilines and benzidines									
2-Nitroaniline	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
3-Nitroaniline	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
3,3'-Dichlorobenzidine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
4-Chloroaniline	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
4-Nitroaniline	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Aniline	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Carbazole	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Dibenzofuran	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Chlorinated hydrocarbons									
1,2-Dichlorobenzene	ALS Headspace GCMS	ug/L	1500	<0.25	24	<0.25	<0.25	<0.25	<0.25
1,2-Dichlorobenzene	US EPA 3510/8270	ug/L	1500	<2	12	<2	<2	<2	<2
1,2,4-Trichlorobenzene	US EPA 3510/8270	ug/L	30	<2	24	<2	<2	<2	<2
1,3-Dichlorobenzene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
1,4-Dichlorobenzene	ALS Headspace GCMS	ug/L	40	<0.25	24	<0.25	<0.25	<0.25	<0.25
Hexachlorobenzene	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
Hexachlorobutadiene	ALS Headspace GCMS	ug/L	0.7	<0.25	24	<0.25	<0.25	<0.25	<0.25
Hexachlorocyclopentadiene	US EPA 3510/8270	ug/L	-	<10	24	<10	<10	<10	<10
Hexachloroethane	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Hexachloropropylene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Pentachlorobenzene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Haloethers									
4-Bromophenyl phenyl ether	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2

Table 8. 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
4-Chlorophenyl phenyl ether	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Bis(2-chloroethoxy) methane	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Bis(2-chloroethyl) ether	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Nitroaromatics and ketones									
1-Naphthylamine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
1,3,5-Trinitrobenzene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2-Picoline	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2,4-Dinitrotoluene	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
2,6-Dinitrotoluene	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
4-Aminobiphenyl	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
4-Nitroquinoline-N-oxide	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
5-Nitro-o-toluidine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Acetophenone	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Azobenzene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Chlorobenzilate	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Dimethylaminoazobenzene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Isophorone	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Nitrobenzene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Pentachloronitrobenzene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Phenacetin	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Pronamide	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Nitrosamines									
Methapyrilene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
N-Nitrosodibutylamine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
N-Nitrosodiethylamine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
N-Nitrosodi-n-propylamine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
N-Nitrosodiphenyl & Diphenylamine	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
N-Nitrosomethylethylamine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
N-Nitrosomorpholine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
N-Nitrosopiperidine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
N-Nitrosopyrrolidine	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
Organochlorine pesticides									
4,4′-DDD	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
4,4′-DDE	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
4,4′-DDT	US EPA 3510/8270	ug/L	9	<4	24	<4	<4	<4	<4
Aldrin	US EPA 8081/8082	ug/L	0.3	<0.25	24	<0.25	<0.25	<0.25	<0.25
alpha-BHC	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
alpha-Endosulfan	US EPA 3510/8270	ug/L	20	<2	24	<2	<2	<2	<2
beta-BHC	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
beta-Endosulfan	US EPA 3510/8270	ug/L	20	<2	24	<2	<2	<2	<2
delta-BHC	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Dieldrin	US EPA 8081/8082	ug/L	0.3	<0.25	24	<0.25	<0.25	<0.25	<0.25
Endrin	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Endosulfan sulfate	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
gamma-BHC	US EPA 3510/8270	ug/L	10	<2	24	<2	<2	<2	<2
Heptachlor	US EPA 8081/8082	ug/L	0.3	<0.25	24	<0.25	<0.25	<0.25	<0.25
Heptachlor epoxide	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2

Table 8. 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	ug/L	2	<2	24	<2	<2	<2	<2
Chlorpyrifos	US EPA 3510/8270	ug/L	10	<2	24	<2	<2	<2	<2
Chlorpyrifos-methyl	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Diazinon	US EPA 3510/8270	ug/L	4	<2	24	<2	<2	<2	<2
Dichlorvos	US EPA 3510/8270	ug/L	5	<2	24	<2	<2	<2	<2
Dimethoate	US EPA 3510/8270	ug/L	7	<2	24	<2	<2	<2	<2
Ethion	US EPA 3510/8270	ug/L	4	<2	24	<2	<2	<2	<2
Fenthion	US EPA 3510/8270	ug/L	7	<2	24	<2	<2	<2	<2
Malathion	US EPA 3510/8270	ug/L	70	<2	24	<2	<2	<2	<2
Pirimiphos-ethyl	ALS LC-MSMS	ug/L	0.5	<0.01	24	<0.01	<0.01	<0.01	<0.01
Prothiofos	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Phenolic compounds									
2,3,4,6-Tetrachlorophenol	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2,4-Dichlorophenol	US EPA 8270	ug/L	200	<0.1	24	<0.1	<0.1	<0.1	<0.1
2,4-Dimethylphenol	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2,4,5-Trichlorophenol	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2,4,6-Trichlorophenol	US EPA 3510/8270	ug/L	20	<2	24	<2	<2	<2	<2
2,6-Dichlorophenol	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2-Chlorophenol	US EPA 8270	ug/L	300	<0.05	24	<0.05	<0.05	<0.05	<0.05
2-Methylphenol	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2-Nitrophenol	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
3- & 4-Methylphenol	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
4-Chloro-3-Methylphenol	US EPA 3510/8270	ug/L		<2	24	<2	<2	<2	<2
Pentachlorophenol	US EPA 3510/8270	ug/L	10	<4	24	<4	<4	<4	<4
Phenol	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Phthalates									
Bis(2-ethylhexyl) phthalate	US EPA 3510/8270	ug/L	10	<10	24	<10	<10	<10	<10
Bis(2-ethylhexyl) phthalate	US EPA 8270D	ug/L	10	<10	24	<10	<10	<10	<10
Butyl benzyl phthalate	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Butyl benzyl phthalate	US EPA 8270D	ug/L	-	<2	24	<2	<2	<2	<2
Diethyl phthalate	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Diethyl phthalate	US EPA 8270D	ug/L	-	<2	24	<2	<2	<2	<2
Dimethyl phthalate	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Dimethyl phthalate	US EPA 8270D	ug/L	-	<2	24	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 8270D	ug/L	-	<2	24	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 8270D	ug/L	-	<2	24	<2	<2	<2	<2
Polycyclic aromatic hydrocarbons									
2-Chloronaphthalene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2-Methylnaphthalene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
3-Methylcholanthrene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
7,12-Dimethylbenz(a)anthracene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Acenaphthene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Acenaphthene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Acenaphthylene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1

Table 8. 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	ug/L	-	<2	24	<2	<2	<2	<2
Anthracene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Anthracene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Benz(a)anthracene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Benz(a)anthracene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Benzo(a)pyrene	ALS GCMS-SIM	ug/L	0.01	<0.005	48	<0.005	<0.005	<0.005	<0.005
Benzo(b) fluoranthene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Benzo(k) fluoranthene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Benzo(b) & Benzo(k) fluoranthene	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
Benzo(g.h.i)perylene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Benzo(g.h.i)perylene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Chrysene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Chrysene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Dibenz(a.h)anthracene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Dibenz(a.h)anthracene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Fluoranthene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Fluoranthene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Fluorene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Fluorene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Indeno(1.2.3.cd)pyrene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Indeno(1.2.3-cd)pyrene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
N-2-Fluorenyl Acetamide	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Phenanthrene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Phenanthrene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Pyrene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Pyrene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
PAHs (total)	US EPA 3510/8270	ug/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
MIB	2-methylisoborneol
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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