Quarterly Water Quality Report
for the
Department of Health

Report to the Department of Health
by
Country Heights Water Pty Ltd
for the period
1 October 2023 to 31 December 2023

Contents

1.0 Water Provider Information

Water Provider Contact Details	
Name of Company	Country Heights Water Pty Ltd ABN 72 624 317 746
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Water Treatment and Distribution

Water from the Leederville confined aquifer is pumped into a 375-kilolitre raw water tank from where the water passes through a sediment filter (which produces high quality water without iron, manganese and turbidity not using any chemicals) prior to pH adjustment (using sodium hydroxide [NaOH] when pH is too low and hydrochloric acid [HCl] when pH is too high) before disinfection with chlorine.

The treated water is then distributed to maintain the residual chlorine in the reticulation at a level of 0.4 milligrams per litre.

Treatment is monitored continuously and regularly tested by a NATA accredited laboratory to ensure it meets the requirements of the ADWG and DoH.

The water is not fluoridated.

The treated water is stored in a 375-kilolitre storage tank adjacent to the Water Treatment Plant for distribution (gravity fed) by a reticulation network to customers in the Country Heights Estate.

Materials used within the bore installation, Water Treatment Plant, storage tanks and reticulation network are approved under Australian Standard AS/NZS 4020 (Testing of Products for Use in Contact with Drinking Water) and comply with the DoH directive Materials and Substances in Contact with Drinking Water Requirements and the MOU.

The critical point at the plant is at the treatment train where the pH is adjusted, and chlorine is added. Only free chlorine and pH are monitored after treatment as treatment does not affect any other water quality parameter, as low turbidity water (<0.3NTU) is pumped from a bore drawing water from the Leederville Aquifer, sampled quarterly, having a pH between 6.65 and 7.51 and an Electrical Conductivity between 518 µS/cm and 576 µS/cm which equates to a Total Dissolved Solids concentration of between 337 mg/L and 374 mg/L.

The filtration system requires regular backwashing to remove materials such as iron precipitates and other impurities, which settle through the carbon filtration media, with the backwashed water pumped to a separate collection tank for further treatment. At regular maintenance intervals the backwash water tank will be dosed with flocculent, which will settle any solids in the bottom of the tank for later removal. The clear water from the top can then be recycled through the system and sent back to the treatment train.

2.0 Performance Summary

Water Quality Meeting the Drinking Water Guidelines/Minister of Health's Directions			
Microbiological Quality	**Zone 1[1] Water Treatment Plant (WTP)**		
	No Assessed[2]	**No within Guidelines**	**Variance[3]**
Thermotolerant Coliforms / *E.coli*	3	3	0
Amoeba (Thermophilic Naegleria)	3	3	0
Chemical Quality[4]			
Chemical – Health Guideline[5] including Total Trihalomethanes	1	1	0
Chemical – Aesthetic[6]	1	1	0
Radiological	0	0	0
	Zone 1[1] Display Home (DH)		
	No Assessed[2]	**No within Guidelines**	**Variance[3]**
Thermotolerant Coliforms / *E.coli*	3	3	0
Amoeba (Thermophilic Naegleria)	3	3	0

Notes:
(1) Table may be expanded or collapsed according to the number of zones.
(2) Number of samples taken for the quarter/year.
(3) Number of samples that do not comply with the drinking water guidelines.
(4) Chemical performance is based on the results of the quarter.
(5) Chemicals tested with a health guideline value – refer to Small Community Sampling Grid.
(6) Chemicals without health guideline values.

3.0 Microbial Performance

3.1 Microbiological - Exception Notifications

Microbiological Water Quality Exceptions							
Region/Scheme/ Zone/Service Provider	Population served	Date	Microbiological Characteristic	Alert Level	Remedial Action	DoH Notified	Close Out Date
Zone 1 (WTP) and (DH): none							

4.0 Chemical - Health Related Performance

4.1 Chemical - Health Related - Exception Notifications

Health Related Chemical Water Quality Exceptions							
Region/Scheme/Zone/ Service Provider	Population served	Date	Health Related Chemical Characteristic	MoU Alert Level	Remedial Action	DoH Notified	Close Out Date
1 – none.							

4.2 Chemical – Health Guideline

Zone 1 Country Heights Estate Water Treatment Plant (WTP)				
Health Characteristic	No of Analyses	No of Analyses Complying	% Compliance	Maximum Concentration (mg/L)
Total Trihalomethanes, THM (0.25mg/L)	3	3	100	0.015
Fluoride, F (1.5mg/L)	1	1	100	<0.01
Nitrite, as NO_3 (50mg/L)	1	1	100	0.02
Nitrate, as NO_2 (3mg/L)	1	1	100	<0.01
Antimony, Sb (0.003mg/L)	1	1	100	<0.001
Arsenic, As (0.01mg/L)	1	1	100	<0.001
Barium, Ba (0.7mg/L)	1	1	100	0.028
Boron, B (4mg/L)	1	1	100	<0.05
Cadmium, Cd (0.002mg/L)	1	1	100	<0.0001
Copper, Cu (2mg/L)	1	1	100	0.006
Lead, Pb (0.01mg/L)	1	1	100	0.002
Manganese, Mn (0.5mg/L)	1	1	100	0.002
Mercury, Hg (0.001mg/L)	1	1	100	<0.0001
Molybdenum, Mo (0.05mg/L)	1	1	100	<0.001
Nickel, Ni (0.02mg/L)	1	1	100	0.010
Selenium, Se (0.01mg/L)	1	1	100	<0.01
Silver, Ag (0.1mg/L)	1	1	100	<0.001
Total Samples Taken	**4**	**All**	**100**	**-**

5.0 Chemical - Aesthetic Performance

5.1 Chemical – Aesthetic Guideline

Zone 1 Country Heights Estate Water Treatment Plant (WTP)				
Aesthetic Characteristic	No of Analyses	No of Analyses Complying	% Compliance	Maximum Concentration (mg/L)
pH (6.5 – 8.5)	1	1	100	7.4
Total Dissolved Solids, TDS (600mg/L)	1	1	100	299
Sulfate, SO_4 (250mg/L)	1	1	100	10
Total Hardness (as $CaCO_3$; 200mg/L	1	1	100	50
Turbidity (5NTU)	1	1	100	0.6
Ammonia, NH_3 (0.5mg/L)	1	1	100	<0.01
Aluminium, Al (0.2mg/L)	1	1	100	<0.01
Iron, Fe (0.3mg/L)	1	1	100	<0.05
Zinc, Zn (3mg/L)	1	1	100	0.041
Total Samples Taken	**1**	**All**	**100**	**-**

5.2 Chemical - Aesthetic - Incident Specific Information

5.2.1 Zone 1 Country Heights Estate Water Treatment Plant (WTP) and Display Home (DH)

No incidents to report.

6.0 Radiological Performance

6.1 Radiological - Exception Notifications

Radiological Water Quality Exceptions							
Zone	Population served	Date	Radiological Characteristic	Alert Level	Remedial Action	DoH Notified	Close Out Date
1 - none							

6.2 Radiological Performance

Zone 1 Country Heights Estate Water Supply Bore CEPB1)

Country Heights Water undertakes radiological monitoring once a year during the January Quarter: this sample was taken in February 2023.

Radiological Characteristic	No of Analyses	No of Analyses Complying	% Compliance	Max Value (Bq/L)
Gross Alpha (0.5)	1	1	100	<0.05
Gross Beta (0.5)	1	1	100	0.26

Bq/L is Becquerels/Litre.

7.0 Planned Sample Summary

Zone	Microbiological			Chemical			Radiological		
	Planned	Taken	% Taken	Planned	Taken	% Taken	Planned	Taken	% Taken
Zone 1 (WTP) and Zone 2 (DH)	3 3	3 3	100 100	1	1	100	1	1	1
Fluoridation of drinking water is not undertaken; hence no sampling will be undertaken.									

7.1 Planned Sample Exceptions

Planned Sample Exceptions				
Zone	Sampling Point	Date Due	Characteristic (Microbiological/Chemical/ Radiological)	Reason for missed sample
None.				

8.0 General Notes

Country Heights Water Pty Ltd adheres strictly to the Guidelines and Regulations of the Department of Health Department WA (DoH) to ensure the safety and health of consumers at the Country Heights Estate are not compromised. The steps we take to treat and disinfect and ensure the drinking water we provide is safe, include targeting microorganisms, as explained below, and implementing recognised industry practices as remedial efforts to combat any of these microorganisms in the potable water we provide and accordingly implement routine monitoring, sampling and analytical testing to ensure our practices are effective and safe.

Micro-organisms (or microbes) are microscopic living organisms, occurring naturally in our environment, in air, soil and in water bodies; some are beneficial, but some may impact human health. Pathogens (pathogenic micro-organisms) are micro-organisms that cause disease or illness; the most common and widespread health risk to humans is associated with drinking water contaminated by pathogens. Organisms associated with faecal matter from humans or other mammals cause several waterborne diseases. It is impossible to test for the presence of all pathogens that may be present in water. The Australian Drinking Water Guidelines recommend testing for the presence of *Escherichia coli (E. coli)* as an indicator of faecal pathogen contamination. The Australian Drinking Water Guidelines state that *E. coli* should not be present in a minimum 100mL sample of drinking water. Thermophilic *Naegleria* refers to a group of common water borne *amoebae* which includes *Naegleria fowleri*, an environmental pathogen living in fresh warm water, and the organism that causes primary amoebic meningoencephalitis, a serious condition, which requires prompt medical treatment to prevent secondary brain damage, neurological (nerve) disorders, or coma.

Country Heights Water Pty Ltd will immediately notify the DoH of any confirmed detection of *E. coli* or Thermophilic *Naegleria* in any microbiological analysis of a sample of water.

8.1 Sampling for Per- and Polyfluorinated Substances (PFAS)

PFAS are a large, complex group of manufactured chemicals that are ingredients in various everyday products. For example, they are used to keep food from sticking to packaging or cookware, make clothes and carpets resistant to stains and water, and create a more effective foam for firefighting. PFAS are used in industries such as aerospace, automotive, construction, and electronics.

PFAS molecules have a chain of linked carbon and fluorine atoms. Because the carbon-fluorine bond is one of the strongest, these chemicals do not degrade easily in the environment and are highly mobile. Multiple health effects associated with PFAS exposure have been identified and are supported by different scientific studies. Concerns about the public health impact of PFAS have arisen for the following reasons:

- Widespread occurrence. Studies find PFAS in the blood and urine of people, and scientists want to know if they cause health problems.
- Numerous exposures. PFAS are used in hundreds of products globally, with many opportunities for human exposure.
- Growing numbers. More than 9,000 PFAS have been identified.
- Persistent. PFAS remain in the environment for an unknown amount of time.

- Bioaccumulation. People may encounter different PFAS chemicals in various ways. Over time, people may take in more of the chemicals than they excrete, a process that leads to bioaccumulation in bodies.

Research conducted to date reveals possible links between human exposures to PFAS and adverse health outcomes. These health effects include altered metabolism, fertility, reduced foetal growth and increased risk of being overweight or obese, increased risk of some cancers, and reduced ability of the immune system to fight infections. While knowledge about the potential health effects of PFAS has grown, many questions remain unanswered with further investigation and research continuing.

Investigations into the presence and extent of PFAS in groundwater in the Leederville Aquifer is currently underway (e-mail correspondence with the Department of Water and Environmental Regulation and the Water Corporation).

Samples of groundwater were obtained on the 16th of March 2023 and 15th of November 2023 and submitted to ALS Environmental Laboratories for determination of Perfluoroalkyl Sulfonic Acids, Perfluoroalkyl Carboxylic Acids, Perfluoroalkyl Sulfonamides, Fluorotelomer Sulfonic Acids and Sums of PFAS; these substances were all below their PFAS Super Ultra Trace Levels, hence are absent in groundwater at the Country Heights Estate.

Zone 1 Country Heights Estate Water Treatment Plant (WTP) **Sample Dates: 16 March 2023 and 15 November 2023**				
Health Characteristic: PFAS Substances	No of Analyses	No of Analyses Complying	% Compliance	Maximum Concentration (mg/L)
Sum of perfluorooctane sulfonate (PFOS) and perfluorohexane sulfonate (PFHxS); 0.07µg/L	2	2	100	<0.0002
Perfluorooctanoic acid (PFOA); 0.56µg/L	2	2	100	<0.0002
Total Samples Taken	**1**	**All**	**100**	**-**

In view of these results, taking due cognisance that the Leederville Aquifer is a confined aquifer i.e. potential contamination from surface sources (including pesticides) are highly unlikely to migrate vertically into the aquifer, hence the risk is negligible, no further sampling for PFAS substances and/or pesticides, will be undertaken.

Notes:

The Australian Drinking Water Guidelines (ADWG) are available from:
https://www.nhmrc.gov.au/about-us/publications/australian-drinking-water- guidelines.
DoH currently uses Version 3.7 (DoH, January, 2023).
DoH currently considers implementing Version 3.8 published in September 2022.

The DoH Fact Sheet Materials, Products and Substances in contact with Drinking Water, May 2023 is available from:
https://www.health.wa.gov.au/~/media/Files/Corporate/general-documents/water/PDF/MaterialsSubstancesDrinkingWater.pdf