



Drinking Water Service

Annual Report

1 July 2022 to 30 June 2023

Central Highlands Regional Council

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Glossary of terms

ADWG	Australian Drinking Water Guidelines (2018). Published by the National Health and Medical Research Council of Australia
CCP	Critical Control Point
CFU/100mL	Colony Forming Units per 100 millilitres
CHRC	Central Highlands Regional Council
DWQMP	Drinking Water Quality Management Plan
<i>E. coli</i>	<i>Escherichia coli</i> , a bacterium that is considered to indicate the presence of faecal contamination and is a potential health risk
LOR	Limit of Reporting
mg/L	Milligrams per litre
ML	Megalitre
µg/L	Micrograms per litre
NTU	Nephelometric Turbidity Units
ND	Not Detected
PFAS	Per-fluoroalkyl and poly-fluoroalkyl substances
pH	Power of Hydrogen
QHFSS	Queensland Health Forensic and Scientific Services
<i>R. raciborskii</i> and <i>Cylindro</i>	<i>Raphidiopsis (formerly Cylindrospermopsis) raciborskii</i> , a freshwater cyanobacteria known to produce the toxin cylindrospermopsin and a potential health risk
RMIP	Risk Management Improvement Program
THM	Trihalomethanes
WTP	Water Treatment Plant
>	Greater than
≥	Greater than or equal to
<	Less than

1 Introduction

This report documents the performance of Central Highlands Regional Council's drinking water service.

It details performance of the water quality and the implementation of actions detailed in the Drinking Water Quality Management Plan (DWQMP) required under the *Water Supply (Safety and Reliability) Act 2008* (the Act).

The report assists the regulator to determine compliance with the current approved DWQMP and provides a public report on the council's management of drinking water.

2 Summary of Schemes Operated

This report relates to the drinking water supply schemes that the Central Highlands Regional Council owned and operated from 1 July 2022 to 30 June 2023.

Table 1 lists the water supply scheme, water source, water treatment process, population and drinking water treatment capacity for the water supply schemes covered in this report.

Table 1 – Summary of water supply schemes

Scheme Name	Communities Supplied	Water Source	Treatment Processes	Population Served [#]	Treatment Capacity ML/day
Anakie	Anakie	May Creek Bore	Disinfection	100	0.4
Bauhinia	Bauhinia Downs	Artesian Bore	Disinfection	25	0.1
Blackwater	Blackwater	Mackenzie River	Coagulation, Filtration, pH correction, Disinfection	4714	15
	Bluff			235	
Capella	Capella	Capella Creek / Mackenzie River	Coagulation, Filtration, Disinfection	975	0.9
Comet	Comet	Comet River	Coagulation, Filtration, pH correction and Disinfection	147	0.3
Dingo	Dingo	Springton Creek / Dingo Creek	Coagulation, Filtration, Disinfection	145	0.4
Duaringa	Duaringa	Dawson River	Coagulation, Filtration and Disinfection	199	0.7
Emerald	Emerald	Nogoa River	Coagulation, Filtration, pH correction, Disinfection	14639	38
Rolleston	Rolleston	Comet River / Sub-artesian Bores	Coagulation, Filtration, Disinfection	255	0.3
Sapphire / Rubyvale	Sapphire / Rubyvale	Retreat Creek Bores	Disinfection	1036	2.1
Springsure	Springsure	Shallow Basalt / Deeper Sandstone Bores	Aeration, Disinfection	723	2
Tieri	Tieri	Mackenzie River	Coagulation, Filtration, pH correction, Disinfection	758	3.6

[#] Available populations at July 2023 sourced @

<https://www.qgso.qld.gov.au/statistics/theme/population/population-estimates/regions>.

3 DWQMP Implementation

The DWQMP describes the operating strategies, operating limits and approaches to water quality monitoring and the overall management of risks to water quality.

Specific changes or improvements to the drinking water services provided by council have occurred with the implementation of a risk management improvement program (RMIP).

3.1 Progress in implementing the risk management improvement program

A summary of that progress and descriptions of the progress made towards the completion of specific tasks can be found in Appendix C. As per section 14 of the overarching volume of the DWQMP the items have been prioritised as short, medium and long-term actions. Short-term actions are intended to be undertaken as soon as possible and completed within 12 months, medium-term actions are intended to be completed within 12-24 months, and long-term actions will be introduced as items in future council budgets to secure capital funding.

3.2 Revisions made to the operational monitoring program to maintain compliance with the water quality criteria in verification monitoring

The operational monitoring program was updated this reporting period and parameters expanded in some locations. Critical limits were reviewed for consistency where possible and as stated in the plan “the critical limits generally do not change, other than to improve processes” and their associated risks.

Additional testing was added to verification monitoring, frequency and sample points updated.

3.3 Amendments made to the DWQMP

There were no amendments made to the DWQMP during the reporting period 01/07/2022 to 30/06/2023.

4 Verification Monitoring - Water Quality Information and Summary

Appendix A provides an overview of the results from the water quality monitoring program for the reporting period of 1 July 2021 to 30 June 2022. The water quality monitoring program was generally carried out as per Section 13 of the approved Central Highlands Regional Council overarching volume of the DWQMP. A small number of samples were collected but did not arrive at Queensland Government Forensic and Scientific Services laboratory for analysis, due to loss of eskies by the courier company engaged for delivery.

The internal database and results in Appendix A are considered complete in so much as all the sample results have been recorded and included. This continues the maturing of our data management as previously identified and completed in the risk management improvement program.

Drinking water results were compared against the water quality criteria, i.e., the health guideline values in the current Australian Drinking Water Guidelines (ADWG), as well as the standards in the former *Public Health Regulation 2005 and the current Public Health Regulation 2018*.

Aesthetic exceedances like pH, sodium and dissolved solids in Springsure and Rolleston, turbidity and iron in Bauhinia and total hardness in Anakie and Sapphire were recorded.

Seasonal monitoring of heavy metals and pesticides was undertaken in both the raw and/or treated water in surface schemes with a potential risk.

Two isolated high turbidity events in Bluff and Duaringa occurred in the reporting period, details are discussed in Section 6 of this report.

In 2021, Queensland Health adopted an interim guideline value of 0.80 mg/L for chlorates. As a result, all service providers using liquid sodium hypochlorite were required to undertake investigative sampling. Council commenced sampling in November 2021, exceedances of the interim guideline value in the reporting period in Bluff, Comet and Dingo, are discussed in Section 6 of this report.

R. raciborskii levels were seasonally monitored in surface water schemes with a recognised risk. The DWQMP trigger level for cylindrospermopsin toxin testing was reached for Capella and Rolleston schemes. While levels of the toxin varied in the raw water no detection was made in the treated water throughout the blue green algae blooms.

Following advice from the regulator as part of the previous DWQMP review, council were advised to undertake radiological monitoring. Quarterly monitoring was completed on bore schemes as the higher priority, with progression to surface schemes to occur over time.

Appendix A (Tables 4.1 to 4.14) contain a summary of the results of the water quality monitoring program for all of council's water supply schemes. Most physicochemical drinking water quality results from the standard monitoring program met the recommended values in the ADWG. An exception was the total Trihalomethanes (THM) value in the surface water sourced schemes of Comet and Tieri. Details of this are discussed in the Section 6 of this report. Note: these results include dual samples sent to the external laboratory which were all compliant.

Appendix B (Tables 5.1 to 5.12) contain a summary of the results of the reticulation *E. coli* verification monitoring program for all council water supply schemes. While all samples taken tested negative for *E. coli*, a number of schemes did have recorded result/s for coliforms. Council observe, monitor, resample and investigate as required positive coliform occurrences.

5 Operational Monitoring

Operational monitoring is undertaken in real time to ensure preventive measures identified are effective. Water analysis recording sheets are completed, entered into the Swim Local database and then archived.

Operational monitoring is scheme specific, parameters, frequency and critical limits are detailed within site-based plans. Operators take chlorine measurements at both representative and accessible locations of the reticulation network to monitor free chlorine residual within the system.

Where operational monitoring of the treated water identifies an exceedance of the water quality criteria health guidelines, this is escalated up the reporting chain and treated as an incident under the Incident and Emergency Response Plan.

6 Incidents Reported to the Regulator

This financial year there were eight incidents where the regulator was notified under sections 102 or 102A of the Act. These notifications did not involve the detection of *E. coli* – an organism that may not directly represent a hazard to human health but indicates the presence of recent faecal contamination.

6.1 Non-compliances with water quality criteria and corrective and preventive actions undertaken

As mentioned in the previous section, Queensland Health adopted an interim guideline value of 0.80 mg/L for chlorates in 2021. In the reporting period, council notified the regulator of three chlorate exceedances of the Queensland Health interim guideline value in Dingo, Bluff and Rolleston.

Additionally, two Trihalomethane (THM) exceedances were reported in Comet and Tieri.

6.2 Prescribed incidents or events reported to the regulator and corrective and preventive actions undertaken

Two high turbidity events were reported during the financial year, firstly following a mains break in Bluff and secondly, a high level of manganese in the raw water at Duaringa.

An event in Anakie required council to issue a 'boil water alert' to the public as a precautionary measure due to a chlorine dosing failure. The boil water alert was lifted once sampling and subsequent results indicated water quality was back in compliance.

Table 2 – Non-compliance and prescribed incidents or events reported to the regulator

Incident date	Scheme	Parameter	Level reported	Health Value	Corrective and Preventive actions
15/11/2022	Comet	THMs	0.28 mg/L	0.25 mg/L	Following rain events, pre-chlorination commenced to manage manganese in the raw water. Pre and post chlorination dose rates were adjusted to achieve optimum dosing and effective disinfection. DWI-481-22-09959
01/12/2022	Bluff	Turbidity	N/A	N/A	A pipeline leak was detected as a point of potential ingress. The leak was repaired, network flushed, and chlorine dosing adjusted to ensure adequate residual. DWI-481-22-09977
14/12/2022	Tieri	THMs	0.27 mg/L	0.25 mg/L	Higher than normal levels of manganese were detected in the raw water post rain. Pre and post chlorine dosing was adjusted to manage the balance between good disinfection and low THM formation. DWI-481-22-10092
09/01/2023	Duaringa	Turbidity	N/A	N/A	Final water turbidity decreased following adjustments to PAC, pre and post chlorine dosing, and ongoing monitoring of manganese levels. DWI-481-23-10110

07/02/2023	Dingo	Chlorates	1.00 mg/L	0.80 mg/L	Review of delivery and storage procedures. Storage container was drained and top up procedure ceased to avoid mixing old and new sodium hypochlorite. New delivery procured and ongoing monitoring continues. DWI-481-23-10185
07/02/2023	Bluff	Chlorates	0.85 mg/L	0.80 mg/L	Storage and replenishment procedures were reviewed, which resulted in the introduction of dilution of sodium hypochlorite for the Bluff scheme. Ongoing monitoring continues to ensure water quality is maintained. DWI-481-23-10184
07/02/2023	Rolleston	Chlorates	0.83 mg/L	0.80 mg/L	Review of delivery and storage procedures to determine optimum future supply frequency and volume. New pallet of sodium hypochlorite procured, switched to a new drum and ongoing monitoring age of product. DWI-481-23-10182
13/03/2023	Anakie	Chlorine	N/A	N/A	A chlorine dosing line direct to the inlet of the raw water tanks was installed. The change in dosing point improved control of chlorine residual for the scheme. DWI-481-23-10209

7 Customer Complaints

Council is required to report on the number of complaints, general details of complaints, and the responses undertaken. Table 3 provides an overview of the customer complaints relating to drinking water quality during this period plus adds some context by including the complaints per 1000 customers.

Table 3 – Customer complaints about water quality (including per 1000 customers)

Scheme	Health Concern	Dirty water	Taste and Odour	Other	Total
Anakie			1 (10.0)		1 (10.0)
Bauhinia					0
Blackwater/Bluff					0
Capella					0
Comet					0
Dingo					0
Duaringa		2 (10.1)			2 (10.1)
Emerald		5 (0.34)	2 (0.14)		7 (0.48)
Rolleston					0
Sapphire/Rubyvale		2 (1.9)			2 (1.9)
Springsure					0
Tieri					0
Total	0	9 (0.375)	3 (0.125)	0	12 (0.50)

* Complaints with multiple categories or multiple complaints for a same event in the system have all been counted as individual complaints for this report. Within the system there are 31 applicable records that total the 31 complaints.

The two graphs overleaf show the breakdown of customer complaints by month in Figure 1 and by scheme in Figure 2. There is a general spread of water quality complaints through the whole reporting period. As expected, there is a higher frequency of complaints for the schemes that service larger communities.

Figure 1 – Monthly complaints about water quality

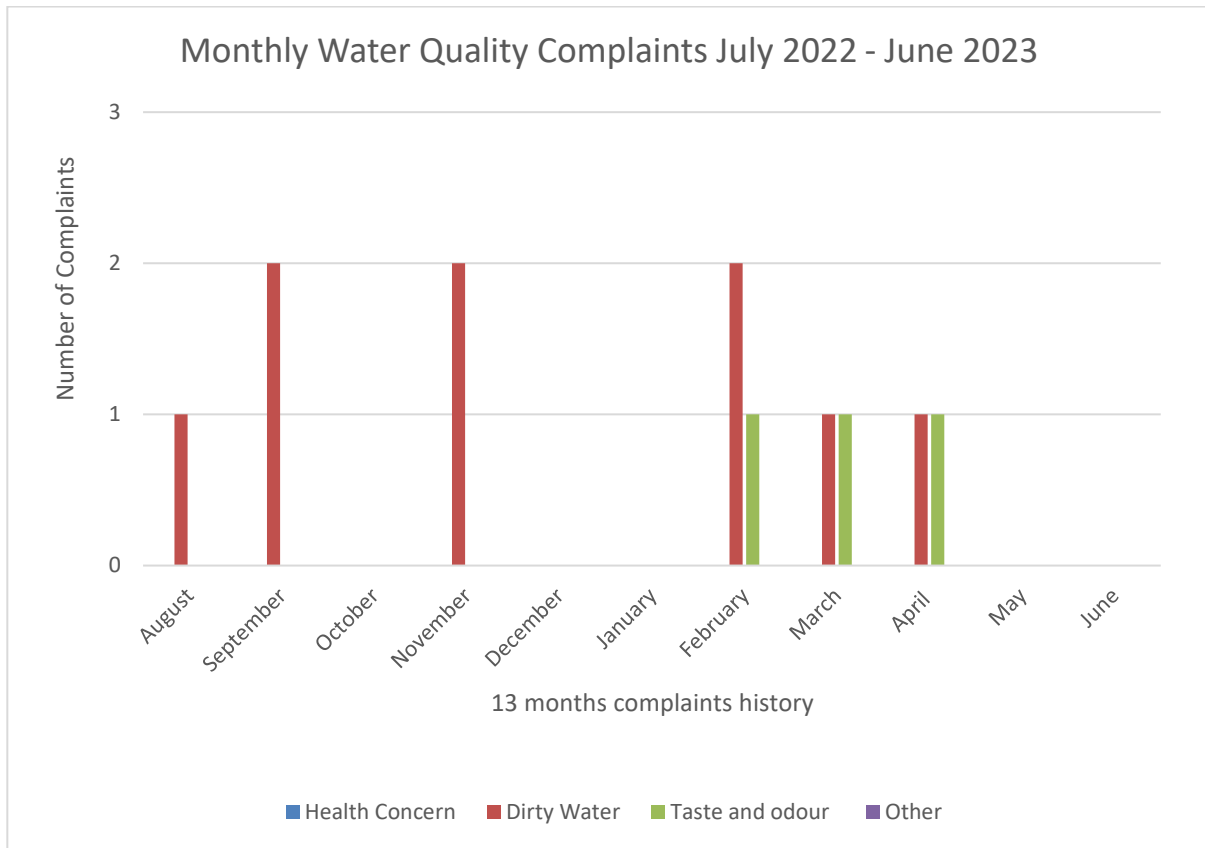
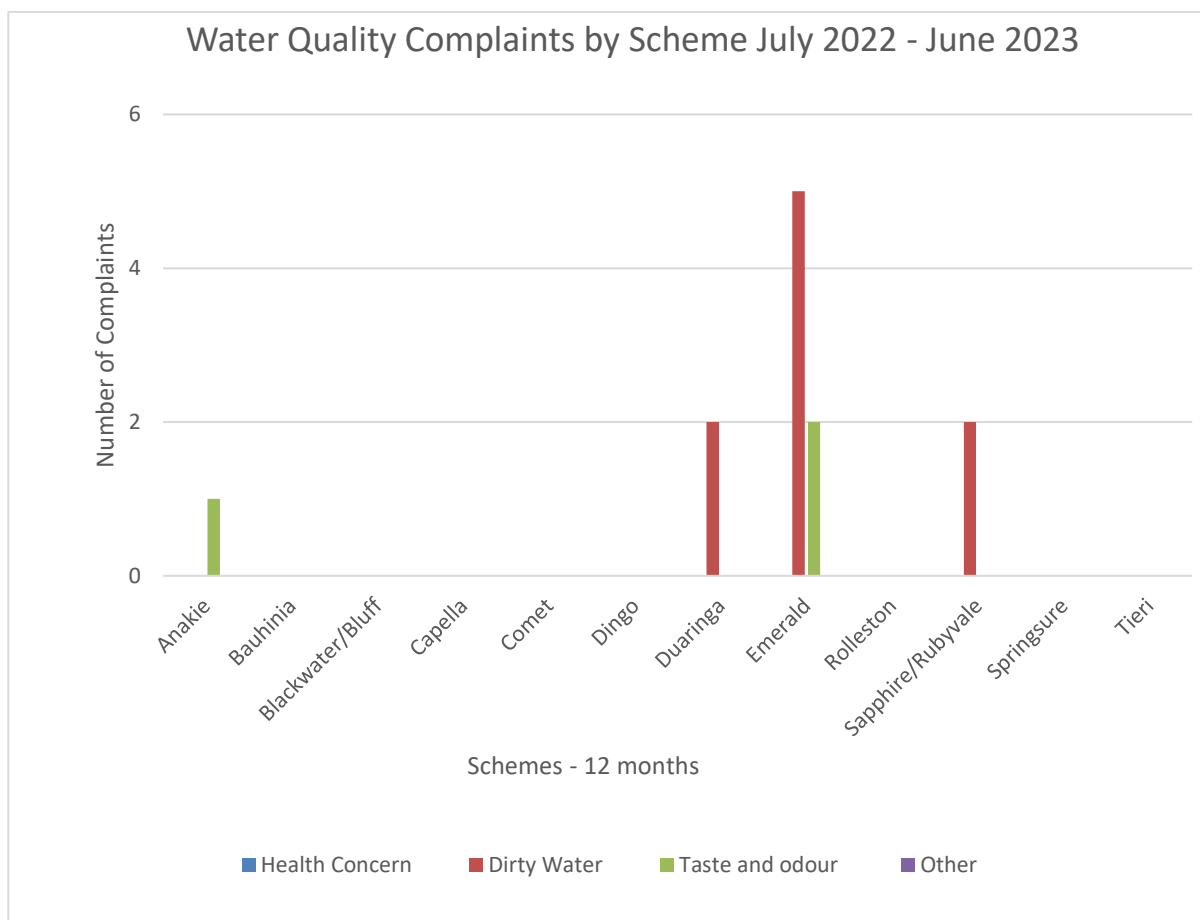


Figure 2 – Complaints about water quality by scheme



7.1 Health Concern

Complaints or enquiries are sometimes received from customers who suspect their water may be associated with an illness they are experiencing. Council investigates each complaint relating to alleged illness from its water quality, typically by testing the customer’s tap and other sampling points close by for general water quality indicators and/or for the presence of *E. coli*. and a standard water analysis as required.

During the 2022-2023 financial year there were no complaints received in relation to a health concern.

7.2 Dirty Water

A total of nine customer complaints associated with dirty water were received between July 2022 and June 2023.

The town of Emerald reported five complaints. Three of these related to black particles in the water, all at differing times, August, September and November. Grab samples were sent for analysis, testing results at the time indicated no parameters exceeded the ADWG guidelines, filters were changed, and lines flushed.

The other two complaints in Emerald were from the same customer, firstly in September and again following replacement of a water meter in March. In both instances the line was flushed, and the dirty water cleared.

Following two separate repairs to mains breaks, council was notified of one complaint in Rubyvale in November where air in the line gave water a milky appearance, and one complaint in Sapphire in April cleared by flushing.

The final two dirty water complaints came from Duaringa in February, in both instances the issue resolved itself and customer notified council the problem had corrected.

Each complaint relating to discoloured water or unusual water appearance is investigated by Council. Testing the water quality, typically by testing the customer's tap and other sampling points close by for turbidity, chlorine levels and/or getting a standard water analysis as required.

The reported areas are then flushed to remove the dirty water and to achieve acceptable chlorine residual results. Flushing targets specific areas such as dead-end mains, where it is anticipated the dirty water would not be flushed through normal use. Customers that report a complaint in this context are advised of the reasons for the dirty or unusual water appearance and are requested to allow the main a short period of time to settle.

7.3 Taste and Odour

A total of three customer complaints associated with taste and odour were received between July 2022 and June 2023.

The three complaints received were isolated, unrelated incidents, in different towns across the region. In Anakie, water quality data was sent to the customer, and no further action taken. The other two complaints in Emerald, were both resolved themselves in a short time without requiring any action from council.

7.4 Other

During the 2022-2023 financial year council received no complaints about 'other' water quality issues.

8 DWQMP Review Outcomes

The next regular review of CHRC's DWQMP is due for completion in November 2023.

CHRC will utilise the DWQMP review prompts from the 'Guideline for the preparation, review and audit of drinking water quality management plans' (2022), as well as expertise and practical field experience to facilitate and structure the review to capture all relevant and necessary requirements.

Following completion of the DWQMP review, an application for approval to amend the DWQMP will be made to the regulator.

9 DWQMP Audit Findings

The second regular audit of CHRC's DWQMP was undertaken in August 2022 through the engagement of Viridis Consultants Pty Ltd, who are Exemplar Global certified drinking water quality management system auditors. The auditor submitted the audit report to the regulator on 27 September 2023. The purpose of the audit was to:

- Verify the accuracy of data,
- Assess compliance with the plan and its conditions,
- Assess the relevance of the plan.

A summary of the auditor's findings includes:

- One major non-compliance due to one step of the Emergency Response Plan not being fully followed during one incident.
- Three minor non-compliances
 - Implementation of preventative measures including a weekly checklist at the Capella WTP and minor damage to the clear water reservoir roof at Tieri WTP.
 - Implementation of operational and maintenance procedures including critical control procedures were overdue for review and instrument calibration had not been completed on time.
 - Relevance of the plan – operational and verification monitoring including aligning critical filtration limits in the DWQMP to the ADWG.
- Overall, a high level of compliance was noted, particularly a significant improvement in infrastructure with the installation of ultrafiltration systems, development of procedures, operational and verification data uploaded to SWIM and being utilised, and close out of items in the Risk Management Improvement Plan.

Findings from both the DWQMP regulatory audits 2018 and 2022 will continue to be considered during the DWQMP review in November 2023.

The next DWQMP regulatory audit is due for completion by November 2026.

Appendix A – Summary of Compliance with Water Quality Criteria

The drinking water results were compared against the water quality criteria, i.e., the health guideline values in the current Australian Drinking Water Guidelines (ADWG), as well as the standards in the former *Public Health Regulation 2005 and the current Public Health Regulation 2018*. While all samples taken tested negative for *E. coli*, a number of schemes did have recorded result/s for coliforms. Most physicochemical drinking water quality results from the standard monitoring program met the recommended health value ranges in the ADWG.

Note: these results include dual samples sent to the external laboratory which were all compliant.

Table 4.1 to 4.14 – Verification monitoring results

Scheme name	Scheme component	Parameter	Units	Minimum frequency of sampling	Total No. samples collected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	LOR
Anakie	Reticulation	Chlorine (Free)	mg/L	Monthly	14	0	0.92	1.82	1.40	0.01
		Ecoli	CFU/100mL	Monthly	14	0	0	0	0	0
		Coliforms	CFU/100mL	Monthly	14	0	0	0	0	0
		Chlorates	mg/L	Seasonal/Event	5	0	0.15	0.32	0.25	0.01
		Trihalomethanes	µg/L	Seasonal/Event	1	0	4	4	4	1
		Conductivity	µs/cm	Monthly	12	No value	690	710	699	1
		pH	at 22°C	Monthly	12	0	7.32	8.07	7.6	0.01
		Total Hardness	mg CaCO ₃ /L	Monthly	12	12	229	233	231	1
		Alkalinity	mg CaCO ₃ /L	Monthly	12	No value	280	290	289	1
		Silica	mg/L	Monthly	12	0	47	48	48	1
		Dissolved Solids	mg/L	Monthly	12	0	420	430	429	1
		True Colour	hazen	Monthly	12	0	8	8	8	1
		Turbidity	NTU	Monthly	12	0	1	1	1	1
		Sodium	mg/L	Monthly	12	0	65	67	66	1
		Potassium	mg/L	Monthly	12	No value	1.2	1.3	1.29	0.1
		Calcium	mg/L	Monthly	12	No value	41	41	41	0.1
		Magnesium	mg/L	Monthly	12	No value	31	32	31.33	0.1
		Chloride	mg/L	Monthly	12	0	47	50	48	1
		Fluoride	mg/L	Monthly	12	0	0.2	0.25	0.225	0.01
		Nitrate	mg/L	Monthly	12	0	0.05	0.09	0.06	0.5
Sulphate	mg/L	Monthly	12	0	19	20	19.83	0.1		
Iron	mg/L	Monthly	12	0	<0.01	<0.01	<0.01	0.01		
Manganese	mg/L	Monthly	12	0	0.001	0.001	0.001	0.01		
Zinc	mg/L	Monthly	12	0	0.06	0.06	0.06	0.01		
Aluminium	mg/L	Monthly	12	0	0.03	0.03	0.03	0.05		
Boron	mg/L	Monthly	12	0	0.05	0.05	0.05	0.01		
Copper	mg/L	Monthly	12	0	0.006	0.13	0.0179	0.03		
	Raw Water	Ecoli	CFU/100mL	Seasonal/Event	14	NA	0	7	1	0

Scheme name	Scheme component	Parameter	Units	Minimum frequency of sampling	Total No. samples collected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	LOR
Bauhinia	Reticulation	Chlorine (Free)	mg/L	Monthly	13	0	0.02	3.6	0.97	0.01
		Coliforms	CFU/100mL	Monthly	13	1	0	200	15	0
		Ecoli	CFU/100mL	Monthly	13	0	0	0	0	0
		Gross Alpha Activity	Bq/L	Seasonal/Event	1	0	0.15	0.15	0.15	0.1
		Gross Beta Activity	Bq/L	Seasonal/Event	1	0	0.20	0.20	0.20	0.1
		Conductivity	µs/cm	Monthly	12	No value	270	480	435	1
		pH	mg/L	Monthly	12	0	7.32	8.70	7.96	0.01
		Total Hardness	mg CaCO ₃ /L	Monthly	12	0	37	65	54	1
		Alkalinity	mg CaCO ₃ /L	Monthly	12	No value	89	180	152	1
		Silica	mg/L	Monthly	12	0	10	18	17	1
		Dissolved Solids	mg/L	Monthly	12	0	160	280	253	1
		True Colour	hazen	Monthly	12	0	8	15	9	1
		Turbidity	NTU	Monthly	12	3	1	6	3	1
		Sodium	mg/L	Monthly	12	0	36	77	63	1
		Potassium	mg/L	Monthly	12	No value	14	23	19.8	0.1
		Calcium	mg/L	Monthly	12	No value	6.8	13	10.4	0.1
		Magnesium	mg/L	Monthly	12	No value	4.8	7.8	6.8	0.1
		Chloride	mg/L	Monthly	12	0	30	52	45	1
		Fluoride	mg/L	Monthly	12	0	0.10	0.18	0.15	0.01
		Nitrate	mg/L	Monthly	12	0	0.10	0.6	0.20	0.5
		Sulphate	mg/L	Monthly	12	0	0.2	0.3	0.3	0.1
		Iron	mg/l	Monthly	12	2	<0.01	0.80	0.18	0.01
		Manganese	mg/L	Monthly	12	0	0.001	0.016	0.004	0.01
		Zinc	mg/L	Monthly	12	0	0.006	0.06	0.056	0.01
		Aluminium	mg/L	Monthly	12	0	0.03	0.03	0.03	0.05
		Boron	mg/L	Monthly	12	0	0.03	0.04	0.04	0.01
		Copper	mg/L	Monthly	12	0	0.003	0.058	0.011	0.03
		Total Aluminium	mg/L	Seasonal/Event	7	0	0.00	0.007	0.003	0.003
		Arsenic	mg/L	Seasonal/Event	7	0	0.0	0.001	0.00053	0.0001
		Cadium	mg/L	Seasonal/Event	7	0	0.0	0.0001	0.00009	0.0001
		Chromium	mg/L	Seasonal/Event	7	0	0.0	0.0001	0.0009	0.0001
		Total Copper	mg/L	Seasonal/Event	7	0	0.0	0.019	0.0107	0.001
		Total Iron	mg/L	Seasonal/Event	7	6	0.0	5.9	2.379	0.005
		Lead	mg/L	Seasonal/Event	7	0	0.0	0.002	0.00041	0.0001
		Total Manganese	mg/L	Seasonal/Event	7	0	0.0	0.23	0.092	0.0001
		Nickel	mg/L	Seasonal/Event	7	0	0.0	0.001	0.00021	0.0001
Total Zinc	mg/L	Seasonal/Event	7	0	0.0	0.009	0.005	0.001		

Scheme name	Scheme component	Parameter	Units	Minimum frequency of sampling	Total No. samples collected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	LOR	
Blackwater	Reticulation	Chlorine (Free)	mg/L	Weekly	60	0	0.16	0.97	0.66	0.01	
		Coliforms	CFU/100mL	Weekly	60	4	0	1	0	0	
		Ecoli	CFU/100mL	Weekly	60	0	0	0	0	0	
		Chlorates	mg/L	Seasonal/Event	6	0	0.12	0.37	0.21	0.01	
		Trihalomethanes	µg/L	Seasonal/Event	6	0	75	140	108	1	
		Conductivity	us/cm	Monthly	12	No value	200	360	263	1	
		pH	mg/L	Monthly	12	0	6.86	7.75	7.26	0.01	
		Total Hardness	mg CaCO3/L	Monthly	12	0	57	95	70	1	
		Alkalinity	mg CaCO3/L	Monthly	12	No value	53	81	66	1	
		Silica	mg/L	Monthly	12	0	10	14	13	1	
		Dissolved Solids	mg/L	Monthly	12	0	120	200	150	1	
		True Colour	hazen	Monthly	12	0	8	8	8	1	
		Turbidity	NTU	Monthly	12	0	1	1	1	1	
		Sodium	mg/L	Monthly	12	0	3	32	19	1	
		Potassium	mg/L	Monthly	12	No value	3.9	7.2	5.3	0.1	
		Calcium	mg/L	Monthly	12	No value	14	23	17.6	0.1	
		Magnesium	mg/L	Monthly	12	No value	5	9.1	6.4	0.1	
		Chloride	mg/L	Monthly	12	0	19	48	31	1	
		Fluoride	mg/L	Monthly	12	0	0.08	0.71	0.45	0.01	
		Nitrate	mg/L	Monthly	12	0	0.1	15	1.6	0.5	
		Sulphate	mg/L	Monthly	12	0	0	20	14	0.1	
		Iron	mg/l	Monthly	12	0	0	<0.01	<0.01	0.01	
		Manganese	mg/L	Monthly	12	0	0.001	0.060	0.006	0.01	
		Zinc	mg/L	Monthly	12	0	0.030	0.060	0.058	0.01	
		Aluminium	mg/L	Monthly	12	0	0.03	0.04	0.03	0.05	
		Boron	mg/L	Monthly	12	0	0.01	0.09	0.05	0.01	
		Copper	mg/L	Monthly	12	0	0.004	0.015	0.008	0.03	
		Metachlor	µg/L	Seasonally	1	NA	0.08	0.08	0.08	0.01	
		Metachlor-OXA	µg/L	Seasonally	1	NA	0.16	0.16	0.16	0.01	
		Tebuthiuron	µg/L	Seasonally	1	NA	0.07	0.07	0.07	0.01	
		Dalapon (2,2-DPA)	µg/L	Seasonally	1	NA	1.8	1.8	1.8	0.01	
		Terbutylazine	µg/L	Seasonally	1	NA	0.02	0.02	0.02	0.01	
		Haloxypop (acid)	µg/L	Seasonally	1	NA	0.04	0.04	0.04	0.01	
	Total Aluminium	mg/L	Seasonal/Event	1	0	0.027	0.027	0.027	0.003		
	Arsenic	mg/L	Seasonal/Event	1	0	0.0003	0.0003	0.0003	0.0001		
	Cadium	mg/L	Seasonal/Event	1	0	0.0001	0.0001	0.0001	0.0001		
	Chromium	mg/L	Seasonal/Event	1	0	0.0001	0.0001	0.0001	0.0001		
	Total Copper	mg/L	Seasonal/Event	1	0	0.008	0.008	0.008	0.001		
	Total Iron	mg/L	Seasonal/Event	1	0	0.005	0.005	0.005	0.005		
	Lead	mg/L	Seasonal/Event	1	0	0.0002	0.0002	0.0002	0.0001		
	Total Manganese	mg/L	Seasonal/Event	1	0	0.0005	0.0005	0.0005	0.0001		
	Nickel	mg/L	Seasonal/Event	1	0	0.0006	0.0006	0.0006	0.0001		
	Total Zinc	mg/L	Seasonal/Event	1	0	0.002	0.002	0.002	0.001		
	Raw Water	Ecoli	CFU/100mL			14	NA	12	110	48	0
		Atrazine	µg/L	Seasonally	1	NA	0.04	0.04	0.04	0.01	
Metachlor		µg/L	Seasonally	1	NA	0.26	0.26	0.26	0.01		
Tebuthiuron		µg/L	Seasonally	1	NA	0.28	0.28	0.28	0.01		
Metsulfuron methyl		µg/L	Seasonally	1	NA	0.24	0.24	0.24	0.01		
Diuron		µg/L	Seasonally	1	NA	0.03	0.03	0.03	0.01		
Propazin-2-hydroxy		µg/L	Seasonally	1	NA	0.01	0.01	0.01	0.01		
Terbutylazine		µg/L	Seasonally	1	NA	0.08	0.08	0.08	0.01		
Haloxypop (acid)		µg/L	Seasonally	1	NA	0.06	0.06	0.06	0.01		
Total Aluminium		mg/L	Seasonal/Event	1	0	1.7	1.7	1.7	0.003		
Arsenic		mg/L	Seasonal/Event	1	0	0.0021	0.0021	0.0021	0.0001		
Cadium		mg/L	Seasonal/Event	1	0	0.0001	0.0001	0.0001	0.0001		
Chromium		mg/L	Seasonal/Event	1	0	0.0013	0.0013	0.0013	0.0001		
Total Copper		mg/L	Seasonal/Event	1	0	0.048	0.048	0.048	0.001		
Total Iron		mg/L	Seasonal/Event	1	0	2.2	2.2	2.2	0.005		
Lead		mg/L	Seasonal/Event	1	0	0.01	0.01	0.01	0.0001		
Total Manganese		mg/L	Seasonal/Event	1	0	0.8	0.8	0.8	0.0001		
Nickel		mg/L	Seasonal/Event	1	0	0.0097	0.0097	0.0097	0.0001		
Total Zinc	mg/L	Seasonal/Event	1	0	0.12	0.12	0.12	0.001			

Scheme name	Scheme component	Parameter	Units	Minimum frequency of sampling	Total No. samples collected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	LOR
Bluff	Reticulation	Chlorine (Free)	mg/L	Monthly	13	0	0.67	1.30	1.05	0.01
		Coliforms	CFU/100mL	Monthly	13	1	0	1	0	0
		Ecoli	CFU/100mL	Monthly	13	0	0	0	0	0
		Chlorates	mg/L	Seasonal/Event	7	3	0.34	1.38	0.69	0.01
		Trihalomethanes	µg/L	Seasonal/Event	7	0	85	170	124	1

Scheme name	Scheme component	Parameter	Units	Minimum frequency of sampling	Total No. samples collected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	LOR
Capella	Reticulation	Chlorine (Free)	mg/L	Monthly	58	0	0.54	1.30	0.90	0.01
		Coliforms	CFU/100mL	Monthly	58	1	0	1	0	0
		Ecoli	CFU/100mL	Monthly	58	0	0	0	0	0
		Trihalomethanes	µg/L	Seasonal/Event	7	0	110	160	127	1
		Conductivity	us/cm	Monthly	12	No value	300	350	321	1
		pH	mg/L	Monthly	12	0	7.73	8.39	7.97	0.01
		Total Hardness	mg CaCO3/L	Monthly	12	0	83	100	90	1
		Alkalinity	mg CaCO3/L	Monthly	12	No value	120	140	128	1
		Silica	mg/L	Monthly	12	0	9	12	11	1
		Dissolved Solids	mg/L	Monthly	12	0	170	200	183	1
		True Colour	hazen	Monthly	12	0	8	8	8	1
		Turbidity	NTU	Monthly	12	0	1	1	1	1
		Sodium	mg/L	Monthly	12	0	29	38	33	1
		Potassium	mg/L	Monthly	12	No value	2.8	3.5	3.1	0.1
		Calcium	mg/L	Monthly	12	No value	18	21	20	0.1
		Magnesium	mg/L	Monthly	12	No value	9.1	12	9.9	0.1
		Chloride	mg/L	Monthly	12	0	25	27	26	1
		Fluoride	mg/L	Monthly	12	0	0.17	0.25	0.20	0.01
		Nitrate	mg/L	Monthly	12	0	0.1	1.2	0.30	0.5
		Sulphate	mg/L	Monthly	12	0	2.5	4.2	3.6	0.1
		Iron	mg/l	Monthly	12	0	<0.01	<0.01	<0.01	0.01
		Manganese	mg/L	Monthly	12	0	0.001	0.001	0.001	0.01
		Zinc	mg/L	Monthly	12	0	0.060	0.060	0.060	0.01
		Aluminium	mg/L	Monthly	12	0	0.03	0.07	0.04	0.05
		Boron	mg/L	Monthly	12	0	0.09	0.10	0.09	0.01
		Copper	mg/L	Monthly	12	0	0.0	0.004	0.003	0.03
		Total Aluminium	mg/L	Seasonal/Event	1	0	0.033	0.033	0.033	0.003
		Arsenic	mg/L	Seasonal/Event	1	0	0.0003	0.0003	0.0003	0.0001
		Cadium	mg/L	Seasonal/Event	1	0	0.0001	0.0001	0.0001	0.0001
		Chromium	mg/L	Seasonal/Event	1	0	0.0001	0.0001	0.0001	0.0001
		Total Copper	mg/L	Seasonal/Event	1	0	0.006	0.006	0.006	0.001
		Total Iron	mg/L	Seasonal/Event	1	0	0.005	0.005	0.005	0.005
		Lead	mg/L	Seasonal/Event	1	0	0.0005	0.0005	0.0005	0.0001
		Total Manganese	mg/L	Seasonal/Event	1	0	0.0003	0.0003	0.0003	0.0001
		Nickel	mg/L	Seasonal/Event	1	0	0.0014	0.0014	0.0014	0.0001
		Total Zinc	mg/L	Seasonal/Event	1	0	0.004	0.004	0.004	0.001
		Atrazine	µg/L	Seasonally	2	NA	0.03	0.11	0.07	0.01
		Desethyl Atrazine	µg/L	Seasonally	2	No value	0.02	0.02	0.02	0.01
		Metachlor	µg/L	Seasonally	1	NA	0.21	0.21	0.21	0.01
		Metolachlor-OXA	µg/L	Seasonally	3	NA	0.46	1.3	0.953	0.01
		Simazine	µg/L	Seasonally	3	NA	0.18	0.7	0.48	0.01
		Tebuthiuron	µg/L	Seasonally	1	NA	0.02	0.02	0.02	0.01
		Atrazine, 2-hydroxy	µg/L	Seasonally	1	NA	0.03	0.03	0.03	0.01
		Dalapon (2,2-DPA)	µg/L	Seasonally	2	NA	0.6	1.6	1.1	0.01
		2,4-D	µg/L	Seasonally	2	NA	0.1	0.16	0.13	0.01
		Fluroxypyr	µg/L	Seasonally	1	NA	0.06	0.06	0.06	0.01
		Terbutylazine	µg/L	Seasonally	3	NA	0.59	2.5	1.397	0.01
		Terbutylazine desethyl	µg/L	Seasonally	2	NA	0.59	1.1	0.845	0.01
		Desisopropyl Atrazine	µg/L	Seasonally	2	NA	0.03	0.05	0.04	0.01
	Imazapyr	µg/L	Seasonally	1	NA	0.03	0.03	0.03	0.01	
MCPA	µg/L	Seasonally	1	NA	0.04	0.04	0.04	0.01		
Haloxypop (acid)	µg/L	Seasonally	1	NA	0.03	0.03	0.03	0.01		
Bromacil	µg/L	Seasonally	1	NA	0.04	0.04	0.04	0.01		
Algae (pot. toxic)	Cells/mL	Seasonally	2	No value	0	83	42	1		
Toxin (cylindro)	µg/L	Seasonally	0	No value				0.2		
Raw Water	Ecoli	CFU/100mL			12	NA	0	550	76	0
	Atrazine	µg/L	Seasonally		3	NA	0.07	0.23	0.127	0.01
	Desethyl Atrazine	µg/L	Seasonally		3	No value	0.04	0.04	0.04	0.01
	Metachlor	µg/L	Seasonally		3	NA	0.48	3.2	1.40	0.01
	Metolachlor-OXA	µg/L	Seasonally		3	NA	0.56	1.2	0.78	0.01
	Simazine	µg/L	Seasonally		3	NA	0.04	1.7	1.2	0.01
	Tebuthiuron	µg/L	Seasonally		1	NA	0.02	0.02	0.02	0.01
	Atrazine, 2-hydroxy	µg/L	Seasonally		2	NA	0.07	0.08	0.075	0.01
	Metsulfuron methyl	µg/L	Seasonally		1	NA	0.03	0.03	0.03	0.01
	2,4-D	µg/L	Seasonally		3	NA	0.09	0.3	0.21	0.01
	Fluroxypyr	µg/L	Seasonally		2	NA	0.06	0.07	0.065	0.01
	Terbutylazine	µg/L	Seasonally		3	NA	1.5	2.9	2.4	0.01
	Terbutylazine desethyl	µg/L	Seasonally		2	NA	0.28	0.29	0.285	0.01
	Desisopropyl Atrazine	µg/L	Seasonally		3	NA	0.09	0.10	0.097	0.01
	Imazapyr	µg/L	Seasonally		2	NA	0.02	0.02	0.02	0.01
	MCPA	µg/L	Seasonally		1	NA	0.06	0.06	0.06	0.01
	Haloxypop (acid)	µg/L	Seasonally		3	NA	0.02	0.04	0.03	0.01
	Bromacil	µg/L	Seasonally		1	NA	0.22	0.22	0.22	0.01
	Imazapic	µg/L	Seasonally		3	NA	0.01	0.04	0.02	0.01
	Total Aluminium	mg/L	Seasonal/Event		1	0	0.14	0.14	0.14	0.003
Arsenic	mg/L	Seasonal/Event		1	0	0.005	0.005	0.005	0.0001	

		Cadium	mg/L	Seasonal/Event	1	0	0.001	0.001	0.001	0.0001
		Chromium	mg/L	Seasonal/Event	1	0	0.0003	0.0003	0.0003	0.0001
		Total Copper	mg/L	Seasonal/Event	1	0	0.007	0.007	0.007	0.001
		Total Iron	mg/L	Seasonal/Event	1	0	0.12	0.12	0.12	0.005
		Lead	mg/L	Seasonal/Event	1	0	0.0003	0.0003	0.0003	0.0001
		Total Manganese	mg/L	Seasonal/Event	1	0	0.014	0.014	0.014	0.0001
		Nickel	mg/L	Seasonal/Event	1	0	0.0029	0.0029	0.0029	0.0001
		Total Zinc	mg/L	Seasonal/Event	1	0	0.003	0.003	0.003	0.001
		Algae (pot. toxic)	Cells/mL	Seasonally	7	No value	530	22000	7576	1
		Toxin (cylindro)	µg/L	Seasonally	0	No value				0.2

Scheme name	Scheme component	Parameter	Units	Minimum frequency of sampling	Total No. samples collected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	LOR
Comet	Reticulation	Chlorine (Free)	mg/L	Monthly	15	0	0.10	1.14	0.68	0.01
		Coliforms	CFU/100mL	Monthly	15	0	0	0	0	0
		Ecoli	CFU/100mL	Monthly	15	0	0	0	0	0
		Chlorates	mg/L	Seasonal/Event	7	1	0.34	0.82	0.58	0.01
		Trihalomethanes	µg/L	Seasonal/Event	8	3	190	310	241	1
		Conductivity	us/cm	Monthly	12	No value	210	260	240	1
		pH	mg/L	Monthly	12	0	7.30	7.99	7.68	0.01
		Total Hardness	mg CaCO3/L	Monthly	12	0	58	87	72	1
		Alkalinity	mg CaCO3/L	Monthly	12	No value	71	110	91	1
		Silica	mg/L	Monthly	12	0	1	20	16	1
		Dissolved Solids	mg/L	Monthly	12	0	130	160	144	1
		True Colour	hazen	Monthly	12	0	8	8	8	1
		Turbidity	NTU	Monthly	12	0	1	1	1	1
		Sodium	mg/L	Monthly	12	0	16	22	19	1
		Potassium	mg/L	Monthly	12	No value	4.5	7.3	5.6	0.1
		Calcium	mg/L	Monthly	12	No value	14	19	16.5	0.1
		Magnesium	mg/L	Monthly	12	No value	5.7	9.8	7.5	0.1
		Chloride	mg/L	Monthly	12	0	16	21	19	1
		Fluoride	mg/L	Monthly	12	0	0.10	0.16	0.14	0.01
		Nitrate	mg/L	Monthly	12	0	0.2	1.4	0.7	0.5
		Sulphate	mg/L	Monthly	12	0	1.4	4.0	2.70	0.1
		Iron	mg/l	Monthly	12	0	<0.01	<0.01	<0.01	0.01
		Manganese	mg/L	Monthly	12	0	0.001	0.007	0.002	0.01
		Zinc	mg/L	Monthly	12	0	0.060	0.060	0.060	0.01
		Aluminium	mg/L	Monthly	12	0	0.03	0.03	0.03	0.05
		Boron	mg/L	Monthly	12	0	0.02	0.06	0.04	0.01
		Copper	mg/L	Monthly	12	0	0.011	0.020	0.014	0.03
		Total Aluminium	mg/L	Seasonal/Event	1	0	0.02	0.02	0.02	0.003
		Arsenic	mg/L	Seasonal/Event	1	0	0.0009	0.0009	0.0009	0.0001
		Cadium	mg/L	Seasonal/Event	1	0	0.0001	0.0001	0.0001	0.0001
		Chromium	mg/L	Seasonal/Event	1	0	0.0001	0.0001	0.0001	0.0001
		Total Copper	mg/L	Seasonal/Event	1	0	0.012	0.012	0.012	0.001
		Total Iron	mg/L	Seasonal/Event	1	0	0.001	0.001	0.001	0.005
	Lead	mg/L	Seasonal/Event	1	0	0.0004	0.0004	0.0004	0.0001	
	Total Manganese	mg/L	Seasonal/Event	1	0	0.0004	0.0004	0.0004	0.0001	
	Nickel	mg/L	Seasonal/Event	1	0	0.0013	0.0013	0.0013	0.0001	
	Total Zinc	mg/L	Seasonal/Event	1	0	0.004	0.004	0.004	0.001	
	Atrazine	µg/L	Seasonally	1	NA	0.09	0.09	0.09	0.01	
	Desethyl Atrazine	µg/L	Seasonally	1	No value	0.02	0.02	0.02	0.01	
	Metachlor	µg/L	Seasonally	1	NA	0.04	0.04	0.04	0.01	
	Tebuthiuron	µg/L	Seasonally	1	NA	0.13	0.13	0.13	0.01	
	Atrazine, 2-hydroxy	µg/L	Seasonally	1	NA	0.06	0.06	0.06	0.01	
	Dalapon (2,2-DPA)	µg/L	Seasonally	1	NA	5.8	5.8	5.8	0.01	
	Terbutylazine	µg/L	Seasonally	1	NA	0.02	0.02	0.02	0.01	
	Raw Water	Metachlor	µg/L	Seasonally	1	NA	0.03	0.03	0.03	0.01
	Raw Water	Tebuthiuron	µg/L	Seasonally	1	NA	0.09	0.09	0.09	0.01

Scheme name	Scheme component	Parameter	Units	Minimum frequency of sampling	Total No. samples collected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	LOR	
Dingo	Reticulation	Chlorine (Free)	mg/L	Monthly	13	0	0.51	1.77	1.06	0.01	
		Coliforms	CFU/100mL	Monthly	13	0	0	0	0	0	
		E.coli	CFU/100mL	Monthly	13	0	0	0	0	0	
		Chlorates	mg/L	Seasonal/Event	6	1	0.20	1.00	0.42	0.01	
		Trihalomethanes	µg/L	Seasonal/Event	7	0	85	150	121	1	
		Conductivity	us/cm	Monthly	12	No value	130	150	138	1	
		pH	mg/L	Monthly	12	0	6.75	7.48	7.02	0.01	
		Total Hardness	mg CaCO3/L	Monthly	12	0	24	32	28	1	
		Alkalinity	mg CaCO3/L	Monthly	12	No value	36	47	41	1	
		Silica	mg/L	Monthly	12	0	10	12	11	1	
		Dissolved Solids	mg/L	Monthly	12	0	77	86	82	1	
		True Colour	hazen	Monthly	12	0	8	8	8	1	
		Turbidity	NTU	Monthly	12	0	1	1	1	1	
		Sodium	mg/L	Monthly	12	0	14	16	15	1	
		Potassium	mg/L	Monthly	12	No value	3.3	4.0	3.7	0.1	
		Calcium	mg/L	Monthly	12	No value	4.4	6.5	5.8	0.1	
		Magnesium	mg/L	Monthly	12	No value	2.7	3.9	3.3	0.1	
		Chloride	mg/L	Monthly	12	0	15	19	17	1	
		Fluoride	mg/L	Monthly	12	0	0.09	0.13	0.11	0.01	
		Nitrate	mg/L	Monthly	12	0	0.2	0.3	0.2	0.5	
		Sulphate	mg/L	Monthly	12	0	1.1	2.1	1.7	0.1	
		Iron	mg/l	Monthly	12	0	<0.01	<0.06	<0.01	0.01	
		Manganese	mg/L	Monthly	12	0	0.001	0.010	0.002	0.01	
		Zinc	mg/L	Monthly	12	0	0.060	0.060	0.060	0.01	
		Aluminium	mg/L	Monthly	12	0	0.03	0.08	0.03	0.05	
		Boron	mg/L	Monthly	12	0	0.05	0.06	0.05	0.01	
		Copper	mg/L	Monthly	12	0	0.003	0.003	0.003	0.03	
		Total Aluminium	mg/L	Seasonal/Event	1	0	0.01	0.01	0.01	0.003	
		Arsenic	mg/L	Seasonal/Event	1	0	0.0004	0.0004	0.0004	0.0001	
		Cadium	mg/L	Seasonal/Event	1	0	0.0001	0.0001	0.0001	0.0001	
		Chromium	mg/L	Seasonal/Event	1	0	0.0001	0.0001	0.0001	0.0001	
		Total Copper	mg/L	Seasonal/Event	1	0	0.002	0.002	0.002	0.001	
		Total Iron	mg/L	Seasonal/Event	1	0	0.01	0.01	0.01	0.005	
	Lead	mg/L	Seasonal/Event	1	0	0.0001	0.0001	0.0001	0.0001		
	Total Manganese	mg/L	Seasonal/Event	1	0	0.001	0.001	0.001	0.0001		
	Nickel	mg/L	Seasonal/Event	1	0	0.0004	0.0004	0.0004	0.0001		
	Total Zinc	mg/L	Seasonal/Event	1	0	0.006	0.006	0.006	0.001		
	Tebuthiuron	µg/L	Seasonally	1	NA	0.11	0.11	0.11	0.01		
	Dalapon (2,2-DPA)	µg/L	Seasonally	1	NA	3.6	3.6	3.6	0.01		
	Hexazinone	µg/L	Seasonally	1	NA	0.01	0.01	0.01	0.01		
	Raw Water	E.coli	CFU/100mL			8	NA	1	82	21	0
		Total Aluminium	mg/L	Seasonal/Event		2	0	0.00	1.20	0.60	0.003
		Arsenic	mg/L	Seasonal/Event		2	0	0.000	0.0013	0.0007	0.0001
Cadium		mg/L	Seasonal/Event		2	0	0.000	0.0001	0.0001	0.0001	
Chromium		mg/L	Seasonal/Event		2	0	0.000	0.0043	0.0022	0.0001	
Total Copper		mg/L	Seasonal/Event		2	0	0.000	0.005	0.003	0.001	
Total Iron		mg/L	Seasonal/Event		2	1	0.00	1.5	0.75	0.005	
Lead		mg/L	Seasonal/Event		2	0	0.000	0.0012	0.0006	0.0001	
Total Manganese		mg/L	Seasonal/Event		2	0	0.000	0.320	0.160	0.0001	
Nickel		mg/L	Seasonal/Event		2	0	0.000	0.0034	0.0017	0.0001	
Total Zinc		mg/L	Seasonal/Event		2	0	0.000	0.012	0.006	0.001	
Tebuthiuron		µg/L	Seasonally		1	NA	0.16	0.16	0.16	0.01	
Hexazinone		µg/L	Seasonally		1	NA	0.03	0.03	0.03	0.01	
Algae (pot. toxic)		Cells/mL	Seasonally		3	No value	0	650	217	1	
Toxin (cylindro)	µg/L	Seasonally		0	No value				0.2		

Scheme name	Scheme component	Parameter	Units	Minimum frequency of sampling	Total No. samples collected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	LOR	
Duaringa	Reticulation	Chlorine (Free)	mg/L	Monthly	13	0	0.53	1.93	1.18	0.01	
		Coliforms	CFU/100mL	Monthly	13	0	0	0	0	0	
		Ecoli	CFU/100mL	Monthly	13	0	0	0	0	0	
		Chlorates	mg/L	Seasonal/Event	5	0	0.16	0.72	0.30	0.01	
		Trihalomethanes	µg/L	Seasonal/Event	7	0	120	200	150	1	
		Conductivity	us/cm	Monthly	12	No value	210	300	243	1	
		pH	mg/L	Monthly	12	0	7.05	7.79	7.52	0.01	
		Total Hardness	mg CaCO3/L	Monthly	12	0	41	66	51	1	
		Alkalinity	mg CaCO3/L	Monthly	12	No value	60	87	71	1	
		Silica	mg/L	Monthly	12	0	13	19	15	1	
		Dissolved Solids	mg/L	Monthly	12	0	120	170	142	1	
		True Colour	hazen	Monthly	12	0	8	8	8	1	
		Turbidity	NTU	Monthly	12	0	1	2	1	1	
		Sodium	mg/L	Monthly	12	0	21	32	27	1	
		Potassium	mg/L	Monthly	12	No value	5.5	6.9	6.1	0.1	
		Calcium	mg/L	Monthly	12	No value	10	16	12.7	0.1	
		Magnesium	mg/L	Monthly	12	No value	2.9	6.2	4.3	0.1	
		Chloride	mg/L	Monthly	12	0	25	37	29	1	
		Fluoride	mg/L	Monthly	12	0	0.10	0.16	0.13	0.01	
		Nitrate	mg/L	Monthly	12	0	0.20	2.0	0.80	0.5	
		Sulphate	mg/L	Monthly	12	0	2.4	6.7	4.8	0.1	
		Iron	mg/l	Monthly	12	0	<0.01	0.01	<0.01	0.01	
		Manganese	mg/L	Monthly	12	0	0.001	0.033	0.007	0.01	
		Zinc	mg/L	Monthly	12	0	0.060	0.060	0.060	0.01	
		Aluminium	mg/L	Monthly	12	0	0.03	0.03	0.03	0.05	
		Boron	mg/L	Monthly	12	0	0.03	0.05	0.04	0.01	
		Copper	mg/L	Monthly	12	0	0.003	0.010	0.007	0.03	
		Total Aluminium	mg/L	Seasonal/Event	2	0	0.00	0.01	0.01	0.003	
		Arsenic	mg/L	Seasonal/Event	2	0	0.0000	0.0026	0.0013	0.0001	
		Cadium	mg/L	Seasonal/Event	2	0	0.0000	0.0001	0.0001	0.0001	
	Chromium	mg/L	Seasonal/Event	2	0	0.0000	0.0001	0.0001	0.0001		
	Total Copper	mg/L	Seasonal/Event	2	0	0.000	0.006	0.003	0.001		
	Total Iron	mg/L	Seasonal/Event	2	0	0.00	0.01	0.01	0.005		
	Lead	mg/L	Seasonal/Event	2	0	0.0000	0.0001	0.0001	0.0001		
	Total Manganese	mg/L	Seasonal/Event	2	0	0.000	0.005	0.003	0.0001		
	Nickel	mg/L	Seasonal/Event	2	0	0.0000	0.0009	0.0005	0.0001		
	Total Zinc	mg/L	Seasonal/Event	2	0	0.000	0.001	0.001	0.001		
	Atrazine	µg/L	Seasonally	2	NA	0.18	0.18	0.18	0.01		
	Desethyl Atrazine	µg/L	Seasonally	2	No value	0.02	0.02	0.02	0.01		
	Metachlor	µg/L	Seasonally	2	NA	0.21	0.21	0.21	0.01		
	Tebuthiuron	µg/L	Seasonally	2	NA	0.54	1.6	1.07	0.01		
	Atrazine, 2-hydroxy	µg/L	Seasonally	1	NA	0.04	0.04	0.04	0.01		
	Dalapon (2,2-DPA)	µg/L	Seasonally	1	NA	2.1	2.1	2.1	0.01		
	Desisopropyl Atrazine	µg/L	Seasonally	1	NA	0.02	0.02	0.02	0.01		
	Hexazinone	µg/L	Seasonally	1	NA	0.02	0.02	0.02	0.01		
	Algae (pot. toxic)	Cells/mL	Seasonally	0	No value				1		
	Raw Water	Ecoli	CFU/100mL			8	NA	0	230	42	0
		Total Aluminium	mg/L	Seasonal/Event		3	0	0.00	0.76	0.31	0.003
		Arsenic	mg/L	Seasonal/Event		3	0	0.0000	0.0043	0.0027	0.0001
		Cadium	mg/L	Seasonal/Event		3	0	0.0000	0.0001	0.0001	0.0001
Chromium		mg/L	Seasonal/Event		3	0	0.0000	0.0006	0.0003	0.0001	
Total Copper		mg/L	Seasonal/Event		3	0	0.000	0.003	0.002	0.001	
Total Iron		mg/L	Seasonal/Event		3	0	0.00	1.1	0.47	0.005	
Lead		mg/L	Seasonal/Event		3	0	0.0000	0.0020	0.0009	0.0001	
Total Manganese		mg/L	Seasonal/Event		3	0	0.000	0.190	0.080	0.0001	
Nickel		mg/L	Seasonal/Event		3	0	0.0000	0.0031	0.0017	0.0001	
Total Zinc		mg/L	Seasonal/Event		3	0	0.000	0.005	0.003	0.001	
Atrazine		µg/L	Seasonally		2	NA	0.45	0.45	0.45	0.01	
Desethyl Atrazine		µg/L	Seasonally		2	No value	0.05	0.50	0.28	0.01	
Metachlor		µg/L	Seasonally		2	NA	0.47	0.47	0.47	0.01	
Tebuthiuron		µg/L	Seasonally		2	NA	1.60	1.60	1.60	0.01	
Atrazine, 2-hydroxy		µg/L	Seasonally		1	NA	0.08	0.08	0.08	0.01	
Diuron		µg/L	Seasonally		1	NA	0.04	0.04	0.04	0.01	
Hexazinone		µg/L	Seasonally		1	NA	0.47	0.47	0.47	0.01	
Desisopropyl Atrazine		µg/L	Seasonally		1	NA	0.02	0.02	0.02	0.01	
Haloxypol Acid		µg/L	Seasonally		1	NA	0.02	0.02	0.02	0.01	
Imazapic		µg/L	Seasonally		1	NA	0.01	0.01	0.01	0.01	
Algae (pot. toxic)		Cells/mL	Seasonally		4	No value	0	250	63	1	
Toxin (microcystins)		µg/L	Seasonally		0	No value				0.2	

Scheme name	Scheme component	Parameter	Units	Minimum frequency of sampling	Total No. samples collected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	LOR		
Emerald	Reticulation	Chlorine (Free)	mg/L	Weekly	114	0	0.49	1.63	1.20	0.01		
		Coliforms	CFU/100mL	Weekly	114	1	0	1	0	0		
		Ecoli	CFU/100mL	Weekly	114	0	0	0	0	0		
		Trihalomethanes	µg/L	Seasonal/Event	2	0	85	90	87	1		
		Conductivity	us/cm	Monthly	24	No value	170	370	246	1		
		pH	mg/L	Monthly	24	0	6.53	7.49	7.25	0.01		
		Total Hardness	mg CaCO3/L	Monthly	24	0	52	97	72	1		
		Alkalinity	mg CaCO3/L	Monthly	24	No value	53	100	80	1		
		Silica	mg/L	Monthly	24	0	9	15	12	1		
		Dissolved Solids	mg/L	Monthly	24	0	100	200	141	1		
		True Colour	hazen	Monthly	24	0	8	8	8	1		
		Turbidity	NTU	Monthly	24	0	1	1	1	1		
		Sodium	mg/L	Monthly	24	0	10	32	18	1		
		Potassium	mg/L	Monthly	24	No value	5.3	7.9	7.14	0.1		
		Calcium	mg/L	Monthly	24	No value	12	22	17.2	0.1		
		Magnesium	mg/L	Monthly	24	No value	5.0	10	7.0	0.1		
		Chloride	mg/L	Monthly	24	0	15	46	25	1		
		Fluoride	mg/L	Monthly	24	0	0.09	1.00	0.48	0.01		
		Nitrate	mg/L	Monthly	24	0	0.09	0.99	0.53	0.5		
		Sulphate	mg/L	Monthly	24	0	2.2	9.9	4.5	0.1		
		Iron	mg/l	Monthly	24	0	<0.01	<0.01	<0.01	0.01		
		Manganese	mg/L	Monthly	24	0	0.001	0.001	0.001	0.01		
		Zinc	mg/L	Monthly	24	0	0.06	0.06	0.06	0.01		
		Aluminium	mg/L	Monthly	24	0	0.03	0.03	0.03	0.05		
		Boron	mg/L	Monthly	24	0	0.04	0.06	0.05	0.01		
		Copper	mg/L	Monthly	24	0	0.005	0.010	0.001	0.03		
		Total Aluminium	mg/L	Seasonal/Event	2	0	0.008	0.012	0.010	0.003		
		Arsenic	mg/L	Seasonal/Event	2	0	0.0004	0.0004	0.0004	0.0001		
		Cadium	mg/L	Seasonal/Event	2	0	0.0001	0.0001	0.0001	0.0001		
		Chromium	mg/L	Seasonal/Event	2	0	0.0001	0.0001	0.0001	0.0001		
		Total Copper	mg/L	Seasonal/Event	2	0	0.011	0.012	0.011	0.001		
		Total Iron	mg/L	Seasonal/Event	2	0	0.005	0.005	0.005	0.005		
		Lead	mg/L	Seasonal/Event	2	0	0.0001	0.0004	0.00025	0.0001		
		Total Manganese	mg/L	Seasonal/Event	2	0	0.0001	0.0005	0.0003	0.0001		
		Nickel	mg/L	Seasonal/Event	2	0	0.0006	0.0006	0.0006	0.0001		
		Total Zinc	mg/L	Seasonal/Event	2	0	0.003	0.006	0.0045	0.001		
		Atrazine	µg/L	Seasonally	2	NA	0.05	0.05	0.05	0.01		
		Tebuthiuron	µg/L	Seasonally	2	NA	0.04	0.72	0.38	0.01		
		Dalapon (2,2-DPA)	µg/L	Seasonally	2	NA	1.2	1.7	1.45	0.01		
		Terbutylazine	µg/L	Seasonally	2	NA	0.01	0.01	0.01	0.01		
		Metachlor	µg/L	Seasonally	2	NA	0.04	0.04	0.04	0.01		
		Raw Water	Ecoli	CFU/100mL			25	NA	4	>2400	365	0
			Total Aluminium	mg/L	Seasonal/Event	2	0	2.4	2.9	2.65	0.003	
	Arsenic		mg/L	Seasonal/Event	2	0	0.0022	0.0022	0.0022	0.0001		
	Cadium		mg/L	Seasonal/Event	2	0	0.0001	0.0001	0.0001	0.0001		
	Chromium		mg/L	Seasonal/Event	2	0	0.0023	0.0032	0.0027	0.0001		
	Total Copper		mg/L	Seasonal/Event	2	0	0.003	0.012	0.075	0.001		
Total Iron	mg/L		Seasonal/Event	2	0	2.6	3.1	2.85	0.005			
Lead	mg/L		Seasonal/Event	2	0	0.001	0.0008	0.0009	0.0001			
Total Manganese	mg/L		Seasonal/Event	2	0	0.052	0.081	0.067	0.0001			
Nickel	mg/L		Seasonal/Event	2	0	0.0046	0.0055	0.0050	0.0001			
Total Zinc	mg/L		Seasonal/Event	2	0	0.007	0.008	0.0075	0.001			
Atrazine	µg/L		Seasonally	1	NA	0.07	0.07	0.07	0.01			
Metachlor	µg/L		Seasonally	1	NA	0.07	0.07	0.07	0.01			
Tebuthiuron	µg/L		Seasonally	1	NA	1.0	1.0	1.0	0.01			
Terbutylazine	µg/L	Seasonally	1	NA	0.02	0.02	0.02	0.01				

Scheme name	Scheme component	Parameter	Units	Minimum frequency of sampling	Total No. samples collected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	LOR
Rolleston	Reticulation	Chlorine (Free)	mg/L	Weekly	13	0	0.63	1.86	1.12	0.01
		Coliforms	CFU/100mL	Weekly	13	0	0	0	0	0
		Ecoli	CFU/100mL	Weekly	13	0	0	0	0	0
		Chlorates	mg/L	Seasonal/Event	7	1	0.14	1.49	0.57	0.01
		Trihalomethanes	µg/L	Seasonal/Event	8	0	140	250	183	1
		Conductivity	us/cm	Monthly	12	No value	200	790	266	1
		pH	mg/L	Monthly	12	4	7.60	8.81	8.24	0.01
		Total Hardness	mg CaCO3/L	Monthly	12	0	44	70	60	1
		Alkalinity	mg CaCO3/L	Monthly	12	No value	80	180	96	1
		Silica	mg/L	Monthly	12	0	10	15	11	1
		Dissolved Solids	mg/L	Monthly	12	0	120	450	154	1
		True Colour	hazen	Monthly	12	0	8	8	8	1
		Turbidity	NTU	Monthly	12	0	1	1	1	1
		Sodium	mg/L	Monthly	12	0	16	160	31	1
		Potassium	mg/L	Monthly	12	No value	3.9	6.1	5.6	0.1
		Calcium	mg/L	Monthly	12	No value	11	15	13.1	0.1
		Magnesium	mg/L	Monthly	12	No value	4.3	7.9	6.6	0.1
		Chloride	mg/L	Monthly	12	0	12	120	24	1
		Fluoride	mg/L	Monthly	12	0	0.17	0.20	0.19	0.01
		Nitrate	mg/L	Monthly	12	0	0.20	5.2	1.1	0.5
		Sulphate	mg/L	Monthly	12	0	1.0	33	4.6	0.1
		Iron	mg/l	Monthly	12	0	<0.01	<0.01	<0.01	0.01
		Manganese	mg/L	Monthly	12	0	0.001	0.004	0.001	0.01
		Zinc	mg/L	Monthly	12	0	0.06	0.06	0.06	0.01
		Aluminium	mg/L	Monthly	12	0	0.00	0.06	0.03	0.05
		Boron	mg/L	Monthly	12	0	0.04	0.06	0.04	0.01
		Copper	mg/L	Monthly	12	0	0.003	0.008	0.006	0.03
		Total Aluminium	mg/L	Seasonal/Event	2	0	0.00	0.04	0.02	0.003
		Arsenic	mg/L	Seasonal/Event	2	0	0.000	0.0014	0.0007	0.0001
		Cadium	mg/L	Seasonal/Event	2	0	0.000	0.0001	0.0001	0.0001
		Chromium	mg/L	Seasonal/Event	2	0	0.000	0.0001	0.0001	0.0001
		Total Copper	mg/L	Seasonal/Event	2	0	0.000	0.005	0.003	0.001
	Total Iron	mg/L	Seasonal/Event	2	0	0.000	0.001	0.001	0.005	
	Lead	mg/L	Seasonal/Event	2	0	0.000	0.0001	0.0001	0.0001	
	Total Manganese	mg/L	Seasonal/Event	2	0	0.000	0.001	0.001	0.0001	
	Nickel	mg/L	Seasonal/Event	2	0	0.000	0.0006	0.0003	0.0001	
	Total Zinc	mg/L	Seasonal/Event	2	0	0.000	0.002	0.001	0.001	
	Atrazine	µg/L	Seasonally	1	NA	0.02	0.02	0.02	0.01	
	Desethyl Atrazine	µg/L	Seasonally	1	No value	0.01	0.01	0.01	0.01	
	Metachlor	µg/L	Seasonally	1	NA	0.03	0.03	0.03	0.01	
	Tebuthiuron	µg/L	Seasonally	1	NA	0.83	0.83	0.83	0.01	
	Atrazine, 2-hydroxy	µg/L	Seasonally	1	NA	0.12	0.12	0.12	0.01	
	Dalapon (2,2-DPA)	µg/L	Seasonally	1	NA	1.8	1.8	1.8	0.01	
Fluroxypyr	µg/L	Seasonally	1	NA	0.09	0.09	0.09	0.01		
Desisopropyl Atrazine	µg/L	Seasonally	1	NA	0.01	0.01	0.01	0.01		
Algae (pot. toxic)	Cells/mL	Seasonally	4	No value	0	0	0	1		
Toxin (cylindro)	µg/L	Seasonally	1	No value	0.20	0.2	0.2	0.2		
Ecoli	CFU/100mL				7	NA	0	6	2	0
Algae (pot. toxic)	Cells/mL	Seasonally			10	No value	80	45,000	11,495	1
Toxin (cylindro)	µg/L	Seasonally			4	No value	0.2	3.3	1.7	0.2
Desethyl Atrazine	µg/L	Seasonally			1	No value	0.01	0.01	0.01	0.01
Metachlor	µg/L	Seasonally			1	NA	0.02	0.02	0.02	0.01
Tebuthiuron	µg/L	Seasonally			1	NA	1.00	1.00	1.00	0.01
Atrazine, 2-hydroxy	µg/L	Seasonally			1	NA	0.11	0.11	0.11	0.01
Fluroxypyr	µg/L	Seasonally			1	NA	0.10	0.10	0.10	0.01
Desisopropyl Atrazine	µg/L	Seasonally			1	NA	0.02	0.02	0.02	0.01
	Raw Water									

Scheme name	Scheme component	Parameter	Units	Minimum frequency of sampling	Total No. samples collected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	LOR
Rubyvale	Reticulation	Chlorine (Free)	mg/L	Weekly	57	0	0.52	1.26	0.95	0.01
		Coliforms	CFU/100mL	Weekly	57	1	0	1	0	0
		Ecoli	CFU/100mL	Weekly	57	0	0	0	0	0
		Chlorates	mg/L	Seasonal/Event	3	0	0.06	0.06	0.06	0.01
		Conductivity	us/cm	Monthly	12	No value	450	560	512	1
		pH	mg/L	Monthly	12	0	6.58	8.14	7.64	0.01
		Total Hardness	mg CaCO3/L	Monthly	12	1	140	180	160	1
		Alkalinity	mg CaCO3/L	Monthly	12	No value	150	170	159	1
		Silica	mg/L	Monthly	12	0	34	35	34	1
		Dissolved Solids	mg/L	Monthly	12	0	270	340	306	1
		True Colour	hazen	Monthly	12	0	8	8	8	1
		Turbidity	NTU	Monthly	12	0	1	1	1	1
		Sodium	mg/L	Monthly	12	0	39	47	43	1
		Potassium	mg/L	Monthly	12	No value	1.2	1.3	1.3	0.1
		Calcium	mg/L	Monthly	12	No value	35	45	39.8	0.1
		Magnesium	mg/L	Monthly	12	No value	13	16	14.6	0.1
		Chloride	mg/L	Monthly	12	0	41	61	51	1
		Fluoride	mg/L	Monthly	12	0	0.20	0.84	0.56	0.01
		Nitrate	mg/L	Monthly	12	0	3.2	3.9	3.6	0.5
		Sulphate	mg/L	Monthly	12	0	17	26	22	0.1
Iron	mg/l	Monthly	12	0	<0.01	<0.01	<0.01	0.01		
Manganese	mg/L	Monthly	12	0	0.001	0.001	0.001	0.01		
Zinc	mg/L	Monthly	12	0	0.06	0.06	0.06	0.01		
Aluminium	mg/L	Monthly	12	0	0.03	0.03	0.03	0.05		
Boron	mg/L	Monthly	12	0	0.03	0.04	0.04	0.01		
Copper	mg/L	Monthly	12	0	0.037	0.083	0.049	0.03		

Scheme name	Scheme component	Parameter	Units	Minimum frequency of sampling	Total No. samples collected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	LOR	
Sapphire	Reticulation	Chlorine (Free)	mg/L	Weekly	56	0	0.61	1.49	1.10	0.01	
		Coliforms	CFU/100mL	Weekly	56	1	0	1	0	0	
		Ecoli	CFU/100mL	Weekly	56	0	0	0	0	0	
		Chlorates	mg/L	Seasonal/Event	3	0	0.04	0.08	0.05	0.01	
		Conductivity	us/cm	Monthly	14	No value	450	700	528	1	
		pH	mg/L	Monthly	14	0	6.88	8.28	7.76	0.01	
		Total Hardness	mg CaCO3/L	Monthly	14	1	140	231	166	1	
		Alkalinity	mg CaCO3/L	Monthly	14	No value	150	290	168	1	
		Silica	mg/L	Monthly	14	0	34	48	35	1	
		Dissolved Solids	mg/L	Monthly	14	0	270	430	316	1	
		True Colour	hazen	Monthly	14	0	8	8	8	1	
		Turbidity	NTU	Monthly	14	0	1	1	1	1	
		Sodium	mg/L	Monthly	14	0	38	65	45	1	
		Potassium	mg/L	Monthly	14	No value	1.1	1.3	1.2	0.1	
		Calcium	mg/L	Monthly	14	No value	10	45	37	0.1	
		Magnesium	mg/L	Monthly	14	No value	13	31	16	0.1	
		Chloride	mg/L	Monthly	14	0	41	61	53	1	
		Fluoride	mg/L	Monthly	14	0	0.19	0.87	0.51	0.01	
		Nitrate	mg/L	Monthly	14	0	0.05	4	3.4	0.5	
		Sulphate	mg/L	Monthly	14	0	17	26	22	0.1	
		Iron	mg/l	Monthly	14	0	<0.01	<0.01	<0.01	0.01	
		Manganese	mg/L	Monthly	14	0	0.001	0.001	0.001	0.01	
		Zinc	mg/L	Monthly	14	0	0.06	0.06	0.06	0.01	
		Aluminium	mg/L	Monthly	14	0	0.03	0.03	0.03	0.05	
		Boron	mg/L	Monthly	14	0	0.03	0.05	0.04	0.01	
		Copper	mg/L	Monthly	14	0	0.006	0.27	0.033	0.03	
		Raw Water	Ecoli Bore 1	CFU/100mL	Monthly	12	NA	0	1	0	0
			Ecoli Bore 2	CFU/100mL	Monthly	13	NA	0	0	0	0
			Ecoli Bore 3	CFU/100mL	Monthly	9	NA	0	1	0	0

Scheme name	Scheme component	Parameter	Units	Minimum frequency of sampling	Total No. samples collected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	LOR
Springsure	Upper Reticulation Zone SG	Chlorine (Free)	mg/L	Monthly	13	0	0.61	1.71	1.34	0.01
		Coliforms	CFU/100mL	Monthly	13	0	0	0	0	0
		Ecoli	CFU/100mL	Monthly	13	0	0	0	0	0
		Conductivity	us/cm	Monthly	11	No value	960	970	963	1
		pH	mg/L	Monthly	11	1	8.22	8.56	8.40	0.01
		Total Hardness	mg CaCO3/L	Monthly	11	0	14	16	15	1
		Alkalinity	mg CaCO3/L	Monthly	11	No value	480	490	489	1
		Silica	mg/L	Monthly	11	0	20	21	21	1
		Dissolved Solids	mg/L	Monthly	11	0	590	600	592	1
		True Colour	hazen	Monthly	11	0	8	8	8	1
		Turbidity	NTU	Monthly	11	0	1	1	1	1
		Sodium	mg/L	Monthly	11	11	230	240	235	1
		Potassium	mg/L	Monthly	11	No value	3.9	4.1	4	0.1
		Calcium	mg/L	Monthly	11	No value	3.7	4.5	4.1	0.1
		Magnesium	mg/L	Monthly	11	No value	1.2	1.3	1.2	0.1
		Chloride	mg/L	Monthly	11	0	31	33	32	1
		Fluoride	mg/L	Monthly	11	0	0.45	0.50	0.47	0.01
		Nitrate	mg/L	Monthly	11	0	0.2	0.3	0.3	0.5
		Sulphate	mg/L	Monthly	11	0	0.2	8.9	1.0	0.1
		Iron	mg/l	Monthly	11	0	0.05	0.08	0.06	0.01
		Manganese	mg/L	Monthly	11	0	0.001	0.002	0.001	0.01
		Zinc	mg/L	Monthly	11	0	0.06	0.06	0.06	0.01
		Aluminium	mg/L	Monthly	11	0	0.03	0.03	0.03	0.05
		Boron	mg/L	Monthly	11	0	0.17	0.18	0.17	0.01
		Copper	mg/L	Monthly	11	0	0.003	0.025	0.006	0.03
		Total Aluminium	mg/L	Seasonal/Event	1	0	0.01	0.01	0.01	0.003
		Arsenic	mg/L	Seasonal/Event	1	0	0.0001	0.0001	0.0001	0.0001
		Cadium	mg/L	Seasonal/Event	1	0	0.0001	0.0001	0.0001	0.0001
		Chromium	mg/L	Seasonal/Event	1	0	0.0001	0.0001	0.0001	0.0001
		Total Copper	mg/L	Seasonal/Event	1	0	0.005	0.005	0.005	0.001
	Total Iron	mg/L	Seasonal/Event	1	0	0.06	0.06	0.06	0.005	
	Lead	mg/L	Seasonal/Event	1	0	0.0002	0.0002	0.0002	0.0001	
	Total Manganese	mg/L	Seasonal/Event	1	0	0.001	0.001	0.001	0.0001	
	Nickel	mg/L	Seasonal/Event	1	0	0.0001	0.0001	0.0001	0.0001	
	Total Zinc	mg/L	Seasonal/Event	1	0	0.005	0.005	0.005	0.001	
	Raw Water	Gross Alpha Activity Bore 11	Bq/L	Seasonal/Event	1	0	0.10	0.10	0.10	0.1
		Gross Beta Activity Bore 11	Bq/L	Seasonal/Event	1	0	0.20	0.20	0.20	0.1
		Gross Alpha Activity Bore 12	Bq/L	Seasonal/Event	1	0	0.10	0.10	0.10	0.1
		Gross Beta Activity Bore 12	Bq/L	Seasonal/Event	1	0	0.20	0.20	0.20	0.1
	Lower Reticulation Zone WH	Chlorine (Free)	mg/L	Monthly	13	0	0.80	1.50	1.20	0.01
		Coliforms	CFU/100mL	Monthly	13	0	0	0	0	0
		Ecoli	CFU/100mL	Monthly	13	0	0	0	0	0
		Conductivity	us/cm	Monthly	12	No value	960	1200	1163	1
		pH	mg/L	Monthly	12	4	8.34	8.80	8.50	0.01
		Total Hardness	mg CaCO3/L	Monthly	12	0	11	16	13	1
		Alkalinity	mg CaCO3/L	Monthly	12	No value	490	580	563	1
		Silica	mg/L	Monthly	12	0	16	21	17	1
		Dissolved Solids	mg/L	Monthly	12	11	590	710	691	1
		True Colour	hazen	Monthly	12	0	7	8	8	1
Turbidity		NTU	Monthly	12	0	1	1	1	1	
Sodium		mg/L	Monthly	12	12	240	290	279	1	
Potassium		mg/L	Monthly	12	No value	3.3	4.0	3.5	0.1	
Calcium		mg/L	Monthly	12	No value	2.6	4.5	3.4	0.1	
Magnesium		mg/L	Monthly	12	No value	1	1.3	1.1	0.1	
Chloride		mg/L	Monthly	12	0	32	51	48	1	
Fluoride		mg/L	Monthly	12	0	0.35	0.49	0.39	0.01	
Nitrate		mg/L	Monthly	12	0	0.2	0.3	0.2	0.5	
Sulphate		mg/L	Monthly	12	0	0	1.2	0.9	0.1	
Iron		mg/l	Monthly	12	0	0.02	0.07	0.04	0.01	
Manganese		mg/L	Monthly	12	0	0.001	0.002	0.001	0.01	
Zinc		mg/L	Monthly	12	0	0.06	0.06	0.06	0.01	
Aluminium		mg/L	Monthly	12	0	0.03	0.03	0.03	0.05	
Boron		mg/L	Monthly	12	0	0.17	0.32	0.30	0.01	
Copper		mg/L	Monthly	12	0	0.003	0.004	0.003	0.03	
Total Aluminium		mg/L	Seasonal/Event	1	0	0.00	0.00	0.00	0.003	
Arsenic		mg/L	Seasonal/Event	1	0	0.0003	0.0003	0.0003	0.0001	
Cadium		mg/L	Seasonal/Event	1	0	0.0001	0.0001	0.0001	0.0001	
Chromium		mg/L	Seasonal/Event	1	0	0.0001	0.0001	0.0001	0.0001	
Total Copper		mg/L	Seasonal/Event	1	0	0.003	0.003	0.003	0.001	
Total Iron	mg/L	Seasonal/Event	1	0	0.04	0.04	0.04	0.005		
Lead	mg/L	Seasonal/Event	1	0	0.0001	0.0001	0.0001	0.0001		
Total Manganese	mg/L	Seasonal/Event	1	0	0.001	0.001	0.001	0.0001		
Nickel	mg/L	Seasonal/Event	1	0	0.0001	0.0001	0.0001	0.0001		
Total Zinc	mg/L	Seasonal/Event	1	0	0.003	0.006	0.0045	0.001		

	Raw Water	Gross Alpha Activity Bore 9	Bq/L	Seasonal/Event	1	0	0.10	0.10	0.10	0.1
		Gross Beta Activity Bore 9	Bq/L	Seasonal/Event	1	0	0.20	0.20	0.20	0.1
		Gross Alpha Activity Bore 10	Bq/L	Seasonal/Event	1	0	0.10	0.10	0.10	0.1
		Gross Beta Activity Bore 10	Bq/L	Seasonal/Event	1	0	0.20	0.20	0.20	0.1

Scheme name	Scheme component	Parameter	Units	Minimum frequency of sampling	Total No. samples collected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	LOR		
Tier1	Reticulation	Chlorine (Free)	mg/L	Weekly	57	0	0.21	1.65	0.96	0.01		
		Coliforms	CFU/100mL	Weekly	57	3	0	2	0	0		
		Ecoli	CFU/100mL	Weekly	57	0	0	0	0	0		
		Trihalomethanes	µg/L	Seasonal/ Event	7	1	140	270	179	1		
		Conductivity	us/cm	Monthly	12	No value	370	620	499	1		
		pH	mg/L	Monthly	12	0	6.37	8.09	7.42	0.01		
		Total Hardness	mg CaCO3/L	Monthly	12	0	73	124	102	1		
		Alkalinity	mg CaCO3/L	Monthly	12	No value	100	140	121	1		
		Silica	mg/L	Monthly	12	0	9	13	10	1		
		Dissolved Solids	mg/L	Monthly	12	0	220	350	288	1		
		True Colour	hazen	Monthly	12	0	8	9	8	1		
		Turbidity	NTU	Monthly	12	0	1	1	1	1		
		Sodium	mg/L	Monthly	12	0	46	82	64	1		
		Potassium	mg/L	Monthly	12	No value	4.8	5.8	5.24	0.1		
		Calcium	mg/L	Monthly	12	No value	18	27	24.25	0.1		
		Magnesium	mg/L	Monthly	12	No value	6.9	14	10	0.1		
		Chloride	mg/L	Monthly	12	0	20	83	50	1		
		Fluoride	mg/L	Monthly	12	0	0.09	0.33	0.19	0.01		
		Nitrate	mg/L	Monthly	12	0	0.05	0.73	0.18	0.5		
		Sulphate	mg/L	Monthly	12	0	46	59	52	0.1		
		Iron	mg/l	Monthly	12	0	<0.01	<0.01	<0.01	0.01		
		Manganese	mg/L	Monthly	12	0	0.001	0.001	0.001	0.01		
		Zinc	mg/L	Monthly	12	0	0.06	0.06	0.06	0.01		
		Aluminium	mg/L	Monthly	12	0	0.03	0.08	0.043	0.05		
		Boron	mg/L	Monthly	12	0	0.04	0.05	0.045	0.01		
		Copper	mg/L	Monthly	12	0	0.003	0.003	0.003	0.03		
		Total Aluminium	mg/L	Seasonal/Event	1	0	0.05	0.05	0.05	0.003		
		Arsenic	mg/L	Seasonal/Event	1	0	0.003	0.003	0.003	0.0001		
		Cadium	mg/L	Seasonal/Event	1	0	0.001	0.001	0.001	0.0001		
		Chromium	mg/L	Seasonal/Event	1	0	0.0001	0.0001	0.0001	0.0001		
		Total Copper	mg/L	Seasonal/Event	1	0	0.002	0.002	0.002	0.001		
		Total Iron	mg/L	Seasonal/Event	1	0	0.01	0.01	0.01	0.005		
		Lead	mg/L	Seasonal/Event	1	0	0.0001	0.0001	0.0001	0.0001		
		Total Manganese	mg/L	Seasonal/Event	1	0	0.007	0.007	0.007	0.0001		
		Nickel	mg/L	Seasonal/Event	1	0	0.0008	0.0008	0.0008	0.0001		
		Total Zinc	mg/L	Seasonal/Event	1	0	0.004	0.004	0.004	0.001		
		Atrazine	µg/L	Seasonally	1	NA	0.05	0.05	0.05	0.01		
		Metachlor	µg/L	Seasonally	1	NA	0.15	0.15	0.15	0.01		
		Metachlor OXA	µg/L	Seasonally	1	NA	0.13	0.13	0.13	0.01		
		Tebuthiuron	µg/L	Seasonally	1	NA	0.24	0.24	0.24	0.01		
		Propazin 2 hydroxy	µg/L	Seasonally	1	NA	0.01	0.01	0.01	0.01		
		Dalapon (2,2-DPA)	µg/L	Seasonally	1	NA	3.4	3.4	3.4	0.01		
		Terbutylazine	µg/L	Seasonally	1	NA	0.07	0.07	0.07	0.01		
		Raw Water	Raw Water	Total Aluminium	mg/L	Seasonal/Event	2	0	0.54	4.10	2.32	0.003
				Arsenic	mg/L	Seasonal/Event	2	0	0.0021	0.0028	0.0025	0.0001
				Cadium	mg/L	Seasonal/Event	2	0	0.0001	0.0001	0.0001	0.0001
Chromium	mg/L			Seasonal/Event	2	0	0.0026	0.0026	0.0026	0.0001		
Total Copper	mg/L			Seasonal/Event	2	0	0.004	0.017	0.011	0.001		
Total Iron	mg/L			Seasonal/Event	2	0	0.29	3.7	2.00	0.005		
Lead	mg/L			Seasonal/Event	2	0	0.0005	0.0016	0.0011	0.0001		
Total Manganese	mg/L			Seasonal/Event	2	0	0.033	0.750	0.392	0.0001		
Nickel	mg/L			Seasonal/Event	2	0	0.0034	0.0085	0.0060	0.0001		
Total Zinc	mg/L			Seasonal/Event	2	0	0.003	0.010	0.007	0.001		
Atrazine	µg/L			Seasonally	1	NA	0.05	0.05	0.05	0.01		
Metachlor	µg/L			Seasonally	1	NA	0.15	0.15	0.15	0.01		
Tebuthiuron	µg/L			Seasonally	1	NA	0.33	0.33	0.33	0.01		
Terbutylazine	µg/L			Seasonally	1	NA	0.06	0.06	0.06	0.01		

Appendix B – Reticulation E.coli verification monitoring

All samples taken tested negative for *E.coli* and below are summaries of the results of the reticulation *E.coli* verification monitoring program for all council water supply schemes.

Table 5.1 to 5.12 – Reticulation E.coli verification monitoring

Drinking water scheme: Anakie scheme

Year	2022 to 2023											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	1	1	1	1	1	1	1	1	3	1	2	1
No. of samples collected in which <i>E. coli</i> is detected (i.e., a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12-month period	12	12	12	12	12	12	12	12	14	14	15	15
No. of failures for previous 12-month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2018* (the regulation) requires that 98 per cent of samples taken in a 12-month period should contain no *E. Coli*.

This requirement is referred to as the 'annual value' in Schedule 3A of the regulation.

This requirement should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Drinking water scheme: Bauhinia Scheme

Year	2022 to 2023											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	1	1	1	1	1	1	1	1	1	1	1	2
No. of samples collected in which <i>E. coli</i> is detected (i.e., a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12-month period	12	12	12	12	12	12	12	12	12	12	12	13
No. of failures for previous 12-month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2018* (the regulation) requires that 98 per cent of samples taken in a 12-month period should contain no *E. Coli*.

This requirement is referred to as the 'annual value' in Schedule 3A of the regulation.

This requirement should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Drinking water scheme: Blackwater & Bluff Scheme

Year	2022 to 2023											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	5	6	5	5	7	6	6	6	5	5	11	6
No. of samples collected in which <i>E. coli</i> is detected (i.e., a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12-month period	64	64	64	64	66	66	67	68	67	67	72	73
No. of failures for previous 12-month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2018* (the regulation) requires that 98 per cent of samples taken in a 12-month period should contain no *E. Coli*. This requirement is referred to as the 'annual value' in Schedule 3A of the regulation.

This requirement should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Drinking water scheme: Capella Scheme

Year	2022 to 2023											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	4	5	4	4	6	4	5	4	4	4	10	4
No. of samples collected in which <i>E. coli</i> is detected (i.e., a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12-month period	52	52	52	52	54	53	54	54	53	53	58	58
No. of failures for previous 12-month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2018* (the regulation) requires that 98 per cent of samples taken in a 12-month period should contain no *E. Coli*. This requirement is referred to as the 'annual value' in Schedule 3A of the regulation.

This requirement should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Drinking water scheme: Comet Scheme

Year	2022 to 2023											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	1	1	1	2	1	1	1	1	2	1	1	2
No. of samples collected in which <i>E. coli</i> is detected (i.e., a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12-month period	12	12	12	13	13	13	13	13	14	14	14	15
No. of failures for previous 12-month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2018* (the regulation) requires that 98 per cent of samples taken in a 12-month period should contain no *E. Coli*. This requirement is referred to as the 'annual value' in Schedule 3A of the regulation.

This requirement should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Drinking water scheme: Dingo Scheme

Year	2022 to 2023											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	1	1	1	1	1	1	1	1	1	1	1	2
No. of samples collected in which <i>E. coli</i> is detected (i.e., a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12-month period	12	12	12	12	12	12	12	12	12	12	12	13
No. of failures for previous 12-month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2018* (the regulation) requires that 98 per cent of samples taken in a 12-month period should contain no *E. Coli*. This requirement is referred to as the 'annual value' in Schedule 3A of the regulation.

This requirement should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Drinking water scheme: Duaringa Scheme

Year	2022 to 2023											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	1	1	1	1	1	1	1	1	1	1	1	2
No. of samples collected in which <i>E. coli</i> is detected (i.e., a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12-month period	12	12	12	12	12	12	12	12	12	12	12	13
No. of failures for previous 12-month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2018* (the regulation) requires that 98 per cent of samples taken in a 12-month period should contain no *E. Coli*. This requirement is referred to as the 'annual value' in Schedule 3A of the regulation.

This requirement should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Drinking water scheme: Emerald Scheme

Year	2022 to 2023											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	8	10	8	8	10	8	10	8	8	8	20	8
No. of samples collected in which <i>E. coli</i> is detected (i.e., a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12-month period	104	104	104	104	106	104	106	106	104	104	114	114
No. of failures for previous 12-month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2018* (the regulation) requires that 98 per cent of samples taken in a 12-month period should contain no *E. Coli*. This requirement is referred to as the 'annual value' in Schedule 3A of the regulation.

This requirement should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Drinking water scheme: Rolleston Scheme

Year	2022 to 2023											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	1	1	1	1	1	1	1	1	1	1	1	2
No. of samples collected in which <i>E. coli</i> is detected (i.e., a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12-month period	12	12	12	12	12	12	12	12	12	12	12	13
No. of failures for previous 12-month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2018* (the regulation) requires that 98 per cent of samples taken in a 12-month period should contain no *E. Coli*. This requirement is referred to as the 'annual value' in Schedule 3A of the regulation.

This requirement should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Drinking water scheme: Sapphire and Rubyvale Scheme

Year	2022 to 2023											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	8	10	8	8	10	8	9	8	8	8	20	8
No. of samples collected in which <i>E. coli</i> is detected (i.e., a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12-month period	104	104	104	104	106	104	105	105	103	103	113	113
No. of failures for previous 12-month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2018* (the regulation) requires that 98 per cent of samples taken in a 12-month period should contain no *E. Coli*. This requirement is referred to as the 'annual value' in Schedule 3A of the regulation.

This requirement should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Drinking water scheme: Springsure Scheme

Year	2022 to 2023											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	2	2	2	2	2	2	2	2	2	2	2	4
No. of samples collected in which <i>E. coli</i> is detected (i.e., a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12-month period	24	24	24	24	24	24	24	24	24	24	24	26
No. of failures for previous 12-month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2018* (the regulation) requires that 98 per cent of samples taken in a 12-month period should contain no *E. Coli*. This requirement is referred to as the 'annual value' in Schedule 3A of the regulation.

This requirement should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Drinking water scheme: Tieri Scheme

Year	2022 to 2023											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	4	5	4	4	5	4	5	4	4	4	10	4
No. of samples collected in which <i>E. coli</i> is detected (i.e., a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12-month period	52	52	52	52	53	52	53	53	52	52	57	57
No. of failures for previous 12-month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2018* (the regulation) requires that 98 per cent of samples taken in a 12-month period should contain no *E. Coli*. This requirement is referred to as the 'annual value' in Schedule 3A of the regulation.

This requirement should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Appendix C – Implementation of the DWQMP Risk Management Improvement Program

Table 6.1 to 6.14 – Progress against the RMIP program in the approved DWQMP

Legend: Complete Changes

RMIP Reference	Process Step	Risk Management Improvements			Status as at 30/06/2023	Responsible Position
		Short term	Medium term	Long term		
CHRC WIDE						
CHR 1	Procedures and Data		Procedures required for bore inspection, reservoir inspection, mains break, pH correction, pipeline transfer.		Procedures drafted, undergoing consultation and expect signoff by end of 2023.	Treatment Co-ordinator
CHR 8 CHR 9 CHR 10	Treated water storage / Reservoirs		Continue to implement recommendations from Reservoir inspections	Contractor re-inspection within 5 years of previous	Inspections completed in 2019 by external contractor. Opal St WTP reservoir roof replaced. 10-15 vermin proofing items on CAPEX list completed 2021/2022 FY including leak repairs, cleaning, external checks. Remaining repairs completed 2022/2023 FY.	Manager WU
CHR 11	Reticulation		Targeted mains cleaning program for surface water schemes		Network program under development, to include valve exercising and flushing	WU Strategic Manager
CHR 12 CHR 13 CHR 14	Training / operator knowledge	Implement training plans / Ensure other staff are confident to operate scheme	Progressive procedure development	Targeted SCADA and alarming	Continual training required due to ongoing staff turnover. All current operators either have or are in the process of attaining Cert III (noting current RTO constraints).	Treatment Co-ordinator
CHR 15 CHR 16	Recruitment / staff retention	Fill vacancies	Corporate people plan and plan for upskilling		Recruitment is ongoing due to continual staff turnover. Operator rotations to continue. More Emerald based operators to know other plants i.e., Anakie, Sapphire, Springsure, Rolleston, Comet. Blackwater based operators to know Bluff, Dingo, Duaringa, Bauhinia.	Treatment Co-ordinator Network Co-ordinator
CHR 17 CHR 18	Maintenance		develop internal skills to reduce reliance on external support, critical spares to be identified	Preventive maintenance of blowers, air compressors, centrifuges, spare retic pumps, dam switchboards, fluoride plant maintenance, chlorine replacement work, generator plug points.	Maintenance schedules to be developed to assist with costing of tenders and technical specifications. Develop list of critical spares for treatment and network assets. Noted on WU 5-year plan.	Treatment Co-ordinator Network Co-ordinator Engineering Co-ordinator

CHR 19 CHR 20	Cyber Security	Investigate governance structure. Linked to site security RMIP items.	Investigate cyber security detection process - current response and recovery plans, add cyber security focused section if necessary.		Consultant engaged to assist with review of current plans and identify gaps specific to water utilities. Include cyber security protection, detection processes, response and recovery plans in the SCADA and Telemetry Master Plan.	WU Strategic Manager Engineering Co-ordinator
CHR 21 CHR 23	Site Security	Implement non-capital Audit recommendations. Investigate reducing temptation of site access for robbery.		Implement capital Audit and Assessment recommendations.	Received proposal from consultant to undertake security audit. Opal St and Blackwater security gate replacements completed. Continuing to implement non-capital audit recommendations.	Manager WU
CHR 24	Sole Operators	Consider formalised staff check ins/texting for schemes without teams and SCADA trends			Considering options and linkage to CHRC lone worker policy.	Treatment Co-ordinator
CHR 28 CHR 29	Health Based Targets/Catchment		Action catchment and treatment assessments	Implement capital recommendations	Surface water and groundwater catchment risk assessments were completed in 2020-2021 with a suite of recommendations to address key risks impacting water supply. A review of the recommended actions is required to identify an implementation plan and timeline.	Planning Co-ordinator

RMIP Reference	Process Step	Risk Management Improvements			Status as at 30/06/2023	Responsible Position
		Short term	Medium term	Long term		
	ANAKIE					
ANA 1	Raw water storage		design/install new tank		Capex project has commenced design and land acquisition for replacement of 2 x tanks. Installation expected to occur 2023-2024 FY.	Manager WU
ANA 2 ANA 3	Disinfection	-	Action outcomes of analysis		Trending indicates improved residual. Change to dosing point has stabilised residual. Next review to consider improvement options.	Treatment Co-ordinator
ANA 4 ANA 5 ANA 6				Investigate options / dual storage	No changes required due to low chlorate results. Ongoing monitoring included in verification program.	Treatment Co-ordinator Engineering Co-ordinator

RMIP Reference	Process Step	Risk Management Improvements			Status as at 30/06/2023	Responsible Position
		Short term	Medium term	Long term		
	BAUHINIA					
BAU 2 BAU 3	Catchment / Disinfection		Investigate disinfection improvements	Chlorine dosing upgrade	Assessing operational structure and investigating upgrade of chlorine dosing system and monitoring. Site is not powered so exploring solar options.	Manager WU

RMIP Reference	Process Step	Risk Management Improvements			Status as at 30/06/2023	Responsible Position
		Short term	Medium term	Long term		
	BLACKWATER					
BLK 3 BLK 4 BLK 5	Disinfection / Redosing (Bluff Reservoir)			Investigate options / chlorine gas	Awaiting outcome of options analysis capital project. Dilution commenced as an effective chlorate management strategy.	Manager WU
BLK 6	Reticulation		Investigate standby generator (reservoirs)		Design completed for WTP generator. Reservoir generator installation commenced.	Manager WU
BLK 7	Redosing (Bluff Reservoir)			Replace generator on site	Generator replacement due for completion by end of 2023.	Manager WU

RMIP Reference	Process Step	Risk Management Improvements			Status as at 30/06/2023	Responsible Position
		Short term	Medium term	Long term		
CAPELLA						
CAP 3 CAP 4	Raw Water Abstraction		-	Implement actions	Priority sections of the pipeline to be replaced 2023/2024 FY.	Manager WU
CAP 9 CAP 10	Filtration	Data collection on turbidity spikes	Investigate ripening to waste		Rented ultra-filtration membrane plant installed.	Manager WU
CAP 13 CAP 14	Transfer from Tieri to Capella		Develop transfer procedure		Procedure drafted, undergoing consultation and expect sign off prior to completion of pipeline replacement work. Include in WTP upgrade scope.	Treatment Co-ordinator Engineering Co-ordinator

RMIP Reference	Process Step	Risk Management Improvements			Status as at 30/06/2023	Responsible Position
		Short term	Medium term	Long term		
COMET						
COM 2 COM 3	pH correction	data collection for procedure target ranges and develop procedure	investigate alarm		Procedure drafted. New pH probe installed.	Treatment Co-ordinator
COM 7 COM 8 COM 9	Disinfection			Investigate options / dual storage	Awaiting outcome of options analysis capital project.	Manager WU
COM 10 COM 11	Reticulation		Investigate UPS and generator for transfer pumps to high tower	Implement appropriate action for supply of water during power outage	New generator installed	Project Team

RMIP Reference	Process Step	Risk Management Improvements			Status as at 30/06/2023	Responsible Position
		Short term	Medium term	Long term		
DINGO						
DIN 1 DIN 2 DIN 3	Catchment		Investigate disinfection improvements	Filter replacement / action disinfection improvements	Rented ultra-filtration membrane plant installed. CAPEX WTP upgrade commenced, including chlorine gas.	Project Team
DIN 5				Relocate pumps	Awaiting prioritisation within CAPEX budget.	Manager WU

DIN 6 DIN 7	Coagulation	clarifier Turbidity monitoring	Turbidity meter online monitoring		Rented ultra-filtration membrane plant installed. CAPEX WTP upgrade commenced.	Project Team
DIN 9 DIN 3	Filtration			Filter replacement	Rented ultra-filtration membrane plant installed. CAPEX WTP upgrade commenced.	Project Team
DIN 11 DIN 3			Investigate ripen to waste option	Filter replacement to include ripen to waste.	Rented ultra-filtration membrane plant installed. CAPEX WTP upgrade commenced.	Project Team
DIN 12 DIN 3			online monitoring and alarms	Filter replacement	Rented ultra-filtration membrane plant installed. CAPEX WTP upgrade commenced.	Project Team
DIN 13 DIN 14 DIN 15	Disinfection			Chlorine gas	Rented ultra-filtration membrane plant installed. CAPEX WTP upgrade commenced, including chlorine gas.	Manager WU

RMIP Reference	Process Step	Risk Management Improvements			Status as at 30/06/2023	Responsible Position
		Short term	Medium term	Long term		
	DUARINGA					
DUA 1 DUA 2 DUA 3	Catchment		Investigate disinfection improvements	action disinfection improvements	Rented ultra-filtration membrane plant installed. CAPEX WTP upgrade commenced, including chlorine gas.	Project Team
DUA 4	Coagulation			flow switch	Rented ultra-filtration membrane plant installed. CAPEX WTP upgrade commenced.	Project Team
DUA 5 DUA 6		clarifier Turbidity monitoring	Turbidity meter online monitoring		Rented ultra-filtration membrane plant installed. CAPEX WTP upgrade commenced.	Project Team
DUA 7 DUA 8 DUA 3	Filtration	Filtered Turbidity monitoring	Turbidity meter online monitoring	Filter replacement	Rented ultra-filtration membrane plant installed. CAPEX WTP upgrade commenced.	Project Team
DUA 9	Disinfection		online monitoring and alarms		Rented ultra-filtration membrane plant installed. CAPEX WTP upgrade commenced, including chlorine gas.	Project Team
DUA 10 DUA 11 DUA 12				Chlorine gas	Rented ultra-filtration membrane plant installed. CAPEX WTP upgrade commenced, including chlorine gas.	Manager WU

RMIP Reference	Process Step	Risk Management Improvements			Status as at 30/06/2023	Responsible Position
		Short term	Medium term	Long term		
	EMERALD EAST NOGOA					
EMEN 1 EMEN 2	pH correction	data collection for procedure target ranges and develop procedure	investigate alarm		Procedure drafted, undergoing consultation. New pH analyser to be installed by Sept 2023. pH correction dosing currently not used.	Treatment Co-ordinator
EMEN 3 EMEN 4 EMEN 5	Coagulation	develop operational rules and document procedure	investigate control of supernatant return	Design and implement solution	Recycled return currently not in use. Installed a supernatant detention basin bypass pipeline with automatic percentage control i.e., 2% to head of plant and 18% released to environment.	Manager WU

RMIP Reference	Process Step	Risk Management Improvements			Status as at 30/06/2023	Responsible Position
		Short term	Medium term	Long term		
	EMERALD OPAL ST					
EMOS 1 EMOS 2	Coagulation - recycle stream	develop operational rules and document procedure	turbidity meter as control of supernatant return	dewatering upgrade	Design and costings on dewatering system commenced. Recycled return currently not in use.	Manager WU
EMOS 3	Coagulation - blanket destabilised	develop operational rules and document procedure			Procedure to be developed.	Treatment Co-ordinator
EMOS 4 EMOS 5	Filtration		auto backwash, shutdowns, to be investigated	Investigate need to replace filter media	Backwash system to be included in Dewatering CAPEX project. Filter media awaiting prioritisation within CAPEX budget.	Manager WU
EMOS 6			investigate new backwash pumps instead of backflow prevention valve		Backwash system to be included in Dewatering CAPEX project.	Manager WU
EMOS 7			investigate blanking off valve		Awaiting prioritisation within CAPEX budget and requires further scoping. Recycled return currently not in use.	Manager WU
EMOS 8 EMOS 9	Reticulation		Investigate UPS and other options	Implement appropriate action	Clearwater switchboard replaced	Project Team

RMIP Reference	Process Step	Risk Management Improvements			Status as at 30/06/2023	Responsible Position
		Short term	Medium term	Long term		
ROLLESTON						
ROL 1 ROL 2	Coagulation	manual turbidity testing at clarifier		turbidity meter	Clearwater switchboard replaced. Ultra-filtration membrane plant purchased which reduces the risk of clarified turbidity affecting water quality. WTP upgrade CAPEX budget 2023-2024.	Project Team
ROL 3	Filtration		Plan and implement post UF unit rental option / upgrade		Ultra-filtration membrane plant purchased.	Manager WU
ROL 3	Disinfection		Plan and implement post UF unit rental option / upgrade		Ultra-filtration membrane plant purchased.	Manager WU
ROL 5			calculation of CT, probably OK, but need to check. pH adjustment capital solution may be required.		WTP upgrade CAPEX budget 2023-2024.	Manager WU
ROL 6 ROL 7 ROL 8				investigate options	Awaiting outcome of options analysis capital project.	Manager WU
ROL 9 ROL 10	pH correction	data collection for procedure target ranges and develop procedure	Investigate online monitoring / alarm		Procedures drafted, undergoing consultation and expect signoff by end of 2023.	Treatment Co-ordinator

RMIP Reference	Process Step	Risk Management Improvements			Status as at 30/06/2023	Responsible Position
		Short term	Medium term	Long term		
SAPPHIRE/RUBYVALE						

RMIP Reference	Process Step	Risk Management Improvements			Status as at 30/06/2023	Responsible Position
		Short term	Medium term	Long term		
SPRINGSURE						
SPR 3	Disinfection		upgrade to flow paced chlorine dosing		Awaiting prioritisation within CAPEX budget.	Engineering Co-ordinator

RMIP Reference	Process Step	Risk Management Improvements			Status as at 30/06/2023	Responsible Position
		Short term	Medium term	Long term		
	TIERI					
TIE 3 TIE 4	Raw Water Abstraction	develop operational rules and document procedure	Investigate turbidity meter as control of supernatant return.		Turbidity meter installed.	Engineering Co-ordinator
TIE 5 TIE 6	pH correction	data collection for procedure target ranges and develop procedure	investigate alarm		Procedure drafted, undertaking consultation.	Treatment Co-ordinator
TIE 3 TIE 4		document recycle procedure	Investigate recycle control. Requires flow meter/pump upgrade.		Awaiting prioritisation within CAPEX budget.	Engineering Co-ordinator
TIE 11	Filtration	investigate alarm level			EDAC replacement installed.	Engineering Co-ordinator
TIE 12 TIE 13			Investigate ripening to waste		Awaiting prioritisation within CAPEX budget.	Engineering Co-ordinator
TIE 14 TIE 15				Investigate blanking off	Awaiting prioritisation within CAPEX budget.	Treatment Co-ordinator