



Drinking Water Quality Management Plan (DWQMP) Annual Report

1 July 2016 to 30 June 2017

Central Highlands Regional Council

SPID: 481

PO Box 21
EMERALD QLD 4720
Phone: 1300 242 686
Fax: 1300 242 687
Web: www.centralhighlands.qld.gov.au

Table of Contents

1	Introduction.....	1
2	Overview of operations.....	1
3	Actions taken to implement the DWQMP	2
3.1	Progress in implementing the risk management improvement program	2
3.2	Revisions made to the operational monitoring program to maintain compliance with the water quality criteria in verification monitoring	2
3.3	Amendments made to the DWQMP	2
4	Compliance with water quality criteria for drinking water	3
5	Notifications to the Regulator under sections 102 and 102A of the Act.....	4
5.1	Non-compliances with the water quality criteria and corrective and preventive actions undertaken	4
5.2	Prescribed Incidents or Events reported to the Regulator and corrective and preventive actions undertaken.....	4
6	Customer complaints related to water quality	5
6.1	Suspected Illness	7
6.2	Appearance or Discoloured.....	7
6.3	Taste and Odour	7
7	Findings and recommendations of the DWQMP auditor.....	8
8	Outcome of the review of the DWQMP and how issues raised have been addressed	8
8.1	Hazards and hazardous events that affected the quality of drinking water during the year and that were not addressed in the DWQMP	8
	Appendix A – Summary of compliance with water quality criteria	9
	Appendix B – Implementation of the DWQMP risk management improvement program.....	28

List of Figures

Figure 1 – Monthly complaints about water quality.....	6
Figure 2 – Complaints about water quality by scheme	6

List of Tables

Table 1 – Overview of water supply schemes	1
Table 2 – Non-compliance notifications	4
Table 3 - Complaints about water quality (including per 1000 customers)	5
Table 4.1 – 4.14 - Verification monitoring results.....	9
Table 5.1 – 5.12 - Reticulation <i>E. coli</i> verification monitoring	16
Table 6.1 to 6.14 – Progress against the risk management improvement program in the approved DWQMP....	28

Glossary of terms

ADWG	Australian Drinking Water Guidelines (2011). Published by the National Health and Medical Research Council of Australia
CFU/100mL	Colony Forming Units per 100 millilitres
CHRC	Central Highlands Regional Council
C. raciborskii and Cylindro	<i>Cylindrospermopsis raciborskii</i> , a freshwater cyanobacteria known to produce the toxin cylindrospermopsin and a potential health risk
D. cf. circinale and Saxitoxin	Dolichospermum cf. circinale, a freshwater cyanobacteria known to produce the toxin Saxitoxin and a potential health risk
DWQMP	Drinking Water Quality Management Plan
E. coli	<i>Escherichia coli</i> , a bacterium that is considered to indicate the presence of faecal contamination and is a potential health risk
EHO	Environmental Health Officer
LOR	Limit of Reporting
mg/L	Milligrams per litre
ML	Megalitre
µg/L	Micrograms per litre
M. cf. aeruginosa and Microcystins	Mircocystis cf. aeruginosa, a freshwater cyanobacteria known to produce the toxin Microcystins and a potential health risk
NTU	Nephelometric Turbidity Units
pH	Power of Hydrogen
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 Overview of operations

This report relates to the drinking water supply schemes that the Central Highlands Regional Council owned and operated from 1 July 2016 to 30 June 2017.

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

Table 1 – Overview of water supply schemes

Scheme Name	Communities Served	Water Source	Treatment Process	Population served	Demand for 16/17 (ML)
Anakie	Anakie	May Creek Bore	Disinfection	98	24.8
Bauhinia	Bauhinia Downs	Artesian Bore	Disinfection	25	14.1
Blackwater	Blackwater	Mackenzie River	Coagulation, Filtration, pH correction, Fluoridation and Disinfection	5,019	1,585
	Bluff			372	103.6
Capella	Capella	Capella Creek / Mackenzie River	Coagulation, Filtration, pH correction and Disinfection	935	307
Comet	Comet	Comet River	Coagulation, Filtration, pH correction and Disinfection	153	40
Dingo	Dingo	Springton Creek/ Dingo Creek	Coagulation, Filtration, and Disinfection	202	45.6
Duaringa	Duaringa	Dawson River	Coagulation, Filtration and Disinfection	267	97.8
Emerald	Emerald	Nogoa River	Coagulation, Filtration, pH correction, Fluoridation and Disinfection	14,620	3,426
Rolleston	Rolleston	Comet River / Sub-artesian Bores	Coagulation, Filtration, and Disinfection	279	26.2
Sapphire / Rubyvale	Sapphire / Rubyvale	Retreat Creek Bores	Fluoridation and Disinfection	1,193	189.4
Springsure	Springsure	Shallow Basalt / Deeper Sandstone Bores	Aeration and Disinfection	951	221.6
Tieri	Tieri	Mackenzie River	Coagulation, Filtration, pH correction, Fluoridation and Disinfection	1,698	512.5

Available town populations sourced @ <http://www.qgso.qld.gov.au/products/tables/erp-ucf-qld/index.php> as at July 2017

3 Actions taken to implement the DWQMP

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 B. As per section 13 of the overarching volume of the DWQMP the items have been prioritised as short, medium and long term actions. Short-term actions will be undertaken as soon as possible (and completed within 6-12 months), medium-term actions are intended to be completed in the current financial year or within 12-18 months, and long-term actions follow on from short/medium items and will be introduced as items in future council budgets in order to secure 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 with corrective actions or relevant procedure references. 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.

3.3 Amendments made to the DWQMP

As reported in last year’s DWQMP annual report (2015/2016) an amendment was approved in September 2016.

The amendment included changes and updates to:

- Details of infrastructure for providing the service.
- Identified hazards and hazardous events.
- Information gathering - water quality and catchment characteristics.
- Assessment of risks.
- Risk management measures.
- Management of incidents and emergencies.
- Risk management improvement program.
- Operational monitoring.
- Verification monitoring.

4 Compliance with water quality criteria for drinking water

Appendix A provides an overview of the results from the water quality monitoring program for the reporting period of 1 July 2016 to 30 June 2017. The water quality monitoring program was generally carried out as per Section 12 of the approved Central Highlands Regional Council overarching volume of the DWQMP. A small number of missed samples are attributed to the Queensland Government Forensic and Scientific Services laboratory closing down during the Christmas and New Year break. Also at least one missed sample was due to cyclonic wet weather and sampling runs had to be cancelled for safety of our staff. In these cases other parameters like chlorine residual continue to be monitored and the verification monitoring is resumed as soon as possible. This year 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 is a result of actioning the improvements in the risk management improvement plan (items CHR 1 and CHR2) and bedding processes for the results review and entry into the database.

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 *Public Health Regulation 2005*. Appendix A (Tables 4.1 to 4.12) 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. Exceptions were some of the total Trihalomethanes (THM) values in some schemes sourced from surface water - namely Duaringa and Dingo. The details of these are discussed in the next section of this report. Other aesthetic exceedances like pH in Rolleston and Springsure, dissolved solids in Springsure and total hardness in Anakie, Sapphire and Rubyvale were recorded with actions and projects implemented or being considered to make improvements in those areas. Appendix A (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. All samples taken tested negative for *E. coli*.

C. raciborskii levels were seasonally monitored in surface water schemes with a recognised risk. The DWQMP trigger level for cylindrospermopsin toxin testing was reached for the Capella and Rolleston schemes. Monitoring showed that while levels of the toxin varied in the raw water no detection of cylindrospermopsin was made in the treated water throughout the blue green algae bloom. In Duaringa during a blue green algae bloom *M. cf. aeruginosa* and *D. cf. circinale* were identified as potentially toxic species and their levels in the raw and treated water were monitored. Toxin monitoring occurred however the results showed that saxitoxins were not present in either the raw or the treat water while microcystins levels varied in the raw water there was no detection made in the treated water.

5 Notifications to the Regulator under sections 102 and 102A of the Act

This financial year there were two instances where the regulator was notified under sections 102 or 102A of the Act. None of these notifications involved 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.

As shown in table 2 both notifications were non-compliances with water quality criteria related to total Trihalomethanes (THM).

Neither of these incidents required the council to issue a 'boil water alert' or 'do not drink notice' to the public.

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

Table 2 – Non-compliance notifications

Scheme	Non-compliance	Level reported µg/L	Health Value* µg/L	Date of non-compliance	Corrective and Preventative Actions
Duaringa	THM	264	250	14/02/2017	Retesting and coagulation improvements. Reviewed chlorine dosing while not compromising effective disinfection
Dingo		273		08/03/2017	

* Health Value is from the ADWG.

5.2 Prescribed Incidents or Events reported to the Regulator and corrective and preventive actions undertaken

No prescribed incidents or events were required to be reported to the regulator this financial year. As mentioned in section 4 of this report – the detection of a blue green algae bloom in Duaringa initiated algae and toxin monitoring. This detection was shared with the regulator and plans for action were discussed with them however it was not required to be reported as an event. It was during this extra monitoring and corrective action phase that we detected our reportable level of total THMs which while not acceptable was an indication that complete disinfection was occurring which continued to be the priority.

6 Customer complaints related to water quality

The 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 and also adds some context by including the complaints per 1000 customers.

Table 3 - Complaints about water quality (including per 1000 customers)

Scheme	Suspected Illness	Appearance or Discoloured	Taste or Odour	Total
Anakie				0
Bauhinia				0
Blackwater/Bluff		2 (0.4)		2 (0.4)
Capella		2 (2.1)		2 (2.1)
Comet				0
Dingo				0
Duaringa			3 (11.2)	3 (11.2)
Emerald	1 (0.1)	4 (0.3)		5 (0.4)
Rolleston		1 (3.6)		1 (3.6)
Sapphire/Rubyvale				0
Springsure	1 (1.1)		1 (1.1)	2 (2.2)
Tieri		1 (0.6)		1 (0.6)
Totals	2	10	4	16

*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 16 applicable records that total the 16 complaints.

The two graphs below 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 with slightly higher frequency of appearance or discoloured and taste or odour in the warmer months. As statistically expected there is a higher frequency of complaints for the schemes that service larger communities. The group of taste complaints in Duaringa were all related to the event previously mentioned in section 5.2 of this report.

Figure 1 – Monthly complaints about water quality

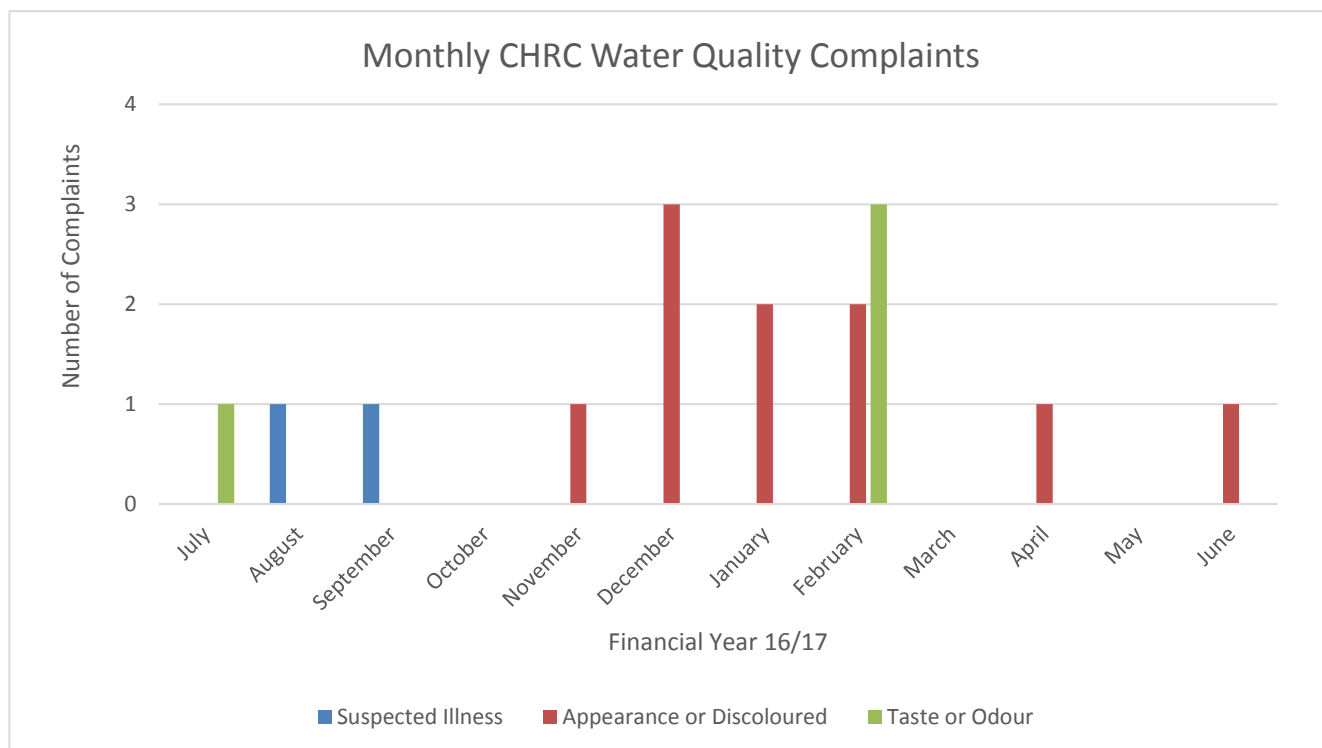
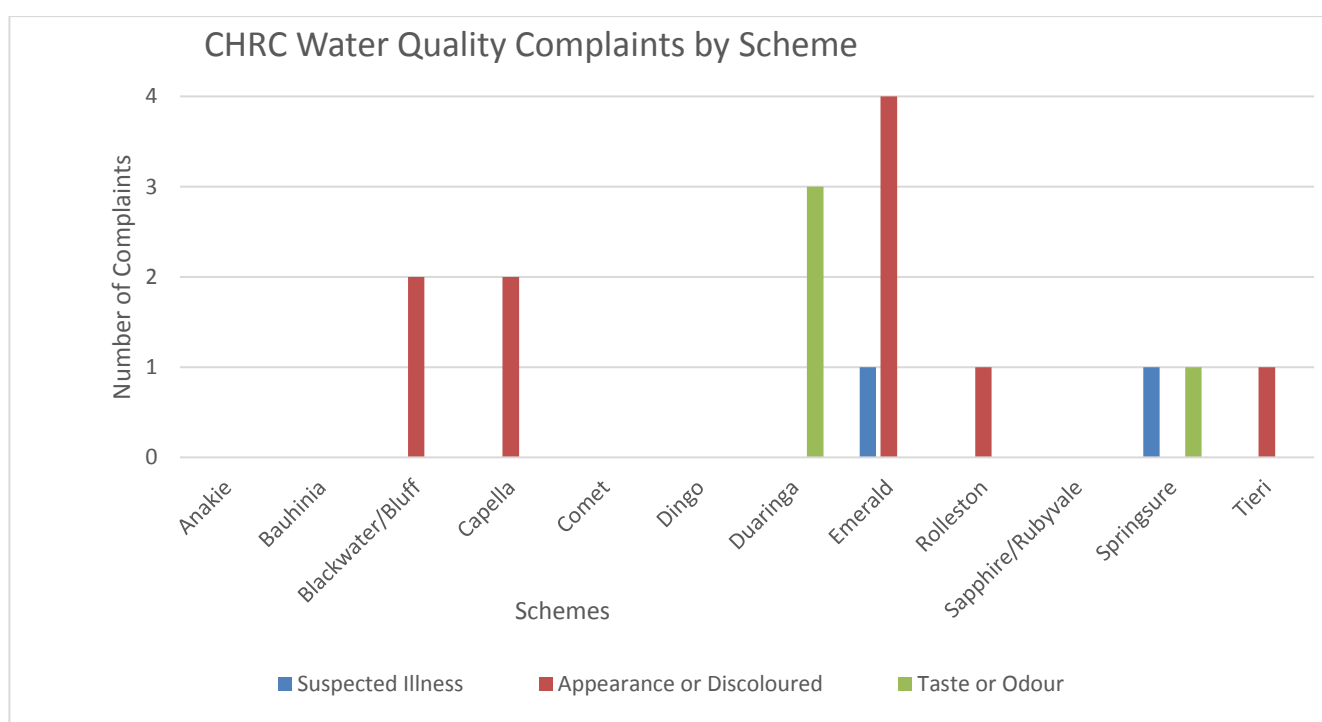


Figure 2 – Complaints about water quality by scheme



6.1 Suspected Illness

Complaints 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, for the presence of *E. coli*. and/or getting a standard water analysis as required.

During the 2016-17 financial year council is not aware of any confirmed cases of illness arising from the water supply system. One complaint regarding illness was investigated by council however testing results showed both compliance with the ADWG and no sign of poor quality water that was likely attributing to the customers suspected illness. The other case included tank water and seems to be registered in the system for information purposes only.

6.2 Appearance or Discoloured

A total of 10 customer complaints associated with discoloured water or appearance were received between July 2016 and June 2017. The majority of complaints were for the largest community of Emerald. However Capella and Rolleston were noted as schemes with high complaint rates per 1000 customers.

Council investigates each complaint relating to discoloured water or unusual water appearance. 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. Most of the complaints received are usually associated with a water main break, presence of air in the water or sedentary water at the extremities of the supply zone. When dealing with water main breaks staff conduct the repairs while ensuring the water quality is protected at all times, as well as managing storage levels in the affected reservoirs to ensure no one was without water. The area is then flushed to remove the dirty water and to achieve detectable chlorine residual results. The flushing targets specific areas such as dead-end mains, where it was 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 water or unusual water appearance and are requested to allow the main a short period of time to settle.

6.3 Taste and Odour

A total of four customer complaints associated with unfavourable taste and/or odour were received between July 2016 and June 2017. Three of these complaints were from an unusual blue green bloom in the raw water storage dams at Duaringa that affected the water's taste and odour. Springsure customers reported via their councillor some taste and odour issues – with bitterness and a strong smell being included in the description. No parameters that exceed the ADWG guidelines were recorded however nor were there any conclusions from the investigation.

7 Findings and recommendations of the DWQMP auditor

During this reporting period, the council was not required to engage an auditor to conduct an audit of the DWQMP. In accordance with legislative requirements, an audit of the DWQMP needs to be completed before 10 November 2018, with subsequent findings of the audit to be incorporated as appropriate in future revisions of the DWQMP.

8 Outcome of the review of the DWQMP and how issues raised have been addressed

The first internal review of the approved plan was to be due before 10 November 2016. As the amended plan was approved in September 2016 this was acknowledged by the regulator as fulfilling the internal review requirements.

8.1 Hazards and hazardous events that affected the quality of drinking water during the year and that were not addressed in the DWQMP

This financial year no hazards and hazardous events affected the quality of drinking water that are not addressed in the DWQMP.

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 *Public Health Regulation 2005*. Most physicochemical drinking water quality results from the standard monitoring program met the recommended value ranges in the ADWG. The exceptions were the total Trihalomethanes (THM) values in some schemes sourced from surface water namely Dingo and Duaringa. Other aesthetic exceedances like pH in Rolleston and Springsure, dissolved solids in Springsure and total hardness in Anakie, Sapphire and Rubyvale were recorded with actions and projects implemented or being considered to make improvements in those areas.

Table 4.1 – 4.14 - Verification monitoring results

Scheme name	Scheme component	Parameter	Units	Frequency of sampling	Total No. samples collected	No. of samples with values ≥ the LOR	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	LOR	Laboratory name
Anakie	Reticulation	Chlorine (Free)	mg/L	Monthly	10	10	0	0.5	1.4	0.9	0.01	Q Health
		Ecoli	CFU/100mL	Monthly	12	0	0	0	0	0	0	Q Health
		Coliforms	CFU/100mL	Monthly	12	0	0	0	0	0	0	Q Health
		Conductivity	µs/cm	Monthly	13	13	No value	447	704	677	1	Q Health
		pH	at 22°C	Monthly	13	13	0	7.3	7.9	7.5	0.01	Q Health
		Total Hardness	mg CaCO3/L	Monthly	13	13	10	59	231	214.2	1	Q Health
		Alkalinity	mg CaCO3/L	Monthly	13	13	No value	148	292	273.9	1	Q Health
		Silica	mg/L	Monthly	13	13	0	18	49	46.1	1	Q Health
		Dissolved Soilds	mg/L	Monthly	13	13	0	258	432	410.7	1	Q Health
		True Colour	hazen	Monthly	13	13	0	1	1	1	1	Q Health
		Turbidity	NTU	Monthly	13	13	0	1	2	1.1	1	Q Health
		Sodium	mg/L	Monthly	13	13	0	61	67	64.8	1	Q Health
		Potassium	mg/L	Monthly	13	13	No value	1.2	22	2.9	0.1	Q Health
		Calcium	mg/L	Monthly	13	13	No value	11	41	37.8	0.1	Q Health
		Magnesium	mg/L	Monthly	13	13	No value	7.8	31	29	0.1	Q Health
		Chloride	mg/L	Monthly	13	13	0	46	49	46.8	1	Q Health
		Fluoride	mg/L	Monthly	13	13	0	0.1	0.3	0.2	0.01	Q Health
		Nitrate	mg/L	Monthly	13	0	0	<0.5	<0.5	<0.5	0.5	Q Health
		Sulphate	mg/L	Monthly	13	13	0	1	21	18.5	0.1	Q Health
		Iron	mg/L	Monthly	13	0	0	<0.01	<0.01	<0.01	0.01	Q Health
		Manganese	mg/L	Monthly	13	0	0	<0.01	<0.01	<0.01	0.01	Q Health
Bauhinia	Reticulation	Zinc	mg/L	Monthly	13	5	0	<0.01	0.1	0.04	0.01	Q Health
		Aluminium	mg/L	Monthly	13	13	0	0.1	0.1	0.1	0.05	Q Health
		Boron	mg/L	Monthly	13	6	0	<0.01	0.1	0.05	0.01	Q Health
		Copper	mg/L	Monthly	13	5	0	<0.03	0.1	0.04	0.03	Q Health

Scheme name	Scheme component	Parameter	Units	Frequency of sampling	Total No. samples collected	No. of samples with values ≥ the LOR	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	LOR	Laboratory name
Bauhinia	Reticulation	Chlorine (Free)	mg/L	Monthly	3	3	0	0.02	0.64	0.2	0.01	Q Health
		Coliforms	CFU/100mL	Monthly	12	0	0	0	0	0	0	Q Health
		Ecoli	CFU/100mL	Monthly	12	0	0	0	0	0	0	Q Health
		Conductivity	us/cm	Monthly	6	6	No value	444	464	453	1	Q Health
		pH	mg/L	Monthly	6	6	0	7.6	7.9	7.7	0.01	Q Health
		Total Hardness	mg CaCO3/L	Monthly	6	6	0	54	58	55.7	1	Q Health
		Alkalinity	mg CaCO3/L	Monthly	6	6	No value	149	165	155.5	1	Q Health
		Silica	mg/L	Monthly	6	6	0	18	19	18.2	1	Q Health
		Dissolved Soilds	mg/L	Monthly	6	6	0	254	274	262	1	Q Health
		True Colour	hazen	Monthly	6	6	0	1	2	1.2	1	Q Health
		Turbidity	NTU	Monthly	6	6	0	1	2	1.2	1	Q Health
		Sodium	mg/L	Monthly	6	6	0	59	58	62.8	1	Q Health
		Potassium	mg/L	Monthly	6	6	No value	20	22	21	0.1	Q Health
		Calcium	mg/L	Monthly	6	6	No value	9.5	11	10.2	0.1	Q Health
		Magnesium	mg/L	Monthly	6	6	No value	7.2	7.6	7.4	0.1	Q Health
		Chloride	mg/L	Monthly	6	6	0	46	50	48	1	Q Health
		Fluoride	mg/L	Monthly	6	6	0	0.10	0.20	0.20	0.01	Q Health
		Nitrate	mg/L	Monthly	6	0	0	<0.5	<0.5	<0.5	0.5	Q Health
		Sulphate	mg/L	Monthly	6	6	0	1	1	1	0.1	Q Health
		Iron	mg/l	Monthly	6	0	0	<0.01	<0.01	<0.01	0.01	Q Health
		Manganese	mg/L	Monthly	6	0	0	<0.01	<0.01	<0.01	0.01	Q Health
Bauhinia	Reticulation	Zinc	mg/L	Monthly	6	4	0	<0.01	0.7	0.10	0.01	Q Health
		Aluminium	mg/L	Monthly	6	6	0	0.1	0.1	0.1	0.05	Q Health
		Boron	mg/L	Monthly	6	0	0	<0.01	<0.01	<0.01	0.01	Q Health
		Copper	mg/L	Monthly	6	0	0	<0.03	<0.03	<0.03	0.03	Q Health

Scheme name	Scheme component	Parameter	Units	Frequency of sampling	Total No. samples collected	No. of samples with values ≥ the LOR	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	LOR	Laboratory name
Blackwater	Reticulation	Chlorine (Free)	mg/L	Weekly	45	45	0	0.05	0.9	0.2	0.01	Q Health
		Coliforms	CFU/100mL	Weekly	50	0	0	0	0	0	0	Q Health
		Ecoli	CFU/100mL	Weekly	50	0	0	0	0	0	0	Q Health
		Trihalomethanes	µg/L	Seasonally/ Event	11	11	0	82	153	109	1	Q Health
		Atrazine	µg/L	Seasonally	1	0	0	<0.02	<0.02	<0.02	0.01	Q Health
		Desethyl Atrazine	µg/L	Seasonally	1	0	No value	<0.02	<0.02	<0.02	0.01	Q Health
		Simazine	µg/L	Seasonally	1	1	0	0.09	0.09	0.09	0.01	Q Health
		Tebuthiuron	µg/L	Seasonally	1	1	No value	0.08	0.08	0.08	0.01	Q Health
		Metolachlor	µg/L	Seasonally	1	0	0	<0.02	<0.02	<0.02	0.01	Q Health
		Conductivity	us/cm	Monthly	11	11	No value	267	502	381.6	1	Q Health
		pH	mg/L	Monthly	11	11	0	7.7	7083	651.1	0.01	Q Health
		Total Hardness	mg CaC03/L	Monthly	11	11	0	66	126	94.2	1	Q Health
		Alkalinity	mg CaC03/L	Monthly	11	11	No value	59	110	85.2	1	Q Health
		Silica	mg/L	Monthly	11	11	0	6	15	10.6	1	Q Health
		Dissolved Soilds	mg/L	Monthly	11	11	0	154	268	208.4	1	Q Health
		True Colour	hazen	Monthly	11	11	0	1	3	1.6	1	Q Health
		Turbidity	NTU	Monthly	11	11	0	1	1	1	1	Q Health
		Sodium	mg/L	Monthly	11	11	0	25	50	36.4	1	Q Health
		Potassium	mg/L	Monthly	11	11	No value	4.4	5.4	4.9	0.1	Q Health
		Calcium	mg/L	Monthly	11	11	No value	16	28	22.5	0.1	Q Health
		Magnesium	mg/L	Monthly	11	11	No value	6.1	14	9.2	0.1	Q Health
		Chloride	mg/L	Monthly	11	11	0	33	77	51.8	1	Q Health
		Fluoride	mg/L	Monthly	11	11	0	0.1	0.7	0.5	0.01	Q Health
		Nitrate	mg/L	Monthly	11	5	0	<0.5	1.7	0.8	0.5	Q Health
		Sulphate	mg/L	Monthly	11	11	0	17	24	20.6	0.1	Q Health
		Iron	mg/l	Monthly	11	0	0	<0.01	<0.01	<0.01	0.01	Q Health
		Manganese	mg/L	Monthly	11	0	0	<0.01	<0.01	<0.01	0.01	Q Health
		Zinc	mg/L	Monthly	11	8	0	<0.01	0.1	0.04	0.01	Q Health
		Aluminium	mg/L	Monthly	11	11	0	0.1	0.1	0.1	0.05	Q Health
		Boron	mg/L	Monthly	11	8	0	<0.01	0.1	0.02	0.01	Q Health
		Copper	mg/L	Monthly	11	0	0	<0.03	<0.03	<0.03	0.03	Q Health
	Raw Water	Atrazine	µg/L	Seasonally	1	1	NA	0.03	0.03	0.03	0.01	Q Health
		Desethyl Atrazine	µg/L	Seasonally	1	0	NA	<0.02	<0.02	<0.02	0.01	Q Health
		Simazine	µg/L	Seasonally	1	0	NA	<0.02	<0.02	<0.02	0.01	Q Health
		Tebuthiuron	µg/L	Seasonally	1	1	NA	0.19	0.19	0.19	0.01	Q Health
		Metolachlor	µg/L	Seasonally	1	1	NA	0.09	0.09	0.09	0.01	Q Health
		Algae (pot. toxic)	Cells/mL	Seasonally	1	1	No value	140	140	140	1	Q Health
		Toxin (cylindro)	µg/L	Seasonally	0	0	No value	0	0	0	0.2	Q Health

Scheme name	Scheme component	Parameter	Units	Frequency of sampling	Total No. samples collected	No. of samples with values ≥ the LOR	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	LOR	Laboratory name
Bluff	Reticulation	Chlorine (Free)	mg/L	Monthly	10	10	0	0.6	1.1	0.8	0.01	Q Health
		Coliforms	CFU/100mL	Monthly	12	0	0	0	0	0	0	Q Health
		Ecoli	CFU/100mL	Monthly	12	0	0	0	0	0	0	Q Health
		Trihalomethanes	µg/L	Seasonally/ Event	11	11	0	97	238	155	1	Q Health

Scheme name	Scheme component	Parameter	Units	Frequency of sampling	Total No. samples collected	No. of samples with values ≥ the LOR	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	LOR	Laboratory name
Capella	Reticulation	Chlorine (Free)	mg/L	Monthly	12	12	0	1.7	2.2	2.07	0.01	Q Health
		Coliforms	CFU/100mL	Monthly	13	0	0	0	0	0	0	Q Health
		Ecoli	CFU/100mL	Monthly	13	0	0	0	0	0	0	Q Health
		Trihalomethanes	µg/L	Seasonally/ Event	12	12	1	51	153	87	1	Q Health
		Conductivity	us/cm	Monthly	8	8	No value	396	632	471	1	Q Health
		pH	mg/L	Monthly	8	8	0	7.3	8.2	7.6	0.01	Q Health
		Total Hardness	mg CaC03/L	Monthly	8	8	0	82	118	100.4	1	Q Health
		Alkalinity	mg CaC03/L	Monthly	8	8	No value	78	130	103.5	1	Q Health
		Silica	mg/L	Monthly	8	8	0	9	14	12.1	1	Q Health
		Dissolved Soilds	mg/L	Monthly	8	8	0	228	361	275.4	1	Q Health
		True Colour	hazen	Monthly	8	8	0	1	3	1.3	1	Q Health
		Turbidity	NTU	Monthly	8	8	0	1	2	1.3	1	Q Health
		Sodium	mg/L	Monthly	8	8	0	46	83	56.6	1	Q Health
		Potassium	mg/L	Monthly	8	8	No value	2.9	5.6	3.8	0.1	Q Health
		Calcium	mg/L	Monthly	8	8	No value	19	26	21.8	0.1	Q Health
		Magnesium	mg/L	Monthly	8	8	No value	8.6	13	11.2	0.1	Q Health
		Chloride	mg/L	Monthly	8	8	0	26	68	37.9	1	Q Health
		Fluoride	mg/L	Monthly	8	8	0	0.1	0.2	0.1	0.01	Q Health
		Nitrate	mg/L	Monthly	8	2	0	<0.5	0.6	0.5	0.5	Q Health
		Sulphate	mg/L	Monthly	8	8	0	53	89	69.4	0.1	Q Health
		Iron	mg/l	Monthly	8	0	0	<0.01	<0.01	<0.01	0.01	Q Health
		Manganese	mg/L	Monthly	8	0	0	<0.01	<0.01	<0.01	0.01	Q Health
		Zinc	mg/L	Monthly	8	6	0	<0.01	0.3	0.1	0.01	Q Health
		Aluminium	mg/L	Monthly	8	8	0	0.1	0.1	0.1	0.05	Q Health
		Boron	mg/L	Monthly	8	6	0	<0.01	0.1	0.1	0.01	Q Health
		Copper	mg/L	Monthly	8	0	0	<0.03	<0.03	<0.03	0.03	Q Health
		Algae (pot. toxic)	Cells/mL	Seasonally	20	20	No value	175	5275	1655	1	Q Health
		Toxin (cylindro)	µg/L	Seasonally	16	0	No value	< 0.2	0.5	0.2	0.2	Q Health
	Raw Water	Atrazine	µg/L	Seasonally	1	1	NA	0.17	0.17	0.17	0.01	Q Health
		Desethyl Atrazine	µg/L	Seasonally	1	0	NA	< 0.02	< 0.02	< 0.02	0.01	Q Health
		Simazine	µg/L	Seasonally	1	1	NA	0.73	0.73	0.73	0.01	Q Health
		Tebuthiuron	µg/L	Seasonally	1	1	NA	0.03	0.03	0.03	0.01	Q Health
		Metolachlor	µg/L	Seasonally	1	0	NA	< 0.02	< 0.02	< 0.02	0.01	Q Health
		Algae (pot. toxic)	Cells/mL	Seasonally	21	21	No value	120	31125	5815	1	Q Health
		Toxin (cylindro)	µg/L	Seasonally	16	11	No value	< 0.2	< 0.2	< 0.2	0.2	Q Health

Scheme name	Scheme component	Parameter	Units	Frequency of sampling	Total No. samples collected	No. of samples with values ≥ the LOR	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	LOR	Laboratory name
Comet	Reticulation	Chlorine (Free)	mg/L	Monthly	11	11	0	0.1	1.2	0.7	0.01	Q Health
		Coliforms	CFU/100mL	Monthly	12	0	0	0	0	0	0	Q Health
		Ecoli	CFU/100mL	Monthly	12	0	0	0	0	0	0	Q Health
		Trihalomethanes	µg/L	Seasonally/ Event	11	11	0	119	236	164	1	Q Health
		Conductivity	us/cm	Monthly	10	10	No value	190	304	234	1	Q Health
		pH	mg/L	Monthly	10	10	0	7.5	8.1	7.9	0.01	Q Health
		Total Hardness	mg CaC03/L	Monthly	10	10	0	42	97	67.5	1	Q Health
		Alkalinity	mg CaC03/L	Monthly	10	10	No value	8.2	127	76.7	1	Q Health
		Silica	mg/L	Monthly	10	10	0	13	22	18.5	1	Q Health
		Dissolved Soilds	mg/L	Monthly	10	10	0	112	184	139.3	1	Q Health
		True Colour	hazen	Monthly	10	10	0	1	4	2.1	1	Q Health
		Turbidity	NTU	Monthly	10	10	0	1	1	1	1	Q Health
		Sodium	mg/L	Monthly	10	10	0	14	23	18.8	1	Q Health
		Potassium	mg/L	Monthly	10	10	No value	3.7	7.2	5.1	0.1	Q Health
		Calcium	mg/L	Monthly	10	10	No value	10	21	15.3	0.1	Q Health
		Magnesium	mg/L	Monthly	10	10	No value	3.9	11	7.1	0.1	Q Health
		Chloride	mg/L	Monthly	10	10	0	16	23	20.1	1	Q Health
		Fluoride	mg/L	Monthly	10	10	0	0.1	0.2	0.1	0.01	Q Health
		Nitrate	mg/L	Monthly	10	7	0	<0.5	3	1	0.5	Q Health
		Sulphate	mg/L	Monthly	10	10	0	1	5.1	3.1	0.1	Q Health
		Iron	mg/l	Monthly	10	0	0	<0.01	<0.01	<0.01	0.01	Q Health
		Manganese	mg/L	Monthly	10	0	0	<0.01	<0.01	<0.01	0.01	Q Health
		Zinc	mg/L	Monthly	10	8	0	<0.01	0.2	0.12	0.01	Q Health
		Aluminium	mg/L	Monthly	10	10	0	0.1	0.1	0.1	0.05	Q Health
		Boron	mg/L	Monthly	10	0	0	<0.01	<0.01	<0.01	0.01	Q Health
		Copper	mg/L	Monthly	10	0	0	<0.03	<0.03	<0.03	0.03	Q Health
	Raw Water	Atrazine	µg/L	Seasonally	1	0	NA	< 0.02	< 0.02	< 0.02	0.01	Q Health
		Desethyl Atrazine	µg/L	Seasonally	1	0	NA	< 0.02	< 0.02	< 0.02	0.01	Q Health
		Simazine	µg/L	Seasonally	1	0	NA	< 0.02	< 0.02	< 0.02	0.01	Q Health
		Tebuthiuron	µg/L	Seasonally	1	0	NA	< 0.02	< 0.02	< 0.02	0.01	Q Health
		Metolachlor	µg/L	Seasonally	1	0	NA	< 0.02	< 0.02	< 0.02	0.01	Q Health

Scheme name	Scheme component	Parameter	Units	Frequency of sampling	Total No. samples collected	No. of samples with values ≥ the LOR	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	LOR	Laboratory name
Dingo	Reticulation	Chlorine (Free)	mg/L	Monthly	10	10	0	0.5	1.8	1.1	0.01	Q Health
		Coliforms	CFU/100mL	Monthly	12	0	0	0	0	0	0	Q Health
		Ecoli	CFU/100mL	Monthly	12	0	0	0	0	0	0	Q Health
		Trihalomethanes	µg/L	Seasonally	7	7	0	124	273	209.6	1	Q Health
		Atrazine	µg/L	Seasonally	1	0	0	< 0.02	< 0.02	< 0.02	0.01	Q Health
		Desethyl Atrazine	µg/L	Seasonally	1	0	No value	< 0.02	< 0.02	< 0.02	0.01	Q Health
		Simazine	µg/L	Seasonally	1	0	0	< 0.02	< 0.02	< 0.02	0.01	Q Health
		Tebuthiuron	µg/L	Seasonally	1	1	No value	0.31	0.31	0.31	0.01	Q Health
		Metolachlor	µg/L	Seasonally	1	0	0	< 0.02	< 0.02	< 0.02	0.01	Q Health
		Conductivity	us/cm	Monthly	8	8	No value	145	163	153	1	Q Health
		pH	mg/L	Monthly	8	8	0	7	7.9	7.5	0.01	Q Health
		Total Hardness	mg CaC03/L	Monthly	8	8	0	20	32	25.6	1	Q Health
		Alkalinity	mg CaC03/L	Monthly	8	8	No value	30	52	38.5	1	Q Health
		Silica	mg/L	Monthly	8	8	0	9	13	10.9	1	Q Health
		Dissolved Soilds	mg/L	Monthly	8	8	0	82	97	86.8	1	Q Health
		True Colour	hazen	Monthly	8	8	0	1	2	1.4	1	Q Health
		Turbidity	NTU	Monthly	8	8	0	1	2	1.1	1	Q Health
		Sodium	mg/L	Monthly	8	8	0	16	19	17.8	1	Q Health
		Potassium	mg/L	Monthly	8	8	No value	3.7	4.2	3.9	0.1	Q Health
		Calcium	mg/L	Monthly	8	8	No value	3	6.1	4.8	0.1	Q Health
		Magnesium	mg/L	Monthly	8	8	No value	2.9	4.1	3.3	0.1	Q Health
		Chloride	mg/L	Monthly	8	8	0	19	25	21.4	1	Q Health
		Fluoride	mg/L	Monthly	8	8	0	0.1	0.1	0.1	0.01	Q Health
		Nitrate	mg/L	Monthly	8	2	0	<0.5	0.5	0.5	0.5	Q Health
		Sulphate	mg/L	Monthly	8	8	0	1	2	1.7	0.1	Q Health
		Iron	mg/l	Monthly	8	0	0	<0.01	<0.01	<0.01	0.01	Q Health
		Manganese	mg/L	Monthly	8	0	0	<0.01	<0.01	<0.01	0.01	Q Health
		Zinc	mg/L	Monthly	8	5	0	<0.01	0.6	0.1	0.01	Q Health
		Aluminium	mg/L	Monthly	8	0	0	0.1	0.1	0.1	0.05	Q Health
		Boron	mg/L	Monthly	8	6	0	<0.01	0.1	0.03	0.01	Q Health
		Copper	mg/L	Monthly	8	8	0	<0.03	<0.03	<0.03	0.03	Q Health
	Raw Water	Algae (pot. toxic)	Cells/mL	Seasonally	3	2	No value	0	3908	1386	1	Q Health
		Toxin (cylindro)	µg/L	Seasonally	0	0	No value	0	0	0	0.2	Q Health

Scheme name	Scheme component	Parameter	Units	Frequency of sampling	Total No. samples collected	No. of samples with values ≥ the LOR	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	LOR	Laboratory name
Duaringa	Reticulation	Chlorine (Free)	mg/L	Monthly	13	13	0	0	202	1	0.01	Q Health
		Coliforms	CFU/100mL	Monthly	14	3	3	0	200	15.4	0	Q Health
		Ecoli	CFU/100mL	Monthly	14	0	0	0	0	0	0	Q Health
		Trihalomethanes	µg/L	Seasonally	10	10	0	90	264	275.2	1	Q Health
		Atrazine	µg/L	Seasonally	2	0	0	< 0.02	< 0.02	< 0.02	0.01	Q Health
		Desethyl Atrazine	µg/L	Seasonally	2	0	No value	< 0.02	< 0.02	< 0.02	0.01	Q Health
		Simazine	µg/L	Seasonally	2	2	0	0.02	0.03	0.03	0.01	Q Health
		Tebuthiuron	µg/L	Seasonally	2	2	No value	0.02	0.75	< 0.02	0.01	Q Health
		Metolachlor	µg/L	Seasonally	2	0	0	< 0.02	< 0.02	< 0.02	0.01	Q Health
		Conductivity	us/cm	Monthly	8	8	No value	224	417	279.5	1	Q Health
		pH	mg/L	Monthly	8	8	0	7.2	7.9	7.7	0.01	Q Health
		Total Hardness	mg CaC03/L	Monthly	8	8	0	49	85	61.3	1	Q Health
		Alkalinity	mg CaC03/L	Monthly	8	8	No value	58	82	70.5	1	Q Health
		Silica	mg/L	Monthly	8	8	0	12	17	14.6	1	Q Health
		Dissolved Soilds	mg/L	Monthly	8	8	0	132	224	158	1	Q Health
		True Colour	hazen	Monthly	8	8	0	2	7	3.9	1	Q Health
		Turbidity	NTU	Monthly	8	8	0	1	2	1.1	1	Q Health
		Sodium	mg/L	Monthly	8	8	0	22	46	28	1	Q Health
		Potassium	mg/L	Monthly	8	8	No value	5.2	6.9	6.1	0.1	Q Health
		Calcium	mg/L	Monthly	8	8	No value	13	20	14.9	0.1	Q Health
		Magnesium	mg/L	Monthly	8	8	No value	4	9.5	6	0.1	Q Health
		Chloride	mg/L	Monthly	8	8	0	23	72	37	1	Q Health
		Fluoride	mg/L	Monthly	8	8	0	0.1	0.2	0.1	0.01	Q Health
		Nitrate	mg/L	Monthly	8	8	0	0.5	1.3	0.9	0.5	Q Health
		Sulphate	mg/L	Monthly	8	8	0	3	15	8.3	0.1	Q Health
		Iron	mg/l	Monthly	8	6	0	<0.01	0.1	0.08	0.01	Q Health
		Manganese	mg/L	Monthly	8	0	0	<0.01	<0.01	<0.01	0.01	Q Health
		Zinc	mg/L	Monthly	8	4	0	<0.01	0.6	0.1	0.01	Q Health
		Aluminium	mg/L	Monthly	8	0	0	0.1	0.1	0.1	0.05	Q Health
		Boron	mg/L	Monthly	8	8	0	<0.01	<0.01	<0.01	0.01	Q Health
		Copper	mg/L	Monthly	8	0	0	<0.03	<0.03	<0.03	0.03	Q Health
	Raw Water	Algae (pot. toxic)	Cells/mL	Seasonally	6	1	No value	0	17800	2967	1	Q Health
		Toxin (microcystins)	µg/L	Seasonally	5	0	No value	< 0.5	< 0.5	< 0.5	0.5	Q Health
		Atrazine	µg/L	Seasonally	2	0	NA	< 0.02	< 0.02	< 0.02	0.01	Q Health
		Desethyl Atrazine	µg/L	Seasonally	2	0	NA	< 0.02	< 0.02	< 0.02	0.01	Q Health
		Simazine	µg/L	Seasonally	2	0	NA	< 0.02	< 0.02	< 0.02	0.01	Q Health
		Tebuthiuron	µg/L	Seasonally	2	2	NA	< 0.02	0.8	0.4	0.01	Q Health
		Metolachlor	µg/L	Seasonally	2	0	NA	< 0.02	< 0.02	< 0.02	0.01	Q Health
		Algae (pot. toxic)	Cells/mL	Seasonally	7	5	No value	0	34340	10036	1	Q Health
		Toxin (microcystins)	µg/L	Seasonally	5	3	No value	< 0.5	7.9	1.9	0.5	Q Health

Scheme name	Scheme component	Parameter	Units	Frequency of sampling	Total No. samples collected	No. of samples with values ≥ the LOR	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	LOR	Laboratory name
Emerald	Reticulation	Chlorine (Free)	mg/L	Weekly	96	96	0	0.5	1.8	1.15	0.01	Q Health
		Coliforms	CFU/100mL	Weekly	102	0	0	0	0	0	0	Q Health
		Ecoli	CFU/100mL	Weekly	102	0	0	0	0	0	0	Q Health
		Trihalomethanes	µg/L	Seasonally	4	4	0	54	86	74	1	Q Health
		Conductivity	us/cm	Monthly	24	24	No value	280	477	358.4	1	Q Health
		pH	mg/L	Monthly	24	24	0	7.3	8	7.6	0.01	Q Health
		Total Hardness	mg CaCO3/L	Monthly	24	24	0	70	125	98.3	1	Q Health
		Alkalinity	mg CaCO3/L	Monthly	24	24	No value	64	129	102	1	Q Health
		Silica	mg/L	Monthly	24	24	0	8	13	9.3	1	Q Health
		Dissolved Solids	mg/L	Monthly	24	24	0	153	251	195.1	1	Q Health
		True Colour	hazen	Monthly	24	24	0	1	9	1.4	1	Q Health
		Turbidity	NTU	Monthly	24	24	0	1	1	1	1	Q Health
		Sodium	mg/L	Monthly	24	24	0	22	42	29.7	1	Q Health
		Potassium	mg/L	Monthly	24	24	No value	5.7	7.6	7	0.1	Q Health
		Calcium	mg/L	Monthly	24	24	No value	16	27	22	0.1	Q Health
		Magnesium	mg/L	Monthly	24	24	No value	7.3	14	10.5	0.1	Q Health
		Chloride	mg/L	Monthly	24	24	0	26	63	38.9	1	Q Health
		Fluoride	mg/L	Monthly	24	24	0	0.2	0.8	0.6	0.01	Q Health
		Nitrate	mg/L	Monthly	24	20	0	<0.5	2.5	0.9	0.5	Q Health
		Sulphate	mg/L	Monthly	24	24	0	6	34	14.7	0.1	Q Health
		Iron	mg/l	Monthly	24	2	0	<0.01	0.1	0.02	0.01	Q Health
		Manganese	mg/L	Monthly	24	0	0	<0.01	<0.01	<0.01	0.01	Q Health
		Zinc	mg/L	Monthly	24	2	0	<0.01	0.2	0.03	0.01	Q Health
		Aluminium	mg/L	Monthly	24	24	0	0.1	0.1	0.1	0.05	Q Health
		Boron	mg/L	Monthly	24	12	0	<0.01	0.1	0.05	0.01	Q Health
		Copper	mg/L	Monthly	24	0	0	<0.03	<0.03	<0.03	0.03	Q Health
	Raw Water	Atrazine	µg/L	Seasonally	1	1	NA	0.05	0.05	0.05	0.01	Q Health
		Desethyl Atrazine	µg/L	Seasonally	1	1	NA	0.02	0.02	0.02	0.01	Q Health
		Simazine	µg/L	Seasonally	1	1	NA	0.18	0.18	0.18	0.01	Q Health
		Tebuthiuron	µg/L	Seasonally	1	1	NA	0.32	0.32	0.32	0.01	Q Health
		Metolachlor	µg/L	Seasonally	1	1	NA	0.02	0.02	0.02	0.01	Q Health
		Algae (pot. toxic)	Cells/mL	Seasonally	1	0	No value	0	0	0	1	Q Health
		Toxin (cylindro)	µg/L	Seasonally	0	0	No value	0	0	0	0.2	Q Health

Scheme name	Scheme component	Parameter	Units	Frequency of sampling	Total No. samples collected	No. of samples with values ≥ the LOR	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	LOR	Laboratory name
Rolleston	Reticulation	Chlorine (Free)	mg/L	Weekly	12	12	0	0.2	1.6	0.7	0.01	Q Health
		Coliforms	CFU/100mL	Weekly	12	0	0	0	0	0	0	Q Health
		Ecoli	CFU/100mL	Weekly	12	0	0	0	0	0	0	Q Health
		Trihalomethanes	µg/L	Seasonally/ Event	8	8	0	140	189	167	1	Q Health
		Atrazine	ug/L	Seasonally	1	1	0	0.03	0.03	0.03	0.01	Q Health
		Desethyl Atrazine	ug/L	Seasonally	1	1	No value	0.03	0.03	0.03	0.01	Q Health
		Simazine	ug/L	Seasonally	1	1	0	0.27	0.27	0.27	0.01	Q Health
		Tebuthiuron	ug/L	Seasonally	1	1	No value	0.11	0.11	0.11	0.01	Q Health
		Metolachlor	ug/L	Seasonally	1	1	0	0.14	0.14	0.14	0.01	Q Health
		Conductivity	us/cm	Monthly	11	11	No value	288	489	342	1	Q Health
		pH	mg/L	Monthly	11	11	4	8.2	8.7	8.5	0.01	Q Health
		Total Hardness	mg CaCO3/L	Monthly	11	11	0	81	95	86.5	1	Q Health
		Alkalinity	mg CaCO3/L	Monthly	11	11	No value	115	156	128.5	1	Q Health
		Silica	mg/L	Monthly	11	11	0	4	13	9	1	Q Health
		Dissolved Solids	mg/L	Monthly	11	11	0	162	263	189.3	1	Q Health
		True Colour	hazen	Monthly	11	11	0	1	3	1.4	1	Q Health
		Turbidity	NTU	Monthly	11	11	0	1	1	1	1	Q Health
		Sodium	mg/L	Monthly	11	11	0	24	69	36.2	1	Q Health
		Potassium	mg/L	Monthly	11	11	No value	5.8	7	6.2	0.1	Q Health
		Calcium	mg/L	Monthly	11	11	No value	16	18	17.3	0.1	Q Health
		Magnesium	mg/L	Monthly	11	11	No value	9.9	12	10.4	0.1	Q Health
		Chloride	mg/L	Monthly	11	11	0	20	56	28.8	1	Q Health
		Fluoride	mg/L	Monthly	11	11	0	0.2	0.3	0.2	0.01	Q Health
		Nitrate	mg/L	Monthly	11	4	0	<0.5	1.1	0.6	0.5	Q Health
		Sulphate	mg/L	Monthly	11	11	0	1	10	3.3	0.1	Q Health
		Iron	mg/l	Monthly	11	0	0	<0.01	<0.01	<0.01	0.01	Q Health
		Manganese	mg/L	Monthly	11	0	0	<0.01	<0.01	<0.01	0.01	Q Health
		Zinc	mg/L	Monthly	11	4	0	<0.01	0.1	0	0.01	Q Health
		Aluminium	mg/L	Monthly	11	11	0	0.1	0.1	0.1	0.05	Q Health
		Boron	mg/L	Monthly	11	11	0	<0.01	0.1	0	0.01	Q Health
		Copper	mg/L	Monthly	11	0	0	<0.03	<0.03	<0.03	0.03	Q Health
	Raw Water	Algae (pot. toxic)	Cells/mL	Seasonally	2	0	No value	0	0	0	1	Q Health
		Toxin (cylindro)	µg/L	Seasonally	2	0	No value	< 0.2	< 0.2	< 0.2	0.2	Q Health
		Atrazine	µg/L	Seasonally	3	2	NA	< 0.02	0.03	0.02	0.01	Q Health
		Desethyl Atrazine	µg/L	Seasonally	3	3	NA	0.03	0.06	0.04	0.01	Q Health
		Simazine	µg/L	Seasonally	3	3	NA	0.25	0.51	0.37	0.01	Q Health
		Tebuthiuron	µg/L	Seasonally	3	3	NA	0.11	0.15	0.13	0.01	Q Health
		Metolachlor	µg/L	Seasonally	3	3	NA	0.11	0.2	0.16	0.01	Q Health
		Algae (pot. toxic)	Cells/mL	Seasonally	5	5	No value	340	53200	23217	1	Q Health
		Toxin (cylindro)	µg/L	Seasonally	2	2	No value	0.2	0.3	0.25	0.2	Q Health

Scheme name	Scheme component	Parameter	Units	Frequency of sampling	Total No. samples collected	No. of samples with values ≥ the LOR	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	LOR	Laboratory name
Rubyvale	Reticulation	Chlorine (Free)	mg/L	Weekly	51	51	0	0.2	1.8	0.9	0.01	Q Health
		Coliforms	CFU/100mL	Weekly	52	0	0	0	0	0	0	Q Health
		Ecoli	CFU/100mL	Weekly	52	0	0	0	0	0	0	Q Health
		Conductivity	us/cm	Monthly	12	12	No value	614	707	657	1	Q Health
		pH	mg/L	Monthly	12	12	0	6.8	7.8	7.3	0.01	Q Health
		Total Hardness	mg CaCO3/L	Monthly	12	12	19	191	230	204.2	1	Q Health
		Alkalinity	mg CaCO3/L	Monthly	12	12	No value	167	191	176.2	1	Q Health
		Silica	mg/L	Monthly	12	12	0	31	34	33	1	Q Health
		Dissolved Solids	mg/L	Monthly	12	12	0	360	412	381.3	1	Q Health
		True Colour	hazen	Monthly	12	12	0	1	1	1	1	Q Health
		Turbidity	NTU	Monthly	12	12	0	1	1	1	1	Q Health
		Sodium	mg/L	Monthly	12	12	0	53	59	55.3	1	Q Health
		Potassium	mg/L	Monthly	12	12	No value	1.5	1.9	1.6	0.1	Q Health
		Calcium	mg/L	Monthly	12	12	No value	0	58	46.8	0.1	Q Health
		Magnesium	mg/L	Monthly	12	12	No value	18	21	19	0.1	Q Health
		Chloride	mg/L	Monthly	12	12	0	69	91	76.9	1	Q Health
		Fluoride	mg/L	Monthly	12	12	0	0.2	0.7	0.3	0.01	Q Health
		Nitrate	mg/L	Monthly	12	12	0	1.2	1.7	1.4	0.5	Q Health
		Sulphate	mg/L	Monthly	12	12	0	33	41	37.2	0.1	Q Health
		Iron	mg/l	Monthly	12	0	0	<0.01	<0.01	<0.01	0.01	Q Health
		Manganese	mg/L	Monthly	12	0	0	<0.01	<0.01	<0.01	0.01	Q Health
		Zinc	mg/L	Monthly	12	9	0	<0.01	0.1	0	0.01	Q Health
		Aluminium	mg/L	Monthly	12	12	0	0.1	0.1	0.1	0.05	Q Health
		Boron	mg/L	Monthly	12	8	0	<0.01	0.1	0	0.01	Q Health
		Copper	mg/L	Monthly	12	12	0	0.1	0.2	0.1	0.03	Q Health

Scheme name	Scheme component	Parameter	Units	Frequency of sampling	Total No. samples collected	No. of samples with values ≥ the LOR	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	LOR	Laboratory name
Sapphire	Reticulation	Chlorine (Free)	mg/L	Weekly	50	50	0	0.3	2.5	1	0.01	Q Health
		Coliforms	CFU/100mL	Weekly	51	0	0	0	0	0	0	Q Health
		Ecoli	CFU/100mL	Weekly	51	0	0	0	0	0	0	Q Health
		Conductivity	us/cm	Monthly	11	11	No value	615	695	658	1	Q Health
		pH	mg/L	Monthly	11	11	0	6.7	8.1	7.3	0.01	Q Health
		Total Hardness	mg CaCO3/L	Monthly	11	11	17	189	221	204.7	1	Q Health
		Alkalinity	mg CaCO3/L	Monthly	11	11	No value	167	194	176.5	1	Q Health
		Silica	mg/L	Monthly	11	11	0	30	34	32.3	1	Q Health
		Dissolved Solids	mg/L	Monthly	11	11	0	361	409	380.9	1	Q Health
		True Colour	hazen	Monthly	11	11	0	1	1	1	1	Q Health
		Turbidity	NTU	Monthly	11	11	0	1	1	1	1	Q Health
		Sodium	mg/L	Monthly	11	11	0	51	59	54.9	1	Q Health
		Potassium	mg/L	Monthly	11	11	No value	1.5	2.1	1.6	0.1	Q Health
		Calcium	mg/L	Monthly	11	11	No value	47	55	50.9	0.1	Q Health
		Magnesium	mg/L	Monthly	11	11	No value	18	21	19.1	0.1	Q Health
		Chloride	mg/L	Monthly	11	11	0	67	90	77	1	Q Health
		Fluoride	mg/L	Monthly	11	11	0	0.1	0.6	0.3	0.01	Q Health
		Nitrate	mg/L	Monthly	11	11	0	1.2	1.7	1.4	0.5	Q Health
		Sulphate	mg/L	Monthly	11	11	0	34	43	37.5	0.1	Q Health
		Iron	mg/l	Monthly	11	0	0	<0.01	<0.01	<0.01	0.01	Q Health
		Manganese	mg/L	Monthly	11	0	0	<0.01	<0.01	<0.01	0.01	Q Health
		Zinc	mg/L	Monthly	11	8	0	<0.01	0.2	0.05	0.01	Q Health
		Aluminium	mg/L	Monthly	11	2	0	<0.01	0.1	0.02	0.05	Q Health
		Boron	mg/L	Monthly	11	0	0	<0.01	<0.01	<0.01	0.01	Q Health
		Copper	mg/L	Monthly	11	9	0	<0.03	0.1	0.1	0.03	Q Health

Scheme name	Scheme component	Parameter	Units	Frequency of sampling	Total No. samples collected	No. of samples with values ≥ the LOR	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	LOR	Laboratory name
Springsure	Upper Reticulation Zone	Chlorine (Free)	mg/L	Monthly	11	11	0	0.2	1.7	0.8	0.01	Q Health
		Coliforms	CFU/100mL	Monthly	12	0	0	0	0	0	0	Q Health
		Ecoli	CFU/100mL	Monthly	12	0	0	0	0	0	0	Q Health
		Conductivity	us/cm	Monthly	11	11	No value	1150	1190	1160	1	Q Health
		pH	mg/L	Monthly	11	11	1	8.6	8.7	8.6	0.01	Q Health
		Total Hardness	mg CaC03/L	Monthly	11	11	0	12	13	12.6	1	Q Health
		Alkalinity	mg CaC03/L	Monthly	11	11	No value	472	607	578.9	1	Q Health
		Silica	mg/L	Monthly	11	11	0	16	18	17.7	1	Q Health
		Dissolved Soilds	mg/L	Monthly	11	11	1	702	716	708.8	1	Q Health
		True Colour	hazen	Monthly	11	11	0	1	2	1.2	1	Q Health
		Turbidity	NTU	Monthly	11	11	0	1	1	1	1	Q Health
		Sodium	mg/L	Monthly	11	11	0	289	300	292.9	1	Q Health
		Potassium	mg/L	Monthly	11	11	No value	2.7	3.8	3.5	0.1	Q Health
		Calcium	mg/L	Monthly	11	11	No value	3.3	3.5	3.4	0.1	Q Health
		Magnesium	mg/L	Monthly	11	11	No value	0.9	1.1	1	0.1	Q Health
		Chloride	mg/L	Monthly	11	11	0	31	100	43.2	1	Q Health
		Fluoride	mg/L	Monthly	11	11	0	0.3	0.5	0.4	0.01	Q Health
		Nitrate	mg/L	Monthly	11	0	0	<0.5	<0.5	<0.5	0.5	Q Health
		Sulphate	mg/L	Monthly	11	0	0	1	7	1.6	0.1	Q Health
		Iron	mg/l	Monthly	11	3	0	<0.01	0.1	0.02	0.01	Q Health
		Manganese	mg/L	Monthly	11	0	0	<0.01	<0.01	<0.01	0.01	Q Health
		Zinc	mg/L	Monthly	11	7	0	<0.01	0.2	0.06	0.01	Q Health
	Lower Reticulation Zone	Aluminium	mg/L	Monthly	11	0	0	0.1	0.1	0.1	0.05	Q Health
		Boron	mg/L	Monthly	11	11	0	0.2	0.5	0.3	0.01	Q Health
		Copper	mg/L	Monthly	11	0	0	<0.03	<0.03	<0.03	0.03	Q Health
		Chlorine (Free)	mg/L	Monthly	11	11	0	0.2	1.7	0.8	0.01	Q Health
		Coliforms	CFU/100mL	Monthly	12	0	0	0	0	0	0	Q Health
		Ecoli	CFU/100mL	Monthly	12	0	0	0	0	0	0	Q Health
		Conductivity	us/cm	Monthly	11	11	No value	1150	1190	1160	1	Q Health
		pH	mg/L	Monthly	11	11	5	8.6	8.7	8.6	0.01	Q Health
		Total Hardness	mg CaC03/L	Monthly	11	11	0	11	12	20	1	Q Health
		Alkalinity	mg CaC03/L	Monthly	11	11	No value	481	604	580.5	1	Q Health
		Silica	mg/L	Monthly	11	11	0	17	18	17.8	1	Q Health
		Dissolved Soilds	mg/L	Monthly	11	11	6	702	717	709.4	1	Q Health
		True Colour	hazen	Monthly	11	11	0	1	3	1.4	1	Q Health
		Turbidity	NTU	Monthly	11	11	0	1	1	1	1	Q Health
		Sodium	mg/L	Monthly	11	11	0	288	300	291.9	1	Q Health
		Potassium	mg/L	Monthly	11	11	No value	2.8	3.8	3.5	0.1	Q Health
		Calcium	mg/L	Monthly	11	11	No value	3.1	4.6	3.4	0.1	Q Health
		Magnesium	mg/L	Monthly	11	11	No value	1	202	1.1	0.1	Q Health
		Chloride	mg/L	Monthly	11	11	0	31	100	43	1	Q Health
		Fluoride	mg/L	Monthly	11	11	0	0.3	0.5	0.4	0.01	Q Health
		Nitrate	mg/L	Monthly	11	0	0	<0.5	<0.5	<0.5	0.5	Q Health
		Sulphate	mg/L	Monthly	11	11	0	1	7	1.6	0.1	Q Health
		Iron	mg/l	Monthly	11	6	0	<0.01	0.1	0.05	0.01	Q Health
		Manganese	mg/L	Monthly	11	0	0	<0.01	<0.01	<0.01	0.01	Q Health
		Zinc	mg/L	Monthly	11	4	0	<0.01	0.1	0.04	0.01	Q Health
		Aluminium	mg/L	Monthly	11	11	0	0.1	0.1	0.1	0.05	Q Health
		Boron	mg/L	Monthly	11	11	0	0.2	0.5	0.3	0.01	Q Health
		Copper	mg/L	Monthly	11	0	0	<0.03	<0.03	<0.03	0.03	Q Health

Scheme name	Scheme component	Parameter	Units	Frequency of sampling	Total No. samples collected	No. of samples with values ≥ the LOR	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	LOR	Laboratory name
Tieri	Reticulation	Chlorine (Free)	mg/L	Weekly	48	48	0	0.17	1.75	1.1	0.01	Q Health
		Coliforms	CFU/100mL	Weekly	52	1	1	0	1	0.02	0	Q Health
		Ecoli	CFU/100mL	Weekly	52	0	0	0	0	0	0	Q Health
		Trihalomethanes	µg/L	Seasonally/ Event	23	23	4	103	217	164	1	Q Health
		Atrazine	µg/L	Seasonally	1	1	0	0	0	0	0.01	Q Health
		Desethyl Atrazine	µg/L	Seasonally	1	1	No value	0	0	0	0.01	Q Health
		Simazine	µg/L	Seasonally	1	0	0	0.2	0.2	0.2	0.01	Q Health
		Tebuthiuron	µg/L	Seasonally	1	1	No value	0.2	0.2	0.2	0.01	Q Health
		Metolachlor	µg/L	Seasonally	1	1	0	0	0	0	0.01	Q Health
		Conductivity	us/cm	Monthly	10	10	No value	410	661	514.6	1	Q Health
		pH	mg/L	Monthly	10	10	0	7	7.7	7.4	0.01	Q Health
		Total Hardness	mg CaC03/L	Monthly	10	10	0	70	134	97.7	1	Q Health
		Alkalinity	mg CaC03/L	Monthly	10	10	No value	67	126	99.4	1	Q Health
		Silica	mg/L	Monthly	10	10	0	8	16	11.7	1	Q Health
		Dissolved Soilds	mg/L	Monthly	10	10	0	251	382	299.5	1	Q Health
		True Colour	hazen	Monthly	10	10	0	1	2	1.1	1	Q Health
		Turbidity	NTU	Monthly	10	10	0	1	1	1	1	Q Health
		Sodium	mg/L	Monthly	10	10	0	52	85	66	1	Q Health
		Potassium	mg/L	Monthly	10	10	No value	4.4	5.7	5.1	0.1	Q Health
		Calcium	mg/L	Monthly	10	10	No value	17	29	23.3	0.1	Q Health
		Magnesium	mg/L	Monthly	10	10	No value	6.4	15	9.7	0.1	Q Health
		Chloride	mg/L	Monthly	10	10	0	25	77	50.2	1	Q Health
		Fluoride	mg/L	Monthly	10	10	0	0.1	0.3	0.1	0.01	Q Health
		Nitrate	mg/L	Monthly	10	8	0	<0.5	1.6	0.7	0.5	Q Health
		Sulphate	mg/L	Monthly	10	10	0	50	90	73.5	0.1	Q Health
		Iron	mg/l	Monthly	10	0	0	<0.01	<0.01	<0.01	0.01	Q Health
		Manganese	mg/L	Monthly	10	0	0	<0.01	<0.01	<0.01	0.01	Q Health
		Zinc	mg/L	Monthly	10	6	0	<0.01	0.2	0.1	0.01	Q Health
		Aluminium	mg/L	Monthly	10	10	0	0.1	0.1	0.1	0.05	Q Health
		Boron	mg/L	Monthly	10	10	0	<0.01	0.1	0	0.01	Q Health
		Copper	mg/L	Monthly	10	0	0	<0.03	<0.03	<0.03	0.03	Q Health

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 – 5.12 - Reticulation *E. coli* verification monitoring

Drinking water scheme: Anakie

Year	2016 - 2017											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
No. of samples collected	1	1	1	1	1	1	1	1	1	1	1	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	12	12	12	12
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%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
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 2005* (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 comes into effect once you have 12 months data and should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Drinking water scheme: Bauhinia - hall

Year	2016 - 2017											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
No. of samples collected	1	1	1	1	1	1	1	1	1	1	1	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	12	12	12	12
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%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
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

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

The *Public Health Regulation 2005* (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 comes into effect once you have 12 months data and should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Drinking water scheme: Blackwater & Bluff Schemes

Year	2016 - 2017											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
No. of samples collected	5	6	5	5	5	4	6	5	4	5	5	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	73	69	65	61	58	57	60	61	61	61	60	61
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%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
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 2005* (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 comes into effect once you have 12 months data and 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	2016 - 2017											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
No. of samples collected	1	1	1	1	1	1	1	1	1	1	1	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	12	12	12	12
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 2005* (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 comes into effect once you have 12 months data and 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	2016 - 2017											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
No. of samples collected	1	1	1	1	1	1	1	1	1	1	1	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	12	12	12	12
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%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
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 2005* (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 comes into effect once you have 12 months data and 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	2016 - 2017											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
No. of samples collected	1	1	1	1	1	1	1	1	1	1	1	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	12	12	12	12
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%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
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 2005* (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 comes into effect once you have 12 months data and 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												
	2016 - 2017											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
No. of samples collected	1	1	1	1	1	1	1	3	1	1	1	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	14	14	14	14	14
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%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
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 2005* (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 comes into effect once you have 12 months data and should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Drinking water scheme: Emerald

Year	2016 - 2017											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
No. of samples collected	8	10	8	8	10	6	10	8	8	8	10	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	96	95	96	97	101	100	102	102	102	102	102	102
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%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
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 2005* (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 comes into effect once you have 12 months data and should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Drinking water scheme: Rolleston

Year												
							2016 - 2017					
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
No. of samples collected	1	1	1	1	1	1	1	1	1	1	1	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	12	12	12	12
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%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
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 2005* (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 comes into effect once you have 12 months data and should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Drinking water scheme: Sapphire & Rubyvale Schemes

Year	2016 - 2017											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
No. of samples collected	8	11	8	8	10	6	10	8	8	8	10	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	93	94	96	98	102	101	103	103	103	103	103	103
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%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
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 2005* (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 comes into effect once you have 12 months data and 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	2016 - 2017											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
No. of samples collected	2	2	2	2	2	2	2	2	2	2	2	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	24	24	24	24	24	24	24	24	24	24	24	24
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%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
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 2005* (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 comes into effect once you have 12 months data and should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Drinking water scheme: Tieri Water Scheme

Year	2016 - 2017											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
No. of samples collected	5	5	4	5	4	3	5	4	4	4	5	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	48	48	48	48	48	47	53	52	52	52	52	52
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 2005* (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 comes into effect once you have 12 months data and should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).

Appendix B – Implementation of the DWQMP risk management improvement program

Table 6.1 to 6.14 – Progress against the risk management improvement program in the approved DWQMP

RMIP Reference	Process Step	Risk Management Improvements			Status as at 30/06/2017
		Short term	Medium term	Long term	
	CHRC WIDE				
CHR 1, CHR 2	SWIM Local Project	Ensure all schemes (verification monitoring location) are represented in SWIM and all new data is captured	Work to fill any gaps in the data, collected between old DEWS database and new CHRC SWIM database and also KPI required data		Started and working - procedure written/EHO email sample record but system requires oversight - the administration role is vital and good hand over of the process is important when staff change

RMIP Reference	Process Step	Risk Management Improvements			Status as at 30/06/2017
		Short term	Medium term	Long term	
	ANAKIE				
ANA 1	Procedures		Procedures required for bore inspection, reservoir inspection, disinfection, mains breaks.		Disinfection procedure drafted and under review
ANA 2	Raw water storage	Inspect			Reservoir inspection templates complete and one inspection undertaken by operator. Inspection to be done by consultant next time with recommendations given
ANA 3	System Wide		plan for upskilling		More Emerald based operators know Anakie plant, operator rotations and operator completed Cert III

RMIP Reference	Process Step	Risk Management Improvements			Status as at 30/06/2017
		Short term	Medium term	Long term	
	BAUHINIA				
BAU 1	Procedures		Procedures required for bore inspection, reservoir inspection, disinfection, mains breaks.		Disinfection procedure drafted and under review
BAU 1, BAU 2	Disinfection	roll out procedure	increase reporting into SWIM to monitor		Daily rounds data being collected and added to SWIM approximately monthly
BAU 4	Treated water storage/ Reservoirs		Investigate extra capacity online permanently		Some extra capacity online permanently and another tank decommissioned
BAU 3	System Wide	fill vacancies	plan for up skilling and Blackwater rotation		Supervision improved but more regular visits is the goal

RMIP Reference	Process Step	Risk Management Improvements			Status as at 30/06/2017
		Short term	Medium term	Long term	
	BLACKWATER				
BLK 1	Procedures		Procedures required for bore inspection, reservoir inspection, disinfection, mains breaks.		Coagulation, filtration and disinfection procedures drafted and under review
BLK 1, BLK 2, BLK 3		data collection for procedure target ranges	procedures to be documented / New filter media		New filter media in
BLK 1, BLK 4		procedure being documented at present	permanganate		System commissioned
BLK 1, BLK 2		data collection for procedure target ranges	procedure to be documented with auto shutdown of plant (coagulate failure)		Auto shutdown commissioned
BLK 5	Raw Water Abstraction		Investigate new raw water pumps		Investigated new raw water pumps, completed design for replacement - awaiting prioritisation within CAPEX budget
BLK 1, BLK 2, BLK 3, BLK 6	Filtration	data collection for procedure target ranges	procedure to be documented / new media	auto backwash, shutdowns	New filter media in / drafted procedure / Auto backwash and shutdowns
BLK 1, BLK 2			ripen to waste		2 filters need to be investigated
BLK 1, BLK 2, BLK 7	Disinfection	data collection for procedure target ranges	procedure to be documented / WTP upgrades		WTP upgrades complete
BLK 1, BLK 7		chlorination procedure being documented at present	online monitoring and alarms		Online monitoring into SCADA
BLK 9, BLK 10			data collection for options analysis	Investigate options / Chlorine gas	Awaiting prioritisation within CAPEX budget
BLK 1, BLK 11	Treated water storage/ Reservoirs	chlorination procedure being documented at present	Formalise inspection checklist	need to vermin proof reservoirs	To be done by consultant with recommendations given
BLK 12	Reticulation		Investigate standby generator		Awaiting prioritisation in CAPEX budget
BLK 13			need to develop routine flushing program		Schedule still to be developed. Procedure will require consideration of customer notifications
BLK 14	Redosing (Bluff Reservoir)			replace generator on site	Awaiting prioritisation in CAPEX budget
BLK 15	System Wide		More operators to cert 3		All current Blackwater operators have Cert III
BLK 16			Plan for up skilling		Traineeship successfully competed at Blackwater, extra operators know Bluff, Dingo and Duaringa plants now
BLK 17			Investigate SCADA lockout		Being reviewed in as greatest risk order
BLK 18, BLK 19			develop internal skills to reduce reliance on external support, critical spares to be identified	Preventive maintenance	Preventive maintenance of blower, air compressors

RMIP Reference	Process Step	Risk Management Improvements			Status as at 30/06/2017
		Short term	Medium term	Long term	
	CAPELLA				
CAP 1	Procedures		Procedures required for pH correction, coagulation, filtration, disinfection, mains breaks, reservoir inspection, transfer procedure		Coagulation, filtration and disinfection procedures drafted and under review
CAP 1, CAP 3, CAP 4	Catchment	chlorination procedure being documented at present	online monitoring	Media Replacement	Online chlorine and turbidity on final water - media replace design... waiting for project delivery timeline
CAP 1, CAP 2, CAP 5	Coagulation	data collection for procedure target ranges	coagulation procedure to be documented / investigate online monitoring	clarifier Turbidity monitoring	Awaiting prioritisation in CAPEX budget
CAP 1, CAP 6, CAP 7, CAP 4	Filtration	Investigate alarm level and lockout to operators	auto backwash, shutdowns, to be investigated. procedure to be documented	Investigate replace filter media	Media replacement design undertaken. Waiting for project delivery timeline. Other tasks not started
CAP 8, CAP 9		Data collection on turbidity spikes	Investigate ripening to waste		Awaiting prioritisation within CAPEX budget
CAP 10, CAP 11	Disinfection	Investigate ACH option and collect data	Investigate pH correction options		report and design for ACH dosing completed - waiting for project delivery timeline
CAP 12	Transfer from Tieri to Capella			monitor for THMs	Seasonal sampling added verification monitoring
CAP 1, CAP 13	Treated water storage/ Reservoirs		Formalise inspection checklist	investigate to confirm vermin proof reservoirs	To be done by consultant with recommendations given
CAP 14, CAP 15	Reticulation	Investigate bypass and back up power options	Implement option		Awaiting prioritisation within CAPEX budget
CAP 16				monitor for THMs	Seasonal and event based sampling added verification monitoring
CAP 1, CAP 17	System Wide	Continued procedure development	More operators to Cert 3 - purchase order issued		All operators have cert III or currently studying for it
CAP 18 CAP 19			Fill vacancies	Plan for up skilling	Operator roles filled for area - some support roles empty
CAP 20		Investigate alarm level and lockout to operators			Being reviewed in as greatest risk order
CAP 21, CAP 22			develop internal skills to reduce reliance on external support, critical spares to be identified	Preventative maintenance	Preventive maintenance of blower, air compressors

RMIP Reference	Process Step	Risk Management Improvements			Status as at 30/06/2017
		Short term	Medium term	Long term	
	COMET				
COM 1	Procedures		Procedures required for pH correction, coagulation, filtration, disinfection, mains breaks, reservoir inspection		Coagulation, filtration and disinfection procedures drafted and under review
COM 3	Raw Water Abstraction		Reinstate duty standby pumps		Design to be in 2017/18 budget
COM 1, COM 2, COM 4	Coagulation	data collection for procedure target ranges	coagulation procedure to be documented / online monitoring	clarifier Turbidity monitoring	Awaiting prioritisation within CAPEX budget
COM 1, COM 5, COM 6	Filtration	develop filtration procedure	auto backwash , shutdowns, to be investigated.	Investigate need to replace filter media	Filter media was replenished and can do auto backwash and/or shutdown
COM 2, COM 7		Data collection on turbidity spikes	Investigate ripening to waste		Task is physically done - awaiting process/electrical work completion
COM 2, COM 8			data collection for options analysis	Investigate options / dual storage	Awaiting prioritisation within CAPEX budget
COM 1, COM 9, COM 10	Treated water storage/ Reservoirs	Formalise inspection checklist	Investigate how vermin proof is storage.	Implement appropriate action	To be done by consultant with recommendations given
COM 11, COM 12	Reticulation		Investigate UPS and generator for transfer pumps	Implement appropriate action	Plug installed for mobile generator
COM 13	System Wide		More operators to cert 3 - purchase order issued		Most operators that go to Comet have Cert III
COM 14, COM 15			Fill vacancies	Plan for up skilling	Most operators roles filled - some support roles empty
COM 16			Investigate SCADA lockout		Being reviewed in as greatest risk order
COM 17, COM 18			develop internal skills to reduce reliance on external support, critical spares to be identified	Preventive maintenance	Preventive maintenance of blower, air compressors

RMIP Reference	Process Step	Risk Management Improvements			Status as at 30/06/2017
		Short term	Medium term	Long term	
	DINGO				
DIN 1	Procedures		Procedures required for coagulation, filtration, disinfection, mains breaks, reservoir inspection		Coagulation, filtration and disinfection procedures drafted and under review
DIN 1, DIN 3, DIN 4	Catchment	chlorination procedure being documented at present	online monitoring	Media Replacement	manual monitoring - Online chlorine and turbidity on final water - media replacement scoped... waiting for project delivery timeline
DIN 1, DIN 22		procedure being documented at present	Investigate need and use of PAC		Awaiting prioritisation within CAPEX budget
DIN 5	Raw Water Abstraction			Two large pumps and one small pump	Determined that no extra capacity required
DIN 6				Relocated pumps	Awaiting prioritisation within CAPEX budget
DIN 1, DIN 2, DIN 7		data collection for procedure target ranges	coagulation procedure to be documented	relocation and add extra check valve	Complete
DIN 1, DIN 2, DIN 8, DIN 9	Coagulation	PLC replacement / data collection for procedure target ranges	Develop Clarification/Coagulation procedure / Turbidity meter online monitoring	clarifier Turbidity monitoring	PLC replaced - manual monitoring - not continuous online yet
DIN 8, DIN 10	Filtration		Turbidity meter online monitoring, develop procedure	Filtered Turbidity monitoring	Continue manual monitoring - not continuous online yet
DIN 2, DIN 11		Collect data	Investigate ripen to waste option		Scoped and waiting for project delivery timeline
DIN 1, DIN 12	Disinfection	chlorination procedure being documented at present	online monitoring and alarms		Scoped and waiting for project delivery timeline
DIN 13, DIN 14			data collection for options analysis	Investigate options / dual storage	Awaiting prioritisation within CAPEX budget
DIN 15	Treated water storage/ Reservoirs		install overflow frog proofing		Awaiting prioritisation
DIN 23			Investigate permanently disconnecting tanks		Disconnected
DIN 16	Reticulation		need to develop routine flushing program		Schedule still to be developed. Procedure will require consideration of customer notifications
DIN 17				monitor for THMs	Seasonal and event based sampling added verification monitoring
DIN 18	System Wide		More operators to cert 3		Possible partnership with CQU, on the list for next session
DIN 19			Plan for up skilling		More Blackwater based operators know Dingo plant - certificate II training
DIN 20, DIN 21			develop internal skills to reduce reliance on external support, critical spares to be identified	Preventive maintenance	Preventive maintenance of blower

RMIP Reference	Process Step	Risk Management Improvements			Status as at 30/06/2017
		Short term	Medium term	Long term	
	DUARINGA				
DUA 1	Procedures		Procedures required for coagulation, filtration, disinfection, mains breaks, reservoir inspection		Coagulation, filtration and disinfection procedures drafted and under review
DUA 1, DUA 3, DUA 4	Catchment	chlorination procedure being documented at present	online monitoring	Media Replacement	manual monitoring - not continuous online yet - temporary media replacement- media/filter replacement scoped... waiting for project delivery timeline
DUA 5	Raw Water Abstraction			Two large pumps and one small pump	Completed
DUA 1, DUA 2, DUA 6	Coagulation	data collection for procedure target ranges	coagulation procedure to be documented	flow switch	Not yet
DUA 1, DUA 2, DUA 7		data collection for procedure target ranges	coagulation procedure to be documented / online monitoring	clarifier Turbidity monitoring	Continue manual monitoring - not continuous online yet
DUA 1, DUA 2, DUA 8,	Filtration	data collection for procedure target ranges	filtration procedures to be documented	Filtered Turbidity monitoring	Continue manual monitoring - not continuous online yet
DUA 2, DUA 9		Collect data	Investigate ripen to waste		Completed - is manually operated
DUA 10, DUA 11		Operator checks	Investigate to Seal the well		Planned removal during filter replacement and waiting for project delivery timeline
DUA 12, DUA 13		Investigate lockout		Investigate blanking off	some removed /one still there - Final bypass removal needs to be scoped
DUA 14, DUA 15	Disinfection		data collection for options analysis	Investigate options / dual storage	Awaiting prioritisation within CAPEX budget
DUA 1, DUA 16, DUA 17	Treated water storage/ Reservoirs	Formalise inspection checklist	Investigate how vermin proof is storage.	Implement appropriate action	To be done by consultant with recommendations given
DUA 18				monitor for THMs	Seasonal and event based sampling added verification monitoring
DUA 19	System Wide		More operators to cert 3		Possible partnership with CQU, on the list for next session
DUA 20			Plan for up skilling		More Blackwater based operators know Duaringa plant
DUA 21, DUA 22			develop internal skills to reduce reliance on external support, critical spares to be identified	Preventive maintenance	Preventive maintenance of blower

RMIP Reference	Process Step	Risk Management Improvements			Status as at 30/06/2017
		Short term	Medium term	Long term	
	EMERALD EAST NOGOA				
EMEN 1	Procedures		Procedures required for pH correction, coagulation, filtration, disinfection, mains breaks, reservoir inspection		Coagulation, filtration and disinfection procedures drafted and under review
EMEN 1, EMEN 3	Coagulation	develop operational rules and document procedure	investigate control of supernatant return		Waste wash water tank to be reconfigured. Recycle control requires further optimisation to minimise return rates
EMEN 1, EMEN 2, EMEN 4		data collection for procedure target ranges	procedure to be documented. Investigate lowering target and critical limits over time.		Clarifier limit currently 5 NTU and it is currently required for operation
EMEN 1, EMEN 2, EMEN 5	Filtration	data collection for procedure target ranges	procedure to be documented . Investigate dropping limit to 0.3 NTU		Filtration limit currently at 0.3 NTU
EMEN 6, EMEN 7	Treated water storage/ Reservoirs		Investigate how vermin proof is storage.	Implement appropriate action	To be done by consultant with recommendations given
EMEN 1, EMEN 8			Formalise inspection checklist	check vermin proofing.	To be done by consultant with recommendations given
EMEN 9	Reticulation		need to develop routine flushing program		Schedule still to be developed. Procedure will require consideration of customer notifications
EMEN 10				monitor for THMs	Seasonal and event based sampling added verification monitoring
EMEN 11	System Wide		More operators to cert 3 - purchase order issued		Possible partnership with CQU, on the list for next session
EMEN 12, EMEN 13		Fill vacancies	Plan for up skilling		More Emerald based operators know other plants, operator rotations but vacancies add pressure
EMEN 14			Investigate SCADA lockout		Lockouts in place - this plant has the standard we will be work towards
EMEN 15, EMEN 16			develop internal skills to reduce reliance on external support, critical spares to be identified	Preventive maintenance	Preventive maintenance of blower, air compressors, centrifuges.

RMIP Reference	Process Step	Risk Management Improvements			Status as at 30/06/2017
		Short term	Medium term	Long term	
	EMERALD OPAL ST				
EMOS 1	Procedures		Procedures required for coagulation, reservoir inspection, mains breaks.		Coagulation, filtration and disinfection procedures drafted and under review
EMOS 3	Coagulation		develop contingency plan		contingency plan is to use poly at a work around
EMOS 4		investigate alarm at 2.5			not yet - currently 5 NTU - filters at 0.5 NTU
EMOS 5, EMOS 6	Filtration		auto backwash , shutdowns, to be investigated.	Investigate need to replace filter media	Media replace design undertaken. Waiting for project delivery timeline - auto shutdowns complete - no auto backwash but backwash on time as a work around
EMOS 7			investigate installing actuators and ripen to waste		Completed
EMOS 8			need to install a valve to prevent backflow.		Awaiting prioritisation within CAPEX budget
EMOS 9			investigate blanking off valve		Awaiting prioritisation within CAPEX budget
EMOS 10, EMOS 11	Treated water storage/ Reservoirs		Investigate how vermin proof is storage.	Implement appropriate action	To be done by consultant with recommendations given
EMOS 1, EMOS 12			Formalise inspection checklist	money in budget to replace roof, will also vermin proof.	To be done by consultant with recommendations given
EMOS 13, EMOS 14, EMOS 15	Reticulation	talk to hospital about water issues	Investigate UPS and water tower options	Implement appropriate action	Awaiting prioritisation within CAPEX budget
EMOS 16			need to develop routine flushing program		Schedule still to be developed. Procedure will require consideration of customer notifications
EMOS 17				monitor for THMs	Seasonal and event based sampling added verification monitoring
EMOS 18	System Wide		More operators to cert 3 - purchase order issued		Possible partnership with CQU, on the list for next session
EMOS 19, EMOS 20		Fill vacancies	Plan for up skilling		More Emerald based operators know other plants, operator rotations but vacancies add pressure
EMOS 21			Investigate SCADA lockout		Being reviewed in as greatest risk order
EMOS 22			remove dead tree near 9ML clear water tank.		Completed
EMOS 23, EMOS 24			develop internal skills to reduce reliance on external support, critical spares to be identified	Preventive maintenance	Preventive maintenance of blower, air compressors.

RMIP Reference	Process Step	Risk Management Improvements			Status as at 30/06/2017
		Short term	Medium term	Long term	
	ROLLESTON				
ROL 1	Procedures		Procedures required for bore inspection, reservoir inspection, PAC, coagulation, filtration, disinfection, mains breaks.		Coagulation, filtration and disinfection procedures drafted and under review
ROL 2	Bore water		test each bore for SWA and heavy metals.		All 3 bores have been checked - identified issue with bore 6 and current it is not to be used without escalation.
ROL 16	PAC		PAC procedure to be documented		no yet
ROL 1, ROL 4, ROL 5, ROL 6	Coagulation	manual turbidity testing at clarifier (ROL 4)	turbidity meters, jar testing, take spare pump (same pump for coagulant and disinfection)(ROL 5) / coagulation procedure to be documented	SCADA (ROL 6)	Have spare parts and pumps and continue manual turbidity samples. SCADA and online monitoring project is in the planning stage
ROL 1, ROL 6, ROL 7,	Filtration	manual turbidity testing of filtrate	filtration procedure to be documented / turbidity meter	SCADA	Continue manual turbidity samples. SCADA and online monitoring project is in the planning stage
ROL 8, ROL 9	Disinfection		calculation of CT, probably OK, but need to check.	pH adjustment to be considered.	Concept design for pH undertaken and waiting for project delivery timeline
ROL 10			Check chlorate levels		no yet
ROL 1, ROL 11	Bore Disinfection	Check configuration	develop procedure for bore operation only.		Have confirmed that all 3 bores get chlorine dosed through bore 7
ROL 16	Treated water storage/ Reservoirs		Reservoir inspection program		To be done by consultant with recommendations given
ROL 12			continue THM testing		Seasonal and event based sampling added verification monitoring
ROL 1, ROL 6, ROL 13	System Wide	Operator currently doing cert III	Developing procedures for WTP	SCADA	No current operator based in Rolleston - recruit with Cert III or add to list
ROL 14, ROL 15		fill vacancies	plan for upskilling		More Emerald based operators know Rolleston plant, operator rotations but vacancies add pressure

RMIP Reference	Process Step	Risk Management Improvements			Status as at 30/06/2017
		Short term	Medium term	Long term	
	SAPPHIRE				
SAP 1	Procedures		Procedures required for bore inspection, reservoir inspection, disinfection, mains breaks.		Disinfection, bore inspection and reservoir inspection procedures drafted and under review
SAP 2	Treated water storage	Inspect and identify ingress location	Vermin proof		Reservoir inspection templates done and one inspection complete. Vermin proofing improved - to be checked by consultant with recommendations given
SAP 3, SAP 4	System Wide	fill vacancies	plan for upskilling		More Emerald based operators know Sapphire plant, operator rotations but vacancies add pressure

RMIP Reference	Process Step	Risk Management Improvements			Status as at 30/06/2017
		Short term	Medium term	Long term	
	SPRINGSURE				
SPR 1	Procedures		Procedures required for bore inspection, reservoir inspection, disinfection, mains breaks.		Disinfection procedure drafted and under review
SPR 2	Disinfection		Need to upgrade to auto dosing		Requires investigation into dose control
SPR 3, SPR 4	Cooling systems	Check integrity and sealing	Seal if this is an issue		To be done by consultant with recommendations given
SPR 5, SPR 6	System Wide	fill vacancies	plan for upskilling		No current operator based in Springsure - recruit with Cert III or add to list
SPR 5, SPR 7, SPR 8			develop internal skills to reduce reliance on external support, critical spares to be identified	Preventive maintenance	Preventive maintenance of chlorine dosing

RMIP Reference	Process Step	Risk Management Improvements			Status as at 30/06/2017
		Short term	Medium term	Long term	
	TIER I				
TIE 1	Procedures		Procedures required for pH correction, coagulation, filtration, disinfection, mains breaks, reservoir inspection		Coagulation, filtration and disinfection procedures drafted and under review
TIE 1, TIE 2, TIE 3	Catchment	chlorination procedure being documented at present	online monitoring	Media Replacement	Media replacement design undertaken. Waiting for project delivery timeline - raw and filtered online monitoring
TIE 1, TIE 3, TIE 4		data collection for procedure target ranges (TIE 4)	Backwash, Coagulation and filtration procedures to be documented /online monitoring	Media Replacement	Media replacement design undertaken. Waiting for project delivery timeline - not started online monitoring, manual trigger to backwash
TIE 1, TIE 5	Raw Water Abstraction	develop operational rules and document procedure	investigate turbidity meter as control of supernatant return		Awaiting prioritisation within CAPEX budget
TIE 1, TIE 4, TIE 6	Coagulation	data collection for procedure target ranges	coagulation procedure to be documented / online monitoring	clarifier Turbidity monitoring	Awaiting prioritisation within CAPEX budget
TIE 1, TIE 7		document recycle procedure	investigate control		Awaiting prioritisation within CAPEX budget
TIE 1, TIE 3, TIE 4, TIE 8, TIE 9	Filtration	Investigate alarm level and lockout to operators, data collection for procedure target ranges	auto backwash , shutdowns, to be investigated, procedure to be documented	Investigate replace filter media	Media replacement design undertaken. Waiting for project delivery timeline - not started on auto backwash and shutdown but recommendations in filter media replacement report
TIE 4, TIE 10		Data collection on turbidity spikes	Investigate ripening to waste		Awaiting prioritisation within CAPEX budget with recommendations in filter media replacement report
TIE 11, TIE 12		Investigate lockout		Investigate blanking off	To be investigated and actioned
TIE 13, TIE 14	Disinfection	Investigate ACH option and collect data	Investigate pH correction options		Planned to follow Capella ACH dosing changes
TIE 15	Treated water storage/ Reservoirs			investigate to confirm vermin proof reservoirs	To be done by consultant with recommendations given
TIE 1, TIE 16	System Wide	Continued procedure development	More operators to cert 3 - purchase order issued		All operators have got cert III or currently studying for it
TIE 17, TIE 18			Fill vacancies	Plan for up skilling	Flexibility of 3 operators rotating - some support staff vacancies
TIE 19		Investigate alarm level and lockout to operators			Being reviewed in as greatest risk order
TIE 20, TIE 21			develop internal skills to reduce reliance on external support, critical spares to be identified	Preventative maintenance	Preventive maintenance of blower, air compressors