Drinking Water Service Annual Report

2023 - 2024

Etheridge Shire Council

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Glossary of terms

ADWG 2004	Australian Drinking Water Guidelines (2004). Published by the National Health and Medical Research Council of Australia
ADWG 2011	Australian Drinking Water Guidelines (2011). Published by the National Health and Medical Research Council of Australia
E. coli	*Escherichia coli*, a bacterium which is considered to indicate the presence of faecal contamination and therefore potential health risk
HACCP	Hazard Analysis and Critical Control Points certification for protecting drinking water quality
mg/L	Milligrams per litre
NTU	Nephelometric Turbidity Units
MPN/100mL	Most probable number per 100 millilitres
CFU/100mL	Colony forming units per 100 millilitres
<	Less than
>	Greater than

1. Introduction

This report documents the performance of Etheridge Shire Council's drinking water service with respect to water quality and performance in implementing the actions detailed in the drinking water quality management plan (DWQMP) as required under the *Water Supply (Safety and Reliability) Act 2008* (the Act).

The report assists the Regulator to determine whether the approved DWQMP and any approval conditions have been complied with and provides a mechanism for providers to report publicly on their performance in managing drinking water quality.

This template has been prepared in accordance with the *Water Industry Regulatory Reform – drinking water quality management plan report factsheet* published by the Department of Energy and Water Supply, Queensland, accessible at www.dews.qld.gov.au.

2. Overview of Operations

Georgetown's water supply is drawn from the aquifer in the alluvial bed sands of the Etheridge River. Surface water filters through the alluvial sands of the Riverbed to the aquifer where it is drawn from a series of wells and pumped to a 600Kl raw water reservoir at the water treatment plant added in 2022. A 150mm main delivers an alternative water source from Charleston Dam which is aprox 31 kilometres to the raw water reservoir. The 2 water sources can be used individually or mixed in the raw water reservoir. The Etheridge River raw water is preferred because of its better quality.

Due to occasional high levels of manganese and iron in Georgetown's water source, a treatment plant was installed in March-May 2015. The treatment comprises of a flocculation tank, 3 AFM glass media filters (media replaced in 2024) and 3 DMI filters. Water is disinfected at the treatment plant and stored in two service reservoirs (1 x 600KL and 1 x 1800KL added in 2017). Water in the reservoirs is monitored and further disinfected (if required) before reticulation via a trim system. We have analysers within the treatment plant process, before and within the treated water reservoirs allowing us to monitor ph, turbidity and chlorine levels remotely.

Forsayth's water is sourced from Charlston Dam located aprox 9 kilometres from the treatment plant which we started utilising in 2022. The raw water is pumped from the Dam by a pump on a floating pontoon into a 1 megalitre raw water reservoir at the Dam site and is then pumped to a 90Kl raw reservoir at the water treatment plant. An alternative water source can be gravity fed from Big Reef Dam 6km away from the treatment plant. Water supply is treated by a DAF water treatment plant commissioned in 2006. Treated water is fed to a 600-kL service reservoir (installed in 2021) which in turn gravity feeds the township. A pressure reducing valve was installed at the top of town in 2011.

The treatment was upgraded in 2018 and comprises of a Pot perm dosing system, a pre-aeration system, carbon dosing and a carbon retention tank, flocculation tank, clarifier, dissolved air floatation system and 4 sand media filters. Water is disinfected at the treatment plant and monitored and further disinfected (if needed) via a trim system in the 600kl reservoir. We have analysers within the treatment plant process, before and within the treated water reservoir allowing us to monitor ph, turbidity and chlorine levels remotely. The Charleston Dam raw water has proven to be much better quality then Big Reef Dam water and is much better to treat.

3. Actions taken to implement the DWQMP

Georgetown and Forsayth

Management conducts regular toolbox meetings to make operational staff aware and familiar with the DWQMP and its implementation. Risk management measures are performed as written in our DWQMP. This includes operational procedures/practices and operational and verification monitoring. We have continued to work through improvements in our Risk management improvement plan.

Operational parameters have been checked and maintained at locations regularly as per our DWQMP. Verification testing has confirmed the operational monitoring programme to be effective.

Progress in implementing the risk management improvement program

We have continued to progress in implementing the risk management improvement program. We have worked towards all actions and completed most of them. For all progress information see Appendix B – Implementation of the Risk Management Improvement Program, Table 5 – Progress against the risk management improvement program in the approved DWQMP

Amendments made to the DWQMP

Our last DWQMP review was submitted in July 2024 where everything was reviewed and updated. Our next review is due to be completed by 1 July 2026.

4. Compliance with water quality criteria for drinking water

See appendix A – Summary of compliance with water quality criteria

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

Forsayth

This financial year there was one new instance at Forsayth where the Regulator required notification under sections 102 or 102A of the Act.

This was a 0.028 mg/L detection of Bromate from a sample taken on the 9-4-2024 which has a guideline of 0.02 mg/L.

Georgetown

This financial year there was no new instance at Georgetown where the Regulator was notified under sections 102 or 102A of the Act.

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

Incident Description: **Bromate – Forsayth** – 0.028 mg/L of Bromate was detected at the Forsayth library on the 9-4-2024, which is over the guideline value limit of .020 mg/L, and incident DWI-49-10967 was opened. An investigation report was submitted on the 28-5-2024.

Corrective and Preventative Actions This detection was only just over the guideline value**.** Detections over the guideline are rare.

6. Customer complaints related to water quality

Etheridge Shire Council is required to report on the number of complaints, general details of complaints, and the responses undertaken.

Throughout the year the following complaints about water quality were received:

Table 1 - complaints about water quality, (including per 1000 customers)

	Suspected Illness	Discoloured water	Taste and odour	Total
Georgetown	0	0	0	0
Forsayth	0	0	0	0
Total	0	0	0	0

Suspected Illness

Complaints are sometimes received from customers who suspect their water may be associated with an illness they are experiencing. Etheridge Shire Council investigates each complaint relating to alleged illness from our water quality, typically by testing the customers tap and closest reticulation sampling point for the presence of *E. coli*.

During 2023/2024, there were zero confirmed cases of illness arising from the water supply system.

Discoloured water

- *We had 0 complaints about coloured water.*

No customer complaints were received.

7. Findings and recommendations of the DWQMP auditor

An Audit was performed in 2021. An audit has not occurred in this period. Our next audit is required by 2025.

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

An internal review of our DWQMP was conducted and submitted to the Regulators by July 2024. Everything was reviewed and updated including incident history, infrastructure details, risk assessment tables, operational and maintenance procedure documentation and record keeping, information management, incident/emergency levels, risk management improvement program, verification monitoring and reservoir information. Historical water quality data table information was further compiled. Proof reading was performed, and spelling errors were rectified which improved the clarity and professionalism of the plan
There were no issues raised, and this review was updating and improving accuracy.
Our next review is in 2026.

Appendix A – Summary of compliance with water quality criteria

The results from the verification-monitoring program have been compared against the levels of the water quality criteria specified by the Regulator in the *Water Quality and Reporting Guideline for a Drinking Water Service*.

The reported statistics do not include results derived from repeat samples, or from emergency or investigative samples undertaken in response to an elevated result.

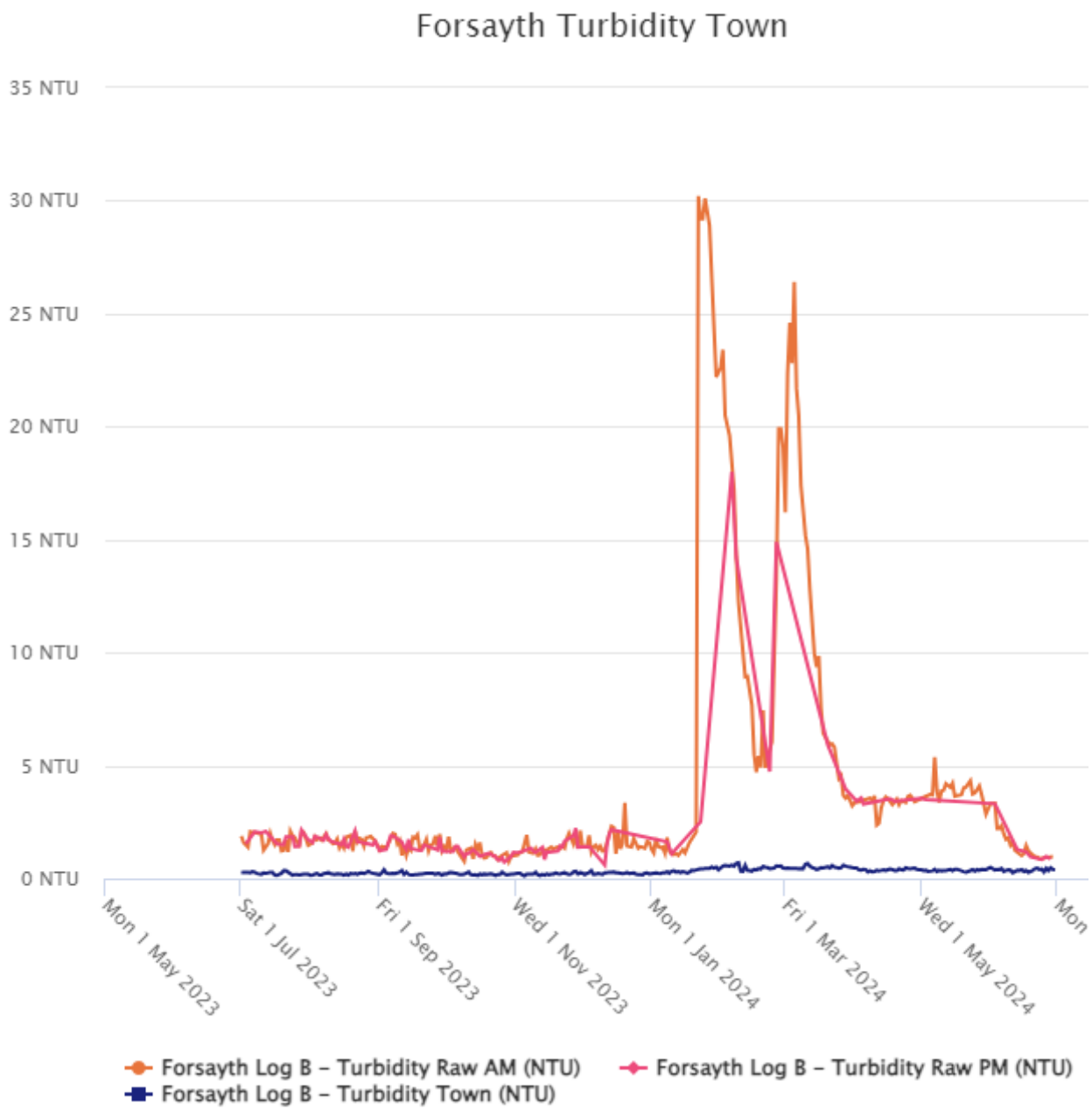
Other verification monitoring was carried out as per our DWQMP.

The presence of potentially toxic Blue/green algae in the raw water at Charleston Dam is detected on occasions and is treated and removed from the retic water. High levels of turbidity and colour are also detected in the raw water at Forsayth and Georgetown during the wet season although is treated and removed in the water treatment plants. Our verification monitoring covers all aspects. It shows any operational faults which can be rectified fast and confirms our operational monitoring is working and remains appropriate.

Upgrades to the Water treatment Plant at Forsayth in 2018 have succeeded to greatly improve turbidity levels in the reticulation. A change of raw water source from Big Reef Dam to Charleston Dam has greatly improved raw water quality and reduced the amount of chemicals needed to treat the water.

In 2023 analysers were installed in Georgetown and Forsayth Water Treatment process, before and within the reservoirs which allows operators to monitor ph, turbidity and chlorine levels.

Our verification monitoring results in the following table shows verification results for treated retic water. They also show operational results from the raw water to help compare and show the achievement of the treatment plants.


Forsayth Turbidity Town
35 NTU
30 NTU
25 NTU
20 NTU
15 NTU
10 NTU
5 NTU
0 NTU
Mon 1 May 2023
Sat 1 Jul 2023
Fri 1 Sep 2023
Wed 1 Nov 2023
Mon 1 Jan 2024
Fri 1 Mar 2024
Wed 1 May 2024
Mon
Forsayth Log B – Turbidity Raw AM (NTU)
Forsayth Log B – Turbidity Raw PM (NTU)
Forsayth Log B – Turbidity Town (NTU)

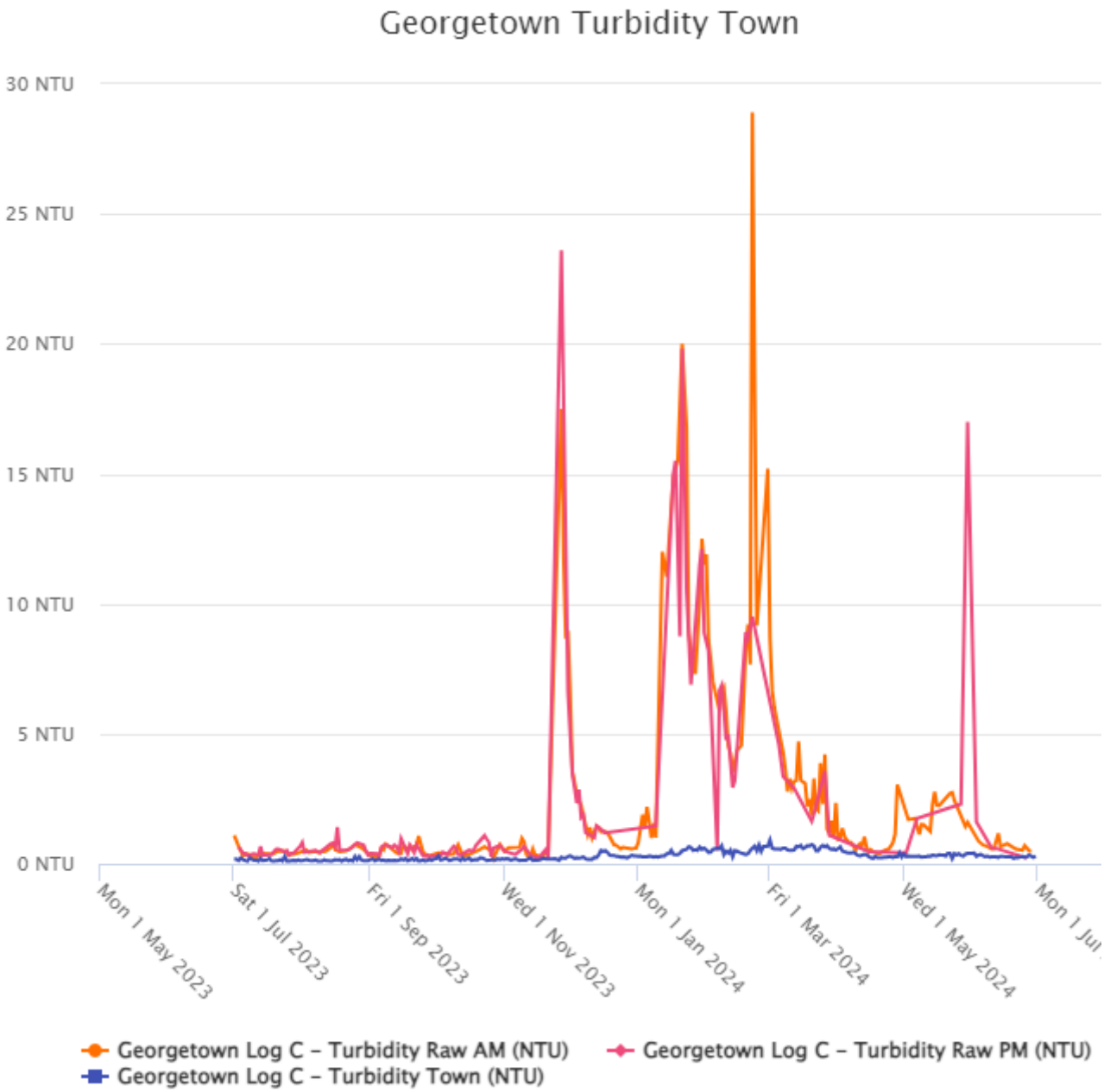

Georgetown Turbidity Town
30 NTU
25 NTU
20 NTU
15 NTU
10 NTU
5 NTU
0 NTU
Mon 1 May 2023
Sat 1 Jul 2023
Fri 1 Sep 2023
Wed 1 Nov 2023
Mon 1 Jan 2024
Fri 1 Mar 2024
Wed 1 May 2024
Mon 1 Jul
Georgetown Log C – Turbidity Raw AM (NTU)
Georgetown Log C – Turbidity Raw PM (NTU)
Georgetown Log C – Turbidity Town (NTU)

Table 1 - Verification monitoring results 2023/2024

Scheme name	Scheme component	Parameter	Units	Frequency of sampling	Total No. samples collected	No. of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
Georgetown	Reticulation	Turbidity	Ntu	Daily	361	361	NA	0.09	0.91	.29		In House
Georgetown	Reticulation	True colour	Pt/Co	Twice a week	96	96	NA	0.00	24.00	3		In House
Georgetown	Reticulation	PH		Daily	365	365	NA	6.5	7.8	7.2		In House
Georgetown	Reticulation	Temperature	C	Daily	362	362	NA	20.0	36.0	29.7		In House
Georgetown	Reticulation	Chlorine Free	Ppm	Daily	369	369	NA	0.23	1.26	.68		In House
Georgetown	Reticulation	Chlorine Total	Ppm	Daily	362	362	NA	.12	1.46	.72		In House
Georgetown	Reticulation	Aluminium	Mg/L	Monthly	24	24	NA	0.023	0.056	0.032	<0.005	Cairns Regional Council
Georgetown	Reticulation	Silicon	Mg/L	Quarterly	4	4	NA	18	22	20	<0.10	Cairns Regional Council
Georgetown	Reticulation	Mercury	ug/L	Quarterly	4	0	0	<0.06	<0.06	<0.06	<0.06	Cairns Regional Council
Georgetown	Reticulation	Arsenic	Mg/L	Quarterly	4	4	0	0.0002	0.0003	0.0003	<0.0002	Cairns Regional Council
Georgetown	Reticulation	Cadmium	Mg/L	Quarterly	4	0	0	<0.0001	<0.0001	<0.0001	<0.0001	Cairns Regional Council
Georgetown	Reticulation	Chromium	Mg/L	Quarterly	4	0	0	<0.0005	<0.0005	<0.0005	<0.0005	Cairns Regional Council
Georgetown	Reticulation	Copper	Mg/L	Quarterly	4	4	0	0.003	0.007	0.005	<0.001	Cairns Regional Council
Georgetown	Reticulation	Iron	Mg/L	Monthly	24	0	NA	<0.015	<0.015	<0.015	<0.015	Cairns Regional Council
Georgetown	Reticulation	Lead	Mg/L	Quarterly	0	0	0	<0.0005	<0.0005	<0.0005	<0.0005	Cairns Regional Council
Georgetown	Reticulation	Manganese	Mg/L	Monthly	24	21	0	<0.0002	0.0011	0.0004	<0.0002	Cairns Regional Council
Georgetown	Reticulation	Nickel	Mg/L	Quarterly	4	0	0	<0.0005	<0.0005	<0.0005	<0.0005	Cairns Regional Council
Georgetown	Reticulation	Zinc	Mg/L	Quarterly	4	1	NA	<0.008	0.009	0.002	<0.008	Cairns Regional Council
Georgetown	Reticulation	Calcium	Mg/L	Quarterly	4	4	NA	11	18	14.8	<0.20	Cairns Regional Council
Georgetown	Reticulation	Magnesium	Mg/L	Quarterly	4	4	NA	3	5.5	4.5	<0.10	Cairns Regional Council
Georgetown	Reticulation	Potassium	Mg/L	Quarterly	4	4	NA	2.3	2.7	2.5	<0.10	Cairns Regional Council
Georgetown	Reticulation	Sodium	Mg/L	Quarterly	4	4	NA	20	31	24	<1	Cairns Regional Council
Georgetown	Reticulation	Total Hardness	MgCaC03/L	Quarterly	4	4	NA	40	63	55	<1	Cairns Regional Council
Georgetown	Reticulation	Salinity	Psu	Quarterly	4	4	NA	.090	.125	107		Cairns Regional Council
Georgetown	Reticulation	Total Dissolved Solids	Mg/L	Quarterly	4	4	NA	110	170	140	<1	Cairns Regional Council
Georgetown	Reticulation	Electrical Conductance	Us/cm	Quarterly	4	4	NA	180	260	220	<1	Cairns Regional Council
Georgetown	Reticulation	Total alkalinity	MgCaCO3/L	Quarterly	4	4	NA	48	92	74	<0.1	Cairns Regional Council
Georgetown	Reticulation	Fluoride	Mg/L	Quarterly	4	4	0	.20	.28	.24	<0.02	Cairns Regional Council
Georgetown	Reticulation	Sulphate	Mg/L	Quarterly	4	4	0	9.4	15	13	<0.01	Cairns Regional Council
Georgetown	Reticulation	Chloride	Mg/L	Quarterly	4	4	NA	9.4	15	13	<0.1	Cairns Regional Council
Georgetown	Reticulation	Chlorate	Mg/L	Monthly	12	12	0	.081	.739	0.304	<0.005	Cairns Regional Council

Scheme name	Scheme component	Parameter	Units	Frequency of sampling	Total No. samples collected	No. of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
Georgetown	Reticulation	Chlorite	Mg/L	Monthly	12	0	0	<0.005	<0.005	<0.005	<0.005	Cairns Regional Council
Georgetown	Reticulation	Bromate	Mg/L	Monthly	12	0	0	<0.005	<0.005	<0.005	<0.005	Cairns Regional Council
Georgetown	Reticulation	Bromide	Mg/L	Monthly	12	2	0	<0.005	0.007	0.001	<0.005	Cairns Regional Council
Georgetown	Reticulation	Giardia, protozoa	Mg/L	Annually	1	0	0	0	0	0		Cairns Regional Council
Georgetown	Reticulation	Organochlorine Pesticides	Ug/L	Annually	1	0	0	0	0	0		Cairns Regional Council
Georgetown	Reticulation	Chloroform	Ug/L	Quarterly	3	3	0	10	22	14		Cairns Regional Council
Georgetown	Reticulation	Bromodichloromethane	Ug/L	Quarterly	3	2	0	<5	8	4		Cairns Regional Council
Georgetown	Reticulation	Dibomochloromethane	Ug/L	Quarterly	3	0	0	<5	<5	<5		Cairns Regional Council
Georgetown	Reticulation	Bromoform	Ug/L	Quarterly	3	0	0	<5	<5	<5		Cairns Regional Council
Georgetown	Reticulation	Total Trihalomethanes	Ug/L	Quarterly	3	3	0	15	22	19		Cairns Regional Council
Georgetown	Reticulation	E. coli	Cells/ML	Monthly	60	0	0	<1	<1	<1		Cairns Regional Council
Georgetown	Reticulation	Total Coliforms	Cells/ML	Monthly	60	0	NA	<1	<1	<1		Cairns Regional Council
Georgetown	Reticulation	HPC	Cells/ML	Monthly	60	10	NA	<10	9500	160		Cairns Regional Council
Georgetown	Reticulation	TOC	Cells/ML	Twice a year	4	4	N/A	<1	2	1.5		Cairns Regional Council
Georgetown	Raw	Turbidity	Ntu	Daily	360	360	NA	0.19	28.90	2.57		In House
Georgetown	Raw	True colour	Pt/Co	Twice a week	100	100	NA	0.00	111.00	19.00		In House
Georgetown	Raw	PH		Daily	280	280	NA	6.1	7.7	7.2		In House
Georgetown	Raw	Temperature	C	Daily	279	279	NA	17.7	33.7	27.7		In House
Georgetown	Raw	Aluminium	Mg/L	Monthly	12	12	NA	<0.015	0.322	0.139	<0.015	Cairns Regional Council
Georgetown	Raw	Silicon	Mg/L	Quarterly	4	4	NA	17	29	21.5	<0.10	Cairns Regional Council
Georgetown	Raw	Mercury	Ug/L	Quarterly	4	0	NA	<0.06	<0.06	<0.06	<0.06	Cairns Regional Council
Georgetown	Raw	Arsenic	Mg/L	Quarterly	4	4	NA	0.0003	0.0007	0.0004	<0.0001	Cairns Regional Council
Georgetown	Raw	Cadmium	Mg/L	Quarterly	4	2	NA	<0.0001	0.0001	0.0001	<0.0001	Cairns Regional Council
Georgetown	Raw	Chromium	Mg/L	Quarterly	4	0	NA	<0.0005	<0.0005	<0.0005	<0.0005	Cairns Regional Council
Georgetown	Raw	Copper	Mg/L	Quarterly	4	4	NA	0.001	0.003	0.002	<0.001	Cairns Regional Council
Georgetown	Raw	Iron	Mg/L	Monthly	12	12	NA	0.001	1.03	0.243	<0.015	Cairns Regional Council
Georgetown	Raw	Lead	Mg/L	Quarterly	4	1	NA	<0.0005	0.0005	0.0001	<0.005	Cairns Regional Council
Georgetown	Raw	Manganese	Mg/L	Monthly	12	12	NA	0.0009	0.271	0.082	<0.001	Cairns Regional Council
Georgetown	Raw	Nickel	Mg/L	Quarterly	4	0	NA	<0.0005	<0.0005	<0.0005	<0.0005	Cairns Regional Council
Georgetown	Raw	Zinc	Mg/L	Quarterly	4	0	NA	<0.008	<0.008	<0.008	<0.008	Cairns Regional Council
Georgetown	Raw	Calcium	Mg/L	Quarterly	4	4	NA	7.7	21	13.9	<0.20	Cairns Regional Council
Georgetown	Raw	Magnesium	Mg/L	Quarterly	4	4	NA	2.6	6.9	4.9	<0.10	Cairns Regional Council

Scheme name	Scheme component	Parameter	Units	Frequency of sampling	Total No. samples collected	No. of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
Georgetown	Raw	Potassium	Mg/L	Quarterly	4	4	NA	2.3	2.7	2.6	<0.10	Cairns Regional Council
Georgetown	Raw	Sodium	Mg/L	Quarterly	4	4	NA	14	30	22	<1	Cairns Regional Council
Georgetown	Raw	Total Hardness	MgCaC03/L	Quarterly	4	4	NA	30	81	55	<1	Cairns Regional Council
Georgetown	Raw	Salinity	Psu	Quarterly	4	4	NA	0.065	0.123	0.101		Cairns Regional Council
Georgetown	Raw	Total Dissolved solids	Mg/L	Quarterly	4	4	NA	87	170	134	<1	Cairns Regional Council
Georgetown	Raw	Electrical conductance	Us/cm	Quarterly	4	4	NA	130	250	205		Cairns Regional Council
Georgetown	Raw	Total Alkalinity	MgCaCO3/L	Quarterly	4	4	NA	45	100	79	<0.1	Cairns Regional Council
Georgetown	Raw	Fluoride	Mg/L	Quarterly	4	4	NA	.20	.39	.25	<0.02	Cairns Regional Council
Georgetown	Raw	Sulphate	Mg/L	Quarterly	4	4	NA	7	21	13	<0.1	Cairns Regional Council
Georgetown	Raw	Chloride	Mg/L	Quarterly	4	4	NA	5.5	13	9	<0.1	Cairns Regional Council
Georgetown	Raw	Chlorate	Mg/L	Monthly	12	2	NA	<0.005	.295	.029	<0.005	Cairns Regional Council
Georgetown	Raw	Chlorite	Mg/L	Monthly	12	0	NA	<0.005	<0.005	<0.005	<0.005	Cairns Regional Council
Georgetown	Raw	Bromate	Mg/L	Monthly	12	0	NA	<0.005	<0.005	<0.005	<0.005	Cairns Regional Council
Georgetown	Raw	Bromide	Mg/L	Monthly	12	9	NA	<0.005	0.055	0.028	<0.005	Cairns Regional Council
Georgetown	Raw	E. coli	Cells/ML	Monthly	12	6	NA	<.1	49	9	<0.1	Cairns Regional Council
Georgetown	Raw	Total Coliforms	Cells/ML	Monthly	12	12	NA	2	1700	280	<10	Cairns Regional Council
Georgetown	Raw	HPC	Cells/ML	Monthly	12	10	NA	<10	560	113	<10	Cairns Regional Council
Forsayth	Reticulation	Turbidity	Ntu	Daily	351	351	NA	0.11	.70	0.31		In House
Forsayth	Reticulation	True colour	Pt/Co	Twice a week	77	77	NA	0.00	15.00	2		In House
Forsayth	Reticulation	PH	PH units	Daily	358	358	NA	6.4	8.5	7.6		In House
Forsayth	Reticulation	Temperature	C	Daily	354	354	NA	20.3	35.8	28.0		In House
Forsayth	Reticulation	Chlorine Free	Ppm	Daily	376	376	NA	0.40	1.40	.71		In House
Forsayth	Reticulation	Chlorine Total	Ppm	Daily	357	357	NA	0.55	1.53	.83		In House
Forsayth	Reticulation	Aluminium	Mg/L	Monthly	24	24	NA	0.03	0.5	0.087	<0.005	Cairns Regional Council
Forsayth	Reticulation	Silicon	Mg/L	Quarterly	4	4	NA	9.5	13	10.8	<0.10	Cairns Regional Council
Forsayth	Reticulation	Mercury	Ug/L	Quarterly	4	0	0	<0.06	<0.06	<0.06	<0.06	Cairns Regional Council
Forsayth	Reticulation	Arsenic	Mg/L	Quarterly	4	3	0	0.0003	0.0004	0.0003	<0.0001	Cairns Regional Council
Forsayth	Reticulation	Cadmium	Mg/L	Quarterly	4	0	0	<0.0001	<0.0001	<0.0001	<0.0001	Cairns Regional Council
Forsayth	Reticulation	Chromium	Mg/L	Quarterly	4	0	0	<0.0005	<0.0005	<0.0005	<0.0005	Cairns Regional Council
Forsayth	Reticulation	Copper	Mg/L	Quarterly	4	4	0	0.007	0.042	0.020	<0.001	Cairns Regional Council
Forsayth	Reticulation	Iron	Mg/l	Monthly	24	0	NA	<0.015	<0.015	<0.015	<0.015	Cairns Regional Council
Forsayth	Reticulation	Lead	Mg/L	Quarterly	4	0	0	<0.0005	<0.0005	<0.0005	<0.0005	Cairns Regional Council
Forsayth	Reticulation	Manganese	Mg/L	Monthly	24	24	0	0.0055	0.0423	0.0123	<0.0002	Cairns Regional

Scheme name	Scheme component	Parameter	Units	Frequency of sampling	Total No. samples collected	No. of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
												Council
Forsayth	Reticulation	Nickel	Mg/L	Quarterly	4	0	0	<0.0005	<0.0005	<0.0005	<0.0005	Cairns Regional Council
Forsayth	Reticulation	Zinc	Mg/L	Quarterly	4	3	NA	<0.0008	0.008	0.017	<0.008	Cairns Regional Council
Forsayth	Reticulation	Calcium	MG/L	Quarterly	4	4	NA	5	11	8	<0.20	Cairns Regional Council
Forsayth	Reticulation	Magnesium	Mg/L	Quarterly	4	4	NA	1.7	3.3	2.7	<0.10	Cairns Regional Council
Forsayth	Reticulation	Potassium	Mg/L	Quarterly	4	4	NA	2.1	2.7	2.4	<0.10	Cairns Regional Council
Forsayth	Reticulation	Sodium	Mg/L	Quarterly	4	4	NA	21	26	24	<1	Cairns Regional Council
Forsayth	Reticulation	Total Hardness	MgCaC03/L	Quarterly	4	4	NA	19	41	32	<1	Cairns regional Council
Forsayth	Reticulation	Salinity	Psu	Quarterly	4	4	NA	0.0801	0.101	0.0908		Cairns Regional Council
Forsayth	Reticulation	Total Dissolved Solids	Mg/L	Quarterly	4	4	NA	100	130	118	<1	Cairns Regional Council
Forsayth	Reticulation	Electrical Conductance	Us/cm	Quarterly	4	4	NA	160	210	187	<1	Cairns Regional Council
Forsayth	Reticulation	Total Alkalinity	MgCaCO3/L	Quarterly	4	4	NA	27	48	40	<1	Cairns Regional Council
Forsayth	Reticulation	Fluoride	Mg/L	Quarterly	4	4	0	0.07	0.17	0.14	<0.02	Cairns Regional Council
Forsayth	Reticulation	Sulphate	Mg/L	Quarterly	4	4	0	28	38	34	<0.1	Cairns Regional Council
Forsayth	Reticulation	Chloride	Mg/L	Quarterly	4	4	NA	0.7	10	6.2	<0.01	Cairns Regional Council
Forsayth	Reticulation	Chlorate	Mg/L	Monthly	12	12	0	0.118	0.348	0.228	<0.005	Cairns Regional Council
Forsayth	Reticulation	Chlorite	Mg/L	Monthly	12	0	0	<0.005	<0.005	<0.005	<0.005	Cairns Regional Council
Forsayth	Reticulation	Bromate	Mg/L	Monthly	12	1	1	<0.005	0.028	0.002	<0.005	Cairns Regional Council
Forsayth	Reticulation	Bromide	Mg/L	Monthly	12	0	0	<0.005	<0.005	<0.005	<0.005	Cairns Regional Council
Forsayth	Reticulation	Giardia, protozoa	Mg/L	Annually	1	0	0	0	0	0		Cairns Regional Council
Forsayth	Reticulation	Organochlorine Pesticides	Ug/L	Annually	1	0	0	0	0	0		Cairns Regional Council
Forsayth	Reticulation	Microcystis aeruginosa	Cells/ML	Monthly	12	0	0	0	0	0		Cairns Regional Council
Forsayth	Reticulation	Raphidiopsis/Cylindrospermopsis raciborskii	Cells/ML	Monthly	12	0	0	0	0	0		Cairns Regional Council
Forsayth	Reticulation	Dolichospermum circinale	Cells/ML	Monthly	12	0	0	0	0	0		Cairns Regional Council
Forsayth	Reticulation	Chrysosporum ovalisporum	Cells/ML	Monthly	12	0	0	0	0	0		Cairns Regional Council
Forsayth	Reticulation	Chloroform	Ug/L	Annually	4	4	0	23	50	13	<5	Cairns Regional Council
Forsayth	Reticulation	Bromodichloromethane	Ug/L	Annually	4	4	0	05	12	08	<5	Cairns Regional Council
Forsayth	Reticulation	Dibomochloromethane	Ug/L	Annually	4	0	0	<5	<5	<5	<5	Cairns Regional Council
Forsayth	Reticulation	Bromoform	Ug/L	Annually	4	0	0	<5	<5	<5	<5	Cairns Regional Council
Forsayth	Reticulation	Total Trihalomethanes	Ug/L	Annually	4	4	0	30	62	41	<5	Cairns Regional Council

Scheme name	Scheme component	Parameter	Units	Frequency of sampling	Total No. samples collected	No. of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
Forsayth	Reticulation	E. coli	Cells/ML	Monthly	36	0	0	<1	<1	<1	<1	Cairns Regional Council
Forsayth	Reticulation	Total Coliforms	Cells/ML	Monthly	36	0	NA	<1	<1	<1	<1	Cairns Regional Council
Forsayth	Reticulation	HPC	Cells/ML	Monthly	36	2	NA	<10	10	.6	<10	Cairns Regional Council
Forsayth	Reticulation	TOC	Cells/ML	Twice yearly	4	4	N/A	1	2	1.8		Cairns Regional Council
Forsayth	Raw	Turbidity	Ntu	Daily	449	449	NA	.59	30.20	3.12		In House
Forsayth	Raw	True colour	Pt/Co	Twice a week	80	80	NA	0.00	94.00	22.00		In House
Forsayth	Raw	PH	PH units	Daily	327	327	NA	6.6	8.2	7.6		In House
Forsayth	Raw	Temperature	C	Daily	331	331	NA	22.5	34.2	28.0		In House
Forsayth	Raw	Aluminium	Mg/L	Monthly	24	23	NA	<0.015	0.640	0.136	<0.03	Cairns Regional Council
Forsayth	Raw	Silicon	Mg/L	Monthly	15	15	NA	10	18	13	<0.10	Cairns Regional Council
Forsayth	Raw	Mercury	Ug/L	Monthly	16	0	NA	<0.06	<0.06	<0.06	<0.06	Cairns Regional Council
Forsayth	Raw	Arsenic	Mg/L	Monthly	16	16	NA	0.0009	0.0019	0.0013	<0.0001	Cairns Regional Council
Forsayth	Raw	Cadmium	Mg/L	Monthly	16	0	NA	<0.0001	<0.0002	<0.0001	<0.0001	Cairns Regional Council
Forsayth	Raw	Chromium	Mg/L	Monthly	16	2	NA	<0.0005	0.0008	.0001	<0.0005	Cairns Regional Council
Forsayth	Raw	Copper	Mg/L	Monthly	16	16	NA	0.001	0.081	0.027	<0.002	Cairns Regional Council
Forsayth	Raw	Iron	Mg/l	Monthly	24	24	NA	0.036	0.610	.185	<0.015	Cairns Regional Council
Forsayth	Raw	Lead	Mg/L	Monthly	16	3	NA	<0.005	0.0009	0.0001	<0.0005	Cairns Regional Council
Forsayth	Raw	Manganese	Mg/L	Monthly	24	24	NA	0.0097	0.0741	0.0373	<0.0005	Cairns Regional Council
Forsayth	Raw	Nickel	Mg/L	Monthly	16	4	NA	<0.005	0.0014	0.0002	<0.005	Cairns Regional Council
Forsayth	Raw	Zinc	Mg/L	Monthly	16	3	NA	<0.008	0.009	0.002	<0.008	Cairns Regional Council
Forsayth	Raw	Calcium	MG/L	Monthly	15	15	NA	5	11	8	<0.20	Cairns Regional Council
Forsayth	Raw	Magnesium	Mg/L	Monthly	16	16	NA	1.8	3.3	2.8	<0.10	Cairns Regional Council
Forsayth	Raw	Potassium	Mg/L	Monthly	15	15	NA	2.1	2.7	2.4	<0.10	Cairns Regional Council
Forsayth	Raw	Sodium	Mg/L	Monthly	15	15	NA	9.4	16	13	<1	Cairns Regional Council
Forsayth	Raw	Total Hardness	MgCaC03/L	Monthly	15	15	NA	20	41	32	<1	Cairns Regional Council
Forsayth	Raw	Salinity	Psu	Monthly	15	15	NA	0.0427	0.0717	0.0635		Cairns Regional Council
Forsayth	Raw	Total Dissolved Solids	Mg/L	Monthly	16	16	NA	68	98	86	<1	Cairns Regional Council
Forsayth	Raw	Electrical Conductance	Us/cm	Monthly	16	16	NA	80	150	124	<1	Cairns Regional Council
Forsayth	Raw	Total Alkalinity	MgCaCO3/L	Monthly	16	16	NA	33	62	51	<0.1	Cairns Regional Council
Forsayth	Raw	Fluoride	Mg/L	Monthly	16	16	NA	0.16	0.29	0.24	<0.02	Cairns Regional Council
Forsayth	Raw	Sulphate	Mg/L	Monthly	16	14	NA	1.7	5.2	3.1	<1	Cairns Regional Council
Forsayth	Raw	Chloride	Mg/L	Monthly	16	16	NA	2.8	7.1	4.9	<0.01	Cairns Regional Council

Scheme name	Scheme component	Parameter	Units	Frequency of sampling	Total No. samples collected	No. of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of reporting	Laboratory name
Forsayth	Raw	Chlorate	Mg/L	Monthly	12	2	NA	<0.005	0.034	0.003	<0.005	Cairns Regional Council
Forsayth	Raw	Chlorite	Mg/L	Monthly	12	0	NA	<0.005	<0.005	<0.005	<0.005	Cairns Regional Council
Forsayth	Raw	Bromate	Mg/L	Monthly	12	1	NA	<0.005	0.006	<0.005	<0.005	Cairns Regional Council
Forsayth	Raw	Bromide	Mg/L	Monthly	12	11	NA	<0.005	0.310	0.050	<0.025	Cairns Regional Council
Forsayth	Raw	Microcystis aeruginosa	Cells/ML	Monthly	12	0	NA	0	0	0		Cairns Regional Council
Forsayth	Raw	Cylindrospermopsis raciborskii	Cells/ML	Monthly	12	3	NA	0	440	43		Cairns Regional Council
Forsayth	Raw	Dolichospermum circinale	Cells/ML	Monthly	12	0	NA	0	0	0		Cairns Regional Council
Forsayth	Raw	Chrysosporum ovalisporum	Cells/ML	Monthly	12	0	NA	0	0	0		Cairns Regional Council
Forsayth	Raw	E. coli	Cells/ML	Monthly	12	0	NA	<1	4	0.6	<1	Cairns Regional Council
Forsayth	Raw	Total Coliforms	Cells/ML	Monthly	12	12	NA	78	52000	6025	<1	Cairns Regional Council
Forsayth	Raw	HPC	Cells/ML	Monthly	12	12	NA	180	1500	581	<10	Cairns Regional Council

Table - Reticulation *E. coli* verification monitoring

Georgetown	***2023***											
Month	***Jan***	***Feb***	***Mar***	***Apr***	***May***	***June***	***July***	***Aug***	***Sept***	***Oct***	***Nov***	***Dec***
No. of samples collected	5	5	5	5	5	5	5	5	5	5	5	5
No. of samples collected in which *E. coli* 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	60	60	60	60	60	60	60	60	60	60	60	60
No. of failures for previous 12 month period	1	1	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

Georgetown	*2024*											
Month	***Jan***	***Feb***	***Mar***	***Apr***	***May***	***June***	***July***	***Aug***	***Sept***	***Oct***	***Nov***	***Dec***
No. of samples collected	5	5	5	5	5	5	5	5	5	5	5	
No. of samples collected in which *E. coli* is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	
No. of samples collected in previous 12 month period	60	60	60	60	60	60	60	60	60	60	60	
No. of failures for previous 12 month period	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 %	
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	

Forsayth	***2023***											
Month	***Jan***	***Feb***	***Mar***	***Apr***	***May***	***June***	***July***	***Aug***	***Sept***	***Oct***	***Nov***	***Dec***
No. of samples collected	3	3	3	3	3	3	3	3	3	3	3	3
No. of samples collected in which *E. coli* 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	36	36	36	36	36	36	36	36	36	36	36	36
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

Forsayth	*2024*											
Month	***Jan***	***Feb***	***Mar***	***Apr***	***May***	***June***	***July***	***Aug***	***Sept***	***Oct***	***Nov***	***Dec***
No. of samples collected	3	3	3	3	3	3	3	3	3	3	3	
No. of samples collected in which *E. coli* is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	
No. of samples collected in previous 12-month period	36	36	36	36	36	36	36	36	36	36	36	
No. of failures for previous 12-month period	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%	
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	

Appendix B – Implementation of the DWQMP Risk Management Improvement Program

Table 2 – Progress against the risk management improvement program in the approved DWQMP

IP item	Action	Priority	Description Describe the deliverable and the scope	Original Target date/s	Progress	Target date/s	Responsibility
Loss of Forsayth water supply from structural failure at Big Reef Dam.	*7*	*Med*	*Investigate water sourcing options or dam repairs/improvements.*	*End 2024*	*Complete – New Dam utilised from July 2022*	*2022*	*Council*
Ongoing siltation & weed management at Big Reef Dam	*8*	*High*	*Investigate resolving ongoing siltation and weed management problems at Big Reef Dam.*	*2020*	*Complete – New Dam utilised from July 2022*	*2022*	*Council*
Loss of water supply through inadequate wet season	*9*	*High*	*Investigate water sourcing options for supply security for Georgetown & Forsayth*	*2020*	*Complete – New Dam utilised from July 2022*	*2022*	*Council*
Scada	*12*	*Med*	*Investigate scada computer system specifically chlorine alarms*	*End 2014*	*We have a system in the Georgetown and Forsayth Reservoirs which circulates the water, senses the chlorine levels and adds chlorine if needed.* *We have a telemetry system at Georgetown, which allows us to monitor reservoir levels and activate pumps.* *We now have a system in place which allows us to monitor the cl2, ph & turbidity levels in the treatment plants, entering the reservoirs and, in the trim, remotely.* *We have upgraded the computer system within our upgrade at the Forsayth*	*2023/on going upgrades*	*Town & Water Manager, Water Treatment Supervisor, Council*

IP item	Action	Priority	Description Describe the deliverable and the scope	Original Target date/s	Progress	Target date/s	Responsibility
					Treatment plant and can view this from Georgetown or a tablet. We can remotely view reservoir levels, chlorine levels, plant faults etc.		
Water mains	*13*	*Low*	*Investigate capital works projects to replace 80mm AC with PVC & extend mains with PVC to complete circuits.*	*2023*	*We have performed capital works jobs and eliminated some dead ends. This is ongoing at this stage.*	*2035*	*Town & Water Manager, Engineer, Council*