

DRINKING WATER QUALITY MANAGEMENT PLAN
(DWQMP) REPORT
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Service Provider # 473

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GLOSSARY OF TERMS

ADWG	Australian Drinking Water Guidelines (2011). Published by the National Health and Medical Research Council of Australia
E. coli	<i>Escherichia coli</i> , a bacterium which is considered to indicate the presence of faecal contamination and therefore potential health risk
BRC	Barcaldine Shire Council
mg/L	Milligrams per litre
DWQMP	Drinking Water Quality Management Plan
CFU/100mL	Colony forming units per 100 millilitres

INTRODUCTION

Pursuant to sections 99(2) (b) and 106 of the Act, regular reporting on the implementation of the approved Drinking Water Quality Management Plan (DWQMP) must be undertaken. This report documents the performance of Barcaldine Regional Councils (BRC) drinking water service, with regard to water quality and performance in implementing the actions detailed in the 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 also provides a mechanism for service providers to report publicly on their performance in managing drinking water quality.

1.0 OVERVIEW OF OPERATIONS

BRC is a medium Drinking Water Service Provider (DWSP) as defined in the Water Supply (Safety and Reliability) Act 2008. BRC covers an area of 54,000sq km with an overall population of approximately 2,869 people which swells significantly in the cooler months with travelling tourists. There are five operational water schemes in the shire, in the towns of Alpha, Aramac, Barcaldine, Jericho and Muttaborra. The administration centre of the region is Barcaldine.

The systems source their water from ground water sources. Aramac, Barcaldine and Muttaborra are situated within the Great Artesian Basin and their water is sourced from the high yielding aquifers within the basin between the depths of 362 and 825m. Alpha and Jericho located on the eastern side of the region source their water from shallower sub-artesian aquifers located at depths between 70 and 120m.

In mid-2018 BRC submitted an amended DWQMP to the department, demonstrating the commitment of council to managing its drinking water quality and complying with requirements of the Water Supply (Safety and Reliability) Act 2008, to protect public health by ensuring the provision of a safe water supply. The development of the DWQMP has documented potential risks associated with the operation of the water schemes and management strategies to safeguard drinking water quality for the public.

2.0 ACTIONS TAKEN TO IMPLEMENT THE DWQMP

BRC has implemented a number of actions set out in the DWQMP to provide greater surety for the supply of safe drinking water for the supply schemes within the region. The application of a range of improvement items and management strategies that are set out in the DWQMP are identified below in section 2.1.

2.1 Progress in Implementing the Risk Management Improvement Program

The information below presents the risks identified in the DWQMP Risk Management Improvement Program and the strategies that have been implemented or are to be actioned to ensure the provision of drinking water quality in the BRC's water schemes.

Table 1 RMIP Status

	Scheme	Improvement Item	Actions	Status at 30th June 2019
2.1.1	<u>Alpha</u> <u>Aramac</u> <u>Barcaldine</u> <u>Jericho</u> <u>Muttaburra</u>	Operational & Maintenance Procedures - Identify new procedures needed, develop and obtain approval and implement.	Operations and Maintenance procedures have been completed in April 2019.	Complete
2.1.2	<u>Alpha</u> <u>Aramac</u> <u>Barcaldine</u> <u>Jericho</u> <u>Muttaburra</u>	Commence Operational Monitoring of raw water quality - monitor individual bores to determine if individual bores have lower water quality.	Source water monitoring program in progress.	Actioned
2.1.3	<u>Alpha</u>	Catchment Characterisation: Identify the effect of flooding on bore water quality considering private bores which may not be capped or correctly constructed.	In accordance with the Risk Management Improvement plan of the DWQMP. When significant flood events occur in Alpha and Jericho sampling of bores will take place to identify if anthropogenic derived contaminants are making their way into the groundwater. There have been no significant flood events in recent times to determine the impact on the supply bore water quality.	Ongoing
2.1.4	<u>Alpha</u>	Seal uncapped bores	Seal bores which are abandoned under council jurisdiction.	Ongoing

	Scheme	Improvement Item	Actions	Status at 30th June 2019
2.1.5	<u>Alpha</u> <u>Jericho</u>	Operator Training and handover process: Allow for peer training approximately 5 days, source operator from other DWSP to train operator	Currently in Alpha and Jericho there are two employees capable of operating the plants and associated water infrastructure. A water services technician has been employed by council who has been trained to operate the schemes. The town supervisor who has experience in managing water operations is a backup staff member who has managed the system in the past.	Actioned
2.1.6	<u>Aramac</u> <u>Muttaburra</u>	Replace ageing mains in accordance with asset replacement program. Continue to apply for internal & external funding.	Major upgrades have been undertaken in the Aramac and Muttaburra schemes. These works have upgraded the lines which had reached their useful life span, completion of the current scope of works will result in these schemes working within their designed useful life expectancy.	Complete
2.1.7	<u>Aramac</u> <u>Barcaldine</u> <u>Muttaburra</u>	Create flushing schematic layout to go with the SOP Air scouring every 5 years. Implement reconfiguration of mains layout to improve flow.	Flushing locations have been identified for the Barcaldine drinking water scheme. Development of flushing points for other schemes has not been actioned due to recent mains upgrades.	Ongoing

3.0 COMPLIANCE WITH WATER QUALITY CRITERIA FOR DRINKING WATER

A summary of verification monitoring results are provided below in tables 2-6. Verification monitoring data indicates that there are limited issues with water quality, for Aramac and Jericho there were no exceedances of ADWG guideline values. The exceedances of ADWG guideline values in Alpha, Barcaldine and Muttaborra are limited to aesthetic guideline value exceedances, with the exception of Barcaldine where E. coli was detected in the distribution system on one occasion through inhouse testing. Water quality exceedances are summarised as follows:

Alpha

Verification monitoring of the drinking water in Alpha has identified several ADWG aesthetic guideline value exceedances, including:

- Chloride
- Silica; and
- Sodium

The presence of elevated concentrations of these analytes in the water is due to geological and biological processes causing the dissolution of minerals into the groundwater.

Barcaldine

Verification monitoring has detected one exceedance of ADWG health guideline limits in the Barcaldine drinking water scheme, with the detection of E.coli in the distribution system at the Barcaldine Hospital on the 23rd of August 2019. The E.coli detection was low with the results indicating a MPN of 1 E. coli/100ml. In accordance with regulatory protocols a follow up test was conducted by QLD Health (Longreach) on the 23rd of August 2019 from multiple locations in the reticulation system, the follow up tests did not detect E. coli in the system.

Verification monitoring in Barcaldine has identified exceedances of ADWG aesthetic guideline values for turbidity with a maximum recorded value of 9NTU and an average of 2.36NTU. These elevated values are most likely associated with the accumulation of sediment in the reticulation, which causes elevated turbidity values from some samples from isolated locations in the reticulation system.

Muttaborra

ADWG aesthetic guideline values for iron and colour have been exceeded in Muttaborra, these exceedances are due to the underlying geology of the Muttaborra bore, where iron values are elevated. The discolouration of the water in Muttaborra is also associated with the presence of iron in the water supply.

3.1 Alpha Drinking Water Scheme Water Quality Results 2018 – 2019

Table 2 Alpha Verification Monitoring Results

Analyte	Number of samples	Minimum value	Maximum value	Average value	Units
Alkalinity	10	186	190	187.6	mg CaCO ₃ /L
Aluminium	10	0.03	0.05	0.0	mg/L
Boron	10	0.28	0.3	0.3	mg/L
Calcium	10	35	39	37.0	mg/L
Carbonate	10	0.2	2	1.2	mg/L
Chlorate	11	0.09	0.39	0.2	
Chloride	10	360	390	378.8	mg/L
Conductivity	10	1620	1760	1688.8	us/cm
Copper	10	0	0.38	0.0	mg/L
Fluoride	10	0.26	0.34	0.3	mg/L
Iron	10	0.01	0.01	0.0	mg/L
Magnesium	10	35	40	37.4	mg/L
Manganese	10	0	0.01	0.0	mg/L
Nitrate	10	28	30	29.3	mg/L
pH	10	7.1	8.15	7.7	
pH (Sat)	10	7.6	7.7	7.7	
Potassium	10	10	11	10.4	mg/L
Silica	10	82	85	83.8	mg/L
Sodium	10	240	250	243.8	mg/L
Sulphate	10	39	41	40.4	mg/L
Total Dissolved Ions	10	971	1030	1004.9	mg/L
Total Dissolved Solids	10	942	997	972.3	mg/L
Total Hardness	10	233	264	247.7	mg CaCO ₃ /L
True Colour	10	1	2	1.3	Hazen
Turbidity	10	1	1	1.0	NTU
Zinc	10	0.01	0.14	0.1	mg/L
E. coli count	117	0	0	0	each
Coliform Count	117	0	1	0.02	each

3.2 Aramac Drinking Water Scheme Water Quality Results 2018 – 2019

Table 3 Aramac Verification Monitoring Results

Analyte	Number of samples	Minimum value	Maximum value	Average value	Units
Alkalinity	10	171	179	173.96	mg CaCO ₃ /L
Aluminium	10	0.03	0.05	0.04	mg/L
Boron	10	0.05	0.06	0.06	mg/L
Calcium	10	6.4	6.9	6.65	mg/L
Carbonate	10	0.2	1.1	0.67	mg/L
Chloride	10	41	42	41.63	mg/L
Conductivity	10	449	461	455.21	us/cm
Copper	10	0	0.42	0.03	mg/L
Fluoride	10	0.49	0.53	0.51	mg/L
Hydroxide	10	0	0	0.00	mg/L
Iron	10	0.01	0.24	0.11	mg/L
Magnesium	10	0.27	0.4	0.29	mg/L
Manganese	10	0.01	0.04	0.03	mg/L
Nitrate	10	0.05	0.5	0.19	mg/L
pH	10	7.18	7.97	7.69	
Potassium	10	5.9	6.2	6.09	mg/L
Silica	10	20	20	20.00	mg/L
Sodium	10	93	96	94.25	mg/L
Sulphate	10	0.2	1	0.39	mg/L
Total Dissolved Ions	10	354	369	361.00	mg/L
Total Dissolved Solids	10	269	279	273.58	mg/L
Total Hardness	10	17	18	17.67	mg CaCO ₃ /L
True Colour	10	1	6	2.38	Hazen
Turbidity	10	1	1	1.00	NTU
Zinc	10	0.01	0.06	0.05	mg/L
E. coli count	20	0	0	0	each
Coliform Count	20	0	5	2.5	each

3.3 Barcaldine Drinking Water Scheme Water Quality Results 2018 – 2019

Table 4 Barcaldine Verification Monitoring Results

Analyte	Number of samples	Minimum value	Maximum value	Average value	Units
Alkalinity	12	136	141	138.43	mg CaCO ₃ /L
Aluminium	12	0.03	0.05	0.03	mg/L
Boron	12	0.03	0.03	0.03	mg/L
Calcium	12	3.1	4.5	3.71	mg/L
Carbonate	12	0.7	2.5	1.74	mg/L
Chloride	12	36	40	38.32	mg/L
Conductivity	12	385	404	391.07	us/cm
Copper	12	0	0.03	0.01	mg/L
Fluoride	12	0.21	0.25	0.23	mg/L
Hydroxide	12	0	0	0.00	mg/L
Iron	12	0.01	0.12	0.03	mg/L
Magnesium	12	0.07	0.3	0.17	mg/L
Manganese	12	0	0.03	0.01	mg/L
Nitrate	12	0.05	1.1	0.59	mg/L
pH	12	7.85	8.42	8.25	
Potassium	12	1.9	3.6	2.66	mg/L
Residual Alkalinity	12	2.5	2.6	2.57	mg/L
Silica	12	23	24	23.57	mg/L
Sodium	12	83	85	84.00	mg/L
Sulphate	12	3	5	4.11	mg/L
Total Dissolved Ions	12	295	306	300.89	mg/L
Total Dissolved Solids	12	236	244	240.43	mg/L
Total Hardness	12	8.1	12	9.86	mg CaCO ₃ /L
True Colour	12	1	4	1.25	Hazen
Turbidity	12	1	9	2.36	NTU
Zinc	12	0.01	0.06	0.05	mg/L
E. coli count	207	0	1	0	each
Coliform count	207	0	1	0.02	each

3.4 Jericho Drinking Water Scheme Water Quality Results 2018 – 2019

Table 5 Jericho Verification Monitoring Results

Analyte	Number of samples	Minimum value	Maximum value	Average value	Units
Alkalinity	9	0	65	44.00	mg CaCO ₃ /L
Aluminium	9	0.05	0.12	0.08	mg/L
Boron	9	0.11	0.12	0.11	mg/L
Calcium	9	6.6	6.7	6.64	mg/L
Carbonate	9	0	0.3	0.09	mg/L
Chlorate	10	0.08	0.13	0.10	mg/L
Chloride	9	220	220	220.00	mg/L
Conductivity	9	892	923	903.77	us/cm
Copper	9	0	0.1	0.02	mg/L
Fluoride	9	0.18	0.2	0.19	mg/L
Hydrogen	9	0	0	0.00	mg/L
Hydroxide	9	0	0	0.00	mg/L
Iron	9	0.01	0.01	0.01	mg/L
Magnesium	9	17	17	17.00	mg/L
Manganese	9	0	0.01	0.00	mg/L
Nitrate	9	0.49	0.6	0.52	mg/L
pH	10	6.22	7.81	7.16	
Potassium	9	7	7.8	7.50	mg/L
Residual Alkalinity	9	0	61	5.08	mg/L
Silica	9	13	13	13.00	mg/L
Sodium	9	130	140	136.67	mg/L
Sulphate	9	34	37	35.52	mg/L
Total Dissolved Ions	9	464	506	482.61	mg/L
Total Dissolved Solids	9	455	482	466.94	mg/L
Total Hardness	8	85	88	86.42	mg CaCO ₃ /L
True Colour	9	1	3	1.27	Hazen
Turbidity	9	1	1	1.00	NTU
Zinc	9	0.04	0.06	0.06	mg/L
E. coli count	118	0	0	0.00	each
Coliform count	118	0	26.6	0.87	each

3.5 Muttaborra Drinking Water Scheme Water Quality Results 2018 – 2019

Table 6 Muttaborra Verification Monitoring Results

Analyte	Number of samples	Minimum value	Maximum value	Average value	Units
Alkalinity	9	178	191	182.29	mg CaCO ₃ /L
Aluminium	9	0.03	0.05	0.04	mg/L
Boron	9	0.07	0.08	0.08	mg/L
Calcium	9	2	4	2.76	mg/L
Carbonate	9	0.4	1.5	0.83	mg/L
Chloride	9	32	35	32.92	mg/L
Conductivity	9	432	449	440.71	us/cm
Copper	9	0	0.03	0.01	mg/L
Fluoride	9	0.23	0.27	0.24	mg/L
Hydrogen	9	0	0	0.00	mg/L
Hydroxide	9	0	0	0.00	mg/L
Iron	9	0.06	0.7	0.35	mg/L
Magnesium	9	0.2	0.25	0.22	mg/L
Manganese	9	0.01	0.08	0.06	mg/L
Nitrate	9	0.05	0.5	0.26	mg/L
pH	9	7.54	8.06	7.78	
Potassium	9	8.5	9.1	8.84	mg/L
Residual Alkalinity	9	3.4	3.7	3.50	mg/L
Silica	9	28	30	28.92	mg/L
Sodium	9	93	100	94.67	mg/L
Sulphate	9	0.02	1	0.35	mg/L
Total Dissolved Ions	9	355	377	361.67	mg/L
Total Dissolved Solids	9	274	289	278.46	mg/L
Total Hardness	9	5.9	11	7.83	mgCaCO ₃ /L
True Colour	9	2	18	7.58	Hazen
Turbidity	9	1	1.3	1.05	NTU
Zinc	9	0.01	0.07	0.05	mg/L
E. coli count	20	0	0	0	each
Coliform count	20	0	0	0	each

4.0 NOTIFICATIONS TO THE REGULATOR UNDER SECTIONS 102 AND 102A OF THE ACT

One notification has been made to the regulator by BRC in the 2019/2020 reporting period for the exceedance of ADWG health guideline limits in the Barcaldine drinking water scheme, with the detection of E.coli in the distribution system at the Barcaldine Hospital on the 23rd of August 2019. The E.coli detection was low with the results indicating a MPN of 1 E. coli/100ml. In accordance with regulatory protocols a follow up test was conducted by QLD Health (Longreach) on the 23rd of August 2019 from multiple locations in the reticulation system, the follow up tests did not detect E. coli in the system.

Incident Date	Scheme / Location	Parameter / Issue	Preventive Actions
23/08/2019	Barcaldine Hospital	E.coli 1 MPN/100mL detected at the Barcaldine Hospital in exceedance of AGWG health guideline value	Follow up testing and ongoing Operational Monitoring

5.0 CUSTOMER COMPLAINTS RELATED TO WATER QUALITY

Over the 2019/29 reporting period there were a total of 133 complaints. Most of these complaints were received in Barcaldine, these complaints are usually associated with service issues, where a customer has made a complaint in regards to low water pressure or a water leak. A total of 7 water quality complaints were registered with Council. These quality complaints are generally regarding the discolouration of water. A summary of water complaints is provided in table 7 below.

Table 7 Aramac Verification Monitoring Results

Service Complaints	Water Quality Complaints
Sum of Service Complaints Alpha	Sum of Quality Complaints Alpha
0	0
Sum of Service Complaints Aramac	Sum of Quality Complaints Aramac
10	0
Sum of Service Complaints Barcaldine	Sum of Quality Complaints Barcaldine
104	7
Sum of Service Complaints Jericho	Sum of Quality Complaints Jericho
0	0
Sum of Service Complaints Muttaborra	Sum of Quality Complaints Muttaborra
11	0
Total service Complaints	Total Water Quality Complaints
125	7
	Total all complaints
	133

6.0 FINDINGS AND RECOMMENDATIONS OF THE DWQMP AUDITOR

No audit was conducted during the 2019-2020 financial year. Next audit scheduled for November 2021.

7.0 OUTCOME OF THE DWQMP REVIEW AND HOW ISSUES RAISED HAVE BEEN ADDRESSED

A DWQMP Review was not conducted during the 2019-2020 financial year. The next DWQMP review is scheduled for December 2021.