

Drinking Water Quality Management Plan (DWQMP) report

2015/2016

Balonne Shire Council

SPID: 6

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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
<i>E. coli</i>	<i>Escherichia coli</i> , 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
PCU	Platinum-Cobalt Units
CFU/100mL	Colony forming units per 100 millilitres
<	Less than
>	Greater than

Introduction

This report documents the performance of Balonne 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.

1. Actions taken to implement the DWQMP

The adopted aesthetic and health limits for all drinking water schemes managed by the Balonne Shire Council are based on the physical, chemical and microbial limits set out in the ADWG 2011. Testing of physical and chemical parameters are undertaken quarterly. Testing for E. coli is undertaken weekly for the St George Water supply and monthly for all other schemes. A full list of the tested parameters can be found in Appendix A.

Progress in implementing the risk management improvement program

Refer to Appendix B for a summary of progress in implementing each of the Improvement Program actions.

Revisions made to the operational monitoring program to assist in maintaining the compliance with water quality criteria¹ in verification monitoring.

No changes have been made to operational monitoring programs in the latest revision of the Balonne Shire Council's DWQMP.

Amendments made to the DWQMP

No amendments have been made to the DWQMP. The next revision of the DWQMP is due on 31 July 2017.

2. Compliance with water quality criteria for drinking water

The water quality criteria refer to health guideline values in the most current Australian Drinking Water Guidelines, as well as the standards in the Public Health Regulation 2005. A summary of monitoring results and compliance assessment for all Balonne Shire drinking water schemes can be found in Appendix A. All schemes in the shire were found to be compliant for the 2015-16 period.

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

This financial year there was 2 non-compliance instances where the Regulator was notified under sections 102 or 102A of the Act. Non-compliance for E.Coli was recorded in November and December 2015 at Dirranbandi. Steps have since been taken to address this issue.

4. Customer complaints related to water quality

Balonne Shire Council is required to report on the number of complaints, general details of complaints, and the responses undertaken. There were no official complaints recorded this financial year.

¹ Refer to *Water Quality and Reporting Guideline for a Drinking Water Service* for the water quality criteria for drinking water.

Very few complaints are received from the schemes supplied by GAB bore water as the water is of a very consistent quality. Complaints for the Dirranbandi and Mungindi water supply schemes are typically directed to the town officer / water treatment plant operator. These complaints are not always recorded.

5. Findings and recommendations of the DWQMP auditor

Balonne Shire Council has not yet conducted a regular audit of the DWQMP. The first required regular audit of the DWQMP is due on 31 July 2017.

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

A regular review/revision of the DWQMP was completed on the 29 June 2016, and covered the time period from 28 August 2015. The purpose of the review was to ensure that the DWQMP remains relevant, having regard to the operation of the drinking water service. The review was conducted by:

- *Author – Daniel Harrington – Balonne Shire Council - Project Engineer*
- *Verifier - Kevin Searle - Balonne Shire Council – Director of Infrastructure Services*

As a result of the review the following changes have been made to the latest revision of the DWQMP.

- Amendments to the population/connection totals.
- Water Quality monitoring results have been revised.
- The Risk Management Measures for the Dirranbandi water treatment plant were revised.
- Amendment to mains flushing dates and cost.
- Amendments to hazard identification and risk assessment ratings.

There were no hazards and hazardous events that were identified in the review that were not addressed in the DWQMP.

Appendix A – Summary of compliance with water quality criteria

The results from the verification monitoring program for each of the schemes 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 annual results demonstrate that the water monitoring program has been effective for measuring and controlling water quality for all the schemes in the shire.

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

Table 1 – St. George - Verification monitoring results and Reticulation *E. coli* verification monitoring.

Summary Page											
Scheme											
Sampling Location											
Laboratory Used											
Parameter	Units	Frequency of Reporting	ADWG Limit		No. Samples	Summary of Results			No. Exceeding		Comment
			Aesthetic	Health		Maximum Value	Average Value	Minimum Value	Aesthetic	Health	
PH		Quarterly	6.5-8.5		3	8.43	8.41	8.39	0	0	ADWG Compliant
Total Hardness	mg/L	Quarterly	200.00		3	7.8	7.70	7.5	0	0	ADWG Compliant
Alkalinity	mg/L	Quarterly			3	287	281.00	275	0	0	ADWG Compliant
Total Dissolved Ions	mg/L	Quarterly			3	692	687.67	680	0	0	ADWG Compliant
Total Dissolved Solids	mg/L	Quarterly	500.00		3	557	553.33	549	3	0	Some Non-Compliances - ADWG Aesthetic Limit
Colour	PCU	Quarterly	15.00		3	1	N/A	<1	0	0	ADWG Compliant
Turbidity	NTU	Quarterly	5.00		3	<1	N/A	<1	0	0	ADWG Compliant
Sodium	mg/L	Quarterly	180.00		3	210	209.33	208	3	0	Some Non-Compliances - ADWG Aesthetic Limit
Potassium	mg/L	Quarterly			3	2.2	2.17	2.1	0	0	ADWG Compliant
Calcium	mg/L	Quarterly			3	3.1	3.07	3	0	0	ADWG Compliant
Magnesium	mg/L	Quarterly			3	0	0.00	0	0	0	ADWG Compliant
Chloride	mg/L	Quarterly	250.00		3	90	88.00	86	0	0	ADWG Compliant
Fluoride	mg/L	Quarterly		1.50	3	0.35	0.33	0.29	0	0	ADWG Compliant
Nitrate	mg/L	Quarterly		50.00	3	<0.05	N/A	<0.05	0	0	ADWG Compliant
Sulphate	mg/L	Quarterly	250.00	500.00	3	49	48.00	47	0	0	ADWG Compliant
Iron	mg/L	Quarterly	0.30		3	<0.01	N/A	<0.01	0	0	ADWG Compliant
Manganese	mg/L	Quarterly	0.10	0.50	3	0.01	N/A	<0.01	0	0	ADWG Compliant
Zinc	mg/L	Quarterly	3.00		3	0.01	N/A	<0.01	0	0	ADWG Compliant
Aluminium	mg/L	Quarterly	0.20		3	<0.05	N/A	<0.05	0	0	ADWG Compliant
Copper	mg/L	Quarterly	1.00	2.00	3	<0.03	N/A	<0.03	0	0	ADWG Compliant
E. Coli	CFU/100mL	Weekly		0.00	47						0 ADWG Compliant

- Note:**
1. Sampling was undertaken in accordance with the DWQMP. No sample was taken for the final quarter due to staff shortages at the time.
 2. TDS & Sodium consistently exceeded the ADWG Aesthetic limit.
 3. All Chloride and E.Coli samples were compliant with the ADWG.

Table 2 – Dirranbandi - Verification monitoring results and Reticulation E. coli verification monitoring

Summary Page											
Scheme		Dirranbandi									
Sampling Location		Dirranbandi Works Depot									
Laboratory Used		Queensland Health Forensic and Scientific Services									
Parameter	Units	Frequency of Reporting	ADWG Limit		No. Samples	Summary of Results			No. Exceeding		Comment
			Aesthetic	Health		Maximum Value	Average Value	Minimum Value	Aesthetic	Health	
PH		Quarterly	6.5-8.5		3	8.13	7.90	7.78	0	0	ADWG Compliant
Total Hardness	mg/L	Quarterly	200.00		3	39	32.67	29	0	0	ADWG Compliant
Alkalinity	mg/L	Quarterly			3	167	158.00	147	0	0	ADWG Compliant
Total Dissolved Ions	mg/L	Quarterly			3	463	404.33	367	0	0	ADWG Compliant
Total Dissolved Solids	mg/L	Quarterly	500.00		3	381	324.67	286	0	0	ADWG Compliant
Colour	PCU	Quarterly	15.00		3	3	N/A	<1	0	0	ADWG Compliant
Turbidity	NTU	Quarterly	5.00		3	31	N/A	5	2	0	Some Non-Compliances - ADWG Aesthetic Limit
Sodium	mg/L	Quarterly	180.00		3	124	107.00	95	0	0	ADWG Compliant
Potassium	mg/L	Quarterly			3	5.1	4.57	3.8	0	0	ADWG Compliant
Calcium	mg/L	Quarterly			3	9.6	8.20	7.4	0	0	ADWG Compliant
Magnesium	mg/L	Quarterly			3	3.8	2.97	2.4	0	0	ADWG Compliant
Chloride	mg/L	Quarterly	250.00		3	55	44.00	38	0	0	ADWG Compliant
Fluoride	mg/L	Quarterly		1.50	3	0.38	0.33	0.24	0	0	ADWG Compliant
Nitrate	mg/L	Quarterly		50.00	3	0.5	N/A	<0.05	0	0	ADWG Compliant
Sulphate	mg/L	Quarterly	250.00	500.00	3	62	45.33	24	0	0	ADWG Compliant
Iron	mg/L	Quarterly	0.30		3	<0.01	N/A	<0.01	0	0	ADWG Compliant
Manganese	mg/L	Quarterly	0.10	0.50	3	0.01	N/A	<0.01	0	0	ADWG Compliant
Zinc	mg/L	Quarterly	3.00		3	0.01	N/A	<0.01	0	0	ADWG Compliant
Aluminium	mg/L	Quarterly	0.20		3	0.06	N/A	<0.05	0	0	ADWG Compliant
Copper	mg/L	Quarterly	1.00	2.00	3	<0.03	N/A	<0.03	0	0	ADWG Compliant
E. Coli	CFU/100mL	Weekly		0.00	33					2	Some Non-Compliances - ADWG Health Limit

- Note:**
1. Sampling was undertaken in accordance with the DWQMP. No sample was taken for the final quarter due to staff shortages at the time.
 2. Turbidity exceeded the ADWG Aesthetic limit on two occasions.
 3. All Chloride levels were compliant with the ADWG
 4. Two E.Coli samples were non-compliant with the ADWG.

Table 3 – Thallon - Verification monitoring results and Reticulation E. coli verification monitoring

Summary Page											
Scheme		Thallon									
Sampling Location		Thallon Park									
Laboratory Used		Queensland Health Forensic and Scientific Services									
Parameter	Units	Frequency of Reporting	ADWG Limit		No. Samples	Summary of Results			No. Exceeding		Comment
			Aesthetic	Health		Maximum Value	Average Value	Minimum Value	Aesthetic	Health	
PH		Quarterly	6.5-8.5		3	8.41	8.36	8.29	0	0	ADWG Compliant
Total Hardness	mg/L	Quarterly	200.00		3	6.1	5.77	5.5	0	0	ADWG Compliant
Alkalinity	mg/L	Quarterly			3	492	474.00	453	0	0	ADWG Compliant
Total Dissolved Ions	mg/L	Quarterly			3	930	893.00	850	0	0	ADWG Compliant
Total Dissolved Solids	mg/L	Quarterly	500.00		3	665	640.00	610	3	0	Some Non-Compliances - ADWG Aesthetic Limit
Colour	PCU	Quarterly	15.00		3	1	N/A	<1	0	0	ADWG Compliant
Turbidity	NTU	Quarterly	5.00		3	<1	N/A	<1	0	0	ADWG Compliant
Sodium	mg/L	Quarterly	180.00		3	270	257.33	243	3	0	Some Non-Compliances - ADWG Aesthetic Limit
Potassium	mg/L	Quarterly			3	2.5	2.47	2.4	0	0	ADWG Compliant
Calcium	mg/L	Quarterly			3	2.4	2.27	2.2	0	0	ADWG Compliant
Magnesium	mg/L	Quarterly			3	0	0.00	0	0	0	ADWG Compliant
Chloride	mg/L	Quarterly	250.00		3	60	58.00	55	0	0	ADWG Compliant
Fluoride	mg/L	Quarterly		1.50	3	0.72	0.63	0.49	0	0	ADWG Compliant
Nitrate	mg/L	Quarterly		50.00	3	<0.05	N/A	<0.05	0	0	ADWG Compliant
Sulphate	mg/L	Quarterly	250.00	500.00	3	2.7	2.50	2.2	0	0	ADWG Compliant
Iron	mg/L	Quarterly	0.30		3	0.9	N/A	<0.01	1	0	Some Non-Compliances - ADWG Aesthetic Limit
Manganese	mg/L	Quarterly	0.10	0.50	3	0.01	N/A	<0.01	0	0	ADWG Compliant
Zinc	mg/L	Quarterly	3.00		3	0.01	N/A	<0.01	0	0	ADWG Compliant
Aluminium	mg/L	Quarterly	0.20		3	<0.05	N/A	<0.05	0	0	ADWG Compliant
Copper	mg/L	Quarterly	1.00	2.00	3	<0.03	N/A	<0.03	0	0	ADWG Compliant
E. Coli	CFU/100mL	Monthly		0.00	11					0	ADWG Compliant

Note:

1. Sampling was undertaken in accordance with the DWQMP. No sample was taken for the final quarter due to staff shortages at the time.
2. TDS & Sodium consistently exceeded the ADWG Aesthetic limit; the aesthetic limit for Iron was exceeded on one occasion.
3. All Chloride and E.Coli samples were compliant with the ADWG.

Table 4 – Mungindi - Verification monitoring results and Reticulation E. coli verification monitoring

Summary Page											
Scheme		Mungindi									
Sampling Location		Mungindi - River Park									
Laboratory Used		Queensland Health Forensic and Scientific Services									
Parameter	Units	Frequency of Reporting	ADWG Limit		No. Samples	Summary of Results			No. Exceeding		Comment
			Aesthetic	Health		Maximum Value	Average Value	Minimum Value	Aesthetic	Health	
PH		Quarterly	6.5-8.5		3	8.08	8.06	8.03	0	0	ADWG Compliant
Total Hardness	mg/L	Quarterly	200.00		3	82	68.33	51	0	0	ADWG Compliant
Alkalinity	mg/L	Quarterly			3	124	104.00	81	0	0	ADWG Compliant
Total Dissolved Ions	mg/L	Quarterly			3	267	238.33	198	0	0	ADWG Compliant
Total Dissolved Solids	mg/L	Quarterly	500.00		3	214	191.00	161	0	0	ADWG Compliant
Colour	PCU	Quarterly	15.00		3	1	N/A	<1	0	0	ADWG Compliant
Turbidity	NTU	Quarterly	5.00		3	45	N/A	<1	1	0	Some Non-Compliances - ADWG Aesthetic Limit
Sodium	mg/L	Quarterly	180.00		3	58	43.00	30	0	0	ADWG Compliant
Potassium	mg/L	Quarterly			3	4.3	3.60	3	0	0	ADWG Compliant
Calcium	mg/L	Quarterly			3	15	13.00	11	0	0	ADWG Compliant
Magnesium	mg/L	Quarterly			3	11	8.73	5.9	0	0	ADWG Compliant
Chloride	mg/L	Quarterly	250.00		3	40	35.33	32	0	0	ADWG Compliant
Fluoride	mg/L	Quarterly		1.50	3	1.1	1.02	0.96	0	0	ADWG Compliant
Nitrate	mg/L	Quarterly		50.00	3	1.9	N/A	<0.05	0	0	ADWG Compliant
Sulphate	mg/L	Quarterly	250.00	500.00	3	8.7	7.10	4.4	0	0	ADWG Compliant
Iron	mg/L	Quarterly	0.30		3	0.01	N/A	<0.01	0	0	ADWG Compliant
Manganese	mg/L	Quarterly	0.10	0.50	3	<0.01	N/A	<0.01	0	0	ADWG Compliant
Zinc	mg/L	Quarterly	3.00		3	0.03	N/A	<0.01	0	0	ADWG Compliant
Aluminium	mg/L	Quarterly	0.20		3	<0.05	N/A	<0.05	0	0	ADWG Compliant
Copper	mg/L	Quarterly	1.00	2.00	3	<0.03	N/A	<0.03	0	0	ADWG Compliant
E. Coli	CFU/100mL	Monthly		0.00	11					0	ADWG Compliant

- Note:**
1. Sampling was undertaken in accordance with the DWQMP. No sample was taken for the final quarter due to staff shortages at the time.
 2. Turbidity exceeded the ADWG Aesthetic limit on one occasion.
 3. All Chloride and E.Coli samples were compliant with the ADWG.

Table 5 – Hebel - Verification monitoring results and Reticulation E. coli verification monitoring

Summary Page											
Scheme		Hebel									
Sampling Location		Hebel Park									
Laboratory Used		Queensland Health Forensic and Scientific Services									
Parameter	Units	Frequency of Reporting	ADWG Limit		No. Samples	Summary of Results			No. Exceeding		Comment
			Aesthetic	Health		Maximum Value	Average Value	Minimum Value	Aesthetic	Health	
PH		Quarterly	6.5-8.5		3	8.59	8.57	8.53	3	0	Some Non-Compliances - ADWG Aesthetic Limit
Total Hardness	mg/L	Quarterly	200.00		3	4.7	4.60	4.5	0	0	ADWG Compliant
Alkalinity	mg/L	Quarterly			3	388	380.33	375	0	0	ADWG Compliant
Total Dissolved Ions	mg/L	Quarterly			3	755	746.00	738	0	0	ADWG Compliant
Total Dissolved Solids	mg/L	Quarterly	500.00		3	551	546.33	541	3	0	Some Non-Compliances - ADWG Aesthetic Limit
Colour	PCU	Quarterly	15.00		3	2	N/A	<1	0	0	ADWG Compliant
Turbidity	NTU	Quarterly	5.00		3	<1	N/A	<1	0	0	ADWG Compliant
Sodium	mg/L	Quarterly	180.00		3	222	220.67	219	3	0	Some Non-Compliances - ADWG Aesthetic Limit
Potassium	mg/L	Quarterly			3	1.4	1.37	1.3	0	0	ADWG Compliant
Calcium	mg/L	Quarterly			3	1.8	1.80	1.8	0	0	ADWG Compliant
Magnesium	mg/L	Quarterly			3	0	0.00	0	0	0	ADWG Compliant
Chloride	mg/L	Quarterly	250.00		3	67	66.33	65	0	0	ADWG Compliant
Fluoride	mg/L	Quarterly		1.50	3	0.48	0.44	0.38	0	0	ADWG Compliant
Nitrate	mg/L	Quarterly		50.00	3	<0.05	N/A	<0.05	0	0	ADWG Compliant
Sulphate	mg/L	Quarterly	250.00	500.00	3	1.5	1.27	1.1	0	0	ADWG Compliant
Iron	mg/L	Quarterly	0.30		3	0.03	N/A	<0.01	0	0	ADWG Compliant
Manganese	mg/L	Quarterly	0.10	0.50	3	<0.01	N/A	<0.01	0	0	ADWG Compliant
Zinc	mg/L	Quarterly	3.00		3	0.01	N/A	<0.01	0	0	ADWG Compliant
Aluminium	mg/L	Quarterly	0.20		3	<0.05	N/A	<0.05	0	0	ADWG Compliant
Copper	mg/L	Quarterly	1.00	2.00	3	<0.03	N/A	<0.03	0	0	ADWG Compliant
E. Coli	CFU/100mL	Monthly		0.00	11					0	ADWG Compliant

Note:

1. Sampling was undertaken in accordance with the DWQMP. No sample was taken for the second quarter due to staff shortages at the time.
2. TDS & Sodium consistently exceeded the ADWG Aesthetic limit. The aesthetic limit for pH was exceeded on one occasion.
3. All Chloride and E.Coli samples were compliant with the ADWG.

Table 6 – Bollon - Verification monitoring results and Reticulation E. coli verification monitoring

Summary Page											
Scheme		Bollon									
Sampling Location		Rayner Place Park									
Laboratory Used		Queensland Health Forensic and Scientific Services									
Parameter	Units	Frequency of Reporting	ADWG Limit		No. Samples	Summary of Results			No. Exceeding		Comment
			Aesthetic	Health		Maximum Value	Average Value	Minimum Value	Aesthetic	Health	
PH		Quarterly	6.5-8.5		3	8.5	8.48	8.45	0	0	ADWG Compliant
Total Hardness	mg/L	Quarterly	200.00		3	5.2	5.17	5.1	0	0	ADWG Compliant
Alkalinity	mg/L	Quarterly			3	371	362.33	355	0	0	ADWG Compliant
Total Dissolved Ions	mg/L	Quarterly			3	766	756.67	746	0	0	ADWG Compliant
Total Dissolved Solids	mg/L	Quarterly	500.00		3	577	572.00	565	3	0	Some Non-Compliances - ADWG Aesthetic Limit
Colour	PCU	Quarterly	15.00		3	1	N/A	<1	0	0	ADWG Compliant
Turbidity	NTU	Quarterly	5.00		3	1	N/A	<1	0	0	ADWG Compliant
Sodium	mg/L	Quarterly	180.00		3	228	226.00	224	3	0	Some Non-Compliances - ADWG Aesthetic Limit
Potassium	mg/L	Quarterly			3	1.8	1.73	1.7	0	0	ADWG Compliant
Calcium	mg/L	Quarterly			3	2.1	2.03	2	0	0	ADWG Compliant
Magnesium	mg/L	Quarterly			3	0	0.00	0	0	0	ADWG Compliant
Chloride	mg/L	Quarterly	250.00		3	90	87.33	85	0	0	ADWG Compliant
Fluoride	mg/L	Quarterly		1.50	3	0.44	0.41	0.34	0	0	ADWG Compliant
Nitrate	mg/L	Quarterly		50.00	3	<0.05	N/A	<0.05	0	0	ADWG Compliant
Sulphate	mg/L	Quarterly	250.00	500.00	3	6.4	5.90	5.6	0	0	ADWG Compliant
Iron	mg/L	Quarterly	0.30		3	0.01	N/A	<0.01	0	0	ADWG Compliant
Manganese	mg/L	Quarterly	0.10	0.50	3	0.01	N/A	<0.01	0	0	ADWG Compliant
Zinc	mg/L	Quarterly	3.00		3	0.01	N/A	<0.01	0	0	ADWG Compliant
Aluminium	mg/L	Quarterly	0.20		3	<0.05	N/A	<0.05	0	0	ADWG Compliant
Copper	mg/L	Quarterly	1.00	2.00	3	<0.03	N/A	<0.03	0	0	ADWG Compliant
E. Coli	CFU/100mL	Monthly		0.00	9					0	ADWG Compliant

Note:

1. Sampling was undertaken in accordance with the DWQMP. No sample was taken for the second quarter due to staff shortages at the time.
2. TDS & Sodium twice exceeded the ADWG Aesthetic limit. The aesthetic limit for pH was exceeded on one occasion.
3. All Chloride and E.Coli samples were compliant with the ADWG.

Appendix B – Implementation of the DWQMP Risk Management Improvement Program

Table 7 – Progress against the risk management improvement program in the approved DWQMP

Scheme	Scheme Component / Sub-component	Action(s)	Target date/s	Status as at <<date>>	(If implementing these actions will take longer than anticipated, please provide detail, as it may affect the approved DWQMP)
GOB Bore Water Supplies- St George, Dirranbandi, Bollon, Thallon and Hebel	Reservoirs and Distribution	<i>Interim - Maintain Monitoring to detect presence of bacteria.</i>	Ongoing	In place	<i>Action should be completed at scheduled time.</i>
		<i>Short/Long Term - Implement Annual Mains Flushing with other annual maintenance procedures.</i>	Ongoing	In place	<i>Action should be completed at scheduled time.</i>
	Whole System	<i>Develop operational and maintenance procedures</i>	June 2017	In progress	<i>Action should be completed at scheduled time.</i>
Dirranbandi – Surface Water Supply	Treatment - Coagulant Dosing Irregularities	<i>Interim - Monitor recent upgrades to coagulation process - coagulant change (ACH) & installation of static mixer. Upgrades to low lift pump system.</i>	July 2017	In progress	<i>Action should be completed at scheduled time.</i>
		<i>Short/Long Term - Implement and Monitor coagulant dosing improvements</i>	June 2017	In progress	<i>Action should be completed at scheduled time.</i>
	Treatment - Disinfection Dosing Irregularities	<i>Interim - Complete investigation and design of disinfection dosing improvements.</i>	June 2017	In progress	<i>Action should be completed at scheduled time.</i>
		<i>Short/Long Term - Implement and Monitor disinfection dosing improvements</i>	June 2017	In progress	<i>Action should be completed at scheduled time</i>
	Treatment - Coagulant Dosing Equipment Malfunction	<i>Interim - Monitor recent upgrades to coagulation system.</i>	Ongoing	In place	<i>Monitoring underway.</i>
		<i>Short/Long Term - Monitor effectiveness of coagulant dosing.</i>	Ongoing	In place	<i>Monitoring underway.</i>
	Treatment - Inadequate Flocculation	<i>Interim - Monitor effectiveness of flocculation in peak demand periods.</i>	Ongoing	In place	<i>Monitoring underway.</i>
		<i>Short/Long Term - Monitor effectiveness of flocculation in peak demand periods. Consider modifications.</i>	Ongoing	None	<i>Monitoring underway.</i>
	Treatment - Inadequate Clarification	<i>Interim – Monitor recent upgrade to coagulation system.</i>	Ongoing	In place	<i>Monitoring underway</i>

Scheme	Scheme Component / Sub-component	Action(s)	Target date/s	Status as at <<date>>	(If implementing these actions will take longer than anticipated, please provide detail, as it may affect the approved DWQMP)
		<i>Short/Long Term – Connect turbidity monitor to SCADA for real time assessment. Monitor effectiveness of flocculation in peak demand periods.</i>	<i>June 2017</i>	<i>In place</i>	<i>Monitoring underway</i>
	<i>Treatment - Inadequate Disinfection Contact Time</i>	<i>Interim – Monitor recent upgrades to water processing rates. Target chlorination break point, monitor chlorine levels</i>	<i>Ongoing</i>	<i>In place</i>	<i>Monitoring underway</i>
		<i>Short/Long Term – Monitor bore water demand during next peak period. Maintain chlorination breakpoint. Connect chlorination monitor to SCADA. Monitor effectiveness of disinfection dosing.</i>	<i>June 2017</i>	<i>In place</i>	<i>Monitoring underway</i>
	<i>Reservoirs & Distribution – Sediment Build Up</i>	<i>Interim - Maintain Monitoring to detect presence of bacteria.</i>	<i>Ongoing</i>	<i>In place</i>	
		<i>Short/Long Term - Implement Annual Mains Flushing with other annual maintenance procedures</i>	<i>June 2017</i>	<i>In progress</i>	
	<i>Reservoirs & Distribution – Long Detention or Stagnation Zones</i>	<i>Interim - Maintain Monitoring to detect presence of bacteria.</i>	<i>Ongoing</i>	<i>In place</i>	
		<i>Short/Long Term - Investigate network to determine zones of long detention and stagnation.</i>	<i>June 2017</i>	<i>None</i>	
	<i>Reservoirs & Distribution – Inadequate Maintenance of Chlorine Residuals</i>	<i>Interim - Maintain Monitoring to detect presence of bacteria.</i>	<i>Ongoing</i>	<i>Ongoing</i>	
		<i>Short/Long Term - Investigate network to determine zones of low chlorine residual. Increase dose rate or consider alternate dosing locations</i>	<i>June 2017</i>	<i>None</i>	
	<i>Reservoirs & Distribution – Reservoir Contamination</i>	<i>Interim – Monitor recent upgrades to water processing rates. Target chlorination break point, Monitor chlorine levels.</i>	<i>Ongoing</i>	<i>In place</i>	<i>Monitoring underway</i>
		<i>Short/Long Term - Monitor bore water demand during next peak demand period.</i>	<i>June 2017</i>	<i>None</i>	<i>Monitoring underway</i>

Scheme	Scheme Component / Sub-component	Action(s)	Target date/s	Status as at <<date>>	(If implementing these actions will take longer than anticipated, please provide detail, as it may affect the approved DWQMP)
		<i>Maintain chlorination breakpoint. Connect chlorination monitor to SCADA. Monitor effectiveness of disinfection dosing. Consider additional reservoir storage to overcome need for bore water supplementing.</i>			
	Whole System - All Hazards	<i>Interim - Nil</i>	-	N/A	
		<i>Short/Long Term - Develop operational and maintenance procedures</i>	June 2017	None	
Mungindi – Surface Water Supply	Reservoirs & Distribution – Sediment Build Up	<i>Interim - Maintain Monitoring to detect presence of bacteria.</i>	Ongoing	None	
		<i>Short/Long Term - Implement Annual Mains Flushing with other annual maintenance procedures</i>	June 2017	None	
	Reservoirs & Distribution – Long Detention or Stagnation Zones	<i>Interim - Maintain Monitoring to detect presence of bacteria.</i>	Ongoing	Ongoing	
		<i>Short/Long Term - Investigate network to determine zones of long detention and stagnation.</i>	June 2017	None	
	Reservoirs & Distribution – Inadequate Maintenance of Chlorine Residuals	<i>Interim - Maintain Monitoring to detect presence of bacteria.</i>	Ongoing	Ongoing	
		<i>Short/Long Term - Investigate network to determine zones of low chlorine residual. Increase dose rate or consider alternate dosing locations</i>	June 2017	None	
	Whole System - All Hazards	<i>Interim - Nil</i>	-	N/A	
		<i>Short/Long Term - Develop operational and maintenance procedures</i>	June 2017	None	