

Drinking Water Quality Management Plan (DWQMP) report

2018-19

Maranoa Regional Council

SPID: 494

Cnr Bungil & Quintin Streets

Roma QLD 4455

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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
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 Maranoa Regional 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. Actions taken to implement the DWQMP

Operational limits have been set and are monitored by field crews. Verification monitoring is also carried out by our laboratory staff on a routine basis. Results that are out of operational limits are referred to supervisors for corrective action.

Progress in implementing the risk management improvement program

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

Key Improvement items are tagged for capital upgrade consideration each financial year, or applied for when suitable external funding becomes available. Operational improvements are conducted within existing operational budgets based on their priority.

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

The current approved plan is in effect with copies dispatched to all operational staff, and regular discussion with field staff to make them aware of the requirements under the plan.

Amendments made to the DWQMP

This year the amendments proposed to be made to the plan involve updating the organizational structure, updating the infrastructure maps of towns in the region following upgrades in each town and updating the risk management matrix with current processes and procedures. .

3. Compliance with water quality criteria for drinking water

The water quality criteria mean health guideline values in the most current Australian Drinking Water Guidelines, as well as the standards in the Public Health Regulation 2005.

Amby

Parameter	Unit	Limit	No of Samples	No of Non-conforming	Max
E. coli	MPN/100mL	<1	54	0	0
coliforms	MPN/100mL	N/A	54	N/A	
pH	pH	6.5 – 8.5	50		8.75
Chlorine (Free)	mg/L	< 5.0	13	0	2.1
Chlorine (Total)	mg/L	< 5.0	13	0	2.30

Injune

Parameter	Unit	Limit	No of Samples	No of Non-conforming	Max
E. coli	MPN/100mL	<1	95	0	0
coliforms	MPN/100mL	N/A	95	N/A	
pH	pH	6.5 – 8.5	95		8.7
Chlorine (Free)	mg/L	< 5.0	71	0	0.91
Chlorine (Total)	mg/L	< 5.0	71	0	0.97

Jackson

Parameter	Unit	Limit	No of Samples	No of Non-conforming	Max
E. coli	MPN/100mL	<1	26	0	0
coliforms	MPN/100mL	N/A	26	N/A	
pH	pH	6.5 – 8.5	26		8.7
Chlorine (Free)	mg/L	< 5.0	25	0	0.42
Chlorine (Total)	mg/L	< 5.0	25	0	0.52

Mitchell

Parameter	Unit	Limit	No of Samples	No of Non-conforming	Max
E. coli	MPN/100mL	<1	123	0	0
coliforms	MPN/100mL	N/A	123	N/A	
pH	pH	6.5 – 8.5	105		9.29
Chlorine (Free)	mg/L	< 5.0	16	0	3.7
Chlorine (Total)	mg/L	< 5.0	16	0	4.6

Muckadilla

Parameter	Unit	Limit	No of Samples	No of Non-conforming	Max
E. coli	MPN/100mL	<1	48	0	0
coliforms	MPN/100mL	N/A	48	N/A	
pH	pH	6.5 – 8.5	26		9.0
Chlorine (Free)	mg/L	< 5.0	26	0	1.46
Chlorine (Total)	mg/L	< 5.0	26	0	1.72

Mungallala

Parameter	Unit	Limit	No of Samples	No of Non-conforming	Max
E. coli	MPN/100mL	<1	36	0	0
coliforms	MPN/100mL	N/A	36	N/A	
pH	pH	6.5 – 8.5	33		8.10
Chlorine (Free)	mg/L	< 5.0	13	0	2.1
Chlorine (Total)	mg/L	< 5.0	13	0	2.3

Roma

Parameter	Unit	Limit	No of Samples	No of Non-conforming	Max
E. coli	MPN/100mL	<1	894	0	0
coliforms	MPN/100mL	N/A	894	N/A	
pH	pH	6.5 – 8.5	610		9.1
Chlorine (Free)	mg/L	< 5.0	626	0	2.13
Chlorine (Total)	mg/L	< 5.0	626	0	3.3

Surat

Parameter	Unit	Limit	No of Samples	No of Non-conforming	Max
E. coli	MPN/100mL	<1	133	0	0
coliforms	MPN/100mL	N/A	133	N/A	
pH	pH	6.5 – 8.5	127		7.77
Chlorine (Free)	mg/L	< 5.0	121	0	3.0
Chlorine (Total)	mg/L	< 5.0	121	0	3.8

Wallumbilla

Parameter	Unit	Limit	No of Samples	No of Non-conforming	Max
E. coli	MPN/100mL	<1	52	0	0
coliforms	MPN/100mL	N/A	52	N/A	
pH	pH	6.5 – 8.5	52		8.2
Chlorine (Free)	mg/L	< 5.0	50	0	1.7
Chlorine (Total)	mg/L	< 5.0	50	0	2.0

Yuleba

Parameter	Unit	Limit	No of Samples	No of Non-conforming	Max
E. coli	MPN/100mL	<1	49	0	0
coliforms	MPN/100mL	N/A	49	N/A	
pH	pH	6.5 – 8.5	49		8.9
Chlorine (Free)	mg/L	< 5.0	44	0	0.76
Chlorine (Total)	mg/L	< 5.0	44	0	1.99

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

This financial year there were no instances where the Regulator was notified under sections 102 or 102A of the Act.

5. Customer complaints related to water quality

Maranoa Regional 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 1,000 customers)

# Complaints (# per 1,000 customers)	Suspected Illness	Discoloured water	Taste and odour	Total
Amby	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Injune	0 (0.0)	1 (3.1)	0 (0.0)	0 (0.0)
Jackson	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mitchell	0 (0.0)	1 (1.1)	1 (1.1)	0 (0.0)
Muckadilla	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mungallala	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Roma	0 (0.0)	2 (0.55)	2 (0.55)	4 (1.16)
Surat	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Wallumbilla	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Yuleba	0 (0.0)	0 (0.0)	0	0 (0.0)
Total	0 (0.0)	4 (0.8)	3 (0.6)	7 (1.4)

Suspected Illness

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

During 2018/19, there were no confirmed cases of illness arising from the water supply system. With the reports that were received being for skin irritation attributed to chlorine disinfection in the towns. Chlorine levels were tested and found to be within acceptable limits and could not be adjusted lower without compromising chlorine residual in further segments of the network.

Discoloured water

In 2018/19, 4 customer complaints were received from within the towns of Injune, Mitchell and Roma. As per standard procedure the areas were flushed to remove the dirty water and to achieve detectable chlorine residuals.

Taste and odour

The taste and odour complaints received are typically related to the smell of sulphur in the water supply bores. Once reported by customers or detected by our employees, Maranoa Regional Council investigates the issue to devise a prompt resolution, which may include flushing the reticulation. Investigation of each complaint found no public health risks, for either microbiological or chemical parameters. These odour complaints reoccur annually and coincide with hotter water being drawn up by the bores due to higher demand during summer.

6. Findings and recommendations of the DWQMP auditor

The next DWQMP audit is due before 25 June 2020. Currently working with the Qldwater - DASBAC group to align audit dates for Maranoa and neighbouring Council's.

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

A review of the DWQMP was conducted following the external audit by Viridis Consultants. 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:

- Graham Sweetlove (Manager – WS&G)
- Michael Seville (Team Coordinator – WS&G)

The review made the following findings:

- Update staff structure
- Update scheme details and diagrams, due to projects being completed
- Incorporate the recommendations of the Auditor's report
- Update the RMIP completed items, and add newly identified items.
- Updated contact listing (staff, external, regulatory and suppliers)
- Updated records management to reflect changes to systems utilised
- Refresher training of field staff and their knowledge of the DWQMP
- Amendments to the Plan are currently under assessment by the Regulator, subject to an information requirement notice.

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.

Table 2 - Verification monitoring results

Scheme name	Scheme component	Parameter	Frequency of sampling	Total No. samples collected	Laboratory name
Amby	Bore	Standard Chemical & Heavy Metals	Annual	1	QHFSS
Injune	Bores	Standard Chemical & Heavy Metals	Annual	3	QHFSS
Jackson	Bore	Standard Chemical & Heavy Metals	Annual	1	QHFSS
Mitchell	Bores	Standard Chemical & Heavy Metals	Annual	2	QHFSS
Muckadilla	Bore	Standard Chemical & Heavy Metals	Annual	1	QHFSS
Mungallala	Bore	Standard Chemical & Heavy Metals	Annual	1	QHFSS
Roma	Bores	Standard Chemical & Heavy Metals	Annual	10	QHFSS
Surat	River	Standard Chemical, Heavy Metals, THMs and Pesticides	Annual	1	QHFSS
Wallumbilla	Bore	Standard Chemical & Heavy Metals	Annual	2	QHFSS
Yuleba	Bore	Standard Chemical & Heavy Metals	Annual	1	QHFSS

Heavy Metals Analysis

		Aluminium	Arsenic	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Nickel	Zinc
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Limit of Reporting		0.003	0.0001	0.0001	0.0001	0.001	0.005	0.0001	0.0001	0.0001	0.001
Health Limit		N/A	0.01	0.002	0.05	2	N/A	0.01	0.5	0.02	N/A
Aesthetic Limit		0.2	N/A	N/A	N/A	1	0.3	N/A	0.1	N/A	3
Amby	Bore 1	0.004	<0.0001	<0.0001	<0.0001	0.004	0.19	<0.0001	0.026	<0.0001	0.001
Injune	Bore 2	0.007	<0.0001	<0.0001	<0.0001	0.002	0.12	0.0008	0.0058	0.0002	0.004
	Bore 3	0.004	<0.0001	<0.0001	<0.0001	0.001	0.086	<0.0001	0.008	<0.0001	0.006
	Bore 4	0.015	0.0004	<0.0001	0.0002	<0.001	0.85	<0.0001	0.022	0.0003	0.002
Jackson	Bore 1	0.004	<0.0001	<0.0001	<0.0001	0.004	0.15	0.0002	0.0082	<0.0001	0.003
Mitchell	Bore 1	0.034	0.0014	<0.0001	<0.0001	0.003	<0.005	<0.0001	0.0024	<0.0001	0.001
	Bore 2	0.033	0.0011	<0.0001	<0.0001	0.002	<0.005	<0.0001	0.0026	<0.0001	0.002
Muckadilla	Bore 1	0.017	<0.0001	<0.0001	<0.0001	0.002	0.015	<0.0001	0.0072	<0.0001	<0.001
Mungallala	Bore 1	<0.003	<0.0001	<0.0001	<0.0001	0.001	0.63	<0.0001	0.069	0.0003	0.002
Roma	Bore 2	0.011	<0.0001	<0.0001	<0.0001	0.002	<0.005	0.0004	0.0045	<0.0001	<0.001
	Bore 9	0.009	0.0002	<0.0001	<0.0001	0.004	0.013	<0.0001	0.006	<0.0002	0.002
	Bore 11	0.016	0.0002	<0.0002	0.0007	0.004	0.14	0.0002	0.0067	0.0006	0.002
	Bore 13	0.008	<0.0001	<0.0001	<0.0001	0.002	0.008	<0.0001	0.007	<0.0001	<0.001
	Bore 14	0.009	<0.0001	<0.0001	<0.0001	0.003	0.062	<0.0001	0.0085	<0.0001	0.003
	Bore 15	0.01	<0.0001	<0.0001	<0.0001	0.005	0.01	0.0005	0.0067	0.0006	0.002
	Bore 16	0.01	0.0003	<0.0001	<0.0001	0.002	0.006	<0.0001	0.0055	<0.0001	0.006
	Bore 17	0.011	0.0002	<0.0001	<0.0001	0.004	0.005	0.0002	0.0067	<0.0001	0.001
	Bore 18	0.01	0.0002	<0.0001	<0.0001	0.003	0.013	0.0002	0.008	<0.0001	0.001
	Bore 19	0.009	<0.0001	<0.0001	<0.0001	0.002	<0.005	0.0002	0.0079	<0.0001	<0.001
Surat	Treated	0.013	0.0009	<0.0001	<0.0001	0.002	<0.005	<0.0001	0.0008	0.0019	0.007
Wallumbilla	Bore 1	0.005	<0.0001	<0.0001	<0.0001	0.014	0.012	0.0003	0.0062	<0.0001	0.002
	Bore 3	0.003	0.0006	<0.0001	0.0003	0.005	1.8	<0.0001	0.029	0.0002	0.001
Yuleba	Bore 1	0.008	0.0002	<0.0001	<0.0001	0.002	0.032	0.0005	0.0034	<0.0001	0.003

Standard Chemical Analysis – Amby Bore 1

Client Reference				AMB_1
Sample Type				Water Bore Untreated
Sampling Time/Date				08:00 02-Apr-2019
Sample Description				Amby Bore
Method	Metals by ICP-MS	Units	Reporting Limit	19NA2762
27441	Aluminium	mg/L	0.003	0.004
27441	Arsenic	mg/L	0.0001	< 0.0001
27441	Cadmium	mg/L	0.0001	< 0.0001
27441	Chromium	mg/L	0.0001	< 0.0001
27441	Copper	mg/L	0.001	0.004
27441	Iron	mg/L	0.005	0.19
27441	Lead	mg/L	0.0001	< 0.0001
27441	Manganese	mg/L	0.0001	0.026
27441	Nickel	mg/L	0.0001	< 0.0001
27441	Zinc	mg/L	0.001	0.001

CERTIFICATE OF ANALYSIS

CLIENT : Maranoa Regional Council
 (HMARAN) PO Box 42
 MITCHELL QLD 4465

Laboratory Reference : SSP0064257
Client Order No. : 2652
Date Received : 22-Mar-2019
Laboratory Number : 19NA2386
Batch No : 231-04

ATTN: C Avancena

Client Reference : INJ_1
Date Sampled : 20-Mar-2019
Sample Source : Bore
Sample Point : Injune Bore 2
Further Information :

Submitting Authority : Maranoa Regional Council
Reason for Analysis : Compliance
Water Treatment : Untreated

Method	Units	Result	Guidelines **		Method	Units	Result	Guidelines **	
			Health	Aesthetic				Health	Aesthetic
18320	Conductivity @ 25°C	µs/cm	339		18195	Sodium	mg/L	81	180
18226	pH	at 22°C	8.07	6.5 - 8.5	18195	Potassium	mg/L	0.9	
18209	Total Hardness*	mg CaCO ₃ /L	6.1	200	18195	Calcium	mg/L	2.4	
18209	Temporary Hardness*	mg CaCO ₃ /L	6.1		18195	Magnesium	mg/L	< 0.1	
18208	Alkalinity	mg CaCO ₃ /L	154		18209	Hydrogen*	mg/L	0.0	
18209	Residual Alkalinity*	meq/L	3.0		ANIONS				
18195	Silica	mg/L	15	80	18209	Bicarbonate*	mg/L	185	
18209	Total Dissolved Ions*	mg/L	293		18209	Carbonate*	mg/L	1.2	
18209	Total Dissolved Solids*	mg/L	214	600	18209	Hydroxide*	mg/L	0.0	
18206	True Colour	Hazen	3	15	18204	Chloride	mg/L	15	250
18212	Turbidity	NTU	<1	5	18204	Fluoride	mg/L	0.10	1.5
18209	pH Sat.* (calc. for CaCO ₃)		8.9		18204	Nitrate	mg/L	<0.5	50
18209	Saturation Index*		-0.8		18204	Sulphate	mg/L	6	500 250
18209	Mole Ratio*		1.4		OTHER DISSOLVED ELEMENTS				
18209	Sodium Absorpt. Ratio*		14		18195	Iron	mg/L	0.10	0.3
18209	Figure of Merit Ratio*		0.0		18195	Manganese	mg/L	<0.01	0.5 0.1
					18195	Zinc	mg/L	<0.01	3
					18195	Aluminium	mg/L	<0.05	0.2
					18195	Boron	mg/L	<0.02	4
					18195	Copper	mg/L	<0.03	2 1

Notes: * parameter is derived from calculation.
 ** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
 † not determined

Lab use Only: TE 648.00 TC 3.67 TA 3.65 Imb 0.02 A IC 0.59

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
 The water complies with Australian Drinking Water Guidelines 2011 for the parameters tested.



19NA2386

This report overrides all previous reports. The results relate solely to the samples as received and are limited to the specific tests undertaken as listed on the report. The results on this report are confidential and are not to be used or disclosed to any other person or used for any other purpose, whether directly or indirectly, unless that use is disclosed or the purpose is expressly authorised in writing by Queensland Health and the named recipient on this report. To the fullest extent permitted by law, Queensland Health will not be liable for any loss or claim (including legal costs calculated on an indemnity basis) which arise because of (a) problems related to the merchantability, fitness or quality of the samples, or (b) any negligent or unlawful act or omissions by Queensland Health that is connected with any activities or services provided by Queensland Health under this agreement (including the timing and/or method under which the samples were taken, stored or transported).

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Nigel Goldthorpe
 Senior Laboratory Technician, Inorganic Chemistry
 12-Apr-2019

CERTIFICATE OF ANALYSIS

CLIENT : Maranoa Regional Council
(HMARAN) PO Box 42
MITCHELL QLD 4465

Laboratory Reference : SSP0064257
Client Order No. : 2652
Date Received : 22-Mar-2019
Laboratory Number : 19NA2387
Batch No : 231-05

ATTN: C Avancena

Client Reference : INJ_2
Date Sampled : 20-Mar-2019
Sample Source : Bore
Sample Point : Injune Bore 3
Further Information :

Submitting Authority : Maranoa Regional Council
Reason for Analysis : Compliance
Water Treatment : Untreated

Method	Units	Result	Guidelines **		Method	Units	Result	Guidelines **	
			Health	Aesthetic				Health	Aesthetic
18320	Conductivity @ 25°C	µs/cm	399		CATIONS				
18226	pH	at 22°C	8.22	6.5 - 8.5	18195	Sodium	mg/L	92	180
18209	Total Hardness*	mg CaCO ₃ /L	8.3	200	18195	Potassium	mg/L	1.0	
18209	Temporary Hardness*	mg CaCO ₃ /L	8.3		18195	Calcium	mg/L	3.3	
18208	Alkalinity	mg CaCO ₃ /L	161		18195	Magnesium	mg/L	< 0.1	
18209	Residual Alkalinity*	meq/L	3.0		18209	Hydrogen*	mg/L	0.0	
18195	Silica	mg/L	16	80	ANIONS				
18209	Total Dissolved Ions*	mg/L	325		18209	Bicarbonate*	mg/L	192	
18209	Total Dissolved Solids*	mg/L	242	600	18209	Carbonate*	mg/L	1.8	
18206	True Colour	Hazen	4	15	18209	Hydroxide*	mg/L	0.0	
18212	Turbidity	NTU	<1	5	18204	Chloride	mg/L	27	250
18209	pH Sat.* (calc. for CaCO ₃)		8.7		18204	Fluoride	mg/L	0.11	1.5
18209	Saturation Index*		-0.5		18204	Nitrate	mg/L	<0.5	50
18209	Mole Ratio*		1.4		18204	Sulphate	mg/L	8	500 250
18209	Sodium Absorpt. Ratio*		14		OTHER DISSOLVED ELEMENTS				
18209	Figure of Merit Ratio*		0.0		18195	Iron	mg/L	0.07	0.3
					18195	Manganese	mg/L	<0.01	0.5 0.1
					18195	Zinc	mg/L	<0.01	3
					18195	Aluminium	mg/L	<0.05	0.2
					18195	Boron	mg/L	<0.02	4
					18195	Copper	mg/L	<0.03	2 1

Notes: * parameter is derived from calculation.
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
^ not determined

Lab use Only: TE 741.00 TC 4.17 TA 4.13 Imb 0.04 A I/C 0.57

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report. The water complies with Australian Drinking Water Guidelines 2011 for the parameters tested.



19NA2387

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Nigel Goldthorpe
Senior Laboratory Technician, Inorganic Chemistry
12-Apr-2019

CERTIFICATE OF ANALYSIS

CLIENT : Maranoa Regional Council
 (HMARAN) PO Box 42
 MITCHELL QLD 4465

Laboratory Reference : SSP0065768
 Client Order No. : 2652
 Date Received : 28-Jun-2019
 Laboratory Number : 19NA5634
 Batch No : 264-01

ATTN: Carolina Avancena

Client Reference : INJ_6
 Date Sampled : 26-Jun-2019
 Sample Source : Bore
 Sample Point : Injune New Bore
 Further Information :

Submitting Authority : Maranoa Regional Council
 Reason for Analysis : Compliance
 Water Treatment : Untreated

Method	Units	Result	Guidelines **	Method	Units	Result	Guidelines **
			Health Aesthetic				Health Aesthetic
18320	Conductivity @ 25°C	µs/cm	341	18195	CATIONS		
18226	pH	at 22°C	8.94	18195	Sodium	mg/L	80
18209	Total Hardness*	mg CaCO ₃ /L	7.3	18195	Potassium	mg/L	1.0
18209	Temporary Hardness*	mg CaCO ₃ /L	7.3	18195	Calcium	mg/L	2.3
18208	Alkalinity	mg CaCO ₃ /L	158	18195	Magnesium	mg/L	0.4
18209	Residual Alkalinity*	meq/L	3.0	18209	Hydrogen*	mg/L	0.0
18195	Silica	mg/L	2		ANIONS		
18209	Total Dissolved Ions*	mg/L	284	18209	Bicarbonate*	mg/L	175
18209	Total Dissolved Solids*	mg/L	196	18209	Carbonate*	mg/L	8.4
				18209	Hydroxide*	mg/L	0.1
18206	True Colour	Hazen	1	18204	Chloride	mg/L	16
18212	Turbidity	NTU	3	18204	Fluoride	mg/L	0.12
				18204	Nitrate	mg/L	<0.5
18209	pH Sat.* (calc. for CaCO ₃)		8.9	18204	Sulphate	mg/L	< 1
18209	Saturation Index*		0.1		OTHER DISSOLVED ELEMENTS		
18209	Mole Ratio*		0.5	18195	Iron	mg/L	<0.01
18209	Sodium Absorpt. Ratio*		13	18195	Manganese	mg/L	<0.01
18209	Figure of Merit Ratio*		0.0	18195	Zinc	mg/L	<0.01
				18195	Aluminium	mg/L	<0.05
				18195	Boron	mg/L	<0.02
				18195	Copper	mg/L	<0.03

Notes: * parameter is derived from calculation.
 ** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
 ** not determined

Lab use Only: TE 636.00 TC 3.63 TA 3.63 Irb 0.00 A IC 0.57

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
 The water does not comply with the Australian Drinking Water Guidelines 2011 for pH.



19NA5634

Matthew Cross
 Matthew Cross
 Laboratory Technician, Inorganic Chemistry
 16-Jul-2019

This report overrides all previous reports. The results relate solely to the samples as received and are limited to the specific tests undertaken as listed on the report. The results on this report are confidential and are not to be used or disclosed to any other person or used for any other purpose, whether directly or indirectly, unless that use is disclosed or the purpose is expressly authorized in writing by Queensland Health and the named recipient on this report. To the fullest extent permitted by law, Queensland Health will not be liable for any loss or claim (including legal costs calculated on an indemnity basis) which arise because of (a) problems related to the merchantability, fitness or quality of the samples, or (b) any negligent or unlawful act or omissions by Queensland Health that is connected with any activities or services provided by Queensland Health under this agreement (including the timing and/or method under which the samples were taken, stored or transported).

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CERTIFICATE OF ANALYSIS

CLIENT : Maranoa Regional Council
(HMARAN) PO Box 42
MITCHELL QLD 4465

Laboratory Reference : SSP0064151
Client Order No. : 2652
Date Received : 15-Mar-2019
Laboratory Number : 19NA2121
Batch No : 227-03

ATTN: C Avancena

Client Reference : JAC-1	Submitting Authority : Maranoa Regional Council
Date Sampled : 13-Mar-2019	Reason for Analysis : Compliance
Sample Source : Bore	Water Treatment : Untreated
Sample Point : Jackson Bore	
Further Information :	

Method	Units	Result	Guidelines **		Method	Units	Result	Guidelines **	
			Health	Aesthetic				Health	Aesthetic
18320	Conductivity @ 25°C	µs/cm	1720		18195	Sodium	mg/L	410	180
18226	pH	at 21°C	8.54	6.5 - 8.5	18195	Potassium	mg/L	1.2	
18209	Total Hardness*	mg CaCO ₃ /L	5.1	200	18195	Calcium	mg/L	1.8	
18209	Temporary Hardness*	mg CaCO ₃ /L	5.1		18195	Magnesium	mg/L	0.2	
18208	Alkalinity	mg CaCO ₃ /L	588		18209	Hydrogen*	mg/L	0.0	
18209	Residual Alkalinity*	meq/L	12						
18195	Silica	mg/L	15	80					
18209	Total Dissolved Ions*	mg/L	1330						
18209	Total Dissolved Solids*	mg/L	1000	600					
18206	True Colour	Hazen	4	15					
18212	Turbidity	NTU	<1	5					
18209	pH Sat.* (calc. for CaCO ₃)		8.5						
18209	Saturation Index*		0.1						
18209	Mole Ratio*		1.3						
18209	Sodium Absorpt. Ratio*		78						
18209	Figure of Merit Ratio*		0.0						
ANIONS					18209	Bicarbonate*	mg/L	684	
CATIONS					18209	Carbonate*	mg/L	17	
ANIONS					18209	Hydroxide*	mg/L	0.1	
ANIONS					18204	Chloride	mg/L	220	250
ANIONS					18204	Fluoride	mg/L	0.77	1.5
ANIONS					18204	Nitrate	mg/L	<0.5	50
ANIONS					18204	Sulphate	mg/L	<1	500 250
OTHER DISSOLVED ELEMENTS					18195	Iron	mg/L	0.14	0.3
OTHER DISSOLVED ELEMENTS					18195	Manganese	mg/L	<0.01	0.5 0.1
OTHER DISSOLVED ELEMENTS					18195	Zinc	mg/L	<0.01	3
OTHER DISSOLVED ELEMENTS					18195	Aluminium	mg/L	<0.05	0.2
OTHER DISSOLVED ELEMENTS					18195	Boron	mg/L	1.2	4
OTHER DISSOLVED ELEMENTS					18195	Copper	mg/L	<0.03	2 1

Notes: * parameter is derived from calculation.
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
^ not determined

Lab use Only: TE 2989.00 TC 17.70 TA 18.05 Imb 0.26 A IC 0.57

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
The water does not comply with the Australian Drinking Water Guidelines 2011 for Sodium, Total Dissolved Solids and pH.



19NA2121

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Nigel Goldthorpe
Senior Laboratory Technician, Inorganic Chemistry
02-Apr-2019

Standard Chemical Analysis – Mitchell Bore 1, Bore 2 & Mungallala Bore 1

Client Reference				MIT_1	MIT_2	MIT_3	MUN_1
Sample Type				Water Bore Untreated	Water Bore Untreated	Water Reticulated Chlorinated	Water Bore Untreated
Sampling Time/Date				11:25 28-Mar-2019	11:15 28-Mar-2019	11:20 28-Mar-2019	08:20 02-Apr-2019
Sample Description				Tower Bore, Mitchell	Standpipe Bore, Mitchell	Standpipe Mitchell	Bore, Mungallala
Method	Metals by ICP-MS	Units	Reporting Limit	19NA2758	19NA2759	19NA2760	19NA2761
27441	Aluminium	mg/L	0.003	0.033	0.034	0.039	< 0.003
27441	Arsenic	mg/L	0.0001	0.0011	0.0014	0.0014	< 0.0001
27441	Cadmium	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
27441	Chromium	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
27441	Copper	mg/L	0.001	0.002	0.003	0.001	0.001
27441	Iron	mg/L	0.005	< 0.005	< 0.005	< 0.005	0.63
27441	Lead	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
27441	Manganese	mg/L	0.0001	0.0026	0.0024	0.0024	0.069
27441	Nickel	mg/L	0.0001	< 0.0001	< 0.0001	< 0.0001	0.0003
27441	Zinc	mg/L	0.001	0.002	0.001	< 0.001	0.002

CERTIFICATE OF ANALYSIS

CLIENT : Maranoa Regional Council
 (HMARAN) PO Box 42
 MITCHELL QLD 4465

Laboratory Reference : SSP0064151
 Client Order No. : 2652
 Date Received : 15-Mar-2019
 Laboratory Number : 19NA2126
 Batch No : 227-08

ATTN: C Avancena

Client Reference : MUC-1
 Date Sampled : 06-Mar-2019
 Sample Source : Bore
 Sample Point : Muckadilla Bore
 Further Information :

Submitting Authority : Maranoa Regional Council
 Reason for Analysis : Compliance
 Water Treatment : Untreated

Method	Units	Result	Guidelines **	Method	Units	Result	Guidelines **
18320	Conductivity @ 25°C	µs/cm	701	18195	CATIONS		
18226	pH	at 21°C	8.87	18195	Sodium	mg/L	170
18209	Total Hardness*	mg CaCO ₃ /L	3.0	18195	Potassium	mg/L	0.8
18209	Temporary Hardness*	mg CaCO ₃ /L	3.0	18195	Calcium	mg/L	1.2
18208	Alkalinity	mg CaCO ₃ /L	282	18195	Magnesium	mg/L	<0.1
18209	Residual Alkalinity*	meq/L	5.6	18209	Hydrogen*	mg/L	0.0
18195	Silica	mg/L	22		ANIONS		
18209	Total Dissolved Ions*	mg/L	557	18209	Bicarbonate*	mg/L	310
18209	Total Dissolved Solids*	mg/L	422	18209	Carbonate*	mg/L	16
18206	True Colour	Hazen	1	18209	Hydroxide*	mg/L	0.1
18212	Turbidity	NTU	<1	18204	Chloride	mg/L	43
18209	pH Sat.* (calc. for CaCO ₃)		9.0	18204	Fluoride	mg/L	0.14
18209	Saturation Index*		-0.1	18204	Nitrate	mg/L	<0.5
18209	Mole Ratio*		0.6	18204	Sulphate	mg/L	20
18209	Sodium Absorpt. Ratio*		42		OTHER DISSOLVED ELEMENTS		
18209	Figure of Merit Ratio*		0.0	18195	Iron	mg/L	0.01
Notes:	* parameter is derived from calculation.			18195	Manganese	mg/L	<0.01
	** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values			18195	Zinc	mg/L	<0.01
	∇ not determined			18195	Aluminium	mg/L	<0.05
Lab use Only:	TE 1267.00	TC 7.30	TA 7.28	18195	Boron	mg/L	0.06
			limb 0.04 A	18195	Copper	mg/L	<0.03
			LC 0.57				

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
 The water does not comply with the Australian Drinking Water Guidelines 2011 for pH.



19NA2126

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Nigel Goldthorpe
 Senior Laboratory Technician, Inorganic Chemistry
 02-Apr-2019

Standard Chemical Analysis – Roma Bore 2



CERTIFICATE OF ANALYSIS

CLIENT : Maranoa Regional Council
(HMARAN) PO Box 42
MITCHELL QLD 4465

Laboratory Reference : SSP0064151
Client Order No. : 2652
Date Received : 15-Mar-2019
Laboratory Number : 19NA2128
Batch No : 227-10

ATTN: C Avancena

Client Reference : ROM-1
Date Sampled : 13-Mar-2019
Sample Source : Bore
Sample Point : Roma Bore 2
Further Information: :
Submitting Authority : Maranoa Regional Council
Reason for Analysis : Compliance
Water Treatment : Untreated

Method	Units	Result	Guidelines ** Health Aesthetic	Method	Units	Result	Guidelines ** Health Aesthetic
18320	Conductivity @ 25°C	µs/cm	884	18195	Sodium	mg/L	210
18226	pH	at 21°C	8.90	18195	Potassium	mg/L	0.8
18209	Total Hardness*	mg CaCO ₃ /L	3.0	18195	Calcium	mg/L	1.2
18209	Temporary Hardness*	mg CaCO ₃ /L	3.0	18195	Magnesium	mg/L	<0.1
18208	Alkalinity	mg CaCO ₃ /L	332	18209	Hydrogen*	mg/L	0.0
18209	Residual Alkalinity*	meq/L	6.6				
18195	Silica	mg/L	19				
18209	Total Dissolved Ions*	mg/L	691				
18209	Total Dissolved Solids*	mg/L	523				
18206	True Colour	Hazen	1				
18212	Turbidity	NTU	<1				
18209	pH Sat.* (calc. for CaCO ₃)		8.9				
18209	Saturation Index*		0.0				
18209	Mole Ratio*		0.8				
18209	Sodium Absorpt. Ratio*		52				
18209	Figure of Merit Ratio*		0.0				
Notes: * parameter is derived from calculation. ** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values † not determined				CATIONS 18195 Sodium mg/L 210 180 18195 Potassium mg/L 0.8 18195 Calcium mg/L 1.2 18195 Magnesium mg/L <0.1 18209 Hydrogen* mg/L 0.0 ANIONS 18209 Bicarbonate* mg/L 367 18209 Carbonate* mg/L 18 18209 Hydroxide* mg/L 0.1 18204 Chloride mg/L 63 250 18204 Fluoride mg/L 0.17 1.5 18204 Nitrate mg/L <0.5 50 18204 Sulphate mg/L 32 500 250 OTHER DISSOLVED ELEMENTS 18195 Iron mg/L <0.01 0.3 18195 Manganese mg/L <0.01 0.5 0.1 18195 Zinc mg/L <0.01 3 18195 Aluminium mg/L <0.05 0.2 18195 Boron mg/L 0.08 4 18195 Copper mg/L <0.03 2 1			
Lab use Only: TE 1571.00 TC 9.13 TA 9.08 Inb 0.04 A UC 0.67 Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report. The water does not comply with the Australian Drinking Water Guidelines 2011 for Sodium and pH.							



19NA2128

N. Goldthorpe

Nigel Goldthorpe
Senior Laboratory Technician, Inorganic Chemistry
02-Apr-2019

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CERTIFICATE OF ANALYSIS

CLIENT : Maranoa Regional Council
 (HMARAN) PO Box 42
 MITCHELL QLD 4465

Laboratory Reference : SSP0064151
 Client Order No. : 2652
 Date Received : 15-Mar-2019
 Laboratory Number : 19NA2129
 Batch No : 227-11

ATTN: C Avancena

Client Reference : ROM-2
 Date Sampled : 13-Mar-2019
 Sample Source : Bore
 Sample Point : Roma Bore 9
 Further Information: :

Submitting Authority : Maranoa Regional Council
 Reason for Analysis : Compliance
 Water Treatment : Untreated

Method	Units	Result	Guidelines **	Method	Units	Result	Guidelines **
			Health Aesthetic				Health Aesthetic
18320	Conductivity @ 25°C	µs/cm	1090	CATIONS			
18226	pH	at 21°C	8.45	18195	Sodium	mg/L	250
18209	Total Hardness*	mg CaCO ₃ /L	5.0	18195	Potassium	mg/L	0.9
18209	Temporary Hardness*	mg CaCO ₃ /L	5.0	18195	Calcium	mg/L	1.7
18208	Alkalinity	mg CaCO ₃ /L	307	18195	Magnesium	mg/L	0.2
18209	Residual Alkalinity*	meq/L	6.0	18209	Hydrogen*	mg/L	0.0
18195	Silica	mg/L	19	ANIONS			
18209	Total Dissolved Ions*	mg/L	805	18209	Bicarbonate*	mg/L	362
18209	Total Dissolved Solids*	mg/L	640	18209	Carbonate*	mg/L	6.5
18206	True Colour	Hazen	1	18209	Hydroxide*	mg/L	0.0
18212	Turbidity	NTU	<1	18204	Chloride	mg/L	120
18209	pH Sat.* (calc. for CaCO ₃)		8.8	18204	Fluoride	mg/L	0.21
18209	Saturation Index*		-0.3	18204	Nitrate	mg/L	<0.5
18209	Mole Ratio*		1.5	18204	Sulphate	mg/L	69
18209	Sodium Absorpt. Ratio*		48	OTHER DISSOLVED ELEMENTS			
18209	Figure of Merit Ratio*		0.0	18195	Iron	mg/L	<0.01
Notes: * parameter is derived from calculation.				18195	Manganese	mg/L	<0.01
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values				18195	Zinc	mg/L	<0.01
✓ not determined				18195	Aluminium	mg/L	<0.05
Lab use Only: TE 1887.50 TC 10.95 TA 10.86 Imb 0.10 A UC 0.57				18195	Boron	mg/L	0.17
Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.				18195	Copper	mg/L	<0.03
The water does not comply with the Australian Drinking Water Guidelines 2011 for Sodium and Total Dissolved Solids.							



19NA2129

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CERTIFICATE OF ANALYSIS

CLIENT : Maranoa Regional Council
 (HMARAN) PO Box 42
 MITCHELL QLD 4465

Laboratory Reference : SSP0064151
Client Order No. : 2652
Date Received : 15-Mar-2019
Laboratory Number : 19NA2130
Batch No : 227-12

ATTN: C Avancena

Client Reference : ROM-3
Date Sampled : 13-Mar-2019
Sample Source : Bore
Sample Point : Roma Bore 11
Further Information :

Submitting Authority : Maranoa Regional Council
Reason for Analysis : Compliance
Water Treatment : Untreated

Method	Units	Result	Guidelines **		Method	Units	Result	Guidelines **	
			Health	Aesthetic				Health	Aesthetic
18320	Conductivity @ 25°C	µs/cm	1180		18195	CATIONS			
18226	pH	at 21°C	8.84	6.5 - 8.5	18195	Sodium	mg/L	270	180
18209	Total Hardness*	mg CaCO ₃ /L	4.4	200	18195	Potassium	mg/L	1.0	
18209	Temporary Hardness*	mg CaCO ₃ /L	4.4		18195	Calcium	mg/L	1.7	
18208	Alkalinity	mg CaCO ₃ /L	372		18195	Magnesium	mg/L	< 0.1	
18209	Residual Alkalinity*	meq/L	7.3		18209	Hydrogen*	mg/L	0.0	
18195	Silica	mg/L	19	80		ANIONS			
18209	Total Dissolved Ions*	mg/L	880		18209	Bicarbonate*	mg/L	414	
18209	Total Dissolved Solids*	mg/L	688	600	18209	Carbonate*	mg/L	19	
					18209	Hydroxide*	mg/L	0.1	
18206	True Colour	Hazen	4	15	18204	Chloride	mg/L	110	250
18212	Turbidity	NTU	<1	5	18204	Fluoride	mg/L	0.26	1.5
					18204	Nitrate	mg/L	<0.5	50
18209	pH Sat.* (calc. for CaCO ₃)		8.7		18204	Sulphate	mg/L	59	500 250
18209	Saturation Index*		0.1			OTHER DISSOLVED ELEMENTS			
18209	Mole Ratio*		1.0		18195	Iron	mg/L	0.05	0.3
18209	Sodium Absorpt. Ratio*		56		18195	Manganese	mg/L	<0.01	0.5 0.1
18209	Figure of Merit Ratio*		0.0		18195	Zinc	mg/L	<0.01	3
					18195	Aluminium	mg/L	<0.05	0.2
					18195	Boron	mg/L	0.24	4
					18195	Copper	mg/L	<0.03	2 1

Notes: * parameter is derived from calculation.
 ** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
 * not determined

Lab use Only: TE 2055.00 TC 11.94 TA 11.85 Tmb 0.09A SC 0.56

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
 The water does not comply with the Australian Drinking Water Guidelines 2011 for Sodium, Total Dissolved Solids and pH.



19NA2130



Nigel Goldthorpe
 Senior Laboratory Technician, Inorganic Chemistry
 02-Apr-2019

This report overrides all previous reports. The results relate solely to the sample/s as received and are limited to the specific tests undertaken as listed on the report. The results on this report are confidential and are not to be used or disclosed to any other person or used for any other purpose, whether directly or indirectly, unless that use is disclosed or the purpose is expressly authorised in writing by Queensland Health and the named recipient on this report. To the fullest extent permitted by law, Queensland Health will not be liable for any loss or claim (including legal costs calculated on an indemnity basis) which arise because of (a) problems related to the merchantability, fitness or quality of the sample/s, or (b) any negligent or unlawful act or omissions by Queensland Health that is connected with any activities or services provided by Queensland Health under this agreement (including the fixing and/or method under which the sample/s were taken, stored or transported).

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CERTIFICATE OF ANALYSIS

CLIENT : Maranoa Regional Council
 (HMARAN) PO Box 42
 MITCHELL QLD 4465

Laboratory Reference : SSP0064151
 Client Order No. : 2652
 Date Received : 15-Mar-2019
 Laboratory Number : 19NA2131
 Batch No : 227-13

ATTN: C Avancena

Client Reference : ROM-4
 Date Sampled : 13-Mar-2019
 Sample Source : Bore
 Sample Point : Roma Bore 13
 Further Information :

Submitting Authority : Maranoa Regional Council
 Reason for Analysis : Compliance
 Water Treatment : Untreated

Method	Units	Result	Guidelines **		Method	Units	Result	Guidelines **	
			Health	Aesthetic				Health	Aesthetic
18320	Conductivity @ 25°C	µs/cm	954		18195	Sodium	mg/L	220	180
18226	pH	at 21°C	8.88	6.5 - 8.5	18195	Potassium	mg/L	0.8	
18209	Total Hardness*	mg CaCO ₃ /L	3.5	200	18195	Calcium	mg/L	1.4	
18209	Temporary Hardness*	mg CaCO ₃ /L	3.5		18195	Magnesium	mg/L	< 0.1	
18208	Alkalinity	mg CaCO ₃ /L	336		18209	Hydrogen*	mg/L	0.0	
18209	Residual Alkalinity*	meq/L	6.6						
18195	Silica	mg/L	18	80					
18209	Total Dissolved Ions*	mg/L	736						
18209	Total Dissolved Solids*	mg/L	566	600					
18206	True Colour	Hazen	1	15					
18212	Turbidity	NTU	<1	5					
18209	pH Sat.* (calc. for CaCO ₃)		8.8						
18209	Saturation Index*		0.0						
18209	Mole Ratio*		0.8						
18209	Sodium Absorpt. Ratio*		52						
18209	Figure of Merit Ratio*		0.0						
Notes:					CATIONS				
* parameter is derived from calculation.					18209 Bicarbonate* mg/L 371				
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values					18209 Carbonate* mg/L 19				
* not determined					18209 Hydroxide* mg/L 0.1				
Lab use Only: TE 1887.00 TC 9.83 TA 9.81 Imb 0.03 A IC 0.57					18204 Chloride mg/L 78 250				
Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.					18204 Fluoride mg/L 0.20 1.5				
The water does not comply with the Australian Drinking Water Guidelines 2011 for Sodium and pH.					18204 Nitrate mg/L <0.5 50				
					18204 Sulphate mg/L 42 500 250				
					OTHER DISSOLVED ELEMENTS				
					18195 Iron mg/L <0.01 0.3				
					18195 Manganese mg/L <0.01 0.5 0.1				
					18195 Zinc mg/L <0.01 3				
					18195 Aluminium mg/L <0.05 0.2				
					18195 Boron mg/L 0.13 4				
					18195 Copper mg/L <0.03 2 1				



19NA2131

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Nigel Goldthorpe
 Senior Laboratory Technician, Inorganic Chemistry
 02-Apr-2019

CERTIFICATE OF ANALYSIS

CLIENT : Maranoa Regional Council
 (HMARAN) PO Box 42
 MITCHELL QLD 4465

Laboratory Reference : SSP0064151
 Client Order No. : 2652
 Date Received : 15-Mar-2019
 Laboratory Number : 19NA2132
 Batch No : 227-14

ATTN: C Avancena

Client Reference : ROM-5	Submitting Authority : Maranoa Regional Council
Date Sampled : 13-Mar-2019	Reason for Analysis : Compliance
Sample Source : Bore	Water Treatment : Untreated
Sample Point : Roma Bore 14	
Further Information :	

Method	Units	Result	Guidelines **		Method	Units	Result	Guidelines **	
			Health	Aesthetic				Health	Aesthetic
18320	Conductivity @ 25°C	µs/cm	869		18195	CATIONS			
18226	pH	at 21°C	8.06	6.5 - 8.5	18195	Sodium	mg/L	210	180
18209	Total Hardness*	mg CaCO ₃ /L	3.3	200	18195	Potassium	mg/L	0.8	
18209	Temporary Hardness*	mg CaCO ₃ /L	3.3		18195	Calcium	mg/L	1.3	
18208	Alkalinity	mg CaCO ₃ /L	334		18195	Magnesium	mg/L	< 0.1	
18209	Residual Alkalinity*	meq/L	6.6		18209	Hydrogen*	mg/L	0.0	
18195	Silica	mg/L	18	80		ANIONS			
18209	Total Dissolved Ions*	mg/L	689		18209	Bicarbonate*	mg/L	371	
18209	Total Dissolved Solids*	mg/L	518	600	18209	Carbonate*	mg/L	17	
					18209	Hydroxide*	mg/L	0.1	
18206	True Colour	Hazen	1	15	18204	Chloride	mg/L	60	250
18212	Turbidity	NTU	<1	5	18204	Fluoride	mg/L	0.19	1.5
					18204	Nitrate	mg/L	<0.5	50
18209	pH Sat.* (calc. for CaCO ₃)		8.8		18204	Sulphate	mg/L	30	500
18209	Saturation Index*		0.0			OTHER DISSOLVED ELEMENTS			
18209	Mole Ratio*		0.8		18195	Iron	mg/L	<0.01	0.3
18209	Sodium Absorpt. Ratio*		49		18195	Manganese	mg/L	<0.01	0.5
18209	Figure of Merit Ratio*		0.0		18195	Zinc	mg/L	<0.01	3
					18195	Aluminium	mg/L	<0.05	0.2
					18195	Boron	mg/L	0.12	4
					18195	Copper	mg/L	<0.03	2

Notes: * parameter is derived from calculation.
 ** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
 † not determined

Lab use Only: TE 1552.00 TC 9.09 TA 9.01 Irb 0.03 A IC 0.57

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
 The water does not comply with the Australian Drinking Water Guidelines 2011 for Sodium and pH.



19NA2132

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 Nigel Goldthorpe
 Senior Laboratory Technician, Inorganic Chemistry
 02-Apr-2019

CERTIFICATE OF ANALYSIS

CLIENT : Maranoa Regional Council
 (HMARAN) PO Box 42
 MITCHELL QLD 4465

Laboratory Reference : SSP0064151
Client Order No. : 2652
Date Received : 15-Mar-2019
Laboratory Number : 19NA2133
Batch No : 227-15

ATTN: C Avancena

Client Reference : ROM-6 **Submitting Authority :** Maranoa Regional Council
Date Sampled : 13-Mar-2019 **Reason for Analysis :** Compliance
Sample Source : Bore **Water Treatment :** Untreated
Sample Point : Roma Bore 15
Further Information :

Method	Units	Result	Guidelines **	Method	Units	Result	Guidelines **
18320	Conductivity @ 25°C	µs/cm	911	CATIONS			
18226	pH	at 21°C	8.95	18195	Sodium	mg/L	220
18209	Total Hardness*	mg CaCO ₃ /L	3.2	18195	Potassium	mg/L	0.8
18209	Temporary Hardness*	mg CaCO ₃ /L	3.2	18195	Calcium	mg/L	1.2
18208	Alkalinity	mg CaCO ₃ /L	364	18195	Magnesium	mg/L	< 0.1
18209	Residual Alkalinity*	meq/L	7.2	18209	Hydrogen*	mg/L	0.0
18195	Silica	mg/L	19	ANIONS			
18209	Total Dissolved Ions*	mg/L	723	18209	Bicarbonate*	mg/L	398
18209	Total Dissolved Solids*	mg/L	540	18209	Carbonate*	mg/L	23
18206	True Colour	Hazen	1	18209	Hydroxide*	mg/L	0.1
18212	Turbidity	NTU	<1	18204	Chloride	mg/L	63
18209	pH Sat.* (calc. for CaCO ₃)		8.8	18204	Fluoride	mg/L	0.19
18209	Saturation Index*		0.1	18204	Nitrate	mg/L	<0.5
18209	Mole Ratio*		0.7	18204	Sulphate	mg/L	19
18209	Sodium Absorpt. Ratio*		53	OTHER DISSOLVED ELEMENTS			
18209	Figure of Merit Ratio*		0.0	18195	Iron	mg/L	<0.01
Notes: * parameter is derived from calculation.				18195	Manganese	mg/L	<0.01
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values				18195	Zinc	mg/L	<0.01
* not determined				18195	Aluminium	mg/L	<0.05
Lab use Only: TE 1628.00 TC 9.57 TA 9.47 Imb 0.10A IC 0.57				18195	Boron	mg/L	0.13
Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.				18195	Copper	mg/L	<0.03
The water does not comply with the Australian Drinking Water Guidelines 2011 for Sodium and pH.							



19NA2133

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 02-Apr-2019

CERTIFICATE OF ANALYSIS

CLIENT : Maranoa Regional Council
 (HMARAN) PO Box 42
 MITCHELL QLD 4465

Laboratory Reference : SSP0084151
 Client Order No. : 2652
 Date Received : 15-Mar-2019
 Laboratory Number : 19NA2134
 Batch No : 227-16

ATTN: C Avancena

Client Reference : ROM-7
 Date Sampled : 13-Mar-2019
 Sample Source : Bore
 Sample Point : Roma Bore 16
 Further Information :

Submitting Authority : Maranoa Regional Council
 Reason for Analysis : Compliance
 Water Treatment : Untreated

Method	Units	Result	Guidelines **	Method	Units	Result	Guidelines **
			Health Aesthetic				Health Aesthetic
18320	Conductivity @ 25°C	µs/cm	1050	CATIONS			
18226	pH	at 21°C	8.88	18195	Sodium	mg/L	240
18209	Total Hardness*	mg CaCO ₃ /L	4.7	18195	Potassium	mg/L	0.9
18209	Temporary Hardness*	mg CaCO ₃ /L	4.7	18195	Calcium	mg/L	1.8
18208	Alkalinity	mg CaCO ₃ /L	312	18195	Magnesium	mg/L	< 0.1
18209	Residual Alkalinity*	meq/L	6.1	18209	Hydrogen*	mg/L	0.0
18195	Silica	mg/L	19	ANIONS			
18209	Total Dissolved Ions*	mg/L	779	18209	Bicarbonate*	mg/L	346
18209	Total Dissolved Solids*	mg/L	622	18209	Carbonate*	mg/L	17
18206	True Colour	Hazen	1	18209	Hydroxide*	mg/L	0.1
18212	Turbidity	NTU	<1	18204	Chloride	mg/L	99
18209	pH Sat.* (calc. for CaCO ₃)		8.7	18204	Fluoride	mg/L	0.19
18209	Saturation Index*		0.1	18204	Nitrate	mg/L	<0.5
18209	Mole Ratio*		1.0	18204	Sulphate	mg/L	71
18209	Sodium Absorpt. Ratio*		49	OTHER DISSOLVED ELEMENTS			
18209	Figure of Merit Ratio*		0.0	18195	Iron	mg/L	<0.01
Notes: * parameter is derived from calculation.				18195	Manganese	mg/L	<0.01
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values				18195	Zinc	mg/L	<0.01
✓ not determined				18195	Aluminium	mg/L	<0.05
Lab use Only: TE 1031.00 TC 10.09 TA 10.52 Inb 0.17 A UC 0.57				18195	Boron	mg/L	0.16
				18195	Copper	mg/L	<0.03

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
 The water does not comply with the Australian Drinking Water Guidelines 2011 for Sodium, Total Dissolved Solids and pH.



19NA2134



Nigel Goldthorpe
 Senior Laboratory Technician, Inorganic Chemistry
 02-Apr-2019

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CERTIFICATE OF ANALYSIS

CLIENT : Maranoa Regional Council
 (HMARAN) PO Box 42
 MITCHELL QLD 4465

Laboratory Reference : SSP0064151
 Client Order No. : 2652
 Date Received : 15-Mar-2019
 Laboratory Number : 19NA2135
 Batch No : 227-17

ATTN: C Avancena

Client Reference : ROM-8	Submitting Authority : Maranoa Regional Council
Date Sampled : 13-Mar-2019	Reason for Analysis : Compliance
Sample Source : Bore	Water Treatment : Untreated
Sample Point : Roma Bore 17	
Further Information :	

Method	Units	Result	Guidelines **	Method	Units	Result	Guidelines **
			Health Aesthetic				Health Aesthetic
18320	Conductivity @ 25°C	µs/cm	958	18195	Sodium	mg/L	230
18226	pH	at 21°C	8.76	18195	Potassium	mg/L	0.9
18209	Total Hardness*	mg CaCO ₃ /L	3.4	18195	Calcium	mg/L	1.3
18209	Temporary Hardness*	mg CaCO ₃ /L	3.4	18195	Magnesium	mg/L	< 0.1
18208	Alkalinity	mg CaCO ₃ /L	314	18209	Hydrogen*	mg/L	0.0
18209	Residual Alkalinity*	meq/L	6.2				
18195	Silica	mg/L	20	80			
18209	Total Dissolved Ions*	mg/L	730				
18209	Total Dissolved Solids*	mg/L	568	600			
18206	True Colour	Hazen	2	15			
18212	Turbidity	NTU	<1	5			
18209	pH Sat.* (calc. for CaCO ₃)		8.9				
18209	Saturation Index*		-0.1				
18209	Mole Ratio*		1.0				
18209	Sodium Absorpt. Ratio*		53				
18209	Figure of Merit Ratio*		0.0				
Notes:				CATIONS 18195 Sodium mg/L 230 18195 Potassium mg/L 0.9 18195 Calcium mg/L 1.3 18195 Magnesium mg/L < 0.1 18209 Hydrogen* mg/L 0.0 ANIONS 18209 Bicarbonate* mg/L 356 18209 Carbonate* mg/L 14 18209 Hydroxide* mg/L 0.1 18204 Chloride mg/L 83 18204 Fluoride mg/L 0.16 18204 Nitrate mg/L <0.5 18204 Sulphate mg/L 49 OTHER DISSOLVED ELEMENTS 18195 Iron mg/L <0.01 18195 Manganese mg/L <0.01 18195 Zinc mg/L <0.01 18195 Aluminium mg/L <0.05 18195 Boron mg/L 0.08 18195 Copper mg/L <0.03			
* parameter is derived from calculation.							
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values							
† not determined							
Lab use Only: TE 1685.00 TC 9.88 TA 9.68 Imb 0.20 A ITC 0.57							

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
 The water does not comply with the Australian Drinking Water Guidelines 2011 for Sodium and pH.



19NA2135



Nigel Goldthorpe
 Senior Laboratory Technician, Inorganic Chemistry
 02-Apr-2019

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CERTIFICATE OF ANALYSIS

CLIENT : Maranoa Regional Council
 (HMARAN) PO Box 42
 MITCHELL QLD 4465

Laboratory Reference : SSP0064151
 Client Order No. : 2652
 Date Received : 15-Mar-2019
 Laboratory Number : 19NA2136
 Batch No : 227-18

ATTN: C Avancena

Client Reference : ROM-9
 Date Sampled : 13-Mar-2019
 Sample Source : Bore
 Sample Point : Roma Bore 18
 Further Information :

Submitting Authority : Maranoa Regional Council
 Reason for Analysis : Compliance
 Water Treatment : Untreated

Method	Units	Result	Guidelines **		Method	Units	Result	Guidelines **	
			Health	Aesthetic				Health	Aesthetic
18320	Conductivity @ 25°C	µs/cm	790		CATIONS				
18226	pH	at 21°C	8.86	6.5 - 8.5	18195	Sodium	mg/L	190	180
18209	Total Hardness*	mg CaCO ₃ /L	3.1	200	18195	Potassium	mg/L	0.8	
18209	Temporary Hardness*	mg CaCO ₃ /L	3.1		18195	Calcium	mg/L	1.2	
18208	Alkalinity	mg CaCO ₃ /L	326		18195	Magnesium	mg/L	< 0.1	
18209	Residual Alkalinity*	meq/L	6.4		18209	Hydrogen*	mg/L	0.0	
18195	Silica	mg/L	18	80	ANIONS				
18209	Total Dissolved Ions*	mg/L	643		18209	Bicarbonate*	mg/L	362	
18209	Total Dissolved Solids*	mg/L	477	600	18209	Carbonate*	mg/L	17	
18206	True Colour	Hazen	2	15	18209	Hydroxide*	mg/L	0.1	
18212	Turbidity	NTU	<1	5	18204	Chloride	mg/L	48	250
18209	pH Sat.* (calc. for CaCO ₃)		8.9		18204	Fluoride	mg/L	0.17	1.5
18209	Saturation Index*		0.0		18204	Nitrate	mg/L	<0.5	50
18209	Mole Ratio*		0.7		18204	Sulphate	mg/L	22	500 250
18209	Sodium Absorpt. Ratio*		47		OTHER DISSOLVED ELEMENTS				
18209	Figure of Merit Ratio*		0.0		18195	Iron	mg/L	0.01	0.3
Notes: * parameter is derived from calculation.					18195	Manganese	mg/L	<0.01	0.5 0.1
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values					18195	Zinc	mg/L	<0.01	3
^ not determined					18195	Aluminium	mg/L	<0.05	0.2
Lab use Only: TE 1430.00 TC 8.39 TA 8.33 Imb 0.06A W0 0.69					18195	Boron	mg/L	0.06	4
Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.					18195	Copper	mg/L	<0.03	2 1
The water does not comply with the Australian Drinking Water Guidelines 2011 for Sodium and pH.									



19NA2136



Nigel Goldthorpe
 Senior Laboratory Technician, Inorganic Chemistry
 02-Apr-2019

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CERTIFICATE OF ANALYSIS

CLIENT : Maranoa Regional Council
 (HMARAN) PO Box 42
 MITCHELL QLD 4465

Laboratory Reference : SSP0064151
 Client Order No. : 2652
 Date Received : 15-Mar-2019
 Laboratory Number : 19NA2137
 Batch No : 227-19

ATTN: C Avancena

Client Reference : ROM-10
 Date Sampled : 13-Mar-2019
 Sample Source : Bore
 Sample Point : Roma Bore 19
 Further Information :

Submitting Authority : Maranoa Regional Council
 Reason for Analysis : Compliance
 Water Treatment : Untreated

Method	Units	Result	Guidelines **	Method	Units	Result	Guidelines **
			Health Aesthetic				Health Aesthetic
18320	Conductivity @ 25°C	µs/cm	781	CATIONS			
18226	pH	at 21°C	8.89	18195	Sodium	mg/L	190
18209	Total Hardness*	mg CaCO ₃ /L	2.6	18195	Potassium	mg/L	0.7
18209	Temporary Hardness*	mg CaCO ₃ /L	2.6	18195	Calcium	mg/L	1.0
18208	Alkalinity	mg CaCO ₃ /L	336	18195	Magnesium	mg/L	< 0.1
18209	Residual Alkalinity*	meq/L	6.7	18209	Hydrogen*	mg/L	0.0
18195	Silica	mg/L	18	ANIONS			
18209	Total Dissolved Ions*	mg/L	638	18209	Bicarbonate*	mg/L	373
18209	Total Dissolved Solids*	mg/L	467	18209	Carbonate*	mg/L	18
				18209	Hydroxide*	mg/L	0.1
18206	True Colour	Hazen	1	18204	Chloride	mg/L	43
18212	Turbidity	NTU	<1	18204	Fluoride	mg/L	0.17
				18204	Nitrate	mg/L	<0.5
18209	pH Sat.* (calc. for CaCO ₃)		8.9	18204	Sulphate	mg/L	14
18209	Saturation Index*		-0.1	OTHER DISSOLVED ELEMENTS			
18209	Mole Ratio*		0.6	18195	Iron	mg/L	<0.01
18209	Sodium Absorpt. Ratio*		51	18195	Manganese	mg/L	<0.01
18209	Figure of Merit Ratio*		0.0	18195	Zinc	mg/L	<0.01
				18195	Aluminium	mg/L	<0.05
				18195	Boron	mg/L	0.06
				18195	Copper	mg/L	<0.03

Notes: * parameter is derived from calculation.
 ** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
 † not determined

Lab use Only: TE 1414.00 TC 8.29 TA 8.22 lmb 0.07 A 9C 0.57

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
 The water does not comply with the Australian Drinking Water Guidelines 2011 for Sodium and pH.



19NA2137



Nigel Goldthorpe
 Senior Laboratory Technician, Inorganic Chemistry
 02-Apr-2019

This report overrides all previous reports. The results relate solely to the samples as received and are limited to the specific tests undertaken as listed on the report. The results on this report are confidential and are not to be used or disclosed to any other person or used for any other purpose, whether directly or indirectly, unless that use is disclosed or the purpose is expressly authorised in writing by Queensland Health and the named recipient on this report. To the fullest extent permitted by law, Queensland Health will not be liable for any loss or claim (including legal costs calculated on an indemnity basis) which arise because of (a) problems related to the merchantability, fitness or quality of the samples, or (b) any negligent or unlawful act or omissions by Queensland Health that is connected with any activities or services provided by Queensland Health under this agreement (including the timing and/or method under which the samples were taken, stored or transported).

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Standard Chemical Analysis – Surat River



CERTIFICATE OF ANALYSIS

CLIENT : Maranoa Regional Council
(HMARAN) PO Box 42
MITCHELL QLD 4465

Laboratory Reference : SSP0064257
Client Order No. : 2652
Date Received : 22-Mar-2019
Laboratory Number : 19NA2385
Batch No : 231-03

ATTN: C Avancena

Client Reference : SUR_3
Date Sampled : 18-Mar-2019
Sample Source : River
Sample Point : Surat River
Further Information: :

Submitting Authority : Maranoa Regional Council
Reason for Analysis : Compliance
Water Treatment : Untreated

Method	Units	Result	Guidelines **		Method	Units	Result	Guidelines **	
			Health	Aesthetic				Health	Aesthetic
18320	Conductivity @ 25°C	µs/cm	177		18195	Sodium	mg/L	18	180
18226	pH	at 22°C	7.18	6.5 - 8.5	18195	Potassium	mg/L	4.8	
18209	Total Hardness*	mg CaCO ₃ /L	41	200	18195	Calcium	mg/L	8.9	
18209	Temporary Hardness*	mg CaCO ₃ /L	41		18195	Magnesium	mg/L	4.6	
18208	Alkalinity	mg CaCO ₃ /L	69		18209	Hydrogen*	mg/L	0.0	
18209	Residual Alkalinity*	meq/L	0.6						
18195	Silica	mg/L	21	80					
18209	Total Dissolved Ions*	mg/L	137						
18209	Total Dissolved Solids*	mg/L	115	600					
18206	True Colour	Hazen	50	15					
18212	Turbidity	NTU	881	5					
18209	pH Sat.* (calc. for CaCO ₃)		8.6						
18209	Saturation Index*		-1.5						
18209	Mole Ratio*		2.5						
18209	Sodium Absorpt. Ratio*		1.2						
18209	Figure of Merit Ratio*		1.1						
Notes: * parameter is derived from calculation. ** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values * not determined									
Lab use Only: TE 1281.00 TC 1.72 TA 1.82 Tmb 0.11 A TC 0.53									

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
The water does not comply with the Australian Drinking Water Guidelines 2011 for Aluminium, Colour and Turbidity.
Fine particles (< 0.45 micrometre) may cause elevated metal and true colour results.



19NA2385

Nigel Goldthorpe
Senior Laboratory Technician, Inorganic Chemistry
12-Apr-2019

This report overrides all previous reports. The results relate solely to the sample/s as received and are limited to the specific tests undertaken as listed on the report. The results on this report are confidential and are not to be used or disclosed to any other person or used for any other purpose, whether directly or indirectly, unless that use is disclosed or the purpose is expressly authorised in writing by Queensland Health and the named recipient on this report. To the fullest extent permitted by law, Queensland Health will not be liable for any loss or claim (including legal costs calculated on an indemnity basis) which arise because of (a) problems related to the merchantability, fitness or quality of the sample/s, or (b) any negligent or unlawful act or omissions by Queensland Health that is connected with any activities or services provided by Queensland Health under this agreement (including the timing and/or method under which the sample/s were taken, stored or transported).

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CERTIFICATE OF ANALYSIS

CLIENT : Maranoa Regional Council
 (HMARAN) PO Box 42
 MITCHELL QLD 4465

Laboratory Reference : SSP0064151
 Client Order No. : 2652
 Date Received : 15-Mar-2019
 Laboratory Number : 19NA2123
 Batch No : 227-05

ATTN: C Avancena

Client Reference : WAL-1
 Date Sampled : 13-Mar-2019
 Sample Source : Bore
 Sample Point : Wallumbilla Bore 1
 Further Information :

Submitting Authority : Maranoa Regional Council
 Reason for Analysis : Compliance
 Water Treatment : Untreated

Method	Units	Result	Guidelines **	Method	Units	Result	Guidelines **
				CATIONS			
				Health Aesthetic			
18320	Conductivity @ 25°C	µs/cm	1530	18195	Sodium	mg/L	370
18226	pH	at 21°C	8.68	18195	Potassium	mg/L	1.2
18209	Total Hardness*	mg CaCO ₃ /L	6.1	18195	Calcium	mg/L	2.2
18209	Temporary Hardness*	mg CaCO ₃ /L	6.1	18195	Magnesium	mg/L	0.1
18208	Alkalinity	mg CaCO ₃ /L	560	18209	Hydrogen*	mg/L	0.0
18209	Residual Alkalinity*	meq/L	11	ANIONS			
18195	Silica	mg/L	14	18209	Bicarbonate*	mg/L	638
18209	Total Dissolved Ions*	mg/L	1200	18209	Carbonate*	mg/L	22
18209	Total Dissolved Solids*	mg/L	889	18209	Hydroxide*	mg/L	0.1
18206	True Colour	Hazen	1	18204	Chloride	mg/L	170
18212	Turbidity	NTU	<1	18204	Fluoride	mg/L	0.44
18209	pH Sat.* (calc. for CaCO ₃)		8.4	18204	Nitrate	mg/L	<0.5
18209	Saturation Index*		0.3	18204	Sulphate	mg/L	6
18209	Mole Ratio*		1.1	OTHER DISSOLVED ELEMENTS			
18209	Sodium Absorpt. Ratio*		65	18195	Iron	mg/L	0.01
18209	Figure of Merit Ratio*		0.0	18195	Manganese	mg/L	<0.01
Notes: * parameter is derived from calculation.				18195	Zinc	mg/L	<0.01
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values				18195	Aluminium	mg/L	<0.05
✓ not determined				18195	Boron	mg/L	0.59
Lab use Only: TE 2680.00 TC 16.03 TA 15.99 Imb 0.04 A WC 0.57				18195	Copper	mg/L	<0.03

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
 The water does not comply with the Australian Drinking Water Guidelines 2011 for Sodium, Total Dissolved Solids and pH.



19NA2123



Nigel Goldthorpe
 Senior Laboratory Technician, Inorganic Chemistry
 02-Apr-2019

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CERTIFICATE OF ANALYSIS

CLIENT : Maranoa Regional Council
 (HMARAN) PO Box 42
 MITCHELL QLD 4465

Laboratory Reference : SSP0064151
 Client Order No. : 2652
 Date Received : 15-Mar-2019
 Laboratory Number : 19NA2124
 Batch No : 227-06

ATTN: C Avancena

Client Reference : WAL-2
 Date Sampled : 13-Mar-2019
 Sample Source : Bore
 Sample Point : Wallumbilla Bore 3
 Further Information :

Submitting Authority : Maranoa Regional Council
 Reason for Analysis : Compliance
 Water Treatment : Untreated

Method	Units	Result	Guidelines **	Method	Units	Result	Guidelines **
			Health Aesthetic				Health Aesthetic
18320	Conductivity @ 25°C	µs/cm	1140	CATIONS			
18226	pH	at 21°C	9.09	18195	Sodium	mg/L	260
18209	Total Hardness*	mg CaCO ₃ /L	3.7	18195	Potassium	mg/L	2.0
18209	Temporary Hardness*	mg CaCO ₃ /L	3.7	18195	Calcium	mg/L	1.4
18208	Alkalinity	mg CaCO ₃ /L	406	18195	Magnesium	mg/L	< 0.1
18209	Residual Alkalinity*	meq/L	8.0	18209	Hydrogen*	mg/L	0.0
18195	Silica	mg/L	5	ANIONS			
18209	Total Dissolved Ions*	mg/L	847	18209	Bicarbonate*	mg/L	420
18209	Total Dissolved Solids* mg/L		636	18209	Carbonate*	mg/L	37
18206	True Colour	Hazen	1	18209	Hydroxide*	mg/L	0.2
18212	Turbidity	NTU	<1	18204	Chloride	mg/L	120
				18204	Fluoride	mg/L	0.17
18209	pH Sat.* (calc. for CaCO ₃)		8.7	18204	Nitrate	mg/L	<0.5
18209	Saturation Index*		0.4	18204	Sulphate	mg/L	2
18209	Mole Ratio*		0.7	OTHER DISSOLVED ELEMENTS			
18209	Sodium Absorpt. Ratio*		60	18195	Iron	mg/L	<0.01
18209	Figure of Merit Ratio*		0.0	18195	Manganese	mg/L	<0.01
				18195	Zinc	mg/L	<0.01
				18195	Aluminium	mg/L	<0.05
				18195	Boron	mg/L	0.08
				18195	Copper	mg/L	<0.03

Notes: * parameter is derived from calculation.
 ** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
 † not determined

Lab use Only: TE 1069.00 TC 11.61 TA 11.56 Inb 0.06 A IC 0.56

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
 The water does not comply with the Australian Drinking Water Guidelines 2011 for Sodium, Total Dissolved Solids and pH.



19NA2124



Nigel Goldthorpe
 Senior Laboratory Technician, Inorganic Chemistry
 02-Apr-2019

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CERTIFICATE OF ANALYSIS

CLIENT : Maranoa Regional Council
(HMARAN) PO Box 42
MITCHELL QLD 4465

Laboratory Reference : SSP0064151
Client Order No. : 2652
Date Received : 15-Mar-2019
Laboratory Number : 19NA2120
Batch No : 227-02

ATTN: C Avancena

Client Reference : YUL-2
Date Sampled : 13-Mar-2019
Sample Source : Bore
Sample Point : Yuleba Bore
Further Information :
Submitting Authority : Maranoa Regional Council
Reason for Analysis : Compliance
Water Treatment : Untreated

Method	Units	Result	Guidelines **		Method	Units	Result	Guidelines **	
			Health	Aesthetic				Health	Aesthetic
18320	Conductivity @ 25°C	µs/cm	1520		18195	Sodium	mg/L	360	180
18226	pH	at 21°C	8.73	6.5 - 8.5	18195	Potassium	mg/L	1.1	
18209	Total Hardness*	mg CaCO ₃ /L	4.1	200	18195	Calcium	mg/L	1.5	
18209	Temporary Hardness*	mg CaCO ₃ /L	4.1		18195	Magnesium	mg/L	< 0.1	
18208	Alkalinity	mg CaCO ₃ /L	504		18209	Hydrogen*	mg/L	0.0	
18209	Residual Alkalinity*	meq/L	10.0		ANIONS				
18195	Silica	mg/L	17	80	18209	Bicarbonate*	mg/L	571	
18209	Total Dissolved Ions*	mg/L	1150		18209	Carbonate*	mg/L	22	
18209	Total Dissolved Solids*	mg/L	873	600	18209	Hydroxide*	mg/L	0.1	
18206	True Colour	Hazen	2	15	18204	Chloride	mg/L	170	250
18212	Turbidity	NTU	<1	5	18204	Fluoride	mg/L	0.47	1.5
18209	pH Sat.* (calc. for CaCO ₃)		8.6		18204	Nitrate	mg/L	< 1	50
18209	Saturation Index*		0.1		18204	Sulphate	mg/L	20	500 250
18209	Mole Ratio*		1.1		OTHER DISSOLVED ELEMENTS				
18209	Sodium Absorpt. Ratio*		76		18195	Iron	mg/L	0.02	0.3
18209	Figure of Merit Ratio*		0.0		18195	Manganese	mg/L	<0.01	0.5 0.1
					18195	Zinc	mg/L	<0.01	3
					18195	Aluminium	mg/L	<0.05	0.2
					18195	Boron	mg/L	0.48	4
					18195	Copper	mg/L	<0.03	2 1

Notes: * parameter is derived from calculation.
** Australian Drinking Water Guidelines 2011 (ADWG) Health and Aesthetic Values
† not determined

Lab use Only: TE 2628.00 TC 15.60 TA 15.42 Imb 0.17 A UC 0.56

Please note that the concentration of total elements present may be higher than that of dissolved elements stated in this report.
The water does not comply with the Australian Drinking Water Guidelines 2011 for Sodium, Total Dissolved Solids and pH.



19NA2120

Nigel Goldthorpe
Senior Laboratory Technician, Inorganic Chemistry
02-Apr-2019

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Table 3 - Reticulation *E. coli* verification monitoring

Drinking water scheme: Amby

Year	2018-19											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
No. of samples collected	4	4	4	4	4	4	4	4	6	8	4	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	48	48	48	50	54	54	54
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: Injune

Year	2018-19											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	7	8	8	8	7	8	8	8	8	7	7	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	89	90	91	92	92	93	94	96	93	92	91	92
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: Jackson

Year	2018-19											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	2	2	2	2	2	2	2	2	4	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	30	29	28	27	26	25	24	24	26	26	26	26
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

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

The *Public Health Regulation 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: Mitchell

Year	2018-19											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	9	9	9	11	9	9	19	12	9	9	9	9
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	105	105	105	107	107	107	117	120	119	121	122	123
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: Muckadilla

Year	2018-19											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	3	6	3	6	3	3	6	3	6	3	3	3
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	27	31	32	36	37	38	42	41	45	46	47	48
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: Mungallala

Year	2018-19											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	3	3	3	3	3	3	3	3	3	3	3	3
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	35	35	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

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: Roma

Year	2018-19											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	64	80	70	77	68	82	85	74	71	80	72	71
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	845	878	850	833	821	834	838	857	852	871	885	894
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: Surat

Year	2018-19											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	5	5	6	6	5	10	46	28	7	5	5	5
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	64	64	65	66	66	71	109	132	134	134	133	133
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: Wallumbilla

Year	2018-19											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	4	6	4	4	4	4	4	4	6	4	4	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	39	42	43	43	44	45	46	47	50	51	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).

Drinking water scheme: Yuleba

Year	2018-19											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	4	4	4	4	4	4	4	4	5	4	4	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	49	49	49	48	48	48	48	48	49	49	49	49
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 4 – Progress against the risk management improvement program in the approved DWQMP

Item No.	Scheme Component / Sub-component	Action(s)	Target date/s	Status as at Dec 2019	(If implementing these actions will take longer than anticipated, please provide detail, as it may affect the approved DWQMP)
	All Towns	Network Modelling Software Purchased, allowing for easier modelling of future upgrades and demands in the towns	On-going	On-going	
	All Towns – Water Quality	Update flushing Procedure and program	Complete	Complete	
	All Towns	New SCADA System	June 2020	In Progress	
	Injune	New Bore	Complete	Complete	
	Amby, Mungallala, Wallumbilla	Install Generators	Complete	Complete	
	Wallumbilla - Supply	New Bore	Complete	Complete	
	Mitchell - Supply	New Bore	On-going	On-going	
	Roma – Supply	New Bore	February 2020	In Progress	
	Roma - Storage	New treated reservoir	May 2020	In Progress	
	Yuleba - Storage	New reservoir constructed	May 2020	In Progress	