Drinking Water Quality Management Plan (DWQMP) Report

July 2013 to June 2014

Rockhampton Regional Council

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Glossary of terms

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

1. Introduction

This report documents the performance of Rockhampton Regional Council's drinking water service with respect to water quality and also its 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.

2. Overview of Operations

This report relates to the drinking water supply schemes which Rockhampton Regional Council (RRC) owned and operated from 1 July 2013 to 30 June 2014. Following de-amalgamation of the newly re-formed Livingstone Shire Council from Rockhampton Regional Council on 1 January 2014, the ownership and operation of two of the four drinking water supply schemes (Capricorn Coast and Marlborough) was transferred to Livingstone Shire Council. Only the performance of water supply schemes for which RRC had ownership and operational responsibility of during the reporting period of 1 July 2013 to 30 June 2014 is detailed in this report. Table 1 lists the drinking water supply schemes, relevant reporting period and the responsible water service provider for the stated period. Table 2 provides summary information of the water source, water treatment process, population and average demand for the drinking water supply schemes covered in this report.

Table 1: Drinking water supply schemes, relevant reporting period for this report and the water service provider for each drinking water supply scheme for the stated period

Scheme	Relevant Reporting Period	Water Service Provider
Rockhampton	1 July 2013 – 30 June 2014	Rockhampton Regional Council
Mount Morgan	1 July 2013 – 30 June 2014	Rockhampton Regional Council
Capricorn Coast	1 July 2013 – 31 December 2013	Rockhampton Regional Council
Marlborough	1 July 2013 – 31 December 2013	Rockhampton Regional Council
Capricorn Coast	1 January 2014 – 30 June 2014	Livingstone Shire Council
Marlborough	1 January 2013 – 30 June 2014	Livingstone Shire Council

Table 2: Water supply source, treatment process, population served and average daily water demand

Scheme	Water Source(s)	Treatment Process	Population	Average Demand (ML/d)
Rockhampton (including Capricorn Coast)	Fitzroy River	Coagulation, flocculation, sedimentation, filtration, pH correction and disinfection	77,140 (99,710)	49 (60)
Mount Morgan	Dee River; Fletcher	Coagulation, sedimentation,	3,130	1.0

Scheme	Water Source(s)	Treatment Process	Population	Average Demand (ML/d)
	Creek Weir	filtration, pH correction and disinfection		
Capricorn Coast	Water Park Creek; Fitzroy River via the Rockhampton to Yeppoon Pipeline	Coagulation, flocculation, sedimentation, filtration, pH correction and disinfection	22,570	11
Marlborough	Glenprairie Road Bores, Marlborough	Filtration, reverse osmosis and disinfection	100	0.03

3. Actions taken to implement the DWQMP

Generally, the DWQMP describes the operating strategies, operating limits and approaches to water quality monitoring and the overall management of risks to water quality that were in place at the time that the DWQMP was approved. Specific changes or improvements to the drinking water services provided by Fitzroy River Water have occurred via the implementation of the Risk Management Improvement Program as detailed below.

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. The information provided describes the progress made during this reporting period towards completion of specific tasks identified in the Risk Management Improvement Program listed in the DWQMP.

Amendments made to the DWQMP

A range of amendments have been proposed for the DWQMP primarily to reflect the changes made following the de-amalgamation of the Livingstone Shire Council from the Rockhampton Regional Council on 1 January 2014, but also to update the DWQMP to reflect any significant changes to the risk assessment due to the implementation of the aspects of the Risk Management Improvement Program or the receipt of new information relating to potential risks. Minor changes were also made to reflect the new data obtained through the ongoing water quality monitoring programs described in the original DWQMP. These amendments are currently being assessed by the regulator.

4. Compliance with water quality criteria for drinking water

Appendix A Table 4 details the results from the verification monitoring program. All the water quality results from all water supply schemes met the recommended health guideline values in the Australian Drinking Water Guidelines and were within the expected range of values detailed in the DWQMP for each scheme.

Appendix A Table 5 summarises the reticulation *E. coli* verification monitoring program. All samples taken from all water supply schemes tested negative for *E. coli* and met the health guideline value in the Australian Drinking Water Guidelines as well as the standards in the Public Health Regulation 2005.

From 17 June 2013, Rockhampton, Mount Morgan and Capricorn Coast Water Supply Schemes ceased fluoridation. Compliance with the Water Fluoridation Regulation 2008 is thereby not covered in this report. The Marlborough Water Supply Scheme was not fluoridated prior to or post this cessation date.

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

From 1 July 2013 to 30 June 2014 This financial year there were no instances where the Regulator was notified under sections 102 or 102A of the Act.

6. Customer complaints related to water quality

Rockhampton 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 3 – Number of drinking water quality complaints

Scheme	Suspected Illness	Taste and/or Odour	Appearance or Discoloured Water	Total
Rockhampton	**0**	**24**	**41**	**65**
Mount Morgan	**0**	**1**	**7**	**8**
Capricorn Coast	**0**	**1**	**51**	**52**
Marlborough	**0**	**0**	**0**	**0**
Total	**0**	**26**	**99**	**125**

Suspected Illness

Complaints are sometimes received from customers who suspect their water may be associated with an illness they are experiencing. Rockhampton Regional Council investigates each complaint relating to alleged illness from our water quality, typically by testing the customers tap and closest reticulation sampling point for the presence of *E. coli*. In addition, Fitzroy River Water staff periodically liaises with local Queensland Health officers in order to receive updates on any reports of suspected waterborne disease.

During 2013-2014, Rockhampton Regional Council was not aware of any confirmed cases of illness arising from the drinking water supply schemes.

Taste and odour

A total number of 26 customer complaints associated with taste and odour were received from July 2013 to June 2014. Twenty-four of the complaints were received from Rockhampton and of these, 5 were related to slightly elevated levels of chlorine in the supply zone. Mount Morgan and Capricorn Coast received one customer complaint each. Most of the taste and odour complaints received are usually associated to changes in water quality in the water supply source including increase in electrical conductivity and sodium content. Once reported by customers, Rockhampton Regional Council investigates the issue to devise a prompt solution which may include flushing of water mains, providing information or providing additional testing. Investigation of each complaint found no public health risks.

Appearance or Discoloured water

A total of 99 customer complaints associated with discoloured water or appearance were received between July 2013 to June 2014. Forty-one of the complaints were received from Rockhampton while Mount Morgan received 7 complaints. Capricorn Coast received 51 complaints of which 32 were received in November 2013 and associated with a significant water main break which caused a change in the way the distribution system was operated to supply water to meet demand. Most of the complaints received are usually associated with

water main break, presence of air in the water or sedentary water at the extremities of the supply zone. All customers who reported a complaint were responded to promptly. Rockhampton Regional Council assisted by taking action to address each issue including flushing of water mains and advising of the reasons for the dirty water or unusual water appearance.

7. Findings and recommendations of the DWQMP auditor

During this reporting period, Fitzroy River Water was not required to engage an auditor to complete an audit of the DWQMP. In accordance with legislative requirements, an audit of the DWQMP is scheduled for completion in 2016, with the subsequent findings of the audit to be incorporated as appropriate in future revisions of the DWQMP.

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

A review of the DWQMP was recently completed by Fitzroy River Water with input provided by the following people:

- Ariane Leyden (Water Quality Officer)
- Jason Plumb (Coordinator Treatment and Supply)
- Nimish Chand (Manager Fitzroy River Water)

No specific issues were raised from the review. A number of amendments to the DWQMP were proposed as outlined in Section 3 above. They specifically relate to changes to the drinking water schemes that are now operated by Fitzroy River Water following de-amalgamation of the Livingstone Shire Council on 1 January 2014, and also some changes related to the acquisition of new water quality data or new information about water supply infrastructure following capital upgrades or work identified in the Risk Management Improvement Program.

The next annual review of the DWQMP will be completed by the end of June 2015.

The information below provides an example of a specific addition to the DWQMP that was identified as part of the review process.

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

Rockhampton Water Supply Scheme

The source water for the Glenmore Water Treatment Plant is taken from the Fitzroy Barrage Storage. A portion of this storage that is located approximately 5 km downstream of the Glenmore Water Treatment Plant intake is adjacent to land that has a history of the usage of perfluorocarbon-containing chemicals for fire-fighting purposes.

The toxicity, mobility and bioaccumulation of PFCs have the potential to pose a risk to public health. With this in mind, this potential hazard has now been considered within the proposed amendments to the DWQMP. This class of chemicals is specifically listed in the potential hazards and is also now included in the water quality monitoring program. Perfluorcarbon testing has now been added in the water quality monitoring program with sampling scheduled annually or event related. Testing for this class of chemical did not detect PFC concentrations above laboratory limits of reporting. PFCs do not currently have a health guideline value in the Australian Drinking Water Guidelines. Inclusion of this class of chemical will help to ensure that any risk posed by this chemical is managed accordingly.

Occurrence of perfluorocarbons was risk assessed in the same category as toxic pesticides or organics. The existing risk treatments are described for this hazard. The risk of this class of chemicals to drinking water supplies can be significantly reduced by the application of coagulation with polyaluminium chlorhydrate and the addition of powdered activated carbon to remove soluble perfluorocarbons. These chemicals are currently used in the conventional treatment of water supply for the Rockhampton Water Supply Scheme. With this existing preventative barrier in place, the residual risk is rated as Low.

Appendix A – Summary of compliance with water quality criteria

The results from the verification monitoring program for the time period of 1 July 2013 to 30 June 2014 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*.

Table 4 contains a summary of the water quality monitoring from each water supply scheme including scheme component, parameter, unit of measure, frequency of sampling, total number of samples taken, number of samples in which parameter was detected, number of samples exceeding health guideline value or in which pathogens were detected, minimum concentration or count, maximum concentration or count, average (mean) concentration or count, limit of reporting, and laboratory name. All the water quality results from all water supply schemes met the health guideline values in the Australian Drinking Water Guidelines.

Table 5 provides a summary of the reticulation verification monitoring with average calculated using a twelve month rolling annual value. All samples taken from this reporting period contain no E. coli. The annual values from all schemes are above the 98% annual compliance value.

Verification monitoring program, apart from fluoride, for this reporting period was carried out as per the program stated in the DWQMP. Cessation of fluoridation in Rockhampton, Mount Morgan and Capricorn Coast Water Supply Schemes on 17 June 2013 meant that monitoring of fluoridated water is no longer a requirement. For this reporting period, naturally occurring fluoride are analysed monthly from the source water and water treatment plant. The verification monitoring program has been updated to reflect this.

The verification monitoring program has also been expanded following the review of the DWQMP in October 2014. The program now includes the monitoring of cyanobacteria toxins on source waters and water treatment plants where potentially toxic cyanobacteria species are present in sufficient numbers in the source water. Perfluocarbons were also added on the water quality monitoring program for Rockhampton Water Supply Scheme following reports of possible leaching from contaminated lands.

The reported statistics in Tables 1 and 2 do not include results derived from repeat samples, or from emergency or investigative samples undertaken in response to an elevated result.

Table 4 - Verification monitoring results

Scheme Name	Scheme Component	Parameter	Units	Frequency of Sampling	Total no. of samples collected	No. of samples in which parameter was detected	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Limit of Reporting	Laboratory Name
Rockhampton	Source Water	Nitrate	mg/L	Monthly	12	8	0	<0.01	0.20	0.08	0.01	ALS Group / Symbio Alliance
Rockhampton	Source Water	Sulphate	mg/L	Monthly	12	11	0	<1	43	21	1	ALS Group / Symbio Alliance
Rockhampton	Source Water	Fluoride	mg/L	Monthly	12	8	0	<0.1	0.2	0.1	0.1	ALS Group / Symbio Alliance
Rockhampton	Source Water	Aluminium (Acid Soluble)	mg/L	Monthly	12	9	0	<0.005	0.212	0.117	0.005	ALS Group / Symbio Alliance
Rockhampton	Source Water	Copper	mg/L	Monthly	12	12	0	0.001	0.005	0.003	0.001	ALS Group / Symbio Alliance
Rockhampton	Source Water	Iron	mg/L	Monthly	12	12	0	0.06	1.20	0.49	0.05	ALS Group / Symbio Alliance
Rockhampton	Source Water	Lead	mg/L	Monthly	12	1	0	<0.001	0.022	<0.001	0.001	ALS Group / Symbio Alliance
Rockhampton	Source Water	Manganese	mg/L	Monthly	12	12	0	0.010	0.078	0.032	0.001	ALS Group / Symbio Alliance
Rockhampton	Source Water	Zinc	mg/L	Monthly	12	6	0	<0.005	0.021	0.009	0.005	ALS Group / Symbio Alliance
Rockhampton	Source Water	pH	pH unit	Monthly	12	12	0	7.08	8.79	8.09	0.01	ALS Group / Symbio Alliance
Rockhampton	Source Water	Turbidity	NTU	Monthly	12	12	0	3.0	56.0	20.3	0.1	ALS Group / Symbio Alliance
Rockhampton	Source Water	Alkalinity, Total	mg/L	Monthly	12	12	0	23	206	98	1	ALS Group / Symbio Alliance
Rockhampton	Source Water	Calcium	mg/L	Monthly	12	12	0	4	30	18	1	ALS Group / Symbio Alliance
Rockhampton	Source Water	Chloride	mg/L	Monthly	12	12	0	20	145	82	1	ALS Group / Symbio Alliance
Rockhampton	Source Water	Colour (True)	PCU	Monthly	12	12	0	10	100	44	1	ALS Group / Symbio Alliance
Rockhampton	Source Water	Electrical Conductivity	µS/cm	Monthly	12	12	0	126	823	439	1	ALS Group / Symbio Alliance
Rockhampton	Source Water	Magnesium	mg/L	Monthly	12	12	0	4	52	20	1	ALS Group / Symbio Alliance

Rockhampton	Source Water	Nitrite	mg/L	Monthly	11	0	0	<0.01	<0.01	<0.01	0.01	ALS Group / Symbio Alliance
Rockhampton	Source Water	Potassium	mg/L	Monthly	12	12	0	1	4	2	1	ALS Group / Symbio Alliance
Rockhampton	Source Water	Sodium	mg/L	Monthly	12	12	0	15	72	43	1	ALS Group / Symbio Alliance
Rockhampton	Source Water	Total Dissolved Solids	mg/L	Monthly	12	12	0	87	531	272	10	ALS Group / Symbio Alliance
Rockhampton	Source Water	Total Hardness	mg/L	Monthly	12	12	0	26	289	127	1	ALS Group / Symbio Alliance
Rockhampton	Source Water	Total Organic Carbon	mg/L	Quarterly	4	2	0	<1	9	3	1	ALS Group / Symbio Alliance
Rockhampton	Source Water	Arsenic	mg/L	Annually	1	1	0	0.002	0.002	0.002	0.001	ALS Group / Symbio Alliance
Rockhampton	Source Water	Cadmium	mg/L	Annually	1	0	0	<0.0001	<0.0001	<0.0001	0.0001	ALS Group / Symbio Alliance
Rockhampton	Source Water	Chromium	mg/L	Annually	1	0	0	<0.001	<0.001	<0.001	0.001	ALS Group / Symbio Alliance
Rockhampton	Source Water	Nickel	mg/L	Annually	1	1	0	0.001	0.001	0.001	0.001	ALS Group / Symbio Alliance
Rockhampton	Source Water	Selenium	mg/L	Annually	1	0	0	<0.01	<0.01	<0.01	0.01	ALS Group / Symbio Alliance
Rockhampton	Source Water	Mercury	mg/L	Annually	1	0	0	<0.0001	<0.0001	<0.0001	0.0001	ALS Group / Symbio Alliance
Rockhampton	Source Water	pH	pH Units	Daily	365	365	0	6.48	9.00	7.84	0.01	Inhouse
Rockhampton	Source Water	Turbidity	NTU	Daily	365	365	0	2.6	298.0	20.1	0.1	Inhouse
Rockhampton	Source Water	pH	pH Units	Continuous			0	6.51	8.92	7.84	0.01	Inhouse - Telemetry
Rockhampton	Source Water	Turbidity	NTU	Continuous			0	11.70	285.90	28.53	0.01	Inhouse - Telemetry
Rockhampton	Water treatment Plant	Nitrate	mg/L	Monthly	12	12	0	0.05	0.27	0.15	0.01	ALS Group / Symbio Alliance
Rockhampton	Water treatment Plant	Sulphate	mg/L	Monthly	12	12	0	2	42	18	1	ALS Group / Symbio Alliance
Rockhampton	Water treatment Plant	Trihalomethanes	µg/L	Quarterly	4	4	0	34	106	69	5	ALS Group / Symbio Alliance
Rockhampton	Water treatment Plant	Fluoride	mg/L	Monthly	12	9	0	<0.1	0.2	0.1	0.1	ALS Group / Symbio Alliance
Rockhampton	Water treatment Plant	Aluminium (Acid Soluble)	mg/L	Monthly	12	10	0	<0.005	0.059	0.020	0.005	ALS Group / Symbio Alliance

Rockhampton	Water treatment Plant	Copper	mg/L	Monthly	12	11	0	<0.01	0.044	0.009	0.001	ALS Group / Symbio Alliance
Rockhampton	Water treatment Plant	Iron	mg/L	Monthly	12	2	0	<0.05	0.14	<0.05	0.05	ALS Group / Symbio Alliance
Rockhampton	Water treatment Plant	Lead	mg/L	Monthly	12	5	0	<0.001	0.004	0.001	0.001	ALS Group / Symbio Alliance
Rockhampton	Water treatment Plant	Manganese	mg/L	Monthly	12	7	0	<0.001	0.004	0.001	0.001	ALS Group / Symbio Alliance
Rockhampton	Water treatment Plant	Zinc	mg/L	Monthly	12	2	0	<0.005	0.012	<0.005	0.005	ALS Group / Symbio Alliance
Rockhampton	Water treatment Plant	pH	pH unit	Monthly	12	12	0	7.55	8.36	8.02	0.01	ALS Group / Symbio Alliance
Rockhampton	Water treatment Plant	Turbidity	NTU	Monthly	12	12	0	0.2	2.0	0.9	0.1	ALS Group / Symbio Alliance
Rockhampton	Water treatment Plant	Alkalinity, Total	mg/L	Monthly	12	12	0	33	201	89	1	ALS Group / Symbio Alliance
Rockhampton	Water treatment Plant	Calcium	mg/L	Monthly	12	12	0	10	30	20	1	ALS Group / Symbio Alliance
Rockhampton	Water treatment Plant	Chloride	mg/L	Monthly	12	12	0	27	146	86	1	ALS Group / Symbio Alliance
Rockhampton	Water treatment Plant	Colour (True)	PCU	Monthly	12	12	0	2	7	5	1	ALS Group / Symbio Alliance
Rockhampton	Water treatment Plant	Electrical Conductivity	µS/cm	Monthly	12	12	0	162	823	453	1	ALS Group / Symbio Alliance
Rockhampton	Water treatment Plant	Magnesium	mg/L	Monthly	12	12	0	4	51	20	1	ALS Group / Symbio Alliance
Rockhampton	Water treatment Plant	Nitrite	mg/L	Monthly	11	0	0	<0.01	<0.01	<0.01	0.01	ALS Group / Symbio Alliance
Rockhampton	Water treatment Plant	Potassium	mg/L	Monthly	12	12	0	1	4	2	1	ALS Group / Symbio Alliance
Rockhampton	Water treatment Plant	Sodium	mg/L	Monthly	12	12	0	15	69	42	1	ALS Group / Symbio Alliance
Rockhampton	Water treatment Plant	Total Dissolved Solids	mg/L	Monthly	12	12	0	98	555	279	10	ALS Group / Symbio Alliance
Rockhampton	Water treatment Plant	Total Hardness	mg/L	Monthly	12	12	0	41	285	131	1	ALS Group / Symbio Alliance
Rockhampton	Water treatment Plant	Total Organic Carbon	mg/L	Quarterly	4	1	0	<1	3	1	1	ALS Group / Symbio Alliance
Rockhampton	Water treatment Plant	Arsenic	mg/L	Annually	1	0	0	<0.001	<0.001	<0.001	0.001	ALS Group / Symbio Alliance
Rockhampton	Water treatment Plant	Cadmium	mg/L	Annually	1	0	0	<0.0001	<0.0001	<0.0001	0.0001	ALS Group / Symbio Alliance

Rockhampton	Water treatment Plant	Chromium	mg/L	Annually	1	0	0	<0.001	<0.001	<0.001	0.001	ALS Group / Symbio Alliance
Rockhampton	Water treatment Plant	Nickel	mg/L	Annually	1	0	0	<0.001	<0.001	<0.001	0.001	ALS Group / Symbio Alliance
Rockhampton	Water treatment Plant	Selenium	mg/L	Annually	1	0	0	<0.01	<0.01	<0.01	0.01	ALS Group / Symbio Alliance
Rockhampton	Water treatment Plant	Mercury	mg/L	Annually	1	0	0	<0.0001	<0.0001	<0.0001	0.0001	ALS Group / Symbio Alliance
Rockhampton	Water treatment Plant	Chlorine (free)	mg/L	Daily	365	365	0	0.62	1.48	1.02	0.01	Inhouse
Rockhampton	Water treatment Plant	pH	pH Units	Daily	365	365	0	7.14	8.29	7.72	0.01	Inhouse
Rockhampton	Water treatment Plant	Turbidity	NTU	Daily	365	365	0	0.1	1.5	0.2	0.1	Inhouse
Rockhampton	Water treatment Plant	Chlorine (free)	mg/L	Continuous			0	0.70	1.15	1.00	0.01	Inhouse - Telemetry
Rockhampton	Water treatment Plant	pH	pH Units	Continuous			0	7.21	8.24	7.78	0.01	Inhouse - Telemetry
Rockhampton	Reticulation	Escherichia coli (E.coli)	MPN/100mL	Weekly	424	0	0	<1	<1	<1		Ecoscope Environmental
Rockhampton	Reticulation	Chlorine (free)	mg/L	Weekly	434	428	0	0.00	2.20	0.77	0	Inhouse
Rockhampton	Reticulation	Trihalomethanes - Keppel Sands	ug/L	Quarterly	2	2	0	158	188	173	5	ALS Group / Symbio Alliance
Rockhampton	Reticulation	Trihalomethanes - Gracemere	ug/L	Quarterly	4	4	0	109	223	163	5	ALS Group / Symbio Alliance
Mount Morgan	Source Water	Nitrate	mg/L	Monthly	12	5	0	<0.01	0.21	0.01	0.01	ALS Group / Symbio Alliance
Mount Morgan	Source Water	Sulphate	mg/L	Monthly	12	12	0	5	13	10	1	ALS Group / Symbio Alliance
Mount Morgan	Source Water	Fluoride	mg/L	Monthly	12	5	0	<0.1	0.1	<0.1	0.1	ALS Group / Symbio Alliance
Mount Morgan	Source Water	Aluminium (Acid Soluble)	mg/L	Monthly	12	9	0	<0.005	0.386	0.080	0.005	ALS Group / Symbio Alliance
Mount Morgan	Source Water	Copper	mg/L	Monthly	11	11	0	<0.01	0.014	0.004	0.001	ALS Group / Symbio Alliance
Mount Morgan	Source Water	Iron	mg/L	Monthly	12	12	0	0.07	1.00	0.27	0.05	ALS Group / Symbio Alliance
Mount Morgan	Source Water	Lead	mg/L	Monthly	12	3	0	<0.001	0.030	<0.001	0.001	ALS Group / Symbio Alliance
Mount Morgan	Source Water	Manganese	mg/L	Monthly	12	12	0	0.019	0.376	0.123	0.001	ALS Group / Symbio Alliance

Mount Morgan	Source Water	Zinc	mg/L	Monthly	12	11	0	<0.005	0.084	0.022	0.005	ALS Group / Symbio Alliance
Mount Morgan	Source Water	pH	pH unit	Monthly	12	12	0	7.42	8.51	8.14	0.01	ALS Group / Symbio Alliance
Mount Morgan	Source Water	Turbidity	NTU	Monthly	12	12	0	1.1	26.0	5.2	0.1	ALS Group / Symbio Alliance
Mount Morgan	Source Water	Alkalinity, Total	mg/L	Monthly	12	12	0	66	135	109	1	ALS Group / Symbio Alliance
Mount Morgan	Source Water	Calcium	mg/L	Monthly	12	12	0	13	29	22	1	ALS Group / Symbio Alliance
Mount Morgan	Source Water	Chloride	mg/L	Monthly	12	12	0	31	70	54	1	ALS Group / Symbio Alliance
Mount Morgan	Source Water	Colour (True)	PCU	Monthly	12	12	0	14	150	36	1	ALS Group / Symbio Alliance
Mount Morgan	Source Water	Electrical Conductivity	µS/cm	Monthly	12	12	0	221	488	375	1	ALS Group / Symbio Alliance
Mount Morgan	Source Water	Magnesium	mg/L	Monthly	12	12	0	9	20	16	1	ALS Group / Symbio Alliance
Mount Morgan	Source Water	Nitrite	mg/L	Monthly	11	8	0	<0.01	0.03	<0.01	0.01	ALS Group / Symbio Alliance
Mount Morgan	Source Water	Potassium	mg/L	Monthly	12	9	0	<1	2	1	1	ALS Group / Symbio Alliance
Mount Morgan	Source Water	Sodium	mg/L	Monthly	12	12	0	21	39	32	1	ALS Group / Symbio Alliance
Mount Morgan	Source Water	Total Dissolved Solids	mg/L	Monthly	12	12	0	130	315	232	10	ALS Group / Symbio Alliance
Mount Morgan	Source Water	Total Hardness	mg/L	Monthly	12	12	0	70	155	121	1	ALS Group / Symbio Alliance
Mount Morgan	Source Water	Total Organic Carbon	mg/L	Quarterly	4	2	0	<1	8	4	1	ALS Group / Symbio Alliance
Mount Morgan	Source Water	Arsenic	mg/L	Annually	1	1	0	0.001	0.001	0.001	0.001	ALS Group / Symbio Alliance
Mount Morgan	Source Water	Cadmium	mg/L	Annually	1	1	0	0.0003	0.0003	0.0003	0.0001	ALS Group / Symbio Alliance
Mount Morgan	Source Water	Chromium	mg/L	Annually	1	0	0	<0.001	<0.001	<0.001	0.001	ALS Group / Symbio Alliance
Mount Morgan	Source Water	Nickel	mg/L	Annually	1	1	0	0.004	0.004	0.004	0.001	ALS Group / Symbio Alliance
Mount Morgan	Source Water	Selenium	mg/L	Annually	1	0	0	<0.01	<0.01	<0.01	0.01	ALS Group / Symbio Alliance
Mount Morgan	Source Water	Mercury	mg/L	Annually	1	0	0	<0.0001	<0.0001	<0.0001	0.0001	ALS Group / Symbio Alliance

Mount Morgan	Source Water	pH	pH Units	Daily	109	109	0	5.73	8.24	7.29	0.01	Inhouse
Mount Morgan	Source Water	Turbidity	NTU	Daily	114	114	0	1.1	16.8	4.0	0.1	Inhouse
Mount Morgan	Source Water	pH	pH Units	Continuous			0	6.93	8.21	7.59	0.01	Inhouse - Telemetry
Mount Morgan	Source Water	Turbidity	NTU	Continuous			0	0.80	999.53	197.94	0.01	Inhouse - Telemetry
Mount Morgan	Source Water	Electrical Conductivity	µS/cm	Continuous			0	122.95	526.74	393.61	0.01	Inhouse - Telemetry
Mount Morgan	Water treatment Plant	Nitrate	mg/L	Monthly	12	12	0	0.04	0.35	0.11	0.01	ALS Group / Symbio Alliance
Mount Morgan	Water treatment Plant	Sulphate	mg/L	Monthly	12	12	0	25	46	39	1	ALS Group / Symbio Alliance
Mount Morgan	Water treatment Plant	Trihalomethanes	µg/L	Quarterly	4	4	0	109	135	122	5	ALS Group / Symbio Alliance
Mount Morgan	Water treatment Plant	Fluoride	mg/L	Monthly	12	4	0	<0.1	0.1	<0.1	0.1	ALS Group / Symbio Alliance
Mount Morgan	Water treatment Plant	Aluminium (Acid Soluble)	mg/L	Monthly	12	12	0	0.042	0.705	0.460	0.005	ALS Group / Symbio Alliance
Mount Morgan	Water treatment Plant	Copper	mg/L	Monthly	11	10	0	<0.01	0.013	0.004	0.001	ALS Group / Symbio Alliance
Mount Morgan	Water treatment Plant	Iron	mg/L	Monthly	12	3	0	<0.05	0.03	<0.05	0.05	ALS Group / Symbio Alliance
Mount Morgan	Water treatment Plant	Lead	mg/L	Monthly	12	1	0	<0.001	<0.02	<0.001	0.001	ALS Group / Symbio Alliance
Mount Morgan	Water treatment Plant	Manganese	mg/L	Monthly	12	12	0	0.002	0.119	0.014	0.001	ALS Group / Symbio Alliance
Mount Morgan	Water treatment Plant	Zinc	mg/L	Monthly	12	6	0	<0.005	0.012	0.008	0.005	ALS Group / Symbio Alliance
Mount Morgan	Water treatment Plant	pH	pH unit	Monthly	12	12	0	7.21	8.41	8.06	0.01	ALS Group / Symbio Alliance
Mount Morgan	Water treatment Plant	Turbidity	NTU	Monthly	12	12	0	0.6	3.9	1.5	0.1	ALS Group / Symbio Alliance
Mount Morgan	Water treatment Plant	Alkalinity, Total	mg/L	Monthly	12	12	0	66	145	111	1	ALS Group / Symbio Alliance
Mount Morgan	Water treatment Plant	Calcium	mg/L	Monthly	12	12	0	14	28	23	1	ALS Group / Symbio Alliance
Mount Morgan	Water treatment Plant	Chloride	mg/L	Monthly	12	12	0	38	74	59	1	ALS Group / Symbio Alliance
Mount Morgan	Water treatment Plant	Colour (True)	PCU	Monthly	12	12	0	2	7	5	1	ALS Group / Symbio Alliance

Mount Morgan	Water treatment Plant	Electrical Conductivity	µS/cm	Monthly	12	12	0	346	610	460	1	ALS Group / Symbio Alliance
Mount Morgan	Water treatment Plant	Magnesium	mg/L	Monthly	12	12	0	10	20	16	1	ALS Group / Symbio Alliance
Mount Morgan	Water treatment Plant	Nitrite	mg/L	Monthly	11	0	0	<0.01	<0.01	<0.01	0.01	ALS Group / Symbio Alliance
Mount Morgan	Water treatment Plant	Potassium	mg/L	Monthly	12	11	0	<1	2	1	1	ALS Group / Symbio Alliance
Mount Morgan	Water treatment Plant	Sodium	mg/L	Monthly	12	12	0	40	60	50	1	ALS Group / Symbio Alliance
Mount Morgan	Water treatment Plant	Total Dissolved Solids	mg/L	Monthly	12	12	0	130	347	273	10	ALS Group / Symbio Alliance
Mount Morgan	Water treatment Plant	Total Hardness	mg/L	Monthly	12	12	0	76	152	122	1	ALS Group / Symbio Alliance
Mount Morgan	Water treatment Plant	Total Organic Carbon	mg/L	Quarterly	4	2	0	<1	4	2	1	ALS Group / Symbio Alliance
Mount Morgan	Water treatment Plant	Arsenic	mg/L	Annually	1	0	0	<0.001	<0.001	<0.001	0.001	ALS Group / Symbio Alliance
Mount Morgan	Water treatment Plant	Cadmium	mg/L	Annually	1	0	0	<0.0001	<0.0001	<0.0001	0.0001	ALS Group / Symbio Alliance
Mount Morgan	Water treatment Plant	Chromium	mg/L	Annually	1	0	0	<0.001	<0.001	<0.001	0.001	ALS Group / Symbio Alliance
Mount Morgan	Water treatment Plant	Nickel	mg/L	Annually	1	0	0	<0.001	<0.001	<0.001	0.001	ALS Group / Symbio Alliance
Mount Morgan	Water treatment Plant	Selenium	mg/L	Annually	1	0	0	<0.01	<0.01	<0.01	0.01	ALS Group / Symbio Alliance
Mount Morgan	Water treatment Plant	Mercury	mg/L	Annually	1	0	0	<0.0001	<0.0001	<0.0001	0.0001	ALS Group / Symbio Alliance
Mount Morgan	Water treatment Plant	Chlorine (free)	mg/L	Daily	365	365	0	0.35	2.03	1.22	0.01	Inhouse
Mount Morgan	Water treatment Plant	pH	pH Units	Daily	365	365	0	6.69	7.81	7.33	0.01	Inhouse
Mount Morgan	Water treatment Plant	Turbidity	NTU	Daily	365	360	0	0.2	4.0	0.6	0.1	Inhouse
Mount Morgan	Water treatment Plant	pH	pH Units	Continuous			0	6.12	9.16	6.91	0.01	Inhouse - Telemetry
Mount Morgan	Water treatment Plant	Turbidity	NTU	Continuous			0	0.5	4.2	1.3	0.1	Inhouse - Telemetry
Mount Morgan	Reticulation	Escherichia coli (E.coli)	MPN/100mL	Weekly	106	0	0	<1	<1	<1		Ecoscope Environmental
Mount Morgan	Reticulation	Chlorine (free)	mg/L	Weekly	106	106	0	0.01	2.12	0.98	0.01	Inhouse

Mount Morgan	Reticulation	Trihalomethanes	ug/L	Quarterly	4	4	0	136	202	161	5	ALS Group / Symbio Alliance
Capricorn Coast	Source Water	Nitrate	mg/L	Monthly	6	1	0	<0.01	6.00	<0.01	0.01	ALS Group / Symbio Alliance
Capricorn Coast	Source Water	Sulphate	mg/L	Monthly	6	6	0	2	4	3	1	ALS Group / Symbio Alliance
Capricorn Coast	Source Water	Fluoride	mg/L	Monthly	6	0	0	<0.1	<0.1	<0.1	0.1	ALS Group / Symbio Alliance
Capricorn Coast	Source Water	Aluminium (Acid Soluble)	mg/L	Monthly	6	4	0	<0.005	0.078	0.045	0.005	ALS Group / Symbio Alliance
Capricorn Coast	Source Water	Copper	mg/L	Monthly	6	6	0	0.030	0.280	0.112	0.001	ALS Group / Symbio Alliance
Capricorn Coast	Source Water	Iron	mg/L	Monthly	6	6	0	0.61	2.97	1.13	0.05	ALS Group / Symbio Alliance
Capricorn Coast	Source Water	Lead	mg/L	Monthly	6	1	0	<0.001	<0.001	<0.001	0.001	ALS Group / Symbio Alliance
Capricorn Coast	Source Water	Manganese	mg/L	Monthly	6	6	0	0.010	0.064	0.022	0.001	ALS Group / Symbio Alliance
Capricorn Coast	Source Water	Zinc	mg/L	Monthly	6	5	0	<0.005	0.012	0.008	0.005	ALS Group / Symbio Alliance
Capricorn Coast	Source Water	pH	pH unit	Monthly	6	6	0	6.59	6.97	6.79	0.01	ALS Group / Symbio Alliance
Capricorn Coast	Source Water	Turbidity	NTU	Monthly	6	6	0	1.9	4.4	3.4	0.1	ALS Group / Symbio Alliance
Capricorn Coast	Source Water	Alkalinity, Total	mg/L	Monthly	6	6	0	5	10	7	1	ALS Group / Symbio Alliance
Capricorn Coast	Source Water	Calcium	mg/L	Monthly	6	6	0	1	2	2	1	ALS Group / Symbio Alliance
Capricorn Coast	Source Water	Chloride	mg/L	Monthly	6	6	0	24	36	30	1	ALS Group / Symbio Alliance
Capricorn Coast	Source Water	Colour (True)	PCU	Monthly	6	6	0	30	80	40	1	ALS Group / Symbio Alliance
Capricorn Coast	Source Water	Electrical Conductivity	µS/cm	Monthly	6	6	0	118	129	122	1	ALS Group / Symbio Alliance
Capricorn Coast	Source Water	Magnesium	mg/L	Monthly	6	6	0	2	3	2	1	ALS Group / Symbio Alliance
Capricorn Coast	Source Water	Nitrite	mg/L	Monthly	6	0	0	<0.01	<0.01	<0.01	0.01	ALS Group / Symbio Alliance
Capricorn Coast	Source Water	Potassium	mg/L	Monthly	6	0	0	<1	<1	<1	1	ALS Group / Symbio Alliance
Capricorn Coast	Source Water	Sodium	mg/L	Monthly	6	6	0	17	18	18	1	ALS Group / Symbio Alliance

Capricorn Coast	Source Water	Total Dissolved Solids	mg/L	Monthly	6	6	0	77	104	90	10	ALS Group / Symbio Alliance
Capricorn Coast	Source Water	Total Hardness	mg/L	Monthly	6	6	0	11	17	13	1	ALS Group / Symbio Alliance
Capricorn Coast	Source Water	Total Organic Carbon	mg/L	Quarterly	2	2	0	5	5	5	1	ALS Group / Symbio Alliance
Capricorn Coast	Source Water	Arsenic	mg/L	Annually	1	0	0	<0.001	<0.001	<0.001	0.001	ALS Group / Symbio Alliance
Capricorn Coast	Source Water	Cadmium	mg/L	Annually	1	0	0	<0.0001	<0.0001	<0.0001	0.0001	ALS Group / Symbio Alliance
Capricorn Coast	Source Water	Chromium	mg/L	Annually	1	0	0	<0.001	<0.001	<0.001	0.001	ALS Group / Symbio Alliance
Capricorn Coast	Source Water	Nickel	mg/L	Annually	1	0	0	<0.001	<0.001	<0.001	0.001	ALS Group / Symbio Alliance
Capricorn Coast	Source Water	Selenium	mg/L	Annually	1	0	0	<0.01	<0.01	<0.01	0.01	ALS Group / Symbio Alliance
Capricorn Coast	Source Water	Mercury	mg/L	Annually	1	0	0	<0.0001	<0.0001	<0.0001	0.0001	ALS Group / Symbio Alliance
Capricorn Coast	Source Water	pH	pH Units	Daily	184	184	0	6.10	7.20	6.52	0.01	Inhouse
Capricorn Coast	Source Water	Turbidity	NTU	Daily	183	183	0	0.9	4.5	1.9	0.1	Inhouse
Capricorn Coast	Water treatment Plant	Nitrate	mg/L	Monthly	6	5	0	<0.01	0.06	0.03	0.01	ALS Group / Symbio Alliance
Capricorn Coast	Water treatment Plant	Sulphate	mg/L	Monthly	6	6	0	22	32	28	1	ALS Group / Symbio Alliance
Capricorn Coast	Water treatment Plant	Trihalomethanes	ug/L	Quarterly	2	2	0	22	32	27	5	ALS Group / Symbio Alliance
Capricorn Coast	Water treatment Plant	Fluoride	mg/L	Monthly	6	0	0	<0.01	<0.1	<0.1	0.1	ALS Group / Symbio Alliance
Capricorn Coast	Water treatment Plant	Aluminium (Acid Soluble)	mg/L	Monthly	6	5	0	<0.005	0.019	0.010	0.005	ALS Group / Symbio Alliance
Capricorn Coast	Water treatment Plant	Copper	mg/L	Monthly	6	6	0	0.004	0.010	0.008	0.001	ALS Group / Symbio Alliance
Capricorn Coast	Water treatment Plant	Iron	mg/L	Monthly	6	0	0	<0.05	<0.05	<0.05	0.05	ALS Group / Symbio Alliance
Capricorn Coast	Water treatment Plant	Lead	mg/L	Monthly	6	0	0	<0.001	<0.001	<0.001	0.001	ALS Group / Symbio Alliance
Capricorn Coast	Water treatment Plant	Manganese	mg/L	Monthly	6	6	0	0.002	0.006	0.004	0.001	ALS Group / Symbio Alliance
Capricorn Coast	Water treatment Plant	Zinc	mg/L	Monthly	6	2	0	<0.005	0.013	<0.005	0.005	ALS Group / Symbio Alliance

Capricorn Coast	Water treatment Plant	pH	pH unit	Monthly	6	6	0	7.23	7.46	7.32	0.01	ALS Group / Symbio Alliance
Capricorn Coast	Water treatment Plant	Turbidity	NTU	Monthly	6	6	0	0.6	1.2	0.9	0.1	ALS Group / Symbio Alliance
Capricorn Coast	Water treatment Plant	Alkalinity, Total	mg/L	Monthly	6	6	0	6	14	11	1	ALS Group / Symbio Alliance
Capricorn Coast	Water treatment Plant	Calcium	mg/L	Monthly	6	6	0	11	12	12	1	ALS Group / Symbio Alliance
Capricorn Coast	Water treatment Plant	Chloride	mg/L	Monthly	6	6	0	27	38	32	1	ALS Group / Symbio Alliance
Capricorn Coast	Water treatment Plant	Colour (True)	PCU	Monthly	6	6	0	3	6	4	1	ALS Group / Symbio Alliance
Capricorn Coast	Water treatment Plant	Electrical Conductivity	µS/cm	Monthly	6	6	0	188	208	198	1	ALS Group / Symbio Alliance
Capricorn Coast	Water treatment Plant	Magnesium	mg/L	Monthly	6	6	0	2	2	2	1	ALS Group / Symbio Alliance
Capricorn Coast	Water treatment Plant	Nitrite	mg/L	Monthly	6	0	0	<0.01	<0.01	<0.01	0.01	ALS Group / Symbio Alliance
Capricorn Coast	Water treatment Plant	Potassium	mg/L	Monthly	6	0	0	<1	<1	<1	1	ALS Group / Symbio Alliance
Capricorn Coast	Water treatment Plant	Sodium	mg/L	Monthly	6	6	0	21	25	22	1	ALS Group / Symbio Alliance
Capricorn Coast	Water treatment Plant	Total Dissolved Solids	mg/L	Monthly	6	6	0	114	183	138	10	ALS Group / Symbio Alliance
Capricorn Coast	Water treatment Plant	Total Hardness	mg/L	Monthly	6	6	0	33	38	37	1	ALS Group / Symbio Alliance
Capricorn Coast	Water treatment Plant	Total Organic Carbon	mg/L	Quarterly	2	2	0	2	3	3	1	ALS Group / Symbio Alliance
Capricorn Coast	Water treatment Plant	Arsenic	mg/L	Annually	1	0	0	<0.001	<0.001	<0.001	0.001	ALS Group / Symbio Alliance
Capricorn Coast	Water treatment Plant	Cadmium	mg/L	Annually	1	0	0	<0.0001	<0.0001	<0.0001	0.0001	ALS Group / Symbio Alliance
Capricorn Coast	Water treatment Plant	Chromium	mg/L	Annually	1	0	0	<0.001	<0.001	<0.001	0.001	ALS Group / Symbio Alliance
Capricorn Coast	Water treatment Plant	Nickel	mg/L	Annually	1	0	0	<0.001	<0.001	<0.001	0.001	ALS Group / Symbio Alliance
Capricorn Coast	Water treatment Plant	Selenium	mg/L	Annually	1	0	0	<0.01	<0.01	<0.01	0.01	ALS Group / Symbio Alliance
Capricorn Coast	Water treatment Plant	Mercury	mg/L	Annually	1	0	0	<0.0001	<0.0001	<0.0001	0.0001	ALS Group / Symbio Alliance
Capricorn Coast	Water treatment Plant	Chlorine (free)	mg/L	Daily	184	184	0	0.80	2.20	1.71	0.01	Inhouse

Capricorn Coast	Water treatment Plant	pH	pH Units	Daily	184	184	0	6.50	7.80	7.36	0.01	Inhouse
Capricorn Coast	Water treatment Plant	Turbidity	NTU	Daily	183	183	0	0.1	1.2	0.2	0.1	Inhouse
Capricorn Coast	Water treatment Plant	Chlorine (free)	mg/L	Continuous			0	1.29	2.07	1.82	0.01	Inhouse - Telemetry
Capricorn Coast	Water treatment Plant	pH	pH Units	Continuous			0	6.88	7.68	7.40	0.01	Inhouse - Telemetry
Capricorn Coast	Water treatment Plant	Turbidity	NTU	Continuous			0	0.13	0.24	0.16	0.01	Inhouse - Telemetry
Capricorn Coast	Reticulation	Escherichia coli (E.coli)	MPN/100mL	Weekly	130	0	0	<1	<1	<1		Ecoscope Environmental
Capricorn Coast	Reticulation	Chlorine (free)	mg/L	Weekly	130	130	0	0.10	2.04	0.89	0.01	Inhouse
Capricorn Coast	Water treatment Plant	Trihalomethanes	ug/L	Quarterly	2	2	0	101	103	102	5	ALS Group / Symbio Alliance
Marlborough	Source Water	Nitrate	mg/L	Monthly	6	6	0	0.64	0.71	0.67	0.01	ALS Group / Symbio Alliance
Marlborough	Source Water	Sulphate	mg/L	Monthly	6	6	0	24	28	25	1	ALS Group / Symbio Alliance
Marlborough	Source Water	Fluoride	mg/L	Monthly	6	6	0	0.1	0.2	0.1	0.1	ALS Group / Symbio Alliance
Marlborough	Source Water	Aluminium (Acid Soluble)	mg/L	Monthly	6	0	0	<0.005	<0.005	<0.005	0.005	ALS Group / Symbio Alliance
Marlborough	Source Water	Copper	mg/L	Monthly	6	6	0	0.002	0.004	0.003	0.001	ALS Group / Symbio Alliance
Marlborough	Source Water	Iron	mg/L	Monthly	6	0	0	<0.05	<0.05	<0.05	0.05	ALS Group / Symbio Alliance
Marlborough	Source Water	Lead	mg/L	Monthly	6	0	0	<0.001	<0.001	<0.001	0.001	ALS Group / Symbio Alliance
Marlborough	Source Water	Manganese	mg/L	Monthly	6	0	0	<0.001	<0.001	<0.001	0.001	ALS Group / Symbio Alliance
Marlborough	Source Water	Zinc	mg/L	Monthly	6	6	0	0.007	0.018	0.011	0.005	ALS Group / Symbio Alliance
Marlborough	Source Water	pH	pH unit	Monthly	6	6	0	7.84	8.37	8.08	0.01	ALS Group / Symbio Alliance
Marlborough	Source Water	Turbidity	NTU	Monthly	6	6	0	0.4	1.4	1.0	0.1	ALS Group / Symbio Alliance
Marlborough	Source Water	Alkalinity, Total	mg/L	Monthly	6	6	0	406	463	424	1	ALS Group / Symbio Alliance
Marlborough	Source Water	Calcium	mg/L	Monthly	6	6	0	24	25	24	1	ALS Group / Symbio Alliance

Marlborough	Source Water	Chloride	mg/L	Monthly	6	6	0	176	212	198	1	ALS Group / Symbio Alliance
Marlborough	Source Water	Colour (True)	PCU	Monthly	6	6	0	3	5	4	1	ALS Group / Symbio Alliance
Marlborough	Source Water	Electrical Conductivity	µS/cm	Monthly	6	6	0	1180	1380	1310	1	ALS Group / Symbio Alliance
Marlborough	Source Water	Magnesium	mg/L	Monthly	6	6	0	96	102	100	1	ALS Group / Symbio Alliance
Marlborough	Source Water	Nitrite	mg/L	Monthly	6	0	0	<0.01	<0.01	<0.01	0.01	ALS Group / Symbio Alliance
Marlborough	Source Water	Potassium	mg/L	Monthly	6	1	0	<1	1	<1	1	ALS Group / Symbio Alliance
Marlborough	Source Water	Sodium	mg/L	Monthly	6	6	0	106	119	113	1	ALS Group / Symbio Alliance
Marlborough	Source Water	Total Dissolved Solids	mg/L	Monthly	6	6	0	699	896	749	10	ALS Group / Symbio Alliance
Marlborough	Source Water	Total Hardness	mg/L	Monthly	6	6	0	455	482	473	1	ALS Group / Symbio Alliance
Marlborough	Source Water	Total Organic Carbon	mg/L	Quarterly	2	2	0	9	10	10	1	ALS Group / Symbio Alliance
Marlborough	Source Water	Arsenic	mg/L	Annually	1	1	0	0.002	0.002	0.002	0.001	ALS Group / Symbio Alliance
Marlborough	Source Water	Cadmium	mg/L	Annually	1	0	0	<0.0001	<0.0001	<0.0001	0.0001	ALS Group / Symbio Alliance
Marlborough	Source Water	Chromium	mg/L	Annually	1	1	0	0.005	0.005	0.005	0.001	ALS Group / Symbio Alliance
Marlborough	Source Water	Nickel	mg/L	Annually	1	0	0	<0.001	<0.001	<0.001	0.001	ALS Group / Symbio Alliance
Marlborough	Source Water	Selenium	mg/L	Annually	1	0	0	<0.01	<0.01	<0.01	0.01	ALS Group / Symbio Alliance
Marlborough	Source Water	Mercury	mg/L	Annually	1	0	0	<0.0001	<0.0001	<0.0001	0.0001	ALS Group / Symbio Alliance
Marlborough	Water treatment Plant	Nitrate	mg/L	Monthly	6	5	0	<0.01	0.41	0.36	0.01	ALS Group / Symbio Alliance
Marlborough	Water treatment Plant	Sulphate	mg/L	Monthly	6	6	0	7	12	10	1	ALS Group / Symbio Alliance
Marlborough	Water treatment Plant	Trihalomethanes	µg/L	Quarterly	2	1	0	<5	8	7	5	ALS Group / Symbio Alliance
Marlborough	Water treatment Plant	Fluoride	mg/L	Monthly	6	0	0	<0.1	<0.1	<0.1	0.1	ALS Group / Symbio Alliance
Marlborough	Water treatment Plant	Aluminium (Acid Soluble)	mg/L	Monthly	6	0	0	<0.005	<0.005	<0.005	0.005	ALS Group / Symbio Alliance

Marlborough	Water treatment Plant	Copper	mg/L	Monthly	6	6	0	0.008	0.012	0.011	0.001	ALS Group / Symbio Alliance
Marlborough	Water treatment Plant	Iron	mg/L	Monthly	6	0	0	<0.05	<0.05	<0.05	0.05	ALS Group / Symbio Alliance
Marlborough	Water treatment Plant	Lead	mg/L	Monthly	6	1	0	<0.001	0.001	<0.001	0.001	ALS Group / Symbio Alliance
Marlborough	Water treatment Plant	Manganese	mg/L	Monthly	6	1	0	<0.001	0.001	<0.001	0.001	ALS Group / Symbio Alliance
Marlborough	Water treatment Plant	Zinc	mg/L	Monthly	6	4	0	<0.005	0.017	0.008	0.005	ALS Group / Symbio Alliance
Marlborough	Water treatment Plant	pH	pH unit	Monthly	6	6	0	7.65	8.34	8.00	0.01	ALS Group / Symbio Alliance
Marlborough	Water treatment Plant	Turbidity	NTU	Monthly	6	6	0	0.3	1.1	0.6	0.1	ALS Group / Symbio Alliance
Marlborough	Water treatment Plant	Alkalinity, Total	mg/L	Monthly	6	6	0	124	209	173	1	ALS Group / Symbio Alliance
Marlborough	Water treatment Plant	Calcium	mg/L	Monthly	6	6	0	6	10	9	1	ALS Group / Symbio Alliance
Marlborough	Water treatment Plant	Chloride	mg/L	Monthly	6	6	0	52	95	76	1	ALS Group / Symbio Alliance
Marlborough	Water treatment Plant	Colour (True)	PCU	Monthly	6	6	0	2	5	4	1	ALS Group / Symbio Alliance
Marlborough	Water treatment Plant	Electrical Conductivity	µS/cm	Monthly	6	6	0	420	658	550	1	ALS Group / Symbio Alliance
Marlborough	Water treatment Plant	Magnesium	mg/L	Monthly	6	6	0	28	46	39	1	ALS Group / Symbio Alliance
Marlborough	Water treatment Plant	Nitrite	mg/L	Monthly	6	2	0	<0.01	0.38	<0.01	0.01	ALS Group / Symbio Alliance
Marlborough	Water treatment Plant	Potassium	mg/L	Monthly	6	0	0	<1	<1	<1	1	ALS Group / Symbio Alliance
Marlborough	Water treatment Plant	Sodium	mg/L	Monthly	6	6	0	38	56	48	1	ALS Group / Symbio Alliance
Marlborough	Water treatment Plant	Total Dissolved Solids	mg/L	Monthly	6	6	0	223	356	310	10	ALS Group / Symbio Alliance
Marlborough	Water treatment Plant	Total Hardness	mg/L	Monthly	6	6	0	130	214	182	1	ALS Group / Symbio Alliance
Marlborough	Water treatment Plant	Total Organic Carbon	mg/L	Quarterly	2	0	0	<1	<1	<1	1	ALS Group / Symbio Alliance
Marlborough	Water treatment Plant	Arsenic	mg/L	Annually	1	0	0	<0.001	<0.001	<0.001	0.001	ALS Group / Symbio Alliance
Marlborough	Water treatment Plant	Cadmium	mg/L	Annually	1	0	0	<0.0001	<0.0001	<0.0001	0.0001	ALS Group / Symbio Alliance

Marlborough	Water treatment Plant	Chromium	mg/L	Annually	1	1	0	0.002	0.002	0.002	0.001	ALS Group / Symbio Alliance
Marlborough	Water treatment Plant	Nickel	mg/L	Annually	1	0	0	<0.001	<0.001	<0.001	0.001	ALS Group / Symbio Alliance
Marlborough	Water treatment Plant	Selenium	mg/L	Annually	1	0	0	<0.01	<0.01	<0.01	0.01	ALS Group / Symbio Alliance
Marlborough	Water treatment Plant	Mercury	mg/L	Annually	1	0	0	<0.0001	<0.0001	<0.0001	0.0001	ALS Group / Symbio Alliance
Marlborough	Water treatment Plant	Chlorine (free)	mg/L	Continuous			0	0.41	0.99	0.79	0.01	Inhouse - Telemetry
Marlborough	Water treatment Plant	pH	pH Units	Continuous			0	6.92	7.45	7.19	0.01	Inhouse - Telemetry
Marlborough	Water treatment Plant	Turbidity	NTU	Continuous			0	0.00	0.31	0.02	0.01	Inhouse - Telemetry
Marlborough	Water treatment Plant	Electrical Conductivity	µS/cm	Continuous			0	292	513	423	1	Inhouse - Telemetry
Marlborough	Reticulation	Escherichia coli (E.coli)	MPN/100mL	Weekly	50	0	0	<1	<1	<1		Ecoscope Environmental
Marlborough	Reticulation	Chlorine (free)	mg/L	Weekly	51	51	0	0.23	1.26	0.65	0.01	Inhouse
Marlborough	Reticulation	Trihalomethanes	ug/L	Quarterly	2	1	0	<5	5	5	5	ALS Group / Symbio Alliance

Table 5 - Reticulation *E. coli* verification monitoring

Drinking water scheme: Rockhampton Water Supply Scheme

Year	***July 2013 to June 2014***											
Month	***Jul***	***Aug***	***Sept***	***Oct***	***Nov***	***Dec***	***Jan***	***Feb***	***Mar***	***Apr***	***May***	***Jun***
No. of samples collected	40	32	40	32	32	32	40	32	40	32	32	40
No. of samples collected in which *E. coli* is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	424	416	424	416	416	416	416	416	424	416	416	424
No. of failures for previous 12 month period	1	1	1	1	1	1	1	1	1	0	0	0
% of samples that comply	99.8%	99.8%	99.8%	99.8%	99.8%	99.8%	99.8%	99.8%	99.8%	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: Mount Morgan Water Supply Scheme

Year	*July 2013 to June 2014*											
Month	***Jul***	***Aug***	***Sept***	***Oct***	***Nov***	***Dec***	***Jan***	***Feb***	***Mar***	***Apr***	***May***	***Jun***
No. of samples collected	10	8	10	8	8	8	10	8	10	8	8	10
No. of samples collected in which *E. coli* is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	104	100	102	100	102	104	104	104	106	104	104	106
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: Capricorn Coast Water Supply Scheme

Year	*July to December 2013*											
Month	***Jul***	***Aug***	***Sept***	***Oct***	***Nov***	***Dec***	***Jan***	***Feb***	***Mar***	***Apr***	***May***	***Jun***
No. of samples collected	25	20	25	20	20	20						
No. of samples collected in which *E. coli* is detected (i.e. a failure)	0	0	0	0	0	0						
No. of samples collected in previous 12 month period	254	260	265	260	260	260						
No. of failures for previous 12 month period	0	0	0	0	0	0						
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%						
Compliance with 98% annual value	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: Marlborough Water Supply Scheme

Year	*July to December 2013*											
Month	***Jul***	***Aug***	***Sept***	***Oct***	***Nov***	***Dec***	***Jan***	***Feb***	***Mar***	***Apr***	***May***	***Jun***
No. of samples collected	10	8	10	8	7	7						
No. of samples collected in which *E. coli* is detected (i.e. a failure)	0	0	0	0	0	0						
No. of samples collected in previous 12 month period	104	104	106	104	103	102						
No. of failures for previous 12 month period	0	0	0	0	0	0						
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%						
Compliance with 98% annual value	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

The information provided in Table 4 describes significant progress that has been made during this reporting period towards the completion of specific actions identified in the Risk Management Improvement Program included in the original DWQMP.

Table 1 – Progress against the risk management improvement program in the approved DWQMP during this reporting period.

Risk No.	Scheme Component / Sub-component	Action(s)	Target date/s	Status as at 30 June 2014	(If implementing these actions will take longer than anticipated, please provide detail, as it may affect the approved DWQMP)
R08	Source – Contamination of raw water Excessive E.C. or TDS	Continue to lobby regulator for tighter water quality limits on mine water discharges.	Ongoing (as required)	Continuing as required	As this is an ongoing matter, it is anticipated that the action will continue to form part of the RMIP
R13	Treatment – Lack of effective treatment Viral Pathogens	Perform testing for viruses for further confirmation of process effectiveness.	30/09/2012 (Planning)	Deferred	This action has been deferred based on the current ADWG and pending any future changes through the development of health based targets for water quality monitoring.
CC13	Treatment – Lack of effective treatment Viral Pathogens	Perform testing for viruses for further confirmation of process effectiveness.	30/09/2012 (Planning)	Deferred	This action has been deferred based on the current ADWG and pending any future changes through the development of health based targets for water quality monitoring.
CC25	Distribution – Reservoir Contamination Bacterial Pathogens	Install additional automated rechlorination at Pacific Heights Reservoir to avoid need for manual dosing at this site.	31/12/2012 (Planning)	Budget planning and budget allocation secured for project commencement via installation of on-line free chlorine analysis	Project transferred to Livingstone Shire Council for completion post-deamalgamation.
CC27	Distribution – Reservoir Contamination Viral Pathogens	Install additional automated rechlorination at Pacific Heights Reservoir to avoid need for manual dosing at this site.	31/12/2012 (Planning)	Budget planning and budget allocation secured for project commencement via installation of on-line free chlorine analysis	Project transferred to Livingstone Shire Council for completion post-deamalgamation.
MM14	Treatment – Lack of effective treatment Viral Pathogens	Complete installation of automated chlorination and on-line chlorine analysis. Perform testing for viruses for further confirmation of process effectiveness.	30/09/2012 (Planning)	New chlorination facility completed before this period commenced, but virus testing deferred.	This action has been deferred based on the current ADWG and pending any future changes through the development of health based targets for water quality

Risk No.	Scheme Component / Sub-component	Action(s)	Target date/s	Status as at 30 June 2014	(If implementing these actions will take longer than anticipated, please provide detail, as it may affect the approved DWQMP)
					monitoring.
MM20	Treatment – Process control failure Coagulant Underdose	Convert coagulant dosing to liquid alum to allow for on-line flow metering and better measurement of chemical usage.	31/12/2012 (Planning)	Budget secured and project well underway with completion schedule for 2014-15 reporting year.	The completion of the project has been delayed due to some design issues associated with the location of the chemical storage tank. This has now been resolved.
MM26	Distribution – Reservoir contamination Bacterial Pathogens	Complete the installation of automated chlorination at the North St Reservoir site to allow for continuous monitoring and alarming to alert operator of incorrect dosing.	30/09/2012	Budget secured for completion of this project with installation work 90% complete.	Project delayed due to some technical issues, although project now completed as at July2014
MM28	Distribution – Reservoir contamination Viral Pathogens	Complete the installation of automated chlorination at the North St Reservoir site to allow for continuous monitoring and alarming to alert operator of incorrect dosing.	30/09/2012	Budget secured for completion of this project with installation work 90% complete.	Project delayed due to some technical issues, although project now completed as at July2014
MM32	Distribution – Sabotage or Terrorism Toxic agent	Identify high risk sites and install CCTV at these sites.	30/06/2013 (Planning)	Budget planning completed for 2014-15 year.	Completion expected in 2014-15 reporting period.
MM33	Distribution – Process control failure Chlorine Underdose	Complete the installation of automated chlorination at the North St Reservoir site to allow for continuous monitoring and alarming to alert operator of incorrect dosing.	30/09/2012	Budget secured for completion of this project with installation work 90% complete.	Project delayed due to some technical issues, although project now completed as at July2014
MM34	Distribution – Process control failure Chlorine Overdose	Complete the installation of automated chlorination at the North St Reservoir site to allow for continuous monitoring and alarming to alert operator of incorrect dosing.	30/09/2012	Budget secured for completion of this project with installation work 90% complete.	Project delayed due to some technical issues, although project now completed as at July2014