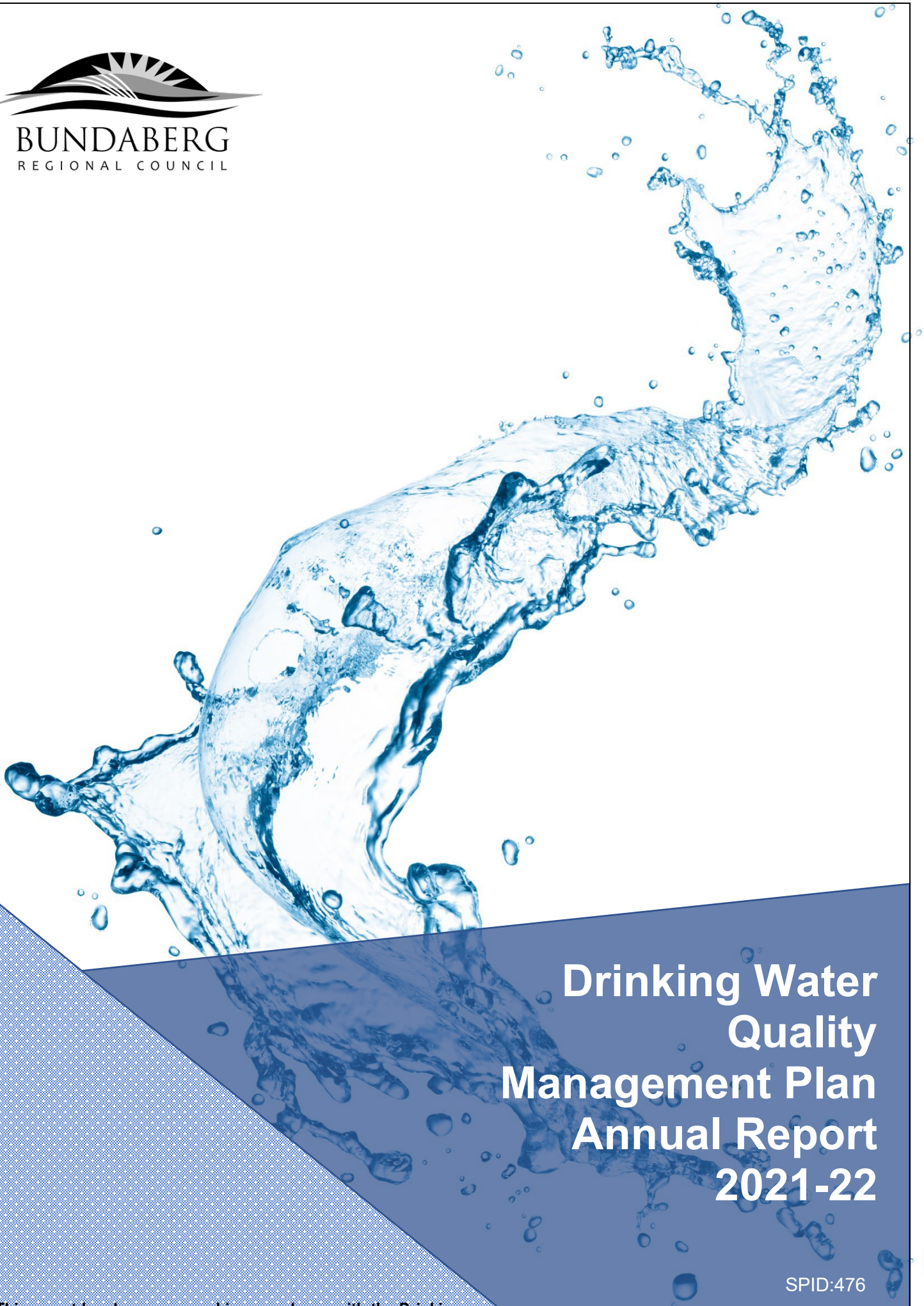
BUNDABERG
REGIONAL COUNCIL



Drinking Water Quality Management Plan Annual Report 2021-22

SPID:476

This report has been prepared in accordance with the Drinking Water Quality Management Plan Report Guidance Note

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1. Service Provider Details

Detail	Information
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LGA covered by this plan	Bundaberg Regional Council
Water Service Schemes covered by this plan	Bundaberg, Kalkie, Gregory River, Gin Gin, Gooburrum, Moore Park, River Park, Rocky Point, Wallaville, Lake Monduran.

2. Glossary of Terms

ADWG 2011	Australian Drinking Water Guidelines (2011) Published by the National Health and Medical Research Council of Australia.
ALS	Australian Laboratory Services
BRC	Bundaberg Regional Council
E. coli	Escherichia coli is a bacterium which is considered to be a superior indicator for detecting faecal contamination which could present a potential health risk.
$CaCO_3$	Calcium Carbonate
CFU/100ml	Colony forming units per 100 millilitres
CCP	Critical Control Point
DAF	Diffused Air Floatation
DRDMW	Department of Regional Development, Manufacturing & Water
DWQMP	Drinking Water Quality Management Plan
F&SS	Forensic & Scientific Services (Queensland Government)
GWTP	Groundwater Treatment Plant/s
IMS	Integrated Management System
LIMS	Laboratory Information Management System
mg/L	Milligrams per litre
MIB	Methylisobomeol, is an organic chemical with a strong odour that can present with an algal bloom
NTU	Nephelometric Turbidity Units
PFAS	Per- and poly - fluoroalkyl substances
QWSR	Queensland Water Supply Regulator
QH	Queensland Health
QCP	Quality Control Point
THM/s	Trihalomethanes are a group of chemicals that may be formed as a by-product when chlorine reacts with organic matter that can be found in some water sources.
TOC	Total Organic Carbon
WSA	Water Service Area
WTP	Water Treatment Plant
<	Less than
>	Greater than
µg/L	Micro-Grams per litre
µS/cm	Micro-Siemens per centimetre

3. Introduction

This is the Drinking Water Quality Management Plan (DWQMP) report for Bundaberg Regional Council (BRC) for the 2021-2022 financial year.

BRC is a registered service provider with identification (SPID) number 476. BRC is operating under an approved DWQMP to ensure consistent supply of safe quality drinking water to protect public health. This is done through proactive identification and minimisation of public health related risks associated with drinking water.

This report documents the performance of BRC's drinking water services with respect to:

- The water quality performance of BRC's drinking water supply,
- The actions undertaken to implement the DWQMP, and
- The information BRC is required to provide to the Queensland Water Supply Regulator (Department of Regional Development, Manufacturing and Water (DRDMW)) in accordance with the *Water Supply (Safety and Reliability) Act 2008* (the Act).

This report is submitted to the Regulator, DRDMW, to fulfil Council's regulatory requirement, and is also made available to customers through Council's website or for inspection upon request at Council offices.

This report has been prepared in accordance with the *Drinking Water Quality Management Plan Report – Guidance Note 2018* and *Drinking Water Quality Management Plan Report Template* published by DRDMW.

4. Overview of Operations

BRC has ten (10) Water Service Areas (WSA) which are zoned in either the Coastal or Hinterland Operational areas. Table 1 below provides a summary of each WSA.

Table 1 - Summary of Schemes

Scheme (Population)	Water Source	Treatment Process	Treatment Capacity (ML/day)	Towns supplied
Coastal Operational Area				
Bundaberg Water Service Area (WSA) (57,035)	Burnett River	Water Treatment Plant (WTP) - PAC Adsorption, coagulation, flocculation, clarification, sedimentation, filtration, and disinfection.	21	Bundaberg City
	Bores: - Heaps St - Peatey St - Lovers Walk - Powers St - Works Depot	Groundwater Treatment Plant (GWTP) - Aeration over limestone process with disinfection	57.6 (combined)	
Kalkie WSA (20,886)	Burnett River via SunWater's Woongarra Main Channel	WTP - Coagulation, flocculation, clarification (DAF), filtration and disinfection	17.3	The Port, Burnett Heads, Bargara, The Hummock, Innes Park, Coral Cove, Elliott Heads, Riverview
	Bundaberg WSA treated water supplement to Hummock reservoirs for consumption within the Kalkie WSA.			
Moore Park WSA (3,142)	SunWater Gooburrum Main Channel	WTP - Coagulation, flocculation, clarification filtration and disinfection	2.16	Moore Park
	Zandes Bores 1 & 2	GWTP - Aeration over limestone process with disinfection		
River Park WSA (321)	SunWater irrigation holding dam	WTP - Coagulation, flocculation, clarification, filtration, and disinfection	1.5	River Park
Rocky Point WSA (224)	Bore	GWTP - Aeration over limestone process with disinfection	0.69	Rocky Point
Gooburrum WSA (142)	Bore	GWTP - Aeration over limestone process with disinfection	1.296	Gooburrum
	Bundaberg WSA treated water supplement			
Hinterland Operational Area				
Gregory River WSA (6,302)	Gregory River	WTP – PAC, flocculation, coagulation, clarification (Inclined Plate Sedimentation Tank), and disinfection	4.3	Childers, Woodgate, Redridge, Forest Ridge, Kinkuna, Goodwood
Gin Gin WSA (1,513)	Gin Gin Creek & SunWater Channel	WTP - coagulation, flocculation, clarification, filtration, and disinfection	1	Gin Gin
Wallaville WSA (256)	Burnett River	WTP - coagulation, flocculation, clarification, filtration, and disinfection	2.5	Wallaville
Lake Monduran WSA (16 Water Connections – 40 people)	Fred Haigh Dam	WTP - coagulation, flocculation, filtration, and disinfection	0.86	Lake Monduran Tourist Park

Figure 1 Overview Map of BRC's WSA's 2021-2022

5. DWQMP Implementation

Council undertook a regular review of the DWQMP in accordance with the Information Notice issued on 29 May 2020. In undertaking this review Council decided to re-shape the plan, making it a more readable, operational document. The reviewed plan captures the commissioning of the new Gregory River Water Treatment Plant and the removal of Gooburrum as a Water Service Area as well as CCP and OCP reviews, supporting documents etc.

As part of the review Council, in consultation with Bligh Tanner Pty Ltd consultants undertook risk assessments in which critical control points and operational control points throughout each of the treatment processes were identified. Limits were then assigned for both internal and reportable exceedances. This process was undertaken with heavy involvement of the water treatment operators. During the review process the opportunity was taken to provide refreshers to the operators re the purpose of the DWQMP, monitoring purposes etc.

The Kalkie Water Treatment Plant upgrade is currently underway with the addition of a Powder Activated Carbon contact chamber, that will assist Council in reducing the occurrence of odour or taste complaints in the water service area.

Appendix B – provides a summary of the actions taken with regards to the Improvement actions captured within Council's Improvement Plan. Actions undertaken during the 2021-2022 financial year Council include:

- Undertaking upgrades to the SCADA network, including authentication and firewall security.
- Installed chlorine analysers to all water treatment plants.
- Beginning construction on the Kalkie WTP.
- Since January 2021 Council has included temperature in all microbiological reticulation sample analysis.

5.1 Revisions made to the operational/verification monitoring

BRC continues to carry out operational monitoring programs across all BRC water schemes, as per the approved DWQMP.

Following the review of the DWQMP, improvement items have been identified for Water Services to review verification sampling locations and review operational monitoring at all plants including OCP/CCP to ensure samples are representative of the processes they are monitoring.

During the undertaking of the verification sampling locations improvement action, Water Services will ensure compliance with the microbiological sampling requirements set by the *Public Health Regulation 2018* and will utalise the Australian Drinking Water Guidelines as a resource document on the methodology in the selection of sample locations.

6. Notification to the Regulator under section 102 & 102A of the Act

During the 2021-2022 financial year there were twelve (12) instances where the Queensland Water Supply Regulator (QWSR) was notified under sections 102 or 102A of the *Water Supply (Safety & Reliability) Act 2008*. The majority of these are detections that were made during routine verification monitoring.

6.1 Non-compliance with the water quality criteria and corrective and preventative actions undertaken

Table 2 summarises the incidents reported to the regulator during the 2021-22 reporting year.

Table 2. Incidents reported to the Regulator 2021-22

Incident Date	Scheme	Parameter	Corrective and Preventive Actions
07/09/2021 03/03/2022	Lake Monduran	THM	The existing configuration of the Lake Monduran WTP can have difficulty in treating elevated levels of organics and therefore, at times, the THM levels in the treated water can exceed the ADWG Health limit of 250µg/L. The WTP only services the Lake Monduran Caravan Park which means that it has a seasonal customer demand. Council is assessing various strategies including possible upgrades to the plant or other treatment technology options. Action taken will be dependent on budget.
07/09/2021	Bundaberg	Lead	Exceedance of the ADWG limit of 0.01 mg/L was detected at two sample sites within the Bundaberg – Works Depot GWTP supply network as part of Council routine sampling program – Dead End Metals. The remaining sample site within this same supply network reported a Lead level of <0.001mg/L. Mains flushes were conducted at both sample locations. A resample from both points reported a Lead level below the ADWG Health Limit. A review of both sample locations resulted in the removal of one sample point from the verification monitoring program as it was no longer deemed a suitable site.
07/09/2021	Kalkie	Lead	Exceedance of the ADWG limit of 0.01 mg/L was detected at one sample site within the Kalkie scheme as part of Council routine sampling program – Dead End Metals. A mains flush was conducted and a resample taken. It was determined that this was an isolated case that it did not represent the water quality within the Kalkie scheme and that it was a result of inadequate flushing of the sample point prior to sample collection. Laboratory sampling staff were reminded of the importance of adequate flushing. It was identified that sample location, due to landowner pressure, was the route issue. Sample locations will be revised in the upcoming review.
8/12/2021	Gregory River	THMs	The treatment process at the old Gregory River WTP did not adequately remove high levels of dissolved organics that maybe present in the raw water. Since the commissioning of the new Gregory River Treatment Plant, the addition of Powder Activated Carbon has seen the THM levels reduce to less than 250 µg/L in the treated water supply.
09/12/2021		Turbidity	Following multiple wet weather events, the turbidity in the raw water supply significantly increased to a level that the treatment plant was unable to filter sufficiently to remove the risk of Pathogen entry into the drinking supply. The suburbs that fall within the Gregory River WSA were put on a Boil Water Notice. This event brought the commissioning of the newly constructed Gregory River WTP forward. Once online the new plants filtration units were able to reduce the turbidity to <0.2NTU in accordance with the ADWGs.
16/12/2021	Wallaville	Turbidity	Following multiple wet weather events, the turbidity in the raw water supply significantly increased to a level that the treatment plant was unable to filter sufficiently to remove the risk of Pathogen entry into the drinking supply. A Boil Water Notice was issued for the Wallaville WSA. Water from the Gin Gin and Bundaberg WSAs was trucked in and used to support the customer demand.
03/03/2022 27/04/2022	Gregory River	Chlorate	Reporting was undertaken in accordance with the Regulators requirement to report the detection of any parameter that does not have a ADWG health limit. Chlorate levels were recorded greater than 0.8mg/L (interim health limit) in the reticulation network. In response to these exceedances' operators undertook routine tank cleaning and increased the frequency of the reservoir's turnover. Council continues to dilute the sodium hypochlorite. Both incidents were closed in June 2022.
28/04/2022	Lake Monduran	Chlorates	Reporting was undertaken in accordance with the Regulators requirement to report the detection of any parameter that does not have a ADWG health limit. Chlorate levels were recorded greater than 0.8mg/L (interim health limit) in the reticulation network. In response to these exceedances' operators undertook routine tank cleaning.
08/06/2022	Bundaberg	*E. coli*	The detection of one (1) *E. coli* was recorded at one (1) of the five (5) sample sites within the supply network. A chlorine residual range of 0.73-1.17mg/L within the network was recorded. A mains flush was conducted on the same day and a free chlorine level of 1.03mg/L was recorded. A resample was collected and reported no detection of *E. coli*. It was deemed that the detection of the *E. coli* on the 08/06/2022 was an isolated case that was not a true reflection of the reticulation network.

7. Customer Complaints

BRC's Water Services monitors and investigates customer complaints received relating to drinking water quality. Reporting on the number of complaints received general details of complaints and the actions undertaken is a requirement that BRC must comply with in accordance with section 142(3)(g) of the Act.

Table 3 below provides a summary of the number and nature of customer complaints received during the 2021-2022 financial year.

Table 3 - Water Quality Customer Complaints

WSA	Discoloured Water	Taste & Odour	Suspected Illness	Total
Bundaberg	38	5	0	**43**
Kalkie	11	5	1	**17**
Gregory River	8	3	1	**12**
Gin Gin	2	0	1	**3**
Rocky Point	1	0	0	**1**
Wallaville	1	0	0	**1**
Total	**61**	**13**	**3**	-

Please note that no customer complaints were received for the following WSA's – Lake Monduran, Moore Park, River Park & Gooburrum.

Discoloured Water (inc. Cloudy Water)

During 2021-2022, BRC received sixty-one (61) customer complaints relating to discoloured water across all WSA's, the majority of which were reported within the Bundaberg WSA.

Eight (8) of these sixty-one (61) complaints related to cloudy water specifically. These complaints are primarily the result of sloughing of sediments in the water mains. At times, milky/white water can be experienced at the consumers tap. This is due to air being trapped within the water main and can occur following repair work when re-establishing the water mains back into service.

The majority of the eight (8) discoloured water complaints recorded in the Gregory River WSA were at the time that turbidity in the raw water source, the Gregory River, was significantly high. The old plant at the time could not guarantee the standard of water quality that Council was wanting to provide. In response the commissioning of the new Gregory Treatment plant was brought forward and completed in December 2021.

Generally, these issues can be resolved quickly through operational corrective actions such as flushing.

Taste & Odour

Taste and odour complaints regarding potable water can be subjective as it depends on an individual's perception. During 2021-22 BRC received thirteen (13) water quality complaints related to taste/odour. In some WSA's BRC can operate on either surface water and/or groundwater, this change can prompt complaints as there can be a slight change in the water taste and/or odour. The most common complaint descriptions included chlorine, chemical and earthy/dirt.

Due to varying raw surface water conditions, some Bundaberg Regional Council WSA's can experience Methylisoborneol (MIB) and Geosmin at levels above the taste threshold of 5ng/L.

When taste and/or odour complaints are received, Council contacts the customer to obtain further information regarding the matter. The latest water quality results for the WTP that supplies the water to property are checked and if no issues are identified the customer is provided information on what is potentially causing the taste/odour issue and why it is happening. If the matter persists the customer is advised that they can contact Council and an operational crew will be sent out to flush the mains.

Suspected Illness

On occasions, complaints are received from customers who believe an illness they are experiencing may be associated with the water supply. BRC investigates all alleged illness complaints relating to its various potable water supplies, typically by testing the closest reticulation sampling point for the presence of *E. coli* and free chlorine residual levels.

During 2021-22 reporting year, there were no 'confirmed' cases of illness arising from the BRC water supply networks. The three (3) suspected illness complaints were complaints where the customers 'believed' the water was responsible for their suspected illness. On all occasions, the water supplied was in adherence with the required ADWG health values. After the complaint was investigated by Council staff, it was recommended to the customers that they contact Queensland Health to investigate the matter further in aid of identifying the cause of the suspected illness.

8. DWQMP Review Outcomes

As per the requirements of Condition 10.1 of the *Information Notice for the Decision* a regular review of BRC'S DWQMP was undertaken prior to 30 June 2022. BRC engaged consultants Bligh Tanner Pty Ltd to undertake the review on behalf of Council with the aim of making the document more concise and user-friendly. This resulted in a complete overhaul of the plan, resulting in a significant number of changes being made. See below for a summary of those changes made:

- Review and update of asset information/scheme descriptions including the recently upgraded Gregory WTP and creation of stand-alone Plan sections for each Water Supply Area that will be turned into their own document for Operators.
- New, higher quality schematics and maps prepared.
- Water quality performance summary compiled and analysed in detail.
- Removal of the Gooburrum Water Service Area, now captured under the Bundaberg Water Service Area, as the supplement from this area fully supports this suburb.
- Removal of the separation of the 'Coastal' and 'Hinterland' Operational Areas.
- Risk assessment entirely reviewed and updated, including new risk management improvement actions to address all unacceptable risks.
- Developed Critical Control Point and Operational Control Point procedures for all treatment plants/schemes based on industry best practice, in particular filtration for Cryptosporidium removal and chlorine disinfection validated to achieve appropriate contact times.
- Incident and Emergency Response Plan reviewed and updated and simplified (three levels).
- Overall document structure and layout revised, text updated for clarity, excessive detail condensed.

Council has received an Information Notice from DRDMW following their assessment of the submitted, reviewed DWQMP. Council will make the necessary changes to the plan with re-submission expected early 2023.

9. DWQMP Audit

No audit was conducted during the reporting period 01/07/2021 to 30/06/2022.

10. Verification Monitoring – Water Quality Information & Summary

BRC undertakes verification monitoring across the drinking water network to ensure the provision of safe and reliable drinking water to our customers. The quantity and location of monitoring sites is provided in the following table:

Table 4. Monitoring Site Details per WSA

Water Service Areas	Quantity of verification monitoring sites	Location of verification monitoring site
Bundaberg	43	Section 3.1 *Verification Monitoring Program* of BRC's DWQMP
Kalkie	22	
Moore Park	7	
River Park	3	
Rocky Point	3	
Gooburrum	2	
Gregory River	24	
Gin Gin	8	
Wallaville	4	
Lake Monduran	1	

Verification monitoring sites are utilised for sample collection for several monitoring programs undertaken by Councils Central Laboratory.

To determine compliance, verification monitoring results are assessed against the following:

- Drinking water quality criteria prescribed in the *Public Health Regulation 2018,*
- Health guideline values in the ADWG (2011); and
- Water quality criteria stated in the *Water Quality and Reporting Guideline for a Drinking Water Service*.

The water quality data for 2021-2022 has been summarised in Appendix A. The reported statistics do not include results derived from repeat samples, or from emergency or investigative samples undertaken in response to an elevated result, as described in the ADWG (2011) section 10.3.1.

Furthermore, data used to calculate the 12 month 'rolling' annual value for *E. coli* has also been presented in Appendix A. A microbial compliance of 100% was achieved for all WSA's, except the Bundaberg WSA which achieved a 99.5% compliance, during the 2021-2022 financial year.

Verification monitoring for 2021-2022 has been carried out in line with the verification monitoring program as stated in the BRC DWQMP *Section 10 – Operational and Verification Monitoring*.

Appendix A. Summary of Compliance with Water Quality Criteria for Drinking Water

Result	Page(s)
WSA's Standard Water Analysis (SWA)	14-23
Pesticide	24-25
E. coli	26
THM's	27

Drinking water quality performance - Verification Monitoring – Bundaberg WSA

Parameter	Number required by DWQMP for all schemes Yr	Frequency of Sampling	Total No. Samples Collected/ Yr	Source	ADWG Health Value (mg/L)	No. of samples Exceeding ADWG Health Value	Comments
Microbiological							
E. coli	192	Monthly	192	Reticulation	1	1 (08/06/2022)	Non-compliant E. coli sample reported to regulator (refer to Table 2)
SPC	192	Monthly	192	Reticulation	~	~	
Faecal Coliforms	192	Monthly	192	Reticulation	~	~	
Physical							
Chlorine (Free)	192	Monthly	192	Reticulation	5	0	
pH	192	Monthly	192	Reticulation	~	~	
Conductivity	88	Quarterly	32	Reticulation	~	~	
Colour (True)	88	Quarterly	32	Reticulation	15	0	
Colour Apparent	88	Quarterly	32	Reticulation	~	~	
Turbidity	88	Quarterly	32	Reticulation	~	~	
Inorganic							
Alkalinity	88	Quarterly	32	Reticulation	~	~	
Calcium Hardness	88	Quarterly	32	Reticulation	~	~	
Chloride	88	Quarterly	32	Reticulation	~	~	
Fluoride	88	Quarterly	32	Reticulation	1.5	0	
Hardness (Total)	88	Quarterly	32	Reticulation	~	~	
Nitrate	88	Quarterly	32	Reticulation	50	0	
Nitrite	88	Quarterly	32	Reticulation	3	0	
Phosphate (Dissolved)	88	Quarterly	32	Reticulation	~	~	
Potassium	88	Quarterly	32	Reticulation	~	~	
Magnesium	88	Quarterly	32	Reticulation	~	~	
Sodium	88	Quarterly	32	Reticulation	~	~	
Sulphate	88	Quarterly	32	Reticulation	500	0	
Calcium	88	Quarterly	32	Reticulation	~	~	
Total Dissolved Solids	88	Quarterly	32	Reticulation	~	~	
Metals							
Aluminium	58	Biannual	21	Reticulation	~	~	
Antimony	58	Biannual	21	Reticulation	0.003	0	
Arsenic	58	Biannual	21	Reticulation	0.01	0	
Barium	58	Biannual	21	Reticulation	2	0	
Beryllium	58	Biannual	21	Reticulation	0.06	0	
Bismuth	58	Biannual	21	Reticulation	~	~	
Boron	58	Biannual	21	Reticulation	4	0	
Caesium	58	Biannual	21	Reticulation	~	~	
Cadmium	58	Biannual	21	Reticulation	0.002	0	
Cerium	58	Biannual	21	Reticulation	~	~	
Chromium	58	Biannual	21	Reticulation	0.05	0	
Cobalt	58	Biannual	21	Reticulation	~	~	
Copper	58	Biannual	21	Reticulation	2	0	
Dysprosium	58	Biannual	21	Reticulation	~	~	
Erbium	58	Biannual	21	Reticulation	~	~	
Gadolinium	58	Biannual	21	Reticulation	~	~	
Gallium	58	Biannual	21	Reticulation	~	~	
Hafnium	58	Biannual	21	Reticulation	~	~	
Holmium	58	Biannual	21	Reticulation	~	~	
Indium	58	Biannual	21	Reticulation	~	~	
Iron	58	Biannual	21	Reticulation	~	~	
Lanthanum	58	Biannual	21	Reticulation	0.002	0	
Lead	58	Biannual	21	Reticulation	0.01	2	Non-compliant Lead sample reported to the regulator 01/10/2021 (refer to Table 2)
Lithium	58	Biannual	21	Reticulation	~	~	
Lutetium	58	Biannual	21	Reticulation	~	~	
Manganese	58	Biannual	21	Reticulation	0.5	0	
Molybdenum	58	Biannual	21	Reticulation	0.05	0	
Nickel	58	Biannual	21	Reticulation	0.02	0	
Neodymium	58	Biannual	21	Reticulation	~	~	
Praseodymium	58	Biannual	21	Reticulation	~	~	
Rubidium	58	Biannual	21	Reticulation	~	~	
Samarium	58	Biannual	21	Reticulation	~	~	
Selenium	58	Biannual	21	Reticulation	0.01	0	
Silver	58	Biannual	21	Reticulation	0.1	0	
Strontium	58	Biannual	21	Reticulation	~	~	
Tellurium	58	Biannual	21	Reticulation	~	~	
Terbium	58	Biannual	21	Reticulation	~	~	
Tin	58	Biannual	21	Reticulation	~	~	
Titanium	58	Biannual	21	Reticulation	~	~	
Thallium	58	Biannual	21	Reticulation	~	~	
Thorium	58	Biannual	21	Reticulation	~	~	
Thuilium	58	Biannual	21	Reticulation	~	~	
Uranium	58	Biannual	21	Reticulation	0.017	0	
Vanadium	58	Biannual	21	Reticulation	~	~	
Ytterdium	58	Biannual	21	Reticulation	~	~	
Yttrium	58	Biannual	21	Reticulation	~	~	
Zinc	58	Biannual	21	Reticulation	~	~	
Zirconium	58	Biannual	21	Reticulation	~	~	
Miscellaneous							
THMs	104	Quarterly	24	Reticulation	250	0	See THM Summary Table Page 22
TOCs	252	Monthly	59	Raw	~	~	
Chlorates	144	Quarterly	13	Treated	0.8 (Interim)	0	
MIB	52	Monthly/ Quarterly	9	Raw	~	~	
	59		9	Treated	~	~	
Geosmin	52	Monthly/ Quarterly	9	Raw	~	~	
	59		9	Treated	~	~	
Algal Count	64	Seasonal	6	Raw	~	~	
PFAS	16	Quarterly	17	Raw	0.07 (µg/L)	6*	All exceedances relate to the Powers St Bore which is mixed with Bourbong St Reservoir which dilutes the supply to which the PFAS results in Bourbong St were compliant - with QLD Health approval.
Pesticide	29	Quarterly	4	Raw	See Pesticide Summary Table Page 24 – Some Branyan samples were not tested as the plant was not in operation		
	60	Quarterly	24	Treated			
Radiological	6/18	Groundwater 2yrs Surface Water 5yr	6 (Groundwater)	Treated	~	~	No Gross Alpha results exceeded 0.16Bq/L, No Gross Beta results exceeded 0.10Bq/L

Drinking water quality performance - Verification Monitoring – Kalkie WSA

Parameter	Number required by DWQMP for all schemes Yr	Frequency of Sampling	Total No. Samples Collected/ Yr	Source	ADWG Health Value (mg/L)	No. of samples Exceeding ADWG Health Value	Comments
Microbiological							
E. coli	102	Monthly	104	Reticulation	1	0	
SPC	102	Monthly	104	Reticulation	~	~	
Faecal Coliforms	102	Monthly	104	Reticulation	~	~	
Physical							
Chlorine (Free)	102	Monthly	104	Reticulation	5	0	
pH	102	Monthly	124	Reticulation	~	~	
Conductivity	88	Quarterly	20	Reticulation	~	~	
Colour (True)	88	Quarterly	20	Reticulation	15	0	
Colour Apparent	88	Quarterly	20	Reticulation	~	~	
Turbidity	88	Quarterly	20	Reticulation	~	~	
Inorganic							
Alkalinity	88	Quarterly	20	Reticulation	~	~	
Calcium Hardness	88	Quarterly	20	Reticulation	~	~	
Chloride	88	Quarterly	20	Reticulation	~	~	
Fluoride	88	Quarterly	20	Reticulation	1.5	0	
Hardness (Total)	88	Quarterly	20	Reticulation	~	~	
Nitrate	88	Quarterly	20	Reticulation	50	0	
Nitrite	88	Quarterly	20	Reticulation	3	0	
Phosphate (Dissolved)	88	Quarterly	20	Reticulation	~	~	
Potassium	88	Quarterly	20	Reticulation	~	~	
Magnesium	88	Quarterly	20	Reticulation	~	~	
Sodium	88	Quarterly	20	Reticulation	~	~	
Sulphate	88	Quarterly	20	Reticulation	500	0	
Calcium	88	Quarterly	20	Reticulation	~	~	
Total Dissolved Solids	88	Quarterly	20	Reticulation	~	~	
Metals							
Aluminium	58	Biannual	11	Reticulation	~	~	
Antimony	58	Biannual	11	Reticulation	0.003	0	
Arsenic	58	Biannual	11	Reticulation	0.01	0	
Barium	58	Biannual	11	Reticulation	2	0	
Beryllium	58	Biannual	11	Reticulation	0.06	0	
Bismuth	58	Biannual	11	Reticulation	~	~	
Boron	58	Biannual	11	Reticulation	4	0	
Caesium	58	Biannual	11	Reticulation	~	~	
Cadmium	58	Biannual	11	Reticulation	0.002	0	
Cerium	58	Biannual	11	Reticulation	~	~	
Chromium	58	Biannual	11	Reticulation	0.05	0	
Cobalt	58	Biannual	11	Reticulation	~	~	
Copper	58	Biannual	11	Reticulation	2	0	
Dysprosium	58	Biannual	11	Reticulation	~	~	
Erbium	58	Biannual	11	Reticulation	~	~	
Gadolinium	58	Biannual	11	Reticulation	~	~	
Gallium	58	Biannual	11	Reticulation	~	~	
Hafnium	58	Biannual	11	Reticulation	~	~	
Holmium	58	Biannual	11	Reticulation	~	~	
Indium	58	Biannual	11	Reticulation	~	~	
Iron	58	Biannual	11	Reticulation	~	~	
Lanthanum	58	Biannual	11	Reticulation	0.002	0	
Lead	58	Biannual	11	Reticulation	0.01	1	Non-compliant Lead sample reported to the regulator
Lithium	58	Biannual	11	Reticulation	~	~	
Lutetium	58	Biannual	11	Reticulation	~	~	
Manganese	58	Biannual	11	Reticulation	0.5	0	
Molybdenum	58	Biannual	11	Reticulation	0.05	0	
Nickel	58	Biannual	11	Reticulation	0.02	0	
Neodymium	58	Biannual	11	Reticulation	~	~	
Praseodymium	58	Biannual	11	Reticulation	~	~	
Rubidium	58	Biannual	11	Reticulation	~	~	
Samarium	58	Biannual	11	Reticulation	~	~	
Selenium	58	Biannual	11	Reticulation	0.01	0	
Silver	58	Biannual	11	Reticulation	0.1	0	
Strontium	58	Biannual	11	Reticulation	~	~	
Tellurium	58	Biannual	11	Reticulation	~	~	
Terbium	58	Biannual	11	Reticulation	~	~	
Tin	58	Biannual	11	Reticulation	~	~	
Titanium	58	Biannual	11	Reticulation	~	~	
Thallium	58	Biannual	11	Reticulation	~	~	
Thorium	58	Biannual	11	Reticulation	~	~	
Thuilium	58	Biannual	11	Reticulation	~	~	
Uranium	58	Biannual	11	Reticulation	0.017	0	
Vanadium	58	Biannual	11	Reticulation	~	~	
Ytterdium	58	Biannual	11	Reticulation	~	~	
Yttrium	58	Biannual	11	Reticulation	~	~	
Zinc	58	Biannual	11	Reticulation	~	~	
Zirconium	58	Biannual	11	Reticulation	~	~	
Miscellaneous							
THMs	104	Quarterly	24	Reticulation	250	0	See THM Summary Table Page 22
TOCs	252	Monthly	76	Raw	~	~	
Chlorates	144	Quarterly	8	Treated	0.8 (Interim)	0	
MIB	52	Monthly/ Quarterly	9	Raw	~	~	
	59		9	Treated	~	~	
Geosmin	52	Monthly/ Quarterly	9	Raw	~	~	
	59		9	Treated	~	~	
Algal Count	64	Seasonal	5	Raw	~	~	
Pesticides	29	Quarterly	4	Raw	See Pesticide Summary Table Page 24, Some Kalkie samples were not tested as the plant was not in operation		
	60	Quarterly	4	Treated			
Radiological	Radiological sampling not undertaken in 2021/22 – undertaken for surface water plants every 5yrs						
							03/06/2021 (refer to Table 2)

Drinking water quality performance - Verification Monitoring – Moore Park WSA

Parameter	Number required by DWQMP for all schemes Yr	Frequency of Sampling	Total No. Samples Collected/ Yr	Source	ADWG Health Value (mg/L)	No. of samples Exceeding ADWG Health Value	Comments
Microbiological							
E. coli	60	Monthly	60	Reticulation	1	0	
SPC	60	Monthly	60	Reticulation	~	~	
Faecal Coliforms	60	Monthly	60	Reticulation	~	~	
				Physical			
Chlorine (Free)	60	Monthly	60	Reticulation	5	0	
pH	60	Monthly	64	Reticulation	~	~	
Conductivity	88	Quarterly	4	Reticulation	~	~	
Colour (True)	88	Quarterly	4	Reticulation	15	0	
Colour Apparent	88	Quarterly	4	Reticulation	~	~	
Turbidity	88	Quarterly	4	Reticulation	~	~	
Inorganic							
Alkalinity	88	Quarterly	4	Reticulation	~	~	
Calcium Hardness	88	Quarterly	4	Reticulation	~	~	
Chloride	88	Quarterly	4	Reticulation	~	~	
Fluoride	88	Quarterly	4	Reticulation	1.5	0	
Hardness (Total)	88	Quarterly	4	Reticulation	~	~	
Nitrate	88	Quarterly	4	Reticulation	50	0	
Nitrite	88	Quarterly	4	Reticulation	3	0	
Phosphate (Dissolved)	88	Quarterly	4	Reticulation	~	~	
Potassium	88	Quarterly	4	Reticulation	~	~	
Magnesium	88	Quarterly	4	Reticulation	~	~	
Sodium	88	Quarterly	4	Reticulation	~	~	
Sulphate	88	Quarterly	4	Reticulation	500	0	
Calcium	88	Quarterly	4	Reticulation	~	~	
Total Dissolved Solids	88	Quarterly	4	Reticulation	~	~	
Metals							
Aluminium	58	Biannual	4	Reticulation	~	~	
Antimony	58	Biannual	4	Reticulation	0.003	0	
Arsenic	58	Biannual	4	Reticulation	0.01	0	
Barium	58	Biannual	4	Reticulation	2	0	
Beryllium	58	Biannual	4	Reticulation	0.06	0	
Bismuth	58	Biannual	4	Reticulation	~	~	
Boron	58	Biannual	4	Reticulation	4	0	
Caesium	58	Biannual	4	Reticulation	~	~	
Cadmium	58	Biannual	4	Reticulation	0.002	0	
Cerium	58	Biannual	4	Reticulation	~	~	
Chromium	58	Biannual	4	Reticulation	0.05	0	
Cobalt	58	Biannual	4	Reticulation	~	~	
Copper	58	Biannual	4	Reticulation	2	0	
Dysprosium	58	Biannual	4	Reticulation	~	~	
Erbium	58	Biannual	4	Reticulation	~	~	
Gadolinium	58	Biannual	4	Reticulation	~	~	
Gallium	58	Biannual	4	Reticulation	~	~	
Hafnium	58	Biannual	4	Reticulation	~	~	
Holmium	58	Biannual	4	Reticulation	~	~	
Indium	58	Biannual	4	Reticulation	~	~	
Iron	58	Biannual	4	Reticulation	~	~	
Lanthanum	58	Biannual	4	Reticulation	0.002	0	
Lead	58	Biannual	4	Reticulation	0.01		
Lithium	58	Biannual	4	Reticulation	~	~	
Lutetium	58	Biannual	4	Reticulation	~	~	
Manganese	58	Biannual	4	Reticulation	0.5	0	
Molybdenum	58	Biannual	4	Reticulation	0.05	0	
Nickel	58	Biannual	4	Reticulation	0.02	0	
Neodymium	58	Biannual	4	Reticulation	~	~	
Praseodymium	58	Biannual	4	Reticulation	~	~	
Rubidium	58	Biannual	4	Reticulation	~	~	
Samarium	58	Biannual	4	Reticulation	~	~	
Selenium	58	Biannual	4	Reticulation	0.01	0	
Silver	58	Biannual	4	Reticulation	0.1	0	
Strontium	58	Biannual	4	Reticulation	~	~	
Tellurium	58	Biannual	4	Reticulation	~	~	
Terbium	58	Biannual	4	Reticulation	~	~	
Tin	58	Biannual	4	Reticulation	~	~	
Titanium	58	Biannual	4	Reticulation	~	~	
Thallium	58	Biannual	4	Reticulation	~	~	
Thorium	58	Biannual	4	Reticulation	~	~	
Thuilium	58	Biannual	4	Reticulation	~	~	
Uranium	58	Biannual	4	Reticulation	0.017	0	
Vanadium	58	Biannual	4	Reticulation	~	~	
Ytterdium	58	Biannual	4	Reticulation	~	~	
Yttrium	58	Biannual	4	Reticulation	~	~	
Zinc	58	Biannual	4	Reticulation	~	~	
Zirconium	58	Biannual	4	Reticulation	~	~	
Miscellaneous							
THMs	104	Quarterly	24	Reticulation	250	0	See THM Summary Table Page 22
TOCs	252	Monthly	24	Raw	~	~	
Chlorates	144	Quarterly	8	Treated	0.8 (Interim)	0	
MIB	52	Monthly/ Quarterly	4	Raw	~	~	
	59		4	Treated	~	~	
Geosmin	52	Monthly/ Quarterly	4	Raw	~	~	
	59		4	Treated	~	~	
Algal Count	64	Seasonal	19	Raw	~	~	
Pesticides	29	Quarterly	4	Raw	See Pesticide Summary Table Page 24		
	60	Quarterly	8	Treated			
Radiological	Radiological sampling not undertaken in 2021/22 – undertaken for surface water plants every 5yrs						

Drinking water quality performance - Verification Monitoring – River Park WSA

Parameter	Number required by DWQMP for all schemes Yr	Frequency of Sampling	Total No. Samples Collected/ Yr	Source	ADWG Health Value (mg/L)	No. of samples Exceeding ADWG Health Value	Comments
Microbiological							
E. coli	24	Monthly	24	Reticulation	1	0	
SPC	24	Monthly	24	Reticulation	~	~	
Faecal Coliforms	24	Monthly	24	Reticulation	~	~	
Physical							
Chlorine (Free)	24	Monthly	24	Reticulation	5	0	
pH	24	Monthly	24	Reticulation	~	~	
Conductivity	88	Quarterly	4	Reticulation	~	~	
Colour (True)	88	Quarterly	4	Reticulation	15	0	
Colour Apparent	88	Quarterly	4	Reticulation	~	~	
Turbidity	88	Quarterly	4	Reticulation	~	~	
Inorganic							
Alkalinity	88	Quarterly	4	Reticulation	~	~	
Calcium Hardness	88	Quarterly	4	Reticulation	~	~	
Chloride	88	Quarterly	4	Reticulation	~	~	
Fluoride	88	Quarterly	4	Reticulation	1.5	0	
Hardness (Total)	88	Quarterly	4	Reticulation	~	~	
Nitrate	88	Quarterly	4	Reticulation	50	0	
Nitrite	88	Quarterly	4	Reticulation	3	0	
Phosphate (Dissolved)	88	Quarterly	4	Reticulation	~	~	
Potassium	88	Quarterly	4	Reticulation	~	~	
Magnesium	88	Quarterly	4	Reticulation	~	~	
Sodium	88	Quarterly	4	Reticulation	~	~	
Sulphate	88	Quarterly	4	Reticulation	500	0	
Calcium	88	Quarterly	4	Reticulation	~	~	
Total Dissolved Solids	88	Quarterly	4	Reticulation	~	~	
Metals							
Aluminium	58	Biannual	2	Reticulation	~	~	
Antimony	58	Biannual	2	Reticulation	0.003	0	
Arsenic	58	Biannual	2	Reticulation	0.01	0	
Barium	58	Biannual	2	Reticulation	2	0	
Beryllium	58	Biannual	2	Reticulation	0.06	0	
Bismuth	58	Biannual	2	Reticulation	~	~	
Boron	58	Biannual	2	Reticulation	4	0	
Caesium	58	Biannual	2	Reticulation	~	~	
Cadmium	58	Biannual	2	Reticulation	0.002	0	
Cerium	58	Biannual	2	Reticulation	~	~	
Chromium	58	Biannual	2	Reticulation	0.05	0	
Cobalt	58	Biannual	2	Reticulation	~	~	
Copper	58	Biannual	2	Reticulation	2	0	
Dysprosium	58	Biannual	2	Reticulation	~	~	
Erbium	58	Biannual	2	Reticulation	~	~	
Gadolinium	58	Biannual	2	Reticulation	~	~	
Gallium	58	Biannual	2	Reticulation	~	~	
Hafnium	58	Biannual	2	Reticulation	~	~	
Holmium	58	Biannual	2	Reticulation	~	~	
Indium	58	Biannual	2	Reticulation	~	~	
Iron	58	Biannual	2	Reticulation	~	~	
Lanthanum	58	Biannual	2	Reticulation	0.002	0	
Lead	58	Biannual	2	Reticulation	0.01		
Lithium	58	Biannual	2	Reticulation	~	~	
Lutetium	58	Biannual	2	Reticulation	~	~	
Manganese	58	Biannual	2	Reticulation	0.5	0	
Molybdenum	58	Biannual	2	Reticulation	0.05	0	
Nickel	58	Biannual	2	Reticulation	0.02	0	
Neodymium	58	Biannual	2	Reticulation	~	~	
Praseodymium	58	Biannual	2	Reticulation	~	~	
Rubidium	58	Biannual	2	Reticulation	~	~	
Samarium	58	Biannual	2	Reticulation	~	~	
Selenium	58	Biannual	2	Reticulation	0.01	0	
Silver	58	Biannual	2	Reticulation	0.1	0	
Strontium	58	Biannual	2	Reticulation	~	~	
Tellurium	58	Biannual	2	Reticulation	~	~	
Terbium	58	Biannual	2	Reticulation	~	~	
Tin	58	Biannual	2	Reticulation	~	~	
Titanium	58	Biannual	2	Reticulation	~	~	
Thallium	58	Biannual	2	Reticulation	~	~	
Thorium	58	Biannual	2	Reticulation	~	~	
Thuilium	58	Biannual	2	Reticulation	~	~	
Uranium	58	Biannual	2	Reticulation	0.017	0	
Vanadium	58	Biannual	2	Reticulation	~	~	
Ytterdium	58	Biannual	2	Reticulation	~	~	
Yttrium	58	Biannual	2	Reticulation	~	~	
Zinc	58	Biannual	2	Reticulation	~	~	
Zirconium	58	Biannual	2	Reticulation	~	~	
Miscellaneous							
THMs	104	Quarterly	24	Reticulation	250	0	See THM Summary Table Page 22
TOCs	252	Monthly	24	Raw	~	~	
Chlorates	144	Quarterly	8	Treated	0.8 (Interim)	0	
MIB	52	Monthly/ Quarterly	4	Raw	~	~	
	59		4	Treated	~	~	
Geosmin	52	Monthly/ Quarterly	4	Raw	~	~	
	59		4	Treated	~	~	
Algal Count	64	Seasonal	8	Raw	~	~	
Pesticide	29	Quarterly	4	Raw	See Pesticide Summary Table Page 24		
	60	Quarterly	4	Treated			
Radiological	Radiological sampling not undertaken in 2021/22 – undertaken for surface water plants every 5yrs						

Drinking water quality performance - Verification Monitoring – Rocky Point WSA

Parameter	Number required by DWQMP for all schemes Yr	Frequency of Sampling	Total No. Samples Collected/ Yr	Source	ADWG Health Value (mg/L)	No. of samples Exceeding ADWG Health Value	Comments
Microbiological							
E. coli	24	Monthly	24	Reticulation	1	0	
SPC	24	Monthly	24	Reticulation	~	~	
Faecal Coliforms	24	Monthly	24	Reticulation	~	~	
Physical							
Chlorine (Free)	24	Monthly	24	Reticulation	5	0	
pH	24	Monthly	24	Reticulation	~	~	
Conductivity	88	Quarterly	4	Reticulation	~	~	
Colour (True)	88	Quarterly	4	Reticulation	15	0	
Colour Apparent	88	Quarterly	4	Reticulation	~	~	
Turbidity	88	Quarterly	4	Reticulation	~	~	
Inorganic							
Alkalinity	88	Quarterly	4	Reticulation	~	~	
Calcium Hardness	88	Quarterly	4	Reticulation	~	~	
Chloride	88	Quarterly	4	Reticulation	~	~	
Fluoride	88	Quarterly	4	Reticulation	1.5	0	
Hardness (Total)	88	Quarterly	4	Reticulation	~	~	
Nitrate	88	Quarterly	4	Reticulation	50	0	
Nitrite	88	Quarterly	4	Reticulation	3	0	
Phosphate (Dissolved)	88	Quarterly	4	Reticulation	~	~	
Potassium	88	Quarterly	4	Reticulation	~	~	
Magnesium	88	Quarterly	4	Reticulation	~	~	
Sodium	88	Quarterly	4	Reticulation	~	~	
Sulphate	88	Quarterly	4	Reticulation	500	0	
Calcium	88	Quarterly	4	Reticulation	~	~	
Total Dissolved Solids	88	Quarterly	4	Reticulation	~	~	
Metals							
Aluminium	58	Biannual	2	Reticulation	~	~	
Antimony	58	Biannual	2	Reticulation	0.003	0	
Arsenic	58	Biannual	2	Reticulation	0.01	0	
Barium	58	Biannual	2	Reticulation	2	0	
Beryllium	58	Biannual	2	Reticulation	0.06	0	
Bismuth	58	Biannual	2	Reticulation	~	~	
Boron	58	Biannual	2	Reticulation	4	0	
Caesium	58	Biannual	2	Reticulation	~	~	
Cadmium	58	Biannual	2	Reticulation	0.002	0	
Cerium	58	Biannual	2	Reticulation	~	~	
Chromium	58	Biannual	2	Reticulation	0.05	0	
Cobalt	58	Biannual	2	Reticulation	~	~	
Copper	58	Biannual	2	Reticulation	2	0	
Dysprosium	58	Biannual	2	Reticulation	~	~	
Erbium	58	Biannual	2	Reticulation	~	~	
Gadolinium	58	Biannual	2	Reticulation	~	~	
Gallium	58	Biannual	2	Reticulation	~	~	
Hafnium	58	Biannual	2	Reticulation	~	~	
Holmium	58	Biannual	2	Reticulation	~	~	
Indium	58	Biannual	2	Reticulation	~	~	
Iron	58	Biannual	2	Reticulation	~	~	
Lanthanum	58	Biannual	2	Reticulation	0.002	0	
Lead	58	Biannual	2	Reticulation	0.01		
Lithium	58	Biannual	2	Reticulation	~	~	
Lutetium	58	Biannual	2	Reticulation	~	~	
Manganese	58	Biannual	2	Reticulation	0.5	0	
Molybdenum	58	Biannual	2	Reticulation	0.05	0	
Nickel	58	Biannual	2	Reticulation	0.02	0	
Neodymium	58	Biannual	2	Reticulation	~	~	
Praseodymium	58	Biannual	2	Reticulation	~	~	
Rubidium	58	Biannual	2	Reticulation	~	~	
Samarium	58	Biannual	2	Reticulation	~	~	
Selenium	58	Biannual	2	Reticulation	0.01	0	
Silver	58	Biannual	2	Reticulation	0.1	0	
Strontium	58	Biannual	2	Reticulation	~	~	
Tellurium	58	Biannual	2	Reticulation	~	~	
Terbium	58	Biannual	2	Reticulation	~	~	
Tin	58	Biannual	2	Reticulation	~	~	
Titanium	58	Biannual	2	Reticulation	~	~	
Thallium	58	Biannual	2	Reticulation	~	~	
Thorium	58	Biannual	2	Reticulation	~	~	
Thuilium	58	Biannual	2	Reticulation	~	~	
Uranium	58	Biannual	2	Reticulation	0.017	0	
Vanadium	58	Biannual	2	Reticulation	~	~	
Ytterdium	58	Biannual	2	Reticulation	~	~	
Yttrium	58	Biannual	2	Reticulation	~	~	
Zinc	58	Biannual	2	Reticulation	~	~	
Zirconium	58	Biannual	2	Reticulation	~	~	
Miscellaneous							
THMs	104	Quarterly	24	Reticulation	250	0	See THM Summary Table Page 22
TOCs	252	Monthly	22	Raw	~	~	
Chlorates	8144	Quarterly	8	Treated	0.8 (Interim)	0	
Pesticide	60	Quarterly	4	Treated	See Pesticide Summary Table 24. Samplers were unable to gain access to the site.		
Radiological	18	Groundwater 2yrs Surface Water 5yr	1(Ground water)	Treated	~	~	Gross Alpha result – 0.062Bq/L, Gross Beta result - 0.05q/L

Drinking water quality performance - Verification Monitoring – Gooburrum WSA

Parameter	Number required by DWQMP for all schemes Yr	Frequency of Sampling	Total No. Samples Collected/ Yr	Source	ADWG Health Value (mg/L)	No. of samples Exceeding ADWG Health Value	Comments
Microbiological							
E. coli	24	Monthly	24	Reticulation	1	0	
SPC	24	Monthly	24	Reticulation	~	~	
Faecal Coliforms	24	Monthly	24	Reticulation	~	~	
Physical							
Chlorine (Free)	24	Monthly	24	Reticulation	5	0	
pH	24	Monthly	24	Reticulation	~	~	
Conductivity	88	Quarterly	4	Reticulation	~	~	
Colour (True)	88	Quarterly	4	Reticulation	15	0	
Colour Apparent	88	Quarterly	4	Reticulation	~	~	
Turbidity	88	Quarterly	4	Reticulation	~	~	
Inorganic							
Alkalinity	88	Quarterly	4	Reticulation	~	~	
Calcium Hardness	88	Quarterly	4	Reticulation	~	~	
Chloride	88	Quarterly	4	Reticulation	~	~	
Fluoride	88	Quarterly	4	Reticulation	1.5	0	
Hardness (Total)	88	Quarterly	4	Reticulation	~	~	
Nitrate	88	Quarterly	4	Reticulation	50	0	
Nitrite	88	Quarterly	4	Reticulation	3	0	
Phosphate (Dissolved)	88	Quarterly	4	Reticulation	~	~	
Potassium	88	Quarterly	4	Reticulation	~	~	
Magnesium	88	Quarterly	4	Reticulation	~	~	
Sodium	88	Quarterly	4	Reticulation	~	~	
Sulphate	88	Quarterly	4	Reticulation	500	0	
Calcium	88	Quarterly	4	Reticulation	~	~	
Total Dissolved Solids	88	Quarterly	4	Reticulation	~	~	
Metals							
Aluminium	58	Biannual	2	Reticulation	~	~	
Antimony	58	Biannual	2	Reticulation	0.003	0	
Arsenic	58	Biannual	2	Reticulation	0.01	0	
Barium	58	Biannual	2	Reticulation	2	0	
Beryllium	58	Biannual	2	Reticulation	0.06	0	
Bismuth	58	Biannual	2	Reticulation	~	~	
Boron	58	Biannual	2	Reticulation	4	0	
Caesium	58	Biannual	2	Reticulation	~	~	
Cadmium	58	Biannual	2	Reticulation	0.002	0	
Cerium	58	Biannual	2	Reticulation	~	~	
Chromium	58	Biannual	2	Reticulation	0.05	0	
Cobalt	58	Biannual	2	Reticulation	~	~	
Copper	58	Biannual	2	Reticulation	2	0	
Dysprosium	58	Biannual	2	Reticulation	~	~	
Erbium	58	Biannual	2	Reticulation	~	~	
Gadolinium	58	Biannual	2	Reticulation	~	~	
Gallium	58	Biannual	2	Reticulation	~	~	
Hafnium	58	Biannual	2	Reticulation	~	~	
Holmium	58	Biannual	2	Reticulation	~	~	
Indium	58	Biannual	2	Reticulation	~	~	
Iron	58	Biannual	2	Reticulation	~	~	
Lanthanum	58	Biannual	2	Reticulation	0.002	0	
Lead	58	Biannual	2	Reticulation	0.01		
Lithium	58	Biannual	2	Reticulation	~	~	
Lutetium	58	Biannual	2	Reticulation	~	~	
Manganese	58	Biannual	2	Reticulation	0.5	0	
Molybdenum	58	Biannual	2	Reticulation	0.05	0	
Nickel	58	Biannual	2	Reticulation	0.02	0	
Neodymium	58	Biannual	2	Reticulation	~	~	
Praseodymium	58	Biannual	2	Reticulation	~	~	
Rubidium	58	Biannual	2	Reticulation	~	~	
Samarium	58	Biannual	2	Reticulation	~	~	
Selenium	58	Biannual	2	Reticulation	0.01	0	
Silver	58	Biannual	2	Reticulation	0.1	0	
Strontium	58	Biannual	2	Reticulation	~	~	
Tellurium	58	Biannual	2	Reticulation	~	~	
Terbium	58	Biannual	2	Reticulation	~	~	
Tin	58	Biannual	2	Reticulation	~	~	
Titanium	58	Biannual	2	Reticulation	~	~	
Thallium	58	Biannual	2	Reticulation	~	~	
Thorium	58	Biannual	2	Reticulation	~	~	
Thuilium	58	Biannual	2	Reticulation	~	~	
Uranium	58	Biannual	2	Reticulation	0.017	0	
Vanadium	58	Biannual	2	Reticulation	~	~	
Ytterdium	58	Biannual	2	Reticulation	~	~	
Yttrium	58	Biannual	2	Reticulation	~	~	
Zinc	58	Biannual	2	Reticulation	~	~	
Zirconium	58	Biannual	2	Reticulation	~	~	
Miscellaneous							
THMs	104	Quarterly	24	Reticulation	250	0	See THM Summary Table Page 22
TOCs	252	Monthly	12	Raw	~	~	
Chlorates	144	Quarterly	8	Treated	0.8 (Interim)	0	
Pesticide	60	Quarterly	4	Treated	See Pesticide Summary Table Page 24		
Radiological	For the 2021/22 FY Gooburrum WSA was supplied solely from the Bundaberg WSA Supplement – no water was drawn from the Gooburrum groundwater supply.						

Drinking water quality performance - Verification Monitoring – Gregory River WSA

Parameter	Number required by DWQMP for all schemes Yr	Frequency of Sampling	Total No. Samples Collected/ Yr	Source	ADWG Health Value (mg/L)	No. of samples Exceeding ADWG Health Value	Comments
Microbiological							
E. coli	156	Monthly	156	Reticulation	1	0	
SPC	156	Monthly	156	Reticulation	~	~	
Faecal Coliforms	156	Monthly	156	Reticulation	~	~	
Physical							
Chlorine (Free)	156	Monthly	156	Reticulation	5	0	
pH	156	Monthly	156	Reticulation	~	~	
Conductivity	88	Quarterly	8	Reticulation	~	~	
Colour (True)	88	Quarterly	8	Reticulation	15	0	
Colour Apparent	88	Quarterly	8	Reticulation	~	~	
Turbidity	88	Quarterly	8	Reticulation	~	~	
Inorganic							
Alkalinity	88	Quarterly	8	Reticulation	~	~	
Calcium Hardness	88	Quarterly	8	Reticulation	~	~	
Chloride	88	Quarterly	8	Reticulation	~	~	
Fluoride	88	Quarterly	8	Reticulation	1.5	0	
Hardness (Total)	88	Quarterly	8	Reticulation	~	~	
Nitrate	88	Quarterly	8	Reticulation	50	0	
Nitrite	88	Quarterly	8	Reticulation	3	0	
Phosphate (Dissolved)	88	Quarterly	8	Reticulation	~	~	
Potassium	88	Quarterly	8	Reticulation	~	~	
Magnesium	88	Quarterly	8	Reticulation	~	~	
Sodium	88	Quarterly	8	Reticulation	~	~	
Sulphate	88	Quarterly	8	Reticulation	500	0	
Calcium	88	Quarterly	8	Reticulation	~	~	
Total Dissolved Solids	88	Quarterly	8	Reticulation	~	~	
Metals							
Aluminium	58	Biannual	8	Reticulation	~	~	
Antimony	58	Biannual	8	Reticulation	0.003	0	
Arsenic	58	Biannual	8	Reticulation	0.01	0	
Barium	58	Biannual	8	Reticulation	2	0	
Beryllium	58	Biannual	8	Reticulation	0.06	0	
Bismuth	58	Biannual	8	Reticulation	~	~	
Boron	58	Biannual	8	Reticulation	4	0	
Caesium	58	Biannual	8	Reticulation	~	~	
Cadmium	58	Biannual	8	Reticulation	0.002	0	
Cerium	58	Biannual	8	Reticulation	~	~	
Chromium	58	Biannual	8	Reticulation	0.05	0	
Cobalt	58	Biannual	8	Reticulation	~	~	
Copper	58	Biannual	8	Reticulation	2	0	
Dysprosium	58	Biannual	8	Reticulation	~	~	
Erbium	58	Biannual	8	Reticulation	~	~	
Gadolinium	58	Biannual	8	Reticulation	~	~	
Gallium	58	Biannual	8	Reticulation	~	~	
Hafnium	58	Biannual	8	Reticulation	~	~	
Holmium	58	Biannual	8	Reticulation	~	~	
Indium	58	Biannual	8	Reticulation	~	~	
Iron	58	Biannual	8	Reticulation	~	~	
Lanthanum	58	Biannual	8	Reticulation	0.002	0	
Lead	58	Biannual	8	Reticulation	0.01		
Lithium	58	Biannual	8	Reticulation	~	~	
Lutetium	58	Biannual	8	Reticulation	~	~	
Manganese	58	Biannual	8	Reticulation	0.5	0	
Molybdenum	58	Biannual	8	Reticulation	0.05	0	
Nickel	58	Biannual	8	Reticulation	0.02	0	
Neodymium	58	Biannual	8	Reticulation	~	~	
Praseodymium	58	Biannual	8	Reticulation	~	~	
Rubidium	58	Biannual	8	Reticulation	~	~	
Samarium	58	Biannual	8	Reticulation	~	~	
Selenium	58	Biannual	8	Reticulation	0.01	0	
Silver	58	Biannual	8	Reticulation	0.1	0	
Strontium	58	Biannual	8	Reticulation	~	~	
Tellurium	58	Biannual	8	Reticulation	~	~	
Terbium	58	Biannual	8	Reticulation	~	~	
Tin	58	Biannual	8	Reticulation	~	~	
Titanium	58	Biannual	8	Reticulation	~	~	
Thallium	58	Biannual	8	Reticulation	~	~	
Thorium	58	Biannual	8	Reticulation	~	~	
Thuilium	58	Biannual	8	Reticulation	~	~	
Uranium	58	Biannual	8	Reticulation	0.017	0	
Vanadium	58	Biannual	8	Reticulation	~	~	
Ytterdium	58	Biannual	8	Reticulation	~	~	
Yttrium	58	Biannual	8	Reticulation	~	~	
Zinc	58	Biannual	8	Reticulation	~	~	
Zirconium	58	Biannual	8	Reticulation	~	~	
Miscellaneous							
THMs	104	Quarterly	24	Reticulation	250	4	See THM Summary Table Page 22 & Table 2
TOCs	252	Monthly	43	Raw	~	~	
Chlorates	144	Quarterly	13	Treated	0.8 (Interim)	1	See Table 2
MIB	52	Monthly/ Quarterly	4	Raw	~	~	
	59		4	Treated	~	~	
Geosmin	52	Monthly/ Quarterly	4	Raw	~	~	
	59		4	Treated	~	~	
Algal Count	64	Seasonal	8	Raw	~	~	
Pesticides	29	Quarterly	4	Raw	See Pesticide Summary Table Page 24		
	60	Quarterly	4	Treated			
Radiological	Radiological sampling not undertaken in 2021/22 – undertaken for surface water plants every 5yrs						

Drinking water quality performance - Verification Monitoring – Gin Gin WSA

Parameter	Number required by DWQMP for all schemes Yr	Frequency of Sampling	Total No. Samples Collected/ Yr	Source	ADWG Health Value (mg/L)	No. of samples Exceeding ADWG Health Value	Comments
Microbiological							
E. coli	60	Monthly	60	Reticulation	1	0	
SPC	60	Monthly	60	Reticulation	~	~	
Faecal Coliforms	60	Monthly	60	Reticulation	~	~	
Physical							
Chlorine (Free)	60	Monthly	60	Reticulation	5	0	
pH	60	Monthly	60	Reticulation	~	~	
Conductivity	88	Quarterly	4	Reticulation	~	~	
Colour (True)	88	Quarterly	4	Reticulation	15	0	
Colour Apparent	88	Quarterly	4	Reticulation	~	~	
Turbidity	88	Quarterly	4	Reticulation	~	~	
Inorganic							
Alkalinity	88	Quarterly	4	Reticulation	~	~	
Calcium Hardness	88	Quarterly	4	Reticulation	~	~	
Chloride	88	Quarterly	4	Reticulation	~	~	
Fluoride	88	Quarterly	4	Reticulation	1.5	0	
Hardness (Total)	88	Quarterly	4	Reticulation	~	~	
Nitrate	88	Quarterly	4	Reticulation	50	0	
Nitrite	88	Quarterly	4	Reticulation	3	0	
Phosphate (Dissolved)	88	Quarterly	4	Reticulation	~	~	
Potassium	88	Quarterly	4	Reticulation	~	~	
Magnesium	88	Quarterly	4	Reticulation	~	~	
Sodium	88	Quarterly	4	Reticulation	~	~	
Sulphate	88	Quarterly	4	Reticulation	500	0	
Calcium	88	Quarterly	4	Reticulation	~	~	
Total Dissolved Solids	88	Quarterly	4	Reticulation	~	~	
Metals							
Aluminium	58	Biannual	4	Reticulation	~	~	
Antimony	58	Biannual	4	Reticulation	0.003	0	
Arsenic	58	Biannual	4	Reticulation	0.01	0	
Barium	58	Biannual	4	Reticulation	2	0	
Beryllium	58	Biannual	4	Reticulation	0.06	0	
Bismuth	58	Biannual	4	Reticulation	~	~	
Boron	58	Biannual	4	Reticulation	4	0	
Caesium	58	Biannual	4	Reticulation	~	~	
Cadmium	58	Biannual	4	Reticulation	0.002	0	
Cerium	58	Biannual	4	Reticulation	~	~	
Chromium	58	Biannual	4	Reticulation	0.05	0	
Cobalt	58	Biannual	4	Reticulation	~	~	
Copper	58	Biannual	4	Reticulation	2	0	
Dysprosium	58	Biannual	4	Reticulation	~	~	
Erbium	58	Biannual	4	Reticulation	~	~	
Gadolinium	58	Biannual	4	Reticulation	~	~	
Gallium	58	Biannual	4	Reticulation	~	~	
Hafnium	58	Biannual	4	Reticulation	~	~	
Holmium	58	Biannual	4	Reticulation	~	~	
Indium	58	Biannual	4	Reticulation	~	~	
Iron	58	Biannual	4	Reticulation	~	~	
Lanthanum	58	Biannual	4	Reticulation	0.002	0	
Lead	58	Biannual	4	Reticulation	0.01		
Lithium	58	Biannual	4	Reticulation	~	~	
Lutetium	58	Biannual	4	Reticulation	~	~	
Manganese	58	Biannual	4	Reticulation	0.5	0	
Molybdenum	58	Biannual	4	Reticulation	0.05	0	
Nickel	58	Biannual	4	Reticulation	0.02	0	
Neodymium	58	Biannual	4	Reticulation	~	~	
Praseodymium	58	Biannual	4	Reticulation	~	~	
Rubidium	58	Biannual	4	Reticulation	~	~	
Samarium	58	Biannual	4	Reticulation	~	~	
Selenium	58	Biannual	4	Reticulation	0.01	0	
Silver	58	Biannual	4	Reticulation	0.1	0	
Strontium	58	Biannual	4	Reticulation	~	~	
Tellurium	58	Biannual	4	Reticulation	~	~	
Terbium	58	Biannual	4	Reticulation	~	~	
Tin	58	Biannual	4	Reticulation	~	~	
Titanium	58	Biannual	4	Reticulation	~	~	
Thallium	58	Biannual	4	Reticulation	~	~	
Thorium	58	Biannual	4	Reticulation	~	~	
Thuilium	58	Biannual	4	Reticulation	~	~	
Uranium	58	Biannual	4	Reticulation	0.017	0	
Vanadium	58	Biannual	4	Reticulation	~	~	
Ytterdium	58	Biannual	4	Reticulation	~	~	
Yttrium	58	Biannual	4	Reticulation	~	~	
Zinc	58	Biannual	4	Reticulation	~	~	
Zirconium	58	Biannual	4	Reticulation	~	~	
Miscellaneous							
THMs	104	Quarterly	24	Reticulation	250	0	See THM Summary Table Page 22 & Table 2
TOCs	252	Monthly	36	Raw	~	~	
Chlorates	144	Quarterly	8	Treated	0.8 (Interim)	0	
MIB	52	Monthly/ Quarterly	12	Raw	~	~	
	59		15	Treated	~	~	
Geosmin	52	Monthly/ Quarterly	12	Raw	~	~	
	59		15	Treated	~	~	
Algal Count	64	Seasonal	9	Raw	~	~	
Pesticides	29	Quarterly	4	Raw	See Pesticide Summary Table Page 24		
	60	Quarterly	4	Treated			
Radiological	Radiological sampling not undertaken in 2021/22 – undertaken for surface water plants every 5yrs						

Drinking water quality performance - Verification Monitoring – Wallaville WSA

Parameter	Number required by DWQMP for all schemes Yr	Frequency of Sampling	Total No. Samples Collected/ Yr	Source	ADWG Health Value (mg/L)	No. of samples Exceeding ADWG Health Value	Comments
Microbiological							
E. coli	36	Monthly	36	Reticulation	1	0	
SPC	36	Monthly	36	Reticulation	~	~	
Faecal Coliforms	36	Monthly	36	Reticulation	~	~	
Physical							
Chlorine (Free)	36	Monthly	36	Reticulation	5	0	
pH	36	Monthly	36	Reticulation	~	~	
Conductivity	88	Quarterly	4	Reticulation	~	~	
Colour (True)	88	Quarterly	4	Reticulation	15	0	
Colour Apparent	88	Quarterly	4	Reticulation	~	~	
Turbidity	88	Quarterly	4	Reticulation	~	~	
Inorganic							
Alkalinity	88	Quarterly	4	Reticulation	~	~	
Calcium Hardness	88	Quarterly	4	Reticulation	~	~	
Chloride	88	Quarterly	4	Reticulation	~	~	
Fluoride	88	Quarterly	4	Reticulation	1.5	0	
Hardness (Total)	88	Quarterly	4	Reticulation	~	~	
Nitrate	88	Quarterly	4	Reticulation	50	0	
Nitrite	88	Quarterly	4	Reticulation	3	0	
Phosphate (Dissolved)	88	Quarterly	4	Reticulation	~	~	
Potassium	88	Quarterly	4	Reticulation	~	~	
Magnesium	88	Quarterly	4	Reticulation	~	~	
Sodium	88	Quarterly	4	Reticulation	~	~	
Sulphate	88	Quarterly	4	Reticulation	500	0	
Calcium	88	Quarterly	4	Reticulation	~	~	
Total Dissolved Solids	88	Quarterly	4	Reticulation	~	~	
Metals							
Aluminium	58	Biannual	8	Reticulation	~	~	
Antimony	58	Biannual	8	Reticulation	0.003	0	
Arsenic	58	Biannual	8	Reticulation	0.01	0	
Barium	58	Biannual	8	Reticulation	2	0	
Beryllium	58	Biannual	8	Reticulation	0.06	0	
Bismuth	58	Biannual	8	Reticulation	~	~	
Boron	58	Biannual	8	Reticulation	4	0	
Caesium	58	Biannual	8	Reticulation	~	~	
Cadmium	58	Biannual	8	Reticulation	0.002	0	
Cerium	58	Biannual	8	Reticulation	~	~	
Chromium	58	Biannual	8	Reticulation	0.05	0	
Cobalt	58	Biannual	8	Reticulation	~	~	
Copper	58	Biannual	8	Reticulation	2	0	
Dysprosium	58	Biannual	8	Reticulation	~	~	
Erbium	58	Biannual	8	Reticulation	~	~	
Gadolinium	58	Biannual	8	Reticulation	~	~	
Gallium	58	Biannual	8	Reticulation	~	~	
Hafnium	58	Biannual	8	Reticulation	~	~	
Holmium	58	Biannual	8	Reticulation	~	~	
Indium	58	Biannual	8	Reticulation	~	~	
Iron	58	Biannual	8	Reticulation	~	~	
Lanthanum	58	Biannual	8	Reticulation	0.002	0	
Lead	58	Biannual	8	Reticulation	0.01		
Lithium	58	Biannual	8	Reticulation	~	~	
Lutetium	58	Biannual	8	Reticulation	~	~	
Manganese	58	Biannual	8	Reticulation	0.5	0	
Molybdenum	58	Biannual	8	Reticulation	0.05	0	
Nickel	58	Biannual	8	Reticulation	0.02	0	
Neodymium	58	Biannual	8	Reticulation	~	~	
Praseodymium	58	Biannual	8	Reticulation	~	~	
Rubidium	58	Biannual	8	Reticulation	~	~	
Samarium	58	Biannual	8	Reticulation	~	~	
Selenium	58	Biannual	8	Reticulation	0.01	0	
Silver	58	Biannual	8	Reticulation	0.1	0	
Strontium	58	Biannual	8	Reticulation	~	~	
Tellurium	58	Biannual	8	Reticulation	~	~	
Terbium	58	Biannual	8	Reticulation	~	~	
Tin	58	Biannual	8	Reticulation	~	~	
Titanium	58	Biannual	8	Reticulation	~	~	
Thallium	58	Biannual	8	Reticulation	~	~	
Thorium	58	Biannual	8	Reticulation	~	~	
Thuilium	58	Biannual	8	Reticulation	~	~	
Uranium	58	Biannual	8	Reticulation	0.017	0	
Vanadium	58	Biannual	8	Reticulation	~	~	
Ytterdium	58	Biannual	8	Reticulation	~	~	
Yttrium	58	Biannual	8	Reticulation	~	~	
Zinc	58	Biannual	8	Reticulation	~	~	
Zirconium	58	Biannual	8	Reticulation	~	~	
Miscellaneous							
THMs	104	Quarterly	24	Reticulation	250	0	See THM Summary Table Page 22
TOCs	252	Monthly	36	Raw	~	~	
Chlorates	144	Quarterly	8	Treated	0.8 (Interim)	0	
MIB	52	Monthly/ Quarterly	4	Raw	~	~	
	59		4	Treated	~	~	
Geosmin	52	Monthly/ Quarterly	4	Raw	~	~	
	59		4	Treated	~	~	
Algal Count	64	Seasonal	8	Raw	~	~	
Pesticides	29	Quarterly	4	Raw	See Pesticide Summary Table Page 24		
	60	Quarterly	4	Treated			
Radiological	Radiological sampling not undertaken in 2021/22 – undertaken for surface water plants every 5yrs						

Drinking water quality performance - Verification Monitoring – Lake Monduran WSA

Parameter	Number required by DWQMP for all schemes Yr	Frequency of Sampling	Total No. Samples Collected/ Yr.	Source	ADWG Health Value (mg/L)	No. of samples Exceeding ADWG Health Value	Comments
Microbiological							
E. coli	12	Monthly	12	Reticulation	1	0	
SPC	12	Monthly	12	Reticulation	~	~	
Faecal Coliforms	12	Monthly	12	Reticulation	~	~	
Physical							
Chlorine (Free)	12	Monthly	12	Reticulation	5	0	
pH	12	Monthly	12	Reticulation	~	~	
Conductivity	88	Quarterly	4	Reticulation	~	~	
Colour (True)	88	Quarterly	4	Reticulation	15	0	
Colour Apparent	88	Quarterly	4	Reticulation	~	~	
Turbidity	88	Quarterly	4	Reticulation	~	~	
Inorganic							
Alkalinity	88	Quarterly	4	Reticulation	~	~	
Calcium Hardness	88	Quarterly	4	Reticulation	~	~	
Chloride	88	Quarterly	4	Reticulation	~	~	
Fluoride	88	Quarterly	4	Reticulation	1.5	0	
Hardness (Total)	88	Quarterly	4	Reticulation	~	~	
Nitrate	88	Quarterly	4	Reticulation	50	0	
Nitrite	88	Quarterly	4	Reticulation	3	0	
Phosphate (Dissolved)	88	Quarterly	4	Reticulation	~	~	
Potassium	88	Quarterly	4	Reticulation	~	~	
Magnesium	88	Quarterly	4	Reticulation	~	~	
Sodium	88	Quarterly	4	Reticulation	~	~	
Sulphate	88	Quarterly	4	Reticulation	500	0	
Calcium	88	Quarterly	4	Reticulation	~	~	
Total Dissolved Solids	88	Quarterly	4	Reticulation	~	~	
Metals							
Aluminium	58	Biannual	2	Reticulation	~	~	
Antimony	58	Biannual	2	Reticulation	0.003	0	
Arsenic	58	Biannual	2	Reticulation	0.01	0	
Barium	58	Biannual	2	Reticulation	2	0	
Beryllium	58	Biannual	2	Reticulation	0.06	0	
Bismuth	58	Biannual	2	Reticulation	~	~	
Boron	58	Biannual	2	Reticulation	4	0	
Caesium	58	Biannual	2	Reticulation	~	~	
Cadmium	58	Biannual	2	Reticulation	0.002	0	
Cerium	58	Biannual	2	Reticulation	~	~	
Chromium	58	Biannual	2	Reticulation	0.05	0	
Cobalt	58	Biannual	2	Reticulation	~	~	
Copper	58	Biannual	2	Reticulation	2	0	
Dysprosium	58	Biannual	2	Reticulation	~	~	
Erbium	58	Biannual	2	Reticulation	~	~	
Gadolinium	58	Biannual	2	Reticulation	~	~	
Gallium	58	Biannual	2	Reticulation	~	~	
Hafnium	58	Biannual	2	Reticulation	~	~	
Holmium	58	Biannual	2	Reticulation	~	~	
Indium	58	Biannual	2	Reticulation	~	~	
Iron	58	Biannual	2	Reticulation	~	~	
Lanthanum	58	Biannual	2	Reticulation	0.002	0	
Lead	58	Biannual	2	Reticulation	0.01		
Lithium	58	Biannual	2	Reticulation	~	~	
Lutetium	58	Biannual	2	Reticulation	~	~	
Manganese	58	Biannual	2	Reticulation	0.5	0	
Molybdenum	58	Biannual	2	Reticulation	0.05	0	
Nickel	58	Biannual	2	Reticulation	0.02	0	
Neodymium	58	Biannual	2	Reticulation	~	~	
Praseodymium	58	Biannual	2	Reticulation	~	~	
Rubidium	58	Biannual	2	Reticulation	~	~	
Samarium	58	Biannual	2	Reticulation	~	~	
Selenium	58	Biannual	2	Reticulation	0.01	0	
Silver	58	Biannual	2	Reticulation	0.1	0	
Strontium	58	Biannual	2	Reticulation	~	~	
Tellurium	58	Biannual	2	Reticulation	~	~	
Terbium	58	Biannual	2	Reticulation	~	~	
Tin	58	Biannual	2	Reticulation	~	~	
Titanium	58	Biannual	2	Reticulation	~	~	
Thallium	58	Biannual	2	Reticulation	~	~	
Thorium	58	Biannual	2	Reticulation	~	~	
Thuilium	58	Biannual	2	Reticulation	~	~	
Uranium	58	Biannual	2	Reticulation	0.017	0	
Vanadium	58	Biannual	2	Reticulation	~	~	
Ytterdium	58	Biannual	2	Reticulation	~	~	
Yttrium	58	Biannual	2	Reticulation	~	~	
Zinc	58	Biannual	2	Reticulation	~	~	
Zirconium	58	Biannual	2	Reticulation	~	~	
Miscellaneous							
THMs	104	Quarterly	24	Reticulation	250	3	See THM Summary Table Page 22
TOCs	252	Monthly	36	Raw	~	~	
Chlorates	144	Quarterly	8	Treated	0.8 (Interim)	1	See Table 2
MIB	52	Monthly/ Quarterly	4	Raw	~	~	
	59		4	Treated	~	~	
Geosmin	52	Monthly/ Quarterly	4	Raw	~	~	
	59		4	Treated	~	~	
Algal Count	64	Seasonal	22	Raw	~	~	
Pesticides	29	Quarterly	4	Raw	See Pesticide Summary Table Page 24		
	60	Quarterly	4	Treated			
Radiological	Radiological sampling not undertaken in 2021/22 – undertaken for surface water plants every 5yrs						

Verification Monitoring Results - All WSA's July 2021 - June 2022 - Pesticides Detected												
Scheme Name	Scheme Component	Parameter	Laboratory Name	Unit of Measure	Limit of Reporting	Frequency of Sampling	Total No. samples collected	No. of Samples in which parameter Detected	ADWG Health Value (mg/L)	No. of samples exceeding ADWG Health Value	Min Value (µg/L)	Max Value (µg/L)
Bundaberg WSA	Branyan WTP Reservoir	2,2-DPA (DI)	F&SS	µg/L	0.02	Quarterly	22	2	500	0	0.2	1.4
		Hexazinone (DI)	F&SS	µg/L	0.01			1	400		<0.01	0.02
		Tebuthiuron (DI)*	F&SS	µg/L	0.01			2	NA		0.01	0.04
		Metolachlor (DI)	F&SS	µg/L	0.01			1	300		<0.01	0.03
	Power St GWTP Reservoir		F&SS	µg/L				1			<0.01	0.01
		Bromacil (DI)	F&SS	µg/L	0.02			2	400		<0.02	0.02
	Heaps St GWTP Reservoir		F&SS	µg/L				4			0.08	0.12
Gin Gin WSA	Gin Gin Reservoir	N-Butylbenzenesulfonamide (OCTG)*	F&SS	µg/L	0.2	Quarterly	4	1	NA	0	<0.1	0.2
		Dalapn (2,2-DPA) (DI)	F&SS	µg/L	0.02			4	500		1	1.9
Gooburrum WSA	Gooburrum Reservoir	Dalapn (2,2-DPA) (DI)	F&SS	µg/L	0.02	Quarterly	4	1	500	0	<0.20	0.2
		Tebuthiuron (DI)*	F&SS	µg/L	0.01			1	NA		<0.01	0.01
Gregory WSA	Gregory Reservoir	Imidacloprid (DI)*	F&SS	µg/L	0.02	Quarterly	4	1	NA	0	<0.02	0.12
		Atrazine 2-Hydroxy (DI)*	F&SS	µg/L	0.02			2	NA		<0.02	0.11
		Atrazine (DI)	F&SS	µg/L	0.02			1	20		<0.02	0.02
		Dalapn (2,2-DPA) (DI)	F&SS	µg/L	0.02			4	500		1	4.1
		Hexazinone (DI)	F&SS	µg/L	0.01			1	400		<0.01	0.01
		Metolachlor-OXA (DI)*	F&SS	µg/L	0.01			2	NA		<0.05	0.07
		Total Imidacloprid (DI)*	F&SS	µg/L	0.04			1	NA		<0.04	0.12
		Tebuthiuron (DI)*	F&SS	µg/L	0.01			2	NA		<0.01	0.04
Kalkie WSA	Kalkie Reservoir	Tebuthiuron (DI)*	F&SS	µg/L	0.01	Quarterly	3	2	NA	0	<0.01	0.09
		Metolachlor (DI)	F&SS	µg/L	0.01			1	300		<0.01	0.04
		Metolachlor-OXA (DI)*	F&SS	µg/L	0.05			1	NA		<0.05	0.08
		Atrazine 2-Hydroxy (DI)*	F&SS	µg/L	0.02			1	NA		<0.02	0.02
		Atrazine (DI)	F&SS	µg/L	0.02			1	20		<0.02	0.02
		Dalapn (2,2-DPA) (DI)	F&SS	µg/L	0.02			2	500		<0.20	2.1
Lake Monduran	Lake Monduran Reservoir	Dalapn (2,2-DPA) (DI)	F&SS	µg/L	0.02	Quarterly	4	4	500	0	2.4	4
		2,4-D (DI)	F&SS	µg/L	0.02			4	30		0.04	0.11
Moore Park WSA	Vecellios Rd Reservoir	Atrazine, 2-Hydroxy (DI)*	F&SS	µg/L	0.02	Quarterly	8	2	NA	0	<0.02	0.16
		Atrazine (DI)	F&SS	µg/L	0.02			2	20		<0.02	0.44
		Dalapn (2,2-DPA) (DI)	F&SS	µg/L	0.02			4	500		0.8	2.1
		Desethyl Atrazine (DI)*	F&SS	µg/L	0.02			2	NA		<0.01	0.04
		Fluroxypyr (DI)*	F&SS	µg/L	0.05			1	NA		<0.05	0.05
		Haloxyfop Acid (DI)*	F&SS	µg/L	0.02			1	NA		<0.02	0.02
		Metolachlor-OXA (DI)*	F&SS	µg/L	0.05			2	NA		<0.05	0.1
		Metolachlor (DI)	F&SS	µg/L	0.01			3	300		<0.01	0.06
		Atrazine (HBL)	F&SS	µg/L	0.02			1	20		0.4	0.4
	Murdoch's Rd Groundwater Reservoir	Imidacloprid (DI)*	F&SS	µg/L	0.02			4	NA		0.03	0.07
		Total Imidacloprid (DI)*	F&SS	µg/L	0.04			2	NA		<0.04	0.07
River Park WSA	River Park Reservoir	Atrazine, 2-Hydroxy (DI)*	F&SS	µg/L	0.02	Quarterly	4	2	NA	0	<0.02	0.03
		Tebuthiuron (DI)*	F&SS	µg/L	0.01			4	NA		0.03	0.3
		Hexazinone (DI)	F&SS	µg/L	0.01			3	400		<0.01	0.03
		Metolachlor-OXA (DI)*	F&SS	µg/L	0.05			2	NA		<0.05	0.06
		Metolachlor (DI)	F&SS	µg/L	0.01			2	300		<0.01	0.09
		Dalapn (2,2-DPA) (DI)	F&SS	µg/L	0.02			4	500		0.3	2.7
Wallaville WSA	Wallaville Reservoir	Dalapn (2,2-DPA) (DI)	F&SS	µg/L	0.02	Quarterly	4	4	500	0	0.6	4.1
		Atrazine, 2-Hydroxy (DI)*	F&SS	µg/L	0.02			1	NA		<0.02	0.02
		Dicamba (DI)*	F&SS	µg/L	0.05			1	NA		<0.05	0.1
		Hexazinone (DI)	F&SS	µg/L	0.01			3	400		<0.01	0.02
		MCPA (DI)	F&SS	µg/L	0.01			2	40		<0.01	0.1
		Metolachlor-OXA (DI)*	F&SS	µg/L	0.05			1	NA		<0.05	0.08
		Metolachlor (DI)	F&SS	µg/L	0.01			4	300		0.01	0.07
		Tebuthiuron (DI)*	F&SS	µg/L	0.01			4	NA		0.03	0.26
		2,4-D (DI)	F&SS	µg/L	0.02			1	30		<0.02	0.03

The Bundaberg Regional Council carries out full and comprehensive pesticide analysis on a routine basis.

* Parameters do not have ADWG health limit – detection of these parameters were not reported to the regulator as all detected levels were below levels previously checked by Qld Health.

Rolling 12-month annual value E. coli compliance FY 2021-2022

% of samples which comply with the nil *E. coli* limit	Month											
	July - 2021	August -2021	September – 2021	October - 2021	November - 2021	December - 2021	January – 2022	February -2022	March – 2022	April - 2022	May - 2022	June -2022
Bundaberg	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	99.5%
Kalkie	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Moore Park	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
River Park	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Rocky Point	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Gooburrum	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Gregory	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Gin Gin	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Wallaville	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Lake Monduran	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Summary of Trihalomethane Sampling – 2021-2022				
Water Service Area	**Frequency of Sampling**	**Total No. of Samples**	**No. of Samples Exceeding ADWG Health Guideline of 250 µg/L**	**Value of Exceedances (µg/L)**
Bundaberg WSA	Quarterly	24	0	-
Kalkie WSA	Quarterly	20	0	-
Gregory River WSA	Quarterly	16	**4**	370, 390, 430, 440
Moore Park WSA	Quarterly	8	0	-
Gin Gin WSA	Quarterly	8	0	-
River Park WSA	Quarterly	8	0	-
Gooburrum WSA	Quarterly	4	0	-
Rocky Point WSA	Quarterly	4	0	-
Wallaville WSA	Quarterly	8	0	-
Lake Monduran WSA	Quarterly	4	**3**	260, 270, 290
	Totals	**104**	**7**	

Appendix B – Implementation of the DWQMP Risk Management Improvement Program

Scheme Name	Ref	Improvement Actions	Target Date	Actions taken to date	Status and Revised target date	Responsible Officer/Position
All Schemes	DMP18-01	A number of water treatment plants do not have online chlorine analysers. This was identified as a risk as chlorine is a major disinfection barrier. BRC will install online chlorine analysers that will include high- and low-level alarms on all plants that use chlorine for disinfection (which is all current BRC water treatment plants).	Mar-21	Chlorine analysers have been installed at all treatment plants – this has been captured in the DWQMP when reviewed 2022	Completed 2022	Process & Asset Manager
GWTPs	DMP18-03	Review the options to improve the security around the Bundaberg Bore Treatment Plants.	Dec-20	A new lock system has been installed at all water treatment plants. Council is also investigating options to enclose/contain the spray bed infrastructure in use.	2022-2023	Manager Planning & Delivery/Electrical & Mechanical Team Manager
All Schemes	DMP18-04	Identify initial procedures and work instructions required to support the CCP program	Jun-21	2022 Review of the DWQMP has captured this. DWQMP has been submitted to DRDMW for approval. Traffic lights	Completed Jun-22	Governance Team
All Schemes	DMP18-05	Prepare and implement listed procedures and instructions to support the CCP program.	Jun-21	2022 Review of the DWQMP has captured this. DWQMP has been submitted to DRDMW for approval	Completed Jun-22	Governance Team
All Schemes	DMP18-07	Implementation plan for the development of an Operations Manual for each WTP to incorporate DWQMP elements. This will include a Process Control Plan for each process unit for all water treatment plants. (Critical Control Point Plan).	Jun-21	2022 Review of the DWQMP resulted in an overhaul of the plan with sections specific to each scheme incl. CCP and OCP walk procedures. DWQMP has been submitted to DRDMW for approval	Completed Jun-22	Governance Team
All Schemes	DMP18-18	Implement a Process Control Plan for each process unit for all water treatment plants. (Critical Control Point Plan) This plan will be written into the Operations Manual.	Oct-21	2022 Review of the DWQMP has captured this. DWQMP has been submitted to DRDMW for approval	Completed Jun-22	Governance Team
Gregory	DMP18-19	Gregory River Water Treatment Plant (WTP) identified improvement measures; • Build a new WTP beside the existing WTP. This will incorporate online instrumentation (e.g. turbidimeters, pH meters, & free chlorine residual analysers. Coagulation/flocculation/sedimentation/filtration/disinfection process replacing the existing DAF process. Will also incorporate powdered activated carbon (PAC) dosing system and a PAC contact tank. Reconfiguration of the filters to use dual filter media.	2020	New site constructed	Completed Dec-21	Service Delivery Manager
Kalkie	DMP18-21	Kalkie Water Treatment Plant (WTP) implementation plan. The Kalkie WTP implementation plan identified the following improvement measures; • Upgrade the existing Kalkie WTP. The plant process will have conventional units such as – Coagulation/flocculation/sedimentation/filtration/disinfection process replacing the existing DAF process. The upgraded plant will incorporate powdered activated carbon (PAC) dosing system and a PAC contact tank. Upgrade the alum storage and dosing system to a new bulk liquid coagulant storage and dosing system; Establish a new bulk bag PAC handling and dosing facility to replace the existing PAC system that uses 15kg bags; • Set up an acid (preferably sulphuric acid) storage and dosing facility to enable flexibility in achieving the desired coagulation pH target; Install online instrumentation (e.g., turbidimeters, pH meter and free chlorine residual analysers; Install a sedimentation process to increase the solids removal capacity and improve the clarified water quality (turbidity as well as TOC) and provide a robust treatment process for prolonged raw water turbidity events;	2021	New plant is currently under construction	Dec-2022	Service Delivery Manager
Lake Monduran	DMP18-22	Lake Monduran Water Treatment Plants (WTP) identified improvement measures; Investigate alternative treatment options to address removal of organics, and algal hazards. <u>Option 1 – Upgrade to Existing Plant</u> •Additional pre-treatment process for coagulation and settling to remove of organics and algal removal prior to filtration; • Establish a PAC dosing and storage facility and contact tank to address raw water source algal bloom risks. • Implementation of control system to include pump operation and filter operation to ensure operation and reliability of the plant; • Filter media replacement; • Differential pressure testing for the filters to ensure the performance of the filters post backwashing; <u>Option 2 - Investigate other Treatment Technology Options</u> <u>Option 3 - BRC may decide to make this water service scheme a non-potable scheme due the high capital costs to upgrade the WTP with a low number of connections.</u>	Dependent on Council decision & budget	Council's Service Delivery Treatment is continuing to work through operational adjustments. A project is to be undertaken to assess the treatment process and identify measures to reduce THM levels.	2022-2023	Process & Asset Manager
GWTPs	DMP18-24	All Ground Water Treatment Plants (GWTP's): Consideration being given to in-line turbidimeters.	Jul-22	Council is looking to undertake grab samples to verify turbidity results to validate the need for in-line turbidimeters	2022-2023	Process & Asset Manager

All Schemes	DMP18-26	All Reservoirs: An investigation is required to establish a reservoir cleaning program.	Jul-22	Due to budget restrictions the program has been budgeted for the 22/23 financial year	2022-2023	Service Delivery Manager
Kalkie	DMP18-27	A review of the supernatant return point in the off-stream storage is required. The potential exists for short circuiting to occur. This is to be rectified with the plant upgrade as per item 18-21.	Jun-23	New plant is currently under construction		Service Delivery Manager
Wallaville	DMP18-28	Wallaville Water Treatment Plant (WTP) identified improvement measures; Option 1 – Upgrade to Existing Plant • Establish a PAC dosing and storage facility and contact tank to address raw water source algal bloom risks Option 2 – Alternative raw water supply • Groundwater supply is currently being investigated. Option 3 - Investigate alternative Treatment Technology Options.	Jun-24	Council's Water Service Planning & Delivery team are in the concept design stage for a possible pipeline connection between Wallaville and Gin Gin WWTP. Water from the Gin Gin or Bundaberg Schemes is being trucked in to support the Wallaville Scheme when required.	Dependant on Budget	Service Delivery Manager
All Schemes	DMP18-34	Review Contact Time (CT) times.	Dec-22	2022 Review of the DWQMP has captured this. DWQMP has been submitted to DRDMW for approval	Completed Jun-22	Governance Team
All Schemes	DMP18-35	Recommendation (REF: REC-001/16): Critical Control Points (CCP) and Quality Control Points (QCP) should be reviewed and updated to ensure that each CCP/QCP is a current process and that there is a defined critical limit at which action must be taken to reduce or remove a hazard. Re-assess if some CCP's can now be QCP's. This recommendation will be achieved through the undertaking of audits of each treatment plant where CCP & QCP levels will be reviewed, information obtained from the audits will be used to create procedures and work instructions (in collaboration with operators) to support the CCP programs which will be written into the Operations Manual for each site.	Jun-22	2022 Review of the DWQMP has captured this. DWQMP has been submitted to DRDMW for approval	Completed Jun-22	Governance Team
All Schemes	DMP20-13	Perform routine manual operation of sites, and ensure documentation exists for operating procedures. Staff should be trained and deemed competent to run manual operation of sites. Training of manual mode operations for each facility ongoing.	Apr-21	Development and review of existing operating procedures are due to occur following the review of the DWQMP	23-24	Service Delivery Manager
All Schemes	DMP20-14	Include information in the plan on what stakeholders have been actively involved in the risk assessment and why.	Dec-21	2022 Review of the DWQMP has captured this. DWQMP has been submitted to DRDMW for approval	Completed Jun-22	Governance Team
All Schemes	DMP20-15	Provide rationale in the plan to explain the acceptable levels of risk, it was noted that prior to the IRN the acceptable risk level in the plan was low. This changed to include both low and medium risk in the plan post IRN. How did BRC risk assessment team come to this decision	Dec-21	2022 Review of the DWQMP has captured this. DWQMP has been submitted to DRDMW for approval	Completed Jun-22	Governance Team
All Schemes	DMP20-16	Suggest including a review section in the plan to document the review processes that BRC is currently doing including long term data trending, data on which the risk assessments have been based etc	Dec-21	2022 Review of the DWQMP resulted in an overhaul of the plan. DWQMP has been submitted to DRDMW for approval	Completed Jun-22	Governance Team
All Schemes	DMP20-17	Group whole of system risks to avoid duplication	Dec-21	2022 Review of the DWQMP has captured this. DWQMP has been submitted to DRDMW for approval	Completed Jun-22	Governance Team
All Schemes	DMP20-18	Document that all verification data is entered into LIMS & that QCP's & CCP's are reviewed annually for trends, creep, rise into the plan to give the regulator a better understanding of the review process & the basis for the risk ratings	Dec-21	2022 Review of the DWQMP resulted in an overhaul of the plan. DWQMP has been submitted to DRDMW for approval	Completed Jun-22	Governance Team
All Schemes	DMP20-20	SCADA Monitoring - - Whilst calibration occurs, it is suggested that the operators specifically check that the instrument readings match the verification records as an additional confirmation of the SCADA results accuracy; - It is suggested, as the conversion from the instrument on the SCADA does not update if the deviation point is not triggered, that the operators refresh the screen (or auto refreshes) so that the data logger can be accurately shown on SCADA, which can then be accurately checked against verification results. A procedure may be written.	Feb-22	Looking at capturing the treatment plant log sheets into Water Services Works Management System – FOCUS in which automatic reminders and checks will be undertaken by operators	22-23	Business Services Manager
All Schemes	DMP20-23	There needs to be a process at the time of chemical delivery on-site whereby each delivery comes with a quality assured certificate for each batch of chemical instead of retrospective certificates being provided. The certificates audited do show the concentration of chemical being supplied. Each delivery docket number should link to that certificate/batch in addition to the Sample ID and delivery docket. The service provider must also be checked for ongoing quality compliance;	Jun-23	Tested parameter results now provided with chemical delivery. Insertion of special conditions into chemical tenders will require the supplier to provide with the delivery docket the SDS and batch certificate of analysis.	Completed Oct 22	Service Delivery Manager
All Schemes	DMP20-24	Sourcing of Quality Assured Materials – It is recommended that sites be checked for reminant equipment and materials that may be questionable in terms of quality materials;	Mar-22	Water Services Technical Team has updated the preferred equipment supplier to reduce this risk.	Completed	Treatment Team Manager