Drinking Water Quality Management Plan (DWQMP) report

2024-2025

Version: 2
Author: KC
Authoriser: AB

SPID	491
Name	South Burnett Regional Council
Address	PO Box 336 Kingaroy QLD 4610
Telephone	07 4189 9100
Email	water@sbrc.qld.gov.au
Website	www.southburnett.qld.gov.au
LGA Covered by This Plan	South Burnett Regional Council
Water Supply Schemes Covered by This Plan	Blackbutt, Kingaroy, Murgon, Nanango, Proston, Wondai, Bjelke-Petersen Dam, Boondooma Dam

Glossary of terms

ADWG 2011	Australian Drinking Water Guidelines (2011). Published by the National Health and Medical Research Council of Australia
DWQMP	Drinking Water Quality Management Plan
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
SBRC	South Burnett Regional Council
NTU	Nephelometric Turbidity Units
MPN/100mL	Most probable number per 100 millilitres
CFU/100mL	Colony forming units per 100 millilitres
<	Less than
>	Greater than
WTP	Water Treatment Plant

Contents

1. Introduction

This report documents the performance of South Burnett Regional Council's drinking water service with respect to water quality and performance in implementing the actions detailed in the drinking water quality management plan (DWQMP) as required under the *Water Supply (Safety and Reliability) Act 2008* (the Act).

The report assists the Regulator to determine whether the approved DWQMP and any approval conditions have been complied with and provides a mechanism for providers to report publicly on their performance in managing drinking water quality.

This report has been prepared in accordance with the *Guideline for the preparation, review and audit of the drinking water quality management plans version 3, October 2022* published by the Department of Local Government, Water and Volunteers, accessible at www.dlgwv.qld.gov.au.

2. Overview of Operations

South Burnett Regional Council water reticulation schemes service the townships of Blackbutt, Kingaroy, Murgon, Nanango, Proston and Wondai, with two smaller drinking water systems at Bjelke-Peterson Dam and Boondooma Dam tourist parks also operated under the approved DWQMP.

The following table provides operational information for each scheme.

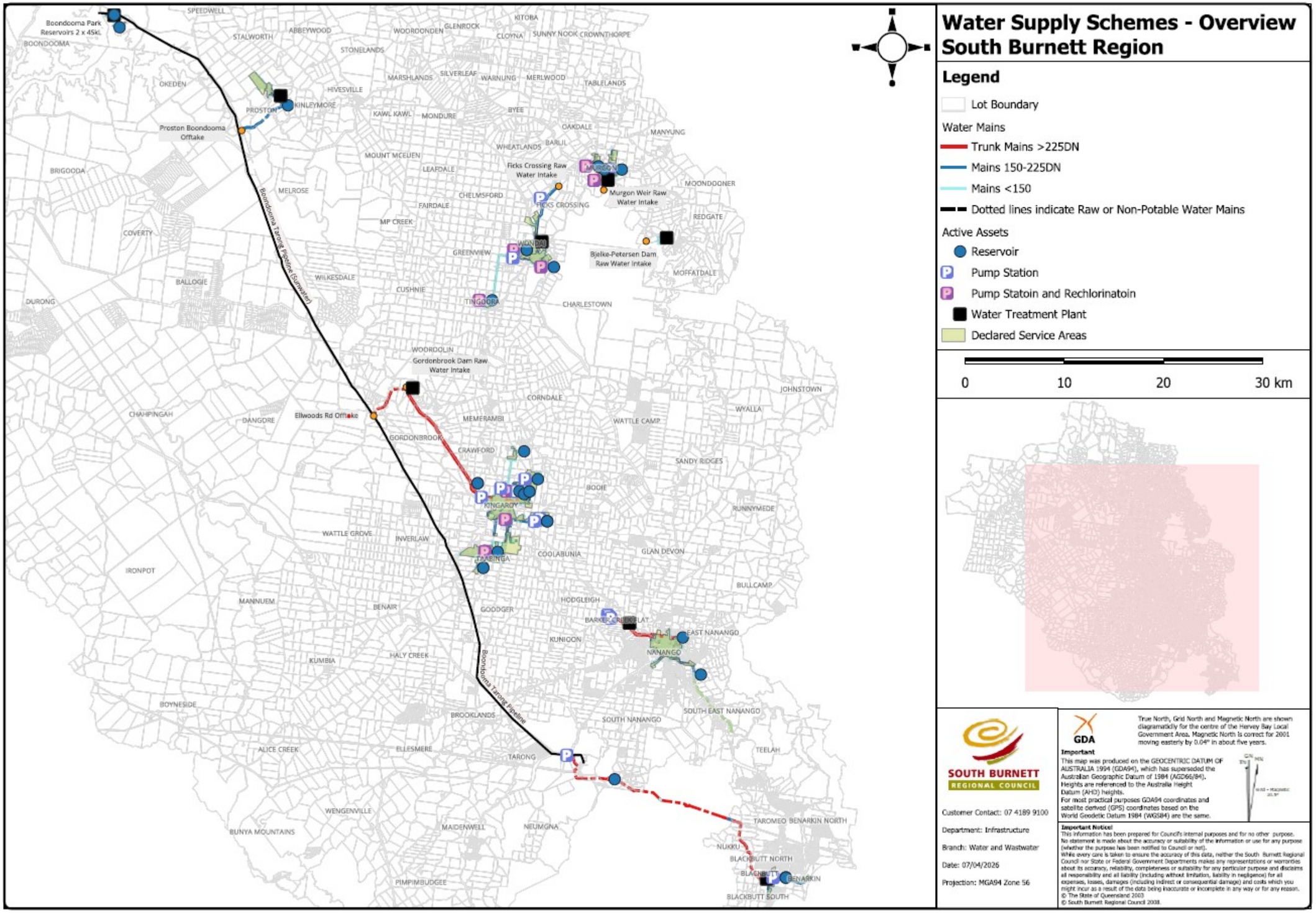
WATER SUPPLY SCHEME	TREATMENT PLANT	WATER SOURCE	WATER TREATMENT PROCESS	CAPACITY
Blackbutt	Blackbutt WTP	• Boobir Dam • Boondooma Dam	• Flocculation • Sedimentation • Filtration • Disinfection	1.15 ML/day
Kingaroy	Gordonbrook WTP	• Gordonbrook Dam • Boondooma Dam	• PAC Dosing • Coagulation • Settling • Clarification • Floatation • Filtration • Disinfection	9.72 ML/day
Murgon	Murgon WTP	• Barambah Creek.(Murgon Wier)	• Flocculation • Sedimentation • Filtration • Disinfection	2.8 ML/day
Nanango	Nanango WTP	• Barkers Creek Bore Field	• Disinfection	1.4 ML/day
Proston	Proston WTP	• Boondooma Dam • Proston Weir	• Flocculation • Sedimentation • Filtration • Disinfection	0.5 ML/day
Wondai	Wondai WTP	• Barambah Creek (Ficks Crossing)	• Flocculation • Dissolved Air Flotation • Filtration • Disinfection	3.3 ML/day

Bjelke-Petersen Dam	Bjelke-Petersen Dam WTP	•	Bjelke-Peterson Dam	• Flocculation • Filtration • Disinfection	0.2 ML/day
Boondooma Dam	Boondooma Dam WTP	•	Boondooma Dam	• Flocculation • Sedimentation • Filtration • Disinfection	0.12 ML/day

Water is disinfected with chlorine (sodium hypochlorite) before entering the reticulation system and is transferred from the treatment plants to storage reservoirs through the reticulation systems.

South Burnett Regional Council maintains more than 610.4 kilometres of water mains supplying approximately 9,932 properties connected to potable water supplies within the South Burnett region. The networks also comprise a total of 31 pump stations and 32 reservoirs with a total capacity of approximately 24.2 ML, and 10 re-chlorination stations. Figure 1 shows the extent of the South Burnett Regional Councils potable water distribution system; including areas serviced and the location of drinking water infrastructure

Figure 1: Overview Map of South Burnett Regional Council's Potable Water Distribution Network



3. Actions taken to implement the DWQMP

3.1 Progress in implementing the risk management improvement program.

The current approved DWQMP is Version 10.2024. The approved RMIP is provided in Appendix B.

RMIP items still current as part of DWQMP Version 8.3 2021have been incorporated in the current DWQMP version 10.1, as provided in appendix.

The last regular audit of Council Drinking Water Management plan was completed in April 2025.

3.2 Amendments made to the DWQMP

Operational monitoring was conducted as per the approved DWQMP plans over the previous 12 months as follows:

- Version 8.3 (between 1 July 2024 & 4 November 2025)
- Version 10 (between 5 November 2024 & 30 June 2025)

An increase in some additional water quality parameters have been monitored in a few locations. These minor changes have not influenced or required any changes to the risk evaluations.

3.3 Amendments made to the DWQMP Risk Management Improvement Program.

The current approved RMIP is in Appendix B

4. Compliance with water quality criteria for drinking water

The water quality criteria for potable water compliance are to meet health guideline values in the most current Australian Drinking Water Guidelines 2011, as well as the standards in the Public Health Regulation 2018.

Results from water quality analysis is in Appendix A. Councils DWQMP version 10 was approved in October 2024, with monitoring under this plan beginning in November 2024 as noted in section 3.2.

4.1 Notifications to the Regulator under sections 102 and 102A of the Act

During the reporting period 2024-2025 there was no microbial incidents reported. However, under sections 102 or 102A of the Act, there was several Physical and Chemical Characteristics incident and events reported to the through to the Regulator. Please see below Table 4.1, status and commentary around the incidents report.

Table 4.1

OPEN/CLOSED	Water Service Area	Parameter	Monitoring Type	QWSR Reference	Incident Date	Initial Date reported to DWSR	Sample Point ID	Comments
Closed	Proston Water Supply	Chlorates	Verification Monitoring	DWI-491-25-11833	22-Jan-25	31-Jan-25	PROS 15	22 Jan 2025 at Pros 15 (0.81) PROS15 - Previous Chlorate testing results for Proston were under the superseded plan and we tested at pros 17 which was the WTP. Chlorate sampling under previous plan Chlorates was not part of out verification monitoring plan but monitoring began from the chlorate advised in Sept 2022. This sample point under the current plan has been relocated to Pros 15. The most recent results that were taken at Pros 17 were sample 15.05.2025 - 0.3 - 8.05.2024 .18 and 1.05.2024 - .81. Due to the low results sampling frequency was reduced until the current plan was approved in Oct 2024. Closed out 14.05.2025
Closed	Wondai Water Supply	Chlorates	Verification Monitoring	DWI-491-25-11834	22-Jan-25	31-Jan-25	TING 1	Increased levels of Chlorate at Tingoora Reservoir secondary dosing station. As per drinking water management plan, follow up samples were taken and staff will be testing chlorine strength and replacing hypo-chlorite at dosing stations as per current approved management plan HACCPs. Close out email sent - 7/8/2025
Closed	Boondooma Water Supply	THM's	Verification Monitoring	DWI-491-24-11686	16-Dec-24	20-Dec-24	BOON 13	Elevated levels of THM's have been detected in the reticulation system. Historically THM levels have been exceeded during this time of year due to temperature changes and with recent high rain falls, we have scene an increase in organic matter in the raw water coming into the plant. When the resampling - 6 Jan 2024 Corrective action - Scour and empty the water reserve for THMs
Closed	Boondooma Water Supply	HAA's	Verification Monitoring	DWI-491-25-11848	23-Jan-25	13-Feb-25	BOON 13	Council has a high HAA (trichloroacetic Acid reading at Boondooma Dam Kiosk (BOON 13) on 22 Jan 2025. Result was received at the lab on the 23 Jan 2025, however Council on received the results of the test on the 13 Feb 2025. The free and total chlorine on the 22 Jan 2025 was 0.07 and 0.27. Chlorine degradation from the plant to the sample location (BOON 13) is expected due to the higher levels of THMs and HAAs identified during the period.
Closed	Murgon Water Supply	THM's	Verification Monitoring	DWI - 491-25-11861	12-Feb-25	18-Feb-25	MURG 5	Council has received high THM results for Murgon at the MURG 5 - Murgon Hospital Reservoir at 260→µg/L. Chlorine results when the samples were taken Free Chlorine - 0.57 and Total Chlorine 0.69. Turb was 1.05. Council has received high THM results for Murgon at the MURG 5 - Murgon Hospital Reservoir at 260→µg/L. Chlorine results when the samples were taken Free Chlorine - 0.57 and Total Chlorine 0.69. Turb was 1.05. 13.11.2025 - closed out
Open	Kingaroy Water Supply	THM's	Verification Monitoring	DWI-491-24-11304	30-Sep-24	1-Oct-24	KING 9	Historically THM levels have been exceeded during this time of year due to temperature changes and with recent high rain falls, we have scene an increase in organic matter in the raw water coming into the plant.
Closed	Proston Water Supply	Micro-Plastics	Verification Monitoring	DWI-491-25-11882	06-Jan-25	27-Feb-25	PROS 17	Council undertakes annual Microplastics testing and the recent test has come back with a result of Polyamide - 1,930MPs/L. Reporting only because it is significantly higher than previous years. Due to operational challenges that occurred, Council has had a delay in undertaking the 2024 annual test (completed in Jan 2025). I have attached the last 2 microplastics results for review. Council has removed the requirement for testing of Microplastics in the current QWQMP as there is no ADWG limits on microplastics and we did not want to be doing testing at a specific time and frequency. However, council continues to do testing on an annual basis.
Open	Kingaroy Water Supply		Event Notification	DWI-491-24-11572		10-Dec-24	Mount Wooroolin Res	Mount Wooroolin Reservoir No.1 has now been isolated to remove and future risk to water quality due to the damaged roof. Following successful commissioning of Mount Wooroolin Reservoir No.2, water quality and supply will be maintained whilst reservoir No.1 is isolated.
Closed	Murgon Water Supply	THM's	Verification Monitoring	DWI-491-24-11159	17-Jul-25	8-Aug-24	MURG 5 & MURG 4	Elevated THM's detected across scheme - Corrective action - Scour and empty the water reserve for THMs Investigation report was submitted, then the limits spike again late July
Closed	Blackbutt Water Supply	Chlorates	Verification Monitoring	DWI-491-25-11953	10-Mar-25	20-Mar-25	BLACK1	Increased levels of Chlorate at Blackbutt Reservoir. Operators changed out the old duty hypo tank (2000L) on 27.2.2025 and have gone to 2x500ml tanks. The aim of this is so that one can be taken offline and cleaned, keeping the chlorine store fresher and reduce the ongoing need to top up chlorine. As per drinking water management plan, follow up samples were taken. Close out email was sent 04-05-25
Closed	Blackbutt Water Supply	Missed Sample	Verification Monitoring	DWI-491-24-11179	14-Aug-24	14-Aug-24	Blackbutt & Kingaroy	Due to public holiday in Kingaroy on 12.08 and a public holiday in Brisbane on 14.8 Councils weekly sampling as per DWQMP has not been undertaken

Closed	Nanango Water Supply	Missed Sample	Verification Monitoring	DWI-491-24-11179	14-Aug-24	14-Aug-24	Nanango	Due to public holiday in Kingaroy on 12.08 and a public holiday in Brisbane on 14.8 Councils weekly sampling as per DWQMP has not been undertaken
Closed	Wondai Water Supply	THM's	Verification Monitoring	DWI-491-24-11243	21-Aug-24	3-Sep-24	WOND 12 & TING 1	Elevated THMs detected across the Wondai/Tingoora Scheme
Closed	Wondai Water Supply	Missed Sample	Verification Monitoring	DWI-491-25-11899	5-Mar-25	5-Mar-25	WOND & Murgon	Received notification from the labs in Brisbane that they weren't accepting samples as of the Cyclone Alfred was due to hit. Council undertook internal testing in the SBRC labs with no issues identified. Closed 14.05.2025
Closed	Murgon Water Supply	Missed Sample	Verification Monitoring	DWI-491-25-11899	5-Mar-25	5-Mar-25		Received notification from the labs in Brisbane that they weren't accepting samples as of the Cyclone Alfred was due to hit. Council undertook internal testing in the SBRC labs with no issues identified. Closed 14.05.2025
Closed	Blackbutt Water Supply	Turbidity	Event Notification	DWI-491-25-11929	10-Mar-25	20-Mar-25	Reticulation Network	Whilst council has been continuing to investigate this event, an incident for High Manganese was opened DWI-491-25-12045 on 30/4/2025 for limits above the ADWG Health guideline at a customer's meter whilst flushing after a complaint. Closed out 30.05.2025.
Closed	Yallakool Water Supply		Event Notification	DWI-491-25-12022	14-Mar-25	22-Mar-25		Notified the regulator of a vandalism attempt and that the pumps failed and the Caravan park had a water outage for about 4 hours. Report and closed as this is Non-reportable.
Closed	Blackbutt Water Supply	Manganese	Operational CCP	DWI-491-25-12045	30-Apr-25	30-Apr-25	Reticulation Network	Through monitoring of event DWI-491-25-11929, Council was undertaking monitoring throughout the reticulation scheme and at customer meter if dirty water was reported. A high Manganese level of 0.624 mg/l. Email notification closing out incident was received on 1.8.2025
Closed	Boondooma Water Supply		Operational	DWI-491-25-12042	30-Apr-25	30-Apr-25	Reticulation Network	Due to a Sunwater pipeline maintenance shut down period, Council will have to truck treated water from the Proston Water Treatment Plant to the Boondooma Water Treatment plant clear water reservoir during this period. Shutdown is from 30.04.2025 to 12.05.2025. During this time verification testing for current open incidents for HAA's, THM and Chlorates at BOON 13 wont be taken at this site for the week beginning 28 April 2025 as the water is being tested as per the verification plan for Pros
Closed	Wondai Water Supply	THM's	Verification Monitoring	DWI-491-25-12065		12-May-25	Reticulation Network	Missed high THM whilst monitoring through spreadsheet. Part B form was submitted to the regulator and a couple weeks later results came back exceeding the 250, as the regulator had not closed it out we ask for this incident to remain open
Closed	Proston Water Supply	THMs	Verification Monitoring	DWI-491-25-12090	13-May-25	23-May-25	Reticulation Network	Received high THMS at PROS 15 (res) believe to be left over water from the Sunwater shutdown. **Investigation report sent off 24.06.2025**
Closed	Wondai Water Supply		Event Notification	DWI-491-25-11899	5-Mar-25	5-Mar-25	WOND	Event notification was sent advising of missed samples as the external labs had closed down due to cyclone Alfred
Closed	Murgon Water Supply		Event Notification	DWI-491-25-11899	5-Mar-25	5-Mar-25	MURG	Event notification was sent advising of missed samples as the external labs had closed down due to cyclone Alfred

Closed	Blackbutt Water Supply	Manganese	Operational CCP	DWI-491-25-11929	12-Mar-25	12-Mar-25	Reticulation Network	On Saturday 8 March dirty water was identified by a treatment operator at the public toilets in Blackbutt and also noted that the Chlorine was low at test points. Flushing of the outer limits was undertaken for approximately 4 hours until was colour cleared up. Program Coordinator contacted Principal Engineer, and after an initial remote assessment identified that an unplanned interruption to the Nukku (Tarong) Pump station which occurred on late on the 3rd March was expected to have caused Mn in the raw water supply line due to pressure, flow and air lock impacts on the raw water supply to Blackbutt. Supply was restored quickly at the Tarong PS once identified (interruption was expected for approximately 4 hours), however the increase in Mn in the raw water was not flushed out prior to entering the water treatment plant.
Closed	Blackbutt Water Supply	Loss of Supply	Operational Event	DWI-491-25-12096	29-May-25	29-May-25	BLACK1, BLACK6, BEN5, BLACK11, WTP	Loss of supply was due to faulty level sensors in the low-level reservoirs, operational monitoring was conducted at the sites indicated. 03-11-25 Part B was submitted
Closed	Blackbutt Water Supply	THM's	Verification Monitoring	DWI-491-25-11977	24-Mar-25	28-Mar-25	BEN 5	07-08-25 High THMs at BEN 5 as per verification sampling -Part B form was submitted one THM levels lowered below critical HACCP.

Customer Service Standards

Council's Customer service review has been reviewed in Oct 2025 but yet to be formally adopted by Council. Council continues to improve record keeping accuracy within the reticulation team for continual improvement with their customer service standards.

Throughout the year 2024-25 the following complaints about water quality were received:

Table 2 complaints about water quality.

	Health Concern	Discoloured Water	Odour	Taste	Total
Blackbutt	~	7	~	~	7
Kingaroy	~	14	~	~	14
Murgon	~	~	~	~	0
Nanango	~	1	~	~	1
Wondai	~	0	~	~	0
Boondooma Dam	~	~	~	~	0
Bjelke-Petersen Dam	~	~	~	~	0
Proston	~	~	~	~	0
Total	**0**	**22**	**0**	**0**	**22**

Customer complaints related to water quality

South Burnett Regional Council is required to report on the number of complaints, general details of complaints and the responses undertaken.

Health Concern

Complaints are sometimes received from customers who suspect their water may be associated with an illness they are experiencing. South Burnett Regional Council investigates each complaint relating to an alleged illness, typically by follow up testing of the customer's tap water and closed reticulation sampling point.

Council had no reported incidents of health concerns related to water quality for the reporting year.

Discoloured water

Twenty-two customer complaints were received by South Burnet Regional Council between July 2024 – June 2025 related to dirty water. Complaints received for dirty water in Kingaroy and Blackbutt this year were primarily related to Manganese, causing the bulk of the complaints. Other complaints arise when there has been a failure within the reticulation system, such as a broken water main or fire hydrant testing**.** Oxidising iron and manganese within the reticulation network can also occur. Flushing and scouring are often used to resolve these issues.

5. Findings and recommendations of the DWQMP auditor

The DWQMP regular audit was conducted and completed April 2025. Following the Audit findings and recommendations a review of the DWQMP was conducted. This amendment was submitted to the regulator on 29 October 2025.

Item	Recommendation / Opportunity for improvement (OFI)	Action	Status of actions	Responsible officer / position
REC 1: Critical Control Point (CCP) Breach Record Keeping	Recommendation	Provide refresher training to operators on actions to take and records to maintain on breach of the CCP critical limit.	SBRC currently undertakes annual DWQMP refresher training for new operators and refresher training for existing. Training is also undertaken following an amendment to an existing plan.	Program Coordinator
REC 2: Risk Management Improvement Plan (RMIP)	Recommendation	Establish a process for regular reviews and updates of the RMIP (in progress).	Following the amendment application (and subsequent approval), the RMIP will be scheduled for an annual review of the improvement item status.	Project Support Officer
REC 3: Reservoir Cleaning	Recommendation	Develop a formal reservoir cleaning program and schedule	A draft procedure has been developed, however not yet implemented as of October 2025. Some reservoirs have access limitations and require additional tools and equipment to access appropriately. The cleaning program is planned to be implemented from July 2026.	Program Coordinator
REC 4: Reservoir Inspection	Recommendation	Develop a formal reservoir inspection program and procedure (e.g. a checklist which can be maintained as a record)	A draft procedure has been developed, however not yet implemented as of October 2025. Some reservoirs have access limitations and require additional tools and equipment to access appropriately. The inspection program is planned to be implemented from July 2026.	Program Coordinator
REC 5: CCP Checks in Supervisory Control and Data	Recommendation	Acquisition (SCADA) Establish a process for periodic checks of the CCP alert and critical limits in SCADA against the approved DWQMP (alert for filtered water turbidity was 0.7 NTU instead of 0.3 NTU, chlorine clear water limits in SCADA are different to the DWQMP)	SBRC is reviewing SCADA programming options to allow for temporary overrides to reset HACCP limits, or restrictions on operational access. Both have difficulties in implementing. Short term, reviewing SCADA HACCP and DWQMP HACCP has been delegated to the Program Coordinator and Treatment Coordinator to review.	Program Coordinator

REC 6: Filtered Water Turbidity Critical Limit	Recommendation	Investigate aligning the filtered water turbidity CCP critical limit with the Australian Drinking Water Guidelines (ADWG) (0.5 NTU)	This recommendation is difficult to achieve due to the age of filters and what they have been designed to achieve historically. WTP infrastructure upgrades are not a routine occurrence and current HACCP limits are set on what the existing filter design are able to achieve. The DWQO Strategy has identified recommendations to improve filter performance, however ultimately the current ADWG values may not be able to consistently be achieved for aged plants without increased capital expenditure.	Manager W&WW
REC 7: Online Monitoring and SCADA	Recommendation	Investigate improved operational controls at all Water Treatment Plants (WTPs) e.g. auto shutdown of the WTP on breach of critical limits	This item has been indicated with the DWQO Strategy, with outcomes identified in the risk assessment and RMIP. The timing for these will be capital budget dependant, and these items are planned to be set in a major review of SBRC Water and Wastewater 10-year capital works plan set from July 2027.	Principle Engineer W&WW - Manager W&WW
OFI 1: Risk Register Review	OFI	Review the risk register (at the next DWQMP review) for adequacy and currency (e.g. consider filter break-through max consequence should be higher than moderate, Blackbutt does not have auto shutdown ability as stated in WTP8 risk item, same issue with Wondai).	SBRC has review the risk register (including the specific item mentioned and have amended the consequences as necessary. However, the associate risk profile was already Very High, so adjusted the consequence did not increase the risk profile.	Program Coordinator
OFI 2: Employee Training	OFI	Consider developing a skills and competency matrix for the water team.	SBRC is participating in the WBBUWA Skills gap and SWIM Skills tool for this project. The expected completion of this project is not known, however the results will provide not only a current status of formal training requirements but also provide a means of documenting and following staff progress in knowledge attainment. Short term this will need to be developed by W&WW and P&C branches in Council	Program Coordinator

OFI 3: DWQMP Annual Report Work Instruction	OFI	Develop a work instruction for preparing the DWQMP annual report.	A draft procedure has been developed. Finalisation of this procedure will be undertaken as part of the review and guidance with next year annual performance reporting.	Program Coordinator
OFI 4: Onboarding Training Record	OFI	Review the filling and recording of the onboarding training checklist (for some the dates are not in the complete form, competency column is not filled).	The onboarding process has been adopted across Water and Wastewater branch. The recording of specific items on the form is dependent on the completion of the onboarding items and the signing supervisor. Review of these documents are generally undertaken once onboarding completed, however this is being considered to be implemented as part of the formal checks with Council's P&C team.	Program Coordinator
OFI 5: Mains/Pipes Repairs	OFI	Include process of testing for chorine and turbidity post repair works and flushing in the procedure. Maintain records of testing undertaken post repairs.	Program Coordinator to Review SWI-177 Water Main Repair to include the need to test for turbidity and chlorine post repair.	Program Coordinator
OFI 6: Procedures Access	OFI	Improve clarity on the location of the procedures (can be in the DWQMP).	DWQMP amendment has indicated the location of the procedures identified.	Program Coordinator
OFI 7: Contacts List	OFI	Review the contacts list in the DWQMP (Appendix J) to include other vulnerable customers for other supplies, for example, Blackbutt and Wondai.	The Emergency contact list has been updated to include necessary customer contact details for schemes other than Kingaroy.	Program Coordinator / Project Support Officer
OFI 8: Incident Response Testing	OFI	Periodically test the drinking water quality incident response management, from identification, response, communications (regulator and public notifications) and recovery.	Incident responses are routinely checked with actual incidents that occur regularly (i.e. THMs) in multiple schemes. However not all scenarios are tested it is planned to include this as part of the DWQMP annual refresher training.	Program Coordinator

OFI 9: Water Sampling	OFI	Maintain in-house training records for water sampling (while the sampler is completing Cert 3). Maintain training and competency records for staff undertaking the in-house Escherichia coli (E. coli) testing.	Training records and procedures have been reviewed and updated for the Kingaroy WWTP laboratory. These are now also listed in the Procedure section of the DWQMP. This now includes a register of competency for staff trained in using the TECTA system.	Senior Laboratory Technician
OFI 10: Catchment Category	OFI	Review the catchment category for the supplies when more raw water E. coli results (e.g., 1-2 years) have been compiled and evaluated.	Raw water sampling E. coli has begun on a 3-month schedule and is now also included in the amended DWQMP. A review of this data will occur with the next review once sufficient data has been collated for a catchment perspective.	Water Sampling Technician
OFI 11: Blackbutt Chlorine tank	OFI	Consider putting shades on the window to prevent sunlight on the tanks (to minimise chlorate risk further).	Council is investigating the option of tinting the windows that allow direct sunlight into the WTP area as this will be a more affordable and less maintenance option.	Program Coordinator / Treatment Coordinator
OFI 12: Daily Run Sheet	OFI	Consider developing a daily run sheet for operator routine tasks other than just water testing at all WTPs (similar to the one used at Gordonbrook WTP).	This item is being considered as part of the O&M manual review and updates. Treatment Coordinator and Technical Officer.	Treatment Coordinator / Technical Officer
OFI 13: Procedures	OFI	Document relevant operational procedures for the Blackbutt supply e.g., process and water quality considerations when switching raw water sources, cleaning of the chlorine tank prior to refill etc.	This item is being considered as part of the O&M manual review and updates. Treatment Coordinator and Technical Officer.	Treatment Coordinator / Technical Officer
OFI 14: Backwash Trigger	OFI	Consider adding filtered water turbidity also as a backwash trigger (currently only time based at Gordonbrook). For example, this can be at the CCP alert level.	This item is included as part of the DWQO Strategy - namely as part of the SCADA and instrument upgrades. The items to achieve this will form part of the Switchboard and Process Control Upgrades when they occur as part of the Capital works programs due to the extensive costs involved in achieving.	Program Coordinator
OFI 15: Clear Water Tank 2	OFI	Investigate the cleanliness, vermin integrity and stagnation at the Gordonbrook WTP clear water tank 2. A layer of ‘dirt’ or something appeared to be floating on top.	Progrm Coordinator and Treatment Coordinator to investigate and provide recommendations as part of RMIP.	Program Coordinator / Treatment Coordinator

OFI 16: SCADA Reports	OFI	Investigate reporting modules in SCADA to easily identify breaches of CCP critical limit as a summary. This information can be used for risk assessments or process improvements.	This item is programmed to follow the upgrade on the remaining SCADA system during 25/26. Expected inclusion will be the 27/28 FY due to the significant increase in cost associated with process control and instrumentation and capital budget arrangements.	Principle Engineer W&WW
OFI 17: Calibration	OFI	Develop a calibration record sheet for in-house calibrations undertaken. For example, for online analysers and checking performance against grab samples (acceptable tolerance range). Include checking of the expiry dates on calibration standards (e.g., pH buffers) in the record sheet.	Calibration schedules and records are kept on the WTP operations log spreadsheets. Program Coordinator and Treatment Coordinator need to provide procedure for routinely reviewing these to ensure calibrations are completed as part the O&M manuals.	Program Coordinator / Treatment Coordinator
OFI 18: Filtered Water Cover	OFI	Investigate a cover for the filtered water storage location prior to chlorine dosage at Wondai WTP.	Treatment Coordinator to investigate and provide a recommendation to include in the RMIP. Currently consideration in relocating Chlorine dosing equipment inside.	Treatment Coordinator
OFI 19: Turbidity Online Monitoring Location	OFI	Investigate relocating the online turbidity monitoring sample line to before chlorine injection at Wondai WTP. This will provide true indication of filtration performance.	Treatment Plant Coordinator to review and provide recommendation for this item. Completed	Treatment Coordinator
OFI 20: Wooroolin Reservoir	OFI	Rectify the three whirly birds which are not working. Rectify the rust at Wooroolin reservoir at the whirly birds.	This has been investigated and forms part of the defect work list for the contractor under the D&C contract. These defects have been completed March 2026	Manager W&WW
OFI 21: Tingoora Reservoir	OFI	Rectify the whirly bird, it seems to be not working.	This item has been added to the maintenance request process to be completed June 2026.	Program Coordinator / Coordinator Maintenance
OFI 22: Reservoir overflow outlet	OFI	Consider installing protection e.g., frog flaps on reservoir overflow outlet at Tingoora (consider applying this across).	This item has been added to the maintenance request process to be completed June 2026.	Program Coordinator / Coordinator Maintenance

Appendix A – Summary of compliance with water quality criteria.

The results from the verification monitoring program have been compared against the levels of the water quality criteria specified by the Regulator in the *Water Quality and Reporting Guideline for a Drinking Water Service*.

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

Verification monitoring was conducted as per DWQMP***. Please note, sample numbers may vary due to public holidays and Christmas shutdown periods and laboratory closures over these periods.***

E. coli verification monitoring: Bjelke-Petersen Dam

Bjelke-Petersen Dam WSA												
Month	**July 2024**	**Aug 2024**	**Sept 2024**	**Oct 2024**	**Nov 2024**	**Dec 2024**	**Jan 2025**	**Feb 2025**	**Mar 2025**	**Apr 2025**	**May 2025**	**June 2025**
No. of samples collected	1	1	1	1	1	1	1	1	1	1	1	1
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	9	10	10	10	10	10	10	11	11	11	12	12
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

E. coli verification monitoring: Blackbutt

Blackbutt WSA												
Month	July 2024	Aug 2024	Sept 2024	Oct 2024	Nov 2024	Dec 2024	Jan 2025	Feb 2025	Mar 2025	Apr 2025	May 2025	June 2025
No. of samples collected	15	9	15	12	1	1	1	1	1	1	1	5
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	138	138	144	141	130	122	112	103	92	81	70	63
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

E. coli verification monitoring: Boondooma

Boondoooma WSA												
Month	July 2024	Aug 2024	Sept 2024	Oct 2024	Nov 2024	Dec 2024	Jan 2025	Feb 2025	Mar 2025	Apr 2025	May 2025	June 2025
No. of samples collected	1	1	1	1	1	1	1	1	1	2	2	1
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	12	12	12	12	12	12	12	12	12	13	14	14
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

E. coli verification monitoring: Kingaroy

Kingaroy WSA												
Month	July 2024	Aug 2024	Sept 2024	Oct 2024	Nov 2024	Dec 2024	Jan 2025	Feb 2025	Mar 2025	Apr 2025	May 2025	June 2025
No. of samples collected	44	44	44	55	7	7	7	7	7	8	7	7
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	537	537	537	548	500	474	437	401	364	317	281	244
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

E. coli verification monitoring: Murgon

Murgon WSA												
Month	July 2024	Aug 2024	Sept 2024	Oct 2024	Nov 2024	Dec 2024	Jan 2025	Feb 2025	Mar 2025	Apr 2025	May 2025	June 2025
No. of samples collected	30	24	24	30	4	5	4	4	4	5	4	4
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	276	277	283	289	263	255	235	215	207	188	162	142
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

E. coli verification monitoring: Nanango

Nanango WSA												
Month	**July 2024**	**Aug 2024**	**Sept 2024**	**Oct 2024**	**Nov 2024**	**Dec 2024**	**Jan 2025**	**Feb 2025**	**Mar 2025**	**Apr 2025**	**May 2025**	**June 2025**
No. of samples collected	25	15	25	20	4	5	4	4	5	4	4	4
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	229	230	240	235	219	209	193	182	167	151	135	119
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

E. coli verification monitoring: Proston

Proston WSA												
Month	**July 2024**	**Aug 2024**	**Sept 2024**	**Oct 2024**	**Nov 2024**	**Dec 2024**	**Jan 2025**	**Feb 2025**	**Mar 2025**	**Apr 2025**	**May 2025**	**June 2025**
No. of samples collected	3	3	3	3	1	1	1	1	1	1	1	1
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	36	36	36	36	34	32	30	28	26	24	22	20
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

E. coli verification monitoring: Wondai

Wondai WSA												
Month	**July 2024**	**Aug 2024**	**Sept 2024**	**Oct 2024**	**Nov 2024**	**Dec 2024**	**Jan 2025**	**Feb 2025**	**Mar 2025**	**Apr 2025**	**May 2025**	**June 2025**
No. of samples collected	30	24	24	30	4	5	5	4	4	5	4	4
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	275	276	282	288	262	255	236	216	208	189	163	143
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

Water quality Analysis: Bjelke-Peterson Dam Raw Water

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Comments
Standard Water Analysis										
Calcium	mg/L	4	10	21	38	29.3	38			
Conductivity	uS/cm	4	10	460	880	642	867			
Magnesium	mg/L	4	10	15	30	21.8	30			
pH		4	10	6.55	7.37	6.86	7.27			
Sodium Abs. ratio	calc.	4	10	1.6	2.2	1.84	2.2			
Total Dissolved Solids	mg/L	4	10	240	440	326	431			
Turbidity	NTU	4	10	<1	9	3	8			
Alkalinity	mg/L	4	10	66	110	89	110			
Aluminium	mg/L	4	10	<0.03	0.08	0.04	0.05			
Bicarbonate	mg/L	4	10	81	138	109.1	137.55			
Boron	mg/L	4	10	0.04	0.05	0.04	0.05	4		
Carbonate	mg/L	4	10	0	0.2	0.05	0.16			
Chloride	mg/L	4	10	93	220	137.4	206.5			
Copper	mg/L	4	10	<0.003	<0.003	0.003	0.002	2		
Figure of merit ratio	calc.	4	10	1.3	1.4	1.4	1.4			
Fluoride	mg/L	4	10	<0.02	0.16	0.09	0.16	1.5		
Hydrogen	mg/L	4	10	0	0	0	0.0			
Hydroxide	mg/L	4	10	0	0	0	0.0			
Iron	mg/L	4	10	<0.01	<0.01	0.01	0.01			
Manganese	mg/L	4	10	<0.00	0.04	0.01	0.04	0.1		
Mole ratio	calc.	4	10	3.2	4.1	3.66	4.06			
Nitrate	mg/L	4	10	0.47	65	7.23	36.29	50		
pH saturation	calc.	4	10	7.8	8.3	8.09	8.26			
Potassium	mg/L	4	10	6.6	7.4	6.96	7.4			
Residual Alkalinity	mg/L	4	10	0	0	0	0			
Sat. index	calc.	4	10	-1.6	-0.5	-1.22	-0.59			
Silica	mg/L	4	10	7	17	12	17			
Sodium (W:WW:RW)	mg/L	4	10	39	76	54.8	75.1			
Sulphate	mg/L	4	10	3.5	12	7.46	12	500		
Temporary Hardness	mg/L	4	10	66	114	90	114			
Total Dissolved Ions	mg/L	4	10	263	491	368	488			
Total Hardness	mg/L	4	10	114	217	163	217			
True Colour	Hazen	4	10	<8	34	13	32	15		
Zinc	mg/L	4	10	<0.06	<0.06	0.06	0.03			

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Comments
Disinfection Monitoring										
Free Chlorine		No tests undertaken on Raw Water								
Total Chlorine										
Disinfection By Products & Pre-Curser										
Total Trihalomethane		No THM tests undertaken on Raw Water								
Bromide		2	6	0.22	0.28	0.26	0.28			
Chlorate		No tests undertaken on Raw Water								
Chlorite										
BGA										
BGA - Total Cells		4	6	100	210000	33942.9	149760			
BGA - Total Toxic Cells			6	170	24000	4595	18350			
BGA-Dolichospermum (Anabaena) circinalis Cells			1	550	550	550	550			
BGA-Raphidiopsis raciborskii Ce	cells/mL		6	170	24000	4595	18350			
BGA-Synechococcus spp. Cell C	cells/mL		6	100	170000	30283.3	128500			
BGA-Total Cyanobacteria Biovolu	mm3/L		7	0.000	3.9	0.639	2.787			
NB: Toxins are only analysed when toxic cell count is greater that 20,000 cells per ml										
Heavy Metals										
Aluminium	mg/L	0	6	0.039	44	9.9395	35.05			
Arsenic	mg/L	0	6	0.0006	0.0016	0.00102	0.00153	0.01		
Cadmium	mg/L	0	6	<0.00010	<0.00010	0.0001	0.00005	0.002		
Chromium	mg/L	0	6	<0.00010	0.0003	0.00013	0.00024	0.05		
Copper	mg/L	0	6	<0.00100	<0.00100	0.001	0.0005	2		
Iron	mg/L	0	6	<0.00500	0.047	0.03067	0.04575			
Lead	mg/L	0	6	<0.00010	<0.00010	0.0001	0.00005	0.005		
Manganese	mg/L	0	6	0.014	0.079	0.0475	0.073	0.5[1]		
Nickel	mg/L	0	6	0.0007	0.0012	0.00095	0.0012	0.02		
Zinc	mg/L	0	6	<0.00100	0.004	0.003	0.004			
Radionuclides										
Total Alpha Activity	Bq/L	1	2	<0.100	<0.100	0.1				
Total Beta Activity	Bq/L	1	2	<0.100	<0.100	0.1				
K_{40} - Corrected Beta Activity	Bq/L	1	2	<0.100	<0.100	0.1				
Pesticides		4	4	No limit exceedences reported						
PFAS		1	1							

Note 1 Health Limit for Manganese is taken to be 0.5mg/L. ADWG Health guidelines were updated to June 2025 to 0.1mg/L however Council has no non-compliances after this

Water quality Analysis: Bjelke-Petersen Dam Treated Water

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Comments
Standard Water Analysis										
Calcium	mg/L	9	9	25	41	31	40.2			
Conductivity	uS/cm	9	9	500	860	648	860			
Magnesium	mg/L	9	9	15	30	20.89	29.6			
pH		9	9	7.04	8.11	7.44	8.02			
Sodium Abs. ratio	calc.	9	9	1.7	2.3	1.94	2.26			
Total Dissolved Solids	mg/L	9	9	260	440	334	436			
Turbidity	NTU	9	9	<1	9	3	8			
Alkalinity	mg/L	9	9	77	130	99	126			
Aluminium	mg/L	9	9	<0.03	<0.03	0.03	0.02			
Bicarbonate	mg/L	9	9	94	151	118	149			
Boron	mg/L	9	9	0.04	0.05	0.04	0.05	4		
Carbonate	mg/L	9	9	0.1	1.7	0.39	1.3			
Chloride	mg/L	9	9	98	190	134.22	186			
Copper	mg/L	9	9	<0.003	0.019	0.006	0.014	2		
Figure of merit ratio	calc.	9	9	1.2	1.3	1.3	1.3			
Fluoride	mg/L	9	9	0.12	0.17	0.14	0.17	1.5		
Hydrogen	mg/L	9	9	0	0	0	0.0			
Hydroxide	mg/L	9	9	0	0	0	0.0			
Iron	mg/L	9	9	<0.01	<0.01	0.01	0.01			
Manganese	mg/L	9	9	<0.00	0.01	0	0.01	0.1		
Mole ratio	calc.	9	9	2.3	3.4	3.04	3.4			
Nitrate	mg/L	9	9	0.77	1.2	1.06	1.2	50		
pH saturation	calc.	9	9	7.8	8.2	8.02	8.16			
Potassium	mg/L	9	9	6.3	7.7	6.87	7.58			
Residual Alkalinity	mg/L	9	9	0	0	0	0			
Sat. index	calc.	9	9	-1.1	0.3	-0.58	0.22			
Silica	mg/L	9	9	10	17	14	17			
Sodium (W:WW:RW)	mg/L	9	9	44	80	58.11	78.4			
Sulphate	mg/L	9	9	6.1	12	8.86	12	500		
Temporary Hardness	mg/L	9	9	77	126	98	124			
Total Dissolved Ions	mg/L	9	9	290	497	379	497			
Total Hardness	mg/L	9	9	124	218	163	218			
True Colour	Hazen	9	9	<8	<8	8	4	15		
Zinc	mg/L	9	9	<0.06	<0.06	0.06	0.03			

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Comments
Disinfection Monitoring										
Free Chlorine		12	13	0.03	2.4	0.54	1.93			
Total Chlorine		12	13	0.15	2.8	0.78	2.11			
Disinfection By Products & Pre-Curser										
Total Trihalomethane		4	10	85	210	134	197	250		
Bromide		4	9	0.09	0.24	0.13	0.28			
Chlorate		4	4	0.12	0.65	0.28	0.58			
Chlorite		4	4	<0.01	<0.01	0.01	0.01	0.8		
BGA										
BGA - Total Cells		0								
BGA - Total Toxic Cells		0								
NB: Toxins are only analysed when toxic cell count is greater that 20,000 cells per ml										
Heavy Metals										
Aluminium	mg/L	8	8	0.037	0.35	0.12288	0.3115			
Arsenic	mg/L	8	8	0.0004	0.0006	0.00053	0.0006	0.01		
Bismuth	mg/L	1	1	<0.00010	<0.00010	0.0001	0.00005	10		
Cadmium	mg/L	8	8	<0.00010	0.0001	0.0001	0.00008	0.002		
Chromium	mg/L	8	8	<0.00010	0.0001	0.0001	0.00008	0.05		
Copper	mg/L	8	8	<0.00100	0.008	0.002	0.0059	2		
Iron	mg/L	8	8	<0.00500	0.022	0.00825	0.0192			
Lead	mg/L	8	8	<0.00010	0.0003	0.00013	0.00023	0.005		
Manganese	mg/L	8	8	0.0013	0.02	0.00923	0.01965	0.5[1]		
Nickel	mg/L	8	8	0.0005	0.0018	0.00085	0.00149	0.02		
Selenium	mg/L	1	1	<0.00100	<0.00100	0.001	0.0005			
Zinc	mg/L	8	8	0.003	0.01	0.00616	0.00941			
Radionuclides										
Total Alpha Activity	Bq/L	2	2	<0.100	<0.100	0.1				
Total Beta Activity	Bq/L	2	2	<0.100	<0.100	0.1				
K_{40} - Corrected Beta Activity	Bq/L	2	2	<0.100	<0.100	0.1				

Note 1 Health Limit for Manganese is taken to be 0.5mg/L ADWG Health guidelines were updated to June 2025 to 0.1mg/L however Council has no non-compliances after this

Water quality Analysis: Blackbutt Raw Water

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Comments
Standard Water Analysis										
Calcium	mg/L	8	19	5	24	11.83	23.1			
Conductivity	uS/cm	8	19	310	980	675	980			
Magnesium	mg/L	8	19	10	23	18.16	23			
pH		8	19	6.28	7.01	6.67	6.99			
Sodium Abs. ratio	calc.	8	19	1.6	9	4.04	6.12			
Total Dissolved Solids	mg/L	8	18	170	480	342	472			
Turbidity	NTU	8	19	<1	64	17	60			
Alkalinity	mg/L	8	19	6	81	39	80			
Aluminium	mg/L	8	18	<0.03	1.4	0.3	1.32			
Bicarbonate	mg/L	8	18	18	99	49.67	97.3			
Boron	mg/L	8	18	0.03	0.1	0.07	0.1	4		
Carbonate	mg/L	8	18	0.00	0.1	0.01	0.1			
Chloride	mg/L	8	19	15	280	165.95	271			
Copper	mg/L	8	18	<0.003	0.011	0.004	0.006	2		
Figure of merit ratio	calc.	8	18	0.3	1.1	0.7	1.1			
Fluoride	mg/L	8	19	0.08	0.15	0.11	0.15	1.5		
Hydrogen	mg/L	8	18	0.00	0.00	0	0.0			
Hydroxide	mg/L	8	18	0.00	0.00	0	0.0			
Iron	mg/L	8	18	<0.01	1	0.28	0.97			
Manganese	mg/L	8	18	<0.00	<0.62	0.07	0.27	0.1		
Mole ratio	calc.	8	18	3.5	5.3	4.38	5.22			
Nitrate	mg/L	8	19	0.07	1.5	0.57	1.32	50		
pH saturation	calc.	8	18	8.2	9.5	8.91	9.5			
Potassium	mg/L	8	19	2.3	6.2	4.19	6.11			
Residual Alkalinity	mg/L	8	18	0	0	0	0			
Sat. index	calc.	8	18	-3.2	-1.2	-2.32	-1.2			
Silica	mg/L	8	18	4	18	11	18			
Sodium (W:WW:RW)	mg/L	8	18	30	140	88.5	140			
Sulphate	mg/L	8	19	2.7	11	6.72	11	500		
Temporary Hardness	mg/L	8	18	15	81	41	80			
Total Dissolved Ions	mg/L	8	18	183	476	356	472			
Total Hardness	mg/L	8	18	70	153	104	147			
True Colour	Hazen	8	18	<8	100	33	98	15		
Zinc	mg/L	8	18	<0.06	<0.06	0.06	0.03			

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Comments
Disinfection Monitoring										
Free Chlorine		No tests undertaken on Raw Water								
Total Chlorine										
Disinfection By Products & Pre-Curser										
Total Trihalomethane		No THM tests undertaken on Raw Water								
Bromide	Mmg/L	52	46	0.17	0.81	0.65				
Chlorate		No tests undertaken on Raw Water								
Chlorite										
BGA										
BGA - Total Cells	cells/mL	52	43	33	130000	27890.1	120000			
BGA - Total Toxic Cells	cells/mL	13	13	15	120000	9534.6	48600			
BGA-Microcystis aeruginosa Cells	cells/mL		3	150	1000	466.7	925			
BGA-Raphidiopsis raciborskii Cells	cells/mL		12	0	670	171.7	659			
BGA-Synechococcus spp. Cell Count	cells/mL		13	0	380	74.2	260			
BGA-Total Cyanobacteria Biovolume	mm3/L		37	0	0.14	0.029	0.092			
NB: Toxins are only analysed when toxic cell count is greater that 20,000 cells per ml										
Heavy Metals										
Aluminium	mg/L	8	18	0.004	15	1.04822	2.896			
Arsenic	mg/L	8	18	0.0002	0.0023	0.00077	0.0023	0.01		
Cadmium	mg/L	8	18	<0.00010	<1.00000	0.05565	0.07504	0.002		
Chromium	mg/L	8	18	<0.00010	0.0011	0.00038	0.0011	0.05		
Copper	mg/L	8	18	0.001	0.013	0.00439	0.01045	2		
Iron	mg/L	8	18	0.02	1.8	0.55844	1.375			
Lead	mg/L	8	18	0.0001	0.0022	0.00061	0.00169	0.005		
Manganese	mg/L	8	18	0.0048	0.71	0.17308	0.5655	0.5[1]		
Nickel	mg/L	8	18	0.001	0.003	0.00175	0.003	0.02		
Zinc	mg/L	8	18	0.002	0.027	0.00861	0.02615			
Pesticides		8	8	No limit exceedences reported						
PFAS		2	2							

Note 1 Health Limit for Manganese is taken to be 0.5mg/L. ADWG Health guidelines were updated to June 2025 to 0.1mg/L however Council has has no non-compliances after this

Water quality analysis: Blackbutt Treated Water

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Comments
Standard Water Analysis										
Calcium	mg/L	12	12	6.5	25	14.58	23.95			
Conductivity	uS/cm	12	12	370	990	766	990			
Magnesium	mg/L	12	12	10	23	20.75	23			
pH		12	12	6.4	7.25	6.81	7.23			
Sodium Abs. ratio	calc.	12	12	2	6	3.81	5.97			
Total Dissolved Solids	mg/L	12	12	190	490	376	487			
Turbidity	NTU	12	12	<1	2	1	2			
Alkalinity	mg/L	12	12	15	71	46	71			
Aluminium	mg/L	12	12	<0.03	<0.03	0.03	0.02			
Bicarbonate	mg/L	12	12	18	86	56.08	86			
Boron	mg/L	12	12	0.03	0.1	0.06	0.1	4		
Carbonate	mg/L	12	12	0.00	0.1	0.03	0.1			
Chloride	mg/L	12	12	77	280	197.25	280			
Copper	mg/L	12	12	<0.003	0.005	0.003	0.003	2		
Figure of merit ratio	calc.	12	12	0.4	1	0.7	1			
Fluoride	mg/L	12	12	0.05	0.08	0.07	0.08	1.5		
Hydrogen	mg/L	12	12	0.00	0.00	0	0.0			
Hydroxide	mg/L	12	12	0.00	0.00	0	0.0			
Iron	mg/L	12	12	<0.01	<0.01	0.01	0.01			
Manganese	mg/L	12	12	<0.00	0.01	0	0.0	0.1		
Mole ratio	calc.	12	12	3.4	5.1	4.16	5.07			
Nitrate	mg/L	12	12	<0.06	1.4	0.71	0.84	50		
pH saturation	calc.	12	12	8.3	9.5	8.8	9.47			
Potassium	mg/L	12	12	2.6	6.3	4.5	6.2			
Residual Alkalinity	mg/L	12	12	0	0	0	0			
Sat. index	calc.	12	12	-3.1	-1	-1.97	-1.04			
Silica	mg/L	12	12	6	14	10	13			
Sodium (W:WW:RW)	mg/L	12	12	40	150	94.33	146.5			
Sulphate	mg/L	12	12	2.4	10	5.43	10	500		
Temporary Hardness	mg/L	12	12	15	71	46	71			
Total Dissolved Ions	mg/L	12	12	211	492	394	488			
Total Hardness	mg/L	12	12	71	156	122	152			
True Colour	Hazen	12	12	<8	<8	8	4	15		
Zinc	mg/L	12	12	<0.06	<0.06	0.06	0.03			

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Comments
Disinfection Monitoring										
Free Chlorine		62	88	0.01	1.39	0.51	1.2			
Total Chlorine		62	88	0.09	1.73	0.72	1.49			
Disinfection By Products & Pre-Curser										
Total Trihalomethane	ug/L	70	83	64	280	162	268	250		
Bromide	mg/L	62	59	0.08	0.47	0.17	0.41			
Chlorate	mg/L	3	14	0.09	0.9	0.51	0.88		4	Exceedances reported to Regulator, refer to Table 4.1 pg8
Chlorite	mg/L	3	14	<0.01	<0.03	0.02	0.01	0.8		
BGA										
BGA - Total Cells		0								
BGA - Total Toxic Cells		0								
NB: Toxins are only analysed when toxic cell count is greater that 20,000 cells per ml										
Heavy Metals										
Aluminium	mg/L	3	12	0.067	1.2	0.46064	0.84			
Arsenic	mg/L	3	12	0.0002	0.0003	0.00023	0.0003	0.01		
Cadmium	mg/L	3	12	<0.00010	<0.00010	0.0001	0.00005	0.002		
Chromium	mg/L	3	12	<0.00010	0.0002	0.00011	0.0001	0.05		
Copper	mg/L	3	12	<0.00100	0.003	0.00218	0.003	2		
Iron	mg/L	3	12	0.012	0.091	0.04209	0.0508			
Lead	mg/L	3	12	<0.00010	0.0004	0.00022	0.00026	0.005		
Manganese	mg/L	3	12	0.0047	0.11	0.03695	0.1004	0.5[1]	2	Exceedances reported to Regulator, refer to Table 4.1 pg8
Nickel	mg/L	3	12	0.0004	0.0008	0.00065	0.0008	0.02		
Zinc	mg/L	3	12	0.002	0.018	0.01009	0.0168			
Radionuclides										
Total Alpha Activity	Bq/L	1	3	<0.1	<0.1	0.05	0.05			
Total Beta Activity	Bq/L	1	3	<0.1	<0.1	0.05	0.05			
K_{40} - Corrected Beta Activity	Bq/L	1	3	<0.1	<0.1	0.05				

Note 1 Health Limit for Manganese is taken to be 0.5mg/L. ADWG Health guidelines were updated to June 2025 to 0.1mg/L however Council has has no non-compliances after this

Water quality analysis: Boondooma Raw Water

*** ***BOON R –*** *Boon R sample point is situated at Gordonbrook Treatment Plant before the water sources are blended. BOON R water also considered representative for Boondooma Water Scheme under DWQMP v8.1.*

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Comments
Standard Water Analysis										
Calcium	mg/L	2	8	9.4	23	14.8	22.65			
Conductivity	uS/cm	2	8	250	660	405	646			
Magnesium	mg/L	2	8	8.4	22	13.68	21.65			
pH		2	8	6.61	7.09	6.76	7.04			
Sodium Abs. ratio	calc.	2	8	1.4	2.3	1.79	2.27			
Total Dissolved Solids	mg/L	2	8	140	330	214	323			
Turbidity	NTU	2	8	2	130	39	107			
Alkalinity	mg/L	2	8	40	80	58	78			
Aluminium	mg/L	2	8	<0.03	1.3	0.47	1.27			
Bicarbonate	mg/L	2	8	48	98	70.63	95.2			
Boron	mg/L	2	8	0.03	0.04	0.03	0.04	4		
Carbonate	mg/L	2	8	0	0.1	0.03	0.1			
Chloride	mg/L	2	8	48	150	85.25	146.5			
Copper	mg/L	2	8	<0.003	0.004	0.003	0.003	2		
Figure of merit ratio	calc.	2	8	1	1.1	1.1	1.1			
Fluoride	mg/L	2	8	0.11	0.14	0.13	0.14	1.5		
Hydrogen	mg/L	2	8	0	0	0	0.0			
Hydroxide	mg/L	2	8	0	0	0	0.0			
Iron	mg/L	2	8	<0.01	0.82	0.36	0.81			
Manganese	mg/L	2	8	<0.00	0.03	0.01	0.02	0.1		
Mole ratio	calc.	2	8	3.5	3.9	3.76	3.9			
Nitrate	mg/L	2	8	0.15	0.93	0.53	0.84	50		
pH saturation	calc.	2	8	8.2	8.9	8.56	8.83			
Potassium	mg/L	2	8	4.8	6.3	5.35	6.2			
Residual Alkalinity	mg/L	2	8	0	0	0	0			
Sat. index	calc.	2	8	-2.3	-1.2	-1.83	-1.24			
Silica	mg/L	2	8	12	18	15	18			
Sodium (W:WW:RW)	mg/L	2	8	25	63	40.38	62.65			
Sulphate	mg/L	2	8	2.5	3.6	2.91	3.5	500		
Temporary Hardness	mg/L	2	8	40	80	58	78			
Total Dissolved Ions	mg/L	2	8	147	362	233	356			
Total Hardness	mg/L	2	8	58	149	93	147			
True Colour	Hazen	2	8	11	150	78	140	15		
Zinc	mg/L	2	8	<0.06	<0.06	0.06	0.03			

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Comments
Disinfection Monitoring										
Free Chlorine		No tests undertaken on Raw Water								
Total Chlorine										
Disinfection By Products & Pre-Curser										
Total Trihalomethane		No THM tests undertaken on Raw Water								
Bromide		8	7	0.14	0.38	0.22	0.34			
Chlorate		No tests undertaken on Raw Water								
Chlorite										
BGA										
BGA - Total Cells		0	8	230	32000	4607.5	21185			
BGA - Total Toxic Cells		0	1	9700	9700	9700	9700			
NB: Toxins are only analysed when toxic cell count is greater that 20,000 cells per ml										
Heavy Metals										
Aluminium	mg/L	2	7	0.01	0.91	0.45857	0.886			
Arsenic	mg/L	2	7	0.0009	0.002	0.00127	0.00179	0.01		
Cadmium	mg/L	2	7	<0.00010	0.0001	0.0001	0.00009	0.002		
Chromium	mg/L	2	7	0.0003	0.01	0.00224	0.00751	0.05		
Copper	mg/L	2	7	<0.00100	0.006	0.00271	0.0057	2		
Iron	mg/L	2	7	0.13	6.1	1.61429	4.72			
Lead	mg/L	2	7	0.0003	0.0026	0.00101	0.00233	0.005		
Manganese	mg/L	2	7	0.071	0.24	0.11143	0.204	0.5[1]		
Nickel	mg/L	2	7	0.0011	0.0089	0.00321	0.00719	0.02		
Zinc	mg/L	2	7	0.002	0.017	0.00886	0.0164			
Pesticides		4	3	No limit exceedences reported						
PFAS		1	1							

Note 1 Health Limit for Manganese is taken to be 0.5mg/L. ADWG Health guidelines were updated to June 2025 to 0.1mg/L however Council has has no non-compliances after this

Water quality analysis: Boondooma Treated Water

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Comments
Standard Water Analysis										
Calcium	mg/L	12	12	12	25	19.08	24.45			
Conductivity	uS/cm	12	12	350	710	543	694			
Magnesium	mg/L	12	12	10	22	16.67	22			
pH		12	12	6.59	7.41	6.95	7.29			
Sodium Abs. ratio	calc.	12	12	1.9	2.6	2.23	2.49			
Total Dissolved Solids	mg/L	12	12	190	350	274	345			
Turbidity	NTU	12	12	<1	1	1	1			
Alkalinity	mg/L	12	12	44	76	63	75			
Aluminium	mg/L	12	12	<0.03	<0.03	0.03	0.02			
Bicarbonate	mg/L	12	12	54	93	77.25	91.35			
Boron	mg/L	12	12	0.03	0.04	0.03	0.04	4		
Carbonate	mg/L	12	12	0	0.1	0.06	0.1			
Chloride	mg/L	12	12	76	170	123.83	164.5			
Copper	mg/L	12	12	0.007	0.02	0.012	0.017	2		
Figure of merit ratio	calc.	12	12	0.9	1	1	1			
Fluoride	mg/L	12	12	0.09	0.13	0.11	0.12	1.5		
Hydrogen	mg/L	12	12	0	0	0	0.0			
Hydroxide	mg/L	12	12	0	0	0	0.0			
Iron	mg/L	12	12	<0.01	0.04	0.01	0.03			
Manganese	mg/L	12	12	<0.00	0	0	0.0	0.1		
Mole ratio	calc.	12	12	3.4	4.1	3.71	4.05			
Nitrate	mg/L	12	12	0.23	0.92	0.49	0.89	50		
pH saturation	calc.	12	12	8.2	8.7	8.41	8.7			
Potassium	mg/L	12	12	5	6.1	5.51	6.1			
Residual Alkalinity	mg/L	12	12	0	0	0	0			
Sat. index	calc.	12	12	-2.1	-0.8	-1.46	-0.91			
Silica	mg/L	12	12	11	15	13	14			
Sodium (W:WW:RW)	mg/L	12	12	38	75	55.42	70.6			
Sulphate	mg/L	12	12	2.5	6.2	3.28	4.77	500		
Temporary Hardness	mg/L	12	12	44	76	63	75			
Total Dissolved Ions	mg/L	12	12	200	389	300	379			
Total Hardness	mg/L	12	12	73	152	116	150			
True Colour	Hazen	12	12	<8	<8	8	4	15		
Zinc	mg/L	12	12	<0.06	<0.06	0.06	0.03			

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Comments
Disinfection Monitoring										
Free Chlorine		12	27	0.02	1.42	0.51	1.12			
Total Chlorine		12	27	0.16	1.69	0.74	1.39			
Disinfection By Products & Pre-Curser										
Total Trihalomethane		12	28	160	300	239	300	250	12	Exceedances reported to Regulator, refer to Table 4.1 pg8
Bromide		12	12	0.03	0.08	0.06	0.08			
Chlorate		4	13	0.29	0.74	0.59	0.71			
Chlorite		4	13	<0.01	<0.02	0.01	0.01	0.8		
HAA-Trichloroacetic Acid (TCAA)	ug/L	4	19	14	160	82	151	100	6	Exceedances reported to Regulator, refer to Table 4.1 pg8
BGA										
BGA - Total Cells		0								
BGA - Total Toxic Cells		0								
NB: Toxins are only analysed when toxic cell count is greater that 20,000 cells per ml										
Heavy Metals										
Aluminium	mg/L	4	7	0.029	0.099	0.06417	0.097			
Arsenic	mg/L	4	7	0.0004	0.0006	0.0005	0.00058	0.01		
Cadmium	mg/L	4	7	<0.00010	0.0001	0.00006	0.00009	0.002		
Chromium	mg/L	4	7	0.0002	0.0002	0.0002	0.0002	0.05		
Copper	mg/L	4	7	0.01	0.017	0.01333	0.01675	2		
Iron	mg/L	4	7	0.035	0.085	0.05733	0.08175			
Lead	mg/L	4	7	0.0003	0.0006	0.00043	0.0006	0.005		
Manganese	mg/L	4	7	0.0033	0.018	0.00963	0.01675	0.5[1]		
Nickel	mg/L	4	7	0.0005	0.0009	0.0008	0.0009	0.02		
Zinc	mg/L	4	7	0.008	0.01	0.00917	0.01			
Radionuclides										
Total Alpha Activity	Bq/L	1	3	<0.1	<0.1	0.05	0.05			
Total Beta Activity	Bq/L	1	3	<0.1	<0.1	0.05	0.05			
K_{40} - Corrected Beta Activity	Bq/L	1	3	<0.1	0.1	0.075	0.098			

Note 1 Health Limit for Manganese is taken to be 0.5mg/L ADWG Health guidelines were updated to June 2025 to 0.1mg/L however Council has has no non-compliances after this

Water quality analysis: Kingaroy Raw Water

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95 Percential	ADWG Value	No. Non-Compliance	Comments
Standard Water Analysis										
Calcium	mg/L	36	34	10	51	26.39	48.8			
Conductivity	uS/cm	36	34	270	1500	741	1500			
Magnesium	mg/L	36	34	8.9	60	27.28	58.4			
pH		36	34	6.63	8.58	7.31	8.25			
Sodium Abs. ratio	calc.	36	34	1.4	3.4	2.26	3.24			
Total Dissolved Solids	mg/L	36	34	38	750	362	738			
Turbidity	NTU	36	34	1	130	21	114			
Alkalinity	mg/L	36	34	42	140	85	130			
Aluminium	mg/L	36	34	<0.03	1.1	0.19	0.81			
Bicarbonate	mg/L	36	34	51	159	103.33	156			
Boron	mg/L	36	34	0.03	0.04	0.04	0.04	4		
Carbonate	mg/L	36	34	0.00	3.4	0.43	1.62			
Chloride	mg/L	36	34	55	390	171.88	374			Number of samples taken less than required due to bulk raw water supplier maintance shutdowns.
Copper	mg/L	36	34	<0.003	0.01	0.003	0.006	2		
Figure of merit ratio	calc.	36	34	1.1	1.2	1.1	1.2			
Fluoride	mg/L	36	34	<0.10	0.17	0.14	0.16	1.5		
Hydrogen	mg/L	36	34	0.00	0.00	0	0.0			
Hydroxide	mg/L	36	34	0.00	0.1	0	0.0			
Iron	mg/L	36	34	<0.01	0.73	0.13	0.58			
Manganese	mg/L	36	34	0.00	0.04	0	0.01	0.1		
Mole ratio	calc.	36	34	2.3	4	3.3	3.9			
Nitrate	mg/L	36	34	<0.05	1.3	0.51	1.04	50		
pH saturation	calc.	36	34	7.7	8.8	8.2	8.74			
Potassium	mg/L	36	34	4.6	8.2	6.21	8.14			
Residual Alkalinity	mg/L	36	34	0	0	0	0			
Sat. index	calc.	36	34	-2.2	0.9	-0.9	0.48			
Silica	mg/L	36	34	5	19	12	18			
Sodium (W:WW:RW)	mg/L	36	34	26	150	71.45	144			
Sulphate	mg/L	36	34	2.6	15	6.05	14	500		
Temporary Hardness	mg/L	36	34	42	136	85	131			
Total Dissolved Ions	mg/L	36	34	159	820	413	810			
Total Hardness	mg/L	36	34	2	366	172	365			
True Colour	Hazen	36	34	11	170	44	150	15		
Zinc	mg/L	36	34	<0.06	<0.06	0.06	0.03			

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percential	ADWG Value	No. Non-Compliance	Comments
Disinfection Monitoring										
Free Chlorine		No tests undertaken on Raw Water								
Total Chlorine										
Disinfection By Products & Pre-Curser										
Total Trihalomethane		No THM tests undertaken on Raw Water								
Bromide	mg/L	153	123	0.15	1.1	0.5	1.1			
Chlorate		No tests undertaken on Raw Water								
Chlorite										
BGA										
BGA - Total Cells	cells/mL	156	120	67	900000	111706.8	439000			
BGA - Total Toxic Cells	cells/mL	34	168	0	79000	7628.8	21250			
BGA Toxin-Cylindrospermopsin	ug/L		10	<0.20	0.9	0.64	0.9			
BGA-Dolichospermum (Anabaena)	cells/mL		5	45	320	663	1930			
BGA-Microcystis aeruginosa Cells	cells/mL		14	30	3200	738.6	1900			
BGA-Raphidiopsis raciborskii Cells	cells/mL		94	20	22000	2519	10700			
BGA-Synechococcus spp. Cell Cou	cells/mL		128	17	540000	47823.8	276500			
BGA-Total Cyanobacteria Biovolum	cells/mL		166	0.000	10	0.943	4.775			
NB: Toxins are only analysed when toxic cell count is greater that 20,000 cells per ml										
Heavy Metals										
Aluminium	mg/L	36	32	<0.00300	1.2	0.24128	1.145			
Arsenic	mg/L	36	32	0.0003	0.005	0.00088	0.0012	0.01		
Cadmium	mg/L	36	32	<0.00010	<0.00010	0.0001	0.00005	0.002		
Chromium	mg/L	36	32	<0.00010	0.0045	0.00058	0.0017	0.05		
Copper	mg/L	36	32	0.0001	0.007	0.0025	0.0049	2		
Iron	mg/L	36	32	0.022	1.9	0.496	1.745			
Lead	mg/L	36	32	<0.00010	0.0013	0.00029	0.00098	0.005		
Manganese	mg/L	36	32	0.035	0.57	0.16109	0.479	0.5[1]		
Nickel	mg/L	36	32	0.001	0.0043	0.0023	0.00395	0.02		
Zinc	mg/L	36	32	<0.00100	0.005	0.00166	0.004			
Pesticides		22	22	No limit exceedences reported						
PFAS		2	2							
Note 1 Health Limit for Manganese is taken to be 0.5mg/L. ADWG Health guidelines were updated to June 2025 to 0.1mg/L however Council has no non-compliances after this										

Water quality analysis: Kingaroy Treated Water

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Comments
Standard Water Analysis										
Calcium	mg/L	16	16	13	38	26.25	36.9			
Conductivity	uS/cm	16	16	520	1200	850	1090			
Magnesium	mg/L	16	16	11	38	26.08	37.45			
pH		16	16	6.87	7.69	7.36	7.64			
Sodium Abs. ratio	calc.	16	16	2.9	3.9	3.27	3.68			
Total Dissolved Solic	mg/L	16	16	300	600	450	567			
Turbidity	NTU	16	16	<1	1	1	1			
Alkalinity	mg/L	16	16	62	120	90	109			
Aluminium	mg/L	16	16	<0.03	0.05	0.03	0.05			
Bicarbonate	mg/L	16	16	76	147	109.75	134.35			
Boron	mg/L	16	16	0.03	0.05	0.04	0.04	4		
Carbonate	mg/L	16	16	0	0.5	0.18	0.39			
Chloride	mg/L	16	16	67	240	169.67	234.5			
Copper	mg/L	16	16	<0.003	0.026	0.007	0.019	2		
Figure of merit ratio	calc.	16	16	0.4	1	0.8	0.9			
Fluoride	mg/L	16	16	0.04	0.06	0.05	0.06	1.5		
Hydrogen	mg/L	16	16	0	0	0	0.0			
Hydroxide	mg/L	16	16	0	0	0	0.0			
Iron	mg/L	16	16	<0.01	0.01	0.01	0.01			
Manganese	mg/L	16	16	0	0	0	0.0	0.1		
Mole ratio	calc.	16	16	2.9	3.6	3.24	3.49			
Nitrate	mg/L	16	16	0.42	0.87	0.62	0.8			
pH saturation	calc.	16	16	7.8	8.5	8.13	8.5			
Potassium	mg/L	16	16	5	6.8	6.11	6.69			
Residual Alkalinity	mg/L	16	16	0	0	0	0			
Sat. index	calc.	16	16	-1.6	-0.1	-0.77	-0.27			
Silica	mg/L	16	16	6	16	11	15			
Sodium (W:WW:RW)	mg/L	16	16	66	130	96.5	119			
Sulphate	mg/L	16	16	56	67	58.75	63.7	500		
Temporary Hardness	mg/L	16	16	62	121	90	111			
Total Dissolved Ions	mg/L	16	16	326	667	494	625			
Total Hardness	mg/L	16	16	75	251	173	247			
True Colour	Hazen	16	16	<8	<8	8	4	15		
Zinc	mg/L	16	16	<0.06	<0.06	0.06	0.03			

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Comments
Disinfection Monitoring										
Free Chlorine	mg/L	256	371	0.02	3.4	1.16	2.3			
Total Chlorine	mg/L	256	371	0.12	4	1.44	2.8			
Disinfection By Products & Pre-Curser										
Total Trihalomethane	ug/L	200	249	47	420	186	320	250	38	Exceedances reported to Regulator, refer to Table 4.1 pg8
Bromide	mg/L	140	162	0.03	0.68	0.19	0.4			
Chlorate	mg/L	15	18	0.04	0.44	0.16	0.39			
Chlorite	mg/L	15	18	<0.01	<0.01	0.01	0.01	0.8		
BGA										
BGA - Total Cells	cells/mL	58	48	17	4300	1005.1	402500			
BGA - Total Toxic Cells	cells/mL		36	0	1400	258.1	6850			
BGA Toxin-Cylindrospermopsin	µg/L		9	<0.20	0.5	0.14	0.34			
BGA-Dolichospermum (Anabaena) circinalis Cells	cells/mL		3	45	2300	931.7	2115			
BGA-Microcystis aeruginosa Cells	cells/mL		10	30	1200	394	975			
BGA-Raphidiopsis raciborskii Cells	cells/mL		50	15	7000	948.4	5315			
BGA-Synechococcus spp. Cell Count	cells/mL		71	17	520000	40839.5	265000			
BGA-Total Cyanobacteria Biovolume	cells/mL									
NB: Toxins are only analysed when toxic cell count is greater that 20,000 cells per ml										
Heavy Metals										
Aluminium	mg/L	8	8	0.014	0.074	0.02488	0.05615			
Arsenic	mg/L	8	8	0.0002	0.0003	0.00024	0.0003	0.01		
Cadmium	mg/L	8	8	<0.00010	<0.00010	0.0001	0.00005	0.002		
Chromium	mg/L	8	8	<0.00010	0.0001	0.0001	0.0001	0.05		
Copper	mg/L	8	8	0.003	0.009	0.00563	0.0083	2		
Iron	mg/L	8	8	<0.00500	0.008	0.00563	0.0073			
Lead	mg/L	8	8	0.0002	0.0004	0.00026	0.00037	0.005		
Manganese	mg/L	8	8	0.008	0.11	0.03938	0.10545	0.5[1]		
Nickel	mg/L	8	8	0.0008	0.0014	0.00116	0.00137	0.02		
Zinc	mg/L	8	8	0.002	0.005	0.0035	0.005			
Radionuclides										
Total Alpha Activity	Bq/L	1	3	<0.1	<0.1	0.05	0.05			
Total Beta Activity	Bq/L	1	3	<0.1	<0.1	0.05	0.05			
K_{40} - Corrected Beta Activity	Bq/L	1	3	<0.1	<0.1	0.05	0.05			
Note 1 Health Limit for Manganese is taken to be 0.5mg/L ADWG Health guidelines were updated to June 2025 to 0.1mg/L however Council has no non-compliances after this										

Water quality analysis: Murgon Raw Water

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Comments
Standard Water Analysis										
Calcium	mg/L	12	12	20	90	47.67	83.4			
Conductivity	uS/cm	12	12	420	1400	899	1345			
Magnesium	mg/L	12	12	15	58	33.67	55.25			
pH		12	12	6.99	7.98	7.41	7.88			
Sodium Abs. ratio	calc.	12	12	1.5	2.5	1.99	2.39			
Total Dissolved Solids	mg/L	12	12	220	730	462	714			
Turbidity	NTU	12	12	1	20	7	19			
Alkalinity	mg/L	12	12	71	260	153	255			
Aluminium	mg/L	12	12	<0.03	0.14	0.06	0.12			
Bicarbonate	mg/L	12	12	87	316	186.25	307.75			
Boron	mg/L	12	12	0.03	0.04	0.04	0.04	4		
Carbonate	mg/L	12	12	0.1	2.1	0.49	1.5			
Chloride	mg/L	12	12	78	270	177.33	264.5			
Copper	mg/L	12	12	0.014	0.41	0.12	0.355	2		
Figure of merit ratio	calc.	12	12	1.3	2.1	1.6	1.9			
Fluoride	mg/L	12	12	0.12	0.2	0.15	0.19	1.5		
Hydrogen	mg/L	12	12	0	0	0	0.0			
Hydroxide	mg/L	12	12	0	0	0	0.0			
Iron	mg/L	12	12	<0.01	0.15	0.05	0.15			
Manganese	mg/L	12	12	<0.00	0.03	0.01	0.02	0.1		
Mole ratio	calc.	12	12	2.3	3.4	2.98	3.35			
Nitrate	mg/L	12	12	0.18	1.7	0.78	1.54			
pH saturation	calc.	12	12	7.1	8.3	7.68	8.14			
Potassium	mg/L	12	12	3.4	7.1	4.73	6.61			
Residual Alkalinity	mg/L	12	12	0	0	0	0			
Sat. index	calc.	12	12	-1.3	0.8	-0.28	0.58			
Silica	mg/L	12	12	10	22	17	22			
Sodium (W:WW:RW)	mg/L	12	12	36	110	74	104.5			
Sulphate	mg/L	12	12	6.8	48	14.34	30.4	500		
Temporary Hardness	mg/L	12	12	71	263	154	254			
Total Dissolved Ions	mg/L	12	12	249	868	539	849			
Total Hardness	mg/L	12	12	110	463	258	437			
True Colour	Hazen	12	12	10	96	38	74	15		
Zinc	mg/L	12	12	<0.06	<0.06	0.06	0.03			

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Comments
Disinfection Monitoring										
Free Chlorine		No tests undertaken on Raw Water								
Total Chlorine										
Disinfection By Products & Pre-Curser										
Total Trihalomethane		No THM tests undertaken on Raw Water								
Bromide	mg/L	12	12	0.21	0.66	0.45	0.65			
Chlorate		No tests undertaken on Raw Water								
Chlorite										
BGA										
BGA - Total Cells	cells/ML	8	10	67	970	474.4	862			
BGA - Total Toxic Cells	cells/ML									
BGA-Synechococcus spp. Cell Count	cells/ML		3	130	570	423.3	570			
BGA-Total Cyanobacteria Biovolume	mm3/L		9	0.000		0.01	0.004	0.01		
NB: Toxins are only analysed when toxic cell count is greater that 20,000 cells per ml										
Heavy Metals										
Aluminium	mg/L	9	9	0.035	1.2	0.279	0.88			
Arsenic	mg/L	9	9	0.0004	0.0028	0.00176	0.00268	0.01		
Bismuth	mg/L	1	1	<0.00010	<0.00010	0.0001	0.00005	10		
Cadmium	mg/L	9	9	<0.00010	0.0001	0.0001	0.00008	0.002		
Chromium	mg/L	9	9	<0.00010	0.0014	0.00037	0.00112	0.05		
Copper	mg/L	9	9	0.006	0.9	0.16467	0.676	2		
Iron	mg/L	9	9	0.006	0.74	0.27156	0.676			
Lead	mg/L	9	9	0.0001	0.0008	0.00031	0.00068	0.005		
Manganese	mg/L	9	9	0.0097	0.21	0.06741	0.162	0.5[1]		
Nickel	mg/L	9	9	0.0013	0.0046	0.00217	0.00396	0.02		
Selenium	mg/L	1	1	<0.00100	<0.00100	0.001	0.0005			
Zinc	mg/L	9	9	0.003	0.036	0.00867	0.028			
Pesticide		4	4	No limit exceedences reported						
PFAS		1	1							

Note 1 Health Limit for Manganese is taken to be 0.5mg/L. ADWG Health guidelines were updated to June 2025 to 0.1mg/L however Council has no non-compliances after this

Water quality analysis: Murgon Treated Water

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Comments
Standard Water Analysis										
Calcium	mg/L	12	12	23	70	44.92	69.45			
Conductivity	uS/cm	12	12	580	1300	914	1245			
Magnesium	mg/L	12	12	17	48	31.75	47.45			
pH		12	12	6.83	7.72	7.13	7.61			
Sodium Abs. ratio	calc.	12	12	1.9	2.7	2.33	2.7			
Total Dissolved Solids	mg/L	12	12	320	690	482	663			
Turbidity	NTU	12	12	<1	<1	1	1			
Alkalinity	mg/L	12	12	63	230	124	197			
Aluminium	mg/L	12	12	<0.03	0.04	0.03	0.04			
Bicarbonate	mg/L	12	12	77	283	152.25	242.85			
Boron	mg/L	12	12	0.03	0.04	0.04	0.04	4		
Carbonate	mg/L	12	12	0	0.8	0.19	0.58			
Chloride	mg/L	12	12	98	260	174.83	249			
Copper	mg/L	12	12	0.004	0.02	0.009	0.016	2		
Figure of merit ratio	calc.	12	12	1	1.6	1.3	1.6			
Fluoride	mg/L	12	12	0.05	0.16	0.1	0.14	1.5		
Hydrogen	mg/L	12	12	0	0	0	0.0			
Hydroxide	mg/L	12	12	0	0	0	0.0			
Iron	mg/L	12	12	<0.01	<0.01	0.01	0.01			
Manganese	mg/L	12	12	<0.00	0.01	0	0.01	0.1		
Mole ratio	calc.	12	12	2.7	3.8	3.38	3.75			
Nitrate	mg/L	12	12	0.25	1.8	0.87	1.58	50		
pH saturation	calc.	12	12	7.3	8.3	7.78	8.19			
Potassium	mg/L	12	12	3.6	6.7	4.78	6.48			
Residual Alkalinity	mg/L	12	12	0	0	0	0			
Sat. index	calc.	12	12	-1.5	0.4	-0.67	0.18			
Silica	mg/L	12	12	9	18	15	18			
Sodium (W:WW:RW)	mg/L	12	12	60	120	83.33	114.5			
Sulphate	mg/L	12	12	41	66	50.25	62.7	50		
Temporary Hardness	mg/L	12	12	63	233	125	200			
Total Dissolved Ions	mg/L	12	12	343	811	543	770			
Total Hardness	mg/L	12	12	129	370	243	368			
True Colour	Hazen	12	12	<8	<8	8	4	15		
Zinc	mg/L	12	12	<0.06	<0.06	0.06	0.03			

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Comments
Disinfection Monitoring										
Free Chlorine	mg/L	160	181	0.03	3.1	1.23	2.7			
Total Chlorine	mg/L	160	181	0.17	4.3	1.54	3.1			
Disinfection By Products & Pre-Curser										
Total Trihalomethane	ug/L	52	136	10	410	198	323	250	26	Exceedances reported to Regulator, refer to Table 4.1 pg8
Bromide	mg/L	52	82	0.05	0.33	0.14	0.28			
Chlorate	mg/L	4	8	0.13	0.43	0.29	0.43			
Chlorite	mg/L	4	8	<0.01	<0.01	0.01	0.01	0.8		
BGA										
BGA - Total Cells		0								
BGA - Total Toxic Cells		0								
NB: Toxins are only analysed when toxic cell count is greater that 20,000 cells per ml										
Heavy Metals										
Aluminium	mg/L	8	8	0.016	0.044	0.02629	0.0413			
Arsenic	mg/L	8	8	0.0003	0.0008	0.0005	0.00074	0.01		
Cadmium	mg/L	8	8	<0.00010	0.0001	0.0001	0.00009	0.002		
Chromium	mg/L	8	8	<0.00010	0.0001	0.0001	0.00009	0.05		
Copper	mg/L	8	8	0.0015	0.02	0.0095	0.0179	2		
Iron	mg/L	8	8	<0.00500	0.008	0.00614	0.0074			
Lead	mg/L	8	8	0.0001	0.0006	0.0004	0.0006	0.005		
Manganese	mg/L	8	8	0.0056	0.045	0.01826	0.0396	0.5[1]		
Nickel	mg/L	8	8	0.001	0.0015	0.00123	0.00144	0.02		
Zinc	mg/L	8	8	0.004	0.008	0.00614	0.008			
Radionuclides										
Total Alpha Activity	Bq/L	1	2	<0.100	<0.100	0.05	0.05			
Total Beta Activity	Bq/L	1	2	<0.100	<0.100	0.05	0.05			
K_{40} - Corrected Beta Activity	Bq/L	1	2	<0.100	<0.100	0.05	0.05			

Note 1 Health Limit for Manganese is taken to be 0.5mg/L. ADWG Health guidelines were updated to June 2025 to 0.1mg/L however Council has no non-compliances after this

Water quality analysis: Nanango Raw Water

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Comments
Standard Water Analysis										
Calcium	mg/L	44	44	98	140	118.07	140			
Conductivity	uS/cm	44	44	2100	2500	2266	2485			
Magnesium	mg/L	44	44	0.87	94	79.86	91.7			
pH		44	44	6.72	7.45	7.09	7.36			
Sodium Abs. ratio	calc.	44	44	3.1	3.9	3.61	3.8			
Total Dissolved Solids	mg/L	44	44	1100	1300	1198	1300			
Turbidity	NTU	44	44	<1	1	1	1			
Alkalinity	mg/L	44	44	170	340	255	340			
Aluminium	mg/L	44	44	<0.03	<0.03	0.03	0.02			
Bicarbonate	mg/L	44	44	201	412	309.25	408.7			
Boron	mg/L	44	44	0.03	0.06	0.04	0.05	4		
Carbonate	mg/L	44	44	0.1	0.9	0.34	0.7			
Chloride	mg/L	44	44	470	620	530	610			
Copper	mg/L	44	44	<0.003	0.006	0.003	0.005	2		
Figure of merit ratio	calc.	44	44	1.3	1.7	1.4	1.7			
Fluoride	mg/L	44	44	0.14	0.24	0.19	0.23	1.5		
Hydrogen	mg/L	44	44	0	0	0	0.0			
Hydroxide	mg/L	44	44	0	0	0	0.0			
Iron	mg/L	44	44	<0.01	<0.01	0.01	0.01			
Manganese	mg/L	44	44	0	0.56	0.15	0.52	0.01		
Mole ratio	calc.	44	44	3	4	3.49	3.9			
Nitrate	mg/L	44	44	<0.25	601	17.96	6.5	50		
pH saturation	calc.	44	44	6.9	7.3	7.05	7.3			
Potassium	mg/L	44	44	2.1	3.3	2.73	3.29			
Residual Alkalinity	mg/L	44	44	0	0	0	0			
Sat. index	calc.	44	44	-0.5	0.6	0.04	0.4			
Silica	mg/L	44	44	48	55	50	54			
Sodium (WWW:RW)	mg/L	44	44	190	230	209.55	220			
Sulphate	mg/L	44	44	27	130	66.8	120	500		
Temporary Hardness	mg/L	44	44	19	339	250	337			
Total Dissolved Ions	mg/L	44	44	1180	1410	1322	1400			
Total Hardness	mg/L	44	44	542	741	631	721			
True Colour	Hazen	44	44	<8	<8	8	4	15		
Zinc	mg/L	44	44	<0.06	<0.06	0.06	0.03			

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Comments
Disinfection Monitoring										
Free Chlorine		No tests undertaken on Raw Water								
Total Chlorine										
Disinfection By Products & Pre-Curser										
Total Trihalomethane		No THM tests undertaken on Raw Water								
Bromide	mg/L	39	39	1.1	2	1.74	2			
Chlorate		No tests undertaken on Raw Water								
Chlorite										
BGA										
BGA - Total Cells										
BGA - Total Toxic Cells										
BGA-Synechococcus spp. Cell Count										
BGA-Total Cyanobacteria Biovolume										
NB: Toxins are only analysed when toxi	mg/L	44	44	<0.00300	<0.00300	0.003	0.0015			
Heavy Metals	mg/L	44	44	0.0002	0.0004	0.00025	0.0003	0.01		
Aluminium	mg/L	44	44	<0.00010	<0.00010	0.0001	0.00005	0.002		
Arsenic	mg/L	44	44	<0.00010	0.0012	0.0002	0.00059	0.05		
Bismuth	mg/L	44	44	<0.00100	0.006	0.00223	0.00485	2		
Cadmium	mg/L	44	44	<0.00500	0.19	0.02186	0.05			
Chromium	mg/L	44	44	<0.00010	0.0014	0.00027	0.0005	0.005		
Copper	mg/L	44	44	0.0002	0.56	0.1553	0.52	0.5[1]	4	Exceedances reported to Regulator, refer to Table 4.1 pg8
Iron	mg/L	44	44	0.0006	0.007	0.00118	0.0021	0.02		
Lead	mg/L	44	44	0.001	0.017	0.00473	0.008			
Manganese		26	26	No limit exceedences reported						
Nickel										
Selenium										
Zinc										
Pesticide										
PFAS										

Note 1 Health Limit for Manganese is taken to be 0.5mg/L. ADWG Health guidelines were updated to June 2025 to 0.1mg/L however Council has no non-compliances after this

Water quality analysis: Nanango Treated Water

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Comments
Standard Water Analysis										
Calcium	mg/L	12	12	110	120	118.33	120			
Conductivity	uS/cm	12	12	2200	2300	2250	2300			
Magnesium	mg/L	12	12	79	83	80.75	83			
pH		12	12	7.04	7.51	7.27	7.49			
Sodium Abs. ratio	calc.	12	12	3.5	3.9	3.72	3.9			
Total Dissolved Solids	mg/L	12	12	1200	1200	1200	1200			
Turbidity	NTU	12	12	<1	1	1	1			
Alkalinity	mg/L	12	12	260	340	286	340			
Aluminium	mg/L	12	12	<0.03	<0.03	0.03	0.02			
Bicarbonate	mg/L	12	12	315	411	347	409.35			
Boron	mg/L	12	12	0.03	0.04	0.04	0.04	4		
Carbonate	mg/L	12	12	0.3	1	0.51	0.84			
Chloride	mg/L	12	12	510	540	518.33	534.5			
Copper	mg/L	12	12	<0.003	0.034	0.015	0.031	2		
Figure of merit ratio	calc.	12	12	1.3	1.4	1.3	1.4			
Fluoride	mg/L	12	12	0.18	0.24	0.2	0.23	1.5		
Hydrogen	mg/L	12	12	0	0	0	0.0			
Hydroxide	mg/L	12	12	0	0	0	0.0			
Iron	mg/L	12	12	<0.01	0.02	0.01	0.02			
Manganese	mg/L	12	12	<0.00	0	0	0.0	0.1		
Mole ratio	calc.	12	12	3	3.5	3.28	3.5			
Nitrate	mg/L	12	12	4.6	7.1	5.08	6.39	50		
pH saturation	calc.	12	12	6.9	7	6.98	7			
Potassium	mg/L	12	12	2.6	2.8	2.68	2.8			
Residual Alkalinity	mg/L	12	12	0	0	0	0			
Sat. index	calc.	12	12	0	0.6	0.29	0.55			
Silica	mg/L	12	12	49	51	50	50			
Sodium (W:WW:RW)	mg/L	12	12	210	220	213.33	220			
Sulphate	mg/L	12	12	28	65	54.08	63.9	500		
Temporary Hardness	mg/L	12	12	258	338	285	336			
Total Dissolved Ions	mg/L	12	12	1320	1410	1342	1394			
Total Hardness	mg/L	12	12	605	650	624	645			
True Colour	Hazen	12	12	<8	<8	8	4	15		
Zinc	mg/L	12	12	<0.06	<0.06	0.06	0.03			

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Comments
Disinfection Monitoring										
Free Chlorine	mg/L	124	139	0.42	1.68	1.11	1.46			
Total Chlorine	gm/L	124	139	0.68	1.81	1.29	1.71			
Disinfection By Products & Pre-Curser										
Total Trihalomethane	mg/L	24	24	5	22	1.4	22	250		
Bromide	ug/L	24	24	0.8	1.8	1.4	1.79			
Chlorate		3	3	0.36	0.53	0.44	0.52			
Chlorite		3	3	<0.01	<0.05	0.04	0.03	0.8		
BGA										
BGA - Total Cells	cells/mL	0								
BGA - Total Toxic Cells	cells/mL	0								
NB: Toxins are only analysed when toxic cell count is greater that 20,000 cells per ml										
Heavy Metals										
Aluminium	mg/L	8	8	<0.00300	0.009	0.00375	0.00638			
Arsenic	mg/L	8	8	0.0003	0.0003	0.0003	0.0003	0.01		
Cadmium	mg/L	8	8	<0.00010	<0.00010	0.0001	0.00005	0.002		
Chromium	mg/L	8	8	<0.00010	0.0002	0.00018	0.0002	0.05		
Copper	mg/L	8	8	0.003	0.13	0.026	0.09325	2		
Iron	mg/L	8	8	0.009	0.31	0.11913	0.2855			
Lead	mg/L	8	8	0.0002	0.0069	0.00156	0.0054	0.005		
Manganese	mg/L	8	8	0.0035	0.076	0.02556	0.0627	0.5[1]		
Nickel	mg/L	8	8	0.0007	0.008	0.00178	0.00576	0.02		
Zinc	mg/L	8	8	0.003	0.076	0.017	0.055			
Radionuclides										
Total Alpha Activity	Bq/L	1	2	<0.100	<0.100	0.05	0.05			
Total Beta Activity	Bq/L	1	2	<0.100	<0.100	0.05	0.05			
K_{40} - Corrected Beta Activity	Bq/L	1	2	<0.100	<0.100	0.05	0.05			
PFAS		1	1							

Note 1 Health Limit for Manganese is taken to be 0.5mg/L. ADWG Health guidelines were updated to June 2025 to 0.1mg/L however Council has no non-compliances after this

Water quality analysis: Proston Raw Water

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Comments
Standard Water Analysis										
Calcium	mg/L	4	9	10	24	16.22	23.6			
Conductivity	uS/cm	4	9	280	670	453	666			
Magnesium	mg/L	4	9	8.7	22	14.51	22			
pH		4	9	6.64	7.16	6.85	7.16			
Sodium Abs. ratio	calc.	4	9	1.6	2.4	1.97	2.36			
Total Dissolved Solids	mg/L	4	9	150	340	234	336			
Turbidity	NTU	4	9	<1	110	30	94			
Alkalinity	mg/L	4	9	42	82	62	81			
Aluminium	mg/L	4	9	<0.03	1.7	0.41	1.32			
Bicarbonate	mg/L	4	9	51	100	75.56	99.2			
Boron	mg/L	4	9	0.03	0.04	0.03	0.04	4		
Carbonate	mg/L	4	9	0	0.1	0.03	0.1			
Chloride	mg/L	4	9	55	150	95.78	150			
Copper	mg/L	4	9	<0.003	0.003	0.003	0.003	2		
Figure of merit ratio	calc.	4	9	1	1	1	1			
Fluoride	mg/L	4	9	0.11	0.15	0.13	0.15	1.5		
Hydrogen	mg/L	4	9	0	0	0	0.0			
Hydroxide	mg/L	4	9	0	0	0	0.0			
Iron	mg/L	4	9	<0.01	1	0.29	0.8			
Manganese	mg/L	4	9	<0.00	0.02	0.01	0.01	0.1		
Mole ratio	calc.	4	9	3.5	3.9	3.69	3.86			
Nitrate	mg/L	4	9	0.26	1.1	0.64	1.1	50		
pH saturation	calc.	4	9	8.2	8.8	8.49	8.76			
Potassium	mg/L	4	9	4.8	6.1	5.37	6.06			
Residual Alkalinity	mg/L	4	9	0	0	0	0			
Sat. index	calc.	4	9	-2.1	-1	-1.63	-1.04			
Silica	mg/L	4	9	12	19	15	18			
Sodium (W:WW:RW)	mg/L	4	9	28	67	45.78	66.2			
Sulphate	mg/L	4	9	2.6	3.6	3.01	3.52	500		
Temporary Hardness	mg/L	4	9	42	82	62	81			
Total Dissolved Ions	mg/L	4	9	161	376	257	372			
Total Hardness	mg/L	4	9	61	151	100	149			
True Colour	Hazen	4	9	<8	120	56	111	15		
Zinc	mg/L	4	9	<0.06	<0.06	0.06	0.03			

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Comments
Disinfection Monitoring										
Free Chlorine		No tests undertaken on Raw Water								
Total Chlorine										
Disinfection By Products & Pre-Curser										
Total Trihalomethane		No THM tests undertaken on Raw Water								
Bromide	mg/L	12	12	0.1	0.28	0.16	0.24			
Chlorate		No tests undertaken on Raw Water								
Chlorite										
BGA										
BGA - Total Cells	cells/mL	8	8	83	24000	7856.6	22950			
BGA - Total Toxic Cells	cells/mL		5	100	9100	2604	7820			
BGA-Raphidiopsis raciborskii Cells	cells/mL		5	100	9100	2604	7820			
BGA-Synechococcus spp. Cell Count	cells/mL		6	17	14000	3390.7	11850			
BGA-Total Cyanobacteria Biovolume	mm3/L		7	0.000	0.55	0.143	0.493			
NB: Toxins are only analysed when toxic cell count is greater that 20,000 cells per ml										
Heavy Metals										
Aluminium	mg/L	8	8	0.008	9.5	1.58513	6.7			
Arsenic	mg/L	8	8	0.0008	0.0022	0.00118	0.00189	0.01		
Cadmium	mg/L	8	8	<0.00010	0.0001	0.0001	0.00008	0.002		
Chromium	mg/L	8	8	<0.00010	0.0091	0.00181	0.00676	0.05		
Copper	mg/L	8	8	0.002	0.007	0.00413	0.0063	2		
Iron	mg/L	8	8	0.019	5.3	1.26963	4.145			
Lead	mg/L	8	8	<0.00010	0.0017	0.00066	0.00156	0.005		
Manganese	mg/L	8	8	0.035	0.33	0.09938	0.253	0.5[1]		
Nickel	mg/L	8	8	0.0007	0.0087	0.0028	0.00702	0.02		
Zinc	mg/L	8	8	0.003	0.014	0.00663	0.0119			
Pesticides		4	4	No limit exceedences reported						
PFAS		1	1							

Note 1 Health Limit for Manganese is taken to be 0.5mg/L. ADWG Health guidelines were updated to June 2025 to 0.1mg/L however Council has no non-compliances after this

Water quality analysis: Proston Treated Water

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Comments
Standard Water Analysis										
Calcium	mg/L	4	9	11	37	19	33.1			
Conductivity	uS/cm	4	9	360	1100	561	977			
Magnesium	mg/L	4	9	9.9	37	17.32	32.5			
pH		4	9	6.64	7.76	7.18	7.69			
Sodium Abs. ratio	calc.	4	9	2	3.2	2.3	2.99			
Total Dissolved Solids	mg/L	4	9	190	540	283	480			
Turbidity	NTU	4	9	<1	<1	1	1			
Alkalinity	mg/L	4	9	39	110	63	100			
Aluminium	mg/L	4	9	<0.03	<0.03	0.03	0.02			
Bicarbonate	mg/L	4	9	48	129	76.89	118.2			
Boron	mg/L	4	9	0.03	0.03	0.03	0.03	4		
Carbonate	mg/L	4	9	0	0.4	0.1	0.34			
Chloride	mg/L	4	9	80	270	128.89	237			
Copper	mg/L	4	9	<0.003	0.003	0.003	0.003	2		
Figure of merit ratio	calc.	4	9	0.8	1	0.9	1			
Fluoride	mg/L	4	9	0.06	0.12	0.09	0.11	1.5		
Hydrogen	mg/L	4	9	0	0	0	0.0			
Hydroxide	mg/L	4	9	0	0	0	0.0			
Iron	mg/L	4	9	<0.01	<0.10	0.02	0.01			
Manganese	mg/L	4	9	<0.00	<0.00	0	0.0	0.1		
Mole ratio	calc.	4	9	3.1	4	3.51	3.94			
Nitrate	mg/L	4	9	0.38	1.2	0.68	1	50		
pH saturation	calc.	4	9	7.9	8.8	8.42	8.77			
Potassium	mg/L	4	9	4.9	6	5.4	5.82			
Residual Alkalinity	mg/L	4	9	0	0	0	0			
Sat. index	calc.	4	9	-2.1	-0.2	-1.29	-0.35			
Silica	mg/L	4	9	10	14	13	14			
Sodium (W:WW:RW)	mg/L	4	9	38	110	57.11	97.7			
Sulphate	mg/L	4	9	2.2	5.1	2.98	4.53	500		
Temporary Hardness	mg/L	4	9	39	106	63	97			
Total Dissolved Ions	mg/L	4	9	196	596	308	531			
Total Hardness	mg/L	4	9	69	243	118	215			
True Colour	Hazen	4	9	<8	<8	8	4	15		
Zinc	mg/L	4	9	<0.06	<0.06	0.06	0.03			

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Comments
Disinfection Monitoring										
Free Chlorine		20	29	0.38	2.3	1.52	1.85			
Total Chlorine		20	29	0.62	2.8	1.82	2.14			
Disinfection By Products & Pre-Curser										
Total Trihalomethane	ug/L	12	15	130	280	175	231	250	1	Exceedances reported to Regulator, refer to Table 4.1 pg8
Bromide	mg/L	12	12	0.02	0.11	0.05	0.08			
Chlorate		8	17	<0.01	0.81	0.34	0.59		1	Exceedances reported to Regulator, refer to Table 4.1 pg8
Chlorite		8	17	<0.01	0.21	0.02	0.59	0.8		
BGA										
BGA - Total Cells		0								
BGA - Total Toxic Cells		0								
NB: Toxins are only analysed when toxic cell count is greater that 20,000 cells per ml										
Heavy Metals										
Aluminium	mg/L	4	8	0.014	0.22	0.06713	0.17065			
Arsenic	mg/L	4	8	0.0002	0.0004	0.00025	0.00037	0.01		
Bismuth	mg/L	1	1	<0.00010	<0.00010	0.0001	0.00005	10		
Cadmium	mg/L	4	8	<0.00010	0.0001	0.0001	0.00008	0.002		
Chromium	mg/L	4	8	<0.00010	0.0001	0.0001	0.00008	0.05		
Copper	mg/L	4	8	<0.00100	0.019	0.00513	0.0148	2		
Iron	mg/L	4	8	<0.00500	0.016	0.00913	0.0139			
Lead	mg/L	4	8	<0.00010	0.0018	0.00041	0.00138	0.005		
Manganese	mg/L	4	8	0.002	0.018	0.00619	0.01422	0.1		
Nickel	mg/L	4	8	0.0004	0.0016	0.00095	0.00143	0.5[1]		
Selenium	mg/L	1	1	<0.00100	<0.00100	0.001	0.0005			
Zinc	mg/L	4	8	0.008	0.12	0.02888	0.0864			
Radionuclides										
Total Alpha Activity	Bq/L	1	3	<0.100	0.1	0.0289	0.095			
Total Beta Activity	Bq/L	1	3	<0.100	0.1	0.0289	0.095			
K_{40} - Corrected Beta Activity	Bq/L	1	3	<0.100	<0.100	0.05	0.05			

Note 1 Health Limit for Manganese is taken to be 0.5mg/L ADWG Health guidelines were updated to June 2025 to 0.1mg/L however Council has no non-compliances after this

Water quality analysis: Wondai Raw Water

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Comments
Standard Water Analysis										
Calcium	mg/L	12	12	19	74	45.67	72.35			
Conductivity	uS/cm	12	12	410	1300	888	1300			
Magnesium	mg/L	12	12	14	52	34.75	52			
pH		12	12	6.9	7.92	7.36	7.85			
Sodium Abs. ratio	calc.	12	12	1.5	2.6	2.07	2.55			
Total Dissolved Solids	mg/L	12	12	220	670	465	654			
Turbidity	NTU	12	12	3	33	12	29			
Alkalinity	mg/L	12	12	70	230	144	225			
Aluminium	mg/L	12	12	<0.03	0.19	0.06	0.16			
Bicarbonate	mg/L	12	12	85	275	175.17	267.85			
Boron	mg/L	12	12	0.02	0.04	0.04	0.04	4		
Carbonate	mg/L	12	12	0	1.6	0.48	1.27			
Chloride	mg/L	12	12	76	280	185.5	274.5			
Copper	mg/L	12	12	<0.003	0.52	0.193	0.416	2		
Figure of merit ratio	calc.	12	12	1.3	1.8	1.5	1.7			
Fluoride	mg/L	12	12	0.1	0.19	0.14	0.18	1.5		
Hydrogen	mg/L	12	12	0	0	0	0.0			
Hydroxide	mg/L	12	12	0	0	0	0.0			
Iron	mg/L	12	12	<0.01	0.18	0.05	0.17			
Manganese	mg/L	12	12	<0.00	0.02	0.01	0.02	0.1		
Mole ratio	calc.	12	12	2.4	3.7	3.06	3.54			
Nitrate	mg/L	12	12	0.15	3.2	0.93	2.32	50		
pH saturation	calc.	12	12	7.3	8.3	7.73	8.19			
Potassium	mg/L	12	12	3.6	6.2	4.91	6.15			
Residual Alkalinity	mg/L	12	12	0	0	0	0			
Sat. index	calc.	12	12	-1.4	0.6	-0.38	0.49			
Silica	mg/L	12	12	8	21	16	21			
Sodium (W:WW:RW)	mg/L	12	12	35	110	76.33	104.5			
Sulphate	mg/L	12	12	6.8	166	26.48	96.15	500		
Temporary Hardness	mg/L	12	12	70	227	145	222			
Total Dissolved Ions	mg/L	12	12	244	786	537	773			
Total Hardness	mg/L	12	12	107	398	256	393			
True Colour	Hazen	12	12	7	98	38	80	15		
Zinc	mg/L	12	12	<0.06	<0.06	0.06	0.03			

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Comments
Disinfection Monitoring										
Free Chlorine		No tests undertaken on Raw Water								
Total Chlorine										
Disinfection By Products & Pre-Curser										
Total Trihalomethane		No THM tests undertaken on Raw Water								
Bromide	mg/L	8	12	0.21	0.71	0.46	0.68			
Chlorate		No tests undertaken on Raw Water								
Chlorite										
BGA										
BGA - Total Cells	cells/mL	12	12	100	5000	2196.7	20			
BGA - Total Toxic Cells	cells/mL		2	20	20	20	20			
BGA-Raphidiopsis raciborskii Ce	cells/mL		2	20	20	20	20			
BGA-Synechococcus spp. Cell C	cells/mL		4	50	3200	1312.5	2870			
BGA-Total Cyanobacteria Biovolu	mm3/L		8	0.000	0.06	0.02	0.057			
NB: Toxins are only analysed when toxic cell count is greater that 20,000 cells per ml										
Heavy Metals										
Aluminium	mg/L	4	9	0.073	1.8	0.378	1.288			
Arsenic	mg/L	4	9	0.001	0.0024	0.00172	0.00228	0.01		
Bismuth	mg/L	1	1	<0.00010	<0.00010	0.0001	0.00005	10		
Cadmium	mg/L	4	9	<0.00010	0.0001	0.0001	0.00008	0.002		
Chromium	mg/L	4	9	0.0002	0.0021	0.00058	0.00158	0.05		
Copper	mg/L	4	9	0.022	0.92	0.38889	0.864	2		
Iron	mg/L	4	9	0.13	1.1	0.43	0.928			
Lead	mg/L	4	9	0.0001	0.0027	0.00062	0.00202	0.005		
Manganese	mg/L	4	9	0.03	0.2	0.08978	0.192	0.5[1]		
Nickel	mg/L	4	9	0.0013	0.0032	0.00198	0.00292	0.02		
Selenium	mg/L	1	1	<0.00100	<0.00100	0.001	0.0005			
Zinc	mg/L	4	9	0.002	0.014	0.00644	0.0132	0.02		
Pesticides		4	4	No limit exceedences reported						
PFAS		1	1							

Note 1 Health Limit for Manganese is taken to be 0.5mg/L. ADWG Health guidelines were updated to June 2025 to 0.1mg/L however Council has no non-compliances after this

Water quality analysis: Wondai Treated Water

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Comments
Standard Water Analysis										
Calcium	mg/L	24	24	21	76	46.58	71.7			
Conductivity	uS/cm	24	24	140	1400	948	1385			
Magnesium	mg/L	24	24	15	55	35.25	51			
pH		24	24	6.78	8.19	7.51	8.17			
Sodium Abs. ratio	calc.	24	24	2.2	3	2.57	2.9			
Total Dissolved Solids	mg/L	24	24	290	750	527	709			
Turbidity	NTU	24	24	<1	1	1	1			
Alkalinity	mg/L	24	24	75	230	145	227			
Aluminium	mg/L	24	24	0.01	0.14	0.06	0.12			
Bicarbonate	mg/L	24	24	91	274	175.25	268			
Boron	mg/L	24	24	0.03	0.04	0.04	0.04	4		
Carbonate	mg/L	24	24	0	2.9	0.64	1.9			
Chloride	mg/L	24	24	83	300	196.79	297			
Copper	mg/L	24	24	<0.003	0.006	0.004	0.005	2		
Figure of merit ratio	calc.	24	24	0.9	1.5	1.2	1.5			
Fluoride	mg/L	24	24	0.06	0.13	0.1	0.13	1.5		
Hydrogen	mg/L	24	24	0	0	0	0.0			
Hydroxide	mg/L	24	24	0	0	0	0.0			
Iron	mg/L	24	24	<0.01	<0.01	0.01	0.01			
Manganese	mg/L	24	24	<0.00	0.01	0	0.0	0.1		
Mole ratio	calc.	24	24	2.2	3.7	2.96	3.6			
Nitrate	mg/L	24	24	0.25	2.7	0.88	1.49	50		
pH saturation	calc.	24	24	7.2	8.3	7.71	8.1			
Potassium	mg/L	24	24	3.7	6.2	4.85	6.09			
Residual Alkalinity	mg/L	24	24	0	0	0	0			
Sat. index	calc.	24	24	-1.4	0.9	-0.2	0.69			
Silica	mg/L	24	24	8	19	15	18			
Sodium (W:WW:RW)	mg/L	24	24	56	130	95.08	128.5			
Sulphate	mg/L	24	24	35	69	47.25	55.7	500		
Temporary Hardness	mg/L	24	24	75	227	145	223			
Total Dissolved Ions	mg/L	24	24	316	877	601	828			
Total Hardness	mg/L	24	24	112	416	261	390			
True Colour	Hazen	24	24	<8	<8	8	4	15		
Zinc	mg/L	24	24	<0.06	<0.06	0.06	0.03			

Parameter	Units	Number Required as per DWQMP	Number of Samples	Min	Max	Average	95th Percentile	ADWG Value	No. Non-Compliance	Comments
Disinfection Monitoring										
Free Chlorine	mg/L	142	188	0.04	3.9	1.28	2.39			
Total Chlorine	mg/L	142	188	0.22	4.1	1.34	2.85			
Disinfection By Products & Pre-Curser										
Total Trihalomethane		40	95	31	310	173	270	250	6	Exceedances reported to Regulator, refer to Table 4.1 pg 8
Bromide		40	70	0.05	0.66	0.14	0.32			
Chlorate		16	70	0.12	1.43	0.54	0.96	0.8	8	Exceedances reported to Regulator, refer to Table 4.1 pg 8
Chlorite		16	70	<0.01	<0.01	0.01	0.02	0.8		
BGA										
BGA - Total Cells		0								
BGA - Total Toxic Cells		0								
NB: Toxins are only analysed when toxic cell count is greater that 20,000 cells per ml										
Heavy Metals										
Aluminium	mg/L	3	7	0.024	0.32	0.11243	0.308			
Arsenic	mg/L	3	7	0.0003	0.0004	0.00034	0.0004	0.01		
Cadmium	mg/L	3	7	<0.00010	0.0001	0.0001	0.00009	0.002		
Chromium	mg/L	3	7	<0.00010	0.0001	0.0001	0.0001	0.05		
Copper	mg/L	3	7	0.005	0.012	0.00671	0.0108	2		
Iron	mg/L	3	7	<0.00500	0.034	0.00943	0.0259			
Lead	mg/L	3	7	<0.00010	0.0004	0.00017	0.00037	0.005		
Manganese	mg/L	3	7	0.0032	0.017	0.00739	0.01466	0.5[1]		
Nickel	mg/L	3	7	0.0009	0.0014	0.00114	0.00137	0.02		
Zinc	mg/L	3	7	0.001	0.007	0.003	0.0061			
Radionuclides										
Total Alpha Activity	Bq/L	1	2	<0.100	<0.100	0.05	0.05			
Total Beta Activity	Bq/L	1	2	<0.100	<0.100	0.05	0.05			
K_{40} - Corrected Beta Activity	Bq/L	1	2	<0.100	<0.100	0.05	0.05			

Note 1 Health Limit for Manganese is taken to be 0.5mg/L. ADWG Health guidelines were updated to June 2025 to 0.1mg/L however Council has no non-compliances after this

Risk Management Improvement Plan - Risk Actions Required

			Proposed Improvement Measures							Resourcing		
No.	Observation	Gap or Comment	Interim	Target Date	Short-Term	Target Date	Long-Term	Target Date	Budget	Assigned to	Group	Infra?
2023-001	Scheme: Whole of System - Process Step: Whole of System - Item: WOS1 - Human Error - Competency - Event: Untrained Staff (formal) No or poor water treatment leading to the presence of harmful bacteria or water of poor aesthetic quality. - Risk: Medium	Routine and formal training complete. Continued training of all staff.			Further formal training being planned. Continued training of all staff.	Ongoing			10,000	Manager Water & Wastewater	HR – Training	
2023-002	Scheme: Whole of System - Process Step: Whole of System - Item: WOS2 - Human Error - Information Management - Event: Water quality data storage and summary - Risk: Medium	Controls in place.			Routine and formal training being undertaken. Continued training of all staff. Action assigned above in WOS1.				-	Manager Water & Wastewater	HR – Training	
2023-003	Scheme: Whole of System - Process Step: Whole of System - Item: WOS6 - Resources - Suppliers - Event: Non qualified contactors working on sites leading to WTP breakdown - Risk: Medium				WQ & OH&S induction TBD. All sites locked and require Operator assistance to gain entry.				-	Manager Water & Wastewater	HR – Training	
2023-004	Scheme: Whole of System - Process Step: Whole of System - Item: WOS7 - Aging Infrastructure - Infrastructure - Event: Asset failure - Risk: High				Asset maintenance register to be created to highlight sections of main prone to breaks or mains replacement. Water supply Project will replace critical infrastructure which will further mitigate this problem. Council to consider and develop guidelines and record keeping for mains breaks to trigger replacement based on performance and cost of repairs. Council to develop a formal asset maintenance register with strategic planning. Strategic plan (whole of government) for water and waste system for whole of system to be prepared.	2025			Internal Wages	Principal Engineer (Water and Wastewater)	Council	
2023-005	Scheme: Whole of System - Process Step: Whole of System - Item: WOS9 - Workflow - Information Management - Event: Delayed response to abnormal WQ results. - Risk: Medium				Council to develop a response plan to non-compliant results.	2024			Internal Wages	Program Coordinator	Laboratory	
2023-006	Scheme: Whole of System - Process Step: Whole of System - Item: WOS11 - Errors - Human - Event: Incorrect sampling procedure resulting in non representative samples recorded/ processed for verification monitoring - Risk: Medium				Council to consider installing dedicated "Ned Kelly" style sampling points to registered sampling sites.	2024			50,000	Program Coordinator	O&M	Yes
2023-007	Scheme: Whole of System - Process Step: Whole of System - Item: WOS12 - Governance - Cybersecurity - Event: Lack of asset management - Risk: Medium				MC-01-Vulnerability assessment Undertake a cybersecurity audit including a penetration test: - identify critical sites, devices and access points specific to the Supervisory Control and Data Acquisition (SCADA) for water quality management. These will include 1) pump sites 2) related operational technology systems - servers, firewalls, network switches, access points, Remote Terminal Units (RTUs) and Programmable Logic Controllers (PLCs). 3) Implement actions to maintain effective cyber security controls of SCADA and Industrial Control Systems (ICS). 4) Implement actions and integration consisting of standards and processes to manage both (IT) and (OT). 5) Implement a single point access to enter the telemetry network. 6) Implement a secure entry protocol/procedure to the IT/OT network.	2024			10,000	Principal Engineer (Water and Wastewater)		
2023-008	Scheme: Whole of System - Process Step: Whole of System - Item: WOS13 - Governance - Cybersecurity - Event: Inability to detect critical Assets - Risk: Medium				MC-02 -Governance structure - Framework to be in place with responsibilities - Procedures for information technology and operation technology security to be created. MC-03- Security safeguards - Create a list of permitted applications to be installed / run within Council's Standard Operating Environment (SOE)	2024			3,000	Principal Engineer (Water and Wastewater)/Information and Corporate Technology		
2023-009	Scheme: Whole of System - Process Step: Whole of System - Item: WOS14 - Intentional Interference - Cybersecurity - Event: Disruption of Cyber information (IT) - Risk: Medium	IT antivirus software currently installed. OT SCADA machines will not have anti-virus installed as this interferes with SCADA installed software and processing. Cybersecurity of OT SCADA machines is controlled by restricting internet access through the use of Meraki firewall/routers and eliminating the use of external USB drives.			MC - 04 Detection process - Require SOE security monitoring system that reports anomalies. e.g. high CPU use, user accounts, high network traffic MC-05 Response & Recovery - Organise routine backups / archiving for ICS equipment, servers and applications.	2024			3,000	Principal Engineer (Water and Wastewater)/Information and Corporate Technology		

			Proposed Improvement Measures							Resourcing		
No.	Observation	Gap or Comment	Interim	Target Date	Short-Term	Target Date	Long-Term	Target Date	Budget	Assigned to	Group	Infra?
2023-010	Scheme: Whole of System - Process Step: Whole of System - Item: WOS18 - Unintentional Interference - Cybersecurity - Event: Disruption of Cyber information (IT) - Risk: Medium	IT has implemented access controls, monitoring and cyber security measures over corporate systems. SCADA systems are not exposed directly to the internet, and remote access to control systems is not permitted by design or policy.			MA - 01 Build out private SCADA network - requires testing and cutover for all water facilities, sites & equipment MA - 02 Build single point of access and authentication method - Undertake after MA-01. A single point access should be built as a mechanism to enter the telemetry network. MA - 03 Implement rules to prevent across network access - After MA-01 & MA-02, SCADA provider to create and document a procedure for secure entry to the IT/OT network. MA - 04 Disallow open internet access - To be actioned with MA-01 & MA-02. Address vulnerability scenarios but also allows for system updates (e.g. allowing Windows Update).	2024			10,000	Principal Engineer (Water and Wastewater)		
2023-011	Scheme: Whole of System - Process Step: Whole of System - Item: WOS23 - Abuse of Cyber Information - Cybersecurity - Event: Systems Configuration and data files / Disgruntled employee - Risk: Medium				MA-05 Install and enable active virus scanning - OT SCADA machines will not have anti-virus installed as it can interferes with SCADA installed software. Cybersecurity of OT SCADA machines is controlled by restricting internet access and eliminating the use of external USB drives and fire wall settings MA-06 Activate and set windows firewall rules - Do after MA-01 is completed MA-07 Implement maintenance and updates schedule - Maintenance will be ongoing in terms of updating SCADA software. All upgrades or changes to a PLC or SCADA shall have their configuration files backed up and saved on each workstation on-site and off-site. MA-08 Certificate or key based authentication for remote access - Do after MA-01 is completed MA-09 Two factor authentication - Do after MA-01 is completed	2024			10,000	Principal Engineer (Water and Wastewater)		
2023-012	Scheme: Whole of System - Process Step: Whole of System - Item: WOS27 - Control - Cybersecurity - Event: Lack of access control and identity management - Risk: Medium				MA-10 Implement backup schedule - To be done as part of regular maintenance of IT/OT systems. Backups of configurations files to be made and stored onsite with a copy stored off-site in the secure corporate Drive, and with the SCADA provider. MA-11 Ensure validity of software licences used across machines - Ongoing as all SCADA OT software is licenced and authentication is used across SCADA OT machines.	2024			2,000	Principal Engineer (Water and Wastewater)		
2023-013	Scheme: Whole of System - Process Step: Whole of System - Item: WOS28 - Technical advancement - Cybersecurity - Event: Lack of protective technology and maintenance - Risk: Medium				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	2024			Internal Wages	Program Coordinator		
2023-014	Scheme: Whole of System - Process Step: Whole of System - Item: WOS29 - Detection - Cybersecurity - Event: Inability to detect a cyber security event - Risk: Medium				Increased awareness from operators surrounding physical security access on ICS sites, provided by means of training sessions. Formal training sessions with water services operators scheduled early May 2020. Add this to the procedures	2024			Internal Wages	Program Coordinator		
2023-015	Scheme: Blackbutt - Process Step: Catchment - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: Very High	There is a catchment management plan in place only for Boondooma. Controls in place but not managed. However risk cannot be reduce at this stage.	Liaise with council on approach to take. Discuss with farmer to remove cattle from the intake area. Toolbox talk for this specific action.	2023	Update procedures and create a Catchment Management Plan for the Blackbutt WTP catchment to link this risk assessment.	2024	Ownership and control of catchment area - including fencing of compound.	TBC - SBRC DWQO Stratery Adoption and Implemen tation	300,000	Program Coordinator	Procedural	
2023-016	Scheme: Blackbutt - Process Step: Catchment - Item: CMT5 - Bacteria/Virus - Biological - Event: Dairy or other plant discharges - Risk: High	See preventative measures.			Update catchment management plan to include farm practices.	2024			-	Program Coordinator	Procedural	
2023-017	Scheme: Blackbutt - Process Step: Catchment - Item: CMT7 - Heavy metals, e.g., copper, lead - Chemical - Event: Natural geology, or mining - Risk: Low	6 years of WQ results reviewed. The aesthetic limit for Aluminium has been exceed - see elsewhere for plant optimisation.			Monitor Aluminium levels pre and post treatment to gauge the effectiveness of treatment of this aesthetic contaminant.		Follow up monitoring		-	Coordinator Treatment	Procedural	

			Proposed Improvement Measures								Resourcing		
No.	Observation	Gap or Comment	Interim	Target Date	Short-Term	Target Date	Long-Term	Target Date	Budget	Assigned to	Group	Infra?
2023-018	Scheme: Blackbutt - Process Step: Catchment - Item: CMT8 - Hydrocarbons - Chemical - Event: Illegal disposal of fuel etc., run off from impermeable urban areas - Risk: Low	Legal requirements for persons to manage their stores. Regular patrols. Possible use of a vehicle but low impact.	Query/discuss usage with property owners. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural	
2023-019	Scheme: Blackbutt - Process Step: Catchment - Item: CMT10 - Manganese - Chemical - Event: Natural geology - Risk: Very High	6 years of WQ results reviewed. Treatment in place however not designed to remove Mn and treated water has exceedances. Known Mn issue with Boobir Dam and also Nukku following bulk supply maintenace periods			Additional testing of raw water supply to be implemented in the verification monitoring program	2026			Internal Wages	Program Coordinator	Laboratory	
2023-020	Scheme: Blackbutt - Process Step: Catchment - Item: CMT11 - Sodium (salt) - Chemical - Event: Natural geology - Risk: Medium	6 years of WQ results reviewed. Aesthetic limit reached. Blending recommended.			Consider blending the Blackbutt raw water with the Boondooma water to reduce the sodium level to below the aesthetic limit.	2024			-	Program Coordinator	Procedural	
2023-021	Scheme: Blackbutt - Process Step: Catchment - Item: CMT12 - Pesticides/ Herbicides - Chemical - Event: Used in catchment - Risk: Low	Pesticides are monitored regularly as per the verification monitoring. Any high readings will require to be evaluated and actioned on occurrence.	Query/discuss usage with property owners. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural	
2023-022	Scheme: Blackbutt - Process Step: Catchment - Item: CMT13 - other treatment chemicals e.g., PFAS, Microplastics - Chemical - Event: No WWTP dicharge, Power Station, Mining, Mill or Airports in catchment - Risk: Medium	Historic PFAS monitoring indicates at low levels. Monitoring frequency increased to quartely for raw water source for 12 months or event based following change to ADWG. If identified, additional upstream raw water samples will be undertaken to increase source awarenes			Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		-	Program Coordinator		
2023-023	Scheme: Blackbutt - Process Step: Catchment - Item: CMT18 - Various Contaminants - Chemical - Event: Chemical spill - Risk: Low	Freak event, alternative water sources available. No major roads in the catchment. Emergency response plan is considered reliable. Local Disaster Management Group can be called into action if required. LDMG plan. Emergency Response Plan, and streams are generally ephemeral allows time for clean up.	Discuss usage with property owners. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1,		Internal Wages	Program Coordinator	Procedural	
2023-024	Scheme: Blackbutt - Process Step: Catchment - Item: CMT21 - Radioactivity - Radiological - Event: Natural geology - Risk: Low	No data - potentially a high risk rating due to no reports of illness however cannot rule it out. Recommend specific testing for this parameter. Filtration and coagulation likely to remove this to manageable levels if there is a contaminant. No action proposed.	Nil.		Test for radionuclides.	2024			1,000	Water Sampling Technician	Laboratory	
2023-025	Scheme: Blackbutt - Process Step: Catchment - Item: CMT23 - Various Contaminants - Physical/Chemical etc. - Turbidity - Event: Bushfire followed by runoff event - Bushfire impact to catchment leading to increased particulate matter in Dams. - Risk: Medium	Bushfires are common in the catchment, however monitoring results have not shown responsive changes in parameters. Alternative source water can be selected.			Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural	
2023-026	Scheme: Blackbutt - Process Step: Intake - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: Very High	Daily inspections. No other active measures to reduce L&C. Residence time in storage and natural die off. Offtake level selection.	Check fences and entry points and secure.	2023	Council to consider fencing/ gates to prevent horses and other animals entering intake area.	2024	Undertake fence and gate management program	2025	20,000	Coordinator Treatment	Procedural	
2023-027	Scheme: Blackbutt - Process Step: Intake - Item: CMT3 - Protozoa/ Cryptosporidium - Biological - Event: Animals in catchment - Contamination of the Dams from dead animals in water. - Risk: Very High	Operational site visits Community notify staff when there is a concern			Update O&M Manual to ensure removal of animals is monitored and performed.	2024			Internal Wages	Coordinator Treatment	Procedural	
2023-028	Scheme: Blackbutt - Process Step: Intake - Item: CMT4 - Amoeba/ Naegleria/ Acanthamoeba - Biological - Event: Animals in catchment - Access by native and feral animals to the Dam introducing faecal contamination. - Risk: High	Daily inspections. No other active measures to reduce L&C.							-	Program Coordinator	Council	
2023-029	Scheme: Blackbutt - Process Step: Intake - Item: CMT20 - Turbidity - Physical - Event: Drought - Risk: High	no real active measures to reduce L&C. Boondooma raw managed by SunWater.							-	Manager Water & Wastewater	O&M	
2023-030	Scheme: Blackbutt - Process Step: Intake - Item: CMT23 - Various Contaminants - Physical/Chemical etc. - Turbidity - Event: Bushfire followed by runoff event - Bushfire impact to catchment leading to increased particulate matter in Dams. - Risk: High	Residence time in dam allows for settling. Alternative source water can be selected. Traditional burn off practices (annually) control undergrowth and the catchment area recovers before the wet season. Potassium Permanganate is currently being investigated instead of a destratification unit.	Investigate if a potassium permanganate unit should be installed. Research seasonal changes in raw water.	2024	Subject to investigation, design potassium permanganate unit to reduce contaminant risk.	2025	Subject to investigation, install a potassium permanganate unit	2026	170,000	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-031	Scheme: Blackbutt - Process Step: Intake - Item: INT2 - Taste and odour - Chemical - Event: Algal bloom - Risk: Very High	Visual inspection with weekly inspection records. Monthly algal testing – increased to weekly when an event is recorded.	Blue-Green Algae Management Plan completed	2023	Staff training	2024			5,000	Program Coordinator	Procedural	
2023-032	Scheme: Blackbutt - Process Step: Intake - Item: INT9 - Various Contaminants - Physical/Chemical etc. - Event: Stagnation or dam turnover - Risk: Low	No aeration in place	DO meter needs to be purchased.	2023					800	Principal Engineer (Water and Wastewater)	Laboratory	
2023-033	Scheme: Blackbutt - Process Step: Filtration - Item: CMT9 - Iron - Chemical - Event: Natural geology, sediment - Risk: Medium	Clarification does not reduce the likelihood but reduces the extent of the contaminant. Filtration reduces the consequence.	Toolbox talk for this specific action.	2023	Update procedures to address chemical dosing and filtration optimisation.	2024			Internal Wages	Coordinator Treatment/Program Coordinator	Procedural	
2023-034	Scheme: Blackbutt - Process Step: Filtration - Item: CMT10 - Manganese - Chemical - Event: Natural geology - Risk: Very High	Clarification does not reduce the likelihood but reduces the extent of the contaminant. Filtration reduces the consequence. Manganese levels are generally low, however there are occasions when the thresholds are exceeded.	Ensure plant optimisation procedures are in place and anticipates seasoning issues that require changes in treatment operations. Particularly if the water source changes and oxidising metals have an influence.	2024			Construction of aeration tower and implementation of KMN04 dosing of raw water sources	TBC - SBRC DWQO Stratery Adoption and Implementation	911,000	Coordinator Treatment/Program Coordinator	Procedural	
2023-035	Scheme: Blackbutt - Process Step: Filtration - Item: CMT20 - Turbidity - Physical - Event: Drought - Risk: Low	Coagulation and filtration will reduce this aesthetic issue. Filters can be derated to ensure quality - See O&M Manual.	Discuss at a toolbox talk that the filters are currently underperforming, and assign an action to address this.	2023	Report on the filter performance and investigate set points and turbidity data. Update the O&M Manual accordingly, and if required update the HACCP charts. This will be a new CCP.	2024	Subject to filter performance report. It is possible that additional in line turbidity meter will be installed to measure the filtered water turbidity prior to the chlorine contact tank. Filter media and filter nozzles are due to be replaced.	2025	25,000	Program Coordinator	Procedural	

			Proposed Improvement Measures							Resourcing		
No.	Observation	Gap or Comment	Interim	Target Date	Short-Term	Target Date	Long-Term	Target Date	Budget	Assigned to	Group	Infra?
2023-036	Scheme: Blackbutt - Process Step: Filtration - Item: INT1 - Cyanobacteria - Biological - Event: Algal bloom - Risk: High	Coagulation and filtration will reduce this issue. There is an old system in place for dosing raw water.	Manual dosing procedure in place. PAC powder on site.	2023	Reinstate PAC dosing system.	2023			Internal Wages	Coordinator Treatment/Principa l Engineer (Water and Wastewater)	O&M	
2023-037	Scheme: Blackbutt - Process Step: Filtration - Item: INT6 - Failure of supply - Whole of System - Event: loss of power or no water for aerators or clarifier. - Risk: Medium	No UPS or backup generators. Reliant on 2 days water storage at Reservoirs. Ergon has been notified of critical infrastructure locations. Can hire generators.	Complete the solar needs assessment for each WTP.	2024	Switchboard upgrade is planned, and will have capability to connect a generator.	2024	Asses the generation needs of each plant and the connectability of each plant.	2025	30,000	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-038	Scheme: Blackbutt - Process Step: Filtration - Item: INT10 - Various Contaminants - Whole of System - Event: Sabotage/ Terrorism - Non authorised persons accessing the site and interrupting the treatment processes (e.g.. Vandalism, trespassing) - Risk: Medium	Site security is considered adequate - Site fully fenced and locked.							-	Manager Water & Wastewater	O&M	
2023-039	Scheme: Blackbutt - Process Step: Filtration - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through. - Risk: Medium	No SCADA interlocks for filter breackthrough Filter outlet valve is a fail to close on loss of power.	Review turbidity and Cl2 controls required for each plant.	2024			Improve Plant Control and interlocks to prevent water quality breaches	TBC - SBRC DWQO Stratery Adoption and Implemen tation	3,578,131	Coordinator Treatment/Progra m Coordinator	O&M	Yes
2023-040	Scheme: Blackbutt - Process Step: Filtration - Item: WTP4 - Various Contaminants - Pathogens/Turbidity - Event: Under dosing (e.g. from error, equipment failure or running out of chemical) resulting in inadequate coagulation - Risk: Medium	Chemical Transfer and ordering done weekly. WTP Daily log sheet and daily diaryincludes chemical storage quantity. Weekly jar testing done to confirm dosing rates. Drop down test conducted to confirm pump rates. Now dosing direct from large tanks and levels can be seen inside the tanks. Pump fail alarm. Filter water Turbidity online.	Chemical Transfer and ordering procedure completed	2024					Internal Wages	Program Coordinator	O&M	
2023-041	Scheme: Blackbutt - Process Step: Filtration - Item: WTP5 - Various Contaminants - Pathogens/Turbidity - Event: Elevated turbidity levels leading to insufficient coagulation - Risk: Low	Online Turbidity & manual levels recorded in Operators Log Sheet	Calibration and maintenance schedule for online turbidity meter is to be developed and implemented. This is to occur for all instruments.		See CMT9		See CMT9		3,000	Coordinator Treatment	O&M	
2023-042	Scheme: Blackbutt - Process Step: Filtration - Item: WTP7 - Various Contaminants - Physical/Chemical etc. - Event: Failure of saturation system - Risk: Low		Preventative Maintenance program TBD. Consider holding saturator feed pump as spare (subject to cost and lead time for delivery)	2023					2,500	Coordinator Treatment/Progra m Coordinator	O&M	
2023-043	Scheme: Blackbutt - Process Step: Filtration - Item: WTP8 - Various Contaminants - Physical/Chemical etc. - Event: Failure of filter resulting in high turbid water. - Risk: Medium	There are no procedures for operation or filter maintenance. Additional training required on filter process and CCP response procedures. Council to consider a filter maintenance program.	Laminate the new HACCP Plans and place on the WTP wall.	2023	There are no procedures for operation or filter maintenance. Additional training required on filter process and CCP response procedures. Council to consider a filter maintenance program.	2024			Internal Wages	Coordinator Treatment/Progra m Coordinator	Procedural	
2023-044	Scheme: Blackbutt - Process Step: Filtration - Item: WTP9 - Various Contaminants - Inability to supply - Event: Backwash / transfer pump failure leading to WTP fail - Risk: Low	Spare pump held as spare.			Create a preventative maintenance program for the scheme.	2024			Internal Wages	Coordinator Maintenance	Procedural	
2023-045	Scheme: Blackbutt - Process Step: Disinfection - Item: CMT3 - Protozoa/ Cryptosporidium - Biological - Event: Animals in catchment - Contamination of the Dams from dead animals in water. - Risk: High	Based on HBT assessment there is still a lingering risk. Disinfection by chlorination does not kill Crypto.	Consider the HBT assessment undertaken by NWM and report to management, noting the public risk, but noting that meeting HBT is not compulsory by the state government at this time.	2023	Investigate risks and consider funding for a UV system, and report to council on the risks.	TBC - SBRC DWQO Stratery Adoption and Implemen tation	Subject to funding, install a UV system. Consider DBP risks.	TBC - SBRC DWQO Stratery Adoption and Implemen tation	537,465	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-046	Scheme: Blackbutt - Process Step: Disinfection - Item: DIS1 - Chlorate - Chemical - Event: chemical breakdown - Risk: High	Council currently does not have a chlorate management plan. Action assigned here.	Chlorate Management Plan to be completed. Includes chlorate testing periodically.	2023	Staff training	2024	Depending on the success of the management plan, consider moving to Chlorine Gas, considering chlorates now need to be managed.	2024	4,000	Manager Water & Wastewater	Procedural	
2023-047	Scheme: Blackbutt - Process Step: Disinfection - Item: DIS2 - Chlorine - Chemical - Event: Injection or recirculation pump or chemical injector equipment failure - Risk: Low	Council has acquired some spare parts for system and purchase as spare parts - e.g., Spare pumps, injectors, etc.	Smaller plants: Consider duty standby tanks with automatic changeover look at a lower strength hypo.	2023	Design duty standby tanks with automatic changeover	2024	Install duty standby tanks with automatic changeover	2025	5,000	Program Coordinator	O&M	
2023-048	Scheme: Blackbutt - Process Step: Disinfection - Item: DIS3 - Chlorine - Chemical - Event: chemical underdose or overdose - Risk: Low	WWW have a Water sampling technician who specialise in water sampling. All WWW staff have undertaken chlorine sample training. All equipment is used and calibrated as per the equipment register.			Chlorine sample testing training is scheduled to be conducted annually. The Council laboratory also can perform microbial analysis within 18 hrs from sampling. Although not NATA certified this is considered best practice for verification.	2024	Annual training, and procedure for returning instruments to the lab for calibration.	2024	-	Coordinator Treatment	HR – Training	
2023-049	Scheme: Blackbutt - Process Step: Disinfection - Item: DIS10 - Chlorine ORP - Chemical - Event: Chlorine quickly dissipates due to a high Oxidation demand - Risk: High	Oxidation reduction potential value check is needed. Action assigned here.	Test ORP	2023	Subject to ORP test	2024	Subject to test, however chlorine concentration increases may only be needed instead of other treatments such as potassium permanganate dosing.	2025	500	Water Sampling Technician	Laboratory	
2023-050	Scheme: Blackbutt - Process Step: Reservoirs - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: Low	Weekly inspections in place. Risk not increased, however cannot reduce. All reservoirs are designed to be vermin proof, and are checked on a maintenance program. Ad hoc cleaning programs are implemented when required.	Purchase analysers for the most critical sites.	2023	A regional program maintenance schedule is required to be developed for all analysers and flow meters etc. With a strategy to identify preferred regionalised equipment list.	2024			4,000	Coordinator Treatment/Progra m Coordinator	O&M	
2023-051	Scheme: Blackbutt - Process Step: Reservoirs - Item: CMT2 - Bacteria/Virus - Biological - Event: Humans in catchment, e.g. septics, camping - Risk: Low	Weekly inspections in place. Risk not increased, however cannot reduce.	All Council & contract staff that have access to water supply facilities to undergo AquaCard training.	2023	TBD Site induction. Contactor Safety and WQ Induction. Inducted contractors and staff only allowed to work on site.	2024			Internal Wages	Manager Water & Wastewater	Procedural	

			Proposed Improvement Measures							Resourcing		
No.	Observation	Gap or Comment	Interim	Target Date	Short-Term	Target Date	Long-Term	Target Date	Budget	Assigned to	Group	Infra?
2023-052	Scheme: Blackbutt - Process Step: Reservoirs - Item: INT10 - Various Contaminants - Whole of System - Event: Sabotage/ Terrorism - Non authorised persons accessing the site and interrupting the treatment processes (e.g.. Vandalism, trespassing) - Risk: High	Regular inspections. Locked access. Community would report unauthorised access to tanks when observed. Some tank sites do not have a secure compound fence. Graffiti is on tank walls. Banarkin requires an additional reservoir. This will help with supply, pressure, and a disinfection station will also improve disinfection residual.			Design of new reservoir - Benarkin.	2025	Installation of new reservoir - Benarkin.	TBC - SBRC DWQO Stratery Adoption and Implemen tation	300,000	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-053	Scheme: Blackbutt - Process Step: Reservoirs - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through. - Risk: Medium	Plant has interlocks in place. No issue at the reservoirs.	Investigate SCADA management during failures	2024					Internal Wages	Manager Water & Wastewater	Procedural	
2023-054	Scheme: Blackbutt - Process Step: Reservoirs - Item: RES1 - Bacteria/Virus - Biological - Event: Ingress of faecal material from human or vermin entry. - Risk: Medium	All Reservoirs are roofed, water proofed and vermin proofed. Reservoir Maintenance Schedule and check sheets (include security and internal checks) TBD a Reservoir Top Up dosing procedure. Action assigned here.	Review reservoir cleanliness status.	2023	Produce a reservoir cleaning procedure. A thorough tank inspection program is to be developed and conducted following a storm event.	2024	Allocate annual funds for contract cleaning, say 6 per year. Too include Gordonbrook intakes dive inspection.	2025	40,000	Coordinator Maintenance	O&M	
2023-055	Scheme: Blackbutt - Process Step: Reservoirs - Item: RES2 - Bacteria/Virus - Biological - Event: Poor Tank turnover, high or low chlorine. - Risk: High	Lower frequency of potential issues due to weekly inspections. Project underway to resolve this. Water height adjustable for some reservoirs. Top fill inlets for some tanks. Action assigned here.	Create a reservoir chlorine dosing Top Up procedure.	2023	Create a procedure for tank turnover. Investigate valve configuration and operation for inlet and outlet. Consider future costs. Council to consider online monitoring and alarms for disinfection residual at Reservoirs. Consider future costs and analyser drainage issues. Also include this issue in the chlorate management plan also.	2024			Internal Wages	Program Coordinator	O&M	
2023-056	Scheme: Blackbutt - Process Step: Reservoirs - Item: RES3 - Loss of Supply - Pressure - Event: Loss of water levels that maintain pressure requirements in the distribution. - Risk: Medium	Individual levels set for each Res. Action assigned here.	Create and SOP for alternative or emergency supplies or water restriction implementation.	2023					Internal Wages	Manager Water & Wastewater	Procedural	
2023-057	Scheme: Blackbutt - Process Step: Reticulation - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through. - Risk: Medium		Investigate SCADA management during failures. Assess future risk.	2023					Internal Wages	Manager Water & Wastewater		
2023-058	Scheme: Blackbutt - Process Step: Reticulation - Item: DIS3 - Chlorine - Chemical - Event: chemical underdose or overdose - Risk: Low	Notification to high priority water uses, Isolation plans are signed by Manager for all program maintenance works.	Flushing Procedure to be completed - an additional program will be created to identify location and frequency with consideration of the current drought conditions, and THM reduction.	2023	Staff training	2024			4,000	Program Coordinator	Procedural	
2023-059	Scheme: Blackbutt - Process Step: Reticulation - Item: RET1 - Bacteria/Virus - Biological - Event: Ingress of contaminated water - Pipe Breaks/Mains Break - Risk: Medium	Procedure in place. Breakage repairs undertaken under Plumbing Code. WR7.7 - Water Service Leak/Repair in place.			Repair Procedure update and training required.	2024			Internal Wages	Program Coordinator	Procedural	
2023-060	Scheme: Blackbutt - Process Step: Reticulation - Item: RET4 - Turbidity - Physical - Event: sloughing of biofilm, resuspension of sediment in reservoirs/mains, or Pipe Breaks/ Mains breaks - Risk: Low		Review dead end locations where possible and add to the flushing program.	2023	Maintenance staff to be trained on valve operation and flushing after repairs. Identify and list sites for Mains Replacement program. See above for the repair procedure action.	2024			Internal Wages	Coordinator Maintenance	Procedural	
2023-061	Scheme: Blackbutt - Process Step: Reticulation - Item: RET6 - Bacteria/Virus - Biological - Event: Dead ends in reticulation leading to stagnation and WQ issues. E.g., Taste and Odour High pH, - Risk: Medium	No dead ends in new developments, generally. Customer complaints initiate a flushing program. New main designs are as per WSSA to prevent dead ends.	Problem areas have to be placed on routine flushing programs.	2023					Internal Wages	Coordinator Maintenance	Procedural	
2023-062	Scheme: Blackbutt - Process Step: Reticulation - Item: RET7 - Bacteria/Virus - Biological - Event: New connections contamination. - Risk: High	Cut-overs procedure for the connection of new mains including inspection and disinfection. ITPs developed. Council considers that the process is current good but requires written procedures.					Development compliance adopts procedures.	2025	Internal Wages	Manager Water & Wastewater	Procedural	
2023-063	Scheme: Blackbutt - Process Step: 2ndaryDis - Item: DIS1 - Chlorate - Chemical - Event: chemical breakdown - Risk: High	No change from previous CCP. See redosing below if used.	Consider a rechlorination unit or higher dosage or flushing or a combination of these.	2023	Design rechlorination unit for Benarkin including chlorine set point adjustments at the WTP and at the future 2ndary Cl2 site. Consider subject to the potasium permanganate investigation.	2030	Install rechlorination unit for Benarkin	2035	138,704	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-064	Scheme: Boondooma - Process Step: Catchment - Item: CMT5 - Bacteria/Virus - Biological - Event: Dairy or other plant discharges - Risk: High	See preventative measures.			Update catchment management plan to include farm practices.	2024			-	Program Coordinator	Procedural	
2023-065	Scheme: Boondooma - Process Step: Catchment - Item: CMT7 - Heavy metals, e.g., copper, lead - Chemical - Event: Natural geology, or mining - Risk: Low	6 years of WQ results reviewed. The aesthetic limit for Aluminium has been exceed - see elsewhere for plant optimisation.			Monitor Aluminium levels pre and post treatment to gauge the effectiveness of treatment of this aesthetic contaminant.	2024	Follow up monitoring	2025	Internal Wages	Coordinator Treatment	O&M	
2023-066	Scheme: Boondooma - Process Step: Catchment - Item: CMT8 - Hydrocarbons - Chemical - Event: Illegal disposal of fuel, fuel form boats., run off from impermeable urban areas - Risk: Low	Legal requirements for persons to manage their stores. Regular patrols. Urban areas limited.	Query/discuss usage with SunWater if needed. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural	
2023-067	Scheme: Boondooma - Process Step: Catchment - Item: CMT12 - Pesticides/ Herbicides - Chemical - Event: Used in catchment - Risk: Low	Pesticides are monitored regularly as per the verification monitoring. Any high readings will require to be evaluated and actioned on occurrence.	Query/discuss usage with SunWater if needed. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural	
2023-068	Scheme: Boondooma - Process Step: Catchment - Item: CMT13 - other treatment chemicals e.g., PFAS, Microplastics - Chemical - Event: WWTP dicharge upstream, Power Station, Mining, Mill or Airports in catchment - Risk: High	Historic PFAS monitoring indicates at low levels. Monitoring frequency increased to quartely for raw water source for 12 months or event based following change to ADWG. If identified, additional upstream raw water samples will be undertaken to increase source awarenes. Kingaroy WWTP discharges upstream, but minimal imapct expected unless continuous stream flows from Gordonbrook Dam			Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		-	Program Coordinator	Procedural	

			Proposed Improvement Measures							Resourcing		
No.	Observation	Gap or Comment	Interim	Target Date	Short-Term	Target Date	Long-Term	Target Date	Budget	Assigned to	Group	Infra?
2023-069	Scheme: Boondooma - Process Step: Catchment - Item: CMT18 - Various Contaminants - Chemical - Event: Chemical spill - Risk: Medium	Freak event, alternative water sources not available. No major roads in the catchment. Emergency response plan is considered reliable. Local Disaster Management Group can be called into action if required. LDMG plan. Emergency Response Plan, and streams are generally ephemeral allows time for clean up.	Query/discuss usage with SunWater if needed. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment. Ensure supply can be isolated until wave passes.	2024	See CMT 1,		Internal Wages	Program Coordinator	Procedural	
2023-070	Scheme: Boondooma - Process Step: Catchment - Item: CMT21 - Radioactivity - Radiological - Event: Natural geology - Risk: Low	Histroic data indicates seasonal spikes, but still below health limits Recommend specific testing for this parameter. Filtration and coagulation likely to remove this to manageable levels if there is a contaminant. No action proposed.	Nil.		Test for radionuclides, incrased during winter when increased levels indicate	2025			1,000	Water Sampling Technician	Laboratory	
2023-071	Scheme: Boondooma - Process Step: Catchment - Item: CMT23 - Various Contaminants - Physical/Chemical etc. - Turbidity - Event: Bushfire followed by runoff event - Bushfire impact to catchment leading to increased particulate matter in Dams. - Risk: Medium	Bushfires are common in the catchment, however monitoring results have not shown responsive changes in parameters. Alternative source water cannot be selected.			Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Technical Officer	Procedural	
2023-072	Scheme: Boondooma - Process Step: Intake - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: High	Daily inspections. No other active measures to reduce L&C. Residence time in storage and natural die off. Offtake level selection.			Update O&M Manual to ensure intake level is properly chosen.	2024			Internal Wages	Coordinator Treatment	Procedural	
2023-073	Scheme: Boondooma - Process Step: Intake - Item: CMT3 - Protozoa/ Cryptosporidium - Biological - Event: Animals in catchment - Contamination of the Dams from dead animals in water. - Risk: High	Operational site visits Community notify staff when there is a concern			Update O&M Manual to ensure removal of animals is monitored and performed.	2024			Internal Wages	Coordinator Treatment	Procedural	
2023-074	Scheme: Boondooma - Process Step: Intake - Item: CMT4 - Amoeba/ Naegleria/ Acanthamoeba - Biological - Event: Animals in catchment - Access by native and feral animals to the Dam introducing faecal contamination. - Risk: Medium	Daily inspections. No other active measures to reduce L&C.	Check fences and entry points and secure.	2023	Council to consider fencing/ gates to prevent horses and other animals entering intake area.	2024	Undertake fence and gate management program	2025	20,000	Program Coordinator	Council	
2023-075	Scheme: Boondooma - Process Step: Intake - Item: CMT23 - Various Contaminants - Physical/Chemical etc. - Turbidity - Event: Bushfire followed by runoff event - Bushfire impact to catchment leading to increased particulate matter in Dams. - Risk: High	Residence time in dam allows for settling. Alternative source water cannot be selected however. Traditional burn off practices (annually) control undergrowth and the catchment area recovers before the wet season.	Investigate if a potassium permanganate unit should be installed. Research seasonal changes in raw water.	2024	Subject to investigation, design potassium permanganate unit to reduce contaminant risk.	2025	Subject to investigation, install a potassium permanganate unit	2026	170,000	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-076	Scheme: Boondooma - Process Step: Intake - Item: INT9 - Various Contaminants - Physical/Chemical etc. - Event: Stagnation or dam turnover - Risk: Medium	No controls in place at this step.	DO meter needs to be purchased.						800	Principal Engineer (Water and Wastewater)	Laboratory	
2023-077	Scheme: Boondooma - Process Step: Filtration - Item: CMT9 - Iron - Chemical - Event: Natural geology, sediment - Risk: Medium	Clarification does not reduce the likelihood but reduces the extent of the contaminant. Filtration reduces the consequence.	Toolbox talk for this specific action.	2023	Update procedures to address chemical dosing and filtration optimisation.	2024			Internal Wages	Coordinator Treatment	Procedural	
2023-078	Scheme: Boondooma - Process Step: Filtration - Item: CMT10 - Manganese - Chemical - Event: Natural geology - Risk: Low	Clarification does not reduce the likelihood but reduces the extent of the contaminant. Filtration reduces the consequence. Manganese levels are generally low, however there are occasions when the thresholds are exceeded.			Ensure plant optimisation procedures are in place and anticipates seasoning issues that require changes in treatment operations.	2024			Internal Wages	Coordinator Treatment	Procedural	
2023-079	Scheme: Boondooma - Process Step: Filtration - Item: CMT20 - Turbidity - Physical - Event: Drought - Risk: Low	Coagulation and filtration will reduce this aesthetic issue. Filters can be derated to ensure quality - See O&M Manual.	Discuss at a toolbox talk that the filters are currently underperforming, and assign an action to address this.	2023	Report on the filter performance and investigate set points and turbidity data. Update the O&M Manual accordingly, and if required update the HACCP charts.	2024	Subject to filter performance report. It is possible that additional in line turbidity meter will be installed to measure the filtered water turbidity prior to the chlorine contact tank. Filter media and filter nozzles are due to be replaced.	2025	25,000	Program Coordinator	Procedural	
2023-080	Scheme: Boondooma - Process Step: Filtration - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through. - Risk: Medium	Relies on plant operator supervision. CWS and dosing will also shut down. The plant won't pump to the elevated tank, therefore it is a lower risk. Electric actuator on the outlet to the filter.	Check that the electric actuator on the outlet to the filter is a close on failure.	2023			Improve Plant Control and interlocks to prevent water quality breaches	TBC - SBRC DWQO Stratery Adoption and Implemen tation	Refer to Blackbutt WTP1 Filtration	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-081	Scheme: Boondooma - Process Step: Filtration - Item: WTP5 - Various Contaminants - Pathogens/Turbidity - Event: Elevated turbidity levels leading to insufficient coagulation - Risk: Low	Online Turbidity & manual levels recorded in Operators Log Sheet. Operator is in attendance when operating the plant. Turbidity samples are taken by operators a minimum of three days per week.	Calibration and maintenance schedule for online turbidity meter is to be developed and implemented. This is to occur for all instruments.		See CMT9		See CMT9		3,000	Coordinator Treatment	O&M	
2023-082	Scheme: Boondooma - Process Step: Filtration - Item: WTP7 - Various Contaminants - Physical/Chemical etc. - Event: Failure of saturation system - Risk: Low		Preventative Maintenance program TBD.	2023					-	Coordinator Treatment	O&M	
2023-083	Scheme: Boondooma - Process Step: Filtration - Item: WTP8 - Various Contaminants - Physical/Chemical etc. - Event: Failure of filter resulting in high turbid water. - Risk: Medium	There are no procedures for operation or filter maintenance. Additional training required on filter process and CCP response procedures. Council to consider a filter maintenance program.	Laminate the new HACCP Plans and place on the WTP wall.	2023	There are no procedures for operation or filter maintenance. Additional training required on filter process and CCP response procedures. Council to consider a filter maintenance program.	2024			Internal Wages	Coordinator Treatment	Procedural	
2023-084	Scheme: Boondooma - Process Step: Filtration - Item: WTP9 - Various Contaminants - Inability to supply - Event: Backwash / transfer pump failure leading to WTP fail - Risk: Low	Spare pump held as spare.			Create a preventative maintenance program for the scheme.	2024			Internal Wages	Coordinator Maintenance	Procedural	
2023-085	Scheme: Boondooma - Process Step: Disinfection - Item: DIS2 - Chlorine - Chemical - Event: Injection or recirculation pump or chemical injector equipment failure - Risk: Low	Council has acquired some spare parts for system and purchase as spare parts - e.g., Spare pumps, injectors, etc.	Smaller plants: Consider duty standby tanks with automatic changeover look at a lower strength hypo.	2023	Design duty standby tanks with automatic changeover	2024	Install duty standby tanks with automatic changeover	2025	5,000	Program Coordinator	O&M	Yes

			Proposed Improvement Measures							Resourcing		
No.	Observation	Gap or Comment	Interim	Target Date	Short-Term	Target Date	Long-Term	Target Date	Budget	Assigned to	Group	Infra?
2023-086	Scheme: Boondooma - Process Step: Disinfection - Item: DIS10 - Chlorine ORP - Chemical - Event: Chlorine quickly dissipates due to a high Oxidation demand - Risk: High	Oxidation reduction potential value check is needed. Action assigned here.	Test ORP. Increase flushing at the day use area.	2023	Subject to ORP test and flushing program changes, consider moving the cabins and bunkhouse to a non-potable supply. The property owners would be responsible, under the pluming and drainage act, to manage the water quality.	2024	Subject to test, however chlorine concentration increases may only be needed instead of other treatments such as potassium permanganate dosing.	2025	500	Water Sampling Technician	Laboratory	
2023-087	Scheme: Boondooma - Process Step: Reservoirs - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: Low	Weekly inspections in place. Risk not increased, however cannot reduce. All reservoirs are designed to be vermin proof, and are checked on a maintenance program. Ad hoc cleaning programs are implemented when required.	Purchase analysers for the most critical sites.	2023	A regional program maintenance schedule action assigned in Blackbutt RA.				4,000	Program Coordinator	O&M	
2023-088	Scheme: Boondooma - Process Step: Reservoirs - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through. - Risk: Medium	Plant has interlocks in place. No issue at the reservoirs.	Investigate SCADA management during failures	2024					Internal Wages	Manager Water & Wastewater	Procedural	
2023-089	Scheme: Boondooma - Process Step: Reservoirs - Item: RES1 - Bacteria/Virus - Biological - Event: Ingress of faecal material from human or vermin entry. - Risk: Medium	All Reservoirs are roofed, water proofed and vermin proofed. Reservoir Maintenance Schedule and check sheets (include security and internal checks) TBD a Reservoir Top Up dosing procedure. Action assigned here.	Review reservoir cleanliness status.	2023	Reservoir cleaning procedure and program action assigned in Blackbutt RA.				-	Coordinator Maintenance	O&M	
2023-090	Scheme: Boondooma - Process Step: Reservoirs - Item: RES2 - Bacteria/Virus - Biological - Event: Poor Tank turnover, high or low chlorine. - Risk: High	Lower frequency of potential issues due to weekly inspections. Project underway to resolve this. Water height adjustable for some reservoirs. Top fill inlets for some tanks. Action assigned here.	Common reservoir chlorine dosing Top Up procedure action assigned in Blackbutt RA.		Common procedure for tank turnover action assigned in Blackbutt RA.				-	Coordinator Treatment	O&M	
2023-091	Scheme: Boondooma - Process Step: Reservoirs - Item: RES3 - Loss of Supply - Pressure - Event: Loss of water levels that maintain pressure requirements in the distribution. - Risk: Medium	Individual levels set for each Res. Action assigned here. SunWater provides notification for planned shutdowns on the Tarong pipeline. Water can be trucked in from Proston scheme due to the low demands.	Common SOP for emergency supplies or water restriction implementation action assigned in Blackbutt RA.						50,000	Manager Water & Wastewater	Procedural	
2023-092	Scheme: Kingaroy - Process Step: Catchment - Item: CMT5 - Bacteria/Virus - Biological - Event: Dairy or other plant discharges - Risk: Medium	See preventative measures.			Update catchment management plan to include farm practices.	2024			-	Program Coordinator	Procedural	
2023-093	Scheme: Kingaroy - Process Step: Catchment - Item: CMT7 - Heavy metals, e.g., copper, lead - Chemical - Event: Natural geology, or mining - Risk: Low	6 years of WQ results reviewed. The aesthetic limit for Aluminium has been exceed - see elsewhere for plant optimisation.			Monitor Aluminium levels pre and post treatment to gauge the effectiveness of treatment of this aesthetic contaminant.		Follow up monitoring		-	Coordinator Treatment	Laboratory	
2023-094	Scheme: Kingaroy - Process Step: Catchment - Item: CMT8 - Hydrocarbons - Chemical - Event: Illegal disposal of fuel, fuel from boats., run off from impermeable urban areas - Risk: Medium	Legal requirements for persons to manage their stores. Regular patrols. Mulitple Fuel Stations in catchment, some with no hydrocarbon cpature from boswer areas. Historic data indicates some levels. addiotnal testing required.	Discuss usage with property owners. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural	
2023-095	Scheme: Kingaroy - Process Step: Catchment - Item: CMT10 - Manganese - Chemical - Event: Natural geology - Risk: Very High	6 years of WQ results reviewed. Treatment in place however treated water has exceedances. Gordonbrook Dam destratifies the raw water supply near the raw water intake tower, although this supply is second priority. Manganese is monitored in raw water supplies. nown Mn issue Boondooma following bulk water supply maintenace periods. Off Stream Storage may introduce addiotnal risks			Additional testing of raw water supply to be implemented in the verification monitoring program, and additional Retic monitoring for manganese.	2024			-	Coordinator Treatment/Water Sampling Technican	Procedural	
2023-096	Scheme: Kingaroy - Process Step: Catchment - Item: CMT11 - Sodium (salt) - Chemical - Event: Natural geology - Risk: Medium	Alternative source can be used. Gbr <50% draw is best practice. Refer DWIAP for additional offsite storage and increase allocation. Irrigation committee for the Barker Meandue Crk catchment.			Update O&M Manual to advise of draw limit from Gordonbrook Dam for salinity reasons.	2024			-	Principal Engineer (Water and Wastewater)	Procedural	
2023-097	Scheme: Kingaroy - Process Step: Catchment - Item: CMT12 - Pesticides/ Herbicides - Chemical - Event: Used in catchment - Risk: Low	Pesticides are monitored regularly as per the verification monitoring. Any high readings will require to be evaluated and actioned on occurrence.	Query/discuss usage with property owners. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural	
2023-098	Scheme: Kingaroy - Process Step: Catchment - Item: CMT13 - other treatment chemicals e.g., PFAS, Microplastics - Chemical - Event: WWTP dicharge, Landfill and Ariport in catchment, No Power Station, Mining or Mill in catchment - Risk: High	Historic PFAS monitoring indicates at low levels. Monitoring frequency increased to quartely for raw water source for 12 months or event based following change to ADWG. If identified, additional upstream raw water samples will be undertaken to increase source awarenes. Kingaroy WWTP discharges upstream.			Update procedures and Catchment Management Plan to link this risk assessment. Increase moniting for stream flow events	2026	See CMT 1		-	Program Coordinator	Procedural	
2023-099	Scheme: Kingaroy - Process Step: Catchment - Item: CMT18 - Various Contaminants - Chemical - Event: Chemical spill - Risk: Low	Freak event, alternative water sources not available. No major roads in the catchment. Emergency response plan is considered reliable. Local Disaster Management Group can be called into action if required. LDMG plan. Emergency Response Plan, and streams are generally ephemeral allows time for clean up.	Query/discuss usage with property owners. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1,		Internal Wages	Program Coordinator	Procedural	
2023-100	Scheme: Kingaroy - Process Step: Catchment - Item: CMT20 - Turbidity - Physical - Event: Drought - Risk: High	6 years of WQ results reviewed. High readings. Catchment response. Have alternative supply. SunWater pipeline and pumping systems are considered reliable. However this is aging infrastructure and an independent risk assessment should be conducted with SunWater to determine the most accurate residual risk.	Liaise with SunWater on their yield studies including water allocation status and projections, and maintenance shutdowns. Record on the O&M Manuals.	2024	An independent risk assessment may need be conducted to determine the most accurate residual risk for the Boondooma Dam supply.	2025			-	Principal Engineer (Water and Wastewater)	Procedural	

			Proposed Improvement Measures							Resourcing		
No.	Observation	Gap or Comment	Interim	Target Date	Short-Term	Target Date	Long-Term	Target Date	Budget	Assigned to	Group	Infra?
2023-101	Scheme: Kingaroy - Process Step: Catchment - Item: CMT21 - Radioactivity - Radiological - Event: Natural geology - Risk: Low	No data - potentially a high risk rating due to no reports of illness however cannot rule it out. Recommend specific testing for this parameter. Filtration and coagulation likely to remove this to manageable levels if there is a contaminant. No action proposed.	Nil.		Test for radionuclides.	2024			1,000	Water Sampling Technician	Laboratory	
2023-102	Scheme: Kingaroy - Process Step: Catchment - Item: CMT23 - Various Contaminants - Physical/Chemical etc. - Turbidity - Event: Bushfire followed by runoff event - Bushfire impact to catchment leading to increased particulate matter in Dams. - Risk: Medium	Bushfires are common in the catchment, however monitoring results have not shown responsive changes in parameters. Alternative source water can be selected.			Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural	
2023-103	Scheme: Kingaroy - Process Step: Intake - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: High	Daily inspections. No other active measures to reduce L&C. Residence time in storage and natural die off. Offtake level selection.			Update O&M Manual to ensure intake level is properly chosen.	2024			Internal Wages	Coordinator Treatment	Procedural	
2023-104	Scheme: Kingaroy - Process Step: Intake - Item: CMT3 - Protozoa/ Cryptosporidium - Biological - Event: Animals in catchment - Contamination of the Dams from dead animals in water. - Risk: High	Operational site visits Community notify staff when there is a concern			Update O&M Manual to ensure removal of animals is monitored and performed.	2024			Internal Wages	Coordinator Treatment	Procedural	
2023-105	Scheme: Kingaroy - Process Step: Intake - Item: CMT4 - Amoeba/ Naegleria/ Acanthamoeba - Biological - Event: Animals in catchment - Access by native and feral animals to the Dam introducing faecal contamination. - Risk: Medium	Daily inspections. No other active measures to reduce L&C.	Check fences and entry points and secure.	2023	Council to consider fencing/ gates to prevent horses and other animals entering intake area.	2024	Undertake fence and gate management program	2025	20,000	Program Coordinator	Council	
2023-106	Scheme: Kingaroy - Process Step: Intake - Item: CMT23 - Various Contaminants - Physical/Chemical etc. - Turbidity - Event: Bushfire followed by runoff event - Bushfire impact to catchment leading to increased particulate matter in Dams. - Risk: High	Residence time in dam allows for settling. Alternative source water can be selected. Traditional burn off practices (annually) control undergrowth and the catchment area recovers before the wet season.	Investigate if a potassium permanganate unit should be installed. Research seasonal changes in raw water.	2024	Subject to investigation, design potassium permanganate unit to reduce contaminant risk.	2025	Subject to investigation, install a potassium permanganate unit	2026	170,000	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-107	Scheme: Kingaroy - Process Step: Intake - Item: INT9 - Various Contaminants - Physical/Chemical etc. - Event: Stagnation or dam turnover - Risk: Medium	Destratificaitons in place in Gordonbrook Dam.	DO meter needs to be purchased.		Increase sampling locations to account for new storage	2026- To begin first week after commissioning			800	Principal Engineer (Water and Wastewater)	Laboratory	
2023-108	Scheme: Kingaroy - Process Step: Filtration - Item: CMT9 - Iron - Chemical - Event: Natural geology, sediment - Risk: Low	Clarification does not reduce the likelihood but reduces the extent of the contaminant. Filtration reduces the consequence. DAFF Unit in place.	Toolbox talk for this specific action.	2023	Update procedures to address chemical dosing and filtration optimisation.	2024			Internal Wages	Coordinator Treatment	Procedural	
2023-109	Scheme: Kingaroy - Process Step: Filtration - Item: CMT10 - Manganese - Chemical - Event: Changing raw water supply from 100% Boondooma Raw to blend - Risk: High	Clarification does not reduce the likelihood but reduces the extent of the contaminant. Filtration reduces the consequence. Manganese levels are generally low, however there are occasions when the thresholds are exceeded. DAFF Unit in place. High turbidity has been caused in the past from oxidising manganese in the Clear water storage tank. Final turbidity analysers will catch this control point.			Ensure plant optimisation procedures are in place and anticipates seasoning issues that require changes in treatment operations. Particularly if the water source changes and oxidising metals have an influence.	2024			Internal Wages	Coordinator Treatment	Procedural	
2023-110	Scheme: Kingaroy - Process Step: Filtration - Item: INT10 - Various Contaminants - Whole of System - Event: Sabotage/ Terrorism - Non authorised persons accessing the site and interrupting the treatment processes (e.g.. Vandalism, trespassing) - Risk: Medium	Gordonbrook WTP has security fences and control building is locked.	Investigate installation of sensor lights or security cameras to deter illegal entry.	2023	Design security system	2024	Install security system	2025	30,000	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-111	Scheme: Kingaroy - Process Step: Filtration - Item: WTP5 - Various Contaminants - Pathogens/Turbidity - Event: Elevated turbidity levels leading to insufficient coagulation - Risk: Low	Online Turbidity & manual levels recorded in Operators Log Sheet	Calibration and maintenance schedule for online turbidity meter is to be developed and implemented. This is to occur for all instruments.		See CMT9		See CMT9		3,000	Coordinator Treatment	O&M	
2023-112	Scheme: Kingaroy - Process Step: Filtration - Item: WTP7 - Various Contaminants - Physical/Chemical etc. - Event: Failure of saturation system - Risk: Low		Preventative Maintenance program TBD.	2023					-	Program Coordinator	O&M	
2023-113	Scheme: Kingaroy - Process Step: Filtration - Item: WTP8 - Various Contaminants - Physical/Chemical etc. - Event: Failure of filter resulting in high turbid water. - Risk: Medium	There are no procedures for operation or filter maintenance. Additional training required on filter process and CCP response procedures. Council to consider a filter maintenance program.	Laminate the new HACCP Plans and place on the WTP wall.	2023	There are no procedures for operation or filter maintenance. Additional training required on filter process and CCP response procedures. Council to consider a filter maintenance program.	2024			Internal Wages	Program Coordinator	Procedural	
2023-114	Scheme: Kingaroy - Process Step: Filtration - Item: WTP9 - Various Contaminants - Inability to supply - Event: Backwash / transfer pump failure leading to WTP fail - Risk: Low	Spare pump held as spare.			Create a preventative maintenance program for the scheme.	2024			Internal Wages	Program Coordinator	Procedural	
2023-115	Scheme: Kingaroy - Process Step: Disinfection - Item: CMT15 - Scaling - Chemical - Event: TDS or organics in raw water - Risk: Low	Possible partial oxidation of dissolved solids, however this may introduce THMs. PAC in place.	Consider THM issues. Gather test results.	2023	Consider a trial using Chlorine Dioxide to reduce THMs, but balance with chlorates as Chlorine dioxide will still form chlorates. If this is an issue, trial chlorine gas, and monitor for THMs.	2024	Subject to trials, switch to Chlorine Dioxide.	2025	200,000	Principal Engineer (Water and Wastewater)	O&M	Yes

			Proposed Improvement Measures							Resourcing		
No.	Observation	Gap or Comment	Interim	Target Date	Short-Term	Target Date	Long-Term	Target Date	Budget	Assigned to	Group	Infra?
2023-116	Scheme: Kingaroy - Process Step: Disinfection - Item: DIS4 - DBPs/ THMs/ Bromide - Chemical - Event: elevated organics and long detention times Change in Raw water supply from 66% Boondooma /33% Gordonbrook blend to 100% Gordonbrook supply - Risk: High	Weekly monitoring is conducted of all schemes outer reservoirs. The use of Boondooma Water has proven recently to be beneficial in Raw water supply to reduce THM's. Flushing can be performed to turn over stagnant storage. Weekly jar testing at water treatment plants is optimising organics removal. Chlorine residuals are regularly reviewed to maintain disinfection. Recent THM data indicates that a reduction in organic material from the new plant has greatly reduced the THM counts. Sufficient data is not available to be considered higher than and Estimate in the level of uncertainty. Reducing the Gordonbrook Raw water supply reduces THM's due to elevated organic and bromide levels. RMIAP to provide additional Boondooma Raw water storage to mitigate the SunWater maintenance periods.			Investigate THM levels and Gordonbrook Dam water levels to see if a general trigger level is found.	2024	Potential additional water allocation from Boondooma Dam TBD.		25,000	Principal Engineer (Water and Wastewater)	Laboratory	
2023-117	Scheme: Kingaroy - Process Step: Disinfection - Item: DIS10 - Chlorine ORP - Chemical - Event: Chlorine quickly dissipates due to a high Oxidation demand - Risk: High	Oxidation reduction potential value check is needed. Action assigned here.	Test ORP	2023	Subject to ORP test	2024	Subject to test, however chlorine concentration increases may only be needed instead of other treatments such as potassium permanganate dosing.	2025	500	Water Sampling Technician	Laboratory	
2023-118	Scheme: Kingaroy - Process Step: Reservoirs - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: Low	Weekly inspections in place. Risk not increased, however cannot reduce. All reservoirs are designed to be vermin proof, and are checked on a maintenance program. Ad hoc cleaning programs are implemented when required.	Purchase analysers for the most critical sites.	2023	A regional program maintenance schedule action assigned in Blackbutt RA.				4,000	Program Coordinator	O&M	
2023-119	Scheme: Kingaroy - Process Step: Reservoirs - Item: INT10 - Various Contaminants - Whole of System - Event: Sabotage/ Terrorism - Non authorised persons accessing the site and interrupting the treatment processes (e.g.. Vandalism, trespassing) - Risk: High	Regular inspections. Locked access. Community would report unauthorised access to tanks when observed. Some tank sites do not have a secure compound fence. Graffiti is on tank walls.	Reservoir Maintenance Schedule and check sheets (include security and internal checks).	2024	Design of new fencing around reservoirs - Orana	2025	Installation of new fencing around reservoirs - Orana	2026	50,000	Program Coordinator	O&M	Yes
2023-120	Scheme: Kingaroy - Process Step: Reservoirs - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through. - Risk: Low	Plant has interlocks in place. No issue at the reservoirs.	Investigate SCADA management during failures	2024					Internal Wages	Manager Water & Wastewater	Procedural	
2023-121	Scheme: Kingaroy - Process Step: Reservoirs - Item: RES1 - Bacteria/Virus - Biological - Event: Ingress of faecal material from human or vermin entry. - Risk: Medium	All Reservoirs are roofed, water proofed and vermin proofed. Reservoir Maintenance Schedule and check sheets (include security and internal checks) TBD a Reservoir Top Up dosing procedure. Action assigned here.	Review reservoir cleanliness status.	2023	Reservoir cleaning procedure and program action assigned in Blackbutt RA.				-	Coordinator Maintenance	O&M	
2023-122	Scheme: Kingaroy - Process Step: Reservoirs - Item: RES2 - Bacteria/Virus - Biological - Event: Poor Tank turnover, high or low chlorine. - Risk: High	Lower frequency of potential issues due to weekly inspections. Project underway to resolve this. Water height adjustable for some reservoirs. Top fill inlets for some tanks. Action assigned here.	Common reservoir chlorine dosing Top Up procedure action assigned in Blackbutt RA.		Common procedure for tank turnover action assigned in Blackbutt RA.				-	Coordinator Maintenance	O&M	
2023-123	Scheme: Kingaroy - Process Step: Reservoirs - Item: RES3 - Loss of Supply - Pressure - Event: Loss of water levels that maintain pressure requirements in the distribution. - Risk: Medium	Individual levels set for each Res. Action assigned here.	Common SOP for emergency supplies or water restriction implementation action assigned in Blackbutt RA.						50,000	Manager Water & Wastewater	Procedural	
2023-124	Scheme: Kingaroy - Process Step: 2ndaryDis - Item: DIS4 - DBPs/ THMs/ Bromide - Chemical - Event: elevated organics and long detention times Change in Raw water supply from 66% Boondooma /33% Gordonbrook blend to 100% Gordonbrook supply - Risk: High	Redosing stations are continually monitored to reduce redosing volumes. These dose rates are now much lower than, previous flow rates. Recent THM results indicate much lower indications due to the large amount or organics removal. Disinfection residuals are not to be compromised to reduce THM's. Reducing the Gordonbrook Raw water supply reduces THM's due to elevated organic and bromide levels. RMIAP to provide additional Boondooma Raw water storage to mitigate the SunWater maintenance periods.			Investigate the use of Reservoir Aerators to redcue THMs	TBC - SBRC DWQO Stratery Adoption and Implemen tation	Relocate Secondary Disinfection points Harris Road and Golf Course to outlet of storage reservoirs to only dose water used as opposed to water stored	TBC - SBRC DWQO Stratery Adoption and Implemen tation	328,747	Engineer Water and Wastewater	O&M	Yes
2023-125	Scheme: Murgon - Process Step: Catchment - Item: CMT5 - Bacteria/Virus - Biological - Event: Dairy or other plant discharges - Risk: Medium	See preventative measures.			Update catchment management plan to include farm practices.	2024			-	Program Coordinator	Procedural	
2023-126	Scheme: Murgon - Process Step: Catchment - Item: CMT7 - Heavy metals, e.g., copper, lead - Chemical - Event: Natural geology, or mining - Risk: High	6 years of WQ results reviewed. The aesthetic limit for Aluminium has been exceed - see elsewhere for plant optimisation. The aesthetic limit for Copper has been exceeded.			Monitor Aluminium levels pre and post treatment to gauge the effectiveness of treatment of this aesthetic contaminant.		Follow up monitoring		-	Coordinator Treatment	Laboratory	
2023-127	Scheme: Murgon - Process Step: Catchment - Item: CMT8 - Hydrocarbons - Chemical - Event: Illegal disposal of fuel, fuel from boats., - Risk: Low	Legal requirements for persons to manage their stores. Regular patrols. Some urban area impacts .	Discuss usage with property owners. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural	
2023-128	Scheme: Murgon - Process Step: Catchment - Item: CMT10 - Manganese - Chemical - Event: Natural geology - Risk: High	6 years of WQ results reviewed. Treatment in place however treated water has exceedances. Missing raw water information however the treated water results show health exceedances.			Additional testing of raw water supply to be implemented in the verification monitoring program, and additional Retic monitoring for manganese.	2024	Implemtation of oxident dosing to reduce mangaense conentrations as per DWQOS 2025	TBC - SBRC DWQO Stratery Adoption and Implemen tation	822,923	Coordinator Treatment	Laboratory	

			Proposed Improvement Measures								Resourcing		
No.	**Observation**	**Gap or Comment**	**Interim**	**Target Date**	**Short-Term**	**Target Date**	**Long-Term**	**Target Date**	**Budget**	**Assigned to**	**Group**	**Infra?**
2023-129	Scheme: Murgon - Process Step: Catchment - Item: CMT12 - Pesticides/ Herbicides - Chemical - Event: Used in catchment - Risk: Low	Pesticides are monitored regularly as per the verification monitoring. Any high readings will require to be evaluated and actioned on occurrence.	Query/discuss usage with property owners. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural	
2023-130	Scheme: Murgon - Process Step: Catchment - Item: CMT13 - other treatment chemicals e.g., PFAS, Microplastics - Chemical - Event: WWTP dicharge downstream, Rural Ariport in catchment, No Power Station, Mining or Mill in catchment - Risk: High	Historic PFAS monitoring indicates at low levels. Monitoring frequency increased to quartely for raw water source for 12 months or event based following change to ADWG. If identified, additional upstream raw water samples will be undertaken to increase source awarenes.			Update procedures and Catchment Management Plan to link this risk assessment. Increase moniting for stream flow events	2024	See CMT 1		-	Program Coordinator	Laboratory	
2023-131	Scheme: Murgon - Process Step: Catchment - Item: CMT18 - Various Contaminants - Chemical - Event: Chemical spill - Risk: Low	Freak event, alternative water sources not available. No major roads in the catchment. Emergency response plan is considered reliable. Local Disaster Management Group can be called into action if required. LDMG plan. Emergency Response Plan.	Query/discuss usage with property owners. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment. Ensure supply can be isolated until wave passes.	2024	See CMT 1,		Internal Wages	Program Coordinator	Procedural	
2023-132	Scheme: Murgon - Process Step: Catchment - Item: CMT21 - Radioactivity - Radiological - Event: Natural geology - Risk: Low	Histroic data indicates seasonal spikes, but still below health limits Recommend specific testing for this parameter. Filtration and coagulation likely to remove this to manageable levels if there is a contaminant. No action proposed.	Nil.		Test for radionuclides, incrased during winter when increased levels indicate	2024			1,000	Water Sampling Technician	Laboratory	
2023-133	Scheme: Murgon - Process Step: Catchment - Item: CMT23 - Various Contaminants - Physical/Chemical etc. - Turbidity - Event: Bushfire followed by runoff event - Bushfire impact to catchment leading to increased particulate matter in Dams. - Risk: Medium	Bushfires are common in the catchment, however monitoring results have not shown responsive changes in parameters. Alternative source water cannot be selected.			Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural	
2023-134	Scheme: Murgon - Process Step: Intake - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: High	Daily inspections. No other active measures to reduce L&C. Residence time in storage and natural die off. Offtake level selection.			Update O&M Manual to ensure intake level is properly chosen.	2024			Internal Wages	Coordinator Treatment	Procedural	
2023-135	Scheme: Murgon - Process Step: Intake - Item: CMT3 - Protozoa/ Cryptosporidium - Biological - Event: Animals in catchment - Contamination of the Dams from dead animals in water. - Risk: High	Operational site visits Community notify staff when there is a concern			Update O&M Manual to ensure removal of animals is monitored and performed.	2024			Internal Wages	Coordinator Treatment	Procedural	
2023-136	Scheme: Murgon - Process Step: Intake - Item: CMT4 - Amoeba/ Naegleria/ Acanthamoeba - Biological - Event: Animals in catchment - Access by native and feral animals to the Dam introducing faecal contamination. - Risk: Medium	Daily inspections. No other active measures to reduce L&C.	Check fences and entry points and secure.	2023	Council to consider fencing/ gates to prevent horses and other animals entering intake area.	2024	Undertake fence and gate management program	2025	20,000	Coordinator Treatment	Council	
2023-137	Scheme: Murgon - Process Step: Intake - Item: CMT20 - Turbidity - Physical - Event: Drought - Risk: High	no real active measures to reduce L&C	Investigate if a floating intake or selective level withdrawal can be used.	2024	Design intake to reduce contaminant risk.	2025	Install a floating intake	2026	75,000	Coordinator Treatment	O&M	Yes
2023-138	Scheme: Murgon - Process Step: Intake - Item: CMT23 - Various Contaminants - Physical/Chemical etc. - Turbidity - Event: Bushfire followed by runoff event - Bushfire impact to catchment leading to increased particulate matter in Dams. - Risk: High	Residence time in dam allows for settling, although the creek may still present an issue. Alternative source water cannot be selected however. Traditional burn off practices (annually) control undergrowth and the catchment area recovers before the wet season.	Investigate if a potassium permanganate unit should be installed. Research seasonal changes in raw water.	2024	Subject to investigation, design potassium permanganate unit to reduce contaminant risk.	2025	Subject to investigation, install a potassium permanganate unit	2026	170,000	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-139	Scheme: Murgon - Process Step: Intake - Item: INT9 - Various Contaminants - Physical/Chemical etc. - Event: Stagnation or dam turnover - Risk: Medium	No controls in place at this step.	DO meter needs to be purchased.						800	Principal Engineer (Water and Wastewater)	Laboratory	
2023-140	Scheme: Murgon - Process Step: Filtration - Item: CMT9 - Iron - Chemical - Event: Natural geology, sediment - Risk: Medium	Clarification does not reduce the likelihood but reduces the extent of the contaminant. Filtration reduces the consequence.	Toolbox talk for this specific action.	2023	Update procedures to address chemical dosing and filtration optimisation.	2024	Refer CMT1		Internal Wages	Program Coordinator	Procedural	
2023-141	Scheme: Murgon - Process Step: Filtration - Item: CMT10 - Manganese - Chemical - Event: Natural geology - Risk: High	Clarification does not reduce the likelihood but reduces the extent of the contaminant. Filtration reduces the consequence. Manganese levels are generally low, however there are occasions when the thresholds are exceeded.			Ensure plant optimisation procedures are in place and anticipates seasoning issues that require changes in treatment operations.	2024	Refer CMT1		Internal Wages	Program Coordinator	Procedural	
2023-142	Scheme: Murgon - Process Step: Filtration - Item: CMT20 - Turbidity - Physical - Event: Drought - Risk: Low	Coagulation and filtration will reduce this issue. Filters can be derated to ensure quality - See O&M Manual. Filter targets are being met.			Start capturing the filter outlet turbidity data.	2024	Refer CMT1		-	Program Coordinator	O&M	
2023-143	Scheme: Murgon - Process Step: Filtration - Item: INT1 - Cyanobacteria - Biological - Event: Algal bloom - Risk: High	Coagulation and filtration will reduce this issue.	Manual dosing procedure in place. PAC on site.	2023	Design automatic PAC dosing system.	2024	Install automatic PAC dosing system.	2025	100,000	Program Coordinator	O&M	Yes
2023-144	Scheme: Murgon - Process Step: Filtration - Item: INT10 - Various Contaminants - Whole of System - Event: Sabotage/ Terrorism - Non authorised persons accessing the site and interrupting the treatment processes (e.g.. Vandalism, trespassing) - Risk: Medium	Murgon WTP has security fences and control building is locked. Pump sheds and dosing facilities are all protected by locked sheds.	Investigate installation of sensor lights or security cameras to deter illegal entry.	2023	Design security system	2024	Install security system	2025	30,000	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-145	Scheme: Murgon - Process Step: Filtration - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through. - Risk: Low	SCADA interlocks in place, and shutdown/isolation occurs on failure.	Assigned in Blackbutt RA for action				Improve Plant Control and interlocks to prevent water quality breaches	TBC - SBRC DWQO Stratery Adoption and Implemen tation	Refer to Blackbutt WTP1 Filtration	Coordinator Treatment	O&M	Yes
2023-146	Scheme: Murgon - Process Step: Filtration - Item: WTP5 - Various Contaminants - Pathogens/Turbidity - Event: Elevated turbidity levels leading to insufficient coagulation - Risk: Low	Online Turbidity & manual levels recorded in Operators Log Sheet	Calibration and maintenance schedule for online turbidity meter is to be developed and implemented. This is to occur for all instruments.		See CMT9		See CMT9		3,000	Coordinator Treatment	O&M	
2023-147	Scheme: Murgon - Process Step: Filtration - Item: WTP7 - Various Contaminants - Physical/Chemical etc. - Event: Failure of saturation system - Risk: Low		Preventative Maintenance program TBD.	2023					-	Coordinator Treatment	O&M	

			Proposed Improvement Measures							Resourcing		
No.	Observation	Gap or Comment	Interim	Target Date	Short-Term	Target Date	Long-Term	Target Date	Budget	Assigned to	Group	Infra?
2023-148	Scheme: Murgon - Process Step: Filtration - Item: WTP8 - Various Contaminants - Physical/Chemical etc. - Event: Failure of filter resulting in high turbid water. - Risk: Medium	There are no procedures for operation or filter maintenance. Additional training required on filter process and CCP response procedures. Council to consider a filter maintenance program.	Laminate the new HACCP Plans and place on the WTP wall.	2023	There are no procedures for operation or filter maintenance. Additional training required on filter process and CCP response procedures. Council to consider a filter maintenance program.	2024			Internal Wages	Coordinator Treatment	Procedural	
2023-149	Scheme: Murgon - Process Step: Filtration - Item: WTP9 - Various Contaminants - Inability to supply - Event: Backwash / transfer pump failure leading to WTP fail - Risk: Low	Spare pump held as spare.			Create a preventative maintenance program for the scheme.	2024			Internal Wages	Coordinator Maintenance	Procedural	
2023-150	Scheme: Murgon - Process Step: Disinfection - Item: DIS10 - Chlorine ORP - Chemical - Event: Chlorine quickly dissipates due to a high Oxidation demand - Risk: High	Oxidation reduction potential value check is needed. Action assigned here.	Test ORP	2023	Subject to ORP test	2024	Subject to test, however chlorine concentration increases may only be needed instead of other treatments such as potassium permanganate dosing.	2025	500	Coordinator Treatment/Water Sampling Technican	Laboratory	
2023-151	Scheme: Murgon - Process Step: Reservoirs - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: Low	Weekly inspections in place. Risk not increased, however cannot reduce. All reservoirs are designed to be vermin proof, and are checked on a maintenance program. Ad hoc cleaning programs are implemented when required.	Purchase analysers for the most critical sites.	2023	A regional program maintenance schedule action assigned in Blackbutt RA.				4,000	Principal Engineer (Water and Wastewater)	O&M	
2023-152	Scheme: Murgon - Process Step: Reservoirs - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through. - Risk: Low	Plant has interlocks in place. No issue at the reservoirs.	Investigate SCADA management during failures	2024					Internal Wages	Manager Water & Wastewater	Procedural	
2023-153	Scheme: Murgon - Process Step: Reservoirs - Item: RES1 - Bacteria/Virus - Biological - Event: Ingress of faecal material from human or vermin entry. - Risk: Medium	All Reservoirs are roofed, water proofed and vermin proofed. Reservoir Maintenance Schedule and check sheets (include security and internal checks) TBD a Reservoir Top Up dosing procedure. Action assigned here.	Review reservoir cleanliness status.	2023	Reservoir cleaning procedure and program action assigned in Blackbutt RA.				-	Coordinator Maintenance	O&M	
2023-154	Scheme: Murgon - Process Step: Reservoirs - Item: RES2 - Bacteria/Virus - Biological - Event: Poor Tank turnover, high or low chlorine. - Risk: High	Lower frequency of potential issues due to weekly inspections. Project underway to resolve this. Water height adjustable for some reservoirs. Top fill inlets for some tanks. Action assigned here.	Common reservoir chlorine dosing Top Up procedure action assigned in Blackbutt RA.		Common procedure for tank turnover action assigned in Blackbutt RA.				-	Program Coordinator	O&M	
2023-155	Scheme: Murgon - Process Step: Reservoirs - Item: RES3 - Loss of Supply - Pressure - Event: Loss of water levels that maintain pressure requirements in the distribution. - Risk: Medium	Individual levels set for each Res. Action assigned here.	Common SOP for emergency supplies or water restriction implementation action assigned in Blackbutt RA.						50,000	Manager Water & Wastewater	Procedural	
2023-156	Scheme: Nanango - Process Step: Catchment - Item: CMT8 - Hydrocarbons - Chemical - Event: Illegal disposal of fuel etc., run off from impermeable urban areas - Risk: Low	Legal requirements for persons to manage their stores. Regular patrols. No major urban area impacts, but Power station upsteam.	Discuss usage with property owners. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural	
2023-157	Scheme: Nanango - Process Step: Catchment - Item: CMT12 - Pesticides/ Herbicides - Chemical - Event: Used in catchment - Risk: Low	Pesticides are monitored regularly as per the verification monitoring. Any high readings will require to be evaluated and actioned on occurrence. Monitoring of all 3 individual bores for Pesticides, Herbicides, Heavy metals are conducted regularly. This monitoring is evaluated in the event additional process is required. Proposed future pipeline from Kingaroy Scheme to Nanango scheme is in concept planning phase.	Discuss usage with property owners. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural	
2023-158	Scheme: Nanango - Process Step: Catchment - Item: CMT13 - other treatment chemicals e.g., PFAS, Microplastics - Chemical - Event: Rural Ariport (infrequent use), Power Station , Mining in catchment .No Mill in catchment - Risk: High	Historic PFAS monitoring indicates at low levels. Monitoring frequency increased to quartely for raw water source for 12 months or event based following change to ADWG			Update procedures and Catchment Management Plan to link this risk assessment. Increase moniting for stream flow events	2024	See CMT 1		-	Program Coordinator	Procedural	
2023-159	Scheme: Nanango - Process Step: Catchment - Item: CMT18 - Various Contaminants - Chemical - Event: Chemical spill - Risk: Medium	Freak event, alternative water sources not available. No major roads in the catchment. Emergency response plan is considered reliable. Local Disaster Management Group can be called into action if required. LDMG plan. Emergency Response Plan, and streams are generally ephemeral allows time for clean up.	Discuss usage with property owners. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment. Ensure supply can be isolated until wave passes.	2024	See CMT 1,		Internal Wages	Program Coordinator	Procedural	
2023-160	Scheme: Nanango - Process Step: Catchment - Item: CMT20 - Turbidity - Physical - Event: Drought - Risk: High	6 years of WQ results reviewed. High readings. Strategic Plan is to regionalise water supplies through the regional water supply strategy. Static bore levels are monitored. Strategic plan is to regionalise the water supply between Kingaroy and Nanango schemes.	Sign off on the Drought Management Plan (All schemes) undertaken by NWM in 2021.	2023					Internal Wages	Manager Water & Wastewater	Emergency Response	
2023-161	Scheme: Nanango - Process Step: Catchment - Item: CMT21 - Radioactivity - Radiological - Event: Natural geology - Risk: Low	No data - potentially a high risk rating due to no reports of illness however cannot rule it out. Recommend specific testing for this parameter. Filtration and coagulation likely to remove this to manageable levels if there is a contaminant. No action proposed.	Nil.		Test for radionuclides.	2024			1,000	Water Sampling Technician	Laboratory	
2023-162	Scheme: Nanango - Process Step: Catchment - Item: CMT23 - Various Contaminants - Physical/Chemical etc. - Turbidity - Event: Bushfire followed by runoff event - Bushfire impact to catchment. - Risk: Medium	Bushfires are common in the catchment, however monitoring results have not shown responsive changes in parameters. Alternative source water cannot be selected.			Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural	
2023-163	Scheme: Nanango - Process Step: Intake - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: High	Daily inspections. No other active measures to reduce L&C. Residence time in storage and natural die off. Offtake level selection.			Update O&M Manual to ensure intake level is properly chosen.	2024			Internal Wages	Program Coordinator	Procedural	
2023-164	Scheme: Nanango - Process Step: Intake - Item: CMT3 - Protozoa/ Cryptosporidium - Biological - Event: Animals in catchment - Contamination of groundwater from dead animals in water. - Risk: Low	Operational site visits Community notify staff when there is a concern			Update O&M Manual to ensure removal of animals is monitored and performed.	2024			Internal Wages	Program Coordinator	Procedural	

			Proposed Improvement Measures							Resourcing		
No.	Observation	Gap or Comment	Interim	Target Date	Short-Term	Target Date	Long-Term	Target Date	Budget	Assigned to	Group	Infra?
2023-165	Scheme: Nanango - Process Step: Intake - Item: CMT4 - Amoeba/ Naegleria/ Acanthamoeba - Biological - Event: Animals in catchment - Access by native and feral animals to the groundwater introducing faecal contamination. - Risk: Medium	Daily inspections. No other active measures to reduce L&C.	Check fences and entry points and secure.	2023	Council to consider fencing/ gates to prevent horses and other animals entering bore intake area.	2024	Undertake fence and gate management program	2025	20,000	Program Coordinator	O&M	Yes
2023-166	Scheme: Nanango - Process Step: Disinfection - Item: INT6 - Failure of supply - Whole of System - Event: loss of power. - Risk: High	System will run on gravity from the reservoir. There is no flow at the disinfection point, However some untreated water may go into the system, and although mixed with disinfected water, the treatment is compromised.	Review system pipe and valving setup	2023	Instal an auto shut-off valve at the disinfection station to ensure untreated water does not diffuse into the network.	2024			10,000	Program Coordinator	O&M	
2023-167	Scheme: Nanango - Process Step: Disinfection - Item: INT8 - Temperature - Physical - Event: Natural water temperature. - Risk: Low	No change - Require a water validation assessment as the c.t value should be high enough.			Require a water validation assessment as the c.t value should be high enough.	2024			5,000	Manager Water & Wastewater	O&M	
2023-168	Scheme: Nanango - Process Step: Disinfection - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through e.g., Failure of alarms from dosing equipment. - Risk: High	Automatic shut-off valve proposed should be linked to a PLC failure.			Investigate how to set up the automatic shut-off valve to close on a PLC failure.	2024	Set up the automatic shut-off valve to close on a PLC failure.	2025	5,000	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-169	Scheme: Nanango - Process Step: Disinfection - Item: DIS2 - Chlorine - Chemical - Event: Injection or recirculation pump or chemical injector equipment failure - Risk: Low	Council has acquired a list of critical spare parts for system and purchase as spare parts - e.g., Spare pumps, injectors, etc. Additional Chlorine residual sampling is conducted by operators above the verification sampling.	Smaller plants: Consider duty standby tanks with automatic changeover look at a lower strength hypo.	2023	Design duty standby tanks with automatic changeover	2024	Install duty standby tanks with automatic changeover	2025	5,000	Coordinator Treatment	O&M	Yes
2023-170	Scheme: Nanango - Process Step: Reservoirs - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: Low	Weekly inspections in place. Risk not increased, however cannot reduce. All reservoirs are designed to be vermin proof, and are checked on a maintenance program. Ad hoc cleaning programs are implemented when required.	Purchase analysers for the most critical sites.	2023	A regional program maintenance schedule action assigned in Blackbutt RA.				4,000	Coordinator Treatment	O&M	
2023-171	Scheme: Nanango - Process Step: Reservoirs - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through e.g., Failure of alarms from dosing equipment. - Risk: High		Investigate SCADA management during failures	2024					Internal Wages	Manager Water & Wastewater	Procedural	
2023-172	Scheme: Nanango - Process Step: Reservoirs - Item: RES1 - Bacteria/Virus - Biological - Event: Ingress of faecal material from human or vermin entry. - Risk: Medium	All Reservoirs are roofed, water proofed and vermin proofed. Reservoir Maintenance Schedule and check sheets (include security and internal checks) TBD a Reservoir Top Up dosing procedure. Action assigned here.	Review reservoir cleanliness status.	2023	Reservoir cleaning procedure and program action assigned in Blackbutt RA.				-	Coordinator Maintenance	O&M	
2023-173	Scheme: Nanango - Process Step: Reservoirs - Item: RES2 - Bacteria/Virus - Biological - Event: Poor Tank turnover, high or low chlorine. - Risk: High	Lower frequency of potential issues due to weekly inspections. Project underway to resolve this. Water height adjustable for some reservoirs. Top fill inlets for some tanks. Action assigned here.	Common reservoir chlorine dosing Top Up procedure action assigned in Blackbutt RA.		Common procedure for tank turnover action assigned in Blackbutt RA.				-	Coordinator Maintenance	O&M	
2023-174	Scheme: Nanango - Process Step: Reservoirs - Item: RES3 - Loss of Supply - Pressure - Event: Loss of water levels that maintain pressure requirements in the distribution. - Risk: Medium	Individual levels set for each Res. Action assigned here.	Common SOP for emergency supplies or water restriction implementation action assigned in Blackbutt RA.						50,000	Manager Water & Wastewater	Procedural	
2023-175	Scheme: Proston - Process Step: Catchment - Item: CMT5 - Bacteria/Virus - Biological - Event: Dairy or other plant discharges - Risk: Medium	See preventative measures.			Update catchment management plan to include farm practices.	2024			-	Program Coordinator	Procedural	
2023-176	Scheme: Proston - Process Step: Catchment - Item: CMT10 - Manganese - Chemical - Event: Natural geology - Risk: High	6 years of WQ results reviewed. Treatment in place however treated water has exceedances for the aesthetic limit.			Additional testing of raw water supply to be implemented in the verification monitoring program, and additional Retic monitoring for manganese.	2024			-	Program Coordinator	Laboratory	
2023-177	Scheme: Proston - Process Step: Catchment - Item: CMT13 - other treatment chemicals e.g., PFAS, Microplastics - Chemical - Event: WWTP dicharge upstream, Power Station, Mining, Mill or Airports in catchment - Risk: Low	Historic PFAS monitoring indicates at low levels. Monitoring frequency increased to quartely for raw water source for 12 months or event based following change to ADWG			Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		-	Program Coordinator	Procedural	
2023-178	Scheme: Proston - Process Step: Catchment - Item: CMT18 - Various Contaminants - Chemical - Event: Chemical spill - Risk: Low	Freak event, alternative water sources not available. No major roads in the catchment. Emergency response plan is considered reliable. Local Disaster Management Group can be called into action if required. LDMG plan. Emergency Response Plan, and streams are generally ephemeral allows time for clean up.	Discuss usage with property owners. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment. Ensure supply can be isolated until wave passes.	2024	See CMT 1,		Internal Wages	Program Coordinator	Procedural	
2023-179	Scheme: Proston - Process Step: Catchment - Item: CMT21 - Radioactivity - Radiological - Event: Natural geology - Risk: Low	No data - potentially a high risk rating due to no reports of illness however cannot rule it out. Recommend specific testing for this parameter. Filtration and coagulation likely to remove this to manageable levels if there is a contaminant. No action proposed.	Nil.		Test for radionuclides.	2024			1,000	Water Sampling Technician	Laboratory	
2023-180	Scheme: Proston - Process Step: Catchment - Item: CMT23 - Various Contaminants - Physical/Chemical etc. - Turbidity - Event: Bushfire followed by runoff event - Bushfire impact to catchment leading to increased particulate matter in Dams. - Risk: Medium	Bushfires are common in the catchment, however monitoring results have not shown responsive changes in parameters. Alternative source water cannot be selected.			Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural	
2023-181	Scheme: Proston - Process Step: Intake - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: High	Daily inspections. No other active measures to reduce L&C. Residence time in storage and natural die off. Offtake level selection.			Update O&M Manual to ensure intake level is properly chosen.	2024			Internal Wages	Coordinator Treatment	Procedural	
2023-182	Scheme: Proston - Process Step: Intake - Item: CMT3 - Protozoa/ Cryptosporidium - Biological - Event: Animals in catchment - Contamination of the Dams from dead animals in water. - Risk: High	Operational site visits Community notify staff when there is a concern			Update O&M Manual to ensure removal of animals is monitored and performed.	2024			Internal Wages	Coordinator Treatment	Procedural	

			Proposed Improvement Measures							Resourcing		
No.	Observation	Gap or Comment	Interim	Target Date	Short-Term	Target Date	Long-Term	Target Date	Budget	Assigned to	Group	Infra?
2023-183	Scheme: Proston - Process Step: Intake - Item: CMT23 - Various Contaminants - Physical/Chemical etc. - Turbidity - Event: Bushfire followed by runoff event - Bushfire impact to catchment leading to increased particulate matter in Dams. - Risk: High	Residence time in dam allows for settling. Alternative source water cannot be selected however. Traditional burn off practices (annually) control undergrowth and the catchment area recovers before the wet season.	Investigate if a potassium permanganate unit should be installed. Research seasonal changes in raw water.	2024	Subject to investigation, design potassium permanganate unit to reduce contaminant risk.	2025	Subject to investigation, install a potassium permanganate unit	2026	170,000	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-184	Scheme: Proston - Process Step: Intake - Item: INT9 - Various Contaminants - Physical/Chemical etc. - Event: Stagnation or dam turnover - Risk: Medium	No controls in place at this step.	DO meter needs to be purchased.						800	Principal Engineer (Water and Wastewater)	Laboratory	
2023-185	Scheme: Proston - Process Step: Filtration - Item: CMT9 - Iron - Chemical - Event: Natural geology, sediment - Risk: Medium	Clarification does not reduce the likelihood but reduces the extent of the contaminant. Filtration reduces the consequence.	Toolbox talk for this specific action.	2023	Update procedures to address chemical dosing and filtration optimisation.	2024	Refer to CMT1		Internal Wages	Program Coordinator	Procedural	
2023-186	Scheme: Proston - Process Step: Filtration - Item: CMT10 - Manganese - Chemical - Event: Natural geology - Risk: Medium	Clarification does not reduce the likelihood but reduces the extent of the contaminant. Filtration reduces the consequence. Manganese levels are generally low, however there are occasions when the thresholds are exceeded.			Ensure plant optimisation procedures are in place and anticipates seasoning issues that require changes in treatment operations.	2024	Refer to CMT1		Internal Wages	Program Coordinator	Procedural	
2023-187	Scheme: Proston - Process Step: Filtration - Item: CMT19 - Colour - Physical - Event: Naturally occurring - Risk: High	Coagulation and filtration will reduce this issue. Unclear if the treated water has reduced the colour issue.			Review the Proston treated water for colour and determine if filter optimisation is possible.	2024	Refer to CMT1		-	Coordinator Treatment	O&M	
2023-188	Scheme: Proston - Process Step: Filtration - Item: CMT20 - Turbidity - Physical - Event: Drought - Risk: High	Coagulation and filtration will reduce this aesthetic issue. Filters can be derated to ensure quality - See O&M Manual. Turbidity needs to be analysed.			Subject to filter performance report. It is possible that additional in line turbidity meter will be installed to measure the filtered water turbidity prior to the chlorine contact tank. Filter media and filter nozzles are due to be replaced.	2025	Refer to CMT1		25,000	Coordinator Treatment	O&M	
2023-189	Scheme: Proston - Process Step: Filtration - Item: INT10 - Various Contaminants - Whole of System - Event: Sabotage/ Terrorism - Non authorised persons accessing the site and interrupting the treatment processes (e.g.. Vandalism, trespassing) - Risk: Medium	Proston water treatment plant is secured with a perimeter fence with dosing equipment located inside the locked dosing shed.	Investigate installation of sensor lights or security cameras to deter illegal entry.	2023	Design security system	2024	Install security system	2025	30,000	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-190	Scheme: Proston - Process Step: Filtration - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through. - Risk: Low	SCADA interlocks in place, and shutdown/isolation occurs on failure.	Assigned in Blackbutt RA for action				Improve Plant Control and interlocks to prevent water quality breaches	TBC - SBRC DWQO Stratery Adoption and Implemen tation	Refer to Blackbutt WTP1 Filtration	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-191	Scheme: Proston - Process Step: Filtration - Item: WTP5 - Various Contaminants - Pathogens/Turbidity - Event: Elevated turbidity levels leading to insufficient coagulation - Risk: Low	Online Turbidity & manual levels recorded in Operators Log Sheet	Calibration and maintenance schedule for online turbidity meter is to be developed and implemented. This is to occur for all instruments.		See CMT9		See CMT9		3,000	Program Coordinator	O&M	
2023-192	Scheme: Proston - Process Step: Filtration - Item: WTP7 - Various Contaminants - Physical/Chemical etc. - Event: Failure of saturation system - Risk: Low		Preventative Maintenance program TBD.	2023					-	Coordinator Treatment	O&M	
2023-193	Scheme: Proston - Process Step: Filtration - Item: WTP8 - Various Contaminants - Physical/Chemical etc. - Event: Failure of filter resulting in high turbid water. - Risk: Medium	There are no procedures for operation or filter maintenance. Additional training required on filter process and CCP response procedures. Council to consider a filter maintenance program.	Laminate the new HACCP Plans and place on the WTP wall.	2023	There are no procedures for operation or filter maintenance. Additional training required on filter process and CCP response procedures. Council to consider a filter maintenance program.	2024			Internal Wages	Coordinator Treatment	Procedural	
2023-194	Scheme: Proston - Process Step: Filtration - Item: WTP9 - Various Contaminants - Inability to supply - Event: Backwash / transfer pump failure leading to WTP fail - Risk: Low	Spare pump held as spare.			Create a preventative maintenance program for the scheme.	2024			Internal Wages	Coordinator Maintenance	Procedural	
2023-195	Scheme: Proston - Process Step: Disinfection - Item: DIS2 - Chlorine - Chemical - Event: Injection or recirculation pump or chemical injector equipment failure - Risk: Medium	Council has acquired some spare parts for system and purchase as spare parts - e.g., Spare pumps, injectors, etc.	Smaller plants: Consider duty standby tanks with automatic changeover look at a lower strength hypo.	2023	Design duty standby tanks with automatic changeover	2024	Install duty standby tanks with automatic changeover	2025	5,000	Coordinator Treatment	O&M	Yes
2023-196	Scheme: Proston - Process Step: Disinfection - Item: DIS10 - Chlorine ORP - Chemical - Event: Chlorine quickly dissipates due to a high Oxidation demand - Risk: High	Oxidation reduction potential value check is needed. Action assigned here.	Test ORP	2023	Subject to ORP test	2024	Subject to test, however chlorine concentration increases may only be needed instead of other treatments such as potassium permanganate dosing.	2025	500	Water Sampling Technician	Laboratory	
2023-197	Scheme: Proston - Process Step: Reservoirs - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: Low	Weekly inspections in place. Risk not increased, however cannot reduce. All reservoirs are designed to be vermin proof, and are checked on a maintenance program. Ad hoc cleaning programs are implemented when required.	Purchase analysers for the most critical sites.	2023	A regional program maintenance schedule action assigned in Blackbutt RA.				4,000	Coordinator Treatment	O&M	
2023-198	Scheme: Proston - Process Step: Reservoirs - Item: INT10 - Various Contaminants - Whole of System - Event: Sabotage/ Terrorism - Non authorised persons accessing the site and interrupting the treatment processes (e.g.. Vandalism, trespassing) - Risk: High	Regular inspections. Locked access. Community would report unauthorised access to tanks when observed. Some tank sites do not have a secure compound fence. Graffiti is on tank walls.	Reservoir Maintenance Schedule and check sheets (include security and internal checks).	2024	Design of new fencing around reservoir - Proston Main Res.	2025	Installation of new fencing around reservoir - Proston Main Res.	2026	50,000	Program Coordinator	O&M	Yes
2023-199	Scheme: Proston - Process Step: Reservoirs - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through. - Risk: Low	Plant has interlocks in place. No issue at the reservoirs.	Investigate SCADA management during failures	2024					Internal Wages	Manager Water & Wastewater	Procedural	
2023-200	Scheme: Proston - Process Step: Reservoirs - Item: RES1 - Bacteria/Virus - Biological - Event: Ingress of faecal material from human or vermin entry. - Risk: Medium	All Reservoirs are roofed, water proofed and vermin proofed. Reservoir Maintenance Schedule and check sheets (include security and internal checks) TBD a Reservoir Top Up dosing procedure. Action assigned here.	Review reservoir cleanliness status.	2023	Reservoir cleaning procedure and program action assigned in Blackbutt RA.				-	Coordinator Maintenance	O&M	

			Proposed Improvement Measures							Resourcing		
No.	Observation	Gap or Comment	Interim	Target Date	Short-Term	Target Date	Long-Term	Target Date	Budget	Assigned to	Group	Infra?
2023-201	Scheme: Proston - Process Step: Reservoirs - Item: RES2 - Bacteria/Virus - Biological - Event: Poor Tank turnover, high or low chlorine. - Risk: High	Lower frequency of potential issues due to weekly inspections. Project underway to resolve this. Water height adjustable for some reservoirs. Top fill inlets for some tanks. Action assigned here.	Common reservoir chlorine dosing Top Up procedure action assigned in Blackbutt RA.		Common procedure for tank turnover action assigned in Blackbutt RA.				-	Coordinator Maintenance	O&M	
2023-202	Scheme: Proston - Process Step: Reservoirs - Item: RES3 - Loss of Supply - Pressure - Event: Loss of water levels that maintain pressure requirements in the distribution. - Risk: Medium	Individual levels set for each Res. Action assigned here.	Common SOP for emergency supplies or water restriction implementation action assigned in Blackbutt RA.						50,000	Program Coordinator	Procedural	
2023-203	Scheme: Wondai - Process Step: Catchment - Item: CMT5 - Bacteria/Virus - Biological - Event: Dairy or other plant discharges - Risk: Medium	See preventative measures.			Update catchment management plan to include farm practices.	2024			-	Program Coordinator	Procedural	
2023-204	Scheme: Wondai - Process Step: Catchment - Item: CMT7 - Heavy metals, e.g., copper, lead - Chemical - Event: Natural geology, or mining - Risk: High	6 years of WQ results reviewed. The aesthetic limit for Aluminium has been exceeded - see elsewhere for plant optimisation. The aesthetic limit for Copper has not been exceeded however at Murgon there has.			Monitor Aluminium levels pre and post treatment to gauge the effectiveness of treatment of this aesthetic contaminant.		Follow up monitoring		-	Coordinator Treatment	Laboratory	
2023-205	Scheme: Wondai - Process Step: Catchment - Item: CMT8 - Hydrocarbons - Chemical - Event: Illegal disposal of fuel, fuel from boats., run off from impermeable urban areas - Risk: Medium	Legal requirements for persons to manage their stores. Regular patrols. Mulitple Fuel Stations in catchment, some with no hydrocarbon cpature from boswer areas.. Multiple Urba areas discherg inot raw watre source. Addiotnal testing required.	Discuss usage with property owners. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural	
2023-206	Scheme: Wondai - Process Step: Catchment - Item: CMT10 - Manganese - Chemical - Event: Natural geology - Risk: High	6 years of WQ results reviewed. Treatment in place however treated water has exceedances. Missing raw water information however the treated water results show aesthetic exceedances. Given this is the same water source as Murgon, which has health exceedances, the same risk lelve is applied			Additional testing of raw water supply to be implemented in the verification monitoring program, and additional Retic monitoring for manganese.	2024			-	Coordinator Treatment/Water Sampling Technican	Laboratory	
2023-207	Scheme: Wondai - Process Step: Catchment - Item: CMT13 - other treatment chemicals e.g., PFAS, Microplastics - Chemical - Event: WWTP dicharges (x3), Landfill and Ariport in catchment, No Power Station, Mining or Mill in catchment - Risk: Low	Historic PFAS monitoring indicates at low levels. Monitoring frequency increased to quartely for raw water source for 12 months or event based following change to ADWG. If identified, additional upstream raw water samples will be undertaken to increase source awarenes.			Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		-	Program Coordinator	Procedural	
2023-208	Scheme: Wondai - Process Step: Catchment - Item: CMT21 - Radioactivity - Radiological - Event: Natural geology - Risk: Low	No data - potentially a high risk rating due to no reports of illness however cannot rule it out. Recommend specific testing for this parameter. Filtration and coagulation likely to remove this to manageable levels if there is a contaminant. No action proposed.	Nil.		Test for radionuclides.	2024			1,000	Coordinator Treatment/Water Sampling Technican	Laboratory	
2023-209	Scheme: Wondai - Process Step: Catchment - Item: CMT23 - Various Contaminants - Physical/Chemical etc. - Turbidity - Event: Bushfire followed by runoff event - Bushfire impact to catchment leading to increased particulate matter in Dams. - Risk: Medium	Bushfires are common in the catchment, however monitoring results have not shown responsive changes in parameters. Alternative source water cannot be selected.			Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural	
2023-210	Scheme: Wondai - Process Step: Intake - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: High	Daily inspections. No other active measures to reduce L&C. Residence time in storage and natural die off. Offtake level selection.			Update O&M Manual to ensure intake level is properly chosen.	2024			Internal Wages	Program Coordinator	Procedural	
2023-211	Scheme: Wondai - Process Step: Intake - Item: CMT3 - Protozoa/ Cryptosporidium - Biological - Event: Animals in catchment - Contamination of the Dams from dead animals in water. - Risk: High	Operational site visits Community notify staff when there is a concern			Update O&M Manual to ensure removal of animals is monitored and performed.	2024			Internal Wages	Program Coordinator	Procedural	
2023-212	Scheme: Wondai - Process Step: Intake - Item: CMT4 - Amoeba/ Naegleria/ Acanthamoeba - Biological - Event: Animals in catchment - Access by native and feral animals to the Dam introducing faecal contamination. - Risk: Medium	Daily inspections. No other active measures to reduce L&C.	Check fences and entry points and secure.	2023	Council to consider fencing/ gates to prevent horses and other animals entering intake area.	2024	Undertake fence and gate management program	2025	20,000	Program Coordinator	Council	
2023-213	Scheme: Wondai - Process Step: Intake - Item: CMT20 - Turbidity - Physical - Event: Drought - Risk: High	no real active measures to reduce L&C	Investigate if a floating intake or selective level withdrawal can be used.	2024	Design intake to reduce contaminant risk.	2025	Install a floating intake	2026	75,000	Program Coordinator	O&M	Yes
2023-214	Scheme: Wondai - Process Step: Intake - Item: CMT23 - Various Contaminants - Physical/Chemical etc. - Turbidity - Event: Bushfire followed by runoff event - Bushfire impact to catchment leading to increased particulate matter in Dams. - Risk: High	Residence time in dam allows for settling, although the creek may still present an issue. Alternative source water cannot be selected however. Traditional burn off practices (annually) control undergrowth and the catchment area recovers before the wet season.	Investigate if a potassium permanganate unit should be installed. Research seasonal changes in raw water.	2024	Subject to investigation, design potassium permanganate unit to reduce contaminant risk.	2025	Subject to investigation, install a potassium permanganate unit	2026	170,000	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-215	Scheme: Wondai - Process Step: Intake - Item: INT9 - Various Contaminants - Physical/Chemical etc. - Event: Stagnation or dam turnover - Risk: Medium	No controls in place at this step.	DO meter needs to be purchased.						800	Principal Engineer (Water and Wastewater)	Laboratory	
2023-216	Scheme: Wondai - Process Step: Filtration - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: Medium	Clarification does not reduce the likelihood but reduces the extent of the contaminant. Filtration reduces the consequence.			Investigate options for temporary clarifier arrangement (Hire) for expected wet seasonal events. Pipework adjustments required and control integration	TBC - SBRC DWQO Stratery Adoption and Implemen tation	D&C of new clarifier for Wondai WTP	TBC - SBRC DWQO Stratery Adoption and Implemen tation	300,000	Manager Water & Wastewater	O&M	Yes
2023-217	Scheme: Wondai - Process Step: Filtration - Item: CMT9 - Iron - Chemical - Event: Natural geology, sediment - Risk: Medium	Clarification does not reduce the likelihood but reduces the extent of the contaminant. Filtration reduces the consequence. DAFF Unit in place.	Toolbox talk for this specific action.	2023	Update procedures to address chemical dosing and filtration optimisation.	2024	Refer to CMT1		Internal Wages	Coordinator Treatment	Procedural	

			Proposed Improvement Measures							Resourcing		
No.	Observation	Gap or Comment	Interim	Target Date	Short-Term	Target Date	Long-Term	Target Date	Budget	Assigned to	Group	Infra?
2023-218	Scheme: Wondai - Process Step: Filtration - Item: CMT10 - Manganese - Chemical - Event: Natural geology - Risk: High	Clarification does not reduce the likelihood but reduces the extent of the contaminant. Filtration reduces the consequence. Manganese levels are generally low, however there are occasions when the thresholds are exceeded. DAFF Unit in place.			Ensure plant optimisation procedures are in place and anticipates seasoning issues that require changes in treatment operations.	2024	Refer to CMT1		-	Coordinator Treatment	Procedural	
2023-219	Scheme: Wondai - Process Step: Filtration - Item: CMT20 - Turbidity - Physical - Event: Drought - Risk: Low	Coagulation and filtration will reduce this aesthetic issue. Filters can be derated to ensure quality - See O&M Manual.					Subject to filter performance report. It is possible that additional in line turbidity meter will be installed to measure the filtered water turbidity prior to the chlorine contact tank. Filter media and filter nozzles are due to be replaced.	2025	25,000	Program Coordinator	O&M	Yes
2023-220	Scheme: Wondai - Process Step: Filtration - Item: CMT24 - Turbidity - Physical - Event: Flood - Risk: Medium	Coagulation and filtration will reduce this issue. The treatment plant process struggles handle high raw water turbidity. This item will be addressed in the MIPP	Toolbox talk to ensure operators to attend the WTP during these times and in the lead up.	2023	Design of plant filtration automatic backwash based on turbidity alert criteria.	2024	Installation of plant filtration automatic backwash based on turbidity alert criteria.	2024	80,000	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-221	Scheme: Wondai - Process Step: Filtration - Item: INT1 - Cyanobacteria - Biological - Event: Algal bloom - Risk: High	Coagulation and filtration will reduce this issue. Will manage THMs.	Manual dosing procedure in place. PAC on site.	2023	Design automatic PAC dosing system.	2024	Install automatic PAC dosing system.	2025	100,000	Program Coordinator	O&M	Yes
2023-222	Scheme: Wondai - Process Step: Filtration - Item: INT10 - Various Contaminants - Whole of System - Event: Sabotage/ Terrorism - Non authorised persons accessing the site and interrupting the treatment processes (e.g.. Vandalism, trespassing) - Risk: Medium	Wondai WTP has security fences and control building is locked. Pump sheds and dosing facilities are all protected by locked sheds.	Investigate installation of sensor lights or security cameras to deter illegal entry.	2023	Design security system	2024	Install security system	2025	30,000	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-223	Scheme: Wondai - Process Step: Filtration - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through. - Risk: Low	SCADA interlocks in place, and shutdown/isolation occurs on failure. Kingfisher radios and telemetry system to be changed. SCADA and telemetry review will be conducted for all SCADA control and strategic plan.	Assigned in Blackbutt RA for action		Kingfisher radios and telemetry system to be changed. SCADA and telemetry review will be conducted for all SCADA control and strategic plan.	2024	Improve Plant Control and interlocks to prevent water quality breaches	Refer to Blackbutt WTP1 Filtration	-	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-224	Scheme: Wondai - Process Step: Filtration - Item: WTP5 - Various Contaminants - Pathogens/Turbidity - Event: Elevated turbidity levels leading to insufficient coagulation - Risk: Low	Online Turbidity & manual levels recorded in Operators Log Sheet	Calibration and maintenance schedule for online turbidity meter is to be developed and implemented. This is to occur for all instruments.		See CMT9		See CMT9		3,000	Coordinator Treatment	O&M	
2023-225	Scheme: Wondai - Process Step: Filtration - Item: WTP7 - Various Contaminants - Physical/Chemical etc. - Event: Failure of saturation system - Risk: Low		Preventative Maintenance program TBD.	2023					-	Coordinator Treatment	O&M	
2023-226	Scheme: Wondai - Process Step: Filtration - Item: WTP8 - Various Contaminants - Physical/Chemical etc. - Event: Failure of filter resulting in high turbid water. - Risk: Medium	There are no procedures for operation or filter maintenance. Additional training required on filter process and CCP response procedures. Council to consider a filter maintenance program.	Laminate the new HACCP Plans and place on the WTP wall.	2023	There are no procedures for operation or filter maintenance. Additional training required on filter process and CCP response procedures. Council to consider a filter maintenance program.	2024			Internal Wages	Coordinator Treatment	Procedural	
2023-227	Scheme: Wondai - Process Step: Filtration - Item: WTP9 - Various Contaminants - Inability to supply - Event: Backwash / transfer pump failure leading to WTP fail - Risk: Low	Spare pump held as spare.			Create a preventative maintenance program for the scheme.	2024			Internal Wages	Coordinator Maintenance	Procedural	
2023-228	Scheme: Wondai - Process Step: Disinfection - Item: DIS1 - Chlorate - Chemical - Event: chemical breakdown - Risk: High	Council currently does not have a chlorate management plan. Action assigned here.	Chlorate Management Plan action assigned in Blackbutt RA		Provde Shade cover of Chemical Storage Tank	2025	Provide new chemcial storage facilites and temperature control to minise chlorine degredation	2027	100,000	Manager Water & Wastewater	O&M	Yes
2023-229	Scheme: Wondai - Process Step: Disinfection - Item: DIS2 - Chlorine - Chemical - Event: Injection or recirculation pump or chemical injector equipment failure - Risk: Low	Council has acquired some spare parts for system and purchase as spare parts - e.g., Spare pumps, injectors, etc.	Smaller plants: Consider duty standby tanks with automatic changeover look at a lower strength hypo.	2023	Design duty standby tanks with automatic changeover	2024	Install duty standby tanks with automatic changeover	2025	5,000	Coordinator Treatment	O&M	Yes
2023-230	Scheme: Wondai - Process Step: Disinfection - Item: DIS10 - Chlorine ORP - Chemical - Event: Chlorine quickly dissipates due to a high Oxidation demand - Risk: High	Oxidation reduction potential value check is needed. Action assigned here.	Test ORP	2023	Subject to ORP test	2024	Subject to test, however chlorine concentration increases may only be needed instead of other treatments such as potassium permanganate dosing.	2025	500	Water Sampling Technician	Laboratory	
2023-231	Scheme: Wondai - Process Step: Reservoirs - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: Low	Weekly inspections in place. Risk not increased, however cannot reduce. All reservoirs are designed to be vermin proof, and are checked on a maintenance program. Ad hoc cleaning programs are implemented when required.	Purchase analysers for the most critical sites.	2023	A regional program maintenance schedule action assigned in Blackbutt RA.				4,000	Coordinator Treatment	O&M	
2023-232	Scheme: Wondai - Process Step: Reservoirs - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through. - Risk: Low	Plant has interlocks in place. No issue at the reservoirs.	Investigate SCADA management during failures	2024					Internal Wages	Manager Water & Wastewater	Procedural	
2023-233	Scheme: Wondai - Process Step: Reservoirs - Item: RES1 - Bacteria/Virus - Biological - Event: Ingress of faecal material from human or vermin entry. - Risk: Medium	All Reservoirs are roofed, water proofed and vermin proofed. Reservoir Maintenance Schedule and check sheets (include security and internal checks) TBD a Reservoir Top Up dosing procedure. Action assigned here.	Review reservoir cleanliness status.	2023	Reservoir cleaning procedure and program action assigned in Blackbutt RA.				-	Coordinator Maintenance	O&M	
2023-234	Scheme: Wondai - Process Step: Reservoirs - Item: RES2 - Bacteria/Virus - Biological - Event: Poor Tank turnover, high or low chlorine. - Risk: High	Lower frequency of potential issues due to weekly inspections. Project underway to resolve this. Water height adjustable for some reservoirs. Top fill inlets for some tanks. Action assigned here.	Common reservoir chlorine dosing Top Up procedure action assigned in Blackbutt RA.		Common procedure for tank turnover action assigned in Blackbutt RA.				-	Coordinator Maintenance	O&M	
2023-235	Scheme: Wondai - Process Step: Reservoirs - Item: RES3 - Loss of Supply - Pressure - Event: Loss of water levels that maintain pressure requirements in the distribution. - Risk: Medium	Individual levels set for each Res. Action assigned here.	Common SOP for emergency supplies or water restriction implementation action assigned in Blackbutt RA.						50,000	Manager Water & Wastewater	Procedural	
2023-236	Scheme: Bjelke-Petersen Dam - Process Step: Catchment - Item: CMT5 - Bacteria/Virus - Biological - Event: Dairy or other plant discharges - Risk: Medium	See preventative measures.			Update catchment management plan to include farm practices.	2024			-	Program Coordinator	Procedural	

			Proposed Improvement Measures							Resourcing		
No.	Observation	Gap or Comment	Interim	Target Date	Short-Term	Target Date	Long-Term	Target Date	Budget	Assigned to	Group	Infra?
2023-237	Scheme: Bjelke-Petersen Dam - Process Step: Catchment - Item: CMT10 - Manganese - Chemical - Event: Natural geology - Risk: Medium	6 years of WQ results reviewed. Treatment in place however not designed to remove Mn and treated water has exceedances.			Additional testing of raw water supply to be implemented in the verification monitoring program, and additional Retic monitoring for manganese.	2024			-	Coordinator Treatment	Laboratory	
2023-238	Scheme: Bjelke-Petersen Dam - Process Step: Catchment - Item: CMT13 - other treatment chemicals e.g., PFAS, Microplastics - Chemical - Event: WWTP dicharge upstream, Power Station, Mining, Mill or Airports in catchment - Risk: High	Historic PFAS monitoring indicates at low levels. Monitoring frequency increased to quartely for raw water source for 12 months or event based following change to ADWG. If identified, additional upstream raw water samples will be undertaken to increase source awarenes.			Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		-	Program Coordinator	Procedural	
2023-239	Scheme: Bjelke-Petersen Dam - Process Step: Catchment - Item: CMT18 - Various Contaminants - Chemical - Event: Chemical spill - Risk: Low	Freak event, alternative water sources not available. No major roads in the catchment. Emergency response plan is considered reliable. Local Disaster Management Group can be called into action if required. LDMG plan. Emergency Response Plan, and streams are generally ephemeral allows time for clean up.	Discuss usage with property owners. Toolbox talk for this specific action.	2023	Update procedures and Catchment Management Plan to link this risk assessment. Ensure supply can be isolated until wave passes.	2024	See CMT 1,		Internal Wages	Program Coordinator	Procedural	
2023-240	Scheme: Bjelke-Petersen Dam - Process Step: Catchment - Item: CMT21 - Radioactivity - Radiological - Event: Natural geology - Risk: Low	No data - potentially a high risk rating due to no reports of illness however cannot rule it out. Recommend specific testing for this parameter. Filtration and coagulation likely to remove this to manageable levels if there is a contaminant. No action proposed.	Nil.		Test for radionuclides.	2024			1,000	Water Sampling Technician	Laboratory	
2023-241	Scheme: Bjelke-Petersen Dam - Process Step: Catchment - Item: CMT23 - Various Contaminants - Physical/Chemical etc. - Turbidity - Event: Bushfire followed by runoff event - Bushfire impact to catchment leading to increased particulate matter in Dams. - Risk: Medium	Bushfires are common in the catchment, however monitoring results have not shown responsive changes in parameters. Alternative source water cannot be selected.			Update procedures and Catchment Management Plan to link this risk assessment.	2024	See CMT 1		Internal Wages	Program Coordinator	Procedural	
2023-242	Scheme: Bjelke-Petersen Dam - Process Step: Intake - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: High	Daily inspections. No other active measures to reduce L&C. Residence time in storage and natural die off. Offtake level selection.			Update O&M Manual to ensure intake level is properly chosen.	2024			Internal Wages	Program Coordinator	Procedural	
2023-243	Scheme: Bjelke-Petersen Dam - Process Step: Intake - Item: CMT3 - Protozoa/ Cryptosporidium - Biological - Event: Animals in catchment - Contamination of the Dams from dead animals in water. - Risk: High	Operational site visits Community notify staff when there is a concern			Update O&M Manual to ensure removal of animals is monitored and performed.	2024			Internal Wages	Program Coordinator	Procedural	
2023-244	Scheme: Bjelke-Petersen Dam - Process Step: Intake - Item: CMT4 - Amoeba/ Naegleria/ Acanthamoeba - Biological - Event: Animals in catchment - Access by native and feral animals to the Dam introducing faecal contamination. - Risk: Medium	Daily inspections. No other active measures to reduce L&C.	Check fences and entry points and secure.	2023	Council to consider fencing/ gates to prevent horses and other animals entering intake area.	2024	Undertake fence and gate management program	2025	20,000	Program Coordinator	Council	
2023-245	Scheme: Bjelke-Petersen Dam - Process Step: Intake - Item: CMT20 - Turbidity - Physical - Event: Drought - Risk: High	no real active measures to reduce L&C	Investigate if a floating intake or selective level withdrawal can be used.	2024	Design intake to reduce contaminant risk.	2025	Install a floating intake	2026	75,000	Program Coordinator	O&M	
2023-246	Scheme: Bjelke-Petersen Dam - Process Step: Intake - Item: CMT23 - Various Contaminants - Physical/Chemical etc. - Turbidity - Event: Bushfire followed by runoff event - Bushfire impact to catchment leading to increased particulate matter in Dams. - Risk: High	Residence time in dam allows for settling, although the creek may still present an issue. Alternative source water cannot be selected however. Traditional burn off practices (annually) control undergrowth and the catchment area recovers before the wet season.	Investigate if a potassium permanganate unit should be installed. Research seasonal changes in raw water.	2024	Subject to investigation, design potassium permanganate unit to reduce contaminant risk.	2025	Subject to investigation, install a potassium permanganate unit	2026	170,000	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-247	Scheme: Bjelke-Petersen Dam - Process Step: Intake - Item: INT9 - Various Contaminants - Physical/Chemical etc. - Event: Stagnation or dam turnover - Risk: Medium	No controls in place at this step.	DO meter needs to be purchased.						800	Principal Engineer (Water and Wastewater)	Laboratory	
2023-248	Scheme: Bjelke-Petersen Dam - Process Step: Filtration - Item: CMT9 - Iron - Chemical - Event: Natural geology, sediment - Risk: Medium	Clarification does not reduce the likelihood but reduces the extent of the contaminant. Filtration reduces the consequence.	Toolbox talk for this specific action.	2023	Update procedures to address chemical dosing and filtration optimisation.	2024			Internal Wages	Program Coordinator	Procedural	
2023-249	Scheme: Bjelke-Petersen Dam - Process Step: Filtration - Item: CMT10 - Manganese - Chemical - Event: Natural geology - Risk: Low	Clarification does not reduce the likelihood but reduces the extent of the contaminant. Filtration reduces the consequence. Manganese levels are generally low, however there are occasions when the thresholds are exceeded.			Ensure plant optimisation procedures are in place and anticipates seasoning issues that require changes in treatment operations.	2024			Internal Wages	Program Coordinator	Procedural	
2023-250	Scheme: Bjelke-Petersen Dam - Process Step: Filtration - Item: CMT20 - Turbidity - Physical - Event: Drought - Risk: Low	Coagulation and filtration will reduce this issue. Filters can be derated to ensure quality - See O&M Manual. Filter Targets are being met.					Subject to filter performance report. It is possible that additional in line turbidity meter will be installed to measure the filtered water turbidity prior to the chlorine contact tank. Filter media and filter nozzles are due to be replaced.	2025	25,000	Program Coordinator	O&M	Yes
2023-251	Scheme: Bjelke-Petersen Dam - Process Step: Filtration - Item: INT1 - Cyanobacteria - Biological - Event: Algal bloom - Risk: High	Coagulation and filtration will reduce this issue.	Manual dosing procedure in place. PAC on site.	2023	Design automatic PAC dosing system.	2024	Install automatic PAC dosing system.	2025	100,000	Program Coordinator	O&M	Yes
2023-252	Scheme: Bjelke-Petersen Dam - Process Step: Filtration - Item: INT10 - Various Contaminants - Whole of System - Event: Sabotage/ Terrorism - Non authorised persons accessing the site and interrupting the treatment processes (e.g.. Vandalism, trespassing) - Risk: Medium	The water treatment plant is contained within a secured and locked shed. Apart from the filtered water storage tanks. Submersible raw water pumps are well protected by a wet well. The high level reservoir is protected by a security fence.	Investigate installation of sensor lights or security cameras to deter illegal entry.	2023	Design security system	2024	Install security system	2025	30,000	Principal Engineer (Water and Wastewater)	O&M	Yes

			Proposed Improvement Measures							Resourcing		
No.	Observation	Gap or Comment	Interim	Target Date	Short-Term	Target Date	Long-Term	Target Date	Budget	Assigned to	Group	Infra?
2023-253	Scheme: Bjelke-Petersen Dam - Process Step: Filtration - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through. - Risk: Low	SCADA interlocks in place, and shutdown/isolation occurs on failure. No remote alarming. This plant will be reviewed with the regional SCADA and telemetry review as per the MIPP and RMIP.	Assigned in Blackbutt RA for action		Kingfisher radios and telemetry system to be changed. SCADA and telemetry review will be conducted for all SCADA control and strategic plan.	2024	Improve Plant Control and interlocks to prevent water quality breaches	TBC - SBRC DWQO Stratery Adoption and Implemen tation	Refer to Blackbutt WTP1 Filtration	Principal Engineer (Water and Wastewater)	O&M	Yes
2023-254	Scheme: Bjelke-Petersen Dam - Process Step: Filtration - Item: WTP5 - Various Contaminants - Pathogens/Turbidity - Event: Elevated turbidity levels leading to insufficient coagulation - Risk: Low	Online Turbidity & manual levels recorded in Operators Log Sheet	Calibration and maintenance schedule for online turbidity meter is to be developed and implemented. This is to occur for all instruments.		See CMT9		See CMT9		3,000	Coordinator Treatment	O&M	
2023-255	Scheme: Bjelke-Petersen Dam - Process Step: Filtration - Item: WTP7 - Various Contaminants - Physical/Chemical etc. - Event: Failure of saturation system - Risk: Low		Preventative Maintenance program TBD.	2023					-	Coordinator Treatment	O&M	
2023-256	Scheme: Bjelke-Petersen Dam - Process Step: Filtration - Item: WTP8 - Various Contaminants - Physical/Chemical etc. - Event: Failure of filter resulting in high turbid water. - Risk: Medium	There are no procedures for operation or filter maintenance. Additional training required on filter process and CCP response procedures. Council to consider a filter maintenance program.	Laminate the new HACCP Plans and place on the WTP wall.	2023	There are no procedures for operation or filter maintenance. Additional training required on filter process and CCP response procedures. Council to consider a filter maintenance program.	2024			Internal Wages	Coordinator Treatment	Procedural	
2023-257	Scheme: Bjelke-Petersen Dam - Process Step: Filtration - Item: WTP9 - Various Contaminants - Inability to supply - Event: Backwash / transfer pump failure leading to WTP fail - Risk: Low	Spare pump held as spare.			Create a preventative maintenance program for the scheme.	2024			Internal Wages	Coordinator Maintenance	Procedural	
2023-258	Scheme: Bjelke-Petersen Dam - Process Step: Disinfection - Item: DIS10 - Chlorine ORP - Chemical - Event: Chlorine quickly dissipates due to a high Oxidation demand - Risk: High	Oxidation reduction potential value check is needed. Action assigned here.	Test ORP	2023	Subject to ORP test	2024	Subject to test, however chlorine concentration increases may only be needed instead of other treatments such as potassium permanganate dosing.	2025	500	Water Sampling Technician	Laboratory	
2023-259	Scheme: Bjelke-Petersen Dam - Process Step: Reservoirs - Item: CMT1 - Bacteria/Virus - Biological - Event: Animals in catchment - Risk: Low	Weekly inspections in place. Risk not increased, however cannot reduce. All reservoirs are designed to be vermin proof, and are checked on a maintenance program. Ad hoc cleaning programs are implemented when required.	Purchase analysers for the most critical sites.	2023	A regional program maintenance schedule action assigned in Blackbutt RA.				4,000	Coordinator Treatment	O&M	
2023-260	Scheme: Bjelke-Petersen Dam - Process Step: Reservoirs - Item: WTP1 - Various Contaminants - Physical/Chemical etc. - Event: PLC failure allowing untreated or semi-treated water through. - Risk: Low	Plant has interlocks in place. No issue at the reservoirs.	Investigate SCADA management during failures	2024					Internal Wages	Manager Water & Wastewater	Procedural	
2023-261	Scheme: Bjelke-Petersen Dam - Process Step: Reservoirs - Item: RES1 - Bacteria/Virus - Biological - Event: Ingress of faecal material from human or vermin entry. - Risk: Medium	All Reservoirs are roofed, water proofed and vermin proofed. Reservoir Maintenance Schedule and check sheets (include security and internal checks) TBD a Reservoir Top Up dosing procedure. Action assigned here.	Review reservoir cleanliness status.	2023	Reservoir cleaning procedure and program action assigned in Blackbutt RA.				-	Coordinator Maintenance	O&M	
2023-262	Scheme: Bjelke-Petersen Dam - Process Step: Reservoirs - Item: RES2 - Bacteria/Virus - Biological - Event: Poor Tank turnover, high or low chlorine. - Risk: High	Lower frequency of potential issues due to weekly inspections. Project underway to resolve this. Water height adjustable for some reservoirs. Top fill inlets for some tanks. Action assigned here.	Common reservoir chlorine dosing Top Up procedure action assigned in Blackbutt RA.		Common procedure for tank turnover action assigned in Blackbutt RA.				-	Coordinator Treatment	O&M	
2023-263	Scheme: Bjelke-Petersen Dam - Process Step: Reservoirs - Item: RES3 - Loss of Supply - Pressure - Event: Loss of water levels that maintain pressure requirements in the distribution. - Risk: Medium	Individual levels set for each Res. Action assigned here.	Common SOP for emergency supplies or water restriction implementation action assigned in Blackbutt RA.						50,000	Manager Water & Wastewater	Procedural	

Total	**10,500,570**
Operating Budget	**2,872,523**
Infrastructure Capital	**7,628,047**