Drinking Water Quality Management Plan (DWQMP) Annual Report

2023 – 2024

Banana Shire Council

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Glossary of Terms

ADWG 2011	NHMRC, NRMMC (2011) Australian Drinking Water Guidelines Paper 6 National Water Quality Management Strategy. National Health and Medical Research Council, National Resource Management Ministerial Council, Commonwealth of Australia, Canberra.
BSC	Banana Shire Council
CCP	Critical Control Point. A critical control point is defined as a step which control can be applied and is essential to prevent or eliminate a water safety hazard or reduce it to an acceptable level.
CFU/100ml	Colony Forming Units per 100 millilitres
DRDMW	Department of Regional Development, Manufacturing and Water. Water supply regulator.
DWQMP	Drinking Water Quality Management Plan – the documents summarising how water service providers manage quality risks for consumers.
HACCP	Hazard Analysis Critical Control Points certification for protecting drinking water quality.
mg/L	Milligrams per litre
ML/d	Megalitres per day
MPN/100ml	Most probable number per 100 millilitres
NTU	Nephelometric Turbidity Units, used to measure clarity of water.
PFAS/PFOS	Per and Poly-fluoroalkyl substances, a group of man-made chemicals widely used in industrial, firefighting and household applications and are persistent in the environment.
QLD Health	Department of Public Health in Queensland
SOPs	Standard Operating Procedures
THM	Trihalomethanes
UF	Ultrafiltration
The Act	The Water Supply Safety and Reliability Act (2008)
WTP	Water Treatment Plant – processes raw water (sourced from a dam, river or bore) to make drinking water.

1. Introduction

This report documents the performance of Banana Shire Council's (BSC) drinking water service with respect to water quality and performance in implementing the actions detailed in their Drinking Water Quality Management Plan (DWQMP) as required under the *Water Supply (Safety and Reliability) Act 2008* (the Act). This report covers the period of the 2023 – 2024 financial year (FY) (01/07/2023 – 30/06/2024).

The report assists the Department of Regional Development, Manufacturing and Water (DRDMW) (the Regulator), to determine whether the approved DWQMP and any approval conditions have been complied with and provides a mechanism for providers to report publicly on their performance in managing drinking water quality.

2. Overview of Operations

BSC is a registered service provider with identification (SPID) 504.

BSC manages drinking water quality through its approved DWQMP which protects public health by ensuring the provision of a safe water supply.

BSC operates a total of nine (9) drinking water supply schemes throughout the Shire consisting of: Biloela (supplying Biloela, Thangool and Callide Dam communities), Moura (supplying Moura and Banana), Baralaba, Taroom and Theodore. Goovigen is a chlorinated bore supply. BSC operates and maintains all water supply infrastructures in these schemes including intakes (apart from Biloela Callide Dam intake), pumping stations, treatment facilities, reservoir storages and reticulation mains. Table 2-1 shows a summary of BSC water schemes.

Table 2-1 - Banana Shire Council Scheme Summaries

Scheme	Water Source	Treatment processes	Treatment capacity (ML/d)	Towns supplied
Banana	Dawson River (Moura Weir)	Treated at the Moura WTP Pumped from Moura, re-chlorinated	transfer	Banana
Baralaba	Dawson River (Neville Hewitt Weir)	Coagulation, flocculation, clarification, ultrafiltration, chlorination	2.2	Baralaba
Biloela	Callide Dam, Callide Valley Aquifer Bores	Coagulation, flocculation, clarification, filtration, fluoridation, chlorination	9.5	Biloela, Callide Dam, Thangool
Callide Dam	Callide Dam	Treated at Biloela WTP. Coagulation, flocculation, clarification, filtration, chlorination	transfer	Callide Dam
Goovigen	Callide Valley Aquifer Bores	Chlorination	0.5	Goovigen
Moura	Dawson River (Moura Weir)	Coagulation, flocculation, clarification, filtration, fluoridation, chlorination	7.9	Moura, Banana
Taroom	Great Artesian Basin Bore	Aeration, chlorination	2.6	Taroom
Thangool	Callide Dam, Callide Valley Aquifer Bores	Treated at Biloela WTP. Pumped from Biloela, re-chlorinated	transfer	Thangool
Theodore	Dawson River	Coagulation, flocculation, clarifications, filtration, chlorination	1.4	Theodore

BSC also operate non-potable water supply schemes at Wowan and Cracow. The non-potable schemes are not covered by this report.

3. Compliance with water quality criteria for drinking water

The water quality criteria refer to guideline values in the most current Australian Drinking Water Guidelines, BSC CCPs, and the standards in the Public Health Regulation 2018.

The following water quality analyses have been performed for the reporting period:

- The results of treated and reticulated *E. coli* monitoring have been summarised in Appendix C
- Details of water quality testing and of all exceedances are summarised in Appendix D
- Statistical analysis of water quality samples is summarised in Appendix E.

Key findings regarding water quality monitoring and performance are outlined below.

3.1 *E. coli* monitoring

There have been no detections of *E. coli* in treated or reticulated water for any scheme within the reporting period.

3.2 Cyanobacteria monitoring

BSC began implementing a cyanobacteria/blue-green algae (BGA) management plan, including monitoring during the 23/24 FY. Verification sampling was undertaken in the treated water from Biloela WTP (BIL03). As per Council's sampling process for algae, testing at this location was conducted fortnightly to monthly based on the "Moderate" or "High" algae levels in the water supply samples analysed by Sunwater.

The potentially toxic species *Raphidiopsis raciborskii* was the dominant cyanobacteria, detected in just under half of the samples. The ADWG does not specify guideline values for this species.

Council's Algae (Cyanobacteria) Management Procedure states that weekly or fortnightly toxin analysis is needed when the cell count is greater than 2,000 cells/mL in treated water. Toxin analysis has been performed more often than required at BIL03 over the reporting period. Once as required when algal cell levels over 2,000 cells/mL have been detected in one treated water sample, and an additional 4 times between August 2023 and March 2024. No toxins were detected in any of the tests.

3.3 Exceedances

Water quality across the schemes typically fell within the ADWG and CCP guidelines for most parameters. However, several non-compliant samples have been noted, beyond those associated with incidents and events reported to the regulator (see Section 5).

Biloela, Callide Dam Village and Thangool

Treated and reticulated water quality was generally within an acceptable range (i.e., ADWG guideline values and BSC critical limits), though numerous aesthetic manganese exceedances were noted for Biloela WTP treated water during the reporting period. It is worth noting that Callide Dam (which feeds Biloela WTP) has ongoing issues with seasonally elevated manganese and managing this raw water quality has been a significant focus area for Council. Issues have been significantly reduced since the aeration system (owned and operated by a non-BSC body) has been reinstalled at the dam intake.

Callide Dam Village reticulated water, which is fed directly from Biloela WTP, also has numerous instances of aesthetic manganese exceedances. A single sample was initially noted to fall above the ADWG health limit of 0.5 mg/L however immediate resampling and retesting provided a result of 0.035mg/L. The elevated manganese levels were also reflected in occasional colour aesthetic exceedances in Callide Dam village.

Manganese aesthetic exceedances were less frequent but still occasionally noted in the Biloela combined treated water (blended with bore water), and in the reticulated water in Biloela and Thangool.

Combined treated water hardness was also consistently above the ADWG aesthetic limit, owing to the elevated hardness in the Biloela bores.

One instance of low chlorine was detected in the combined treated (bore and WTP) water at Biloela with two subsequent low chlorine results below 0.2 mg/L in the treated water. These instances are related to the incident reported to the regulator (Section 5.1), and do not seem indicative of a larger issue.

Moura and Banana

Treated and reticulated water quality at Moura and Banana was consistently within acceptable limits, with few instances of high colour, iron, and manganese (aesthetic).

Goovigen

Treated and reticulated water quality at Goovigen was within acceptable limits with only a small number of aesthetic exceedances for pH, colour, iron, and manganese within the reporting period. There were no health exceedances for any parameter in the treated and reticulated waters.

Baralaba

Treated and reticulated water quality was generally within acceptable limits, though several aesthetic exceedances have been noted for the Baralaba scheme. Manganese levels in the Dawson River fluctuate seasonally and this was reflected in occasional aesthetic manganese exceedances in the treated and reticulated water.

There were also occasional aesthetic exceedances for iron, and turbidity in the treated and reticulated water. Several aesthetic pH exceedances were observed in both the treated and reticulated water.

Theodore

Treated and reticulated water quality at Theodore was generally within acceptable limits, though several aesthetic exceedances were noted for the pH of the treated water, and only one aesthetic colour exceedance in the reticulated water in the reporting period.

Taroom

Treated and reticulated water quality at Taroom was within acceptable limits with only a small number of aesthetic exceedances noted for turbidity and iron in the reporting period.

3.4 Minimum Chlorine Detections

The table below shows the minimum detected chlorine levels in each scheme over the reporting period. Each value is from operational monitoring. Values have been rounded to two decimal points.

Table 3-1 Summary of minimum chlorine detections throughout BSC water supply

Sample point	Location	Minimum chlorine value *(mg/L)*	Date
BIL03	Biloela WTP	0.04	10/02/2024
BIL04	TWPS	0.3	21/01/2024
BIL14	Biloela Reticulation	0.04	03/01/2024
BIL17	Biloela Reticulation	0.46	03/01/2024
BIL20	Biloela Reticulation	0.35	11/12/2023
BIL36	Biloela Reticulation	0.13	22/01/2024
THA01	Thangool Reticulation	0.25	22/01/2024
THA02	Thangool Reticulation	0.25	27/11/2023
THA05	Thangool Reticulation	0.22	27/11/2023

CAL01	Callide Dam Village Reticulation	0.04	05/02/2024
CAL02	Callide Dam Village Reticulation	0.06	25/07/2023, 12/02/2024
BAR02	Baralaba WTP	0.34	29/01/2024
BAR03	Baralaba Reticulation	0.53	27/12/2023
BAR12	Baralaba Reticulation	0.1	27/12/2023
GOO04	Goovigen Treated	0.22	20/03/2024
GOO03	Goovigen Reticulation	0.19	28/05/2024
MOU03	Moura WTP	0.23	21/01/2024
MOU09	Moura Reticulation	0.24	28/12/2023
MOU11	Moura Reticulation	0.09	22/02/2024
MOU25	Moura Reticulation	0.28	11/10/2023
MOU26	Moura Reticulation	0.29	28/12/2023
BAN01	Banana Reticulation	0.51	28/12/2023
BAN04	Banana Reticulation	0.34	12/12/2023
THE03	Theodore WTP	0.71	03/11/2023
THE05	Theodore Reticulation	0.28	07/02/2024
THE06	Theodore Reticulation	0.23	03/01/2024, 07/02/2024
THE09	Theodore Reticulation	0.22	25/07/2023
TAR03	Taroom WTP	0.64	04/08/2023
TAR06	Taroom Reticulation	0.42	30/01/2024
TAR15	Taroom Reticulation	0.45	17/11/2023
TAR16	Taroom Reticulation	0.089	08/05/2024

3.5 Compliance with Monitoring Plan

Deviations from the approved monitoring plan were noted for several operational and verification parameters and are described below.

Improving compliance with the approved monitoring plan has been added to the Risk Management Improvement Program and is in progress.

Council has noted a seasonal limitation affecting weekly verification monitoring for *E. coli*. During the Christmas holiday period, laboratory closures may result in a shortfall of samples for this interval.

3.5.1 Operational

The operational monitoring undertaken throughout the reporting period is typically close to but under what is prescribed in the current monitoring plan. Most operational monitoring parameters were tested slightly less than required, often with 5-20 less tests across the year compared to the frequency indicated in the monitoring plan. There is no clear pattern to when tests were not undertaken.

Iron testing was less frequently undertaken in the Moura reticulated water compared to other parameters, whereas manganese testing was less frequently undertaken in the Theodore treated water.

Operational *E. coli* and total coliforms testing were also typically tested less frequently than described in the monitoring plan.

Temperature testing has been identified in the Risk Management Improvement Plan and while testing is not yet being undertaken, Council worked to implement the program during the 23/24 FY.

Other notable discrepancies compared to the monitoring plan include:

- Fluoride was tested less often than indicated in the monitoring plan for Biloela as the dosing system was operational only part of the year. Fluoride testing was not performed for Moura as it was not operational over the course of the whole FY.
- Soluble manganese was infrequently tested in Baralaba treated water (though total manganese testing was undertaken), due to limited availability of test kits.
- Alkalinity testing for Theodore reticulated water was undertaken much less frequently than indicated in the monitoring program.
- Total coliforms were rarely tested for Theodore reticulated water. It is worth noting that operational *E. coli* testing was performed at a higher frequency which utilises the same test method, so the lack of total coliforms readings is suspected to be partially due to simply not recording results from tests that were performed.

3.5.2 Verification

Verification testing generally aligned with or exceeded the monitoring plan frequency for most schemes. A small number of discrepancies were noted. Council continue work to improve compliance with the approved monitoring plan.

- *E. coli,* total coliforms, and free chlorine testing were below the prescribed levels for the Biloela, Baralaba, Goovigen (treated only), Theodore (treated only), and Taroom schemes.
- Treated water at Goovigen underwent only 1 THM test, 1 metals suite test, and 1 standard water analysis (4 are required). No pesticide tests were undertaken (2 are required).
- No PFAS testing was undertaken for reticulated water at Goovigen (1 required).
- No THM testing was undertaken for treated water at Theodore and Taroom (12 required at each).
- No verification free chlorine testing was undertaken by Qld Health for treated water at Taroom (12 required). However, daily operational testing was undertaken by operators as required.
- Fluoride was tested less often than indicated in the monitoring plan for Biloela as the dosing system was operational only part of the year. Fluoride testing was not performed for Moura as it was not operational over the course of the whole FY.

3.5.3 PFAS Monitoring

Following a low level detection of Perfluorohexanesulfonic acid (PFHxS) in the Biloela groundwater bore in 2018, Council introduced periodic testing to monitor changes. Additionally in 2021 PFAS was detected by CS Energy in the Callide Valley Aquifer upstream Council's bores, although no PFAS was detected in the dam.

Due to consistently low results below ADWG recommendations, BSC have reduced the monitoring frequency to annual. PFAS monitoring was undertaken in March 2023 and is next due to occur in August 2024.

PFAS sampling at Goovigen was identified as a requirement during the DWQMP review and will be undertaken in the 24/25 FY.

4. DWQMP Implementation

Key actions in how the DWQMP was implemented, including progress in implementing the RMIP and completed actions are shown below. The full RMIP is presented in Appendix A, including actions that have been completed during the reporting period and any new items added.

- The latest DWQMP was reviewed during the 2023/2024 FY and submitted to the regulator, and, as at end of financial year (EOFY), was awaiting approval by the Regulator see Section DWQMP review outcomes for further details).
- A whole of system risk review was undertaken.
- RMIP IP005 completed: Baralaba WTP installation of isolation valve on clear water tank.

- RMIP IP006 completed: Biloela PFAS monitoring reduced to annually based on water quality results and assessment of risk.
- RMIP IP036 completed: quarterly management meetings to review drinking water quality and compliance were implemented.
- RMIP IP041 completed: clean and clear vegetation at Moura WTP wastewater ponds.
- Investigations for RMIP IP043 and IP044 completed: cooling options for high temperature bore water at Taroom, and lack of pH adjustment.

4.1 Staff

BSC carried out a number of activities to ensure staff are aware of the DWQMP. Of note:

- Water and Sewerage services operators meetings that include the following agenda items: operational monitoring review, customer water quality enquiries review, incidents, and general discussion on matters regarding water quality management systems
- Management review of ADWG elements including compliance, incidents, review and audit
- Weekly water quality operational review meetings have been held since July 2024 between consultants City Water Technology (CWT) and Council staff to consider results and any issues.

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

There was one instance where the Regulator was notified under sections 102 or 102A of the Act.

5.1 Incident– Low Chlorine at Biloela

Date – 09/02/2024

Scheme – Biloela

Parameter – Chlorine critical limit breach

On 09/02/2024 while the plant was not operational there was a chlorine CCP Alert Limit alarm followed by a CCP Critical Limit breach of chlorine <0.2 mg/L at BIL03 (outlet of clear water tank). Onsite investigation on 10/02/2024 showed the regulator on the chlorine gas bottle in the off position, and the pre dose bottle empty.

As immediate corrective actions operators followed the CCP Procedure for Drinking Water Disinfection. All valves were check for correct positioning, the regulator was reinstated and the pre dosing cylinder changed. Chlorine dosing was increased, while supply to Biloela from the WTP was ceased to lower demand and the area was supplied from the town reservoir and bores. Samples were taken at strategic locations across the network and at the WTP, and the mains flushed.

Preventive actions following investigation included increasing the cleaning frequency of the inline filter increase to monthly to prevent back up and staff retraining, an increase in monitoring of pre cylinder chlorine weights and installation of scales for pre chlorine and standby post chlorine cylinders.

6. Customer complaints related to water quality

Banana Shire Council is required to report on the number of complaints, general details of complaints, and the responses undertaken. Throughout the year, the following complaints about water quality were received.

Figure 6.1 shows customer complaints broken down by scheme and type of complaint.

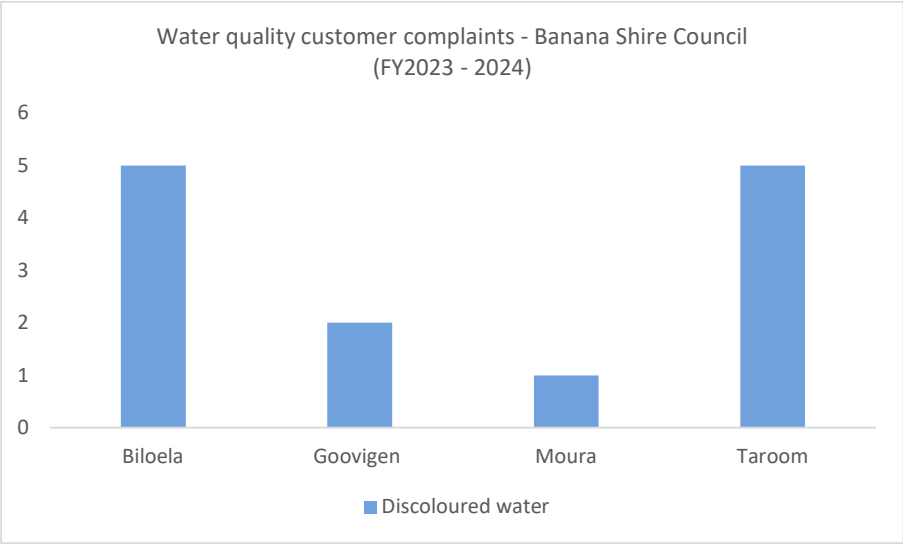

Figure 6.1 – Banana Shire Council water quality customer complaints by scheme and type of complaint for financial year 2023-2024.

6.1 Suspected Illness

Complaints are occasionally received from customers who suspect their water may be associated with an illness they are experiencing. Banana Shire Council investigates each complaint relating to alleged illness from our water quality, typically by inspecting and testing the customers tap.

During the 2023/2024 reporting period there were no complaints of suspected illness arising from the water supply system.

6.2 Discoloured water

A total of thirteen (13) complaints about discoloured water were received from the below schemes during the reporting period.

Two (2) complaints occurred in Goovigen.

One (1) complaint occurred in Moura.

Five (5) complaints occurred in Taroom.

Five (5) complaints occurred in Biloela.

For the discoloured water complaints, Council flushed mains adjacent to the property until the water was clear.

7. Review of customer service standards

A review was conducted during the 2023/2024 financial year incorporating customer service standards and water and sewerage service areas.

The outcomes of the review were:

- generation of a new policy: Declared Service Areas – Water Supply and Sewerage Policy and Procedure to combine and replace previous policies and service area plans for individual water schemes;
- update to the document structure of the Customer Service Standard Water Supply and Sewerage; and

- no material changes to the Customer Service Standard Water Supply and Sewerage were made.

8. DWQMP audit findings

Banana Shire Council completed the latest DWQMP audit in February 2021. This external audit covered the period from 2015 to 2020. The purpose of the audit is to:

- verify the accuracy of the monitoring and performance data provided to the Regulator;
- assess compliance with the DWQMP; and
- assess the relevance of the DWQMP in relation to the service provided.

No audit was required or conducted during the relevant financial year 2023 –2024. The next external audit must be conducted by the 25th February 2025 and details included in the 2024/2025 annual report.

9. DWQMP review outcomes

The Banana Shire Council Drinking Water Quality Management Plan was last approved by the DRDMW on 24 December 2021.

The latest DWQMP was reviewed during the 2023/2024 FY and submitted to the regulator, and, as at EOFY, was awaiting approval by the Regulator.

Review and endorsement of the amended DWQMP by the DRDMW will occur outside of the reporting period of this annual report and will be reported on in the 2024/2025 annual report.

Actions identified throughout the DWQMP review that are relevant to 2023/2024 FY are presented in Appendix B.

Appendix A – Implementation of the DWQMP Risk Management Improvement Program

Table A-1 - Key items of progress against the risk management improvement program in the approved DWQMP

Task ID	Scheme	Plant	Process Step	Description	Action	Status 23/24 FY	Status 24/25 FY	Status 25/26 FY	Comments
IP002	Baralaba	Baralaba WTP	Treated Water	Treatment chemical storage needs to meet A/S	Upgrade chemical storage and bunding		Due for completion.		New chemical storage & dosing cabinets have arrived on site, awaiting installation, due to be finished 24/25.
IP007a	Biloela	Biloela WTP	Monitoring	Lack of ventilation in the laboratory poses a safety hazard during monitoring and the use of chemicals.	Install fume hoods in the laboratory	In progress	Bench refurbishment due for completion.	Fume hoods due for completion.	Contractor engaged for laboratory bench refurbishment. Expected to be completed by end of 2024.
IP008	Biloela	Biloela WTP	Clarified water	Monitor the water turbidity prior to entering the filters.	Install online turbidity meter at the clarified water outlet (before the filters)		Due for completion expected June 2025.		Tender received for supply and install. Completion expected June 2025.
IP009	Biloela	Biloela WTP	Backwash/ clarified water	Increasing the flow of water to the ponds will allow quicker draining of the clarifiers and improve efficiency.	Upgrade the splitter box to increase the flow of water to the ponds.			Due for completion.	Additional work required at clarifier drain pit to allow installation. Scheduled for completion 25-26. Budget constraints.
IP011	Moura	Moura WTP	Clarified water	Clarifier 2 refurbishment-completion	The existing clarifier 2 will be replaced with a new clarifier. The WTP capacity will increase to 110L/s which will meet the peak day demands		Due for completion.		Contractor issues. Project due for completion 24-25.
IP016	Taroom	Taroom WTP	Treated Water	Assess the structural integrity of the roof support for clear water tank	Roof support condition investigation and design proposal	Design Phase		Future capital project	Completed 22/23 FY Designed Phase.
IP017	Taroom	Bore Intake	Raw water intake	Contamination of water	Replace bore head			Future capital project	Investigation completed. Determined that the bore head requires replacement. Recommended that the project to replace the bore head

Task ID	Scheme	Plant	Process Step	Description	Action	Status 23/24 FY	Status 24/25 FY	Status 25/26 FY	Comments
									be considered as a future capital project.
IP018	Taroom	Taroom WTP	Aeration	Contamination of water	Investigate enclosing aerator to prevent contamination	In progress	Investigation due for completion		Draft report under review as of November 2024.
IP019	Taroom	Taroom WTP	Clear Water Tank	Poor water quality leaving clear water tank	Investigate implementing turbidity monitoring		Due for completion.		Instruments installed.
IP021	Theodore	Theodore WTP	Raw water intake	Intake of contaminated water during wet weather event and moderate flood	Consider installation of automatic level sensors connected to telemetry and automated plant shut down on increased raw water turbidity and river level		Due for completion.		
IP022	Theodore	Theodore WTP	Raw water intake	Preliminary design and tender document for the construction of a new raw water intake	Design of a new RWPS.		Due for completion.	Future capital project	Design phase complete. Contingent on Theodore Water completing their scheduled project work.
IP023	Theodore	Theodore WTP	Coagulation / Flocculation	Underdose of coagulant	Install duty/standby coagulant dosing pump (Spare pump stored at the WTP)			Future Upgrade	Currently, one pump working, one spare - to Include in Future Tender Specs. Delayed due to budget constraints.
IP024	Theodore	Theodore WTP	Activated carbon adsorption	Underdose PAC, Inefficient algal toxin removal	Consider installing automatic PAC dosing system			Future Upgrade	To include in Future Tender Specs. Delayed due to budget constraints.
IP025	Theodore	Theodore WTP	Activated carbon adsorption	Overdose PAC	Consider installing automatic PAC dosing system			Future Upgrade	To include in Future Tender Specs. Delayed due to budget constraints.
IP026	Theodore	Theodore WTP	Filtration	Breakthrough and mud balls	Consider installing automatic backwash system			Future Upgrade	WTP automation. Delayed due to budget constraints .
IP029	Theodore	Theodore WTP	Reticulation	Risk of contamination by vermin	Improve vermin proofing of reservoirs.			Future Upgrade	Condition assessment 22/23 FY. Work cannot be undertaken without taking the reservoir offline. Being

Task ID	Scheme	Plant	Process Step	Description	Action	Status 23/24 FY	Status 24/25 FY	Status 25/26 FY	Comments
									considered as part of major treatment upgrade.
IP030	General	General	General	Failure of equipment	Develop and implement maintenance management system including maintenance procedures, register of spares and requirements	In progress			Currently under way. Assetic implemented. O&M manuals used to develop maintenance procedures.
IP032	General	General	General	Inadequate calibration leading to incorrect readings/operations	Review calibration methodologies, frequencies, recording practices	Ongoing			Procedures for verification of calibration to be included in BSC Laboratory manual procedures. Fields have been added to SWIMS to record calibration results.
IP033	General	General	General	DW Audit Report	Implement corrective and preventative action for all findings from the DW Audit	Ongoing			Focus on calibration.
IP035	General	General	Reticulation	*Naegleria fowleri* risk due to high regional water temperatures	Add temperature testing to monitoring plan to further assess *Naegleria fowleri* risk	In progress			Adding to monitoring plan in 23/24 FY. Will require time to implement as equipment is purchased.
IP037	General	General	Monitoring	Inadequate operational and verification monitoring of WQ parameters	Improve compliance with operational and verification monitoring across all WTPs.	In progress			Identified during preparation of the 22/23 FY annual report.
IP038	General	General	Monitoring	Inadequate escalation of exceedances	Improve compliance with BSC's exceedance and CCP breach procedures	Ongoing			Identified during preparation of the 22/23 FY annual report. Weekly meetings to review WQ data and exceedances have been initiated.
IP039	Biloela	Biloela WTP	Monitoring	Lack of process monitoring reducing treatment oversight and effectiveness	Investigate adding additional online monitors (e.g. NTU, UV) throughout process		Biloela due for completion.		Consultant engaged to develop specification for new instrumentation. Tenders received for Biloela, evaluating.
IP040	Biloela	Biloela WTP	Disinfection	Low chlorine residual levels	Investigate and improve operation of chlorine disinfection		Planned		

Task ID	Scheme	Plant	Process Step	Description	Action	Status 23/24 FY	Status 24/25 FY	Status 25/26 FY	Comments
					systems at the WTP to improve treated and reticulated chlorine residual consistency				
IP042	Moura	Moura WTP	Monitoring	Lack of process monitoring reducing treatment oversight and effectiveness	Investigate adding additional online monitors (e.g. NTU, UV) throughout process			Future Upgrade	Consultant engaged to develop specification for new instrumentation. Out to tender.
IP043	Taroom	Taroom WTP	Treatment	High temperatures in bore water leaving GAB	Investigate options for cooling bore water and associated benefits	In progress - Investigation completed		Consider as part of future works.	Investigation complete – outcomes and Council strategy to be further considered in a future FY.
IP044	Taroom	Taroom WTP	Treatment	Lack of pH adjustment at Taroom WTP	Investigate options for pH adjustment system at Taroom WTP	In progress - Investigation completed		Consider as part of future works.	Investigation complete – outcomes and Council strategy to be further considered in a future FY.
IP045	Taroom	Taroom WTP	Treatment	Reservoir air vent is open, risking contamination	Place screen over vent to ensure vermin cannot enter tank.		Planned		
IP046	Taroom	Taroom WTP	Monitoring	Lack of colour monitoring for reticulated water.	Add colour tests to routine reticulated water sampling		Planned		
IP047	General	General	Reticulation	CCTV monitoring (Reticulation RE4)	Investigate CCTV at standpipe to monitor users		IT Project (TBC)	IT Project (TBC)	Low priority risk (3) – Budget allocated within IT budget. Project not confirmed as this stage. Follow up and update status accordingly.
IP048	General	General	Reticulation	Domestic connection (including illegal connections) to trunk mains before town reservoir. (Reticulation RE17)	Develop register of location and contact details of these properties. Regularly monitoring of trunk lines will identify illegal connections.		Planned		

Task ID	Scheme	Plant	Process Step	Description	Action	Status 23/24 FY	Status 24/25 FY	Status 25/26 FY	Comments
Items completed during FY 2023-2024									
IP005	Baralaba	Baralaba WTP	Treated Water	There is no current isolation on the CWT. Operators are unable to isolate the tank in an emergency, resulting in a loss of stored water.	Installation of clear water tank isolation valve.	Completed			Modifications are needed to the tank roof to allow access for the valve to be installed. Council has modified tank roof to allow access for value installations
IP006	Biloela	Biloela Bores	Monitoring	Investigation into PFAS concentrations in the surrounding groundwater to ensure ADWG are met.	Routine monitoring and evaluation of the results to ensure the water is safe.	Completed			Completed 23-24 FY Monitoring Program updated - PFAS monitoring moving back to annually based on recent results.
IP036	General	General	Monitoring	Inadequate long-term water quality trending	Implement quarterly management meetings to review drinking water quality and compliance	Completed			Completed 23-24 FY Quarterly Management Review meeting implemented. Commenced January 2024.
IP041	Moura	Moura WTP	Treated	Refurbish wastewater ponds	Clean and clear vegetation	Completed			

Appendix B – Summary of DWQMP review actions identified

Table B-1 – DWQMP Review Action status

Action	Detail	Complete	Comment
Section 2 - Infrastructure details	Updated details of infrastructure and included details on duty / standby arrangements and back-up power generation infrastructure where relevant.	Y	
Section 2 - Treatment details	Updated details to include triggers for sodium hydroxide dosing, PAC dosing and potassium permanganate dosing.	Y	
Section 2 – Risk assessment	Separated the risk assessment for Dawson River tab into individual schemes .	Y	
Section 2 – Risk assessment	Updated details on risk assessment review schedule.	Y	
Section 2 – Risk assessment	Risk assessment review workshop undertaken. Improvement action noted regarding involvement of upstream entities at future risk assessment workshop - "Update Appendix J risk assessment tabs to include an additional column which defines owner of each barrier."	N	In progress
Section 5 – Verification of drinking water quality	Updated Goovigen monitoring program to include PFAS	Y	
Section 6 – Management of incidents and emergencies	Generation of incident and emergency management procedures.	N	In progress
Section 10 - Documentation	Updated Appendix L Water Supply and Sewage Table of Contents with next review date. Process to be drafted and added to DWQMP.	Y	
Section 12 – Risk management improvement plan	Updated improvement plan to contain more information relevant to timeframes, and added unique identifier to each item for traceability.	Y	
Appendices C - H - Reviewed water quality data	Water quality data reviewed and included in subsequent risk assessment, increased commentary for any abnormal data points.	Y	
Whole document	Updated naming convention for consistency for clear water storage tanks .	Y	

Appendix C – *E. coli* Monitoring and Compliance

Appendix C summarises compliance with the Public Health regulation 2018 in relation to *E. coli*, where 98% of samples taken in a rolling 12 month period should contain no *E. coli* (98% annual value).

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

The results reported are NATA approved verification testing and Readycult internal approved testing, as per the DWQMP.

Banana *E. coli* Results

Drinking water scheme: Banana (BAN01, BAN02, BAN04)

Year	2023 to 2024											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	9	13	8	12	6	6	11	7	7	11	10	10
Of which Readycult samples	6	10	4	10	5	5	10	6	6	10	8	8
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	108	110	112	119	114	113	115	113	111	115	112	110
No. of failures in previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Baralaba *E. coli* Results

Drinking water scheme: Baralaba (BAR02, BAR03, BAR12)

Year	2023 to 2024											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	10	7	13	3	10	10	10	10	11	15	13	14
Of which Readycult samples	7	4	9	1	8	7	8	8	8	13	10	12
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	133	123	122	108	105	106	114	116	116	124	126	126
No. of failures in previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Biloela *E. coli* Results

Drinking water scheme: Biloela (BIL03, BIL04, BIL14, BIL17, BIL20, BIL36)

Year	2023 to 2024											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	30	23	33	35	40	20	38	35	31	51	36	32
Of which Readycult samples	9	8	16	20	28	11	23	22	19	36	24	20
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	374	358	358	353	363	359	368	370	374	398	407	404
No. of failures in previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Callide Dam Village *E. coli* Results

Drinking water scheme: Callide Dam (CAL01, CAL02)

Year	2023 to 2024											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	12	11	14	10	12	6	10	10	8	12	9	7
Of which Readycult samples	6	6	8	8	10	5	9	8	7	12	9	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	113	114	116	115	118	118	121	120	119	122	120	115
No. of failures in previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Goovigen *E. coli* Results

Drinking water scheme: Goovigen (GOO03, GOO04)

Year	2023 to 2024											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	12	5	12	9	13	4	10	10	10	10	12	8
Of which Readycult samples	3	4	8	10	2	6	8	8	11	8	9	6
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	109	103	108	108	112	109	113	114	112	117	121	115
No. of failures in previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Moura *E. coli* Results

Drinking water scheme: Moura (MOU03, MOU09, MOU11, MOU25, MOU26)

Year	2023 to 2024											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	37	35	37	34	37	29	39	28	28	40	32	30
Of which Readycult samples	16	20	16	20	25	20	25	16	16	25	20	18
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	388	389	392	397	403	408	415	411	403	415	407	406
No. of failures in previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Taroom *E. coli* Results

Drinking water scheme: Taroom (TAR03, TAR06, TAR15, TAR16)

Year	2023 to 2024											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	19	19	16	19	16	15	23	16	16	19	11	13
Of which Readycult samples	15	15	12	15	12	12	19	12	12	15	11	9
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	201	201	204	206	199	198	207	207	207	210	202	202
No. of failures in previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Thangool *E. coli* Results

Drinking water scheme: Thangool (THA01, THA02, THA05)

Year	2023 to 2024											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	10	10	12	14	17	7	10	13	10	19	13	10
Of which Readycult samples	6	6	9	12	15	6	9	12	9	18	12	9
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	150	145	144	142	148	146	146	144	141	150	151	145
No. of failures in previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Theodore *E. coli* Results

Drinking water scheme: Theodore (THE03, THE05, THE06, THE09)

Year	2023 to 2024											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	0	4	5	8	16	13	16	16	13	4	15	20
Of which Readycult samples	0	0	1	4	12	9	12	12	9	0	15	16
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	132	120	119	111	111	113	125	137	134	122	114	130
No. of failures in previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Appendix D – Water Testing Summary Results

The results from the operational and verification monitoring program have been compared against the levels of the water quality criteria as defined in Schedule 3 of the Act.

This report is best read in conjunction with the Australian Drinking Water Guidelines, where the relevance of each parameter is explained in detail.

This analysis focuses on operational and verification testing for treated and reticulated water. Operational testing for raw water and water at intermediate process stages (e.g. dosed, settled, filtered etc.) have not been included as they are not indicative of the final water quality that reaches customers.

BSC's treated and reticulated water verification testing is undertaken by Queensland Health's (QH) laboratory services. Testing is undertaken primarily via set water quality testing suites. The test suites used are shown in Table D-1Table D- below. For simplicity, verification monitoring compliance is shown per test suite unless there were any exceedances, in which case the specific parameter that was exceeded is individually shown.

In interpreting test results, the Regulator in the Water Quality and Reporting Guideline for a Drinking Water Service[1] (the Reporting Guideline") states that no rounding of laboratory results should be carried out by the provider prior to comparison with the criteria or standard. For example, a sample test result of 0.51mg/L of formaldehyde is greater than the criteria of 0.5mg/L, which is the health guideline value of the ADWG, and thus is considered an incident and must be reported to the regulator. Banana SC have followed this convention when determining exceedances.

Any detections of pesticides without an ADWG guideline value have been included in this report. As per the ADWG, persistent detection of pesticides may indicate their inappropriate use or spillage, requiring investigation in line with the risk management plan for that particular water source. Council undertakes an informed risk-based monitoring program, and it has been determined that all pesticide detections to date are not persistent and indicate no concern for human health.

Note that the water quality criteria include ADWG health and aesthetic guideline values, and BSC critical limits for treated water as defined in Council's DWQMP CCP register.

Verification testing of free chlorine in treated water across all schemes (weekly for Biloela and Moura schemes including BIL04 treated mixed WTP and/or Bore, monthly for all others), and monthly verification testing of chlorate in the Thangool reticulation were also added to the monitoring program in September 2023. As such, there are fewer than the 52 or 12 samples respectively that would have been required for a full year's monitoring.

[1] Water Quality and Reporting Guideline for a Drinking Water Service (Queensland Dept Regional Development, Manufacturing and Water) September 2010.

Table D-1 - Queensland Health Test Suites and ADWG Limits

Queensland Health Test Suite	Parameters	ADWG limit
Standard Water Analysis	pH	≥6.5 & ≤8.5 (A)
	Turbidity (NTU)	≤5 (A)
	True Colour (HU)	≤15 (A)
	Iron (mg/L)	≤0.3 (A)
	Manganese (mg/L)	≤0.1 (A) ≤0.5 (H)
	Aluminium (mg/L)	≤0.2 (A)
	Alkalinity (Total) (mg/L CaCO3)	n/a
	Residual Alkalinity (meq/L)	n/a
	Total Hardness (mg/L CaCO3)	≤200 (A)
	Temporary Hardness (mg/L CaCO3)	n/a
	Total Dissolved Ions (mg/L)	n/a
	Total Dissolved Solids (mg/L)	≤600 (A)
	Conductivity (µS/cm)	n/a
	Bicarbonate (mg/L CaCO3)	n/a
	Carbonate (mg/L CaCO3)	n/a
	Hydroxide (mg/L CaCO3)	n/a
	Hydrogen (mg/L)	n/a
	Boron (mg/L)	≤4 (H)
	Calcium (mg/L)	n/a
	Chloride (mg/L)	≤250 (A)
	Copper (mg/L)	≤1 (A)
	Fluoride (mg/L)	≤1.5 (H)
	Magnesium (mg/L)	n/a
	Nitrate (mg/L)	≤50 (H)
	Potassium (mg/L)	n/a
	Silica (mg/L)	≤80 (A)
	Sodium (mg/L)	≤180 (A)
	Sulphate (mg/L)	≤250 (A)
	Zinc (mg/L)	≤3 (A)
Metals	Iron (mg/L)	≤0.3 (A)
	Manganese (dissolved) (mg/L)	n/a
	Aluminium (mg/L)	≤0.2 (A)
	Arsenic (mg/L)	≤0.01 (H)
	Cadmium (mg/L)	≤0.002 (H)
	Chromium (mg/L)	≤0.05 (H)
	Copper (mg/L)	≤1 (A)
	Lead (mg/L)	≤0.01 (H)
	Nickel (mg/L)	≤0.02 (H)
THMs	Chloroform (µg/L)	≤250 (H)
	Bromodichloromethane (µg/L)	≤250 (H)
	Dibromochloromethane (µg/L)	≤250 (H)
	Bromoform (µg/L)	≤250 (H)
	Total Trihalomethanes (µg/L)	≤250 (H)
Pesticides	247 Pesticide/ Herbicide species	Varies
Radiological	Total Alpha activity (Bq/L)	≤0.5 (H)
	K40-Corrected Beta Activity (Bq/L)	≤0.5 (H)

Biloela WTP Treated Water

Table D-2 Biloela Treated Water Testing Summary Results

Scheme name	Sampling Type	Parameter	No. of samples required to be collected (as per DWQMP)	No. of samples actually collected and tested in FY23/24	Water quality criteria	No. of non-compliant samples	Comments
Biloela WTP Treated Water (BIL03)	Operational	pH	365	364	≥6.5 & ≤8.5 (A)	1	To one significant figure, there have been no exceedances
		Turbidity (NTU)	365	364	≤5 (A)	0	
		True Colour (HU)	365	364	≤15 (A)	0	
		Total Iron (mg/L)	365	364	≤0.3 (A)	0	
		Total Manganese (mg/L)	365	364	≤0.1 (A) ≤0.5 (H)	28 0	To one significant figure, there have only been 13 exceedances of the aesthetic limit
		Alkalinity (mg/L of CaCO3)	365	362			
		Fluoride (mg/L)	365	224	≤1.5 (H)	0	
		Free Chlorine (mg/L)	365	363	≥0.2 (CCP) & ≤5.0 (H)	2	
		E. coli – Readycult	52	35			
	Verification	*E. coli* (mpn/100mL)	52	52	<1 (H)	0	
		Total Coliforms (cfu/100mL)	52	52			
		Free Chlorine (mg/L)	35	45	≥0.2 (CCP) & ≤5.0 (H)	1	
		THMs	12	11	See Table 5.	0	
		Standard Water Analysis	4	5	See Table 5.	0	
		Heavy Metals	4	5	See Table 5.	0	
		Pesticides	4	5	ADWG 2011 Chapter 10 Table 10.6	0	

Exceedances are summarised in the table below.

Table D-3 Biloela Treated Water Exceedances

Scheme name	Verification/ Operational	Parameter	Exceedance Type	Exceedance Value	Exceedance Date
Biloela WTP Treated Water (BIL03)	Operational	pH	Aesthetic	6.47	12/12/2023
		Total Manganese (mg/L)	Aesthetic	0.158	20/07/2023
				0.105	21/07/2023
				0.118	10/08/2023
				0.116	11/08/2023
				0.105	12/09/2023
				0.150	13/09/2023
				0.113	13/09/2023
				0.162	14/12/2023
				0.122	20/12/2023
				0.112	25/12/2023
				0.274	27/12/2023
				0.154	28/12/2023
				0.112	29/12/2023
				0.183	09/01/2024
				0.135	10/01/2024
				0.161	11/01/2024
				0.142	12/01/2024
				0.138	16/01/2024
				0.141	17/01/2024
				0.154	18/01/2024
				0.161	19/01/2024
				0.153	20/01/2024
				0.258	21/01/2024
				0.221	22/01/2024
				0.152	23/01/2024
				0.114	24/01/2024
				0.108	04/03/2024
				0.103	06/03/2024
		Free Chlorine (mg/L)	Critical CCP	0.04*	10/02/2024
				0.09*	11/02/2024
	Verification	Free Chlorine (mg/L)	Critical CCP	0.08*	12/02/2024

*Note that the three critical CCP breaches are in relation to the low chlorine incident that was reported to the regulator.

Biloela Combined Treated Water

Table D-4 Biloela Combined Treated Water Testing Summary Results

Scheme name	Sampling Type	Parameter	No. of samples required to be collected (as per DWQMP)	No. of samples actually collected and tested in FY23/24	Water quality criteria	No. of non-compliant samples	Comments
Biloela Combined Treated Water (BIL04)	Operational	pH	365	364	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	365	364	≤5 (A)	0	
		True Colour (HU)	365	363	≤15 (A)	0	
		Total Iron (mg/L)	365	364	≤0.3 (A)	0	
		Total Manganese (mg/L)	365	364	≤0.1 (A) ≤0.5 (H)	2 (A)	To 1 significant figure, there have been no exceedances
		Alkalinity (mg/L of CaCO3)	365	362			
		Fluoride (mg/L)	365	222	≤1.5 (H)	0	
		Free Chlorine (mg/L)	365	363	≥0.2 (CCP) & ≤5.0 (H)	0	
		E. coli - Readycult	52	32		0	
		Total Coliforms	52	32			
	Verification	*E. coli* (mpn/100mL)	52	51	<1 (H)	0	
		Total Coliforms (cfu/100mL)	52	51			
		Free Chlorine (mg/L)	35	45	≥0.2 (CCP) & ≤5.0 (H)	0	
		THMs	12	11	See Table 5.	0	
		Fluoride (mg/L)	12	5	≤1.5 (H)	0	As part of standard water analysis
		Standard Water Analysis	4	5	See Table 5.	5	Total hardness only
		Metals	4	5	See Table 5.	0	
		Pesticides	2	4	ADWG 2011 Chapter 10 Table 10.6	0	
		Radiological	0	0	See Table 5.		See note

Note: Sampling required every 2 years. None required this FY as last taken in FY22-23

Exceedances are summarised in the table below.

Table D-5 Biloela Combined Treated Water Exceedances

Scheme name	Verification/ Operational	Parameter	Exceedance Type	Exceedance Value	Exceedance Date
Biloela Combined Treated Water (BIL04)	Operational	Total Manganese (mg/L)	Aesthetic	0.12	22/01/2024
				0.104	23/01/2024
	Verification	Total Hardness (mg/L as CaCO3)	Aesthetic	230	10/07/2023
				225	07/08/2023
				228	05/12/2023
				217	04/03/2024
				209	04/06/2024

Biloela Reticulated Water

Table D-6 Biloela Reticulated Water Testing Summary Results

Scheme name	Sampling Type	Parameter	No. of samples required to be collected (as per DWQMP)	No. of samples actually collected and tested in FY23/24	Water quality criteria	No. of non-compliant samples	Comments
Biloela Reticulated Water (BIL14, BIL17, BIL20 & BIL36)	Operational	pH	208	204	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	208	204	≤5 (A)	0	
		True Colour (HU)	208	204	≤15 (A)	0	
		Total Iron (mg/L)	208	204	≤0.3 (A)	0	
		Total Manganese (mg/L)	208	204	≤0.1 (A) ≤0.5 (H)	3 (A) 0 (H)	
		Alkalinity (mg/L of CaCO3)	208	203			
		Free Chlorine (mg/L)	208	204	≤5.0 (H)	0	
		E. coli – Readycult	208	169		0	
		Total Coliforms	208	169			
	Verification (BIL20)	Free Chlorine (mg/L)	35	45	≤5.0 (H)	0	
		E. coli (mpn/100mL)	52	50	<1 (H)	0	
		Total Coliforms (cfu/100mL)	52	50			

Exceedances are summarised in the table below.

Table D-7 Biloela Reticulated Water Exceedances

Scheme name	Verification/ Operational	Parameter	Exceedance Type	Exceedance Value	Exceedance Date
Biloela Reticulated Water (BIL14, BIL17, BIL20 & BIL36)	Operational	Total Manganese (mg/L)	Aesthetic	0.144	19/07/2023 (BIL20)
				0.105	22/01/2024 (BIL17)
				0.216	05/02/2024 (BIL36)

Thangool Reticulated Water

Table D-8 Thangool Reticulated Water Testing Summary Results

Scheme name	Sampling Type	Parameter	No. of samples required to be collected (as per DWQMP)	No. of samples actually collected and tested in FY23/24	Water quality criteria	No. of non-compliant samples	Comments
Thangool Reticulated Water (THA01, THA02 & THA05)	Operational	pH	156	149	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	156	149	≤5 (A)	1	
		True Colour (HU)	156	149	≤15 (A)	1	
		Total Iron (mg/L)	156	149	≤0.3 (A)	0	
		Total Manganese (mg/L)	156	149	≤0.1 (A) ≤0.5 (H)	5 (A)	To 1 significant figure, there have only been 4 exceedances
		Alkalinity (mg/L of CaCO3)	156	149			
		Free Chlorine (mg/L)	156	149	≤5.0 (H)	0	
		E. coli – Readycult	156	124		0	
		Total Coliforms	156	124			
	Verification (THA02)	*E. coli* (mpn/100mL)	12	20	<1 (H)	0	
		Total Coliforms (cfu/100mL)	12	20	≥6.5 & ≤8.5 (A)		
		Free Chlorine (mg/L)	9	17	≤5.0 (H)	0	
		Chlorate (mg/L)	9	9			
		Pesticides	12	9			

Exceedances are summarised in the table below.

Table D-9 Thangool Reticulated Water Exceedances

Scheme name	Verification/ Operational	Parameter	Exceedance Type	Exceedance Value	Exceedance Date
Thangool Reticulated Water (THA01, THA02 & THA05)	Operational	Turbidity (NTU)	Aesthetic	8.53	10/07/2023 (THA05)
		True Colour (HU)	Aesthetic	21	05/07/2023 (THA05)
		Total Manganese (mg/L)	Aesthetic	0.37	10/07/2023 (THA05)
				0.301	09/01/2024 (THA05)
				0.306	05/02/2024 (THA02)
				0.124	11/03/2024 (THA05)
				0.215	08/05/2024 (THA01)

Callide Dam Village Reticulated Water

Table D-10 Callide Dam Village Reticulated Water Testing Summary Results

Scheme name	Sampling Type	Parameter	No. of samples required to be collected (as per DWQMP)	No. of samples actually collected and tested in FY23/24	Water quality criteria	No. of non-compliant samples	Comments
Callide Dam Village Reticulated Water (CAL01 & CAL02)	Operational	pH	104	102	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	104	104	≤5 (A)	4	
		True Colour (HU)	104	104	≤15 (A)	9	
		Total Iron (mg/L)	104	104	≤0.3 (A)	0	
		Total Manganese (mg/L)	104	104	≤0.1 (A) ≤0.5 (H)	16(A) 1 (H)	To 1 significant figure, there have only been 4 aesthetic exceedances and 1 health exceedance
		Alkalinity (mg/L of CaCO3)	104	102			
		Free Chlorine (mg/L)	104	102	≤5.0 (H)	0	
		E. coli – Readycult	104	92		0	
		Total Coliforms	104	92			
	Verification	*E. coli* (mpn/100mL)	12	24	<1 (H)	0	
		Total Coliforms (cfu/100mL)	12	24			
		Free Chlorine (mg/L)	18	21	≤5.0 (H)	0	

Exceedances are summarised in the table below.

Table D-11 Callide Dam Village Reticulated Water Exceedances

Scheme name	Verification/ Operational	Parameter	Exceedance Type	Exceedance Value	Exceedance Date
Callide Dam Village Reticulated Water (CAL01 & CAL02)	Operational	Turbidity (NTU)	Aesthetic	14.5	05/07/2023 (CAL02)
				6.61	21/08/2023 (CAL02)
				10.7	06/11/2023 (CAL02)
				5.93	27/05/2024 (CAL02)
		True Colour (HU)	Aesthetic	20	05/12/2023 (CAL01)
				43	05/12/2023 (CAL02)
				20	03/01/2024 (CAL02)
				16	09/01/2024 (CAL02)

				61	11/03/2024 (CAL01)
				50	18/03/2024 (CAL01)
				68	18/03/2024 (CAL02)
				24	25/03/2024 (CAL01)
				48	27/05/2024 (CAL02)
		Total Manganese (mg/L)	Aesthetic	0.175	10/07/2023 (CAL02)
				0.257	21/08/2023 (CAL02)
				0.144	09/10/2023 (CAL02)
				0.43	06/11/2023 (CAL02)
				0.12	13/11/2023 (CAL02)
				0.128	05/12/2023 (CAL01)
				0.147	05/12/2023 (CAL02)
				0.134	27/12/2023 (CAL01)
				0.13	03/01/2024 (CAL02)
				0.14	22/01/2024 (CAL01)
				0.106	04/03/2024 (CAL01)
				0.103	25/03/2024 (CAL01)
				0.121	21/05/2024 (CAL02)
				0.114	27/05/2024 (CAL01)
				0.203	27/05/2024 (CAL02)
				0.108	17/06/2024 (CAL02)
			Health	0.576*	05/07/2023 (CAL02)

*Sample was retested and showed a result of 0.035 mg/L.

Baralaba Treated Water

Table D-12 Baralaba Treated Water Testing Summary Results

Scheme name	Sampling Type	Parameter	No. of samples required to be collected (as per DWQMP)	No. of samples actually collected and tested in FY23/24	Water quality criteria	No. of non-compliant samples	Comments
Baralaba Treated Water (BAR02)	Operational	pH	104	103	≥6.5 & ≤8.5 (A)	20	
		Turbidity (NTU)	104	102	≤5 (A)	2	
		Apparent Colour (HU)	104	103			
		True Colour (HU)	104	103	≤15 (A)	0	
		Total Iron (mg/L)	104	101	≤0.3 (A)	0	
		Total Manganese (mg/L)	104	101	≤0.1 (A) ≤0.5 (H)	5 (A)	
		Soluble Manganese (mg/L)	104	10			
		Alkalinity (mg/L of CaCO3)	104	100			
		Free Chlorine (mg/L)	104	104	≥0.3 (CCP) & ≤4.0 (H) *	0	
		E. coli – Readycult	52	19	<1 (H)	0	
		Total Coliforms	52	19			
	Verification	*E. coli* (mpn/100mL)	12	16	<1 (H)	0	
		Total Coliforms (cfu/100mL)	12	24			
		Free Chlorine (mg/L)	9	22	≥0.3 (CCP)& ≤4.0 (H) *	0	
		THMs	12	10	See Table 5.	0	
		Standard Water Analysis	4	6	See Table 5.	0	
		Heavy Metals	4	5	See Table 5.	0	
		Pesticides	4	4	ADWG 2011 Chapter 10 Table 10.6		

*The disinfection CCP for the Baralaba WTP is a narrower range than the other plants and ADWG guidelines due to the requirements of the scheme.

Exceedances are summarised in the table below.

Table D-13 Baralaba Treated Water Exceedances

Scheme name	Verification/ Operational	Parameter	Exceedance Type	Exceedance Value	Exceedance Date
Baralaba Treated Water (BAR02)	Operational	pH	Aesthetic	6.34	03/07/2023
				6.45	07/07/2023
				5.27	24/07/2023
				5.59	28/07/2023
				6.27	01/08/2023
				5.99	07/08/2023
				6.36	11/08/2023
				6.47	14/08/2023
				6.49	25/08/2023
				5.43	30/08/2023
				6.2	11/09/2023
				6.2	18/09/2023
				6.19	21/09/2023
				6.26	09/10/2023
				5.79	12/10/2023
				6.44	20/10/2023
				6.4	11/12/2023
				6.31	15/12/2023
				6.27	12/01/2024
				6.44	19/01/2024
		Turbidity (NTU)	Aesthetic	6.85	04/12/2023
				6.93	08/12/2023
		Total Manganese (mg/L)	Aesthetic	0.161	02/01/2024
				0.181	29/01/2024
				0.214	30/01/2024
				0.221	02/02/2024
				0.102	27/05/2024

Baralaba Reticulated Water

Table D-14 Baralaba Reticulated Water Testing Summary Results

Scheme name	Sampling Type	Parameter	No. of samples required to be collected (as per DWQMP)	No. of samples actually collected and tested in FY23/24	Water quality criteria	No. of non-compliant samples	Comments
Baralaba Reticulated Water (BAR03 & BAR12)	Operational	pH	104	103	≥6.5 & ≤8.5 (A)	9	
		Turbidity (NTU)	104	103	≤5 (A)	0	
		True Colour (HU)	104	103	≤15 (A)	0	
		Total Iron (mg/L)	104	103	≤0.3 (A)	1	
		Total Manganese (mg/L)	104	102	≤0.1 (A) ≤0.5 (H)	5 (A)	To one significant figure, there has only been 1 exceedance
		Alkalinity (mg/L of CaCO3)	104	100			
		Free Chlorine (mg/L)	104	103	≤4.0 (H)		
		E. coli – Readycult	104	76			
		Total Coliforms	104	76			
	Verification (1 sample point rotationally)	Free Chlorine (mg/L)	9	17	≤4.0 (H)*	0	
		E. coli (mpn/100mL)	12	19	<1 (H)	0	
		Total Coliforms (cfu/100mL)	12	7			

*The disinfection CCP for the Baralaba WTP is a narrower range than the other plants and ADWG guidelines due to the requirements of the scheme.

Exceedances are summarised in the table below.

Table D-15 Baralaba Reticulated Water Exceedances

Scheme name	Verification/ Operational	Parameter	Exceedance Type	Exceedance Value	Exceedance Date
Baralaba Reticulated Water (BAR03 & BAR12)	Operational	pH	Aesthetic	6.12	24/07/2023 (BAR03)
				6.49	25/08/2023 (BAR03)
				6.43	18/09/2023 (BAR03)
				6.33	26/09/2023 (BAR03)
				6.45	26/09/2023 (BAR12)
				6.46	06/11/2023 (BAR03)
				6.45	15/01/2024 (BAR03)
				6.49	22/01/2024 (BAR03)
				6.22	02/04/2024 (BAR12)
		Total Iron (mg/L)	Aesthetic	0.37	11/09/2023 (BAR12)
		Total Manganese (mg/L)	Aesthetic	0.114	04/09/2023 (BAR12)
				0.202	04/10/2023 (BAR12)
				0.131	05/02/2024 (BAR03)
				0.114	15/04/2024 (BAR03)
				0.108	27/05/2024 (BAR03)

Goovigen Treated Water (Reservoir)

Table D-16 Goovigen Reservoir Water Testing Summary Results

Scheme name	Sampling Type	Parameter	No. of samples required to be collected (as per DWQMP)	No. of samples actually collected and tested in FY23/24	Water quality criteria	No. of non-compliant samples	Comments
Goovigen Treated Water (GOO04)	Operational	pH	52	48	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	52	48	≤5 (A)	0	
		Apparent Colour (HU)	52	48			
		True Colour (HU)	52	48	≤15 (A)	0	
		Total Iron (mg/L)	52	48	≤0.3 (A)	3	To 1 significant figure, there have only been 2 exceedances
		Total Manganese (mg/L)	52	48	≤0.1 (A) ≤0.5 (H)	7 (A) - (H)	To 1 significant figure, there have only been 3 aesthetic exceedances
		Alkalinity (mg/L of CaCO3)	52	47			
		Salinity (mg/L)	52	48			
		Conductivity @ 25°C (µS/cm)	52	45			
		Free Chlorine (mg/L)	52	46	≥0.2 (CCP) & ≤4.0 (H)	0	
		E. coli – Readycult	52	39			
		Total Coliforms	52	39			
	Verification	*E. coli* (mpn/100mL)	12	9			See note
		Total Coliforms (cfu/100mL)	12	9			
		Free Chlorine (mg/L)	9	7	≥0.2 (CCP) & ≤4.0 (H)	0	
		THMs	4	1	See Table 5.	0	
		Standard Water Analysis	4	1	See Table 5.	0	
		Heavy Metals	4	1	See Table 5.	0	
		Pesticides	2	0	ADWG 2011 Chapter 10 Table 10.6		

Note: Council has noted that there seems to have been significant issues sampling the Goovigen Reticulation over FY23-24, most analytes having been missed. Sampling commenced again in April 2024 at GOO04 when it should have been at GOO03.

Exceedances are summarised in the table below.

Table D-17 Goovigen Reservoir Water Exceedances

Scheme name	Verification/ Operational	Parameter	Exceedance Type	Exceedance Value	Exceedance Date
Goovigen Treated Water (GOO04)	Operational	Total Iron (mg/L)	Aesthetic	0.49	19/09/2023
				0.31	16/01/2024
				0.42	08/05/2024
		Total Manganese (mg/L)	Aesthetic	0.165	19/09/2023
				0.11	20/12/2023
				0.169	16/01/2024
				0.103	30/01/2024
				0.105	06/02/2024
				0.11	27/02/2024
				0.178	13/03/2024

Goovigen Reticulated Water (Park)

Table D-18 Goovigen Park Water Testing Summary Results

Scheme name	Sampling Type	Parameter	No. of samples required to be collected (as per DWQMP)	No. of samples actually collected and tested in FY23/24	Water quality criteria	No. of non-compliant samples	Comments
Goovigen Reticulated Water (GOO03)	Operational	pH	52	49	≥6.5 & ≤8.5 (A)	1	
		Turbidity (NTU)	52	49	≤5 (A)	0	
		Apparent Colour (HU)	52	49			
		True Colour (HU)	52	48	≤15 (A)	1	
		Total Iron (mg/L)	52	49	≤0.3 (A)	3	
		Total Manganese (mg/L)	52	49	≤0.1 (A) ≤0.5 (H)	6 (A) 0 (H)	To 1 significant figure, there are only 3 aesthetic exceedances
		Alkalinity (mg/L of CaCO3)	52	48			
		Salinity (mg/L)	52	49			
		Conductivity @ 25°C (µS/cm)	52	46			
		Free Chlorine (mg/L)	52	45	≤5.0 (H)	0	
		E. coli – Readycult	52	40			
		Total Coliforms	52	40			
	Verification	*E. coli* (mpn/100mL)	12	20	<1 (H)	0	See note beneath Table D-16
		Total Coliforms (cfu/100mL)	12	20			
		Free Chlorine (mg/L)	9	20	≤5.0 (H)	0	
		PFAS	1	0	ADWG 2011 Table 10.6		

Exceedances are summarised in the table below.

Table D-19 Goovigen Park Water Exceedances

Scheme name	Verification/ Operational	Parameter	Exceedance Type	Exceedance Value	Exceedance Date
Goovigen Reticulated Water (GOO03)	Operational	pH	Aesthetic	6.43	03/04/2024
		True Colour (HU)	Aesthetic	25	06/02/2024
		Total Iron (mg/L)	Aesthetic	0.55	13/12/2023
				0.36	30/01/2024
				0.41	08/05/2024
		Total Manganese (mg/L)	Aesthetic	0.112	24/07/2023
				0.216	02/08/2023
				0.281	30/01/2024
				0.128	06/02/2024
				0.119	27/02/2024
				0.177	08/05/2024

Moura Treated Water

Table D-20 Moura Treated Water Testing Summary Results

Scheme name	Sampling Type	Parameter	No. of samples required to be collected (as per DWQMP)	No. of samples actually collected and tested in FY23/24	Water quality criteria	No. of non-compliant samples	Comments
Moura Treated Water (MOU03)	Operational	pH	365	366	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	365	366	≤5 (A)	0	
		True Colour (HU)	365	366	≤15 (A)	0	
		Total Iron (mg/L)	365	366	≤0.3 (A)	1	
		Total Manganese (mg/L)	365	366	≤0.1 (A) ≤0.5 (H)	0	
		Alkalinity (mg/L of CaCO3)	365	366			
		Fluoride (mg/L)	365	366	≤1.5 (H)		All are “MD” – missing data
		Free Chlorine (mg/L)	365	366	≥0.2 (CCP) & ≤5.0 (H)	0	
		E. coli – Readycult	52	53			
		Total Coliforms	52	53			
	Verification	*E. coli* (mpn/100mL)	52	51	<1 (H)	0	
		Total Coliforms (cfu/100mL)	52	51			
		Free Chlorine (mg/L)	35	43	≥0.2 (CCP) & ≤5.0 (H)	0	
		THMs	12	11	See Table 5.	0	
		Fluoride	12	5	≤1.5 (H)	0	As part of standard water analysis
		Standard Water Analysis	4	5	See Table 5.	0	
		Heavy Metals	4	4	See Table 5.	0	
		Pesticides	4	5	ADWG 2011 Chapter 10 Table 10.6	0	

Exceedances are summarised in the table below.

Table D-21 Moura Treated Water Exceedances

Scheme name	Verification/ Operational	Parameter	Exceedance Type	Exceedance Value	Exceedance Date
Moura Treated Water (MOU03)	Operational	Total Iron (mg/L)	Aesthetic	0.32	05/01/2024 (MOU03)

Moura Reticulated Water

Table D-22 Moura Reticulated Water Testing Summary Results

Scheme name	Sampling Type	Parameter	No. of samples required to be collected (as per DWQMP)	No. of samples actually collected and tested in FY23/24	Water quality criteria	No. of non-compliant samples	Comments
Moura Reticulated Water (MOU09, MOU11, MOU25 & MOU26)	Operational	pH	208	199	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	208	200	≤5 (A)	0	
		True Colour (HU)	208	200	≤15 (A)	4	
		Total Iron (mg/L)	208	195	≤0.3 (A)	0	
		Total Manganese (mg/L)	208	200	≤0.1 (A) ≤0.5 (H)	1 (A) 0 (H)	To 1 significant figure, there have been no aesthetic exceedances
		Alkalinity (mg/L of CaCO3)	208				
		Free Chlorine (mg/L)	208	200	≤5.0 (H)	0	
		E. coli – Readycult	208	184			
		Total Coliforms	208	184			
	Verification (MOU09 and MOU11)	*E. coli* (mpn/100mL)	104	90	<1 (H)	0	
		Total Coliforms (cfu/100mL)	104	100			
		Free Chlorine (mg/L)	70	88	≤5.0 (H)	0	

Exceedances are summarised in the table below.

Table D-23 Moura Reticulated Water Exceedances

Scheme name	Verification/ Operational	Parameter	Exceedance Type	Exceedance Value	Exceedance Date
Moura Reticulated Water (MOU09, MOU11, MOU25 & MOU26)	Operational	True Colour (HU)	Aesthetic	22	31/01/2024 (MOU25)
				16	07/02/2024 (MOU09)
				19	07/02/2024 (MOU25)
				31	13/02/2024 (MOU25)
		Total Manganese (mg/L)	Aesthetic	0.128	31/01/2024 (MOU25)

Banana Reticulated Water

Table D-24 Banana Reticulated Water Testing Summary Results

Scheme name	Sampling Type	Parameter	No. of samples required to be collected (as per DWQMP)	No. of samples actually collected and tested in FY23/24	Water quality criteria	No. of non-compliant samples	Comments
Banana Reticulated Water (BAN01 & BAN04)	Operational	pH	104	102	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	104	102	≤5 (A)	0	
		True Colour (HU)	104	102	≤15 (A)	1	
		Total Iron (mg/L)	104	102	≤0.3 (A)	0	
		Total Manganese (mg/L)	104	102	≤0.1 (A) ≤0.5 (H)	2 (A)	To 1 significant figure, there have been no exceedances
		Alkalinity (mg/L of CaCO3)	104	102			
		Free Chlorine (mg/L)	104	102	≤5.0 (H)	0	
		E. coli – Readycult	104	88			
		Total Coliforms	104	88			
	Verification (BAN04)	*E. coli* (mpn/100mL)	12	14	<1 (H)	0	
		Total Coliforms (cfu/100mL)	12	22			
		Free Chlorine (mg/L)	9	22	≤5.0 (H)	0	

Exceedances are summarised in the table below.

Table D-25 Banana Reticulated Water Exceedances

Scheme name	Verification/ Operational	Parameter	Exceedance Type	Exceedance Value	Exceedance Date
Banana Reticulated Water (BAN01 & BAN04)	Operational	True Colour (HU)	Aesthetic	29	14/02/2024 (BAN01)
		Total Manganese (mg/L)	Aesthetic	0.12	11/01/2024 (BAN04)
				0.102	14/02/2024 (BAN01)

Theodore Treated Water

Table D-26 Theodore Treated Water Testing Summary Results

Scheme name	Sampling Type	Parameter	No. of samples required to be collected (as per DWQMP)	No. of samples actually collected and tested in FY23/24	Water quality criteria	No. of non-compliant samples	Comments
Theodore Treated Water (THE03)	Operational	pH	365	364	≥6.5 & ≤8.5 (A)	17	
		Turbidity (NTU)	365	366	≤5 (A)	0	
		True Colour (HU)	365	366	≤15 (A)	0	
		Total Iron (mg/L)	365	363	≤0.3 (A)	0	
		Total Manganese (mg/L)	365	232	≤0.1 (A) ≤0.5 (H)	0	
		Alkalinity (mg/L of CaCO3)	365	366			
		Free Chlorine (mg/L)	365	366	≥0.2 (CCP) & ≤5.0 (H)	0	
		E. coli – Readycult	52	4			
		Total Coliforms	52	4			
	Verification	*E. coli* (mpn/100mL)	12	10	<1 (H)	0	
		Total Coliforms (cfu/100mL)	12	10			
		Free Chlorine (mg/L)	9	6	≥0.2 (CCP) & ≤5.0 (H)	0	
		THMs	12	0	See Table 5.		
		Standard Water Analysis	4	2	See Table 5.		
		Heavy Metals	4	2	See Table 5.	0	
		Pesticides	4	14	ADWG 2011 Chapter 10 Table 10.6	0	

Exceedances are summarised in the table below.

Table D-27 Theodore Treated Water Exceedances

Scheme name	Verification/ Operational	Parameter	Exceedance Type	Exceedance Value	Exceedance Date
Theodore Treated Water (THE03)	Operational	pH	Aesthetic	6.32	23/05/2024
				6.39	24/05/2024
				6.38	25/05/2024
				6.42	26/05/2024
				6.35	27/05/2027
				6.38	28/05/2024
				6.43	29/05/2024
				6.43	30/05/2024
				6.42	03/06/2024

				6.41	04/06/2024
				6.35	05/06/2024
				6.26	06/06/2024
				6.46	07/06/2024
				6.43	09/06/2024
				6.27	10/06/2024
				6.45	11/06/2024
				6.43	12/06/2024

Theodore Reticulated Water

Table D-28 Theodore Reticulated Water Testing Summary Results

Scheme name	Sampling Type	Parameter	No. of samples required to be collected (as per DWQMP)	No. of samples actually collected and tested in FY23/24	Water quality criteria	No. of non-compliant samples	Comments
Theodore Reticulated Water (THE05, THE06, THE09)	Operational	pH	156	126	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	156	126	≤5 (A)	0	
		True Colour (HU)	156	125	≤15 (A)	1	
		Total Iron (mg/L)	156	126	≤0.3 (A)	0	
		Total Manganese (mg/L)	156	125	≤0.1 (A) ≤0.5 (H)	0	
		Alkalinity (mg/L of CaCO3)	156	24			
		Free Chlorine (mg/L)	156	126	≤5.0 (H)	0	
		E. coli – Readycult	156	86			
		Total Coliforms	156	11			
	Verification (1 sample point rotationally)	*E. coli* (mpn/100mL)	12	28	<1 (H)	0	
		Total Coliforms (cfu/100mL)	12	30			
		Free Chlorine (mg/L)	9	18	≤5.0 (H)	0	

Exceedances are summarised in the table below.

Table D-29 Theodore Reticulated Water Exceedances

Scheme name	Verification/ Operational	Parameter	Exceedance Type	Exceedance Value	Exceedance Date
Theodore Reticulated Water (THE05, THE06, THE09)	Operational	True Colour (HU)	Aesthetic	19	05/07/2023 (THE09)

Taroom Treated Water

Table D-30 Taroom Treated Water Testing Summary Results

Scheme name	Sampling Type	Parameter	No. of samples required to be collected (as per DWQMP)	No. of samples actually collected and tested in FY23/24	Water quality criteria	No. of non-compliant samples	Comments
Taroom Treated Water (TAR03)	Operational	pH	365	366	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	365	366	≤5 (A)	0	
		True Colour (HU)	365	366	≤15 (A)	0	
		Total Iron (mg/L)	365	366	≤0.3 (A)	0	
		Total Manganese (mg/L)	365	366	≤0.1 (A) ≤0.5 (H)	0	
		Alkalinity (mg/L of CaCO3)	365	366			
		Free Chlorine (mg/L)	365	366	≥0.2 (CCP) & ≤5.0 (H)		
	Verification	*E. coli* (mpn/100mL)	12	8	<1 (H)	0	
		Total Coliforms (cfu/100mL)	12	10			
		Free Chlorine (mg/L)	9	0	≥0.2 (CCP) & ≤5.0 (H)		
		THMs	12	0	See Table 5.		
		Standard Water Analysis	4	4	See Table 5.	1	
		Heavy Metals	4	4	See Table 5.	4	
		Pesticides	1	12	ADWG 2011 Chapter 10 Table 10.6	0	

Exceedances are summarised in the table below.

Table D-31 Taroom Treated Water Exceedances

Scheme name	Verification/ Operational	Parameter	Exceedance Type	Exceedance Value	Exceedance Date
Taroom Treated Water (TAR03)	Verification	Standard Water Analysis – Total Iron (mg/L)	Aesthetic	0.41	14/09/2022
		Metals – Total Iron (mg/L)		2.9	07/12/2023
				1.6	03/01/2024
				2.2	17/01/2024
				2.6	27/06/2024

Taroom Reticulated Water

Table D-32 Taroom Reticulated Water Testing Summary Results

Scheme name	Sampling Type	Parameter	No. of samples required to be collected (as per DWQMP)	No. of samples actually collected and tested in FY23/24	Water quality criteria	No. of non-compliant samples	Comments
Taroom Reticulated Water (TAR06, TAR15, & TAR16)	Operational	pH	156	52	≥6.5 & ≤8.5 (A)	0	77.36 on 21/05/2024 (TAR15) is likely an error and has not been considered as an exceedance
		Turbidity (NTU)	156	52	≤5 (A)	1	
		Total Iron (mg/L)	156	52	≤0.3 (A)	0	55 on 25/06/2024 (TAR06) is likely an error and has not been considered as an exceedance
		Total Manganese (mg/L)	156	52	≤0.1 (A) ≤0.5 (H)	0 (A) 0 (H)	
		Alkalinity (mg/L of CaCO3)	156	52			
		Free Chlorine (mg/L)	156	52	≤5.0 (H)	0	
		E. coli – Readycult	156	152			
		Total Coliforms	156	98			
	Verification (TAR06)	*E. coli* (mpn/100mL)	12	26	<1 (H)	0	
		Total Coliforms (cfu/100mL)	12	33		0	
		Free Chlorine (mg/L)	8	10	≤5.0 (H)	0	

Exceedances are summarised in the table below.

Table D-33 Taroom Reticulated Water Exceedances

Scheme name	Verification/ Operational	Parameter	Exceedance Type	Exceedance Value	Exceedance Date
Taroom Reticulated Water (TAR06, TAR15, TAR16)	Operational	Turbidity (NTU)	Aesthetic	6.42	04/06/2024 (TAR06)

Appendix E – Water Quality Statistical Summary

Water quality results for treated and reticulated water for each scheme is presented below. The following points should be noted:

- Statistical analysis is presented for parameters outlined in the approved Banana Shire Council Monitoring Program, though additional testing is undertaken for some parameters that are not specifically within the Monitoring Program.
- BSC tests for approximately 250 pesticide and herbicide species as part of its pesticide verification testing. For simplicity, only those that have been detected (i.e. readings above the limit of detection) have been shown at a species level within this analysis. As explained in Appendix D – Water Testing Summary Results, these detections were not considered reportable.
- As part of the data analysis process, clear clerical errors in the operational data were corrected in the raw data where necessary to ensure the statistical analysis was as accurate as possible.
- Council has noted a seasonal limitation affecting weekly verification monitoring for *E. coli*. During the Christmas holiday period, laboratory closures may result in a shortfall of samples for this interval.

Biloela WTP Treated Water

Table E-1 BIL03 Water Quality

Biloela WTP Treated Water Quality											
Sampling Location(s)		**BIL03**				**Timeframe**		**July 2023 – June 2024**			
Operational / Verification	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	364	6.47	6.96	7.23	7.4225	7.53	≥6.5 & ≤8.5 (A)	1	
		Turbidity (NTU)	364	0.02	0.17	0.68	2.07	3.25	≤5	0	
		Alkalinity (mg/L of CaCO3)	364	120	127	145	150	165			
		True Colour (Pt - Co)	364	0	0	0	0	4	≤15	0	
		Free Chlorine - Onsite (mg/L)	364	0.04	0.58	1.43	2.61	3.14	≥0.2 (CCP) & ≤5.0 (H)	2	
		Total Iron (mg/L)	362	0	0	0.01	0.01	0.02	≤0.3 (A)	0	
		Total Manganese (Treated) (mg/L)	224	0.0	0.0	0.0	0.1	0.2	≤0.5 (H) ≤0.1 (A)	0 (H)	
		Fluoride (mg/L)	363	0.017	0.022	0.099	0.16	0.18	≤1.5 (H)	0	
Operational and Verification Microbial	QLD Health	*E. coli* (mpn/100mL)	52	0	0	0	0	0	<1 (H)	0	See note
Verification Microbial	QLD Health	Free Chlorine (mg/L)	45	0.08	0.47	1.71	2.78	3.43	≥0.2 & ≤5.0 (H)	1	
Verification THMs	QLD Health	Chloroform (µg/L)	11	41	42	55	71.5	75			
		Bromodichloromethane (µg/L)	11	34	38.5	48	57	59			
		Dibromochloromethane (µg/L)	11	21	22.5	32	34.5	36			
		Bromoform (µg/L)	11	3	3	5	6	6			

		Total Trihalomethanes (µg/L)	11	98	109	140	165	170	≤250 (H)	0	
Verification Standard Water Analysis	QLD Health	pH	5	6.91	6.99	7.82	8.13	8.18	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	5						≤5 (A)	0	5 of 5 samples are below LOD
		True Colour (HU)	5						≤15 (A)	0	5 of 5 samples are below LOD
		Iron (mg/L)	5						≤0.3 (A)	0	5 of 5 samples are below LOD
		Manganese (mg/L)	5	0.001	0.00175	0.0165	0.0355	0.037	≤0.5 (H) ≤0.1 (A)	0	1 of 5 samples are below LOD
		Aluminium (mg/L)	5						≤0.2 (A)	0	5 of 5 samples are below LOD
		Alkalinity (Total) (mg/L CaCO3)	5	130	130	150	150	150			
		Residual Alkalinity (meq/L)	5	0	0	0	0	0			
		Total Hardness (mg/L CaCO3)	5	135	135.6	154	159.8	160	≤200 (A)	0	
		Temporary Hardness (mg/L CaCO3)	5	131	131.4	149	149.8	150			
		Total Dissolved Ions (mg/L)	5	313	313.8	358	362.8	364			
		Total Dissolved Solids (mg/L)	5	240	242	280	280	280	≤600 (A)	0	
		Conductivity (µS/cm)	5	460	462	530	538	540			
		Bicarbonate (mg/L CaCO3)	5	159	159.6	178	181.6	182			
		Carbonate (mg/L CaCO3)	5	0.1	0.12	0.8	1.56	1.7			
		Hydroxide (mg/L CaCO3)	5	0	0	0	0	0			
		Hydrogen (mg/L)	5	0	0	0	0	0			
		Boron (mg/L)	5	0.06	0.06	0.07	0.07	0.07	≤4 (H)	0	

		Calcium (mg/L)	5	29	29.2	33	35	35			
		Chloride (mg/L)	5	0	0	0	0	0	≤250 (A)	0	
		Copper (mg/L)	5	0.013	0.0134	0.022	0.04	0.041	≤2 (H) ≤1 (A)	0	
		Fluoride (mg/L)	5	0.14	0.15	0.21	0.22	0.22	≤1.5 (H)	0	
		Magnesium (mg/L)	5	15	15	17	18	18			
		Nitrate (mg/L)	5	0.23	0.30	0.6	0.94	1	≤50 (H)	0	
		Potassium (mg/L)	5	3.9	3.92	4.1	4.28	4.3			
		Silica (mg/L)	5	10	10	12	12	12	≤80 (A)	0	
		Sodium (mg/L)	5	38	38	44	44	44	≤180 (A)	0	
		Sulphate (mg/L)	5	5.4	5.4	5.6	6.94	7	≤250 (A)	0	
		Zinc (mg/L)	5						≤3 (A)	0	5 of 5 samples are below LOD
Verification Heavy Metals	QLD Health	Iron (mg/L)	5	0.006	0.006	0.008	0.035	0.038	≤0.3 (A)	0	
		Manganese (dissolved) (mg/L)	5	0.005	0.005	0.013	0.101	0.11			
		Aluminium (mg/L)	5	0.015	0.015	0.027	0.034	0.035	≤0.2 (A)	0	
		Arsenic (mg/L)	5	0.0015	0.0016	0.0019	0.0023	0.0023	≤0.01 (H)	0	
		Cadmium (mg/L)	5						≤0.002 (H)	0	5 of 5 samples are below LOD
		Chromium (mg/L)	5						≤0.05 (H)	0	5 of 5 samples are below LOD
		Copper (mg/L)	5	0.017	0.018	0.03	0.059	0.063	≤1 (A)	0	
		Lead (mg/L)	5	0.0001	0.0001	0.0002	0.0016	0.0019	≤0.01 (H)	0	
		Nickel (mg/L)	5	Below LOD	0.00032	0.0004	0.00066	0.0007	≤0.02 (H)	0	1 of 5 samples is below LOD
		Zinc (mg/L)	5	0.001	0.0016	0.008	0.022	0.025	≤3 (A)	0	
Verification Pesticides	QLD Health	Dalapon (2,2-DPA) (µg/L)	4	0.5	0.55	0.95	1.19	1.2	≤500 (H)	0	
		2-Nitro-m-xylene (%)	4	58	59.5	71	77.4	78			
		Decachlorobiphenyl (µg/L)	4	111	112.4	121	132.2	134			

		Dibromobiphenyl (%)	4	97	97.3	99	106.7	108			
		N-Butylbenzenesulfonamide (µg/L)	4					0.08			3 of 4 samples are below LOD
		Pyrene-d10 (%)	4	94	94.9	101.5	106.4	107			
		Triphenyl phosphate (%)	4	112	113	120	130	131			
		Other Pesticides	4						Various		All other pesticides samples are below LOD

Note: Samples received on 3/07/23 and 7/02/24 were received more than 2 days after collection and deemed unsuitable for microbiological analysis. These samples were not tested.

Biloela Combined Treated Water

Table E-2 BIL04 Water Quality

Treated Mixed – WTP and/or Bore (from Town Pump Station Reservoir) Water Quality											
Sampling Location(s)		BIL04				Timeframe		July 2023 – June 2024			
Operational / Verification	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	364	6.67	6.89	7.05	7.2	7.34	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	364	0.019	0.167	0.378	1.178	1.95	≤5 (A)	0	
		True Colour (HU)	363	0	0	0	0	8	≤15 (A)	0	
		Total Iron (mg/L)	364	0	0	0.01	0.03	0.05	≤0.3 (A)	0	
		Total Manganese (mg/L)	364	0.004	0.01	0.03	0.064	0.12	≤0.5 (H) ≤0.1 (A)	0 (H)	
		Alkalinity (mg/L of CaCO3)	362	131	145	157	175	193			
		Fluoride (mg/L)	222	0.011	0.021	0.087	0.147	0.174	≤1.5 (H)	0	
		Free Chlorine (mg/L)	363	0.3	0.77	1.42	2.12	2.68	≥0.2 & ≤4.0 (H)	0	
		E. coli - Readycult	32	Absent							Not detected in any sample
		Total Coliforms	32	Absent							Not detected in any sample
Verification Microbial	QLD Health	*E. coli* (mpn/100mL)	51	0	0	0	0	0	<1 (H)	0	See note
		Total Coliforms (cfu/100mL)	51	0	0	0	0.6	4			See note
		Free Chlorine (mg/L)	45	0.35	0.85	1.49	2.01	2.17	≥0.2 & ≤4.0 (H)	0	
Verification THMs	QLD Health	Chloroform (µg/L)	11	10	14	25	41.5	42			
		Bromodichloromethane (µg/L)	11	8	15	29	51	53			
		Dibromochloromethane (µg/L)	11	11	16	32	50.5	53			
		Bromoform (µg/L)	11	9	9	13	19.5	20			
		Total Trihalomethanes (µg/L)	11	38	56	110	155	160	≤250 (H)	0	
Verification Standard Water Analysis	QLD Health	pH	5	6.88	6.96	7.54	7.74	7.78	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	5						≤5 (A)	0	5 of 5 samples are below LOD

		True Colour (HU)	5						≤15 (A)	0	5 of 5 samples are below LOD
		Iron (mg/L)	5						≤0.3 (A)	0	5 of 5 samples are below LOD
		Manganese (mg/L)	5	0.001	0.0011	0.002	0.0029	0.003	≤0.5 (H) ≤0.1 (A)	0 (H)	3 of 5 samples are below LOD
		Aluminium (mg/L)	5						≤0.2 (A)	0	5 of 5 samples are below LOD
		Alkalinity (Total) (mg/L CaCO3)	5	150	152	160	160	160			
		Residual Alkalinity (meq/L)	5	0	0	0	0	0			
		Total Hardness (mg/L CaCO3)	5	209	210.6	225	229.6	230	≤200 (A)	5	
		Temporary Hardness (mg/L CaCO3)	5	154	154.2	156	161.8	163			
		Total Dissolved Ions (mg/L)	5	450	453.8	488	490.8	491			
		Total Dissolved Solids (mg/L)	5	370	376	410	418	420	≤600 (A)	0	
		Conductivity (µS/cm)	5	710	716	780	780	780			
		Bicarbonate (mg/L CaCO3)	5	188	188	189	195.8	197			
		Carbonate (mg/L CaCO3)	5	0.1	0.12	0.4	0.74	0.8			
		Hydroxide (mg/L CaCO3)	5	0	0	0	0	0			
		Hydrogen (mg/L)	5	0	0	0	0	0			
		Boron (mg/L)	5	0.06	0.06	0.06	0.06	0.06	≤4 (H)	0	
		Calcium (mg/L)	5	46	46.4	50	50.8	51			
		Chloride (mg/L)	5	110	114	130	138	140	≤250 (A)	0	
		Copper (mg/L)	5						≤2 (H) ≤1 (A)	0	5 of 5 samples are below LOD
		Fluoride (mg/L)	5	0.12	0.126	0.16	0.178	0.18	≤1.5 (H)	0	
		Magnesium (mg/L)	5	23	23.2	24	25	25			
		Nitrate (mg/L)	5	3.9	3.96	4.3	5.12	5.3	≤50 (H)	0	
		Potassium (mg/L)	5	2.5	2.5	2.5	3.02	3.1			
		Silica (mg/L)	5	19	19.8	24	24.8	25	≤80 (A)	0	
		Sodium (mg/L)	5	58	58.4	63	64	64	≤180 (A)	0	

		Sulphate (mg/L)	5	13	13.4	16	17	17	≤250 (A)	0	
		Zinc (mg/L)	5						≤3 (A)	0	5 of 5 samples are below LOD
Verification Heavy Metals	QLD Health	Iron (mg/L)	5	Below LOD	0.009	0.018	0.028	0.03	≤0.3 (A)	0	1 of 5 samples is below LOD
		Manganese (dissolved) (mg/L)	5	0.002	0.004	0.013	0.076	0.091			
		Aluminium (mg/L)	5	0.007	0.0074	0.01	0.0148	0.016			
		Arsenic (mg/L)	5	0.0011	0.0011	0.0012	0.0014	0.0014	≤0.01 (H)	0	
		Cadmium (mg/L)	5						≤0.002 (H)	0	5 of 5 samples are below LOD
		Chromium (mg/L)	5	0.0001	0.00011	0.00015	0.0002	0.0002	≤0.05 (H)	0	3 of 5 samples below LOD
		Copper (mg/L)	5	0	0.0006	0.003	0.0214	0.026	≤2 (H) ≤1 (A)	0	
		Lead (mg/L)	5	0.0001	0.00011	0.0002	0.0002	0.0002	≤0.01 (H)	0	2 of 5 samples are below LOD
		Nickel (mg/L)	5	0.0003	0.00032	0.0004	0.00048	0.0005	≤0.02 (H)	0	
		Zinc (mg/L)	5	0.005	0.0054	0.007	0.0104	0.011	≤3 (A)	0	
		Total Beta activity (Bq/L)	-								No sampling required for 23/24FY
		K40-Corrected Beta Activity (Bq/L)	-								
Verification Pesticides	QLD Health	Dalapon (2,2-DPA) (µg/L)	2	0.9	0.9	0.9	0.9	0.9	≤500 (H)	0	
		2-Nitro-m-xylene (%)	3	61	62.3	74	82.1	83			
		Decachlorobiphenyl (µg/L)	3	104	105.4	118	125.2	126			
		Dibromobiphenyl (%)	3	92	93.1	103	103.9	104			
		Pyrene-d10 (%)	3	94	94.5	99	102.6	103			
		Triphenyl phosphate (%)	3	115	115.2	117	120.6	121			
		Other Pesticides	3						Various		All other pesticide samples are below LOD

Note: Samples received on 3/07/23 and 7/02/24 were received more than 2 days after collection and deemed unsuitable for microbiological analysis. These samples were not tested.

Biloela Reticulated Water

Table 9-1 BIL14 Water Quality

Biloela Reticulated Water Quality											
Sampling Location(s)		BIL14				Timeframe		July 2023 – June 2024			
Operational / **Verification**	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	52	6.8	6.9	7.16	7.5	7.59	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	52	0.18	0.21	0.42	0.95	1.91	≤5 (A)	0	
		True Colour (HU)	52	0	0	0	0	1	≤15 (A)	0	
		Total Iron (mg/L)	52	0	0.005	0.03	0.05	0.06	≤0.3 (A)	0	
		Total Manganese (mg/L)	52	0.007	0.013	0.027	0.053	0.076	≤0.5 (H) ≤0.1 (A)	0 (H)	
		Alkalinity (mg/L of CaCO3)	52	146	151.5	165	183	186			
		Free Chlorine (mg/L)	52	0.04	0.195	0.61	0.885	1.19	≤5 (H)	0	
		E. coli – Readycult	43	Absent							Not detected in any sample
		Total Coliforms	43	Absent							Not detected in any sample

Table E-3 BIL17 Water Quality

Biloela Reticulated Water Quality											
Sampling Location(s)		BIL17				Timeframe		July 2023 – June 2024			
Operational / **Verification**	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	50	6.86	6.97	7.13	7.32	7.37	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	50	0.16	0.17	0.41	1.01	2.08	≤5 (A)	0	
		True Colour (HU)	50	0	0	0	0	2	≤15 (A)	0	
		Total Iron (mg/L)	50	0	0	0.01	0.03	0.04	≤0.3 (A)	0	
		Total Manganese (mg/L)	50	0.01	0.013	0.028	0.051	0.105	≤0.5 (H) ≤0.1 (A)	0 (H)	
		Alkalinity (mg/L of CaCO3)	50	140	143	157	173	185			
		Free Chlorine (mg/L)	50	0.46	0.65	1.33	2.08	2.2	≤5 (H)	0	
		E. coli – Readycult	41	Absent							Not detected in any sample
		Total Coliforms	41	Absent							Not detected in any sample

Table E-4 BIL20 Water Quality

Biloela Reticulated Water Quality											
Sampling Location(s)		BIL20				Timeframe		July 2023 – June 2024			
Operational / Verification	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	51	6.62	6.9	7.08	7.23	7.28	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	51	0.02	0.16	0.48	1.02	1.79	≤5 (A)	0	
		True Colour (HU)	51	0	0	0	0	1	≤15 (A)	0	
		Total Iron (mg/L)	51	0	0	0.01	0.04	0.05	≤0.3 (A)	0	
		Total Manganese (mg/L)	51	0.007	0.014	0.033	0.059	0.144	≤0.5 (H) ≤0.1 (A)	0 (H)	
		Alkalinity (mg/L of CaCO3)	51	142	146	160	173	175			
		Free Chlorine (mg/L)	51	0.48	0.68	1.42	1.97	2.1	≤5 (H)	0	
		E. coli – Readycult	43	Absent							Not detected in any sample
		Total Coliforms	43	Absent							Not detected in any sample
Verification Microbial	QLD Health	Free Chlorine (mg/L)	45	0.35	0.45	1	1.5	1.83	≤5 (H)	0	
		E. coli (mpn/100mL)	50	0	0	0	0	0	<1 (H)	0	
		Total Coliforms (cfu/100mL)	50	0	0	0	0	0			

Table E-5 BIL36 Water Quality

Biloela Reticulated Water Quality											
Sampling Location(s)		BIL36				Timeframe		July 2023 – June 2024			
Operational / Verification	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	51	6.67	6.83	7.02	7.22	7.32	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	51	0.18	0.20	0.42	1.66	4.1	≤5 (A)	0	
		True Colour (HU)	51	0	0	0	0	14	≤15 (A)	0	
		Total Iron (mg/L)	51	0	0	0.01	0.04	0.05	≤0.3 (A)	0	
		Total Manganese (mg/L)	51	0.014	0.018	0.028	0.075	0.216	≤0.1 (A)	0	
		Alkalinity (mg/L of CaCO3)	50	140	143	157	177	180			
		Fluoride (mg/L)	-						≤1.5 (H)	0	Testing not performed
		Free Chlorine (mg/L)	51	0.13	0.37	1.27	1.89	2.06	≤5 (H)	0	
		E. coli – Readycult	42	Absent							Not detected in any sample
		Total Coliforms	42	Absent							Not detected in any sample

Thangool Reticulated Water

Table E-6 THA01 Water Quality

Thangool Reticulated Water Quality											
Sampling Location(s)		THA01				Timeframe		July 2023 – June 2024			
Operational / **Verification**	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	50	6.86	7.02	7.29	7.44	7.57	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	50	0.14	0.19	0.45	0.90	1.55	≤5 (A)	0	
		True Colour (HU)	50	0	0	0	0	1	≤15 (A)	0	
		Total Iron (mg/L)	50	0.00	0.00	0.01	0.03	0.04	≤0.3 (A)	0	
		Total Manganese (mg/L)	50	0.01	0.01	0.03	0.06	0.22	≤0.5 (H) ≤0.1 (A)	0 (H)	
		Alkalinity (mg/L of CaCO3)	50	129	134	156	176	183			
		Free Chlorine (mg/L)	50	0.25	0.68	1.26	1.85	2.11	≥0.2 & ≤5 (H)	0	Lower limit for chlorine at the booster pump station only
		E. coli – Readycult	42	Absent							Not detected in any sample
		Total Coliforms	42	Absent							Not detected in any sample

Table E-7 THA02 Water Quality

Thangool Reticulated Water Quality											
Sampling Location(s)		THA02				Timeframe		July 2023 – June 2024			
Operational / Verification	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	49	6.89	7.05	7.26	7.47	7.53	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	49	0.03	0.21	0.44	1.70	6.12	≤5 (A)	0	
		True Colour (HU)	49	0	0	0	0	13	≤15 (A)	0	
		Total Iron (mg/L)	49	0	0	0.01	0.03	0.04	≤0.3 (A)	0	
		Total Manganese (mg/L)	49	0.01	0.02	0.03	0.08	0.31	≤0.5 (H) ≤0.1 (A)	0 (H)	
		Alkalinity (mg/L of CaCO3)	49	136	144	155	172	181			
		Free Chlorine (mg/L)	49	0.25	0.96	1.42	1.77	1.92	≤5 (H)	0	
		E. coli – Readycult	41	Absent							Not detected in any sample
		Total Coliforms	41	Absent							Not detected in any sample
Verification Microbial	QLD Health	Free Chlorine (mg/L)	17	0.35	0.71	1.49	1.688	1.72	≤5 (H)	0	
		E. coli (mpn/100mL)	20	0	0	0	0	0	<1 (H)	0	See note
		Total Coliforms (cfu/100mL)	20	0	0	0	0	0			See note
Verification Disinfection	QLD Health	Chlorate (mg/L)	9	0.03	0.03	0.12	0.18	0.18			

Note: Samples received on 03/07/23 were received more than 2 days after collection and deemed unsuitable for microbiological analysis. These samples were not tested.

Table E-8 THA05 Water Quality

Thangool Reticulated Water Quality											
Sampling Location(s)		THA05				Timeframe		July 2023 – June 2024			
Operational / Verification	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	50	6.84	7.11	7.29	7.50	7.95	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	50	0.16	0.22	0.45	2.84	8.53	≤5 (A)	2	
		True Colour (HU)	50	0	0	0	0	21	≤15 (A)	0	
		Total Iron (mg/L)	50	0.00	0.00	0.02	0.06	0.12	≤0.3 (A)	0	
		Total Manganese (mg/L)	50	0.01	0.02	0.03	0.11	0.37	≤0.5 (H) ≤0.1 (A)	0 (H)	
		Alkalinity (mg/L of CaCO3)	50	112	142	158	174	183			
		Free Chlorine (mg/L)	50	0.22	0.80	1.36	1.69	2.01	≤5 (H)	0	
		E. coli – Readycult	41	Absent							Not detected in any sample
		Total Coliforms	41	Absent							Not detected in any sample

Callide Dam Village Reticulated Water

Table E-9 CAL01 Water Quality

Callide Dam Village Reticulated Water Quality											
Sampling Location(s)		CAL01				Timeframe		July 2023 – June 2024			
Operational / Verification	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	51	6.81	7.07	7.38	7.59	7.72	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	52	0.18	0.27	0.88	2.29	3.79	≤5 (A)	0	
		True Colour (HU)	52	0	0	0	22	61	≤15 (A)	4	
		Total Iron (mg/L)	52	0.00	0.00	0.01	0.05	0.13	≤0.3 (A)	0	
		Total Manganese (mg/L)	52	0.00	0.01	0.04	0.11	0.13	≤0.5 (H) ≤0.1 (A)	0 (H)	
		Alkalinity (mg/L of CaCO3)	51	123	131	150	169	181			
		Free Chlorine (mg/L)	51	0.04	0.06	0.65	1.62	2.20	≤5 (H)	0	
		E. coli – Readycult	43	Absent							Not detected in any sample
		Total Coliforms	43	Absent							Not detected in any sample
Verification Microbial	QLD Health	*E. coli* (mpn/100mL)	24	0	0	0	0	0	<1 (H)	0	See note
		Total Coliforms (cfu/100mL)	24	0	0	0	0	0			See note
		Free Chlorine (mg/L)	21	0.13	0.16	0.55	1.61	2.15	≤5 (H)	0	

Note: Samples received on 03/07/23 were received more than 2 days after collection and deemed unsuitable for microbiological analysis. These samples were not tested.

Table E-10 CAL02 Water Quality

Callide Dam Village Reticulated Water Quality											
Sampling Location(s)		CAL02				Timeframe		July 2023 – June 2024			
Operational / Verification	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	51	6.75	6.93	7.35	7.55	7.61	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	52	0.33	0.36	1.12	6.27	14.50	≤5 (A)	4	
		True Colour (HU)	52	0	0	0	32	68	≤15 (A)	5	
		Total Iron (mg/L)	52	0.00	0.00	0.01	0.07	0.10	≤0.3 (A)	0 (H)	
		Total Manganese (mg/L)	52	0.01	0.01	0.04	0.23	0.58	≤0.5 (H) ≤0.1 (A)	1 (H)	
		Alkalinity (mg/L of CaCO3)	51	128	130	148	167	186			
		Free Chlorine (mg/L)	51	0.06	0.27	0.93	2.20	2.20	≤5 (H)	0	
		E. coli – Readycult	49	Absent							Not detected in any sample
		Total Coliforms	49	Absent							Not detected in any sample

Baralaba Treated Water

Table E-11 BAR02 Water Quality

Baralaba WTP Treated Water Quality											
Sampling Location(s)		BAR02				Timeframe		July 2023 – June 2024			
Operational / Verification	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	103	5.27	6.191	6.8	7.34	7.9	≥6.5 & ≤8.5 (A)	20	
		Turbidity (NTU)	102	0.10	0.13	0.28	0.91	6.93	≤5 (A)	2	
		Apparent Colour (HU)	103	0	0	0	10	34			
		True Colour (HU)	103	0	0	0	0	4	≤15 (A)	0 (H)	
		Total Iron (mg/L)	101	0	0	0.01	0.08	0.23	≤0.3 (A)	0 (H)	
		Total Manganese (mg/L)	101	0.00	0.01	0.02	0.09	0.22	≤0.5 (H) ≤0.1 (A)	0 (H)	
		Soluble Manganese (mg/L)	10	0.01	0.01	0.03	0.36	0.53			
		Alkalinity (mg/L of CaCO3)	100	50	56	82	114	125			
		Free Chlorine (mg/L)	104	0.34	0.96	1.87	2.79	3.01	≥0.3 & ≤4.0	0	
		E. coli – Readycult	19	Absent							Not detected in any sample
		Total Coliforms	19	Absent							Not detected in any sample
Verification Microbial	QLD Health	Free Chlorine (mg/L)	22	0.89	1.11	2.07	2.66	2.96	≥0.3 & ≤4.0	0	
		E. coli (mpn/100mL)	24	0.00	0.00	0.00	0.00	0	<1 (H)	0	
		Total Coliforms (cfu/100mL)	24	0.00	0.00	0.00	0.00	0.00			
Verification THMs	QLD Health	Chloroform (µg/L)	10	47.00	48.80	68.50	137.50	160.00			
		Bromodichloromethane (µg/L)	10	10.00	10.45	15.50	49.50	54.00			
		Dibromochloromethane (µg/L)	10	1.00	1.40	2.00	19.00	21.00			1 of 10 samples below LOD
		Bromoform (µg/L)	10	2.00	2.00	2.00	2.00	2.00			8 of 10 samples below LOD
		Total Trihalomethanes (µg/L)	10	65.00	72.65	94.50	175.00	220.00	≤250 (H)	0	
Verification Standard	QLD Health	pH	6	6.64	6.73	7.01	7.33	7.40	≥6.5 & ≤8.5 (A)	0	

Water Analysis		Turbidity (NTU)	5						≤5 (A)	0	5 of 5 samples are below LOD
		True Colour (HU)	6						≤15 (A)	0	6 of 6 samples are below LOD
		Iron (mg/L)	6						≤0.3 (A)	0	6 of 6 samples are below LOD
		Manganese (mg/L)	6						≤0.5 (H) ≤0.1 (A)	0	6 of 6 samples are below LOD
		Aluminium (mg/L)	6						≤0.2 (A)	0	6 of 6 samples are below LOD
		Alkalinity (Total) (mg/L CaCO3)	6	33.00	33.50	62.00	81.25	85.00			
		Residual Alkalinity (meq/L)	6	0.00	0.00	0.10	0.20	0.20			
		Total Hardness (mg/L CaCO3)	6	32.00	32.25	54.50	73.75	77.00	≤200 (A)	0	
		Temporary Hardness (mg/L CaCO3)	6	32.00	32.25	54.50	73.75	77.00			
		Total Dissolved Ions (mg/L)	6	87.00	88.75	160.00	219.00	229.00			
		Total Dissolved Solids (mg/L)	6	81.00	82.00	140.00	182.50	190.00	≤600 (A)	0	
		Conductivity (µS/cm)	6	130.00	132.50	240.00	332.50	350.00			
		Bicarbonate (mg/L CaCO3)	6	40.00	40.75	75.00	98.75	103.00			
		Carbonate (mg/L CaCO3)	6	0.00	0.00	0.00	0.10	0.10			
		Hydroxide (mg/L CaCO3)	6	0.00	0.00	0.00	0.00	0.00			
		Hydrogen (mg/L)	6	0.00	0.00	0.00	0.00	0.00			
		Boron (mg/L)	6	0.03	0.03	0.05	0.06	0.06	≤4 (H)	0	
		Calcium (mg/L)	6	7.80	8.00	13.00	17.25	18.00			
		Chloride (mg/L)	6	17.00	17.50	31.50	49.50	52.00	≤250 (A)	0	
		Copper (mg/L)	6	0.01	0.01	0.01	0.01	0.01	≤2 (H) ≤1 (A)	0 (H)	
		Fluoride (mg/L)	6	0.08	0.08	0.11	0.16	0.17	≤1.5 (H)	0	
		Magnesium (mg/L)	6	2.50	2.68	5.15	7.60	7.90			
		Nitrate (mg/L)	6	0.29	0.32	0.60	1.38	1.40	≤50 (H)	0	
		Potassium (mg/L)	6	6.60	6.63	6.80	7.88	7.90			

		Silica (mg/L)	6	12.00	12.50	14.00	17.25	18.00	≤80 (A)	0	
		Sodium (mg/L)	6	8.80	9.35	21.50	34.00	36.00	≤180 (A)	0	
		Sulphate (mg/L)	6	1.70	1.73	3.35	5.25	5.30	≤250 (A)	0	
		Zinc (mg/L)	6						≤3 (A)	0	6 of 6 samples are below LOD
Verification Heavy Metals	QLD Health	Iron (mg/L)	5						≤0.3 (A)	0	5 of 5 samples are below LOD
		Manganese (dissolved) (mg/L)	5	0.009	0.010	0.017	0.073	0.087			
		Aluminium (mg/L)	5	0.006	0.006	0.006	0.006	0.006			
		Arsenic (mg/L)	5	0.000	0.000	0.000	0.001	0.001	≤0.01 (H)	0	
		Cadmium (mg/L)	5						≤0.002 (H)	0	5 of 5 samples are below LOD
		Chromium (mg/L)	5	0.000	0.000	0.001	0.001	0.002	≤0.05 (H)	0	
		Copper (mg/L)	5	0.009	0.009	0.010	0.012	0.012	≤2 (H) ≤1 (A)	0 (H)	
		Lead (mg/L)	5	0.000	0.000	0.000	0.000	0.000	≤0.01 (H)	0	
		Nickel (mg/L)	5	0.001	0.001	0.002	0.003	0.004	≤0.02 (H)	0	
		Zinc (mg/L)	5	0.004	0.004	0.006	0.008	0.008	≤3 (A)	0	
Verification Pesticides	QLD Health	Metolachlor ESA (µg/L)	3					0.10			2 out of 3 samples are below LOD
		Atrazine (µg/L)	4	0.08	0.09	0.15	0.16	0.16	≤20 (H)	0	
		Desethyl atrazine (µg/L)	4	0.01				0.02			2 out of 4 samples are below LOD
		Hexazinone (µg/L)	4	0.01	0.02	0.08	0.14	0.15	≤400 (H)	0	
		Metolachlor (µg/L)	4	0.01	0.02	0.05	0.15	0.17	≤300 (H)	0	
		Tebuthiuron (µg/L)	4	0.40	0.41	0.56	0.73	0.74			
		2,4-D (µg/L)	3					0.16	≤30 (H)	0	2 out of 3 samples are below LOD
		Atrazine, 2-hydroxy (µg/L)	3	0.01	0.013	0.04	0.085	0.09			
		Dalapon (2,2-DPA) (µg/L)	3	1.4	1.45	1.9	2.35	2.4	≤500 (H)	0	
		Metolachlor-OXA (µg/L)	3					0.2			2 out of 3 samples are below LOD

		2-Nitro-m-xylene (%)	3	37	41.3	80	84.5	85			
		Decachlorobiphenyl (µg/L)	3	111	112.5	126	201.6	210			
		Dibromobiphenyl (%)	3	101	101.4	105	127.5	130			
		Pyrene-d10 (%)	3	99	100.1	110	127.1	129			
		Triphenyl phosphate (%)	3	111	112.1	122	172.4	178			
		Other Pesticides									All other pesticide samples are below LOD

Baralaba Reticulated Water

Table E-12 BAR03 Water Quality

Baralaba Reticulated Water Quality											
Sampling Location(s)		BAR03				Timeframe		July 2023 – June 2024			
Operational / Verification	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	53	6.12	6.44	6.95	7.31	7.4	≥6.5 & ≤8.5 (A)	7	
		Turbidity (NTU)	53	0.14	0.16	0.39	1.01	4.16	≤5 (A)	0	
		True Colour (HU)	53	0	0	0	4	12	≤15 (A)	0	
		Total Iron (mg/L)	53	0.00	0.00	0.01	0.06	0.13	≤0.3 (A)	0	
		Total Manganese (mg/L)	52	0.00	0.01	0.03	0.10	0.131	≤0.5 (H) ≤0.1 (A)	0 (H)	
		Alkalinity (mg/L of CaCO3)	52	37	39	73	95	103			
		Free Chlorine (mg/L)	53	0.53	0.72	1.35	2.02	2.18	≤5 (H)	0	
		E. coli – Readycult	39	Absent							Not detected in any sample
		Total Coliforms	39	Absent							Not detected in any sample

Table E-13 BAR12 Water Quality

Baralaba Reticulated Water Quality											
Sampling Location(s)		BAR12				Timeframe		July 2023 – June 2024			
Operational / Verification	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	50	6.22	6.55	7.06	7.50	7.72	≥6.5 & ≤8.5 (A)	2	
		Turbidity (NTU)	50	0.15	0.16	0.29	1.57	3.74	≤5 (A)	0	
		True Colour (HU)	50	0	0	0	5	9	≤15 (A)	0	
		Total Iron (mg/L)	50	0.00	0.00	0.01	0.12	0.37	≤0.3 (A)	1	
		Total Manganese (mg/L)	50	0.000	0.008	0.020	0.053	0.212	≤0.5 (H) ≤0.1 (A)	0 (H)	
		Alkalinity (mg/L of CaCO3)	48	37	41	73	93	112			
		Free Chlorine (mg/L)	50	0.10	0.27	1.01	1.62	1.78	≤5 (H)	0	
		E. coli – Readycult	37	Absent							Not detected in any sample
		Total Coliforms	37	Absent							Not detected in any sample
Verification Microbial	QLD Health	Free Chlorine (mg/L)	5	0.32	0.374	0.91	1.63	1.73	≤5 (H)	0	
		E. coli (mpn/100mL)	7	0	0	0	0	0	<1 (H)	0	
		Total Coliforms (mpn/100mL)	7	0	0	0	0	0			

Goovigen Treated Water (Reservoir)

Table E-14 GOO04 Water Quality

Goovigen Treated Water Quality											
Sampling Location(s)		GOO04				Timeframe		July 2023 – June 2024			
Operational / Verification	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	48	6.55	6.58	6.71	6.91	6.97	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	48	0.11	0.14	0.41	1.24	4.57	≤5 (A)	0	
		Apparent Colour (HU)	48	0	0	0	32	56			
		True Colour (HU)	48	0	0	0	0	1	≤15 (A)	0	
		Total Iron (mg/L)	48	0.01	0.02	0.07	0.27	0.49	≤0.3 (A)	0	
		Total Manganese (mg/L)	48	0.02	0.02	0.06	0.15	0.18	≤0.5 (H) ≤0.1 (A)	0 (H)	
		Alkalinity (mg/L of CaCO3)	47	17	134	149	176	193			
		Salinity (mg/L)	48	0.20	0.23	0.30	0.40	887			
		Conductivity @ 25°C (µS/cm)	45	0	436	534	705	721			
		Free Chlorine (mg/L)	46	0.22	0.43	1.39	2.03	2.20	≥0.2 & ≤4.0 (H)	0	
		E. coli – Readycult	39	Absent							Not detected in any sample
		Total Coliforms	39	Absent							Not detected in any sample
Verification Microbial	QLD Health	Free Chlorine (mg/L)	7	0.42	0.56	1.08	1.37	1.41	≥0.2 & ≤4.0 (H)		
		E. coli (mpn/100mL)	9	0	0	0	0	0	<1 (H)		
		Total Coliforms (cfu/100mL)	9	0	0	0	0	0			
Verification THMs	Qld Health	Chloroform (µg/L)	1					1	≤250 (H)		
		Bromodichloromethane (µg/L)	1					6	≤250 (H)		
		Dibromochloromethane (µg/L)	1					9	≤250 (H)		
		Bromoform (µg/L)	1					6	≤250 (H)		
		Total Trihalomethanes (µg/L)	1	22	22	22	22	22	≤250 (H)	0	
Verification Standard	Qld Health	pH	1					7.4	≥6.5 & ≤8.5 (A)	0	

Water Analysis		Turbidity (NTU)	1						≤5 (A)	0	Sample below LOD
		True Colour (HU)	1						≤15 (A)	0	Sample below LOD
		Iron (mg/L)	1						≤0.3 (A)	0	Sample below LOD
		Manganese (mg/L)	1						≤0.5 (H) ≤0.1 (A)	0	Sample below LOD
		Aluminium (mg/L)	1						≤0.2 (A)	0	Sample below LOD
		Alkalinity (Total) (mg/L CaCO3)	1					150			
		Residual Alkalinity (meq/L)	1					0			
		Total Hardness (mg/L CaCO3)	1					155	≤200 (A)	0	
		Temporary Hardness (mg/L CaCO3)	1					154			
		Total Dissolved Ions (mg/L)	1					359			
		Total Dissolved Solids (mg/L)	1					300	≤600 (A)	0	
		Conductivity (µS/cm)	1					520			
		Bicarbonate (mg/L CaCO3)	1					187			
		Carbonate (mg/L CaCO3)	1					0.5			
		Hydroxide (mg/L CaCO3)	1					0			
		Hydrogen (mg/L)	1					0			
		Boron (mg/L)	1					0.06	≤4 (H)	0	
		Calcium (mg/L)	1					35			
		Chloride (mg/L)	1					61	≤250 (A)	0	
		Copper (mg/L)	1					0.034	≤2 (H) ≤1 (A)	0 (H)	
		Fluoride (mg/L)	1					0.13	≤1.5 (H)	0	
		Magnesium (mg/L)	1					16			
		Nitrate (mg/L)	1						≤50 (H)	0	Sample below LOD
		Potassium (mg/L)	1					2			
		Silica (mg/L)	1					33	≤80 (A)	0	
		Sodium (mg/L)	1					44	≤180 (A)	0	

		Sulphate (mg/L)	1					13	≤250 (A)	0	
		Zinc (mg/L)	1						≤3 (A)	0	Sample below LOD
Verification Heavy Metals	Qld Health	Iron (mg/L)						0.11	≤0.3 (A)	0	
		Manganese (dissolved) (mg/L)						0.047			
		Aluminium (mg/L)	1								Sample below LOD
		Arsenic (mg/L)	1					0.0004	≤0.01 (H)	0	
		Cadmium (mg/L)	1						≤0.002 (H)	0	Sample below LOD
		Chromium (mg/L)	1					0.0004	≤0.05 (H)	0	
		Copper (mg/L)	1					0.06	≤2 (H) ≤1 (A)	0 (H)	
		Lead (mg/L)	1					0.0004	≤0.01 (H)	0	
		Nickel (mg/L)	1					0.0008	≤0.02 (H)	0	
		Zinc (mg/L)	1					0.13	≤3 (A)	0	
Verification Pesticides	QLD Health	Pesticides	-						Various		Testing not performed

Goovigen Reticulated Water (Park)

Table E-15 GOO03 Water Quality

Goovigen Reticulated Water Quality											
Sampling Location(s)		GOO03				Timeframe		July 2023 – June 2024			
Operational / Verification	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	49	6.43	6.54	6.71	6.86	6.91	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	49	0.17	0.21	0.39	1.45	1.79	≤5 (A)	0 (H)	
		Apparent Colour (HU)	49	0	0	0	24	67			
		True Colour (HU)	48	0	0	0	5	25	≤15 (A)	0	
		Total Iron (mg/L)	49	0.010	0.020	0.070	0.297	0.550	≤0.3 (A)	0	
		Total Manganese (mg/L)	49	0.013	0.030	0.055	0.160	0.281	≤0.5 (H) ≤0.1 (A)	0 (H)	
		Alkalinity (mg/L of CaCO3)	48	133	139	153	168	170			
		Conductivity @ 25°C (µS/cm)	46	433	447.4	537	710.6	817			
		Salinity (mg/L)	49	0.3	0.3	0.3	0.4	0.4			
		Free Chlorine (mg/L)	45	0.19	0.80	1.33	1.97	2.20	≤5 (H)	0	
		E. coli – Readycult	40	Absent							Not detected in any sample
		Total Coliforms	40	Absent							Not detected in any sample
Verification Microbial	QLD Health	Free Chlorine (mg/L)	20	0.65	0.6785	1.31	1.84	1.84	≤5 (H)	0	
		E. coli (mpn/100mL)	20	0	0	0	0	0	<1 (H)	0	
		Total Coliforms (mpn/100mL)	20	0	0	0	0	0			

Moura Treated Water

Table E-16 MOU03 Water Quality

Moura Treated Water Quality											
Sampling Location(s)		MOU03				Timeframe		July 2023– June 2024			
Operational / Verification	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	366	6.61	7.01	7.17	7.63	7.37	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	366	0.04	0.13	0.24	0.58	2.30	≤5 (A)	0	
		True Colour (HU)	366	0	0	0	0	7	≤15 (A)	0	
		Total Iron (mg/L)	366	0.00	0.00	0.01	0.04	0.32	≤0.3 (A)	1	
		Total Manganese (mg/L)	366	0.00	0.00	0.01	0.03	0.24	≤0.5 (H) ≤0.1 (A)	0 (H)	
		Alkalinity (mg/L of CaCO3)	366	36	45	95	118	124			
		Fluoride (mg/L)	366						≤1.5 (H)	0	All samples below LOD
		Free Chlorine (mg/L)	366	0.23	0.99	1.54	2.06	2.62	≥0.2 & ≤5 (H)	0	
		E. coli - Readycult	53	Absent							Not detected in any sample
		Total Coliforms	53	Absent							Not detected in any sample
Verification Microbial	QLD Health	Free Chlorine (mg/L)	43	0.43	1.007	1.79	2.381	2.62	≥0.2 & ≤5 (H)	0	
		E. coli (mpn/100mL)	51	0	0	0	0	0	<1 (H)	0	See note
		Total Coliforms (cfu/100mL)	51	0	0	0	0	5			See note
Verification THMs	QLD Health	Chloroform (µg/L)	11	71	74.5	110	145	150	≤250 (H)		
		Bromodichloromethane (µg/L)	11	13	13.5	22	78	82	≤250 (H)		
		Dibromochloromethane (µg/L)	11	1	1	4	48	51	≤250 (H)		
		Bromoform (µg/L)	11	2	2	5	5.8	6	≤250 (H)		
		Total Trihalomethanes (µg/L)	11	110	120	150	235	240	≤250 (H)	0	
Verification Standard Water Analysis	QLD Health	pH	5	6.71	6.73	7.10	7.56	7.56	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	5						≤5 (A)	0	5 of 5 samples below LOD
		True Colour (HU)	5						≤15 (A)	0	5 of 5 samples below LOD

		Iron (mg/L)	5						≤0.3 (A)	0	5 of 5 samples below LOD
		Manganese (mg/L)	5	0.0000	0.0000	0.0010	0.0018	0.0020	≤0.5 (H) ≤0.1 (A)	0	
		Aluminium (mg/L)	5						≤0.2 (A)	0	5 of 5 samples below LOD
		Alkalinity (Total) (mg/L CaCO3)	5	44	47	97	100	100			
		Residual Alkalinity (meq/L)	5	0.00	0.02	0.20	0.28	0.30			
		Total Hardness (mg/L CaCO3)	5	41	42	82	95	95	≤200 (A)	0	
		Temporary Hardness (mg/L CaCO3)	5	41	42	82	95	95			
		Total Dissolved Ions (mg/L)	5	108	115	258	297	298			
		Total Dissolved Solids (mg/L)	5	96	101	210	248	250	≤600 (A)	0	
		Conductivity (µS/cm)	5	160	168	380	466	470			
		Bicarbonate (mg/L CaCO3)	5	53	57	117	125	126			
		Carbonate (mg/L CaCO3)	5	0.00	0.00	0.10	0.30	0.30			
		Hydroxide (mg/L CaCO3)	5	0.00	0.00	0.00	0.00	0.00			
		Hydrogen (mg/L)	5	0.00	0.00	0.00	0.00	0.00			
		Boron (mg/L)	5	0.03	0.03	0.05	0.05	0.05	≤4 (H)	0	
		Calcium (mg/L)	5	11	11	20	24	24			
		Chloride (mg/L)	5	19	20	54	80	82	≤250 (A)	0	
		Copper (mg/L)	5	0.01	0.01	0.01	0.02	0.02	≤2 (H) ≤1 (A)	0 (H)	
		Fluoride (mg/L)	5	0.09	0.09	0.12	0.18	0.18	≤1.5 (H)	0	
		Magnesium (mg/L)	5	3.00	3.12	7.80	9.20	9.30			
		Nitrate (mg/L)	5	0.17	0.18	0.31	1.64	1.80	≤50 (H)	0	
		Potassium (mg/L)	5	7.00	7.06	7.50	8.30	8.40			
		Silica (mg/L)	5	12.00	12.00	15.00	18.20	19.00	≤80 (A)	0	
		Sodium (mg/L)	5	11	12	42	51	52	≤180 (A)	0	

		Sulphate (mg/L)	5	2.20	2.32	4.80	7.26	7.30	≤250 (A)	0	
		Zinc (mg/L)	5						≤3 (A)	0	5 of 5 samples below LOD
Verification Heavy Metals	QLD Health	Iron (mg/L)	4					0.018	≤0.3 (A)	0	3 out of 4 samples below LOD
		Manganese (dissolved) (mg/L)	4	0.0007	0.0009	0.0020	0.0074	0.0083			
		Aluminium (mg/L)	4	0.005	0.0053	0.019	0.0336	0.034			
		Arsenic (mg/L)	4	0.0006	0.0006	0.0007	0.0011	0.0012	≤0.01 (H)	0	
		Cadmium (mg/L)	4						≤0.002 (H)	0	4 of 4 samples below LOD
		Chromium (mg/L)	4					0.0001	≤0.05 (H)	0	3 out of 4 samples below LOD
		Copper (mg/L)	4	0.009	0.0096	0.015	0.020	0.021	≤2 (H) ≤1 (A)	0 (H)	
		Lead (mg/L)	4	Below LOD	0.00011	0.0002	0.0002	0.0002	≤0.01 (H)	0	1 out of 4 samples is below LOD
		Nickel (mg/L)	4	0.0006	0.0006	0.0007	0.0008	0.0008	≤0.02 (H)	0	
		Zinc (mg/L)	4	0.003	0.00315	0.0055	0.00955	0.01	≤3 (A)	0	
Verification Pesticides	QLD Health	Metolachlor ESA (µg/L)	5	Below LOD	0.0215	0.04	0.0585	0.06			1 of 5 values is below LOD
		Atrazine (µg/L)	5					0.02	≤20 (H)	0	4 of 5 values are below LOD
		Hexazinone (µg/L)	5					0.02	≤400 (H)	0	4 of 5 values are below LOD
		Metolachlor (µg/L)	5	0.02	0.0215	0.04	0.067	0.07	≤300 (H)	0	1 of 5 values is below LOD
		Tebuthiuron (µg/L)	5	0.32	0.35	0.77	1.064	1.1			
		Atrazine, 2-hydroxy (µg/L)	5	0.01	0.012	0.03	0.038	0.04			
		Dalapon (2,2-DPA) (µg/L)	5	1.9	1.9	2.1	2.92	3	≤500 (H)	0	
		Imazapic (µg/L)	5					0.01			4 of 5 values are below LOD

		Metolachlor-OXA (µg/L)	5					0.06			3 of 5 values are below LOD
		Propazin-2-hydroxy (µg/L)	5					0.01			4 of 5 values are below LOD
		2-Nitro-m-xylene (%)	5	58	58.6	72	80.6	82			
		Decachlorobiphenyl (µg/L)	5	108	108.8	114	130	132			
		Dibromobiphenyl (%)	5	86	87.8	98	109	111			
		Pyrene-d10 (%)	5	97	97.4	100	108.4	110			
		Triphenyl phosphate (%)	5	113	113.6	118	130.8	134			
		Other Pesticides							Various		All other samples are below LOD

Note: Samples received on 03/07/2023 were received more than 2 days after collection and deemed unsuitable for microbiological analysis. These samples were not tested.

Moura Reticulated Water

Table E-17 MOU09 Water Quality

Moura Reticulated Water Quality											
Sampling Location(s)		MOU09				Timeframe		July 2023 – June 2024			
Operational / Verification	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	50	6.77	7.07	7.27	7.72	7.80	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	50	0.13	0.17	0.30	0.67	0.90	≤5 (A)	0	
		True Colour (HU)	50	0	0	0	5	16	≤15 (A)	16	
		Total Iron (mg/L)	49	0	0.004	0.02	0.05	0.2	≤0.3 (A)	0 (H)	
		Total Manganese (mg/L)	50	0	0.0015	0.014	0.029	0.033	≤0.5 (H) ≤0.1 (A)	0	
		Alkalinity (mg/L of CaCO3)	50	38	45	87	115	117			
		Free Chlorine (mg/L)	50	0.24	0.50	1.14	1.76	2.06	≤5 (H)	0	
		E. coli - Readycult	46	Absent							Not detected in any sample
		Total Coliforms	46	Absent							Not detected in any sample
Verification Microbial	QLD Health	Free Chlorine (mg/L)	45	0.57	0.74	1.07	1.61	2.13	≤5 (H)	0	
		E. coli (mpn/100mL)	46	0	0	0	0	0	<1 (H)	0	See note
		Total Coliforms (cfu/100mL)	51	0	0	0	0	2			See note

Note: Samples received on 03/07/2023 were received more than 2 days after collection and deemed unsuitable for microbiological analysis. These samples were not tested.

Table E-18 MOU11 Water Quality

Moura Reticulated Water Quality											
Sampling Location(s)		MOU11				Timeframe		July 2023 – June 2024			
Operational / Verification	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	49	7.03	7.10	7.28	7.55	7.77	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	49	0.12	0.14	0.31	0.67	0.78	≤5 (A)	0	
		True Colour (HU)	49	0	0	0	3	15	≤15 (A)	0	
		Total Iron (mg/L)	48	0.00	0.01	0.02	0.08	0.21	≤0.3 (A)	0	
		Total Manganese (mg/L)	49	0	0.000	0.013	0.027	0.050	≤0.5 (H) ≤0.1 (A)	0 (H)	
		Alkalinity (mg/L of CaCO3)	49	38	44	74	118	119			
		Free Chlorine (mg/L)	49	0.09	0.46	1.30	1.88	1.97	≤5 (H)	0	
		E. coli - Readycult	46	Absent							Not detected in any sample
		Total Coliforms	46	Absent							Not detected in any sample
Verification Microbial	QLD Health	Free Chlorine (mg/L)	43	0.26	0.48	1.26	1.83	1.98	≤5 (H)	0	
		E. coli (mpn/100mL)	44	0	0	0	0	0	<1 (H)	0	See note
		Total Coliforms (cfu/100mL)	49	0	0	0	0	0			See note

Note: Samples received on 03/07/2023 were received more than 2 days after collection and deemed unsuitable for microbiological analysis. These samples were not tested.

Table E-19 MOU25 Water Quality

Moura Reticulated Water Quality											
Sampling Location(s)		MOU25				Timeframe		July 2023 – June 2024			
Operational / Verification	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	50	7.11	7.18	7.32	7.68	7.79	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	51	0.12	0.15	0.27	0.54	2.21	≤5 (A)	0	
		True Colour (HU)	51	0	0	0	12	31	≤15 (A)	3	
		Total Iron (mg/L)	49	0.00	0.00	0.01	0.04	0.07	≤0.3 (A)	0	
		Total Manganese (mg/L)	51	0.000	0.001	0.013	0.033	0.128	≤0.5 (H) ≤0.1 (A)	0 (H)	
		Alkalinity (mg/L of CaCO3)	50	39	44	88	116	118			
		Free Chlorine (mg/L)	51	0.28	0.59	1.16	1.73	1.85	≤5 (H)	0	
		E. coli - Readycult	46	Absent							Not detected in any sample
		Total Coliforms	46	Absent							Not detected in any sample

Table E-20 MOU26 Water Quality

Moura Reticulated Water Quality											
Sampling Location(s)		MOU26				Timeframe		July 2023 – June 2024			
Operational / Verification	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	50	7.11	7.147	7.29	7.65	7.81	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	50	0.13	0.15	0.26	0.48	1.12	≤5 (A)	0	
		True Colour (HU)	50	0	0	0	9	12	≤15 (A)	0	
		Total Iron (mg/L)	49	0	0	0.01	0.04	0.09	≤0.3 (A)	0	
		Total Manganese (mg/L)	50	0.000	0.000	0.009	0.038	0.049	≤0.5 (H) ≤0.1 (A)	0 (H)	
		Alkalinity (mg/L of CaCO3)	50	37	46	78	117	120			
		Free Chlorine (mg/L)	50	0.29	0.43	0.97	1.53	1.67	≤5 (H)	0	
		E. coli - Readycult	46	Absent							Not detected in any sample
		Total Coliforms	46	Absent							Not detected in any sample

Banana Reticulated Water

Table E-21 BAN01 Water Quality

Banana Reticulated Water Quality											
Sampling Location(s)		BAN01				Timeframe		July 2023 – June 2024			
Operational / Verification	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	51	6.97	7.03	7.25	7.65	7.98	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	51	0.01	0.18	0.28	0.49	0.70	≤5 (A)	0	
		True Colour (HU)	51	0	0	0	3	29	≤15 (A)	1	
		Total Iron (mg/L)	51	0	0	0.02	0.045	0.09	≤0.3 (A)	0	
		Total Manganese (mg/L)	51	0	0.002	0.013	0.035	0.102	≤0.5 (H) ≤0.1 (A)	0 (H)	
		Alkalinity (mg/L of CaCO3)	51	1	42	96	117	120			
		Free Chlorine (mg/L)	51	0.51	0.82	1.65	2.36	2.73	≥0.2 & ≤4.0 (H)	0	Limits for re-chlorination
		E. coli - Readycult	45	Absent							Not detected in any sample
		Total Coliforms	45	Absent							Not detected in any sample

Table E-22 BAN04 Water Quality

Banana Reticulated Water Quality											
Sampling Location(s)		BAN04				Timeframe		July 2023 – June 2024			
Operational / Verification	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	51	6.67	6.97	7.24	7.54	7.84	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	51	0.15	0.19	0.29	0.48	0.75	≤5 (A)	0	
		True Colour (HU)	51	0	0	0	3	5	≤15 (A)	0	
		Total Iron (mg/L)	51	0	0	0.02	0.06	0.1	≤0.3 (A)	0	
		Total Manganese (mg/L)	51	0	0.001	0.013	0.035	0.12	≤0.5 (H) ≤0.1 (A)	0 (H)	
		Alkalinity (mg/L of CaCO3)	51	36	46	95	115	118			
		Free Chlorine (mg/L)	22	0.39	0.49	1.46	2.13	2.47	≤5 (H)	0	
		E. coli - Readycult	44	Absent							Not detected in any sample
		Total Coliforms	44	Absent							Not detected in any sample
Verification Microbial	QLD Health	Free Chlorine (mg/L)	22	0.34	0.68	1.16	2.05	2.17	≤5 (H)	0	
		E. coli (mpn/100mL)	14	0	0	0	0	0	<1 (H)	0	
		Total Coliforms (mpn/100mL)	22	0	0	0	0	0			

Theodore Treated Water

Table E-23 THE03 Water Quality

Theodore WTP Treated Water Quality											
Sampling Location(s)		THE03				Timeframe		July 2023 – June 2024			
Operational / Verification	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	364	6.26	6.53	6.97	7.17	7.36	≥6.5 & ≤8.5 (A)	17	
		Turbidity (NTU)	366	0.06	0.07	0.11	0.20	0.71	≤5 (A)	0	
		True Colour (HU)	366	0	0	0	0	5	≤15 (A)	0	
		Total Iron (mg/L)	363	0	0	0.01	0.03	0.07	≤0.3 (A)	0	
		Total Manganese (mg/L)	232	0	0	0.004	0.01	0.067	≤0.5 (H) ≤0.1 (A)	0 (H)	
		Alkalinity (mg/L of CaCO3)	366	30	35	56	90	130			
		Free Chlorine (mg/L)	366	0.71	0.92	1.31	1.75	2.08	≥0.2 & ≤5 (H)	0	
		E. coli - Readycult	4	Absent							Not detected in any sample
		Total Coliforms	4	Absent							Not detected in any sample
Verification Microbial	QLD Health	Free Chlorine (mg/L)	6	0.99	1.02	1.43	1.49	1.49	≥0.2 & ≤5 (H)	0	
		E. coli (mpn/100mL)	9	0	0	0	0	0	<1 (H)	0	
		Total Coliforms (cfu/100mL)	10	0	0	0	0	0			
Verification THMs	QLD Health	THMs	-								Testing not performed
Verification Standard Water Analysis	QLD Health	pH	2	6.64	6.65	6.70	6.74	6.75	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	2						≤5 (A)	0	2 of 2 samples below LOD
		True Colour (HU)	2						≤15 (A)	0	2 of 2 samples below LOD
		Iron (mg/L)	2						≤0.3 (A)	0	2 of 2 samples below LOD
		Manganese (mg/L)	2						≤0.5 (H) ≤0.1 (A)	0	2 of 2 samples below LOD
		Aluminium (mg/L)	2						≤0.2 (A)	0	2 of 2 samples below LOD
		Alkalinity (Total) (mg/L CaCO3)	2	64	64	69	73	73			
		Residual Alkalinity (meq/L)	2	0.3	0.3	0.3	0.3	0.3			
		Total Hardness (mg/L CaCO3)	2	51	51	56	60	60	≤200 (A)	0	

		Temporary Hardness (mg/L CaCO3)	2	51	51	56	60	60			
		Total Dissolved Ions (mg/L)	2	167	168	179	189	190			
		Total Dissolved Solids (mg/L)	2	140	141	150	159	160	≤600 (A)	0	
		Conductivity (µS/cm)	2	240	242	260	278	280			
		Bicarbonate (mg/L CaCO3)	2	79	79.5	84	88.5	89			
		Carbonate (mg/L CaCO3)	2	0	0	0	0	0			
		Hydroxide (mg/L CaCO3)	2	0	0	0	0	0			
		Hydrogen (mg/L)	2	0	0	0	0	0			
		Boron (mg/L)	2	0.04	0.04	0.04	0.04	0.04	≤4 (H)	0	
		Calcium (mg/L)	2	14	14.1	15	15.9	16			
		Chloride (mg/L)	2	34	34.25	36.5	38.75	39	≤250 (A)	0	
		Copper (mg/L)	2	0.017	0.017	0.021	0.024	0.024	≤2 (H) ≤1 (A)	0 (H)	
		Fluoride (mg/L)	2	0.10	0.10	0.11	0.11	0.11	≤1.5 (H)	0	
		Magnesium (mg/L)	2	4.1	4.15	4.55	4.96	5			
		Nitrate (mg/L)	2	0.7	0.715	0.85	0.985	1	≤50 (H)	0	
		Potassium (mg/L)	2	7.1	7.11	7.15	7.20	7.2			
		Silica (mg/L)	2	13	13.1	14	14.9	15	≤80 (A)	0	
		Sodium (mg/L)	2	25	25.15	26.5	27.85	28	≤180 (A)	0	
		Sulphate (mg/L)	2	3.8	3.9	4.4	4.8	4.9	≤250 (A)	0	
		Zinc (mg/L)	2						≤3 (A)	0	2 of 2 samples below LOD
Verification Heavy Metals	QLD Health	Iron (mg/L)	2						≤0.3 (A)	0	2 of 2 samples below LOD
		Manganese (dissolved) (mg/L)	2	0.0002	0.0002	0.0002	0.0002	0.0002			
		Aluminium (mg/L)	2					0.007			1 of 2 samples below LOD
		Arsenic (mg/L)	2	0.0005	0.00052	0.0007	0.00088	0.0009	≤0.01 (H)	0	
		Cadmium (mg/L)	2						≤0.002 (H)	0	2 of 2 samples below LOD
		Chromium (mg/L)	2						≤0.05 (H)	0	2 of 2 samples below LOD
		Copper (mg/L)	2	0.018	0.0184	0.022	0.0256	0.026	≤2 (H) ≤1 (A)	0 (H)	
		Lead (mg/L)	2						≤0.01 (H)	0	2 of 2 samples below LOD

		Nickel (mg/L)	2	0.0006	0.00061	0.00065	0.00070	0.0007	≤0.02 (H)	0	
		Zinc (mg/L)	2	0.005	0.0051	0.0055	0.0060	0.006	≤3 (A)	0	
Verification Pesticides	QLD Health	Fluxapyroxad (µg/L)	12					0.03		0	11 of 12 samples are below LOD
		Metolachlor ESA (µg/L)	14	0.02	0.021	0.03	0.048	0.05		0	11 of 14 samples are below LOD
		Atrazine (µg/L)	14	0.02	0.02	0.03	0.0575	0.06	≤20 (H)	0	8 of 14 samples are below LOD
		Desethyl atrazine (µg/L)	14					0.02		0	13 of 14 samples are below LOD
		Diuron (µg/L)	14	0.04	0.041	0.05	0.059	0.06	≤20 (H)	0	11 of 14 samples are below LOD
		Hexazinone (µg/L)	14	0.01	0.01	0.01	0.0265	0.03	≤400 (H)	0	6 of 14 samples are below LOD
		Metolachlor (µg/L)	14	0.01	0.01	0.01	0.0595	0.07	≤300 (H)	0	6 of 14 samples are below LOD
		Tebuthiuron (µg/L)	12	0.23	0.24	0.695	1.37	1.7			
		Pendimethalin (µg/L)	12					0.02	≤400 (H)	0	11 of 12 samples are below LOD
		Terbuthylazine (µg/L)	12	0.02	0.02	0.02	0.02	0.02	≤10 (H)	0	10 of 12 samples are below LOD
		Diazinon (µg/L)	14					0.02	≤4 (H)	0	13 of 14 samples are below LOD
		Acetamiprid (µg/L)	14					0.8			13 of 14 samples are below LOD
		Atrazine, 2-hydroxy (µg/L)	14	0.01	0.01	0.02	0.038	0.04			9 of 14 samples are below LOD
		Dalapon (2,2-DPA) (µg/L)	14	0.3	0.3	0.6	0.99	1.1	≤500 (H)	0	2 of 14 samples are below LOD
		Fluroxypyr (µg/L)	14					0.01			13 of 14 samples are below LOD
		Methoxyfenozide (µg/L)	14					0.52			13 of 14 samples are below LOD
		Metolachlor-OXA (µg/L)	14					0.05			13 of 14 samples are below LOD
		Propazin-2-hydroxy (µg/L)	12					0.02			11 of 12 samples are below LOD
		2-Nitro-m-xylene (%)	2	62	62.3	65	67.7	68			
		Decachlorobiphenyl (µg/L)	2	121	121.65	127.5	133.35	134			
		Dibromobiphenyl (%)	2	101	101.1	102	102.9	103			
		Pyrene-d10 (%)	2	92	92.45	96.5	100.55	101			
		Triphenyl phosphate (%)	2	129	129.2	131	132.8	133			
		Metalaxyl (µg/L)	14					0.01			13 of 14 samples are below LOD

Theodore Reticulated Water

Table E-24 THE05 Water Quality

Theodore Reticulated Water Quality											
Sampling Location(s)		THE05				Timeframe		July 2023 – June 2024			
Operational / Verification	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	42	6.97	7.01	7.23	7.36	7.67	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	42	0.01	0.02	0.11	0.28	0.48	≤5 (A)	0	
		True Colour (HU)	41	0	0	0	4	8	≤15 (A)	0	
		Total Iron (mg/L)	42	0	0	0.01	0.04	0.04	≤0.3 (A)	0	
		Total Manganese (mg/L)	41	0	0	0.004	0.009	0.01	≤0.5 (H) ≤0.1 (A)	0 (H)	
		Alkalinity (mg/L of CaCO3)	8	44	44	54	61	62			
		Free Chlorine (mg/L)	42	0.28	0.58	1.07	1.90	1.94	≤5 (H)	0	
		E. coli - Readycult	32	Absent							Not detected in any sample
		Total Coliforms	5	Absent							Not detected in any sample
Verification Microbial	QLD Health	Free Chlorine (mg/L)	6	0.33	0.43	1.07	1.66	1.69	≤5 (H)	0	
		E. coli (mpn/100mL)	10	0	0	0	0	0	<1 (H)	0	
		Total Coliforms (mpn/100mL)	10	0	0	0	0	0			

Table E-25 THE06 Water Quality

Theodore Reticulated Water Quality											
Sampling Location(s)		THE06				Timeframe		July 2023 – June 2024			
Operational / Verification	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	42	6.94	7.04	7.22	7.43	7.53	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	42	0.02	0.06	0.18	0.47	0.48	≤5 (A)	0	
		True Colour (HU)	42	0	0	0	4	5	≤15 (A)	0	
		Total Iron (mg/L)	42	0	0	0.02	0.05	0.07	≤0.3 (A)	0	
		Total Manganese (mg/L)	42	0	0	0.005	0.011	0.02	≤0.5 (H) ≤0.1 (A)	0	
		Alkalinity (mg/L of CaCO3)	8	45	45	46	59	60			
		Free Chlorine (mg/L)	42	0.23	0.26	0.70	1.15	1.31	≤5 (H)	0	
		E. coli - Readycult	27	Absent							Not detected in any sample
		Total Coliforms	3	Absent							Not detected in any sample
Verification Microbial	QLD Health	Free Chlorine (mg/L)	6	0.23	0.32	0.60	0.87	0.87	≤5 (H)	0	
		E. coli (mpn/100mL)	9	0	0	0	0	0	<1 (H)	0	
		Total Coliforms (cfu/100mL)	10	0	0	0	3.1	4			Coliforms detected in 3 samples

Table E-26 THE09 Water Quality

Theodore Reticulated Water Quality											
Sampling Location(s)		THEO09				Timeframe		July 2023 – June 2024			
Operational / Verification	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	42	7.02	7.05	7.2	7.36	7.67	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	42	0.01	0.04	0.14	0.43	0.48	≤5 (A)	0	
		True Colour (HU)	42	0	0	0	7	19	≤15 (A)	1	
		Total Iron (mg/L)	42	0	0	0.02	0.04	0.06	≤0.3 (A)	0	
		Total Manganese (mg/L)	42	0	0	0.005	0.008	0.018	≤0.5 (H) ≤0.1 (A)	0 (H)	
		Alkalinity (mg/L of CaCO3)	8	44	44	52	61	62			
		Free Chlorine (mg/L)	42	0.22	0.33	0.87	1.49	1.9	≤5 (H)	0	
		E. coli - Readycult	27	Absent							Not detected in any sample
		Total Coliforms	3	Absent							Not detected in any sample
Verification Microbial	QLD Health	Free Chlorine (mg/L)	6	0.39	0.45	0.76	1.51	1.73	≤5 (H)	0	
		E. coli (mpn/100mL)	9	0	0	0	0	0	<1 (H)	0	
		Total Coliforms (cfu/100mL)	10	0	0	0	0	0			

Taroom Treated Water

Table E-27 TAR03 Water Quality

Taroom WTP Treated Water Quality											
Sampling Location(s)		TAR03				Timeframe		July 2023 – June 2024			
Operational / Verification	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	366	6.5	7.18	7.43	7.80	8.17	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	366	0.10	0.16	0.22	0.69	4.03	≤5 (A)	0	
		True Colour (HU)	366	0	0	0	5	14	≤15 (A)	0	
		Total Iron (mg/L)	366	0	0	0.01	0.04	0.1	≤0.3 (A)	0	
		Total Manganese (mg/L)	366	0	0	0.006	0.018	0.051	≤0.5 (H) ≤0.1 (A)	0 (H)	
		Alkalinity (mg/L of CaCO3)	366	43	50	60	60	68			
		Free Chlorine (mg/L)	366	0.1	0.76	0.96	1.27	1.95	≥0.2 & ≤5 (H)	1	
Verification Microbial	QLD Health	Free Chlorine (mg/L)	-						≥0.2 & ≤5 (H)	0	Testing not performed
		E. coli (mpn/100mL)	8	0	0	0	0	0	<1 (H)	0	
		Total Coliforms (cfu/100mL)	10	0	0	0	0	0			
Verification THMs	QLD Health	THMs	-						≤250 (H) (Total THMs)	0	Testing not performed
Verification Standard Water Analysis	QLD Health	pH	4	7.22	7.23	7.34	7.40	7.41	≥6.5 & ≤8.5 (A)	0	1 sample point is “MD”
		Turbidity (NTU)	4	2	2	2	2	2	≤5 (A)	0	2 of 4 samples are below LOD. 1 sample point is “MD”
		True Colour (HU)	4						≤15 (A)	0	3 of 4 samples are below LOD. The remaining sample is “MD”
		Iron (mg/L)	4	0.03	0.036	0.09	0.333	0.36	≤0.3 (A)	0	1 sample is “MD”
		Manganese (mg/L)	4	0.001	0.001	0.001	0.0037	0.004	≤0.5 (H) ≤0.1 (A)	0 (H)	1 sample is “MD”

		Aluminium (mg/L)	4						≤0.2 (A)	0	3 of 4 samples are below LOD. The remaining sample is “MD”
		Alkalinity (Total) (mg/L CaCO3)	4	57	57.1	58	58.9	59			1 sample is “MD”
		Residual Alkalinity (meq/L)	4	1.1	1.1	1.1	1.1	1.1			
		Total Hardness (mg/L CaCO3)	4	3.1	3.11	3.2	3.2	3.2	≤200 (A)	0	1 sample is “MD”
		Temporary Hardness (mg/L CaCO3)	4	3.1	3.11	3.2	3.2	3.2			1 sample is “MD”
		Total Dissolved Ions (mg/L)	4	116	116.1	117	118.8	119			1 sample is “MD”
		Total Dissolved Solids (mg/L)	4	99	99	99	99.9	100	≤600 (A)	0	1 sample is “MD”
		Conductivity (µS/cm)	4	140	140	140	140	140			1 sample is “MD”
		Bicarbonate (mg/L CaCO3)	4	70	70	70	71.8	72			1 sample is “MD”
		Carbonate (mg/L CaCO3)	4	0.1	0.1	0.1	0.1	0.1			1 sample is “MD”
		Hydroxide (mg/L CaCO3)	4	0	0	0	0	0			1 sample is “MD”
		Hydrogen (mg/L)	4	0	0	0	0	0			1 sample is “MD”
		Boron (mg/L)	4						≤4 (H)	0	3 of 4 samples are below LOD. The remaining sample is “MD”
		Calcium (mg/L)	4	0.8	0.8	0.8	0.8	0.8			1 sample is “MD”
		Chloride (mg/L)	4	11	11.1	12	12	12	≤250 (A)	0	1 sample is “MD”
		Copper (mg/L)	4	0.004	0.0042	0.006	0.0132	0.014	≤2 (H) ≤1 (A)	0 (H)	1 sample is “MD”
		Fluoride (mg/L)	4	0.1	0.101	0.11	0.11	0.11	≤1.5 (H)	0	1 sample is “MD”
		Magnesium (mg/L)	4	0.29	0.29	0.29	0.29	0.29			1 sample is “MD”
		Nitrate (mg/L)	4	0.08	0.081	0.09	0.153	0.16	≤50 (H)	0	1 sample is “MD”
		Potassium (mg/L)	4	2	2	2	2	2			1 sample is “MD”
		Silica (mg/L)	4	18	18	18	18.9	19	≤80 (A)	0	1 sample is “MD”

		Sodium (mg/L)	4	31	31	31	31	31	≤180 (A)	0	1 sample is “MD”
		Sulphate (mg/L)	4					0.4	≤250 (A)	0	2 of 4 samples are below LOD. 1 sample is “MD”
		Zinc (mg/L)	4						≤3 (A)	0	3 of 4 samples are below LOD. The remaining sample is “MD”
Verification Heavy Metals	QLD Health	Iron (mg/L)	4	1.6	1.7	2.4	2.9	2.9	≤0.3 (A)	4	
		Manganese (dissolved) (mg/L)	4	0.023	0.024	0.028	0.036	0.037			
		Aluminium (mg/L)	4					0.004			3 of 4 samples are below LOD
		Arsenic (mg/L)	4	Below LOD	0.0001	0.0001	0.0001	0.0001	≤0.01 (H)	0	1 of 4 samples is below LOD
		Cadmium (mg/L)	4						≤0.002 (H)	0	4 of 4 samples are below LOD
		Chromium (mg/L)	4					0.0001	≤0.05 (H)	0	3 of 4 samples are below LOD
		Copper (mg/L)	4	0.055	0.055	0.057	0.062	0.063	≤2 (H) ≤1 (A)	0 (H)	
		Lead (mg/L)	4	0.0013	0.0013	0.0017	0.0025	0.0026	≤0.01 (H)	0	
		Nickel (mg/L)	4	0.0001	0.00011	0.00015	0.00020	0.0002	≤0.02 (H)	0	2 of 4 samples are below LOD
		Zinc (mg/L)	4	0.012	0.0126	0.017	0.0206	0.021	≤3 (A)	0	
Verification Pesticides	QLD Health	2-Nitro-m-xylene (%)	1					72			
		Decachlorobiphenyl (µg/L)	1					101			
		Dibromobiphenyl (%)	1					90			
		Pyrene-d10 (%)	1					93			
		Triphenyl phosphate (%)	1					99			

Taroom Reticulated Water

Table E-28 TAR06 Water Quality

Taroom WTP Treated Water Quality											
Sampling Location(s)		**TAR03**				**Timeframe**		**July 2023 – June 2024**			
Operational / Verification	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	52	6.88	7.00	7.25	7.58	7.7	≥6.5 & ≤8.5 (A)	0	0.89 on 21/05/2024 is assumed to be an error and has been excluded from statistical analysis
		Turbidity (NTU)	366	52	0.19	0.21	0.35	1.11	2.26	≤5 (A)	0
		True Colour (HU)	366	52	0	0	0.01	0.04	0.06	≤0.3 (A)	
		Total Iron (mg/L)	366	52	0	0	0.01	0.04	0.06	≤0.3 (A)	
		Total Manganese (mg/L)	366	52	0	0	0.007	0.037	0.08	≤0.5 (H) ≤0.1 (A)	0 (H)
		Alkalinity (mg/L of CaCO3)	366	52	50	50	56	66	79		
		Free Chlorine (mg/L)	366	52	0.42	0.48	0.79	1.15	1.26	≤5 (H)	0
		E. coli – Readycult	51	Absent							Not detected in any sample
		Total Coliforms	33	Absent							Not detected in any sample
Verification Microbial	QLD Health	Free Chlorine (mg/L)	10	0.44	0.51	0.83	1.04	1.08	≤5 (H)	0	
		E. coli (mpn/100mL)	8	0	0	0	0	0	<1 (H)	0	
		Total Coliforms (cfu/100mL)	11	0	0	0	0	0			

Table E-29 TAR15 Water Quality

Taroom Reticulated Water Quality											
Sampling Location(s)		TAR15				Timeframe		July 2023 – June 2024			
Operational / Verification	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	51	6.51	6.93	7.24	7.56	7.73	≥6.5 & ≤8.5 (A)	0	77.36 on 21/05/2024 is assumed to be an error and has not been considered
		Turbidity (NTU)	51	0.11	0.14	0.22	0.67	1.34	≤5 (A)	0	
		Total Iron (mg/L)	51	0	0	0.01	0.055	0.29	≤0.3 (A)	0	
		Total Manganese (mg/L)	51	0	0	0.005	0.025	0.066	≤0.5 (H) ≤0.1 (A)	0 (H)	
		Alkalinity (mg/L of CaCO3)	51	50	50	56	60	65			
		Free Chlorine (mg/L)	51	0.45	0.47	0.78	1.15	1.28	≤5 (H)	0	
		E. coli – Readycult	50	Absent							Not detected in any sample
		Total Coliforms	32	Absent							Not detected in any sample
Verification Microbial	QLD Health	Free Chlorine (mg/L)	10	0.57	0.62	0.86	1.12	1.14	≤5 (H)	0	
		E. coli (mpn/100mL)	9	0	0	0	0	0	<1 (H)	0	
		Total Coliforms (cfu/100mL)	11	0	0	0	0	0			*E. coli*

Table E-30 TAR16 Water Quality

Taroom Reticulated Water Quality											
Sampling Location(s)		TAR16				Timeframe		July 2023 – June 2024			
Operational / Verification	Lab	Parameter	Count	Min	5th %ile	Median	95th %ile	Max	Target value(s)	No. that exceed target value(s)	Comments
Operational	WTP	pH	52	6.65	6.91	7.21	7.56	7.96	≥6.5 & ≤8.5 (A)	0	
		Turbidity (NTU)	52	0.18	0.19	0.30	1.37	6.42	≤5 (A)	1	
		Total Iron (mg/L)	52	0	0	0.01	0.05	0.08	≤0.3 (A)	0	
		Total Manganese (mg/L)	52	0	0	0.0065	0.0239	0.038	≤0.5 (H) ≤0.1 (A)	0 (H)	
		Alkalinity (mg/L of CaCO3)	52	50	50	55	65	75			
		Free Chlorine (mg/L)	52	0.09	0.50	0.83	1.20	1.25	≤5 (H)	0	
		E. coli – Readycult	51	Absent							Not detected in any sample
		Total Coliforms	33	Absent							Not detected in any sample
Verification Microbial	QLD Health	Free Chlorine (mg/L)	9	0.85	0.85	0.92	1.09	1.15	≤5 (H)	0	
		E. coli (mpn/100mL)	9	0	0	0	0	0	<1 (H)	0	
		Total Coliforms (cfu/100mL)	11	0	0	0	0	0			