Drinking Water Quality Management Plan (DWQMP) report

For the financial year: 2022-2023

Scheme: COOKTOWN

Cook Shire Council

SPID: 511

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Glossary of terms

ADWG 2011	Australian Drinking Water Guidelines (2011). Published by the National Health and Medical Research Council of Australia
E. coli	*Escherichia coli*, a bacterium which is considered to indicate the presence of faecal contamination and therefore potential health risk
mg/L	Milligrams per litre
µg/L	Micrograms per litre
NTU	Nephelometric Turbidity Units
HU	Hazen units
µS/cm	Micro Siemens per centimetre
MPN/100mL	Most probable number per 100 millilitres
CFU/100mL	Colony forming units per 100 millilitres
<	Less than
>	Greater than
NATA Lab	Accredited by the National Association of Testing Authorities of Australia. Cook Shire Council currently uses the Cairns Regional Council Laboratory as its NATA registered Lab.
CCP's	Critical Control Point
RMIP	Risk Management Improvement Program

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1. Introduction

This is the Drinking Water Quality Management Plan (DWQMP) report for Cook Shire Council for the financial year 2022-2023 for the Cooktown Water Scheme.

Cook Shire Council is a registered service provider with identification (SPID) number 511. Cook Shire Council is operating under an approved DWQMP to ensure consistent supply of safe quality drinking water in order to protect public health. This is done through proactive identification and minimisation of public health risks associated with drinking water.

The DWQMP report includes:

- The activities undertaken over the financial year in operating our drinking water service
- Drinking water quality summary
- Summary of our performance in implementing our approved DWQMP

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

2. Overview of Operations

Cooktown's Water is sourced from the Annan River which originates high in the rainforest from the North and North western sides of Mount Misery, Mount Poverty and Mount Romeo which is North North West of Bloomfield. The catchment area of approx. 37,350 hectares contains pristine rainforest and has very limited human impact apart from the ex Collingwood Tin Mine.

Water is pumped up from the Annan River to the Treatment Plant where it undergoes the following treatment processes:

- Coagulation & Flocculation
- Sedimentation
- Filtration
- Chlorination
- Fluoridation

The treated water is pumped to a 2ML Reservoir on site, and then gravity fed to the Cooktown High Level Reservoir, in Cooktown, as required and controlled by telemetry signals. The Cooktown Reservoir directly supplies water to the Cooktown after being re-chlorinated.

Cooktown currently has 985 water service connections which can be broken down to approximately:

- Residential 80%
- Commercial 9%
- Industrial 2%
- Institutional 2%
- Council 6%
- Government 1%

Cooktown's' water has historically been a very safe and reliable water supply and given its origins in the rainforest is also pleasant tasting as well. Cooktown's water won the Queensland Water Directorate's "Best Tasting Tap Water in Queensland" in 2013.

3. Actions taken to implement the DWQMP

Water and Wastewater department staff meet fortnightly to discuss the department's operational issues. This provided an opportunity to refer to the approved DWQMP and emphasise the importance of using the plan. These meetings are chaired by the Manager of Water and Wastewater and the Team Leader.

Cook Shire Council adopted the Drinking Water Quality Policy in September 2019. This policy confirms Councils management of water quality through the on-going implementation of the DWQMP.

Capital funding applications are submitted to Council each year, however are not always successful. This can cause delays in delivering Councils Risk Management Improvements. Funding was received in the 2022/2023 financial year to replace a water main and the High Level Reservoir Roof.

Scheme	Component	Improvement Action and Origin of Action	Target Date	Actions undertaken to date	Status and revised target date	Responsible officer
Cooktown	Water supply	Contingent water supply for Cooktown if natural disaster or other issue renders the Annan WTP inoperable, borefield to be alternative water supply.	June 2023	Scope includes providing chlorinated bore water to town and an electrical upgrade. Stage 2 includes a filter and iron and manganese removal.	Stage 1 Complete Sept 2021. Stage 2 requires funding. Not funded in the 2022/23 FY.	Manager/Team Leader Water and Wastewater
Cooktown	System Wide	Meter replacement program	June 2023	Meters over 15 years old replaced in Cooktown	On-going	Manager/Team Leader Water and Wastewater
Cooktown	Reticulation	Replace 80 AC water main that is over 50 years old and is showing signs of failure	June 2023	80mm AC water main was replaced on Helen Street from Furneaux Street to Boundary Street, Cooktown.	Funding was received for 2022/23 FY. Revised target is June 2023.	Manager/Team Leader Water and Wastewater
Cooktown	Reticulation	Roof of High Level Reservoir was rusting. Ingress into reservoir would have been possible however, the main risk was the loss of the roof during a weather event	June 2023	Roof of Reservoir is currently being replaced	Completion date 31/08/2023.	Manager/Team Leader Water and Wastewater
Cooktown	Reticulation	Chlorate detected	On-going	Change sampling practices to use 75% alcohol wipes to clean taps instead of chlorine spray which is believed to be source of the chlorate	Chlorate Management plan in last revision of DWQMP	Manager/Team Leader Water and Wastewater
Cooktown	System Wide	Cybersecurity	June 2023	Report being written. Preliminary report indicates that Cybersecurity in Cook Shire Council Water and Wastewater is well handled.	Complete Sep 2023	Manager/IT Manager

4. Operational and Verification Monitoring – Water Quality Information and Summary.

All drinking water in Cooktown met the recommended values in the Australian Drinking Water Guidelines and the Public Health Regulation for *E.coli*.

The following results for Cooktown are in Appendix A:

Table 2A: Cooktown Reticulation – Physical Chemical – (NATA Lab)
Table 2B: Cooktown Reticulation – Metals – (NATA Lab)
Table 2C: Cooktown Reticulation – E.coli (CSC Annan Lab and NATA Lab verification)
Table 2D: Cooktown Reticulation – Physical Chemical – (CSC Annan WTP Lab)
Table 2E: Cooktown Reticulation - Trihalomethanes and Chlorate
Table 2F: Cooktown Reticulation and Annan WTP Plant – Fluoride – (CSC Annan WTP Lab and NATA Verification)
Table 3A: Cooktown Annan WTP Treated Water Final – Physical Chemical (NATA Lab)
Table 3B: Cooktown Annan WTP Treated Water Final - Metals (NATA Lab)
Table 3C: Cooktown Annan WTP Treated Water Final – Physical Chemical including Free Chlorine – (CSC Annan WTP Lab and on-line analyser)
Table 3D: WTP Dosed Water (Outflow – Sedimentation Basin)
Table 3E: WTP Post Filtration
Table 3F: Cooktown Annan WTP Treated Water Final – *E.coli* monitoring (CSC Annan WTP Lab & NATA Lab verification)
Table 4A: Cooktown Raw Water - Physical Chemical (NATA Lab)
Table 4B: Cooktown Raw Water - Metals (NATA Lab)
Table 4C: Cooktown Raw Water – E. coli (CSC Annan WTP lab)
Table 4D: Cootkown Raw Water – Physical Chemical (CSC Annan WTP lab)
Table 4E: Cooktown Borefields Raw Water – Physical chemical (NATA Lab)
Table 4F: Cooktown Borefields Raw Water – Metals (NATA lab)
Table 5: Reticulation *E. coli* 12 Month Rolling Average

Table 1 Location of sampling sites within Cooktown's water reticulation network.

All reticulation sampling for all parameters are collected from these fixed sites for the reasons listed.

Sample Location Name	Street Name	Site Chosen Because	GPS Coordinates *
Mobil Service Station	Endeavour Valley Road	Towards the end of the line.	15°28'21.81"S - 145°13'13.98"E
Powder Magazine	Webber Esplanade	Towards the end of the line.	15°27'27.49"S - 145°15'14.33"E
Lions Park	Charlotte St	Ease of access	15°27'51.65"S - 145°15'2.91"E
Cooktown Library	Helen St	Centrally located in Residential area	15°28'16.08"S - 145°14'57.80"E
Simmo's	Furneaux St	Residential area	15°28'13.02"S - 145°15'22.46"E
Water Depot	Boundary St	Towards the end of the line.	15°28'29.80"S - 15°28'29.80"S
Cemetery	Charlotte	Ease of access	15°28'38.90"S - 145°14'30.40"E
Cooktown Hospital	Hope St	Close to Hospital & Medical Services	15°28'40.87"S - 145°14'58.82"E
Cooktown Kindergarten	Charles St	Close to Kindergarten and Schools	15°28'52.40"S - 145°15'10.27"E
Royce's Paddock	Ida St	Towards the end of the line.	15°28'51.64"S - 145°15'31.98"E
Ambrose old Service Racecourse Rd	Racecourse Rd	Centrally located in Residential area	15°28'51.85"S - 145°14'22.21"E
Peninsular Pump Station	Howard St	Towards the end of the line.	15°28'34.25"S - 145°15'26.40"E

5. Notifications to the Regulator

There was no incident notifications to the Regulator in the 2022 – 2023 financial year.

6. Customer complaints related to water quality

There was no water quality complaints in the 2022-2023 financial year.

7. DWQMP review outcomes

Version 4.5 was approved on the 17 June 2021. A review of the DWQMP was due in the 2021 - 2022 financial year and was submitted to the Regulator in June 2022 (Version 5). This version of the plan was approved on the 07/09/2022. Version 5 is now the current version of the plan for this Annual Report.

The Verification and Operational Monitoring changed in Version 5. Physical/chemical and metals analysis was better targeted and parameters that have not been detected for many years are no longer tested for. The tables in Appendix 1 reflect this with different requirements for sample analysis.

8. DWQMP audit findings

No audits were conducted in the 2021 – 2022 financial year. The next round of audits is due in 2024 – 2025. Cooktown was last audited in 2017.

Appendix A – Summary of compliance with water quality criteria

Table 2A Cooktown Reticulation – Treated Water – Physical Chemical (NATA Lab)

Date Sampled – 01/07/2022 – 30/06/2023									
Parameter	**Unit**	**No of samples required to be collected**	**No of Samples collected**	**Summary of Results**			**ADWQ Guidelines Value (2011)**	**No of Samples exceeding ADWG**	
				Min. Value	**Max. Value**	**Avg. Value**		**Health**	**Aesthetic**
Alkalinity	mg/L as CaCO3	12	12	13.0	54.0	25.4	-	-	-
Calcium	mg/L	12	12	3.8	18.0	8.8	-	-	-
Chloride	mg/L	6	6	15.0	18.0	16.0	< 250 mg/L	-	0
Colour	HU	12	12	0.0	1.9	0.84	< 15 HU	-	0
Electrical Conductance	µS/cm	12	12	100.0	550.0	175.0	-	-	-
Fluoride	mg/L	12	12	0.64	0.75	0.69	< 1.5 mg/L	0	-
Magnesium	mg/L	12	12	0.39	1.4	0.70	-	-	-
pH	pH units	12	12	7.6	8.0	7.7	6.5-8.5	-	0
Potassium	mg/L	6	6	0.75	0.86	0.82	-	-	-
Salinity	PSU	12	12	50	270	87	-	-	-
Sodium	mg/L	12	12	16.0	23.0	17.9	< 180 mg/L	-	0
Total Dissolved Solids	mg/L	6	6	60.0	71.0	66.3	< 600 mg/L	-	0
Total Hardness	mg/L as CaCO3	12	12	11.0	51.0	25.0	200 mg/L	-	0
Turbidity	NTU	12	12	0.1	0.4	0.14	< 5 NTU	-	0

Table 2B Cooktown Reticulation – Treated Water – Metals (NATA Lab)

Date Sampled – 01/07/2022 – 30/06/2023									
Parameter	**Unit**	**No of Samples required to be collected**	**No of Samples collected**	**Summary of Results**			**ADWQ Guidelines Value (2011)**	**No of Samples exceeding ADWG**	
				Min. Value	**Max. Value**	**Avg. Value**		**Health**	**Aesthetic**
Arsenic	*mg/L*	12	12	0.0003	0.0007	0.0004	0.01 mg/L	0	-
Barium	*mg/L*	6	6	0.002	0.002	0.002	< 2 mg/L	0	-
Beryllium	*mg/L*	6	6	0.0001	0.0001	0.0001	< 0.06 mg/L	0	-
Cadmium	*mg/L*	6	6	0.0001	0.0001	0.0001	< 0.002 mg/L	0	-
Chromium	*mg/L*	12	12	0.0005	0.0005	0.0005	< 0.05 mg/L	0	-
Cobalt	*mg/L*	6	6	0.0005	0.0005	0.0005	-	-	-
Copper	*mg/L*	12	12	0.001	0.008	0.0041	< 2 mg/L	0	0
Iron	*mg/L*	12	12	0.015	0.015	0.015	< 0.3 mg/L	-	0
Lead	*mg/L*	12	12	0.0005	0.0005	0.0005	< 0.01 mg/L	0	-
Manganese	*mg/L*	12	12	0.0002	0.0003	0.0002	< 0.1 mg/L	0	0
Mercury	*mg/L*	6	6	0.00006	0.00006	0.00006	0.001 mg/L		
Nickel	*mg/L*	6	6	0.0005	0.0005	0.0005	< 0.02 mg/L	0	-
Selenium	*mg/L*	6	6	0.002	0.002	0.002	< 0.01 mg/L	0	-
Vanadium	*mg/L*	6	6	0.0002	0.0002	0.0002	-	-	-
Zinc	*mg/L*	12	12	0.008	0.017	0.009	< 3.0 mg/L	-	0

Table 2C Cooktown Reticulation – E.coli and coliform monitoring

Date Sampled – 01/07/2022 – 30/06/2023							
	Parameter	**Sampling Location**	**No of samples required to be taken**	**No of samples taken**	**No of samples with E.coli detected**	**Public Health Regulation standard (2018)**	**Laboratory**
E.coli and Coliforms (Annan Lab)	E.coli – MPN/100ml	12 sample points throughout Cooktown reticulation	156	156	0	0	Annan WTP
E.coli and Coliforms (NATA Lab)	E. coli cfu/100ml		12	12	0	0	Cairns Regional Council

Table 2D Cooktown Reticulation – Physical Chemical – (CSC Annan WTP Lab)

Date Sampled – 01/07/2022 – 30/06/2023							
Parameter	**Unit**	**Sample Site**	**No of samples required to be taken**	**No of Samples collected**	**Summary of Results**		
					Min. Value	**Max. Value**	**Avg. Value**
Daily Samples							
Free Chlorine Residual	mg/L	Fire Station Reservoir	365	365	0.37	1.38	0.80
Total Chlorine Residual	mg/L	Fire Station Reservoir	0	51	0.48	1.42	0.88
Free Chlorine Residual	mg/L	New Pump Station	365	365	0.52	1.68	0.86
Total Chlorine Residual	mg/L	New Pump Station	0	70	0.64	1.28	0.89
Free Chlorine Residual	mg/L	Four Mile Reservoir	365	365	0.46	4.90	0.75
Total Chlorine Residual	mg/L	Four Mile Reservoir	0	50	0.61	1.29	0.80
Free Chlorine Residual	mg/L	Reticulation	36	36	0.41	1.04	0.83
Alkalinity	Mg/L	Reticulation	18	18	22.0	54.0	41.1
Colour	mg/L	Reticulation	36	37	0.00	10.0	1.88
Dissolved Oxygen	mg/L	Reticulation	18	18	7.1	8.5	7.7
Electrical Conductivity	mg/L	Reticulation	36	37	114.1	211.8	166.8
pH	mg/L	Reticulation	36	37	6.4	7.9	7.1
Total Dissolved Solids	mg/L	Reticulation	18	18	70.4	114.6	87.4
Total Hardness	mg/L	Reticulation	18	18	11.0	50.0	25.4
Turbidity	mg/L	Reticulation	36	37	0.06	0.41	0.14

Samples collected from Cooktown Reticulation sample points as listed in Table 1.

Table 2E Cooktown Reticulation – Trihalomethanes and Chlorates (NATA Lab)

Date Sampled – 01/07/2022 – 30/06/2023									
Parameter	**Unit**	**No of Samples required to be collected**	**No of Samples collected**	**Summary of Results**			**ADWQ Guidelines Value (2011)**	**No of Samples exceeding ADWG or WHO**	
				Min. Value	**Max. Value**	**Avg. Value**		**Health**	**Aesthetic**
Chloroform	µg/L	12	12	5	50	21	<250 µg/L	0	-
Bromodichloromethane	µg/L	12	12	7	14	10	<250 µg/L	0	-
Dibromochloromethane	µg/L	12	12	5	7	5	< 250 mg/L	0	-
Bromoform	µg/L	12	12	5	5	5	<250 µg/L	0	-
Total Trihalomethanes	µg/L	12	12	18	61	32	<250 µg/L	0	-
Chlorate	mg/L	12	12	0.218	0.550	0.372	<0.8 mg/L*	0	-

*Provisional guideline.

Table 2F Cooktown Reticulation & Annan WTP – Fluoride – (CSC Annan WTP Lab and NATA Lab)

Date Sampled – 01/07/2022 – 30/06/2023								
Parameter (mg/L)	**Laboratory**	**Sampling Location**	**No of samples required to be collected**	**No of samples collected**	**Summary of results**			**No of samples exceeding Australian Drinking Water Guidelines value**
					Min. Value	**Max. Value**	**Avg. Value**	
Fluoride	Cook Shire Council Annan WTP	Annan WTP Final Water	365	365	0.07*	0.89	0.70	0
Fluoride	Cairns Regional Council NATA lab	Annan WTP Final Water	0	10	0.66	0.73	0.70	0
Fluoride (2 sites)	Cook Shire Council Annan WTP	Reticulation	104	102*	0.60	0.88	0.71	0
Fluoride (2 sites)	Cairns Regional Council NATA lab	Reticulation	24	24	0.65	0.78	0.70	0

*Fluoride plant off at the Annan for 3 days in financial year.

Table 3A Cooktown Annan WTP Treated Water Final - Physical Chemical (NATA Lab)

Date Sampled – 01/07/2022 – 30/06/2023									
Parameter	Unit	No of Samples required to be collected	No of Samples collected	Summary of Results			ADWQ Guidelines Value (2011)	No of Samples exceeding ADWG	
				Min. Value	Max. Value	Avg. Value		Health	Aesthetic
Alkalinity	mg/L as CaCO3	4	4	9.3	49.0	27.3	-	-	-
Calcium	mg/L	4	4	1.2	15.0	7.9	-	-	-
Colour	HU	4	4	0.0	1.0	0.8	< 15 HU	-	0
Electrical Conductance	µS/cm	4	4	97.0	210.0	146.8	-	-	-
Fluoride	mg/L	4	4	0.66	0.71	0.68	< 1.5 mg/L	0	-
Magnesium	mg/L	4	4	1.20	1.60	1.35	-	-	-
pH	pH units	4	4	7.10	7.30	7.23	6.5-8.5	-	0
Potassium	mg/L	4	4	0.84	1.00	0.96	-	-	-
Salinity	mg/L	4	4	50.0	103.0	72.4	-	-	-
Silicon	mg/L	4	4	9.7	12.0	10.7	-	-	-
Sodium	mg/L	4	4	16.0	25.0	18.3	< 180 mg/L	-	0
Total Dissolved Solids	mg/L	4	4	57.0	62.0	59.5	< 600 mg/L	-	0
Total Hardness	mg/L as CaCO3	4	4	7.9	43.0	25.5	< 200 mg/L	-	0
Turbidity	NTU	4	4	0.1	0.2	0.2	<5 NTU	0	0

Table 3B Cooktown Annan WTP Treated Water Final – Metals – (NATA Lab)

Date Sampled – 01/07/2022 – 30/06/2023									
Parameter	Unit	No of Samples required to be collected	No of Samples collected	Summary of Results			ADWQ Guidelines Value (2011)	No of Samples exceeding ADWG	
				Min. Value	Max. Value	Avg. Value		Health	Aesthetic
Arsenic	*mg/L*	4	4	0.0002	0.0006	0.0004	0.01 mg/L	0	-
Barium	*mg/L*	2	2	0.0030	0.0040	0.0040	< 2 mg/L	0	-
Beryllium	*mg/L*	2	2	0.0001	0.0001	0.0001	< 0.06 mg/L	0	-
Cadmium	*mg/L*	2	2	0.0001	0.0001	0.0001	< 0.002 mg/L	0	-
Chromium	*mg/L*	4	4	0.0005	0.0005	0.0005	< 0.05 mg/L	0	-
Cobalt	*mg/L*	2	2	0.0005	0.0005	0.0005	-	-	-
Copper	*mg/L*	4	4	0.0010	0.0010	0.0010	< 2 mg/L	0	0
Iron	*mg/L*	4	4	0.0150	0.0150	0.0150	< 0.3 mg/L	-	0
Lead	*mg/L*	4	4	0.0005	0.0005	0.0005	< 0.01 mg/L	0	-
Manganese	*mg/L*	4	4	0.0010	0.0028	0.0017	< 0.1 mg/L	0	0
Mercury	*µg/L*	2	2	0.0600	0.0600	0.0600	<1.0 µg/L		
Nickel	*mg/L*	2	2	0.0005	0.0005	0.0005	< 0.02 mg/L	0	-
Selenium	*mg/L*	2	2	0.0020	0.0020	0.0020	< 0.01 mg/L	0	-
Vanadium	*mg/L*	2	2	0.0001	0.0001	0.0001	-	-	-
Zinc	*mg/L*	4	4	0.0080	0.0160	0.0100	< 3.0 mg/L	-	0

Table 3C Cooktown Annan WTP Treated Water Final – Physical Chemical (CSC Annan WTP Lab)

Date Sampled – 01/07/2022 – 30/06/2023									
Parameter	Unit	No of samples required to be collected	No of Samples collected	Summary of Results			ADWQ Guidelines Value (2011)	No of Samples exceeding ADWG	
				Min. Value	Max. Value	Avg. Value		Health	Aesthetic
Free Chlorine Residual	*mg/L*	365	364	0.71	2.59	1.41	<5	0	-
Total Chlorine	*mg/L*	52	245	0.81	2.10	1.49	<5	0	0
Alkalinity	*mg/L as CaCo3*	365	364	7.0	65.0	33.0	-	-	-
Aluminium	*mg/L*	260	256	0.000	0.120	0.003	0.2	-	0
Colour	*HU*	365	362	0.00	3.00	0.04	<15	-	0
Electrical Conductivity	*µS/cm*	365	363	94.3	245.5	159.9	-	-	-
pH	*pH units*	365	364	5.74	7.51	6.70	6.5-8.5	-	49
Total Dissolved Solids	*mg/L*	130	184	61.9	137.8	94.0	< 600 mg/L	-	0
Total Hardness	*mg/L as CaCo3*	260	257	1.0	53.0	29.7	< 200 mg/L	-	0
Calcium Hardness	*mg/L as CaCo3*	NA	231	0	60	25	-	-	-
Turbidity	*NTU*	365	364	0.04	0.20	0.06	< 5 NTU	-	0

Table 3D Cooktown Annan WTP Outflow - Sedimentation basin

Date Sampled – 01/07/2022 – 30/06/2023						
Parameter	Unit	No of samples required to be collected	No of Samples collected	Summary of Results		
				Min. Value	Max. Value	Avg. Value
Temperature	*°C*	0	248	20.6	29.7	25.3
pH		260	248	5.50	7.16	6.20
Turbidity	*NTU*	260	248	0.40	7.10	1.36
Colour	*HU*	260	228	0	53.0	13.1

Sedimentation basin is off line for maintenance during the dry season each year.

Table 3E Cooktown Annan WTP – Post filtration

Date Sampled – 01/07/2022 – 30/06/2023						
Parameter	**Unit**	**No of samples required to be collected**	**No of Samples collected**	**Summary of Results**		
				Min. Value	**Max. Value**	**Avg. Value**
Combined Turbidity	NTU	260	248	0.040	1.12	0.06
Filter 1 Turbidity	NTU	260	248	0.040	1.250	0.061
Filter 2 Turbidity	NTU	260	248	0.040	0.910	0.061
Filter 3 Turbidity	NTU	260	248	0.040	1.11	0.061
Filter 4 Turbidity	NTU	260	248	0.040	0.990	0.060

Table 3F Cooktown Annan WTP Treated Water Final – E.coli monitoring – Cook Shire Council Annan WTP Lab

Date Sampled – 01/07/2022 – 30/06/2023					
Parameter (MPN/100ml)	**Sampling Location**	**No. of samples required to be collected**	**No of samples taken in time period**	**E.coli detected**	**No of samples exceeding Australian Drinking Water Guidelines guideline value**
E.coli	Final Treated Water Annan Water Treatment Plant	52	52	0	0

Table 4A Cooktown Annan River Raw Water - Physical Chemical (NATA Analysed)

Date Sampled – 01/07/2022 – 30/06/2023						
Parameter	**Unit**	**No of Samples required to be collected**	**No of Samples collected**	**Summary of Results**		
				Min. Value	**Max. Value**	**Avg. Value**
Alkalinity	mg/L as CaCO3	4	4	6.4	11.0	8.7
Calcium	mg/L	4	4	0.8	1.3	1.0
Colour	HU	4	4	12.0	44.0	23.8
Electrical Conductance	µS/cm	4	4	60.0	77.0	66.3
Fluoride	mg/L	4	4	0.03	0.06	0.04
Magnesium	mg/L	4	4	1.20	1.70	1.40
pH	pH units	4	4	7.10	7.30	7.18
Potassium	mg/L	4	4	0.85	1.10	0.99
Salinity	mg/L	4	4	34.0	41.2	36.6
Silicon	mg/L	4	4	11.0	14.0	13.0
Sodium	mg/L	4	4	1.1	10.0	7.2
Total Dissolved Solids	mg/L	2	2	43.0	45.0	44.0
Total Hardness	mg/L as CaCO3	4	4	7.0	10.0	8.3
Turbidity	NTU	4	4	1.7	50.0	13.8

Table 4B Cooktown Annan River Raw Water – Metals (NATA Analysed)

Date Sampled – 01/07/2022 – 30/06/2023						
Parameter	**Unit**	**No of Samples required to be collected**	**No of Samples collected**	**Summary of Results**		
				Min. Value	**Max. Value**	**Avg. Value**
Arsenic	*mg/L*	4	4	0.0009	0.0016	0.0012
Barium	*mg/L*	2	2	0.003	0.004	0.004
Beryllium	*mg/L*	2	2	0.0001	0.0001	0.0001
Cadmium	*mg/L*	2	2	0.0001	0.0001	0.0001
Chromium	*mg/L*	4	4	0.0005	0.0005	0.0005
Cobalt	*mg/L*	2	2	0.0005	0.0005	0.0005
Copper	*mg/L*	4	4	0.0010	0.0010	0.0010
Iron	*mg/L*	4	4	0.1120	0.2550	0.1875
Lead	*mg/L*	4	4	0.0005	0.0005	0.0005
Manganese	*mg/L*	4	4	0.0022	0.0052	0.0036
Mercury	*µg/L*	2	2	0.0600	0.0600	0.0600
Nickel	*mg/L*	2	2	0.0005	0.0005	0.0005
Selenium	*mg/L*	2	2	0.0020	0.0020	0.0020
Vanadium	*mg/L*	2	2	0.0003	0.0007	0.0005
Zinc	*mg/L*	4	4	0.0008	0.0080	0.0062

Table 4C Cooktown Annan River Raw Water – E.coli (CSC Annan WTP Lab)

Date Sampled – 01/07/2022 – 30/06/2023						
Parameter (MPN/100ml)	**Sampling Location**	**Minimum**	**Maximum**	**Average**	**Number of samples taken**	**Laboratory**
E.coli	Annan River intake	<1	201	47	51	Annan WTP

Table 4D Cooktown Annan River Raw Water Physical Chemical parameters (CSC Annan WTP Lab)

Date Sampled – 01/07/2022 – 30/06/2023						
Parameter	**Unit**	**No of samples required to be collected**	**No of Samples collected**	**Summary of Results**		
				Min. Value	**Max. Value**	**Avg. Value**
Alkalinity	mg/L	365	364	1.0	14.0	8.8
pH		365	364	5.57	7.5	6.41
Turbidity	NTU	365	364	1.04	240.00	8.84
Colour	HU	365	364	4	1435	68
Total Hardness	mg/L	260	252	3	13	8
Total Dissolved Solids	mg/L	130	129	4.3	56.9	45.1
Electrical conductance	µS/cm	365	364	47.2	89.1	71.4
Fluoride	mg/L	12	12	0.01	0.07	0.05

Table 4E Cooktown Borefields Raw Water - Physical Chemical (NATA Analysed)

Date Sampled – 01/07/2022 – 30/06/2023						
Parameter	**Unit**	**No of Samples required to be collected**	**No of Samples collected**	**Summary of Results**		
				Min. Value	**Max. Value**	**Avg. Value**
Alkalinity	mg/L as CaCO3	2	2	150.0	200.0	175.0
Calcium	mg/L	2	2	38.0	43.0	40.5
Chloride	mg/L	2	2	81.0	89.0	85.0
Colour	HU	2	2	1.2	4.4	2.8
Electrical Conductance	µS/cm	2	2	550.0	660.0	605.0
Fluoride	mg/L	2	2	0.21	0.25	0.23
Magnesium	mg/L	2	2	20.0	15.50	15.50
pH	pH units	2	2	7.70	8.50	8.10
Potassium	mg/L	2	2	1.80	1.80	1.80
Salinity	mg/L	2	2	267.0	320.0	293.5
Silicon	mg/L	2	2	42.0	51.0	46.5
Sodium	mg/L	2	2	57.0	69.0	63.0
Sulphate	mg/L	2	2	9.6	9.9	9.8
Total Dissolved Solids	mg/L	1	1	390.0	390.0	390.0
Total Hardness	mg/L as CaCO3	2	2	140.0	190.0	165.0
Turbidity	NTU	2	2	0.2	1.7	1.0

Table 4F Cooktown Borefields Raw Water – Metals (NATA Analysed)

Date Sampled – 01/07/2022 – 30/06/2023						
Parameter	**Unit**	**No of Samples required to be collected**	**No of Samples collected**	**Summary of Results**		
				Min. Value	**Max. Value**	**Avg. Value**
Arsenic	*mg/L*	2	2	0.0003	0.0012	0.0008
Barium	*mg/L*	1	1	0.006	0.006	0.006
Beryllium	*mg/L*	1	1	0.0001	0.0001	0.0001
Cadmium	*mg/L*	1	1	0.0001	0.0001	0.0001
Chromium	*mg/L*	2	2	0.0005	0.0005	0.0005
Cobalt	*mg/L*	1	1	0.0005	0.0005	0.0005
Copper	*mg/L*	2	2	0.0010	0.0010	0.0010
Iron	*mg/L*	2	2	0.0150	0.0150	0.0150
Lead	*mg/L*	2	2	0.0005	0.0005	0.0005
Manganese	*mg/L*	2	2	0.0004	0.0108	0.0056
Mercury	*µg/L*	1	1	0.0600	0.0600	0.0600
Nickel	*mg/L*	1	1	0.0011	0.0011	0.0011
Selenium	*mg/L*	1	1	0.0020	0.0020	0.0020
Vanadium	*mg/L*	1	1	0.0005	0.0005	0.0005
Zinc	*mg/L*	2	2	0.0110	0.0350	0.0230

Table 5 Cooktown Reticulation - *E. coli* - 12 Month Rolling Average

Cooktown

Year	*2022/2023*											
Month	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*
No. of samples collected	12	15	12	15	12	12	15	12	12	12	15	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	150	150	150	150	153	150	153	156	156	156	156	156
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES