



MAPOON
Aboriginal Shire Council

Drinking Water Quality Management Plan
Annual Report 2017-18

December 2018



Drinking Water Quality Management Plan

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Contents

Acronyms and Abbreviations	iii
1. Introduction	1
1.1. Scope	1
1.2. Purpose	1
2. Drinking Water Scheme	1
3. DWQMP Implementation	2
3.1. Risk Management	2
3.2. Monitoring	2
3.3. Improvement Plan	2
4. Reporting to the Regulator	3
5. Compliance with Water Quality Criteria	3
5.1. Source Waters	3
5.2. Operational Monitoring	3
5.3. Treated Water	4
6. Customer Complaints	5
7. DWQMP Review	6
8. DWQMP Audit	6
9. References	8

Appendices

Improvement Plan Progress	A
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Tables

Table 1 Mapoon Reticulation Monitoring Data	5
Table 2 Action Plan - Audit Recommendations	6

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Acronyms and Abbreviations

ADWG	Australian Drinking Water Guidelines
DNRME	Department of Natural Resources, Mines and Energy
DWQMP	Drinking Water Quality Management Plan
n/a	Not Applicable
MASC	Mapoon Aboriginal Shire Council
ND	Not Detected
NATA	National Association of Testing Authorities
OoS	Out of Specification
WSR	Water Supply Regulation
SPID	Service Provider Identification

1. Introduction

This is the Drinking Water Quality Management Plan (DWQMP) Annual Report for Mapoon Aboriginal Shire Council (MASC or Council) for the financial year 2017-18.

The DWQMP has been established and is being adhered to in order to protect public health through the identification and minimisation of public health related risks associated with drinking water. Council is operating under an approved DWQMP, with the approval granted by the Water Supply Regulation unit, Department of Natural Resources, Mines and Energy (WSR, DNRME).

This Annual Report summarises Council's drinking water quality performance for the reporting period, outcomes of the DWQMP audit undertaken and progress on the implementation of the improvement plan. The report is made available to customers on Council's website and for inspection upon request at the Council office.

1.1. Scope

The report has been prepared to fulfil the legislative DWQMP reporting requirements set out in the *Water Supply (Safety and Reliability) Act 2008* (the Act).

1.2. Purpose

This annual report aims to:

- be a reference document for the Regulator, as well as customers, on Council's performance in relation to the DWQMP reporting obligations under the Act, for the reporting period
- provide a summary of Council's performance in implementing the DWQMP.

2. Drinking Water Scheme

With the introduction of the Act, water service providers are required to register as a drinking water service provider for the delivery of a drinking water service. Council is a registered drinking water service provider, with the service provider identification (SPID) number as 176.

Council manages the Mapoon drinking water supply scheme and distributes treated water to the township of Mapoon. The water supply scheme is comprised of a single raw water source, a water treatment plant, pump stations, service reservoirs and distribution network.

3. DWQMP Implementation

The implementation of the DWQMP is discussed in this section, and also captured in the other sections that follow.

3.1. Risk Management

The process of keeping drinking water safe is one of risk management. Through efficient operations and implementation of the DWQMP, Council has ensured effective risk management to assure safe quality of drinking water to our customers.

During the reporting period, Council supplied drinking water that complied with the water quality criteria set in the Australian Drinking Water Guidelines. There was no major incident or event that comprised Council's ability to supply safe quality drinking water to customers.

3.2. Monitoring

Council maintains comprehensive monitoring programs to ensure that the quality of water supplied to customers is safe. The monitoring programs assist to identify any issue before it becomes a significant water quality incident. The results from the verification monitoring for the reporting period are discussed in Section 5.

Council also undertakes operational monitoring, which includes the planned sequence of measurements and observations to assess and confirm the performance of our preventive or control measures. Measurements are of operational parameters that indicate whether processes are functioning effectively.

To ensure timely actions on operational monitoring, Council has introduced a water quality spreadsheet to track and provide graphical analysis of water quality data and flagging of results that trigger adjustment limits or critical limits for critical control points. These actions will provide Council with additional information to act of water quality data.

Council has experienced some issues with the retention of data over the July 2017 - December 2017 period. A review of the DWQMP early 2019 will ensure processes and procedures are working as required which will also include a review of data retention and storage.

Quality assurance is important to guarantee consistently reliable and legally defensible results and ensure customers are provided with the best quality water.

Council has the following quality management systems in place:

- microbiology samples are sent to the Cairns Regional Council Water Laboratory, which is a NATA accredited laboratory
- operations staff have been appropriately trained to undertake sampling

3.3. Improvement Plan

Council maintains a culture of continuous improvement and are implementing the Improvement Plan of the DWQMP and making progress towards strengthening the management of the water supply. During the reporting period, Council implemented a number of actions including:

- Implementation of daily sampling to test for chlorine and pH to provide constant disinfection monitoring. Results are recorded and monitored in a water quality spreadsheet.
- Implementation of a regular maintenance program.
- Investigation into reticulating and treating sewage was commenced, with an application for sewage works has been submitted and approvals to be actioned in 2019
- Researching equipment for in house turbidity and *E. coli* testing, as part of Water infrastructure upgrade 2019. This is planned to involve testing 4 time per month, 3 in house and 1 through the Cairns Regional Council Water Laboratory.

- Investigation into opportunities for formal training for existing staff was commenced, with staff member receiving a Certificate 3 and opportunities to undertake water courses in Cairns are sought out as needed.

Detailed status on the Improvement Plan implementation is presented in Appendix A.

4. Reporting to the Regulator

There were no incidents reported to the regulator for the reporting period.

5. Compliance with Water Quality Criteria

Verification of drinking water quality provides an assessment of the overall performance of the system and the ultimate quality of the drinking water being supplied to customers. It confirms compliance with water quality criteria set by DNRME, Queensland Health and any other formal requirements. Council undertakes regular sampling and testing to assess whether water quality is complying with the DWQMP water quality criteria.

Details of data used in the report and treatments applied to the data are as follows:

- data sources: verification monitoring data
- data analysis: undertaken using Microsoft Excel software
- identified errors, if any: removed from statistical analysis, and noted at the respective place.
- <LOD and >UL: <LOD (limit of detection) was treated as LOD/2 and >UL (upper limit specified for test) was taken as UL.
- Outliers: considered in the statistical analysis, uncles classed as specific error.

5.1. Source Waters

No source water monitoring was conducted during the reporting period. The DWQMP in force during the reporting period did not require source water monitoring. A review of the DWQMP is scheduled to take place in early 2019.

5.2. Operational Monitoring

Council has introduced a water quality spreadsheet to track and provide graphical analysis of water quality data and flagging of results that trigger adjustment limits or critical limits for critical control points. Daily samples are tested for pH and free chlorine. The graphical results of this daily operational monitoring from 1st January to 30th June 2018 for chlorine in Figure 1 and pH in Figure 2.

Prior to this spreadsheet, results were manually written in log sheets. These results were not transcribed for this Annual Report. Figure shows that the chlorination process at the plant needs some optimisation as it shows some variation. This will be discussed and reviewed as part of the DWQMP review in early 2019.

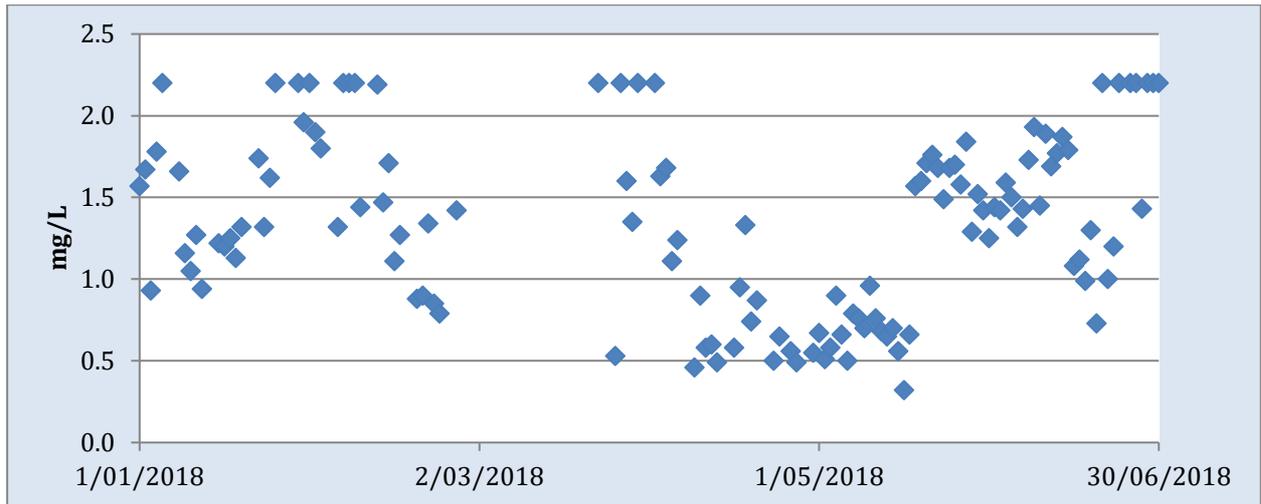


Figure 1 Treated Water Free Chlorine

Figure 2 shows that the pH is generally low (< pH 7) generally, which could be corrosive to the assets. This will be discussed and reviewed as part of the DWQMP review in early 2019.

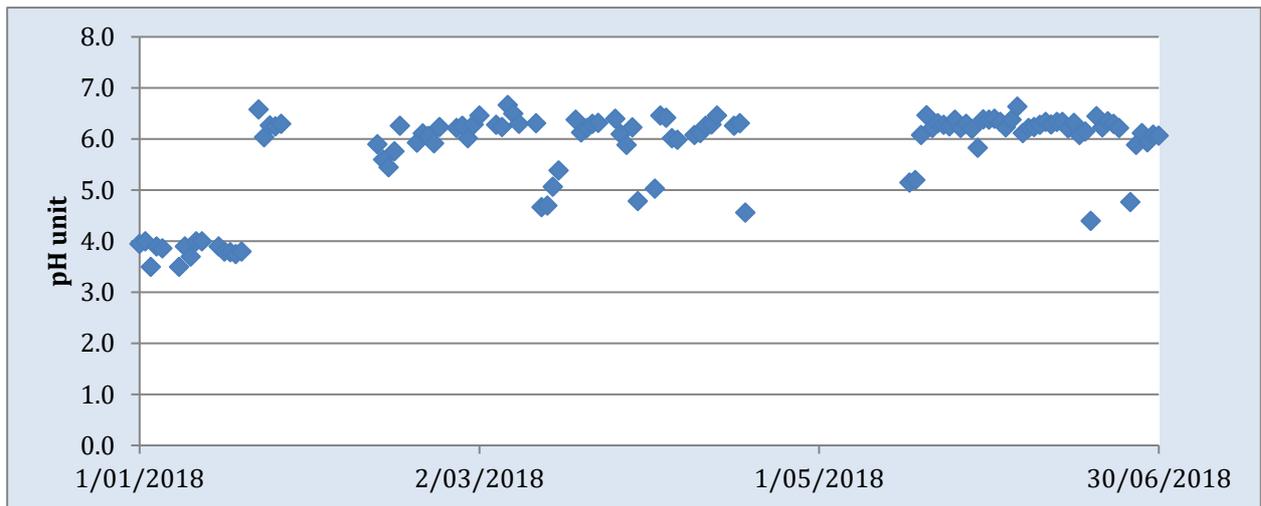


Figure 2 Treated Water pH

5.3. Treated Water

The verification monitoring data for the Mapoon scheme reticulation sites, and level of compliance are discussed in Table 1.

E. coli verification monitoring was conducted monthly by council from each site in accordance with the DWQMP in force during the reporting period.

Mapoon has experienced some issues with the retention of data over the July 2017 - December 2017 period. Mapoon is reviewing their DWQMP in early 2019 and will also review data retention and storage processes.

Table 1 Mapoon Reticulation Monitoring Data

Source	Parameter	N	Min	Max	Mean	Spec	OoS	% Meeting Spec	Comments
Cullen Point Road	<i>E. coli</i>	6	ND	ND	ND	ND (H)	0	100%	Compliant with water quality criteria, which is the <i>Public Health Regulation (2018)</i> .
	Heterotrophic Plate Count	5	ND	ND	ND	-	-	-	Not of health significance and are used as an indicator of system integrity and disinfection performance.
	Total coliforms	6	ND	ND	ND	-	-	-	Not of health significance and are used as an indicator of system integrity and disinfection performance.
School	<i>E. coli</i>	6	ND	ND	ND	ND (H)	0	100%	Compliant with water quality criteria, which is the <i>Public Health Regulation (2018)</i> .
	Heterotrophic Plate Count	5	ND	360	84	-	-	-	Not of health significance and are used as an indicator of system integrity and disinfection performance.
	Total coliforms	6	ND	ND	ND	-	0	100%	Not of health significance and are used as an indicator of system integrity and disinfection performance.
	pH	5	5.4	7.4	6.8	-	-	-	Not of health significance and are used as an indicator of disinfection performance.
Thungoo	<i>E. coli</i>	6	ND	ND	ND	ND (H)	0	100%	Compliant with water quality criteria, which is the <i>Public Health Regulation (2018)</i> .
	Heterotrophic Plate Count	5	ND	2800	606	-	-	-	Not of health significance and are used as an indicator of system integrity and disinfection performance.
	Total coliforms	6	ND	2	1.17	-	-	-	Not of health significance and are used as an indicator of system integrity and disinfection performance.

ND - not detected

n/a - not applicable

spec - specification (ADWG guideline value)

OoS - out of specification

A - aesthetic guideline value

H - health guideline value

6. Customer Complaints

There were no water quality related customer complaints recorded for the reporting period.

7. DWQMP Review

No review of the DWQMP was undertaken during the reporting period. A review of the DWQMP is scheduled to take place in early 2019.

8. DWQMP Audit

Council organised an external regulatory audit of the DWQMP in August 2017. There were 4 minor non-compliances and 1 major non-compliance identified. The major non-compliance was in relation to the management of incidents and emergencies. There was a slow response to a detection of *Escherichia coli*, the DWQMP requires an immediate response and it should have been reported to the regulator immediately upon receiving the results, which was not done for a number of months

As part of continuous improvement, several recommendations (and opportunities for improvement) were identified in the report.

The table below includes details of the recommendations and Council's plan to address these. Note, some recommendations have already been addressed.

Table 2 Action Plan - Audit Recommendations

Element audited	Recommendation	Comments
Accurate Data	Increase the number of <i>E. coli</i> samples to 4/month. This allows for one positive sample a year and for the scheme to still be compliant.	Will be reviewed and considered as part of the DWQMP review in early 2019.
Compliance with the Pan	Ensure that regulatory reporting deadlines are met, and records of submission are kept.	Noted and will be undertaken.
	Ensure that incidents are reported to the regulator within 3 hours. This must be followed up with a notice of noncompliance and records of these correspondence with the regulator and Queensland Health, if required, must be kept.	Noted and will be undertaken.
	Ensure that the authorised officers in the sampling section of the plan are current.	Will be reviewed and considered as part of the DWQMP review in early 2019.
	Monthly verification monitoring must be taken as specified in the plan.	Noted and will be undertaken.
	Review the RIMP, setting achievable dates and implement the improvements as detailed in the plan. Track progress of the improvements.	Will be reviewed and considered as part of the DWQMP review in early 2019.
	Ensure that review and other requirements in the Approval Notice actioned in a timely manner and records maintained.	Noted and will be undertaken.
	Consider developing checklists, or similar, to record the implementation of routine operation and maintenance activities.	Will be reviewed and considered as part of the DWQMP review in early 2019.
	Ensure that water quality aspects of the operations and maintenance are picked up in the newly developed procedures. Consider identifying for pH and chlorination, as a minimum.	Will be reviewed and considered as part of the DWQMP review in early 2019.
	Have a formal process for training and maintain records.	Will be reviewed and considered as part of the DWQMP review in early 2019.
	Ensure that staff training in the management of incidents and emergencies are recorded.	Noted and will be considered.
	Consider differentiating between health and aesthetic guidelines in the incident and emergency levels.	Will be reviewed and considered as part of the DWQMP review in early 2019.
	Consider including operational checks on he	Will be reviewed and considered as part of the

Element audited	Recommendation	Comments
	existing log sheets (e.g. bore checks on the Bore Log Sheet).	DWQMP review in early 2019.
	In order to track progress of the RMIP consider maintaining it as a spreadsheet.	Will be reviewed and considered as part of the DWQMP review in early 2019.
	Records management does need to be substantially improved to ensure that important information is stored and readily accessible.	Noted and will be considered.
Relevance of the Plan	The schematic infrastructure detailed in the DWQMP needs to be updated. Chlorine and soda ash dosing is being implemented and the high-level reservoir is still in use.	Will be reviewed and considered as part of the DWQMP review in early 2019.
	The hazard of viruses needs to be considered in the risk assessment.	Will be reviewed and considered as part of the DWQMP review in early 2019.
	The corrosive nature of the water needs to be considered in the risk assessment.	Will be reviewed and considered as part of the DWQMP review in early 2019.
	pH and chlorine monitoring must be undertaken at the WTP daily (7 days/week). Remote alarming must also be established, SCADA would be a good option to provide this functionality.	Will be reviewed and considered as part of the DWQMP review in early 2019.
	Undertake a full suite of analysis on the water, in the reticulation, once per year.	Will be reviewed and considered as part of the DWQMP review in early 2019.
	Monitor turbidity in each bore, no less than once per month, to identify surface water influences.	Will be reviewed and considered as part of the DWQMP review in early 2019.
	The risk assessment should consider corrosion due to the use of non-compatible materials.	Will be reviewed and considered as part of the DWQMP review in early 2019.
	Consider developing CCPs for pH correction and chlorination.	Will be reviewed and considered as part of the DWQMP review in early 2019.

9. References

James Howey 2017, DWQMP Regular Audit - Mapoon Aboriginal Shire Council DWQMP Audit Report, prepared for Mapoon Aboriginal Shire Council by Viridis Consultants Pty Ltd.

MASC. (2016). Drinking Water Quality Management Plan. Council Office.

NHMRC & NRMCC (2011). National Water Quality Management Strategy: Australian Drinking Water Guidelines (ADWG). 6th Ed. National Health and Medical Research Council and Natural Resource Management Ministerial Council. Australian Government, Canberra.

Public Health Regulation 2018. Queensland Government.

Water Supply (Safety and Reliability) Act 2008. Queensland Government.

Glossary

Disinfection	The process designed to kill most microorganisms in water, including essentially all pathogenic (disease-causing) bacteria. There are several ways to disinfect, with chlorine being most frequently used in water treatment.
<i>E. coli</i>	Bacterium found in the gut, used as an indicator of faecal contamination of water.
Hazard	A biological, chemical, physical or radiological agent that has the potential to cause harm.
Hazardous event	An incident or situation that can lead to the presence of a hazard (what can happen and how).
Risk	The likelihood of a hazard causing harm in exposed populations in a specified time frame, including the magnitude of that harm.
Source water	Water in its natural state, before any treatment to make it suitable for drinking.
Total coliforms	Group of bacteria whose presence in drinking water can be used as an indicator for operational monitoring.

Appendix A

Improvement Plan Progress

Improvement Plan Action Item	Progress
Investigate the possibility of reticulating and treating sewage	Application for sewage works submitted and in process for approval Additionally: Researching equipment for in house turbidity and E. coli testing, as part of Water infrastructure upgrade 2019. This is planned to involve testing 4 time per month, 3 in house and 1 through the Cairns Regional Council Water Laboratory.
Investigate issue with filter media, the grade of the calcium carbonate may be too fine	Removed media, cleaned bore, water treated soda ash
Constant disinfection monitoring	Daily samples are tested for chlorine and pH are recorded on a spreadsheet
Regular maintenance program needs to be developed. Procedure to be developed for mains breaks.	Maintenance program has been developed and repairs have been performed. Upgrades planned to increase capacity (1.2 ML tank) and introduce a new bore. Water test last week to ensure no cross contamination with sewage and new bore.
Investigate possible opportunities for formal training for existing staff	Water course opportunities are regularly sought out (Tom has been to some courses) Worker recently completed a Cert 3 relating to water (not sure on specifics)
Investigate possibilities for having an admin officer record data and store electronically	Have been using excel spreadsheet (chlorine) Additionally: SCADA coming soon as a part of upgrades. ETA November 2019



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