



Drinking Water Quality Management Plan

Annual Report 2021-22

December 2022



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EXECUTIVE SUMMARY

Water suppliers in Queensland (QLD) are required under the *Water Supply (Safety and Reliability) Act 2008* (the Act) to operate under an approved Drinking Water Quality Management Plan (DWQMP) to protect public health. In addition, the preparation of a DWQMP report per financial year is required by the Act.

This DWQMP report documents the performance of Napranum Aboriginal Shire Council (NASC) in implementing the DWQMP for the 2021-22 financial year.

NASC is a registered service provider operating the drinking water scheme for the Napranum township under an approved DWQMP. The water supply scheme is comprised of raw water sources (bores), a water treatment plant, pump stations, service reservoirs and distribution network.

NASC has undertaken water quality testing to ensure the supply of safe drinking water. The water quality verification results and assessment showed that NASC supplied safe quality water to its customers. There were no Events or Incidents reported in this period. The absence of water quality related customer complaints indicated excellent customer satisfaction.



Various improvement actions have been undertaken and/or in progress as continual improvement. The improvement actions have been identified through detailed risk assessment to ensure safe quality of drinking water.

The DWQMP was reviewed and amended during the reporting period. The amended DWQMP was approved by the Regulator without any issues. The next formal review is due by 1 March 2024. There was no regular audit that was required to be undertaken for the DWQMP during the reporting period.

1. INTRODUCTION

This is the Drinking Water Quality Management Plan (DWQMP) Annual Report for Napranum Aboriginal Shire Council (NASC) for the financial year 2021-22.

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. NASC is operating under an approved DWQMP, with the approval granted by the Department of Regional Development, Manufacturing and Water (DRDMW).

This Annual Report summarises NASC's drinking water quality performance for the reporting period 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 NASC's performance in relation to the DWQMP reporting obligations under the Act, for the reporting period
- provide a summary of NASC's performance in implementing the DWQMP.

2. SCHEME OPERATED

NASC is a registered drinking water service provider, with the service provider identification (SPID) number as 144.

It manages the Napranum drinking water supply scheme and distributes treated water to the township of Napranum. The water supply scheme is comprised of raw water sources (bores), 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, NASC has ensured effective risk management to assure safe quality of drinking water to our customers.

During the reporting period, NASC supplied drinking water that complied with the water quality criteria of the DWQMP. There was no major incident or event that comprised NASC's ability to supply safe quality drinking water to customers.

3.2. Monitoring

NASC maintains 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 4.

NASC 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. SWIM Local is now in use for all operational monitoring records (iPad used for sampling and operational monitoring data). Operational monitoring data is synced daily to SWIM platform.

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

NASC has the following quality management systems in place:

- while microbiological samples are tested in-house, quality checks for testing accuracy are undertaken by sending regular samples to the Cairns Regional Council Water Laboratory, which is a NATA accredited laboratory
- operations staff have been appropriately trained to undertake sampling.

3.3. Implementation of Risk Management Improvement Plan

NASC maintains a culture of continuous improvement and are actively implementing the Improvement Plan of the DWQMP.

A detailed status on the Improvement Plan implementation, including commentary, is presented in Appendix A.

4. VERIFICATION MONITORING COMPLIANCE

This section discusses the compliance with the water quality criteria. NASC supplied safe quality drinking water to its customers during the reporting period as discussed in the following tables.

A summary of the weekly in-house testing is included in Table 1.

Table 1 Drinking water quality performance – weekly internal verification monitoring

Locations ¹	Parameter	Sampling frequency ¹	No. of samples tested	Water quality criteria (spec)	Non-compliant samples	Comments
Water Yard (WTP) NECC (Child Care or Pre-School) Health Services (Hospital) NADS Aged Care	<i>E. coli</i> (P/A ²)	Weekly	51 ³ per site	Not detected	0	✓ Compliant. <i>E. coli</i> rolling average for the reporting period was 100%, at least 98% is required by the Public Health Regulation 2018.

Note:

- The Health Services (Hospital) site was not tested in-house in July-August 2021, from records. However, other sites were tested. This was picked up and corrected.

As *E. coli* is tested in-house, monthly quality assurance checks are undertaken by sending off *E. coli* samples from selected reticulation points to an external laboratory. The monthly *E. coli* results from the external laboratory verified that the in-house testing results were acceptable. No *E. coli* was detected in the monthly samples tested by the external laboratory as well. The monthly checks for the reticulation sites were missed in July 21, August 21 and October 21 due to logistical issues. However, the weekly sampling continued. The sampling program is under revision with the external laboratory to ensure compliance with the DWQMP.

¹ As per the DWQMP

² P/A – Presence/Absence test

³ 51 sampling runs in the reporting period. 51 samples collected for each site, except Health Services (refer to note)

A summary of the physio-chemical testing undertaken for the bores⁴ is included in Table 2. Although raw water, all parameters were compliant with the ADWG, except pH. pH is naturally low in the source water. This is an aesthetic parameter and not of health concern. NASC undertake pH correction as part of the water treatment process. The verification monitoring for the bores was undertaken in August 2021.

Table 2 Drinking water quality performance – bores verification monitoring

Analysis	Unit	LOR	Bore 1	Bore 2	ADWG Limit	Out of Spec
Total Dissolved Solids	mg/L	<1	14	16	600(A)	No
Electrical Conductance	uS/cm	<1	18	19	NA	NA
pH		<0.1	5.1	5.0	6.5-8.5(A)	Yes
Turbidity	NTU	<0.1	0.1	0.1	5(A)	No
Total Alkalinity as CaCO ₃	mg/L	<1.5	<1.5	<1.5	NA	NA
Calcium	mg/L	<0.2	<0.2	<0.2	NA	NA
Magnesium	mg/L	<0.05	0.24	0.26	NA	NA
Sodium	mg/L	<0.05	2.6	2.6	180(A)	No
Potassium	mg/L	<0.15	<0.15	<0.15	NA	NA
Total Hardness as CaCO ₃	mg/L	<1	1.5	1.6	200(A)	No
Arsenic	mg/L	<0.0002	<0.0002	<0.0002	0.01(H)	No
Aluminium	mg/L	<0.015	<0.015	<0.015	0.2(A)	No
Iron	mg/L	<0.015	<0.015	<0.015	0.3(A)	No
Cadmium	mg/L	<0.0001	<0.0001	<0.0001	0.002(H)	No
Copper	mg/L	<0.001	0.018	0.011	2(H) 1(A)	No
Lead	mg/L	<0.0005	0.0014	0.0017	0.01	No
Silicon as SiO ₂	mg/L	<0.2	6.2	6.1	80(A)	No
Manganese	mg/L	<0.0002	<0.0002	<0.0002	0.5(H) 0.1(A)	No
Fluoride	mg/L	<0.02	<0.02	<0.02	1.5(H)	No
Sulphate	mg/L	<1	<1	<1	250(A)	No
Chloride	mg/L	<0.5	3.8	3.6	250(A)	No
<i>Escherichia coli</i>	CFU/100mL	<1	<1	<1	Not Detected	No

A – aesthetic guidelines (spec) as per the ADWG. Does not impact public health.

H – health-based guidelines (spec) as per the ADWG. Requires investigation and corrective actions.

Note:

- The sampling program has been updated with the external laboratory to ensure compliance with the DWQMP.

⁴ This will be done quarterly post this reporting period.

A summary of the physio-chemical testing undertaken post treatment⁵ is included in Table 3. All parameters were compliant with the ADWG. The verification monitoring post treatment was undertaken in February 2022.

Table 3 Drinking water quality performance – post WTP verification monitoring

Analysis	Unit	LOR	Post WTP	ADWG Limit	Out of Spec
Colour	HU	<1	<1	15 (A)	No
Electrical Conductance	uS/cm	<1	44	NA	NA
pH		<0.1	7.2	6.5-8.5(A)	No
Turbidity	NTU	<0.1	<0.1	5(A)	No
Total Alkalinity as CaCO ₃	mg/L	<1.5	16	NA	NA
Calcium	mg/L	<0.2	5.6	NA	NA
Magnesium	mg/L	<0.05	0.26	NA	NA
Arsenic	mg/L	<0.0002	<0.0002	0.01(H)	No
Aluminium	mg/L	<0.015	<0.015	0.2(A)	No
Iron	mg/L	<0.015	<0.015	0.3(A)	No
Cadmium	mg/L	<0.0001	<0.0001	0.002(H)	No
Copper	mg/L	<0.001	0.002	2(H) 1(A)	No
Lead	mg/L	<0.0005	<0.0005	0.01	No
Manganese	mg/L	<0.0002	0.0004	0.5(H) 0.1(A)	No
Antimony	mg/L	<0.001	<0.001	<0.003 (H)	No
Barium	mg/L	<0.002	<0.002	<2.0 (H)	No
Beryllium	mg/L	<0.0001	<0.0001	<0.06 (H)	No
Boron	mg/L	<0.05	<0.05	<4.0 (H)	No
Chromium	mg/L	<0.0005	<0.0005	<0.05 (H)	No
Cobalt	mg/L	<0.0005	<0.0005	NA	NA
Molybdenum	mg/L	<0.0005	<0.0005	<0.05 (H)	No
Nickel	mg/L	<0.0005	<0.0005	<0.02 (H)	No
Selenium	mg/L	<0.002	<0.01	<0.002 (H)	No
Silver	mg/L	<0.0002	<0.0002	<0.1 (H)	No
Thallium	mg/L	<0.0005	<0.0005	NA	NA
Thorium	mg/L	<0.002	<0.002	NA	NA
Tin	mg/L	<0.001	0.001	NA	NA
Titanium	mg/L	<0.001	<0.001	NA	NA
Uranium	mg/L	<0.0001	<0.0001	<0.02 (H)	No
Vanadium	mg/L	<0.0001	<0.0001	NA	NA
Zinc	mg/L	<0.008	<0.008	<3.0 (A)	No

A – aesthetic guidelines (spec) as per the ADWG. Does not impact public health.

H – health-based guidelines (spec) as per the ADWG. Requires investigation and corrective actions.

Note:

- The sampling program has been updated with the external laboratory to ensure compliance with the DWQMP.

⁵ This will be done quarterly in the reticulation post this reporting period.

5. INCIDENTS REPORTED TO THE REGULATOR

There were no Events⁶ or Incidents⁷ reported for the 2021-22 period.

6. CUSTOMER COMPLAINTS

There were no water quality related customer complaints for 2021-22 period.

7. DWQMP REVIEW OUTCOMES

The DWQMP was required to be reviewed by 1 March 2022 as part of the DWQMP approval conditions. An external contractor was engaged to facilitate the review process. A review workshop was undertaken on 9 February 2022 and the review was completed on 28 February 2022 (within the required period).

The findings of the review are shown in Table 4.

Table 4 DWQMP Review Details and Findings

Area reviewed	Details	Changes needed
Water Quality Data	Detailed analysis of available water quality data (statistics and graphs) was undertaken to guide the risk assessment review and verify the risk profiles. Section 4.1 of the DWQMP was updated to include recent operational and verification monitoring data. This was updated prior to the risk review workshop, as a draft.	Finalise Section 4.1 of the DWQMP.
Supply Description	The schematic or process flow and infrastructure information were discussed to verify changes. This was undertaken during the review workshop on 9/2/22. The information was largely the same, some updates needed.	Minor updates to clarify the process, including raw water blending (can be done if needed), pH adjustment is via water going through a calcite bed – there is no direct lime dosing as such, bypass for pH unit is not a separate line but a line/valve at the bottom which can be turned on if needed, Figure 2 to be updated to better show the process flow, Figure 3 to be updated to show that reservoir is in the Water Yard, Koutinee Ct identified as a dead end.
Risk Assessment	The risk assessment for the supply was reviewed in detail via a workshop on 9/2/22. The risk team details are included in the Risk Register – relevant tab.	Finalise the risk assessment review based on the workshop discussions.
Improvement Actions	Improvement actions were reviewed as part of the workshop discussions.	Update the Improvement Plan following the workshop.
Monitoring Programs	These were reviewed. Minor changes discussed.	Minor changes needed. Operational - add turbidity to reticulation testing, change 208 Tuwal St to 203 Tuwal St, testing at WTP (Water Yard) to remain daily 7 days, testing in reticulation to be Daily Mon-Fri (except public holidays), ESS is responsible for reviewing and assessing results, pH in raw water naturally low always – no need to test daily, add bore water integrity (via turbidity) as a CCP

⁶ Potential to impact water quality

⁷ Non-compliance against ADWG value

Area reviewed	Details	Changes needed
		<p>with a critical limit, add SCADA to monitoring frequency where relevant, minor changes to actions to take in operational monitoring table. Appendix B – pH control to be reviewed and updated for consistency with discussions during the risk assessment review.</p> <p>Verification – Tavern Rd not tested for <i>E. coli</i> – remove (operational monitoring done there so okay), change annual water testing to quarterly – both bores and one reticulation site to be tested, to obtain seasonal dataset.</p>
Incident and emergency response	This was reviewed. There was no major change noted but minor updates required.	<p>ESS is responsible for incident management, on call phone number to be changed, old Figure 4 – Preliminary Incident/Emergency Flow Chart – no added value – remove, minor updates to the incident management tables, change regulators email, add Disaster Event reporting flow chart, update the vulnerable customers list, change regulator’s email addresses in the incident flow charts figures.</p>
Critical Control Points	CCPs were discussed at the review workshop on 9/2/22.	<p>Lower limit for Disinfection CCP can be changed to 0.2 mg/L based on <i>C.t</i> calculation, target to be given a range, changes to corrective actions to provide more guidance.</p> <p>Add bore water integrity as a CCP, with limits and corrective actions.</p>
DWQMP Body	Reviewed following the risk workshop.	<p>Minor updates required in line with the above areas reviewed.</p> <p>Change ESO to ESS across.</p> <p>Stakeholders list in Section 3.5 to be reviewed and updated.</p> <p>Vulnerable customer details to be reviewed and updated in Section 6.4.2.</p> <p>Include Appendix C into the DWQMP – currently is separate.</p> <p>A meeting was undertaken with the senior team leaders (SLT) to present on the DWQMP importance and requirements and the review process. Following the meeting, the SLT reviewed the updated DWQMP.</p>

The outcome of the review was the need to update the DWQMP. The DWQMP was subsequently amended and submitted to the Regulator. The Regulator approved the amended DWQMP on 27 April 2022.

The next formal review is due by 1 March 2024.

8. DWQMP AUDIT FINDINGS

No regulatory audit was required to be conducted during the reporting period. A regular audit was conducted post the reporting period and findings will be included in the next DWQMP Annual Report.

9. GLOSSARY

ADWG	Australian Drinking Water Guidelines (2011). Published by the National Health and Medical Research Council of Australia
DRDMW	Department of Regional Development, Manufacturing and Water
DWQMP	Drinking Water Quality Management Plan
<i>E. coli</i>	<i>Escherichia coli</i> , a bacterium which is considered to indicate the presence of faecal contamination and therefore potential health risk
Event	Means anything that has happened to the service that has escalated beyond the ability to control and there is concern that public health may be adversely impacted as a result.
Incident	Means a non-compliance with water quality criteria (e.g. exceeding an ADWG health guideline value).
pH	An expression of the intensity of the basic or acid condition of a liquid. Natural waters usually have a pH between 6.5 and 8.5. Aesthetic issue (not of health concern).
mg/L	Milligrams per litre
NTU	Nephelometric Turbidity Units
CFU/100mL	Colony forming units per 100 millilitres
uS/cm	MicroSiemens per cm

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A. IMPROVEMENT PLAN PROGRESS

The DWQMP improvement actions are included here with relevant commentary on implementation status.

Action No.	Improvement Action	Priority	Status	Comments
1	Develop procedure on checks and inspections needed for the chlorine gas facility	High	In Progress	Checks and inspections are done but procedure is needed to standardise practice. Viridis has been contracted for SOPs development/documentation, drafts to be field verified.
2	Remove all redundant decommissioned pipes and valves and structures from the water treatment compound.	Low	To Start	Remnants are of an elevated tower reservoir. Funding needed. Within timeframe
3	Install water tanks under ute trays to allow wash down as needed.	Medium	To Start	One car has it, one more needs it. Both water operator vehicles need to have one. Within timeframe
4	Fully label all valves, sample points, pipelines with English language labels. Indicate direction of flow.	Medium	To Start	Within timeframe
5	Assess condition of sewer mains e.g. using camera or based on any previous (recent) condition report. Review and implement the findings from the condition assessment.	Medium	To Start	Within timeframe
6	Investigate procuring Council-owned sewer inspection cameras to undertake periodic condition assessment of sewer mains.	Medium	To Start	Within timeframe
7	Test for turbidity weekly at the bores, and establish a CCP for bore turbidity.	High	Completed	CCP established - Appendix A of the DWQMP. Testing has started, to be continued.
8	Test the 2 bores (and 1 reticulation network site) quarterly for metals and physio-chemical parameters to gain more understanding of the source water characteristics.	Medium	In Progress	Being scheduled in with the lab
9	Establish contact with RTA Weipa (Water and Tailings Department and/or Weipa Town Authority) to be alerted of any PFAS issues in their monitoring bores which are relatively close to Napranum.	Medium	To Start	Within timeframe
10	Investigate if there are zoning measures in place for bores (e.g. no development within 2-5 km). Establish measures if not in place, as relevant.	Medium	To Start	Within timeframe
11	Undertake bore casing condition assessment using downhole camera. Review and implement the findings from the condition assessment.	Medium	To Start	Within timeframe
12	Install a work platform on the southern side of the aeration/pH adjustment unit.	Medium	To Start	Within timeframe
13	Develop a procedure for operation of the calcite filter, including changing filter bed, washing, adjusting pH with raw water if needed.	High	In Progress	Procedure is needed to standardise practice. Viridis has been contracted for SOPs development/documentation, drafts to be field verified.

Action No.	Improvement Action	Priority	Status	Comments
14	Investigate having a contingency chlorination system e.g. hypo system can be recommissioned as emergency backup and/or maintain chlorine tablets.	Medium	To Start	Within timeframe
15	Review or develop a new daily checks sheet for all related drinking water services tasks (e.g. bore inspections, testing, reservoir visual check etc).	High	In Progress	Procedure is needed to standardise practice. Viridis has been contracted for SOPs development/documentation, drafts to be field verified.
16	Document the 3 monthly more detailed reservoir inspection as a checklist. Investigate the use of drones to complete visual inspections of reservoir roof during the 3 monthly checks.	High	In Progress	Procedure is needed to standardise practice. Viridis has been contracted for SOPs development/documentation, drafts to be field verified.
17	Document the reservoir cleaning and internal inspection program, including schedule.	High	In Progress	Procedure is needed to standardise practice. Viridis has been contracted for SOPs development/documentation, drafts to be field verified.
18	Repair hydrant at Koutinee Ct to serve also as a flushing point when needed.	Medium	To Start	Within timeframe
19	Document the flushing procedure (for reactive and proactive), including schedule and record keeping.	High	In Progress	Procedure is needed to standardise practice. Viridis has been contracted for SOPs development/documentation, drafts to be field verified.
20	Develop a mains/pipes repair procedure, including hygienic practices, disinfection and water quality acceptance criteria. Share the procedure with the contractor.	High	In Progress	Procedure is needed to standardise practice. Viridis has been contracted for SOPs development/documentation, drafts to be field verified.
21	Verify the operational status of Hospital backflow prevention device. If it hasn't been tested then organise for testing to be done by the Hospital.	Medium	To Start	Within timeframe
22	Test for turbidity also in the reticulation.	High	Completed	Being done, to be continued
23	Recruit a new operator and train them on the DWQMP.	High	To Start	Within timeframe
24	Fill in the Operations Manager position (there is a person Acting in the role currently).	High	To Start	Within timeframe
25	Document a DWQMP induction training pack for new recruits.	High	In Progress	Procedure is needed to standardise practice. Viridis has been contracted for SOPs development/documentation, drafts to be field verified.
26	SCADA training to be undertaken by ESS and new operator when onboard.	High	To Start	Within timeframe
27	Verify that spreadsheets are being backed up in Council's shared drive and not only maintained on a USB. Set up a process to backup the USB regularly.	Medium	To Start	Within timeframe
28	Develop a preventive maintenance program/schedule for all the pumps.	High	In Progress	Procedure is needed to standardise practice. Viridis has been contracted for SOPs development/documentation, drafts to be field verified.

Action No.	Improvement Action	Priority	Status	Comments
29	Investigate commissioning another bore to supplement the two existing bores, and also to serve as contingency.	Medium	To Start	Within timeframe
30	Investigate from Austech on the cybersecurity strategies in place for the SCADA system.	Medium	In Progress	Discussions underway
31	Investigate what Council's corporate cybersecurity procedure/policy is and the need to develop one.	Medium	To Start	Within timeframe
32	Document the equipment calibration program, including record keeping	High	In Progress	Procedure is needed to standardise practice. There is a sampling device recalibration spreadsheet (return to supplier for certification/recalibration). Viridis has been contracted for SOPs development/documentation, drafts to be field verified.
33	Document the process on ensuring chemical quality, including procurement requirements, certificates of analysis, record keeping.	High	In Progress	Procedure is needed to standardise practice. Viridis has been contracted for SOPs development/documentation, drafts to be field verified.
34	Establish and document a QA/QC framework and procedures for the in-house micro testing, including sampling, negative/positive checks, staff training, external QA check.	High	In Progress	Viridis has been contracted for SOPs development/documentation, drafts to be field verified. As part of this Viridis will assess the QA/QC in place and provide brief recommendations