

Drinking Water Quality Management Plan Report

North Queensland Bulk Ports (NQBP)

SPID: 548

Financial Year 2019/2020

This report has been prepared in accordance with the Drinking Water Quality Management Plan Report Guidance Note by:

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1 Introduction

This report documents the performance of North Queensland Bulk Port's (NQBP) drinking water service with respect to water quality and performance in implementing the actions detailed in the drinking water quality management plan (DWQMP) as required under the *Water Supply (Safety and Reliability) Act 2008* (the Act) for the financial year 2019-20. NQBP is a registered service provider with identification (SPID) number 548.

The report assists the Regulator in determining 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. Specifically, it covers:

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

This template has been prepared following the *Drinking Water Quality Management Plan Report Template and Guidance Note* published by the Department of Natural Resources, Mines and Energy accessible at www.dnrme.qld.gov.au.

The 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.

2 Summary of scheme/s operated

The details of the scheme to which this plan applies, and the corresponding details of connections, and current and future demands, are provided within the DWQMP. Note that as NQBP does not have any residential customers, population figures have not been modelled and are not included in this report.

Results of network modelling, presented in NQBP's Port of Mackay Utilities Water Asset Management Plan (AMP) 2018 shows the network average day (AD) demand as approximately 534 KL/day, the maximum day (MD) demand as 1,911 KL/day (6.1 and 22 L/s equivalent continuous flow rate respectively). The maximum hour (MH) demand was assessed as a rate of 44.5 L/s. According to the Water AMP, future demand over the next 25 years is expected to be driven mostly by land holdings, with maritime demand expected to remain relatively constant.

The Port of Mackay sources water from the Mackay Regional Council (MRC) distribution network. NQBP does not implement any water treatment within its DWQMP.

Table 1 – Summary of schemes

	<i>Water Source</i>	<i>Treatment processes</i>	<i>Treatment capacity</i>	<i>Towns supplied</i>
Port of Mackay	MRC	Nil – Treated by MRC	Nil	Port of Mackay tenants, approximately 122 connections

3 DWQMP implementation

The actions undertaken to implement the DWQMP are summarised below.

During the recent period NQBP continued to implement the DWQMP by:

- Undertaking internal training on the DWQMP;
- Implementing various improvement items contained within the DWQMP improvement plan;
- Continuation of monitoring water quality within its system at five (5) locations within the Port of Mackay. There have been no changes made to the monitoring program;
- Undertake monthly meetings with relevant departments to ensure compliance and to discuss and investigate strategies to improve the Port of Mackay reticulated water network; and
- Water Network Strategy for Port of Mackay developed to ensure continued safety and reliability of the water supply

The actions undertaken to implement the risk management improvement program are discussed in Table 2. Note, action items marked as complete within the previous year's annual report have not been included within the table below.

The next section provides a brief presentation of the improvement plan undertaking to meet the requirements of our Water Network Strategy

3.1 Water Network Strategy and Improvement Plan

Port of Mackay developed a Water Network Strategy during last year which comprises of several works to upgrade or maintain the water network aiming to achieve full compliance in all respects.

The Water Network Strategy has identified all the opportunities to improve our Water Network and classified them under to broad categories. The first category is associated with improvement works combined with road upgrade projects, so to achieve better delivery outcomes. The second category is associated with developments to be undertaken as a standalone activity.

Hence, we have been planning and implementing the following improvements/ developments:

- 1) Renewal of an existing galvanised iron main crossing Ken White Avenue to service Wharf 2

This main has historical performance issues and that it most recently failed when the new secondary connection from Gudyara Road was in operation. The pipeline has been isolated. However, this results in 'dead-ending' of water for Wharf 2 and reduces the reliability of supply in this area.

- 2) Decommissioning of the DN250 Harbour Road asbestos concrete water main and connection of DN150 Graeme Heggie Street water main to the DN250 Harbour Road PVC water main.

The DN250 AC water main has a history of poor performance. It currently services only the Graeme Heggie Street area and potentially 1-2 fire hydrants on Harbour Road. It is proposed to decommission this water main and 'cut-over' existing services to an existing DN250 PVC water main installed on Harbour Road;

- 3) Installation of a pressure reducing valve (PRV) downstream of the secondary connection on Gudyara Road

NQBP seek to make regular use of the recently constructed secondary connection on Gudyara Road rather than use it as a supplementary or emergency supply. To enable regular use of this connection,

installation of a PRV is required to protect NQBP water assets and to reduce backflow risks to Mackay Regional Council (MRC) assets.

4) Compliance with MRC's BPD Requirement

- MRC and NQBP agreed in commencing the installation of appropriate backflow prevention devices (BPD's) at the most critical facilities. However, upon the installation of a number of BPD's, the water pressure dropped around 100KPa, past BPD, resulted negatively in the performance of the firefighting network.
- In parallel, MRC and NQBP agreed to undertake a hazard rating assessment of every customers and rate the sites as "Low", "Medium" or "High" based on the business activities. The assessment has been completed, following the recommended AS3500.1 and agreed in principle with MRC.
- However, in situ installation can only be finalized upon the completion of next step. In the meantime, the procurement is progressing.

5) Installation of booster pump station

In order to ensure the agreed supply pressure of 220 kPa at the property boundaries (past the BPD's) it required to revisit the water network model, which has been updated to incorporate all the required BPD's.

The outcome of the water network model indicated the size and number of Booster pumps required. NQBP proceeds with the procurement of this works as well.

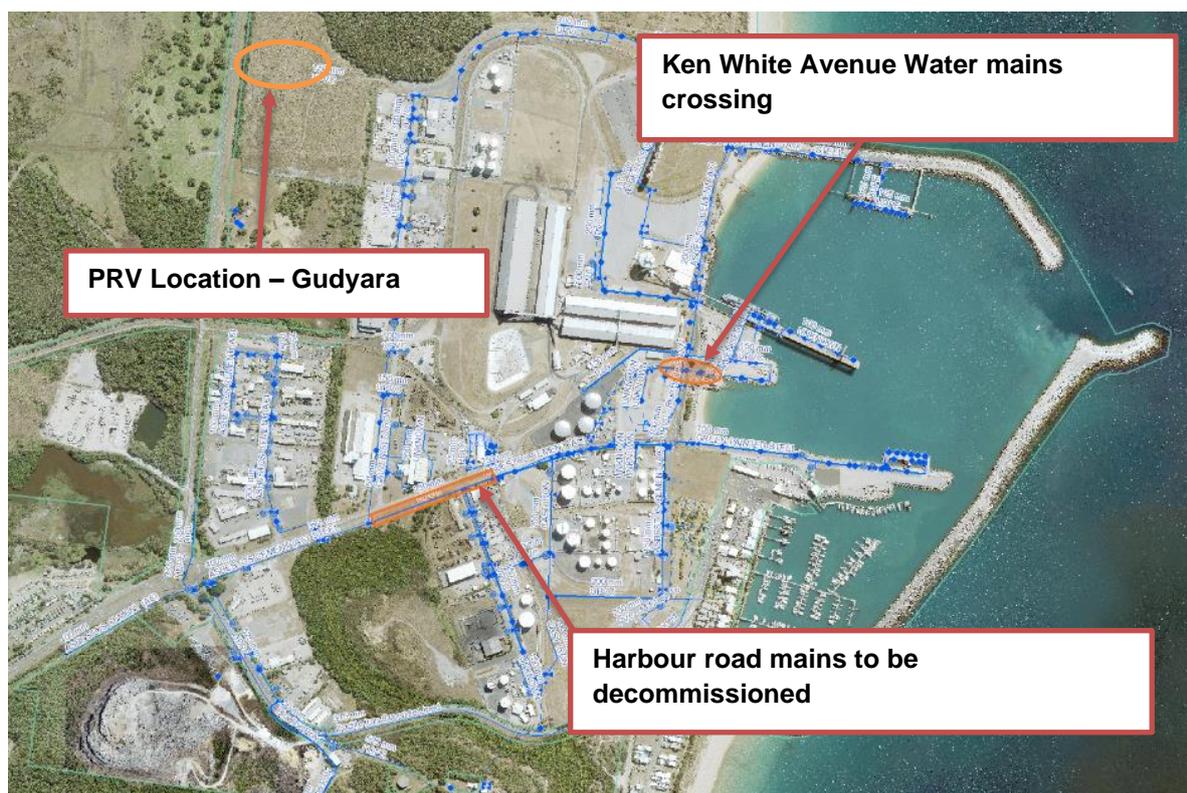


Figure 1 - Port Water Network

3.2 Water Bulk Supply Agreement

The Water Bulk Supply Agreement has been prepared but has not been discussed in detail with MRC due to the following still outstanding issues:

- a. Water Supply Flow requirements considering the new developments
- b. Water Supply Connection requirements considering the new developments
- c. Water Supply Pressure considering the installation of a BPDs and Booster Pump Station

Currently we have finalized the Preliminary Design and are near to agree with MRC on the scope of work. This agreement will enable us to have a solid understanding of the Water Supply requirements which will facilitate the drafting of the technical requirements of the Bulk Supply Agreement.

We plan to have finalize this Bulk Supply Agreement by 31 August 2021.

Table 2. Risk management improvement program implementation status

ID #	Category	Improvement actions	Target date	Actions taken to date	Status and revised target date	Responsible Officer / Position
01	1.2 Regulatory and Formal Requirements	Develop formal Bulk Water Supply Agreement between MRC and NQBP. Ensure that this specifies water quality, a statement such as the following is recommended: "MRC shall supply water that meets the latest Australian Drinking Water Guidelines".	30/06/2019	Draft Deed complete; however, not yet agreed between MRC and NQBP. Bulk Water Supply Agreement to be updated to include additional bulk water supply issues such as flow rates, availability, fees, head charges etc. Refer to Section 3.2.	Underway 31/08/2021	Principal Asset Manager
02	2.1 Water Supply and System Analysis	Continue improvement of GIS. Improvement measure shall be identification and positioning of all water supply pipeline components.	Task is ongoing. 30/06/2019	Reliability of data set improved through increased control around Permit to Dig and retrieval of As-Constructed drawings from close-out of NQBP Projects which interface with the water network. All available desktop-based data has been incorporated within the GIS system. On-site inspection and verification/audit commenced. ERP Project in progress. Action #31	Task is ongoing. 30/11/2021	GIS Officer
03	3.1 Preventative measures and multiple barriers	Review planning application approval process to ensure that it covers water quality management.	01/03/2019	Planning department confirmed that the requirement for Backflow Protection Devices will be included within the next Port Development Guidelines update. Assessment report to be updated to include water quality management.	31/03/2020	Port Engineer – Mackay
04	3.2 Critical control points	Investigate options for online monitoring of bulk water supply at handover point.	30/06/2019	Pending Bulk Water Supply Agreement and completion of Action #01 and 3.1 DWMP Implementation.	Underway 31/08/2021	Principal Asset Manager
05	3.2 Critical control points	Consider options for dealing with non-conforming water received at handover point	30/06/2019	Pending Bulk Water Supply Agreement and completion of Action #01 and 3.1 DWMP Implementation.	Underway 31/08/2021	Principal Asset Manager
06	6.2 Incident and emergency response protocols	Adopt and integrate Drinking Water Incident and Emergency Plan and associated Drinking Water Incident Response Procedures.	Underway 31/03/2019	Include DWIEMP and DWIRP as a sub-plan to the NQBP Emergency Management Plan. The Business Continuity Plan and Emergency Management Plan are in different stages of completion. Port Engineer to liaise with Emergency Manager to close this out.	Underway 30/06/2021	Port Engineer – Mackay
07	6.2 Incident and emergency	Align DWEMP and DWIRP's with Emergency and Business Continuity Manual.	Underway 31/03/2019	This will be completed during the review of NQBP's Emergency Response Plan (Business Continuity Manual).	Underway 30/06/2021	Port Engineer – Mackay

ID #	Category	Improvement actions	Target date	Actions taken to date	Status and revised target date	Responsible Officer / Position
	response protocols					
08	2.2 Assessment of water quality data	Purchase handheld testing instrument and undertake additional operational monitoring of free chlorine within the network. Update MEX with Preventative Maintenance task associated with this.	Underway	Colorimeter purchased to undertake additional operational monitoring of free chlorine within the network. Monitoring carried out consecutively with monthly flush of mains and Mex PM135 updated.	Completed	Port Engineer – Mackay
09-12	1.2 Regulatory and Formal Requirements	Bulk Water Supply Agreement inclusions	31/12/2019	Pending Bulk Water Supply Agreement and completion of Action #01 and 3.1 DWMP Implementation.	Underway 31/08/2021	Principal Asset Manager
13	7.1 Employee awareness and involvement	Consider requiring all contractors etc to have an 'Aqua-Card' (issued by Queensland Water Directorate) for drinking water quality awareness.	31/10/2019	Course completed by plumber, apprentice and maintenance superintendent online at https://watertraining.com.au/ . Contractual requirement to be added to ensure contractors hold the Aqua Card.	Completed	NQBP Plumber
14	6.2 Incident and emergency response protocols	Update the emergency plan to reference key documents rather than having the same information in more than one place (creates issues with maintaining currency). Refer also Action #21.	20/12/2019	To be undertaken through the update and finalisation of the NQBP emergency management system.	Underway 30/06/2021	Port Engineer – Mackay
15	6.2 Incident and emergency response protocols	Consider developing a diagram to show the architecture of the incident management framework and how other systems such as the external plan and records management systems (such as RiskWare and Guardian) support the framework.	20/12/2019	To be undertaken through the update and finalisation of the NQBP emergency management system.	Underway 30/06/2021	Port Engineer – Mackay
16	1.2 Regulatory and formal requirements	Prioritise establishment of the formal contract (Mackay Water Supply Deed) for the supply of treated drinking water from MRC. (REC-03). Refer also Action #01.	31/12/2019	Pending Bulk Water Supply Agreement and completion of Action #01 and 3.1 DWMP Implementation.	Underway 31/08/2021	Port Engineer – Mackay
17	4.2 Operational monitoring	Establish operational monitoring of free chlorine and establish appropriate corrective actions in response to low free chlorine results. (REC-05)	31/12/2019	Colorimeter purchased. Monitoring program implemented in MEX under PM 135. Flushing carried out if low free chlorine results not within recommended guidelines are recorded during monthly inspection testing using colorimeter or on receipt of monthly water testing results.	Completed	Port Engineer – Mackay

ID #	Category	Improvement actions	Target date	Actions taken to date	Status and revised target date	Responsible Officer / Position
18	4.2 Operational monitoring	Review SOPs to include testing of chlorine residual to assess if the actions has been successful in implementing the preventive measure. (REC-06)	31/12/2019	SOPs reviewed and revised to include testing of cholrine residual.	Completed	Port Engineer – Mackay
19	10.2 Reporting	Consider capturing the drinking water risk assessment in the Risk Ware program to standardise risk management across the organisation. (OFI-01)	31/03/2020	Outcomes of drinking water risk assessment to be loaded into RiskWare	Underway 31/03/2020	Port Engineer – Mackay
20	6.2 Incident and emergency response protocols	Consider undertaking incident scenario testing in conjunction with MRC to test emergency protocols and lines of communication. (OFI-08)	30/06/2020	To be discussed with MRC.	Underway 30/06/2020	Port Engineer – Mackay
21	10.1 Management of documentation and records	Consider referencing the master list of emergency contacts, kept by NQBP rather than updating the DWQMP each time the list. (OFI-09)	31/12/2019	To be undertaken through the update and finalisation of the NQBP emergency management system.	Underway 30/06/2021	Port Engineer – Mackay
22	4.2 Operational monitoring	Consider liaising with MRC to receive relevant verification data on the bulk water supplied to NQBP. (OFI-10) Refer also Action #01.	31/12/2019	Pending Bulk Water Supply Agreement and completion of Action #01 and 3.1 DWMP Implementation.	Underway 31/08/2021	Principal Asset Manager
23	1.2 Regulatory and formal requirements	Enter into Bulk Water Supply Agreement between NQBP and MRC by December 2019. Consider including the requirement for a minimum free chlorine residual at the bulk water handover point in the drinking water supply deed. (OFI-14). Refer also Action #01.	31/12/2019	Pending Bulk Water Supply Agreement and completion of Action #01 and 3.1 DWMP Implementation.	31/08/2021	Principal Asset Manager
24	4.4 Equipment capability and maintenance	Confirm, document and install as appropriate, a BPD at: 1. Each (high risk tenant) meter 2. Atom (If not BPD check for an airgap) 3. Each wharf (to install). Ensure any unregistered BPD is added to register to track asset condition and ensure tenant is undertaking routine maintenance.	30/06/2020	Audit of BPD to be undertaken. Project Brief approved and 14 BPD's purchased for installation. 8 installed during 19/20FY with the remaining 6 to be installed during 20/21FY.	Underway 30/06/2021	Port Engineer – Mackay
25	6.1 Communication	Establish formal procedures to ensure MRC informs NQBP of breaches of chlorine	31/12/2019	Include in Bulk Supply Agreement. Refer Action #01 and 3.1 DWMP Implementation.	Underway 31/08/2021	Port Engineer – Mackay

ID #	Category	Improvement actions	Target date	Actions taken to date	Status and revised target date	Responsible Officer / Position
		residual at Mt Bassett register (MRC quality control point). Add this condition the to Bulk Water Supply Agreement.				
26	4.4 Equipment capability and maintenance	Investigate directional flow devices at two fire-fighting tanks for their efficiency in preventing backflow into reticulation particularly in the event of the pipe breaks (or low pressure) in reticulation.	31/03/2020	BFP installed at meter that covers both tanks to prevent backflow into reticulation.	Completed	NQBP Plumber
27	7.1 Employee awareness and involvement	Consider including the requirement of the Aquacard. Refer also Action #13.	31/10/2019	Refer also Action #13. Requirement added and assigned in People Connect.	Completed	NQBP Plumber
28	4.2 Operational monitoring	Once a chlorine meter is procured, establish a monitoring program to monitor loss of chlorine residual; particularly after periods of time where water has not been supplied in bulk from wharfs.	30/06/2020	Chlorine meter procured. Monitoring program established as per Action 17. Monthly testing carried out.	Completed	Port Engineer – Mackay
29	4.4 Equipment capability and maintenance	Install fence or barrier (e.g. bollard) around Harbour Rd connection flowmeter (subject to MRC approval).	30/06/2020	To be budgeted and approved internally. Include requirement in next AMP update. This is pending completion of Action #01 and #35.	31/08/2021	Port Engineer – Mackay
30	4.4 Equipment capability and maintenance	Determine requirement for assigning criticality levels to equipment in AMP and/or MEX to ensure that sufficient redundancy (spares) are available in the event of a failure of critical equipment.	31/07/2020	To be reviewed in next AMP update. Consideration of critical spares being recorded in ERP Program Action #31.	To be completed 31/10/2021	Port Engineer – Mackay
31	4.2 Operational monitoring	Implement process to ensure all regulatory requirements relating to the DWQMP are documented and available in one central location.	31/10/2021	ERP program (Technology One) will be rolled out across the business 01/10/2021. This will ensure all documents, work orders, customer communications, testing results etc relating to the DWQMP will be recorded in the one central location.	31/10/2021	Port Engineer – Mackay
32	7.1 Employee awareness and involvement	Consider refresher training of NQBP staff on the DWQMP to ensure awareness and compliance.	31/07/2021	Investigate training options. Previous training carried out by external contractor (City Water Technology) in August 2018.	28/02/2021	Port Engineer – Mackay
33	4.4 Equipment capability and maintenance	Asses and develop a Water Network Strategy to identify risks and recommendations to maintain the water network over the next 20 years.	30/04/2020	Premise engaged to audit, investigate and develop the Water Network Strategy relating to NQBP's water network.	Completed	Port Engineer – Mackay

ID #	Category	Improvement actions	Target date	Actions taken to date	Status and revised target date	Responsible Officer / Position
34	4.4 Equipment capability and maintenance	Establish a 5 year plan to deliver all the major compliance and improvement works required to NQBP's water network as identified in the Water Network Strategy to ensure safety and reliability of the water supply.	30/04/2021	Water Network Improvement Project Brief has been finalized. The procurement process has commenced. Relates to Action #33.	30/04/2021	Engineering Manager
35	4.4 Equipment capability and maintenance	Consider installation of a booster pump at water meter handover point of MRC to NQBP to improve pressure/flow of water to customer connections.	30/06/2021	Booster pump station preliminary design is near to completion/ agreement with MRC.	30/06/2021	Engineering Manager

4 Verification monitoring - water quality information and summary

This section discusses the compliance with the water quality criteria.

The results from the verification monitoring program have been compared against the levels of the water quality criteria specified by the Regulator in the *Water Quality and Reporting Guideline for a Drinking Water Service*. The reported statistics do include results derived from repeat samples, but do not include those from emergency or investigative samples undertaken in response to an elevated result. Verification monitoring was carried out as per the program stated within the DWQMP. Refer to Tables 3 and 4 below for relevant monitoring data.

Table 3. Drinking water quality performance - verification monitoring – Mackay Scheme

Parameter	No. of samples required to be collected (as per the approved DWQMP)	No. of samples actually collected and tested	Water quality criteria (i.e ADWG health guideline value)	No. of non compliant samples	Comments
Free Residual Chlorine (mg/L)	65	91	>0.2, <5	4	4 samples resulted in a chlorine reading < 0.2 mg/L. Reactive flushes were undertaken when free chlorine results came back at < 0.2mg/L.
Total Chlorine (mg/L)	65	91	>0.2, <5	3	3samples resulted in a total chlorine reading < 0.2 mg/L. A reactive flush was taken following receipt of results.
Turbidity (NTU)	65	91	<5	0	
E. Coli (MPN/100mL)	65	91	0	0	
pH	65	91	>6.5, <8.5	0	
Conductivity (µS/cm)	65	91	-	n/a	Min = 181 µS/cm Median = 258 µS/cm Avg = 254.9 µS/cm Max = 493 µS/cm
Dissolved Oxygen (% Sat)	65	91	>85	79	79 samples were below the aesthetic guideline value of 85% sat. The minimum value was 56%. Low DO consistent with MRC readings.
Temperature (°C)	65	91	-	n/a	Min = 18.4 °C Median = 26.9 °C Avg = 27.1°C Max = 36.7 °C
Total Coliforms (MPN/100mL)	65	91	0	0	Min = 0 MPN/100mL Max = 0 MPN/100mL

Table 4 - E. coli compliance with annual value

Drinking water scheme: Port of Mackay

Year	2019-2020												
	Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	8	6	7	11	7	7	7	7	7	10	7	7	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	0
No. of samples collected in previous 12 month period	88	86	86	86	90	90	90	90	90	89	93	90	90
No. of failures for previous 12 month period	0	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%	100%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

5 Incidents reported to the Regulator

The incidents reported to the regulator and management actions undertaken over the financial year are provided in this section.

This financial year there were 0 instances where the Regulator was notified under sections 102 or 102A of the Act. There were a total of 4 instances where the Free and Total Chlorine content within the water tested was below the ADWG.

Table 5 – Incidents reported to the Regulator

Incident date	Scheme / location	Parameter / issue	Preventive actions
Nil			

6 Customer complaints

This section discusses details of any complaints received about the drinking water service.

NQBP is required to report on the number of complaints, general details of complaints, and the responses undertaken.

Throughout the year no complaints were received by NQBP with respect to water quality within the Port of Mackay.

Table 6 – Example: customer complaints about water quality

Scheme	Health concern	Dirty water	Taste and odour	Other
Port of Mackay	0	0	0	0
Total	0	0	0	0

However, we would like to note that we had complaints regarding the water pressure drop by the tenants of the facilities where we installed the BPDs. Taken into consideration the importance of the water pressure for the current fire fighting network, we decided to isolate the BPDs, while in parallel we proceeded with the design studies for construction a Booster Pump Station.

7 DWQMP review outcomes

A summary of the outcomes of the review and how issues/changes raised in the review, were actioned is provided in this section.

A risk assessment and review of the DWQMP was conducted in April 2019 and covered the time period from 01/07/18 to 31/06/19. The purpose of the review was to ensure that the DWQMP remains relevant, having regard to the operation of the drinking water service. The review was conducted by:

- Jen Annice – Port Engineer;
- Mark Berts – Plumber; and
- Jess Circosta – Senior Process Engineer, City Water Technology.

The review considered comments and recommendations from the DWQMP training session and external audit undertaken within August 2018 and September 2018 respectively.

A formal update and revision to the DWQMP was issued to the Regulator via an Amendment Application and approved by the Regulator on 22nd April 2020.

Refer to Appendix 1 for 2018-19 FY review outcomes.

The next scheduled review of the DWQMP is due at the completion of 2020-21 FY.

8 DWQMP audit findings

The first regular audit of NQBP's DWQMP was undertaken in September 2018 through the engagement of Viridis Consultants Pty Ltd, who are Exemplar Global certified Drinking Water Quality Management System Auditors. The auditor submitted the audit report to the Regulator on 24th September 2018. The purpose of the audit was to:

- Verify the accuracy of monitoring and performance data;
- Assess NQBP's compliance with its DWQMP; and
- Assess the relevance of the DWQMP in relation to the Port of Mackay drinking water service.

A summary of the auditor's findings includes:

- The data supplied within the 2016/2017 and 2015/2016 Annual Reports was accurate;
- NQBP is generally operating its drinking water service in compliance with its approved DWQMP;
- The DWQMP reflects the current circumstances of the scheme and water quality results are consistent with the outcomes of the risk assessment;
- NQBP will benefit from reviewing the identification and implementation of preventive measures and confirming implementation of the drinking water incident management plan and keeping records of incident management;
- The link between the procedures and the management of water quality risk needs to be strengthened;
- The Water Supply Deed with Mackay Regional Council (MRC) needs to be established as a priority; and
- The maintenance of chlorine residual in the water supply network is the most important preventative measure for the NQBP distribution network. This needs to be captured within the risk assessment and additional monitoring is required to quantify chlorine residual in the network regularly.

The actions undertaken to address the audit recommendations are outlined in Table 8.

Note, action items marked as complete within the previous year's annual report have not been included within the table below.

Table 8 – DWQMP audit findings and status

Item	Recommendation (REC) or OFI	Action	Status of actions	Responsible Officer / Position
Prioritise establishment of the formal contract (Mackay Water Supply Deed) for the supply of treated drinking water from MRC.	REC-03 – Recommendation	Included as Improvement Plan ID 16. Bulk Water Supply Agreement to be implemented with MRC (also Improvement Plan Item 2).	Underway. Agreement to be finalised.	Principal Asset Manager
Establish operational monitoring of free chlorine and establish appropriate corrective actions in response to low free chlorine results	REC-05 – Recommendation	Included as Improvement Plan ID 17. Colorimeter purchased and monitoring program implemented in MEX (PM 135).	Complete. Colorimeter purchased and Monitoring program implemented.	Port Engineer – Mackay
Review SOPs to include testing of chlorine residual to assess if the actions has been successful in implementing the preventive measure.	REC-06 – Recommendation	Included as Improvement Plan ID 18. Review SOPs to include testing of chlorine residual.	Complete. SOP reviewed and revised to include testing with Colorimeter.	Port Engineer – Mackay
Consider capturing the drinking water risk assessment in the Risk Ware program to standardise risk management across the organisation.	OFI-01 – Opportunity for Improvement	Included as Improvement Plan ID 19. Outcomes of drinking water risk assessment to be loaded into RiskWare	Underway. To be completed.	Port Engineer – Mackay
Consider undertaking incident scenario testing in conjunction with MRC to test emergency protocols and lines of communication.	OFI-08 – Opportunity for Improvement	Included as Improvement Plan ID 20. To be discussed with MRC.	Not completed. Scheduled to be completed by 30/06/2020.	Port Engineer – Mackay
Consider referencing the master list of emergency contacts, kept by NQBP rather than updating the DWQMP each time the list	OFI-09 – Opportunity for Improvement	Included as Improvement Plan ID 21. To be undertaken through the update and finalisation of the NQBP emergency management system.	Not completed. Scheduled to be completed by 31/03/2021.	Port Engineer – Mackay

Item	Recommendation (REC) or OFI	Action	Status of actions	Responsible Officer / Position
Consider liaising with MRC to receive relevant verification data on the bulk water supplied to NQBP.	OFI-10 – Opportunity for Improvement	Included as Improvement Plan ID 22. To be included within Bulk Water Supply Agreement.	Underway. Agreement to be finalised.	Port Engineer – Mackay
Consider including the requirement for a minimum free chlorine residual at the bulk water handover point in the drinking water supply deed.	OFI-14 – Opportunity for Improvement	Included as Improvement Plan ID 23. To be included within Bulk Water Supply Agreement.	Underway. Agreement to be finalised.	Principal Asset Manager

The next scheduled audit of the DWQMP is due at the completion of 2021-22 FY.

Table 7 – DWQMP review outcomes**Review Date: April 2019**

Review component	Findings	Outcomes	Status of actions	Responsible Officer / Position
Service description	Current and future demand not in alignment with revised Asset Management Plan (AMP). Water quality team, including roles and responsibilities, not in alignment with current business structure.	Current and future demand updated to align with most recent AMP. Water quality team along with roles and responsibilities to be updated to align with current business structure.	Complete. Changes included within Rev 3 update.	Port Engineer – Mackay
Details of infrastructure	No changes	Not applicable	Not applicable	Port Engineer – Mackay
Water quality catchment characteristics	New set of water quality data available for past two years.	Water quality data in DWQMP to be updated.	Complete. Changes included within Rev 3 update.	Port Engineer – Mackay
Risk assessment	Outcomes from Risk Assessment (completed 21/05/19) to be included as an updated Appendix to the DWQMP.	Risk Assessment Summary Paper and Risk Register included within Appendix 7. Resulting improvement items included within Improvement Program.	Complete. Changes included within Rev 3 update.	Port Engineer – Mackay
Operations and maintenance procedures	Standard Operating Procedures (SOPs) require review and update to align with current practice and to include relevant Preventative Maintenance reference numbers. Training records to be included. Reporting requirements need to be updated to align with DNRME requirements.	SOPs updated as required, training records and details included. Location of SOPs included. Reporting requirements updated to align with DNRME requirements.	Complete. Changes included within Rev 3 update.	Port Engineer – Mackay

Review component	Findings	Outcomes	Status of actions	Responsible Officer / Position
Management of incidents and emergencies	Actions to be taken in the case of an incident to be updated to include 'logging in RiskWare for all Tier Levels.	RiskWare logging included as an action for every incident.	Complete. Changes included within Rev 3 update.	Port Engineer – Mackay
Risk management improvement program	The Improvement Plan needs to be updated to include outcomes from the Training Workshop, External Audit and Risk Assessment. All improvement action items need to be updated to reflect current status.	DWQMP Improvement Plan updated to include outcomes from the Training Workshop, External Audit and Risk Assessment (ID 09 to 24 inclusive). All improvement action items updated to reflect current status.	Complete. Changes included within Rev 3 update.	Port Engineer – Mackay
Service wide information management	No changes	Not applicable	Not applicable	Port Engineer – Mackay
Operational monitoring	No changes	Not applicable	Not applicable	Port Engineer – Mackay
Verification monitoring	Complaint process requires updating to align with current business practice. Reporting of results duration to be updated in to correctly align with DNRME requirements.	Complaint process updated to align with business practice. Reporting requirements updated.	Complete. Changes included within Rev 3 update.	Port Engineer – Mackay
Other	Document review and audit intervals need to be updated to match Decision Notice letter dated 8/3/2018 Document review interval needs to be updated to match Decision Notice letter dated 8/3/18.	Document review and audit intervals updated to match Decision Notice letter dated 8/3/18 (2-yearly review, 4-yearly audit). Document review interval updated to match Decision Notice letter dated 8/3/18 (2-yearly review).	Complete. Changes included within Rev 3 update.	Port Engineer – Mackay