Port of Townsville Limited

Drinking Water Quality Management Plan

Report 1 July 2020 to June 2021

Service Provider Identification Number (SPID): 570

PORT Water Distribution Scheme

PORT OF TOWNSVILLE
delivering sustainable prosperity

CONTENTS

1. INTRODUCTION

This report documents the performance of Port of Townsville Limited's (Port) drinking water service with respect to water quality and performance in implementing the actions detailed in its drinking water quality management plan (DWQMP- 4 June 2021) as required under the *Water Supply (Safety and Reliability) Act 2008* (the Act). Port has been registered as a service provider under the *Water Supply (Safety and Reliability) Act 2008* (the Act) since 19 January 2015.

The report has been prepared in accordance with the *Drinking Water Quality Management Plan Report Guidance Note (September 2018)* by the Department of Natural Resources, Mines and Energy (DNRME), which provides a mechanism for providers to report publicly on their performance in managing drinking water quality.

2. OVERVIEW OF OPERATIONS

Port is responsible for its on-site potable water distribution network within the Port of Townsville, namely the Port Water Distribution Scheme, which includes Port owned and maintained potable water distribution mains across Port owned lands. This distribution scheme only services Port owned buildings, lease held lands and facilities and the port berths for visiting ship connection.

The Port Water Distribution Scheme draws its drinking water supply from Townsville City Council's (TCC) reticulated supply through two metered supply points. Port does not store or have the capacity to treat potable water. Port has no influence over the quality of water distributed through its scheme and has no opportunity to treat water distributed through its scheme. Port relies solely on the municipal potable water supplier in providing potable water that meets all necessary standards and no recycled water or alternate potable water sources are distributed by Port within the Port of Townsville. The management of water quality, until it is supplied to Port of Townsville, is the responsibility of TCC. On a monthly basis, Port requests and is supplied with a summary Certificate of Analysis on the potable water quality at the nearest reservoir to the Port to confirm compliance with the ADWG. Port is committed to ensuring that the water scheme is managed so that the supply does not constitute a hazard to employees or the public.

Table 1 details the water source, treatment processes, disinfection processes and other infrastructure of the scheme along with the context of the supply in terms of current population and demand.

Table 1: Infrastructure Details

Component		Details
Name of Scheme		Port Water Distribution Scheme
Operator		Port of Townsville Limited
Sources	Name	Townsville City Council Municipal Water Supply
	Type	Treated Water Supply
	% of supply	100%
Sourcing Infrastructure	Type (pumped/gravity/equipped bore/etc.)	Supply Mains
	Description	The Port Water Distribution Scheme is supplied by two water mains from the TCC Municipal Water Supply. One 200mm pipeline services the Western area of the port and a second 300 mm pipeline services the Eastern area of the port.
Are there any sources that **do not** undergo treatment prior to supply?		No
Treatment Plant	Not applicable. The Port Water Distribution Scheme has no treatment plants. All treatment is performed by the TCC Municipal Water Supply prior to water entering the Port Water Distribution Scheme.	
Are there any sources that **do not** undergo disinfection prior to supply?		No
Disinfection	Not applicable. The Port Water Distribution Scheme has no disinfection processes. All disinfection is performed by the TCC Municipal Water Supply prior to water entering the Port Water Distribution Scheme.	
Distribution and Reticulation Scheme	Pipe material	Ductile Iron/Polyethylene, PVC, copper, galvanized and stainless steel.
	Age range	15~ 50 years
	Approximate percentage % of total length	60% @ 50 year 40% @ 15 year
	Areas where potential long detention periods could be expected	N/A
	Areas where low water pressure (example < 12 m) could be expected during peak or other demand periods)	N/A
	Communities served	Port of Townsville Workplaces
	Population served	approx. 600
	Connections	106
	Demand	approx. 550 kL/d
Reservoirs	Not applicable. The Port Water Distribution Scheme has no reservoirs. All water storage is performed by the TCC Municipal Water Supply prior to water entering the Port Water Distribution Scheme.	
Water Quality Responsibility Changes	Upstream location	Townsville City Council – bulk supplier
	Downstream location	None

3. COMPLIANCE WITH WATER QUALITY CRITERIA FOR DRINKING WATER

Tables 3 and 4 provide a summary of the results of the operational and verification monitoring programs for the Port Water Distribution Scheme. Both monitoring programs were carried out as per the specifications stated in the DWQMP.

The results from the operational and verification monitoring programs 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 water quality criteria means the health guideline values in the most current Australian Drinking Water Guidelines (ADWG), as well as the standards in the Public Health Regulation 2018.

The water quality results met the recommended values in the *E. coli* and fluoride standards and health guidelines in the ADWG.

It should be noted that the laboratory limit of reporting (LOR) for Selenium is the same as the guideline limit.

3.1 Appropriateness of Operational Monitoring Program

Port does not store or treat water in its Water Distribution Scheme. The only operational parameter under Port's control is residence time of water in its distribution scheme. Long residence times in the Port scheme may result in low disinfectant residuals, microbial growth or regrowth and high concentrations of contaminants due to leaching or corrosion of system materials. Residual chlorine remains a useful measure of the potential for microbial growth and residence time of water in a system.

In the DWQMP Operational Limits for Residual Chlorine are assigned as between 0.2 to 0.5 mg/L. During 2020/21 there were 2 results below 0.2 mg/L. Both results occurred at sampling site PW01 (Berth 1) which is at the end of the reticulation system with limited demand for potable water. A non-potable water sign has been placed at this location and as part of the 2020 DWQMP review, the site was removed as an operational control point due to infrequent usage. A subsequent risk assessment classified this location as non-representative of an operational site.

3.2 Appropriateness of Verification Monitoring Program

All parameters tested as part of the verification monitoring program met the ADWG. Port will continue to review the scope of testing and/or the frequency of testing for particular parameters as continual improvement and knowledge of risks improve through monitoring and understanding of Port water distribution scheme.

Port has monitored Polynuclear Aromatic Hydrocarbons since 2016 and the results during this period remain below the LOR. However, it is noted that only one parameter (Benzo(a)pyrene) has applicable drinking water guidelines. Previous testing was undertaken with the standard level analysis LOR for Benzo(a)pyrene (2 ug/l), which is higher than the guideline limit (0.01 ug/l). In 2018/19 Port identified a low-level laboratory test able to undertake analysis with a lower LOR (0.005 ug/l) which enabled comparison to the guideline limit of 0.01 ug/l. Port has undertaken this low-level analysis since the 2019/20 period which showed that PAH's were not present to this low concentration. Port will continue to test PAH using this low-level laboratory test then review whether to retain PAH analysis or not in the verification program in the next review of the DWQMP.

3.3 Risk Management Improvement Program (RMIP)

Table 2 details the status of the improvement actions as detailed in the DWQMP.

Table 2: Risk management improvement program implementation status

Action	Component	Improvement Actions	Target Date	Actions taken to date	Status and revised target date	Responsible Parties
7	Drinking water supply to vessels	Upgrade backflow protection devices at key connection points on berths to ensure contaminants and pathogens are not introduced to distribution scheme.	30/09/2021	Design phase completed.	Project approved for FY22/23	Manager Maintenance
12	Asset control manuals	Develop asset specific control manuals incorporating relevant procedures.	30/09/2021	Overarching Asset Management Plan for all services completed.	Asset specific services plans in development. Revised target date of 30/06/2022 for the Drinking Water component.	Manager Maintenance

Action	Component	Improvement Actions	Target Date	Actions taken to date	Status and revised target date	Responsible Parties
13	Develop agreement between TCC & the Port	A recommendation from the 2020 DWQMP audit recognised the complex nature of infrastructure on Port land and suggested a specific agreement with TCC and the Port to clearly identify asset ownership where responsibility is shared and/or transferred.	31/03/2022	Port have contacted TCC to develop a customised agreement.	In progress	Manager Maintenance Manager Environment & Planning

3.4 Berth monitoring (RMIP#8)

Berth monitoring (RMIP#8) action item was completed after the 2020 DWQMP review when annual testing of potable water at Berths was incorporated into the Verification Monitoring Program.

During 20/21 monitoring was conducted at Berths 3, 4, 5, 8, 9, and 10 with and without the hose that provides water to the vessels. This sampling occurred directly from the outlet and then from the hose (attached to the outlet) following a short period of flushing. The results from the outlets and hoses met the ADWG guidelines for all parameters tested, including total metals, fluoride, nitrite, nitrate and *E-coli*.

3.5 PFAS (Per- and poly-fluoroalkyl substances)

The ADWG (amended August 2018) now includes health guidance values for PFOS (0.07 ug/l) and PFOA (0.56 ug/l). Port undertook PFAS sampling in November 2018 at the Operational monitoring sites under the DWQMP. Results showed for standard and TOPA analysis, that PFOS and PFOA was not detectable at any site. The results indicate that PFOS/PFOA is not present in the incoming water from TCC. No PFAS testing was conducted in 2020/2021 and no further testing of PFAS is proposed at this time.

3.6 Incidents and complaints

No incidents that affected water supply occurred in 2020/21.

No complaints were received about potable water during 2020/21.

4. DWQMP REVIEW

A review of the DWQMP was undertaken in September 2020 which incorporated audit findings (refer 5. DWQMP Audit). The review report and amendment application was submitted to DNRME identifying proposed updates to risk assessment, schematic system layouts and operational and verification monitoring programs. Revisions were made to the DWQMP and submitted to the DNRME with the DWQMP (revision 4) approval dated 4 June 2021.

Table 3: DWQMP review outcomes

Review Date: 25/09/2020

Review component	Findings	Outcomes	Status of actions	Responsible Position
1. Introduction	Reference to superseded Public Health Regulation 2005 to be updated to current 2018 version.	Update DWQMP to reflect the current 2018 version.	Completed – reference to superseded regulation was updated with current 2018 version.	Environmental Advisor
	There are opportunities for contractors to work on lessees' sites without Port authorisation,	Review POT 1809 – Water Provider Customer Service Standard 2015 and circulate update to Port Tenants.	Completed – POT 1809 Customer Service Standard for Drinking Water was updated and circulated to Port Tenants.	Manager Environment and Planning Manager Maintenance Environmental Advisor Manager Property Services
2. Registered Service Details	Incorrect email address for Maintenance Manager	Update email address.	Completed – email address was updated.	Environmental Advisor
3. Infrastructure Providing the Service	There is limited detail of upstream provider connection points and schematics are not clear.	Describe in greater detail the connection points from upstream provider and update schematics.	Completed – description of upstream provider connection points was included in the plan along with an updated schematic layout.	Environmental Advisor Manager Maintenance
	Component section (pipe material) needs to include: ductile iron/polyethylene, PVC, copper, galvanized and stainless steel.	Update component section with additional pipe material descriptions.	Completed - component section was updated with additional pipe material descriptions.	Environmental Advisor

Review component	Findings	Outcomes	Status of actions	Responsible Position
4. Hazards Identification	There is no data presented in the DWQMP of the water quality from the upstream provider.	Include publicly available information from TCC regarding water quality into a separate appendix and add a paragraph to summarise information.	Completed – publicly available information was added under Appendix 2 and a summary provided within 4.2.1 Catchment Characteristics of the DWQMP (R4)	All
	Risk assessment to be reviewed considering the inclusion of TCC monitoring data in DWQMP	Port to review publicly available monitoring data to inform the next risk assessment.	Completed – TCC publicly available data was included in the revised DWQMP and considered during the risk assessment review.	Environmental Advisor Manager Environment and Planning
	Uncertainty is stated in the text to be incorporated into the residual risk – but it is not clear that this was done. There are some residual risk values where controls are in place but preventative controls do not lower the risk level and no actions are detailed.	Review the risk assessment including hazards, likelihood, consequence scoring and residual risk.	Completed – the risk assessment was reviewed and updated during the DWQMP 04/06/2021 amendment.	Environmental Advisor
	There were metal exceedances detailed in the periodic report and annual report in 2017 that are not discussed in the DWQMP.	Discuss in the DWQMP the reported metal exceedances in 2017.	Completed – metal exceedances that occurred and were reported in 2017 were discussed in the DWQMP 04/06/2021 amendment.	Environmental Advisor
5. Assessment of Risks	Cyber security to be included in risk assessment.	Update risk assessment to include cyber security.	Completed – cyber security now included within risk assessment in DWQMP.	Environmental Advisor
6. Management of Risks	No change	N/A	N/A	N/A
6.2 Operation and maintenance procedures	Identify procedures required for processes and activities from catchment to consumer	Review overarching Asset Management Plan for all services, followed by development of asset specific service plan for drinking water - to encompass processes and procedures.	In progress - RIMP#12 Overarching Services Asset Management Plan completed. Asset specific services plan for drinking water in development.	Maintenance Manager

Review component	Findings	Outcomes	Status of actions	Responsible Position
6.3 Management of Incidents and Emergencies	A specific agreement to be put in place between Port and TCC to identify asset ownership and where responsibility is shared and/or transferred.	Contact TCC and work to develop a specific Port/TCC agreement.	In progress – RMIP# 13 development of a Port/TCC specific agreement.	Manager Environment and Planning Maintenance Manager
6.4 Risk Management Improvement Program (RMIP)	There are some RMIP action items within the DWQMP that are now completed.	Remove completed RMIP action items.	Completed – completed RMIP action items have been removed.	All
7. Operational and Verification Monitoring Programs	Consider whether Berth 1 should be removed as an operational monitoring site as supply at this point is now considered non-potable.	Remove Berth 1 from Operational Monitoring but retain within Verification Monitoring Program. Update tables to reflect program change.	Completed – Berth 1 was removed as an operational monitoring site but retained as a verification site within the DWQMP (R4) with tables updated.	Environmental Advisor Manager Environment and Planning
Other Appendix	There is no data included in the DWQMP from the source waters.	Add an additional Appendix to include TCC publicly available data.	Completed – Appendix 2 was added to include TCC publicly available data.	Environmental Advisor

5. DWQMP AUDIT

The first audit of Port's DWQMP was undertaken in September 2020 through engagement of Bligh Tanner who are Exemplar Global Drinking Water-Quality Management System certified auditors. The auditor submitted the report to the regulator on 18 September 2020. The purpose of the audit was to:

- verify whether the monitoring and performance data given to the regulator under the plan is accurate,
- assess the providers compliance with the plan and the conditions, and
- assess the plan's relevance to the water service

A summary of the auditor's findings includes:

- The data provided in the DWQMP Reports matches the stated verification monitoring.

- The scheme description should be updated to highlight the areas on Port land where the Port is not the drinking water service provider.
- The risk assessment could and/or should be more detailed.
- Monitoring equipment is regularly calibrated to ensure valid performance.
- Some procedures in the DWQMP have been identified as early drafts and need finalizing.

A summary of recommendations and/or opportunities for improvement (OFI) from the audit report can be found in Table 4

Table 4: DWQMP audit findings and status

Item	Recommendation or OFI	Action	Status of actions	Responsible Position
Review requirements periodically to reflect any changes.	OFI	The reference to the Public Health Regulation needs to be updated to the current 2018 version, not the 2005 superseded regulation.	Completed	Environmental Advisor
Construct a flow diagram of the water supply system from catchment to consumer	OFI	The master water reticulation plan is not clear in the pdf version of the DWQMP, such that the date and accuracy cannot be fully assessed. There are added complexities in that there are still council assets on Port land.	A clearer GIS map layout of the Port's Drinking Water Distribution Scheme was provided for the 04/06/2021 DWQMP review. A map detailing asset ownership between Port and TCC can be completed after RMIP#13 is developed.	Environmental Advisor Manager Maintenance Manager Environment & Planning
Assemble pertinent information and document key characteristics of the water supply system to be considered.	OFI	There is no data presented in the DWQMP of the water quality from upstream provider. This should be requested from TCC or included from TCC published DWQMP Reports.	Completed	Environmental Advisor
		Berth 1 is currently signed as non-potable. This should be described in the DWQMP.	Completed	Environmental Advisor
Assemble historical data from source waters, treatment plants and finished water supplied to consumers (over time and following specific events).	OFI	There is no separate assessment of the incoming water quality in the current DWQMP. The distribution water quality data in Table 3 and Appendix 1 (one year) does include the sample points at the point of supply, but the list of parameters is not as detailed as the TCC DWQMP reports provide.	Completed – TCC data was added to Appendix 2	Environmental Advisor

Item	Recommendation or OFI	Action	Status of actions	Responsible Position
List and examine exceedances	OFI	There were metal exceedances detailed in the periodic report and annual report in 2017 that are not discussed in the DWQMP.	Completed	Environmental Advisor
Identify and document hazards, sources, and hazardous events for each component of the water supply system.	OFI	Table 8 in the DWQMP identifies hazards and hazardous events. It is recommended that if incoming water quality data is included (e.g. either for the closest monitoring site if TCC provides it, or by using publicly available information for their DWQMP reports), that the risk assessment be reviewed in light of the updated information to ensure that any additional relevant hazards that may be identified are assessed.	Completed – the risk assessment was reviewed and updated during the DWQMP 04/06/2021 amendment.	Environmental Advisor
Evaluate the major sources of uncertainty associated with each hazard and hazardous event and consider actions to reduce uncertainty.	OFI	Uncertainty is stated in the text to be incorporated into the residual risk – but it is not clear that this was done as all the residual risks look to be scored the same as the maximum risks with the same likelihood and consequence scores without the stated modifiers that would be expected to have changed at least some of the risk levels	Completed – the risk assessment was reviewed and updated during the DWQMP 04/06/2021 amendment.	Environmental Advisor
Determine significant risks and document priorities for risk management.	OFI	Medium risks are stated to require a risk control plan. Some medium risks have associated actions, but not all. This has arisen from the amendment by agreement where previously identified actions have been completed. No risks were subsequently reduced following the implementation of those risk improvements. A number of low risks have identified actions.	Completed – the risk assessment was reviewed and updated during the DWQMP 04/06/2021 amendment.	Environmental Advisor
Evaluate alternative or additional preventative measures where improvement is required.	OFI	The recent update to the DWQMP removed completed actions from the risk register, leaving some medium risks as not having additional actions. Recommend that if these risks are acceptable with the new preventative measures, but still medium, that they are identified as “as low as reasonably practical” or similar, to identify that no further action is required.	Completed – the risk assessment was reviewed and updated during the DWQMP 04/06/2021 amendment which rescored many risks as low considering the completion of previous risk register actions.	Environmental Advisor
Identified procedures required for processes and activities from catchment to consumer.	OFI	Review overarching Asset Management Plan for all services, followed by development of asset specific service plan for drinking water - to encompass processes and procedures.	In progress - RIMP#12 Overarching Services Asset Management Plan completed.	Maintenance Manager

Item	Recommendation or OFI	Action	Status of actions	Responsible Position
			Asset specific services plan for drinking water in development.	
Establish and document a sampling plan for each characteristic, including the location and frequency of sampling	OFI	There was a missed sample in January 2018 with staff changeover at this time and a replacement sample was collected in February 2018. The missed sample and rectification action was advised to the Regulator in the relevant DWQMP report.	A sampling plan is currently in place with an electronic scheduling system being configured which will highlight any missed samples or parameters.	Environmental Advisor
Ensure monitoring data are representative and reliable.	OFI	Consider whether Berth 1 is still an appropriate site given that the supply at this point is now considered as non-potable.	Completed. Berth 1 was removed as an operational site from the DWQMP revision 2 update.	Environmental Advisor
Ensure that employees, including contractors, maintain the appropriate experience and qualifications.	OFI	All contractors are required to demonstrate competency before they do the site inductions and can get an access card. However, there are opportunities for contractors to work on lessees' sites without Port authorisation. Port is not being made aware of the existence of these devices that protect the Port drinking water supply. This introduces a risk that the devices are not tested appropriately, and may fail, increasing risks to the water quality within the Port.	In progress – RMIP# 13 through development of a Port/TCC specific agreement.	Manager Maintenance Manager Environment & Planning

Table 5: Operational *E. coli* Monitoring Results

Scheme Name	Port Water Distribution Scheme											
Scheme Component	Distribution											
Year	2020/2021											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	5	5	5	5	5	5	4*	4*	4*	4*	4*	4*
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 failures for previous 12-month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Compliance with 98% annual value	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Laboratory	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS
Unit	CFU/100 ml	CFU/100 ml	CFU/100 ml	CFU/100 ml	CFU/100 ml	CFU/100 ml	CFU/100 ml	CFU/100 ml	CFU/100 ml	CFU/100 ml	CFU/100 ml	CFU/100 ml
Limit of reporting	1	1	1	1	1	1	1	1	1	1	1	1

Note: "*" PW01 (Berth 1) monitoring point was removed as an Operational Control Point (refer 3.1 Appropriateness of Operational Monitoring Program)

Table 6: Operational Residual Chlorine Monitoring Results & Verification Program Monitoring Results

Scheme Name		Port Water Distribution Scheme
Scheme Component		Distribution

Parameter	Units	Limit of reporting	Frequency of sampling	No. samples required to be collected per annum (as per approved DWQMP)	Total No. samples collected	Water Quality criteria (ADWG health guideline mg/L)	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Laboratory name
Residual Chlorine	mg/L	0.02	monthly	54	55	-	N/A	0.05	1.36	0.89	ALS*
pH	pH unit	0.01	six-monthly /annually	12	22	-	N/A	7.39	7.72	7.55	ALS
Turbidity	NTU	0.1	six-monthly /annually	12	22	-	N/A	0.10	1.9	0.25	ALS
Fluoride	mg/L	0.1	six-monthly /annually	12	22	1.5	0	0.60	0.70	0.70	ALS
Sulphate	mg/L	1	six-monthly /annually	12	22	-	N/A	<1.00	<1.00	<1.00	ALS
Chloride	mg/L	1	six-monthly /annually	12	22	-	N/A	14.00	21.00	18.18	ALS
Calcium	mg/L	1	six-monthly	12	22	-	N/A	6.00	16.00	11.14	ALS

Scheme Name		Port Water Distribution Scheme									
Scheme Component		Distribution									
Parameter	Units	Limit of reporting	Frequency of sampling	No. samples required to be collected per annum (as per approved DWQMP)	Total No. samples collected	Water Quality criteria (ADWG health guideline mg/L)	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Laboratory name
			/annually								
Magnesium	mg/L	1	six-monthly	12	22	-	N/A	1.00	3.00	2.36	ALS
Potassium	mg/L	1	six-monthly	12	22	-	N/A	2.00	3.00	2.27	ALS
Sodium	mg/L	1	six-monthly /annually	12	22	-	N/A	16.00	21.00	17.64	ALS
Nitrite	mg/L	0.01	six-monthly /annually	12	22	3	0	<0.01	<0.01	<0.01	ALS
Nitrate	mg/L	0.01	six-monthly /annually	12	22	50	0	0.01	0.08	0.03	ALS
Aluminium (Total)	mg/L	0.01	six-monthly /annually	12	22	-	N/A	0.02	0.19	0.04	ALS
Antimony (Total)	mg/L	0.001	six-monthly	12	22	0.003	0	<0.001	0.003	<0.001	ALS

Scheme Name		Port Water Distribution Scheme									
Scheme Component		Distribution									
Parameter	Units	Limit of reporting	Frequency of sampling	No. samples required to be collected per annum (as per approved DWQMP)	Total No. samples collected	Water Quality criteria (ADWG health guideline mg/L)	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Laboratory name
			/annually								
Arsenic (Total)	mg/L	0.001	six-monthly /annually	12	22	0.01	0	<0.001	<0.001	<0.001	ALS
Barium (Total)	mg/L	0.001	six-monthly /annually	12	22	2	0	0.033	0.044	0.037	ALS
Boron (Total)	mg/L	0.05	six-monthly /annually	12	22	4	0	<0.05	<0.05	<0.05	ALS
Cadmium (Total)	mg/L	0.0001	six-monthly /annually	12	22	0.002	0	<0.0001	<0.0001	<0.0001	ALS
Chromium (Total)	mg/L	0.001	six-monthly /annually	12	22	0.05	0	<0.001	0.001	<0.001	ALS
Copper (Total)	mg/L	0.001	six-monthly /annually	12	22	2	0	<0.001	0.131	0.018	ALS

Scheme Name		Port Water Distribution Scheme									
Scheme Component		Distribution									
Parameter	Units	Limit of reporting	Frequency of sampling	No. samples required to be collected per annum (as per approved DWQMP)	Total No. samples collected	Water Quality criteria (ADWG health guideline mg/L)	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Laboratory name
Iron (Total)	mg/L	0.05	six-monthly /annually	12	22	-	N/A	<0.05	0.09	<0.05	ALS
Lead (Total)	mg/L	0.001	six-monthly /annually	12	22	0.01	0	<0.001	0.002	<0.001	ALS
Manganese (Total)	mg/L	0.001	six-monthly /annually	12	22	0.5	0	<0.001	0.017	0.004	ALS
Molybdenum (Total)	mg/L	0.001	six-monthly /annually	12	22	0.05	0	<0.001	0.009	<0.001	ALS
Nickel (Total)	mg/L	0.001	six-monthly /annually	12	22	0.02	0	<0.001	<0.001	<0.001	ALS
Selenium (Total)	mg/L	0.01	six-monthly /annually	12	22	0.01	0	<0.01	<0.01	<0.01	ALS

Scheme Name		Port Water Distribution Scheme									
Scheme Component		Distribution									
Parameter	Units	Limit of reporting	Frequency of sampling	No. samples required to be collected per annum (as per approved DWQMP)	Total No. samples collected	Water Quality criteria (ADWG health guideline mg/L)	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Laboratory name
Silver (Total)	mg/L	0.001	six-monthly /annually	12	22	0.1	0	<0.001	<0.001	<0.001	ALS
Uranium (Total)	mg/L	0.001	six-monthly /annually	12	22	0.017	0	<0.001	<0.001	<0.001	ALS
Zinc (Total)	mg/L	0.005	six-monthly /annually	12	22	-	N/A	<0.005	0.012	0.006	ALS
Mercury (Total)	mg/L	0.0001	six-monthly /annually	12	22	0.001	0	<0.0001	<0.0001	<0.0001	ALS
Acenaphthene	µg/L	0.02	six-monthly /annually	12	22	-	N/A	<0.02	<0.02	<0.02	ALS
Acenaphthylene	µg/L	0.02	six-monthly /annually	12	22	-	N/A	<0.02	<0.02	<0.02	ALS

Scheme Name		Port Water Distribution Scheme									
Scheme Component		Distribution									
Parameter	Units	Limit of reporting	Frequency of sampling	No. samples required to be collected per annum (as per approved DWQMP)	Total No. samples collected	Water Quality criteria (ADWG health guideline mg/L)	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Laboratory name
Anthracene	µg/L	0.02	six-monthly /annually	12	22	-	N/A	<0.02	<0.02	<0.02	ALS
Benz(a)anthracene	µg/L	0.02	six-monthly /annually	12	22	-	N/A	<0.02	<0.02	<0.02	ALS
Benzo(a)pyrene	µg/L	0.005	six-monthly /annually	12	22	0.01	0	<0.005	<0.005	<0.005	ALS
Benzo(a)pyrene TEQ (zero)	µg/L	0.005	six-monthly /annually	12	22	-	N/A	<0.005	<0.005	<0.005	ALS
Benzo(b+j) & Benzo(k)fluoranthene	µg/L	0.02	six-monthly /annually	12	22	-	N/A	<0.02	<0.02	<0.02	ALS
Benzo(g.h.i)perylene	µg/L	0.02	six-monthly /annually	12	22	-	N/A	<0.02	<0.02	<0.02	ALS

Scheme Name		Port Water Distribution Scheme									
Scheme Component		Distribution									
Parameter	Units	Limit of reporting	Frequency of sampling	No. samples required to be collected per annum (as per approved DWQMP)	Total No. samples collected	Water Quality criteria (ADWG health guideline mg/L)	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Laboratory name
Chrysene	µg/L	0.02	six-monthly /annually	12	22	-	N/A	<0.02	<0.02	<0.02	ALS
Dibenz(a.h)anthracene	µg/L	0.02	six-monthly /annually	12	22	-	N/A	<0.02	<0.02	<0.02	ALS
Fluoranthene	µg/L	0.02	six-monthly /annually	12	22	-	N/A	<0.02	<0.02	<0.02	ALS
Fluorene	µg/L	0.02	six-monthly /annually	12	22	-	N/A	<0.02	<0.02	<0.02	ALS
Indeno(1.2.3.cd)pyrene	µg/L	0.02	six-monthly /annually	12	22	-	N/A	<0.02	<0.02	<0.02	ALS
Naphthalene	µg/L	0.02	six-monthly /annually	12	22	-	N/A	<0.02	<0.02	<0.02	ALS

Scheme Name		Port Water Distribution Scheme									
Scheme Component		Distribution									
Parameter	Units	Limit of reporting	Frequency of sampling	No. samples required to be collected per annum (as per approved DWQMP)	Total No. samples collected	Water Quality criteria (ADWG health guideline mg/L)	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Laboratory name
Phenanthrene	µg/L	0.02	six-monthly /annually	12	22	-	N/A	<0.02	<0.02	<0.02	ALS
Pyrene	µg/L	0.02	six-monthly /annually	12	22	-	N/A	<0.02	<0.02	<0.02	ALS
Sum of polycyclic aromatic hydrocarbons	µg/L	0.005	six-monthly /annually	12	22	-	N/A	<0.005	<0.005	<0.005	ALS

Note: "-" indicates that no guideline value is specified. "*" ALS concluded residual chlorine analysis from October 2020 as Port were also conducting institu residual chlorine testing.

6. ACRONYMS AND GLOSSARY

ADWG	Australian Drinking Water Guidelines
ALS	Australian Laboratory Services
CFU/100ml	Colony forming units per 100 millilitres
DNRME	Department of National Resources, Mines and Energy
E. coli	*Escherichia coli*, a bacterium which is considered to indicate the presence of faecal contamination and therefore potential health risk
LOR	Limit of Reporting
mg/L	Milligrams per litre
NTU	Nephelometric Turbidity Units
org/100ml	Organisms per 100 millilitres
Port	Port of Townsville Limited
TCC	Townsville City Council
<	Less than