Port of Townsville Limited

Drinking Water Quality Management Plan

Annual Report 1 July 2023 to 30 June 2024

PORT OF TOWNSVILLE
delivering sustainable prosperity

Service Provider Identification Number (SPID): 570

PORT Water Distribution Scheme

CONTENTS

1. INTRODUCTION

This annual 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 v5.1 dated 2 Feb 2023) as required under section 142 of *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 *Guideline for the preparation, review and audit of drinking water quality management plans* by the Department of Regional Development, Manufacturing and Water (DRDMW), 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, Port leased lands and 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 three 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 from TCC, 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 Australian Drinking Water Guidelines (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 three 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. The third water pipeline is approximately 100mm and services an outdoor area.
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, Tenants and Port Users
	Population served	approx. 900
	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 5, 6 and 7 attached to this report 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 water quality criteria specified by the Regulator in the *Water Quality and Reporting Guideline for a Drinking Water Service*. This includes 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 can potentially 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 2023/24 there were three results recorded at PW06 (Port Tower, Level 2) below 0.2 mg/L for an operational monitoring site (July 2023, August 2023, and January 2024). The residual chlorine was recorded at the 2-minute flush time and again at the 15-minute time. At the 15-minute flush time improvement in residual chlorine was observed on 2 out of 3 occasions. This site, (PW06) is a known low demand area (as denoted in the DWQMP) and at the time of sampling was not being utilised on a regular basis. These low readings of residual chlorine have prompted further investigations to determine if flushing or additional dosing from the municipal supplier is required for this location.

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 the Port water distribution scheme.

Port has monitored Polynuclear Aromatic Hydrocarbons, (PAHs) since 2016 and the results during this period remain below the LOR. However, it is noted that only one PAH parameter, (Benzo(a)pyrene) has applicable drinking water guidelines. Previous testing was undertaken with the standard level analysis LOR for Benzo(a)pyrene (2 µg/L), which is higher than the guideline limit (0.01 µg/L). In 2018/19 Port identified a low-level laboratory test able to undertake analysis with a lower LOR (0.005 µg/L) which enabled comparison to the guideline limit of 0.01 µg/L. Port has undertaken this low-level analysis since the 2019/20 period which showed that Benzo(a)pyrene was 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.

Annual monitoring was conducted in May 2024 at Berths 3, 4, 5, 8, 9, and 10 for water that is provided to 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 analyzed, including total metals, fluoride, nitrite, nitrate and *E-coli.*

The ADWG (amended August 2018) now includes health guidance values for PFOS (0.07 µg/L) and PFOA (0.56 µg/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. As such, no PFAS testing was conducted in 2023/24 and no further testing of PFAS is proposed at this time.

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 (As per the DWQMP v6 11/11/2024)

Action	Component	Improvement Actions	Target Date	Actions taken to date/status	Responsible officer /position	Complete
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.	30/03/2023	All water carts on berths have backflow devices installed and are available for use.	Manager Assets and Maintenance	Complete 08/11/2024
13	Develop a common understanding between TCC & the Port on drinking water infrastructure	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.	October 2025	Port and TCC are working towards documenting the drinking water infrastructure on Port land to mitigate this risk.	Manager Assets and Maintenance Manager Climate & Environment	Ongoing
14	GIS schematics for drinking water assets	An opportunity for improvement highlighted in the 2024 DWQMP audit; continue to update GIS schematics with additional attribute data (e.g. pipe data) so that it can be easily queried if necessary	December 2026	Planning for GIS work in progress. GIS data updates to commence in 2025	Environmental Advisor Manager Assets & Maintenance Engineer GIS Officer	Ongoing
15	Review hazard identification and risk assessment	An opportunity for improvement highlighted in the 2024 DWQMP audit; consider clearly identifying other piped networks at the Port to mitigate potential cross connection risks	December 2025	Planning for this work has commenced, with further mapping of further piped networks to commence in 2025	Environmental Advisor Assets Maintenance Planner	Ongoing

Action	Component	Improvement Actions	Target Date	Actions taken to date/status	Responsible officer /position	Complete
16	Risk Management	A recommendation from the 2024 DWQMP audit; consider developing a mains repair procedure including disinfection as well as improvements to storage of pipes and fittings	June 2025	Resource planning for this work has commenced and work to develop this procedure to commence in 2025	Environmental Advisor Assets Maintenance planner Manager Assets and Maintenance	Ongoing

* As specified in DWQMP v6 dated 11/11/2024

3.4 Incidents and complaints

No reportable incidents that affected water supply occurred in 2023/24.

No complaints were received about potable water during 2023/24.

4. DWQMP REVIEW

A review of the DWQMP v5.1 was undertaken in September 2024 which incorporated findings from the June 2024 audit (refer section 5 DWQMP Audit). The review identified several changes which were made to the DWQMP and submitted to DRDMW (DWQMP revision 6) in November 2024.

Table 3: DWQMP review outcomes (Review date: 30/09/2024, status of actions as of 11/11/2024)

Review component	Findings	Outcomes	Status of actions	Responsible officer/ position
2. Registered Service Details	Service providers contact details outdated	As per the recommendation from the 2024 audit – Update providers contact details	Completed	Environmental Advisor
2. Registered Service Details	Review population size served, number of connections, demand data and 10-year projections	As per the recommendation from the 2024 audit – Update population size served, number of connections, demand data and 10-year projection in table 1 of DWQMP if necessary.	Completed	Environmental Advisor
	Clarify and make infrastructure details consistent regarding the number of connections from TCC (page 12 - text at top says 3 supply mains, Table 2 says 2 supply mains).	As per the recommendation from the 2024 audit – update table 2 DWQMP to reflect 3 supply mains	Completed	Environmental Advisor

Review component	Findings	Outcomes	Status of actions	Responsible officer/ position
3. Infrastructure Providing the Service	2024 Audit Non-conformance – Pressure and flow monitoring is no longer undertaken as per the Operational Monitoring program in the approved DWQMP.	Amend Table 8 of DWQMP to reflect current pressure and flow monitoring status of the system, (as per the recommendation from the 2024 audit)	Completed	Environmental Advisor
		As per the recommendation from the 2024 audit, Port will consider replacing the flow and pressure monitoring devices at the TCC connections by obtaining quotes and projected costs to replace real time pressure monitoring devices then completing a cost vs risk vs benefit analysis.	Planning for this work has commenced. A review and risk assessment of pressure and flow monitoring to commence in 2025	Environmental Advisor + Assets Maintenance Planner Risk assessment to be reviewed by Manager Climate & Environment, Environmental Operations Lead and Manager Assets & Maintenance &
4. Hazards Identification	There have been some personnel and title changes of positions listed in Table 4 of the DWQMP, however, responsibilities essentially remain unchanged.	Update personnel / position titles	Completed	Environmental Advisor
	Additional monitoring to assist in hazard identification	As per the 2024 audit recommendation – Add BTEX/TPH into verification sampling. Update work instruction and field parameters to include visual / odour / taste contamination in the operational monitoring	Review has been completed. Additional parameters will be added to verification monitoring from 2025. Work instructions have been updated to reflect this change.	Environmental Advisor
	Continue to update GIS so that pipe attribute data (e.g. age, diameter, material) is easily queried if necessary.	As per the 2024 audit recommendation – continue to update POTL GIS with pipe attribute data	Planning for GIS work in progress. GIS data updates to commence in 2025	Environmental Advisor Manager Assets & Maintenance GIS Officer Engineer
	There are other piped systems on site which could be considered in the risk assessment with potential for cross contamination	As per the recommendation from the 2024 audit – At the next risk review, consider more clearly identifying other piped systems as cross connection risks and refer to the control measures that exist in those other systems, not just the measures that exist in the drinking water network (pressure and backflow prevention).	Planning for this work has commenced, with further mapping of other piped networks to commence in 2025	Environmental Advisor Assets Maintenance Planner

Review component	Findings	Outcomes	Status of actions	Responsible officer/ position
6.2 Operation and maintenance procedures	There is no formal document describing repair, installation and disinfection of mains, the Maintenance Planner OFI/ Scheduler verbally described the process of super chlorination and achieving disinfectant contact time, and clearly understood the process well. Spare pipes and fittings were stored on site, but storage conditions could be improved	As per the recommendation from the 2024 audit – Consider developing a mains repair procedure including disinfection (including when required and how undertaken)	Resource planning for this work has commenced and work to develop this procedure to commence in 2025	Environmental Advisor Assets Maintenance Planner
		As per the recommendation from the 2024 audit – Consider developing a plan for hygienic storage of spares	Resource planning for this work has commenced and target date of June 2025 has been set	Manager Assets & Maintenance Assets Maintenance Planner
		As per the recommendation from the 2024 audit – Consider Implementing a plan for hygienic storage of spares	Resource planning for this work has commenced and a target date of June 2026 has been set.	Manager Assets & Maintenance Assets Maintenance Planner
	2020 Audit - A specific agreement to be put in place between Port and TCC to identify asset ownership and where responsibility is shared and/or transferred.	This action was incorporated into the RMIP in the 2020 review. The Port and TCC have been negotiating an agreement on asset ownership and maintenance responsibility. Port and TCC are continuing discussions to clarify meter location ownership and maintenance responsibility to establish an agreement.	In progress – RMIP# 13 development of a Port/TCC specific agreement.	Manager Climate & Environment Environmental Operations Lead Environmental Advisor
6.4 Risk Management Improvement Program (RMIP)	2024 Audit Non-Conformance – The due dates for actions in the RMIP were not met.	Table 12 to be updated to reflect new timeframes and status for RMIP actions in the updated DWQMP.	Complete	Environmental Advisor
6.4 Risk Management Improvement Program (RMIP)	RMIP actions are in progress and the DWQMP needs to be updated as noted in 6.4(a).	Table 12 to be updated to reflect new timeframes and status for RMIP actions in the updated DWQMP.	Complete	Environmental Advisor
7. Operational and Verification Monitoring Programs Other	Consider monitoring for additional parameters	As per the recommendation from the 2024 audit – Review and incorporate additional parameters if required	Complete	Environmental Advisor
	The verification monitoring program was not fully implemented in 2022 and 2023, with some samples missed. The missed samples were not reported as an event to DRDMW.	POTL has implemented a procedure whereby its environmental advisors manually review the data to ensure that all samples have been taken in accordance with the program under the DWQMP.	Complete	Environmental Advisor
Appendix One - Data	Review / Update the appendix data	Update appendix of DWQMP with most recent data from upstream provider (TCC).	Complete	Environmental Advisor

5. DWQMP AUDIT FINDINGS

An audit of Port's DWQMP was undertaken on 20 June 2024 through engagement of Bligh Tanner who are Exemplar Global Drinking Water-Quality Management System certified auditors. The audit was completed in accordance with Section 108 of the *Water Supply (Safety and Reliability) Act 2008* (Qld) to:

1. verify whether the monitoring and performance data given to the regulator under the plan is accurate,
2. assess the provider's compliance with the plan and the conditions, and
3. assess the plan's relevance to the water service

The auditor submitted the report to the regulator on 26 June 2024. Findings from the audit have been incorporated as revisions to the DWQMP and submitted to DRDMW with the DWQMP (revision 6) on the 11/11/2024.

A summary of the auditor's findings include:

- Overall, the DWQMP is relevant to the Ports drinking water service
- Samples of the verification monitoring dataset provided were cross referenced against the DWQMP annual reports. Data matched in all cases.
- Employee training, awareness, and appropriate staff licences and certifications meet requirements.
- Development of a formal Drinking Water Quality Policy could be considered, however may be of little practical use given the nature of the scheme.
- Port of Townsville maintains its third-party certification for their ISO9001 quality management system as stated in the DWQMP.
- There was no evidence sighted of any failures of water quality criteria, or other incidents that may have represented a public health concern.
- Three non-conformances as requirement of the DWQMP, Act or Guideline was not being met

The next audit is due in June 2028.

A summary of the non-conformances, recommendations and/or opportunities for improvement (OFI) from the 2024 audit with action status can be found in Table 4.

Table 4: DWQMP audit summary of findings and status (Audit Date: 20/06/2024, status of actions as of 11/11/2024)

Item	Recommendation or OFI	Action	Status of actions	Responsible Person
Pressure and flow monitoring is no longer undertaken as per the Operational Monitoring program in the approved DWQMP.	Non-Conformance	Amend Table 8 of DWQMP to reflect current pressure and flow monitoring status of the system, (as per the recommendation from the 2024 audit)	Complete	Environmental Advisor
		As per the recommendation from the 2024 audit, Port will consider replacing the flow and pressure monitoring devices at the TCC connections by obtaining quotes and projected costs to replace real time pressure monitoring devices then completing a cost vs risk vs benefit analysis.	Planning for this work has commenced. A review and risk assessment of pressure and flow monitoring to commence in 2025	
The due dates for actions in the RMIP were not met.	Non-Conformance	Table 12 to be updated to reflect new timeframes and status for RMIP actions in the updated DWQMP.	Complete	Environmental Advisor
The verification monitoring program was not fully implemented in 2022 and 2023, with some samples missed. The missed samples were not reported as an event to DRDMW.	Non-Conformance	Implement a schedule and planner program to ensure the staff responsible are aware of the timing requirements for the undertaking of sampling Update work instructions to provide that if a site is unable to be sampled in accordance with the program Regular refresher training, to ensure that all relevant staff are familiar with the work instructions and any updates that may have occurred as part of POTL's periodic reviews of those work instructions Implement a procedure whereby its environmental advisors manually review the data recorded in Envirosys to ensure that all samples have been taken in accordance with the program under the DWQMP	Complete	Environmental Advisor

Review number of connections, population size served and demand data including 10-year projections	OFI	As per the recommendation from the 2024 audit – Update number of connections, population size served and demand data including 10-year projection in table 1 of DWQMP if necessary.	Complete	Environmental Advisor
Service providers contact details are outdated in the DWQMP	OFI	As per the recommendation from the 2024 audit – Update providers contact details in the DWQMP	Complete	Environmental Advisor
Clarify and make infrastructure details consistent regarding the number of connections from TCC (page 12 - text at top says 3 supply mains, Table 2 says 2 supply mains).	OFI	As per the recommendation from the 2024 audit – update table 2 DWQMP to reflect 3 supply mains	Complete	Environmental Advisor
Continue to update GIS so that pipe attribute data (e.g. age, diameter, material) is easily queried if necessary.	OFI	As per the 2024 audit recommendation – continue to update POTL GIS with pipe attribute data	Planning for GIS work in progress. GIS data updates to commence in 2025	Environmental Advisor Manager Maintenance Engineer GIS Officer
There are other piped systems on site which could be considered in the risk assessment with potential for cross contamination	OFI	As per the recommendation from the 2024 audit – At the next risk review, consider more clearly identifying other piped systems as cross connection risks and refer to the control measures that exist in those other systems, not just the measures that exist in the drinking water network (pressure and backflow prevention).	Planning for this work has commenced, with further mapping of further piped networks to commence in 2025	Environmental Advisor Assets Maintenance Planner
There is no formal document describing repair, installation and disinfection of mains, the Maintenance Planner OFI/ Scheduler verbally described the process of super chlorination and achieving disinfectant contact time, and clearly understood the process well.	OFI	As per the recommendation from the 2024 audit – Consider developing a mains repair procedure including disinfection (including when required and how undertaken)	Resource planning for this work has commenced and target date of June 2025 has been set	Environmental Advisor

Spare pipes and fittings were stored on site, but storage conditions could be improved		As per the recommendation from the 2024 audit – Consider developing a plan for hygienic storage of spares	Resource planning for this work has commenced and target date of June 2025 has been set	Asset planner maintenance Assets Maintenance Manager
		As per the recommendation from the 2024 audit – Consider Implementing a plan for hygienic storage of spares	Resource planning for this work has commenced and a target date of June 2026 has been set.	
Additional monitoring to assist in hazard identification	OFI	As per the 2024 audit recommendation – Add BTEX/TPH into verification sampling. Update work instruction and field parameters to include visual / odour / taste contamination in the operational monitoring	Review has been completed. Additional parameters will be added to verification monitoring from 2025. Work instructions have been updated to reflect this change.	Environmental Advisor
Relevance of the DWQMP: are reporting details relevant? Section 6.5.4 of the DWQMP refers to an external reporting requirement within 30 business days after 30 June each year, which is understood to be related to service provider registration details review. There is also mention of the requirement to report all drinking water quality monitoring result on a yearly basis.	OFI	As per the 2024 audit recommendation - Consider referencing the "Guideline for the preparation, review and audit of drinking water quality management plans" in section 6.5.4 of the DWQMP. Section 9 of the Guideline provides the requirements for the annual DWQMP reports and may be of benefit to staff less familiar with the reporting requirements	Complete	Environmental Advisor

Table 5: Operational Program Monitoring Results 2023-24 (as per Table 13 DWQMP v6)

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 and tested	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	48	48	-	N/A	0.03	1.41	0.77	Field test

Table 6: E. coli Verification Monthly Monitoring Results 2023-24 (as per Table 14 DWQMP v6)

Scheme Name	Port Water Distribution Scheme											
Scheme Component	Distribution											
Year	2023/2024											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	4	4	4	4	4	4	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/100ml	CFU/100ml	CFU/100ml	CFU/100ml	CFU/100ml	CFU/100ml	CFU/100ml	CFU/100ml	CFU/100ml	CFU/100ml	CFU/100ml	CFU/100ml
Limit of reporting	1	1	1	1	1	1	1	1	1	1	1	1

Table 7: Verification Program Monitoring Results 6 monthly 2023-24 (as per table 14 DWQMP v6)

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 and tested	Water Quality criteria (ADWG health guideline mg/L)	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Laboratory name
pH	pH unit	0.01	six-monthly /annually	12	20	-	N/A	7.46	7.82	7.55	ALS
Turbidity	NTU	0.1	six-monthly /annually	12	20	-	N/A	<0.10	0.6	0.2	ALS
Fluoride	mg/L	0.1	six-monthly /annually	12	20	1.5	0	0.4	0.5	0.5	ALS
Sulphate	mg/L	1	six-monthly /annually	12	20	-	N/A	1.0	2.0	1.1	ALS
Chloride	mg/L	1	six-monthly /annually	12	20	-	N/A	23.0	28.0	24.6	ALS
Calcium	mg/L	1	six-monthly /annually	12	20	-	N/A	8	13	9.8	ALS
Magnesium	mg/L	1	six-monthly /annually	12	20	-	N/A	3	4	3.2	ALS
Potassium	mg/L	1	six-monthly /annually	12	20	-	N/A	3	4	3.1	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 and tested	Water Quality criteria (ADWG health guideline mg/L)	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Laboratory name
Sodium	mg/L	1	six-monthly /annually	12	20	-	N/A	19.0	28.0	21.3	ALS
Nitrite	mg/L	0.01	six-monthly /annually	12	20	3	0	<0.01	<0.01	<0.01	ALS
Nitrate	mg/L	0.01	six-monthly /annually	12	20	50	0	0.01	0.08	0.03	ALS
Aluminium (Total)	mg/L	0.01	six-monthly /annually	12	20	-	N/A	0.02	0.11	0.04	ALS
Antimony (Total)	mg/L	0.001	six-monthly /annually	12	20	0.003	0	<0.001	<0.001	<0.001	ALS
Arsenic (Total)	mg/L	0.001	six-monthly /annually	12	20	0.01	0	<0.001	0.001	0.001	ALS
Barium (Total)	mg/L	0.001	six-monthly /annually	12	20	2	0	0.035	0.045	0.039	ALS
Boron (Total)	mg/L	0.05	six-monthly /annually	12	20	4	0	<0.05	<0.05	<0.05	ALS
Cadmium (Total)	mg/L	0.0001	six-monthly /annually	12	20	0.002	0	<0.0001	<0.0001	<0.0001	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 and tested	Water Quality criteria (ADWG health guideline mg/L)	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Laboratory name
Chromium (Total)	mg/L	0.001	six-monthly /annually	12	20	0.05	0	<0.001	<0.001	<0.001	ALS
Copper (Total)	mg/L	0.001	six-monthly /annually	12	20	2	0	0.001	0.073	0.017	ALS
Iron (Total)	mg/L	0.05	six-monthly /annually	12	20	-	N/A	<0.05	<0.05	<0.05	ALS
Lead (Total)	mg/L	0.001	six-monthly /annually	12	20	0.01	0	<0.001	<0.001	<0.001	ALS
Manganese (Total)	mg/L	0.001	six-monthly /annually	12	20	0.5	0	<0.001	0.002	0.0015	ALS
Molybdenum (Total)	mg/L	0.001	six-monthly /annually	12	20	0.05	0	<0.001	<0.001	<0.001	ALS
Nickel (Total)	mg/L	0.001	six-monthly /annually	12	20	0.02	0	<0.001	<0.001	<0.001	ALS
Selenium (Total)	mg/L	0.01	six-monthly /annually	12	20	0.01	0	<0.01	<0.01	<0.01	ALS
Silver (Total)	mg/L	0.001	six-monthly /annually	12	20	0.1	0	<0.001	<0.001	<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 and tested	Water Quality criteria (ADWG health guideline mg/L)	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Laboratory name
Uranium (Total)	mg/L	0.001	six-monthly /annually	12	20	0.017	0	<0.001	<0.001	<0.001	ALS
Zinc (Total)	mg/L	0.005	six-monthly /annually	12	20	-	N/A	<0.005	0.014	0.008	ALS
Mercury (Total)	mg/L	0.0001	six-monthly /annually	12	20	0.001	0	<0.0001	<0.0001	<0.0001	ALS
Acenaphthene	µg/L	0.02	six-monthly /annually	12	20	-	N/A	<0.02	<0.02	<0.02	ALS
Acenaphthylene	µg/L	0.02	six-monthly /annually	12	20	-	N/A	<0.02	<0.02	<0.02	ALS
Anthracene	µg/L	0.02	six-monthly /annually	12	20	-	N/A	<0.02	<0.02	<0.02	ALS
Benz(a)anthracene	µg/L	0.02	six-monthly /annually	12	20	-	N/A	<0.02	<0.02	<0.02	ALS
Benzo(a)pyrene	µg/L	0.005	six-monthly /annually	12	20	0.01 µg/L*	0	<0.005	<0.005	<0.005	ALS
Benzo(a)pyrene TEQ (zero)	µg/L	0.005	six-monthly /annually	12	20	-	N/A	<0.005	<0.005	<0.005	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 and tested	Water Quality criteria (ADWG health guideline mg/L)	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Laboratory name
Benzo(b+j) & Benzo(k)fluoranthene	µg/L	0.02	six-monthly /annually	12	20	-	N/A	<0.02	<0.02	<0.02	ALS
Benzo(g.h.i)perylene	µg/L	0.02	six-monthly /annually	12	20	-	N/A	<0.02	<0.02	<0.02	ALS
Chrysene	µg/L	0.02	six-monthly /annually	12	20	-	N/A	<0.02	<0.02	<0.02	ALS
Dibenz(a.h)anthracene	µg/L	0.02	six-monthly /annually	12	20	-	N/A	<0.02	<0.02	<0.02	ALS
Fluoranthene	µg/L	0.02	six-monthly /annually	12	20	-	N/A	<0.02	<0.02	<0.02	ALS
Fluorene	µg/L	0.02	six-monthly /annually	12	20	-	N/A	<0.02	<0.02	<0.02	ALS
Indeno(1.2.3.cd)pyrene	µg/L	0.02	six-monthly /annually	12	20	-	N/A	<0.02	<0.02	<0.02	ALS
Naphthalene	µg/L	0.02	six-monthly /annually	12	20	70µg/L*	N/A	<0.02	<0.02	<0.02	ALS
Phenanthrene	µg/L	0.02	six-monthly /annually	12	20	150µg/L*	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 and tested	Water Quality criteria (ADWG health guideline mg/L)	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Laboratory name
Pyrene	µg/L	0.02	six-monthly /annually	12	20	150µg/L*	N/A	<0.02	<0.02	<0.02	ALS
Sum of polycyclic aromatic hydrocarbons	µg/L	0.005	six-monthly /annually	12	20	-	N/A	<0.005	0.15	<0.005	ALS

Guideline values expressed in mg/L unless otherwise indicated

" – " indicates that no guideline value is specified

* Supplementary Guideline value referenced: Australian Guidelines for Water Recycling: Augmentation of Drinking Water Supplies, 2008

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
µg/L	Micrograms per litre
<	Less than