Port of Townsville Limited

Drinking Water Quality Management Plan

Report 1 July 2019 to June 2020

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- 10 December 2018) 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 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 the 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 2 and 3 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 2019/20 there were 6 results below 0.2 mg/L with 5 of these results occurring 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, will consider whether this site is retained under the operational and verification monitoring programs.

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. Previously 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 undertook this low-level analysis during 2019/20 period (1 sample event) and showed that PAH's were not present to this low concentration. Port will continue to test PAH using this low-level laboratory test in 2020/21 and then review whether to retain PAH analysis or not in the verification program in the next review of the DWQMP.

3.3 Berth monitoring (action 8 of the RMIP)

As per action 8 of the Risk Management Improvement Plan (RMIP) in the DWQMP, Port carried out Berth monitoring during 2019/20. In May 2020, Berth monitoring was carried out 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. Residual chlorine results were all within the range 0.2 to 0.5mg/L. This indicates that the transfer of drinking water to ships (on request from the vessel) using existing Berth infrastructure and following a period of initial flushing, is appropriate to manage the potential hazard identified in the RMIP.

Annual testing of potable water on the Berths will be considered as part of the next review of the DWQMP.

3.4 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 2019/20 and no further testing of PFAS is proposed at this time.

3.5 Incidents and complaints

No incidents that affected water supply occurred in 2019/20.

No complaints were received about potable water during 2019/20.

4. 2020 DWQMP REVIEW AND AUDIT

An audit and review of the DWQMP is scheduled for September 2020 with respective reports to be submitted to DNRME as required. Following the audit and review, revisions are proposed to be made to the DWQMP with a copy of the revised DWQMP to be provided to the regulator.

Table 2: Operational E. coli Monitoring Results

Scheme Name	Port Water Distribution Scheme											
Scheme Component	Distribution											
Year	2019/2020											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	5	5	5	5	5	5	5	5	5	5	5	5
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

Table 3: Operational Residual Chlorine Monitoring Results and 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	60	60	-	N/A	0.03	1.22	0.65	ALS
pH	pH unit	0.01	six-monthly	6	19	-	0	7.43	7.62	7.55	ALS
Turbidity	NTU	0.1	six-monthly	6	19	-	0	0.10	0.20	0.13	ALS
Fluoride	mg/L	0.1	six-monthly	6	19	1.5	0	0.60	0.70	0.67	ALS
Sulphate	mg/L	1	six-monthly	6	19	-	0	<1.00	1.00	<1.00	ALS
Chloride	mg/L	1	six-monthly	6	19	-	0	12.00	15.00	13.47	ALS
Calcium	mg/L	1	six-monthly	6	19	-	N/A	9.00	11.00	10.05	ALS
Magnesium	mg/L	1	six-monthly	6	19	-	N/A	2.00	3.00	2.11	ALS
Potassium	mg/L	1	six-monthly	6	19	-	N/A	2.00	2.00	2.00	ALS

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Scheme Component		Distribution									
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Sodium	mg/L	1	six-monthly	6	19	-	0	12	15	14.05	ALS
Nitrite	mg/L	0.01	six-monthly	6	19	3	0	<0.01	<0.01	<0.01	ALS
Nitrate	mg/L	0.01	six-monthly	6	19	50	0	0.03	0.08	0.05	ALS
Aluminium (Total)	mg/L	0.01	six-monthly	6	19	-	N/A	0.01	0.04	0.02	ALS
Antimony (Total)	mg/L	0.001	six-monthly	6	19	0.003	0	<0.001	<0.001	<0.001	ALS
Arsenic (Total)	mg/L	0.001	six-monthly	6	19	0.01	0	<0.001	<0.001	<0.001	ALS
Barium (Total)	mg/L	0.001	six-monthly	6	19	2	0	0.025	0.031	0.029	ALS
Boron (Total)	mg/L	0.05	six-monthly	6	19	4	0	<0.05	<0.05	<0.05	ALS
Cadmium (Total)	mg/L	0.0001	six-monthly	6	19	0.002	0	<0.0001	<0.0001	<0.0001	ALS

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Chromium (Total)	mg/L	0.001	six-monthly	6	19	0.05	0	<0.001	<0.001	<0.001	ALS
Copper (Total)	mg/L	0.001	six-monthly	6	19	2	0	0.002	0.074	0.018	ALS
Iron (Total)	mg/L	0.05	six-monthly	6	19	-	N/A	<0.05	<0.05	<0.05	ALS
Lead (Total)	mg/L	0.001	six-monthly	6	19	0.01	0	<0.001	0.007	<0.001	ALS
Manganese (Total)	mg/L	0.001	six-monthly	6	19	0.5	0	<0.001	0.003	0.001	ALS
Molybdenum (Total)	mg/L	0.001	six-monthly	6	19	0.05	0	<0.001	<0.001	<0.001	ALS
Nickel (Total)	mg/L	0.001	six-monthly	6	19	0.02	0	<0.001	0.004	0.001	ALS
Selenium (Total)	mg/L	0.01	six-monthly	6	19	0.01	0	<0.01	<0.01	<0.01	ALS
Silver (Total)	mg/L	0.001	six-monthly	6	19	0.1	0	<0.001	<0.001	<0.001	ALS

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Uranium (Total)	mg/L	0.001	six-monthly	6	19	0.017	0	<0.001	<0.001	<0.001	ALS
Zinc (Total)	mg/L	0.005	six-monthly	6	19	-	0	<0.005	0.026	0.009	ALS
Mercury (Total)	mg/L	0.0001	six-monthly	6	19	0.001	0	<0.0001	<0.0001	<0.0001	ALS
Acenaphthene	µg/L	0.02/2	six-monthly	6	19	-	N/A	<0.02	<2*	<0.02	ALS
Acenaphthylene	µg/L	0.02/2	six-monthly	6	19	-	N/A	<0.02	<2*	<0.02	ALS
Anthracene	µg/L	0.02/2	six-monthly	6	19	-	N/A	<0.02	<2*	<0.02	ALS
Benz(a)anthracene	µg/L	0.02/2	six-monthly	6	19	-	N/A	<0.02	<2*	<0.02	ALS
Benzo(a)pyrene	µg/L	0.005/2	six-monthly	6	19	0.01	0	<0.005	<2*	<0.005	ALS
Benzo(a)pyrene TEQ (zero)	µg/L	0.005/2	six-monthly	6	19	-	N/A	<0.005	<2*	<0.005	ALS

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Benzo(b+j) & Benzo(k)fluoranthene	µg/L	0.02/4	six-monthly	6	19	-	N/A	<0.02	<4*	<0.02	ALS
Benzo(g.h.i)perylene	µg/L	0.02/2	six-monthly	6	19	-	N/A	<0.02	<2*	<0.02	ALS
Chrysene	µg/L	0.02/2	six-monthly	6	19	-	N/A	<0.02	<2*	<0.02	ALS
Dibenz(a.h)anthracene	µg/L	0.02/2	six-monthly	6	19	-	N/A	<0.02	<2*	<0.02	ALS
Fluoranthene	µg/L	0.02/2	six-monthly	6	19	-	N/A	<0.02	<2*	<0.02	ALS
Fluorene	µg/L	0.02/2	six-monthly	6	19	-	N/A	<0.02	<2*	<0.02	ALS
Indeno(1.2.3.cd)pyrene	µg/L	0.02/2	six-monthly	6	19	-	N/A	<0.02	<2*	<0.02	ALS
Naphthalene	µg/L	0.02/2	six-monthly	6	19	-	N/A	<0.02	<2*	<0.02	ALS
Phenanthrene	µg/L	0.02/2	six-monthly	6	19	-	N/A	<0.02	<2*	<0.02	ALS

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Pyrene	µg/L	0.02/2	six-monthly	6	19	-	N/A	<0.02	<2*	<0.02	ALS
Sum of polycyclic aromatic hydrocarbons	µg/L	0.005/2	six-monthly	6	19	-	N/A	<0.005	<2*	<0.005	ALS

Note: "-" indicates that no guideline value is specified. "*" PAH Benzo(a)pyrene ultra-trace analysis on three (3) samples was not conducted by the laboratory resulting in a higher LOR (Limit of Reporting) available.

5. ACRONYMS AND GLOSSARY

ADWG	Australian Drinking Water Guidelines
ALS	Australian Laboratory Services
CFU/100ml	Colony forming units per 100 millilitres
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