



ROTTNEST IS

PROGRAMMED
Facility Management

Programmed Facility Management

For the

Rottnest Island Authority

**Quarterly Drinking Water Report to the
Department of Health by the Rottnest Island
Authority
July – September 2017**



Submission Date: 20th October 2017



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1. Water Provider Information

Rottnest Island Authority Contact Details	
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1.1. System Information

1.1.1. Consumers

The water demand on Rottnest Island is related to tenancy and is highly seasonal, being low in winter and high in summer. Historical data indicates that over 660,000 visits are typically made to the island on a yearly basis, with a low season minimum of 24,200 visitors/month (August) and a high season maximum of 92,700 visitors/month (January).

The number of beds on the island for guests is approximately 2,150, with the average length of stay being 3.5 nights. In addition to this, there are approximately 250 permanent residents on the island, which also fluctuates in accordance with high and low seasons.

1.1.2. Distribution System & Water Supply

The Rottnest Island distribution system is relatively small, consisting of approximately 22km of mains. Water is sourced from 15 freshwater bores located in the Wadjemup bore field and 6 saline (seawater) bores located in the Longreach borefield. The freshwater bores typically produce less than 15% of the island’s water, and is utilised as a contingency supplementary water supply, secondary to the saline production bores.

Water abstracted from the saline bores feeds into the desalination plant, where reverse osmosis occurs. The desalinated water is then disinfected with chlorine, ensuring the provision of safe drinking water to Rottnest Island customers. The quality and purity of the chlorine gas used for the disinfection of supplied drinking water, is ensured to be of high quality by only engaging approved product suppliers for the island.

Regular maintenance of the chlorine dosing unit is also completed by a qualified third party at the frequencies mandated by the manufacturer. In addition to this, the quality and performance of disinfection occurring within the drinking water supply is regularly monitored by qualified Hydraulic Technicians. This ensures that the drinking water produced on Rottnest Island meets the requirements of the Australian Drinking Water Guideline Values.

The water demand on Rottnest is highly seasonal, and the monthly consumption can range from approximately 6,000kL in July to 25,000kL in January. The combined storage capacity of the drinking water infrastructure on site is 14,000kL, which is able to maintain at least 28 days of water storage.

The island's bitumen catchment runoff collection system, which previously supplied the drinking water to storage tanks, was decommissioned from the drinking water supply chain in 2007. The runoff from the bitumen catchment is now utilised to supplement irrigation of the Golf Course. Tank 6 had minor structural repairs in 2012 whilst Tank 3 was refurbished early 2013, both of which are also used to store irrigation water for the golf course, separately from the drinking water supply chain.

There are several remote locations outside the main settlement, such as the outer island ablutions, Wadjemup lighthouse and the Research House, which are supplied with water via tanker. The supplied water in these areas is deemed not suitable for drinking and warning signs are posted accordingly.



Image 1 Example of Public Signage

1.1.3. Sampling Schedule & Procedure

A comprehensive sampling schedule is in place and the distribution sampling points are R12/001, R12/002, R12/003, R12/004, R12/005, R12/006, R12/007 and R12/008.

The sampling procedures are carried out in accordance with guidelines established to meet the requirements of the Department of Health for the supply of drinking water. Where opportunities exist to further monitor and assess drinking water supply, these are implemented as appropriate.

2. Performance Summary

Water Quality Meeting the <i>Australia Drinking Water Guidelines v.3.3 (2016) (ADWG)</i>			
July – September 2017			
	No. of Analyses Completed	No. of Analyses Within Guidelines	No. of Non-conformances to Guidelines
Microbial			
Bacterial (<i>E.coli</i>)	57	57	0
Amoeba (<i>Thermophilic Naegleria</i>)	28	28	0
Chemical & Physical			
Health	81	81	0
Aesthetic	167	161	6
Radiological			
Gross Alpha	0	0	0
Gross Beta	0	0	0

3. Microbial Performance

During the July – September 2017 reporting period, there were no incidences where exceedances of the Microbial Health ADWG occurred.

3.1. Microbial – Compliance Summary

Rottnest Island Distribution System July – September 2017				
Microbial Characteristic	MoU Compliance Criteria	No. of Analyses	No. of Analyses Complying with MoU	% Compliance
Bacterial				
<i>E.coli</i>	Non Detect	57	57	100%
Amoeba				
Thermophilic <i>Naegleria</i>	Non Detect	28	28	100%

3.2. Microbial – Exception Notifications

Microbial Water Quality Exceptions July – September 2017						
Population Served	Date	Microbial Characteristic	MoU Alert Level	Remedial Action	DoH Notified	Close Out Date
No Exceptions						

3.3. Microbial Incident Specific Information

There were no non-conformances with the MoU or ADWG criteria for *E.coli* or Thermophilic *Naegleria* during this reporting period.

4. Chemical: Health Related Performance

During the July – September 2017 reporting period, there were no incidences where exceedances of the Chemical Health ADWG occurred.

4.1. Chemical: Health Related - Compliance Summary

Rottnest Island Distribution System July – September 2017					
Health Characteristic	ADWG Guideline (mg/L)	No. of Analyses	No. of Analyses Complying with ADWG	% Compliance with ADWG	Max Value of Analysis (mg/L)
Antimony (Sb)	0.003	3	3	100%	<0.001
Cadmium (Cd)	0.002	3	3	100%	<0.0001
Chlorine (Cl ₂) (in house testing)	5	21	21	100%	0.95
Copper (Cu)	2	3	3	100%	0.02
Fluoride (F)	1.5	1	1	100%	0.10
Lead (Pb)	0.01	3	3	100%	0.002
Manganese (Mn)	0.5	19	19	100%	0.018
Nickel (Ni)	0.02	3	3	100%	<0.001
Nitrate (NO ₃) (Nitrate as nitrate)	50	3	3	100%	<0.5
Nitrite (NO ₂)	3	11	11	100%	<0.5
Trihalomethanes (THMs)	0.25	11	11	100%	0.015

4.2. Chemical: Health Related - Exception Notifications

Chemical: Health Related Water Quality Exceptions July – September 2017						
Population Served	Date	Chemical Characteristic	MoU Alert Level	Remedial Action	DoH Notified	Close Out Date
No Exceptions						



4.3. Chemical: Health Related Incident Specific Information

There were no non-conformances with the ADWG criteria for health related parameters during this reporting period.

5. Chemical: Aesthetic Performance

5.1. Chemical: Aesthetic – Compliance Summary

Rottnest Island Distribution System July – September 2017					
Aesthetic Characteristic	ADWG Guideline (mg/L unless stated)	No. of Analyses	No. of Analyses Complying with ADWG	% Compliance with ADWG	Max Value of Analysis (mg/L)
Aluminium (Al)	0.2	1	1	100%	0.01
Ammonia (NH ₄)	0.5	15	15	100%	0.01
Chloride (Cl)	250	45	45	100%	240
Chlorine (Cl ₂) <i>(in house testing)</i>	0.6	21	5	23%	1.21
Colour	15 (HU)	6	6	100%	<5
Copper (Cu)	1	3	3	100%	0.02
Hardness (CaCO ₃)	200	1	1	100%	17
Iron (Fe)	0.3	18	15	88%	0.74
Manganese (Mn)	0.1	18	18	100%	0.02
pH	6.5 – 8.5	21	17	80	9.5
Sodium (Na)	180	2	2	100%	150
Sulphate	250	3	3	100%	4
Sulphide (H ₂ S)	0.05	3	3	100%	<0.01
TDS	600	1	1	100%	500
Turbidity	5 (NTU)	6	6	100%	0.8
Zinc (Zn)	3	3	3	100%	0.05

5.2. Chemical: Aesthetic - Incident Specific Information

There were several instances where analytical results exceeded the aesthetic guidelines for chemical and physical properties, these are summarised below:

- **Chlorine:** The highest value was 1.21 mg/L recorded at R12/001. Concentrations reported were well below the Health Criteria guideline value, with no complaints received during the reporting period. It is important to maintain adequate disinfection to ensure provision of safe drinking water, at times, this may mean that the aesthetic guideline for chlorine may be exceeded. This does not however pose a risk to human health.
- **Iron:** 3 out of 18 samples reported iron concentrations above the ADWG value of 0.3mg/L. The maximum concentration was 0.74mg/L at R12/007.

As iron has a taste threshold of approximately 0.3 mg/L in water; this may cause taste and odour problems. Having noted this, there have been no complaints regarding water quality during the reporting period and results have remained below the Health ADWG.

- **pH:** 4 out of 21 samples reported pH values outside the ADWG range of 6.5 to 8.5. The maximum pH value was recorded at R12/007 (9.50 pH units).

A higher pH can be due to longer retention times in the water main, and can also be a characteristic of distribution systems that are constructed partly of concrete tanks and cement-mortar lined pipes; typical of the Rottneast Island distribution system. The ADWG indicates that pipes constructed of these materials can significantly increase pH, and a higher pH value may be tolerated, provided monitoring indicates no deterioration in microbial quality.

As discussed in Section 3, there were no non-conformances with the MoU criteria for *E.coli* or Thermophilic *Naegleria* during this reporting period, or the previous reporting period.

Whilst some monitoring locations reported analyte concentrations outside of the guideline values for aesthetic water quality, it is important to note that these results do not pose a risk to health.

6. Radiological Performance

No radiological samples were required during the reporting period. The next round of radiological samples are due in 2019 and will be reported during the appropriate reporting cycle.

6.1. Radiological – Compliance Summary

Rottnest Island Distribution System July – September 2017				
Radiological Characteristic	MoU Compliance Criteria	No. of Analyses	No. of Analyses Complying with MoU	% Compliance
Gross Alpha	< 0.5 Bq/L	NA	NA	NA
Gross Beta	< 0.5 Bq/L	NA	NA	NA

7. Planned Sample Summary

7.1. Planned Sample – Compliance Summary

Planned Samples ¹ July – September 2017								
Microbial			Chemical			Radiological		
Planned	Taken	% Taken	Planned	Taken	% Taken	Planned	Taken	% Taken
85	85	100%	167	167	100%	NA	NA	NA

¹ A planned sample is defined as being included in the Sampling Program for this period.

7.2. Planned Sample - Exception Notifications

Planned Sample Exceptions July – September 2017			
Sampling Point	Date Due	Characteristic	Reason for Missing Sample
No Exceptions			

8. Comments

During the quarter, the Rottnest Island Authority submitted the Rottnest Island Drinking Water Quality Management Plan to the Department of Health for review and acceptance. It is expected that this will be formally accepted but the Department, and implemented on Rottnest Island by the end of 2017.

The scheduled Quarterly Drinking Water Meeting was due in September; however this was postponed, with an alternative date to be provided by the Department of Health.

Tank 4 underwent refurbishment, in preparation for the summer season, to ensure potable water demands can be met during this time. Water quality testing has commenced for Tank 4 and will continue as required, to ensure provision of high quality drinking water to island consumers.