



Programmed Facility Management
For the
Rottnest Island Authority

Quarterly Drinking Water Report to the Department
of Health by the Rottnest Island Authority
1 January – 31 March 2023





Table of Contents

- 1. Water Provider Information 3**
- 1.1. System Information 3**
- 1.1.1. Consumers 3
- 1.1.2. Distribution System & Water Supply 3
- 1.1.3. Sampling Schedule & Procedure 4
- 2. Performance Summary 5**
- 3. Microbial Performance 6**
- 3.1. Microbial – Compliance Summary 6
- 3.2. Microbial – Exception Notifications 7
- 3.3. Microbial Incident Specific Information 7
- 4. Chemical: Health Related Performance 8**
- 4.1. Chemical: Health Related - Compliance Summary 8
- 4.2. Chemical: Health Related - Exception Notifications 9
- 4.3. Chemical: Health Related Incident Specific Information 9
- 5. Chemical: Aesthetic Performance 10**
- 5.1. Chemical: Aesthetic – Compliance Summary 10
- 5.2. Chemical: Aesthetic - Incident Specific Information 11
- 6. Radiological Performance 12**
- 6.1. Radiological – Compliance Summary 12
- 7. Planned Sample Summary 13**
- 7.1. Planned Sample – Compliance Summary 13
- 7.2. Planned Sample - Exception Notifications 13
- 8. Customer Complaints 14**
- 9. Comments 15**
- 9.1 Bromate management 15
- 9.2 Drinking Fountain Monitoring Initiative 15
- 9.3 Ad Hoc Monitoring 16
- 9.4 Other Sampling 16



1. Water Provider Information

Rottnest Island Authority Contact Details			
Name of Company	Rottnest Island Authority		
Company Address	1 Mews Road, Fremantle WA 6160		
Company Phone	Ph. (08) 9432 9300	Fax	(08) 9432 9301
Company Website	www.rotnestisland.com		
Company Email	enquiries@rotnestisland.com		
Executive Director	Jason Banks		
Director Environment Heritage and Parks	Arvid Hogstrom		
Director Infrastructure	Martin Marerwa		
Environment and Compliance Manager (RIA)	Rebecca Gabbitus		
Compliance Officer (PFM)	Jason Vogel		

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 500,000 visits are typically made to Rottnest Island on a yearly basis.

During January 2023, a total of 119,554 ferry visitor numbers were recorded with 70,658 in February 2023. The visitor numbers for March 2023 have not yet been finalised.

The number of beds on Rottnest 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 Rottnest 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 22 km of mains. Water is supplied by six saline (seawater) bores located in the Longreach Borefield. Water abstracted from the saline bores feed into the desalination plant, where reverse osmosis occurs. Desalinated water is then disinfected through a dual chlorination system, which ensures the provision of safe drinking water to Rottnest Island customers.

The water demand on Rottnest Island is highly seasonal, and the monthly consumption can range from approximately 14,000kL in July to 24,000kL in the summer months. Consumption levels during this reporting period were 24,261kL in January 2023, 19,751kL in February 2023 and 21,304kL in March 2023.

Rottnest Island has a combined storage capacity of 14,000kL, which provides approximately 22 days of potable water storage at full capacity, however, water security is targeted at a minimum of seven days storage during peak periods.

Remote locations outside the main settlement, such as the outer island ablutions, Wadjemup Lighthouse and surrounding area, are supplied with water via a tanker. The supplied water in these areas is deemed not suitable for drinking and warning signs are posted accordingly.



Figure 1 Example of Public Signage

1.1.3. Sampling Schedule & Procedure

Potable water sampling is carried out in accordance with the Australian Drinking Water Guidelines (ADWG) and is scheduled in accordance with the Rottneest Island Drinking Water Quality Risk Management Plan dated November 2022.

To respond to emerging trends, and to further ensure the safety of the drinking water quality, further monitoring or adjustment of the schedule can occur in response to:

- Risk assessment;
- New information or industry best practice;
- Guidance or specialist recommendations from Government Departments; or
- Post incident.

In addition to the sampling regime presented in the *Drinking Water Quality Risk Management Plan (2022)*, the Rottneest Island Authority (RIA) are additionally testing:

- Tanks 4 and 7, however, the data does not form part of the statistical data required for analysis in this quarterly report.
- Drinking water fountains, as recommended by the Department of Health (WAHealth) in 2017.
- Bromate, following testing for additional minerals and metals in 2017. Bromate was identified, and weekly sampling occurs to monitor the results.



2. Performance Summary

Summary of Water Quality results compared to the ADWG			
January – March 2023			
Parameters	No. of Analyses	No. of Analyses Complying with ADWG	No. of ADWG exceedance events
Microbial			
Bacterial (<i>E.coli</i>)	59*	59	0
Thermotolerant Coliforms	59*	59	0
Thermophilic Amoebae	29*	29	0
Amoeba (Thermophilic <i>Naegleria</i>)	29*	29	0
Chemical & Physical			
Health	312*	254	0
Aesthetic	377*	271	106
Radiological			
Gross Alpha	0	0	0
Gross Beta	0	0	0

Note = '*' indicates that the number of samples does not include Tank 7.



3. Microbial Performance

During the January to March 2023 reporting period, there were no reported exceedances of microbiological parameters compared against the ADWG in the potable water distribution system.

3.1. Microbial – Compliance Summary

Rottnest Island Distribution System January – March 2023				
Microbial Characteristic	Memorandum of Understanding Compliance Criteria	No. of Analyses	No. of Analyses Complying with Memorandum of Understanding	% Compliance
Bacterial				
<i>E.coli</i>	Non-Detect	59	59	100%
Thermotolerant Coliforms	Non-Detect	59	59	100%
Amoeba				
Thermophilic Amoebae	Non-Detect	29	29	100%
Thermophilic <i>Naegleria</i>	Non-Detect	29	29	100%



3.2. Microbial – Exception Notifications

Date	Microbial Characteristic	Memorandum of Understanding Alert Level	Remedial Action	Department of Health Notified	Close Out Date
Nothing to report					

3.3. Microbial Incident Specific Information

There were no microbial related exception notifications during the reporting period.



4. Chemical: Health Related Performance

During the January - March 2023 reporting period there were no results reported in exceedance of the chemical health parameters outlined in the ADWG in the potable water distribution system.

4.1. Chemical: Health Related - Compliance Summary

Rottnest Island Distribution System January – March 2023					
Health Parameter	ADWG Compliance Criteria (mg/L)	No. of Analyses	No. of Analyses Complying with ADWG	% Compliance with ADWG	Max Value of Analysis (mg/L)
Antimony (Sb)	0.003	24	24	100%	< 0.001
Bromate (BrO ₃ ⁻)	0.02	104	104	100%	0.016
Chlorine Total (Cl ₂) <i>(in house testing Total Residual)</i>	5	104	104	100%	1.04
Copper (Cu)	2	3	3	100%	0.066
Fluoride (F)	1.5	32	32	100%	0.1
Lead (Pb)	0.01	3	3	100%	0.001
Nickel (Ni)	0.02	3	3	100%	< 0.001
Nitrate (NO ₃ ⁻)	50	3	3	100%	< 0.02
Nitrite (NO ₂ ⁻)	3	14	14	100%	< 0.02
Trihalomethanes (THMs)	0.25	14	14	100%	0.004



4.2. Chemical: Health Related - Exception Notifications

Chemical: Health Related Water Quality Exceptions January – March 2023					
Date	Chemical Characteristic	Memorandum of Understanding Alert Level	Remedial Action	Department of Health Notified	Close Out Date
Nothing to report					

4.3. Chemical: Health Related Incident Specific Information

There were no chemical health related exception notifications during the reporting period.

5. Chemical: Aesthetic Performance

5.1. Chemical: Aesthetic – Compliance Summary

During the January – March 2023 reporting period, there were 106 sample exceedances of chemical aesthetic parameters in the potable water distribution system, the details of which are outlined in Section 5.2.

Rottnest Island Distribution System January - March 2023					
Aesthetic Parameter	ADWG (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	4	4	100%	< 0.05
Ammonia (NH ₃)	0.5	14	14	100%	0.05
Chloride (Cl ⁻)	250	1	1	100%	110
Chlorine Free Residual (Cl) <i>(in house testing)</i>	0.6	104	1	1%	0.99
Colour	15 (HU)	6	6	100%	< 5
Hardness (CaCO ₃)	200	1	1	100%	12
Hydrogen Sulphide	0.05	3	3	100%	< 0.05
Iron (Fe)	0.3	24	21	88%	1.4
pH	6.5 – 8.5	104	104	100%	6.94, 8.31 ¹
Sodium (Na)	180	104	104	100%	150
Sulphate	250	1	1	100%	2.1
TDS	600	1	1	100%	200
Turbidity	5 (NTU)	5	5	100%	0.4 (NTU)
Zinc (Zn)	3	3	3	100%	0.027

¹ The two numbers represent the lowest and the highest pH values measured respectively.

5.2. Chemical: Aesthetic - Incident Specific Information

- **Chlorine (free):** During this reporting period, 103 out of 104 recorded samples were reported with chlorine values above the ADWG aesthetic limit of 0.6mg/L.

The ADWG state that chlorine has an aesthetic odour threshold of 0.6mg/L, however, the reported concentrations exceeding this threshold do not pose any health risks, as all values are below the specific health guideline value of 5.0mg/L.

The aesthetic exceedances were reported across multiple distribution sampling points over the three-month period. All results were reported well below the health limit, with the maximum value of 0.99 mg/L reported at one sampling point on 28 February 2023.

Whilst impacts to the aesthetic quality of drinking water may occur due to greater concentrations of chlorine, it is important to note that adequate disinfection is paramount for the provision of safe drinking water.

- **Iron:** There were three values in exceedance of the ADWG aesthetic limit of 0.05 mg/L. No health limit is currently available in the ADWG. The exceedances were recorded at the following dates and locations:
 - 17 January 2023: One detection of 0.64 mg/L.
 - 13 February 2023: One detection of 1.40 mg/L.
 - 14 March 2023: One detection of 1.20 mg/L.



6. Radiological Performance

6.1. Radiological – Compliance Summary

Rottnest Island Distribution System January – March 2023					
Radiological Characteristic	Australian Drinking Water Guidelines (Bq/L)	No. of Analyses	No. of Analyses Complying with Australian Drinking Water Guidelines	% Compliance with Australian Drinking Water Guidelines	Max Value of Analysis (Bq/L)
Nothing to report					



7. Planned Sample Summary

7.1. Planned Sample – Compliance Summary

Planned Samples January - March 2023								
Microbial			Chemical			Radiological		
Planned ¹	Taken ²	% Taken	Planned ¹	Taken ²	% Taken	Planned	Taken	% Taken
176	176	100%	689	689	100%	0	0	NA

¹ A planned sample is defined as being included in the sampling schedule for this period.

² Physical number of samples taken for this period.

7.2. Planned Sample - Exception Notifications

Planned Sample Exceptions January - March 2023			
Sampling Point	Date Due	Characteristic(s)	Reason for Missing Sample
Nothing to report.			



8. Customer Complaints

Water Quality Related Complaints January – March 2023			
Complainant	Date(s)	Description	Resolution
Report of brown water at Units 505, 506, 523 and 541	9/02/2023 – 10/02/2023	Report received of brown water coming from taps and temporarily cut off water at units 505, 506, 523 and 541. Water became clear after one minute flush.	Immediately delivered bottled water to guests then conducted water sampling at unit 523 on 13 February, results are detailed in section 9.3. There were no ADWG exceedances reported.

9. Comments

9.1 Bromate management

The RIA continues to monitor and manage bromate formation across the distribution network based on the decision from the Quarterly Meeting held between the RIA, PFM and WAHealth on 26 September 2019. Bromate is tested weekly at locations R12/001 – R12/008 and Tank 4. Bromide is tested weekly at Tank 7.

The ADWG has a health limit of 0.020 mg/L for Bromate. There were no bromate exceedance events during this reporting period.

9.2 Drinking Fountain Monitoring Initiative

The RIA commenced a drinking fountain monitoring initiative in December 2017 following a recommendation from WAHealth.

Results obtained from the sampling program supported the island’s drinking fountain replacement project, which included the replacement of all existing drinking fountains and the addition of new amenities around the settlement. The final drinking fountain installation was completed in October 2018.

The drinking fountain monitoring program and sampling results are reported separately to the distribution system or network, which are represented below.

The drinking fountain results are represented in the below table for the January - March quarter. Drinking fountain sampling occurs once every four weeks.

Rottnest Island Drinking Fountain January - March 2023					
Health Characteristic	ADWG (mg/L)	No. of Analyses	No. of Analyses Complying with ADWG	% Compliance with ADWG	Max Value of Analysis (mg/L)
Antimony (Sb)	0.003	48	48	100%	< 0.001
Cadmium (Cd)	0.002	48	48	100%	< 0.0001
Copper (Cu)	2	48	48	100%	0.21
Lead (Pb)	0.01	48	48	100%	0.005
Nickel (Ni)	0.02	48	48	100%	0.006
Aesthetic Characteristic	ADWG (mg/L)	No. of Analyses	No. of Analyses Complying with ADWG	% Compliance with ADWG	Max Value of Analysis (mg/L)
Zinc (Zn)	3	48	48	100%	0.42

9.3 Ad Hoc Monitoring

There was one ad hoc sampling event in response to the customer complaint of brown water detailed in section 8. None of the parameters reported exceeded the ADWG limits.

Ad Hoc Monitoring Exceedances				
January – March 2023				
Date	Location	Parameter	Australian Drinking Water Guidelines	Result
9/02/2023	Units 505, 506,523 and 541 (Bathurst area)	Colour	15 HU	< 5
		Conductivity	NA	410 uS/cm
		TDS	600 mg/L	210 mg/L
		TSS	NA	< 5
		Turbidity	5 NTU	0.1 NTU
		Hardness	200 mg CaCO3/L	15 mg CaCO3/L
		Aluminium	0.2 mg/L	< 0.05 mg/L
		Copper	2 mg/L	0.004 mg/L
		Iron	0.3 mg/L	0.09 mg/L
		Lead	0.01 mg/L	< 0.001 mg/L
		Zinc	3 mg/L	0.019 mg/L
		Calcium	NA	3.7 mg/L
		Total Coliforms	0 CFU/100ml	< 1 CFU/100ml
		Faecal Coliforms	0 CFU/100ml	< 1 CFU/100ml
		E.Coli	0 CFU/100ml	< 1 CFU/100ml

9.4 Other Sampling

Annual sampling for *Legionella* bacteria was conducted on 15 March 2023 from eight hot water units at: the Homestead, Units 241, 101, 346, 519, 946, 419 and from the Longreach ablution block. No detection of *Legionella* was reported.