ROTTNEST ISLAND AUTHORITY

PROGRAMMED

Quarterly Drinking Water Report to the Department of Health

1 October – 31 December 2024

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Contents

1. Water Provider Information

Rottnest Island Authority Contact Details	
Name of Company	Rottnest Island Authority
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Company Email	enquiries@rottnestisland.com
Executive Director	Jason Banks
Director Environment Heritage and Parks	Arvid Hogstrom
Director Infrastructure	Martin Marerwa
Manager Approvals and Compliance	Rebecca Gabbitus
Manager Island Operations (PFM)	Gary Monaghan

1.1 System Information

1.1.1 Consumers

The water demand on Wadjemup / Rottnest Island is related to tenancy and is highly seasonal, being low in winter and high in summer. A total of 69,469 ferry visitor numbers were recorded for October 2024, 83,321 for November 2024, and 109,628 for December 2024.

The number of beds on Rottnest Island for guests is approximately 4,362 with the average length of stay being 2 nights. In addition to this, there are approximately 150 permanent residents on Wadjemup / 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 (RO) 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 becoming more consistent throughout the year with reduced seasonal variability. Monthly consumption can range from approximately 14,000kL in July to 24,000kL in December.

Consumption levels for October 2024 were 17,393 kL, with 19,285 kL in November 2024 and 21,622 kL in December 2024.

Rottnest Island has a combined storage capacity of 14,000 kL, which provides approximately 18 days of potable water storage at full capacity, however, water security is targeted at a minimum of twelve days storage during peak periods. At the time of reporting two trains in the desalination plant are nearing the end of life. Trains 1 and 2 are being refurbished and with the new Train 4 in operation the three RO trains are capable of producing 910 kL of potable water per day. The RIA has appointed a contractor to upgrade the existing desalination plant with two new 500 m3/day Sea Water Reverse Osmosis desalination trains. The design of the new desal plant has commenced and it is anticipated the construction phase will be completed by the end of 2025, in time for the start of the summer peak period on the island.

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 Rottnest 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 Rottnest 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 (DoH) 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 October - December 2024			
Parameters	**No. of Analyses**	**No. of Analyses Complying with ADWG**	**No. of ADWG exceedance events**
Microbial			
Bacterial (*E.coli*)	65[1]	65	0
Amoeba (Thermophilic *Naegleria)*	22[2]	22	0
Chemical & Physical			
Health	319[3]	318	1
Aesthetic	419[4]	300	119
Radiological			
Gross Alpha	9	9	0
Gross Beta	9	9	0
PFAS[5]			
PFOS & PFHxS	0	NA	NA
PFOA	0	NA	NA

[1] This number does not include Tank 7

[2] Ibid

[3] Ibid

[4] Ibid

[5] Not taken this reporting period

3. Microbial Performance

During the October - December 2024 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 October - December 2024				
Microbial Characteristic	**Memorandum of Understanding Compliance Criteria**	**No. of Analyses**	**No. of Analyses Complying with Memorandum of Understanding**	**% Compliance**
Bacterial				
E.coli	Non-Detect	65	65	100%
Amoeba				
Thermophilic *Naegleria*	Non-Detect	22	22	100%

4. Chemical: Health Related Performance

During the October - December 2024 reporting period there was one Bromate result reported as exceeding the chemical health parameters outlined in the ADWG in the potable water distribution system, the details of which are outlined in Section 4.2 and a detailed exceedance explanation provided in section 4.3.

Section 4.1 provides an overall compliance summary for all Chemical health related sample analysis.

4.1 Chemical: Health Related – Compliance Summary

Rottnest Island Distribution System October - December 2024					
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	18	18	100%	< 0.001
Bromate ($BrO3^-$)	0.02	117	116	99%	0.03
Chlorine Total (Cl2) *(in house testing Total Residual)*	5	117	117	100%	1.62
Copper (Cu)	2	4	4	100%	0.009
Fluoride (F)	1.5	27	27	100%	0.30
Lead (Pb)	0.01	4	4	100%	< 0.001
Nickel (Ni)	0.02	4	4	100%	< 0.001
Nitrate ($NO3^-$)	50	4	4	100%	< 0.01
Nitrite ($NO2^-$)	3	12	12	100%	< 0.01
Trihalomethanes (THMs)	0.25	12	12	100%	0.0068

4.2 Chemical: Health Related – Exception Notifications

Chemical: Health Related Water Quality Exceptions October - December 2024						
Date	**Chemical Characteristic**	**Memorandum of Understanding Alert Level**	**Level reported**	**Sample Location**	**Department of Health Notified**	**Close Out Date**
3 December 2024	Bromate	0.020 mg/L	0.030 mg/L	R12/005	Yes	18 December 2024

4.3 Chemical: Health Related Incident Specific Information

There was one exceedance event for bromate during the reporting period, on 3rd December 2024 at R12/005 South Thompson Bay. At this time, there were ongoing works to upgrade the area from the aged gravity-fed water main to the upgraded pressurised water main. The sampling point was not changed to the pressurised main at the time this exceedance occurred. Once the sampling point was changed to the new main, additional sampling was undertaken in a number of accommodation units and the sampling point was flushed as per Drinking Water Response Protocol 10.

As per Drinking Water Response Protocol 10 for Chemical Exceedance, the following actions took place after the bromate exceedance event:

- The sample was verified with the laboratory.
- Remedial flushing was initiated in accordance with the Rottnest Island Flushing Plan and the Island's Bromate Remediation Plan (PFM, 2018). For each exceedance event, the nearby flush point was flushed for 24 hours.
- An investigation of the water supply line was carried out which determined that water had been sitting in the pipe work for a prolonged period, enabling the formation of bromate.
- Resampling took place from the sample location where the exceedance was reported and at every other distribution sample point as part of the weekly sampling schedule.
- Critical Control Points (Desalination RO membranes and chlorination stations) were then checked and confirmed to be operating within the prescribed critical control limits (pH, chlorine, and turbidity sensors).

5. Chemical: Aesthetic Performance

5.1 Chemical: Aesthetic - Compliance Summary

During the October – December 2024 reporting period, there were 119 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 October - December 2024					
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	3	3	100%	< 0.05
Ammonia (NH3)	0.5	12	12	100%	< 0.02
Chloride (Cl^-)	250	2	2	100%	110
Chlorine Free Residual (Cl) *(in house testing)*	0.6	117	0	0%	1.59
Colour	15 (HU)	7	7	100%	< 5
Hardness (CaCO3)	200	1	1	100%	13
Hydrogen Sulphide	0.05	4	4	100%	< 0.05
Iron (Fe)	0.3	27	25	93%	1.2
pH	6.5 – 8.5	117	117	100%	7.06, 7.99[6]
Sodium (Na)	180	117	117	100%	91
Sulphate	250	1	1	100%	1.90
TDS	600	1	1	100%	230
Turbidity	5 (NTU)	1	1	100%	0.50 (NTU)
Zinc (Zn)	3	4	4	100%	0.028

[6] 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, 117 out of 117 recorded samples were reported with chlorine values above the ADWG aesthetic limit of 0.6 mg/L.

  The ADWG state that chlorine has an aesthetic odour threshold of 0.6 mg/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 5.0 mg/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 1.59 mg/L reported at R12/001 Tank 5 on 5 November 2024.

  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 two values in exceedance of the ADWG aesthetic limit of 0.30 mg/L. No health limit is currently available in the ADWG. The exceedances were recorded at the following dates and locations:
  - 22 October 2024: 1.2mg/L at R12/008
  - 19 November 2024: 0.43mg/L at R12/008

6. Radiological Performance

Date	Radiological Characteristic	No. of Analyses	No. of Analyses Complying with Australian Drinking Water Guidelines	% Compliance with Australian Drinking Water Guidelines	Max Value of Analysis (Bq/L)
22 October 2024	Gross Alpha	9	9	100%	0.038 ± 0.027
22 October 2024	Gross Beta	9	9	100%	0.048 ± 0.043

7. PFAS Performance

No samples were taken during the reporting period.

The sampling schedule for PFAS was updated in November, changing the frequency of PFAS monitoring from annually to six-monthly, with sampling events to occur in May and November, commencing in May 2025.

8. Planned Sample Summary

8.1 Planned Sample – Compliance Summary

Planned Samples October - December 2024								
Microbial			Chemical			Radiological		
Planned[7]	Taken[8]	% Taken	Planned	Taken	% Taken	Planned	Taken	% Taken
184	174	95%	738	738	100%	18	18	100%

8.2 Planned Sample - Exception Notifications

Five samples to test for Thermophilic Naegleria and five samples to test for Thermophilic Amoeba were missed as the bottles were not received from the lab in time to take the samples. PFM did not have sufficient bottles on hand and there was a change in operational staff which resulted in these samples being missed. Management measures have been implemented to ensure that sufficient bottles are on hand to collect 3 months' worth of samples.

[7] A planned sample is defined as being included in the sampling schedule for this reporting period.

[8] A taken sample is the physical sample taken for this reporting period.

9. Customer Complaints

There were no customer complaints relating to drinking water quality performance made during this reporting period. RIA has a Utilities Customer Complaint Procedure, which outlines how complaints can be submitted.

10. Comments

10.1 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 DoH on 26 September 2019. Bromate is tested weekly at locations R12/001 – R12/008, Fays Bay, Tank 4 and the Homestead. Bromide is tested weekly at Tank 7.

10.2 Drinking Fountain Monitoring Initiative

The RIA commenced a drinking fountain monitoring initiative in December 2017 following a recommendation from DoH. 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 drinking fountain monitoring program and sampling results are reported separately to the distribution system or network. The drinking fountain results are represented in the below table for the October - December 2024 quarter. Drinking fountain sampling occurs once every four weeks. There were no exceedance events during the reporting period.

Rottnest Island Drinking Fountain October - December 2024					
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	67	67	100%	< 0.001
Cadmium (Cd)	0.002	67	67	100%	< 0.0001
Copper (Cu)	2	67	67	100%	0.190
Lead (Pb)	0.010	67	67	100%	0.010
Nickel (Ni)	0.020	67	67	100%	0.017
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	67	67	100%	0.180

10.2.1 Drink Fountain Exemption Notifications

There were no exceedance events during the reporting period.

10.3 Ad Hoc Monitoring

No ad hoc sampling was conducted this quarter.

10.4 Other Sampling

10.4.1 Homestead

PFM commenced monthly sampling of a 3 kL potable water storage tank installed at the Rottnest Island Homestead shortly after its installation in November 2022. In February 2024 that 3 kL tank was replaced with a 50 kL tank which was directly supplied by the pressurised water main. This tank is sampled weekly for bromate and monthly for microbiological indicators. There were no exceedance events during the reporting period.