ROTTNEST ISLAND AUTHORITY

PROGRAMMED

Quarterly Drinking Water Report

to the

Department of Health

1 July – 30 September 2025

ROTTNEST ISLAND AUTHORITY

PROGRAMMED

Contents

1. Water Provider Information

Rottnest Island Authority Contact Details	
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Executive Director	Jason Banks
Director Environment Heritage and Parks	Arvid Hogstrom
Director Infrastructure	Martin Marerwa
A/Manager Approvals and Compliance	David Pond
Environmental Compliance Officer (PFM)	Jay Petterwood

1.1 System Information

1.1.1 Consumers

Water demand on Wadjemup / Rottnest Island is highly seasonal, reflecting fluctuations in visitor numbers and accommodation occupancy. Peak demand occurs during the summer months, with lower consumption during winter. In July 2025, ferry arrivals reached 34,463 visitors and 40,062 in August. The number of arrivals for September has not yet been confirmed.

The Island offers approximately 4,362 guest beds, with an average visitor stay of two nights. During the July - September 2025 reporting period, an additional 50 beds were temporarily allocated for the workers' camp associated with the Longreach and Fays Bay Accommodation Refurbishment Project. Further accommodation expansions are anticipated by the end of 2025 but fall outside the current reporting period.

The Island also maintains a fluctuating population of around 150 permanent residents, which varies in response to seasonal demand.

1.1.2 Distribution System & Water Supply

The Rottnest Island water distribution system is a relatively small network comprising approximately 22 km of mains. Water supply for the island is sourced from six saline bores within the Longreach Borefield. The abstracted seawater is directed to the desalination plant, where it undergoes reverse osmosis (RO) treatment. Following desalination, the water is disinfected through a dual chlorination system, ensuring the provision of safe drinking water to consumers on the island.

The water demand on Rottnest Island is becoming more consistent throughout the year with reduced seasonal variability. Monthly consumption can range from approximately 12,000 kL in July to 24,000kL in December. Consumption levels for July 2025 were 12,733 kL, with 12,028 kL in May 2025 and 14,074 kL in June 2025.

Rottnest Island has a combined potable water storage capacity of 14,000 kL, providing approximately 18 days of supply at full capacity. Water security is managed to maintain a minimum of twelve days storage during peak periods. Trains 1 and 2 within the existing desalination plant are nearing end-of-life but have recently had major refurbishment undertaken on them. While the desalination plant has a theoretical maximum production capacity of 910 kL per day with Trains 1, 2, and 4 operational, production is currently limited to approximately 720 kL per day due to operational constraints at the Borefield, allowing only either Train 1 or Train 2 to operate alongside Train 4.

The RIA has appointed a contractor to deliver two new 500 kL/day seawater reverse osmosis desalination trains as part of a major plant upgrade. The new plant will be up to the equivalent of Water Corporation water quality standard and will include Multi Media Filtration as well as a second pass train.

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 quality monitoring on Rottnest Island is conducted in line with the Australian Drinking Water Guidelines (ADWG) and follows the sampling schedule outlined in the Rottnest Island Drinking Water Quality Risk Management Plan (November 2022).

All sampling, reporting, and compliance assessments are based on the ADWG Version 3.7 as per direction from Department of Health (DoH).

The monitoring program is adaptable and may be revised in response to:

- Updated risk assessments;
- Emerging industry trends or best practice;
- Guidance or specialist recommendations from Government Departments; and
- Incident investigations or post incident reviews.

In addition to routine sampling under the 2022 risk management plan, RIA also undertakes targeted monitoring of:

- 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 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 July – September 2025			
Parameters	**No. of Analyses**	**No. of Analyses Complying with ADWG**	**No. of ADWG exceedance events**
Microbial			
Bacterial (*E.coli*)	66[1]	66	0
Amoeba (Thermophilic *Naegleria)*	30[2]	30	0
Chemical & Physical			
Health	351[3]	351	0
Aesthetic	423[4]	303	120
Radiological[5]			
Gross Alpha	0	NA	NA
Gross Beta	0	NA	NA
PFAS[6]			
PFOS & PFHxS	0	NA	NA
PFOA	0	NA	NA

[1] This number does not include Tank 4 & 7

[2] Ibid

[3] Ibid

[4] Ibid

[5] Not taken this reporting period

[6] Ibid

3. Microbial Performance

During the July to September 2025 reporting period, there were no reported exceedances of microbiological parameters compared against the ADWG in the potable water distribution system.

Section 3.1 presents an overall compliance summary for all microbial-related sample analyses.

3.1 Microbial – Compliance Summary

Rottnest Island Distribution System July - September 2025				
Microbial Characteristic	**Memorandum of Understanding Compliance Criteria**	**No. of Analyses**	**No. of Analyses Complying with Memorandum of Understanding**	**% Compliance**
Bacterial				
E.coli	Non-Detect	66	66	100%
Amoeba				
Thermophilic *Naegleria*	Non-Detect	30	30	100%

4. Chemical: Health Related Performance

During the July – September 2025 reporting period, there were no exceedances of the chemical health parameters outlined in the ADWG recorded for the potable water distribution system. A number of exceedances were reported at Kingstown Barracks, Homestead and also in drinking fountains which are not identified in this section on potable water distribution, please refer to Section 10.

Section 4.1 presents an overall compliance summary for all chemical health-related sample analyses.

4.1 Chemical: Health Related – Compliance Summary

Rottnest Island Distribution System July – September 2025					
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	34	34	100%	0.001
Bromate ($BrO3^-$)	0.02	112	112	100%	0.008
Chlorine Total (Cl2) *(in house testing Total Residual)*	5	121	121	100%	2.08
Copper (Cu)	2	4	4	100%	0.1
Fluoride (F)	1.5	26	26	100%	0.60
Lead (Pb)	0.01	4	4	100%	< 0.001
Nickel (Ni)	0.02	4	4	100%	< 0.001
Nitrate ($NO3^-$)	50	4	4	100%	< 0.001
Nitrite ($NO2^-$)	3	12	12	100%	< 0.01
Trihalomethanes (THMs)	0.25	8	8	100%	0.0092

5. Chemical: Aesthetic Performance

During the July – September 2025 reporting period, there were 120 sample exceedances of chemical aesthetic parameters in the potable water distribution system, the details of which are outlined in Section 5.2.

5.1 Chemical: Aesthetic - Compliance Summary

Rottnest Island Distribution System July – September 2025					
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	5	5	100%	< 0.02
Chloride (Cl^-)	250	1	1	100%	120
Free Chlorine (Cl) *(in house testing)*	0.6	121	1	0.8%	2.01
Colour	15 (HU)	7	7	100%	< 5
Hardness (CaCO3)	200	1	1	100%	10
Hydrogen Sulphide	0.05	4	4	100%	< 0.05
Iron (Fe)	0.3	34	34	100%	0.2
pH	6.5 – 8.5	121	121	100%	7.02, 7.53[7]
Sodium (Na)	180	121	121	100%	81
Sulphate	250	1	1	100%	1.6
TDS	600	1	1	100%	240
Turbidity	5 (NTU)	7	7	100%	0.50 (NTU)
Zinc (Zn)	3	4	4	100%	0.066

[7] 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, 120 recorded samples exceeded the ADWG aesthetic limit of 0.6 mg/L for chlorine.

  The ADWG establishes an aesthetic odour threshold of 0.6 mg/L; however, these exceedances do not pose any health risks, as all values remained well below the health guideline limit of 5.0 mg/L.
  Aesthetic exceedances were observed across multiple distribution sampling points over the three-month period, with a maximum recorded concentration of 2.01 mg/L at R12/002 on 5 August 2025.
  While higher chlorine concentrations may affect the aesthetic quality of drinking water and may also contribute to corrosion, maintaining adequate disinfection is essential to ensuring its safety.

6. Radiological Performance

No radiological water quality samples were collected during this reporting period.

7. PFAS Performance

No PFAS water quality samples were collected during this reporting period.

8. Planned Sample Summary

During the July – September 2025 reporting period, routine monitoring was conducted in accordance with the planned sampling schedule for microbial, chemical, and radiological parameters, with a total of 543 samples collected. A summary of sample numbers and compliance with the sampling program is provided in Section 8.1.

8.1 Planned Sample – Compliance Summary

Planned Samples July - September 2025								
Microbial			Chemical			Radiological		
Planned[8]	Taken[9]	% Taken	Planned	Taken	% Taken	Planned	Taken	% Taken
192	192	100%	351	351	100%	0	0	NA

8.2 Planned Sample - Exception Notifications

During the reporting period, sampling at location R12/002 (Longreach sample point) was suspended in July due to ongoing construction activities. The site was formally removed from the sampling schedule at that time and therefore excluded from the total expected sample count for the month. Sampling resumed from August onwards, following completion of recommissioning activities and subsequent verification sampling.

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

[9] 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 during this reporting period. RIA has a Utilities Customer Complaint Procedure, which outlines how complaints can be submitted.

10. Special Investigations

10.1 Bromate Management

The RIA continues to actively monitor and manage bromate formation across the distribution network, in line with the decisions made during the Quarterly Meeting held on 26 September 2019 between the RIA, PFM, and the DoH. To ensure water quality, bromate levels are tested weekly at the following locations: R12/001 - R12/008, Fays Bay, Tank 4, and Homestead. Additionally, bromide levels are monitored weekly at Tank 7 to support effective management of bromate formation.

10.2 Drinking Fountain Monitoring Initiative

The RIA initiated a drinking fountain monitoring program in December 2017, following a recommendation from the DoH. The findings from this sampling program played a key role in supporting the island's drinking fountain replacement project, which involved the replacement of all existing drinking fountains and the installation of new facilities throughout the settlement.

The drinking fountain monitoring program and its sampling results are reported separately from the broader distribution system or network. The results for the July – September 2025 quarter are provided in the table below. Sampling of the drinking fountains occurs on a four-week cycle. During this reporting period, there was one exceedance event recorded, as outlined in section 10.2.1.

Rottnest Island Drinking Fountain July - September 2025					
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	70	70	100%	< 0.001
Cadmium (Cd)	0.002	70	70	100%	< 0.0001
Copper (Cu)	2	70	70	100%	0.53
Lead (Pb)	0.010	70	70	100%	0.006
Nickel (Ni)	0.020	70	68	97%	0.028
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	70	70	100%	0.42

10.2.1 Drink Fountain Exemption Notifications

On 19 August 2025, routine monitoring of the drinking fountains located at Pedal & Flipper and Digby Drive recorded nickel concentrations of 0.028 mg/L and 0.025 mg/L respectively (first flush), exceeding the ADWG health guideline limit of 0.020 mg/L. In response, follow-up sampling was undertaken using the 30MS method, and samples were submitted to the laboratory for confirmation. An inspection of the drinking fountains was also completed to check for any corrosion or rusting that could contribute to elevated results.

Subsequent analysis confirmed that nickel concentrations at both locations had returned to below the ADWG guideline value. No further exceedances were detected, and the matter was considered resolved at the time of reporting.

10.3 Ad Hoc Monitoring

10.3.1 Kingstown Barracks

In July 2025, PFM undertook targeted non-routine water sampling at the Kingstown Barracks precinct as part of a comparative assessment investigating plumbing deterioration observed elsewhere on the island. Kingstown was selected as a reference site due to its similar internal hot-water recirculation system, allowing water chemistry and material interactions to be compared under equivalent conditions. Although outside the scheduled monitoring regime, the sampling aimed to determine whether water characteristics such as hardness and alkalinity were contributing to corrosion or metal leaching within internal plumbing systems.

Several comparison samples from Kingstown returned elevated lead concentrations above the ADWG health guideline value of 0.010 mg/L. This prompted an immediate investigation using the 30-minute stagnation (30 MS) sampling technique to assess the extent of metal leaching within the internal network. Sampling was undertaken across multiple points within the Barracks compound, including the main pipeline (Kingstown Inlet), fire hydrant, and first and last hot and cold water outlets, as well as verification points throughout the wider Kingstown precinct (e.g. P Hut and Kingstown Hostel).

Twenty-four results from the Barracks network collected by RIA exceeded the health guideline, with concentrations ranging from 0.011 mg/L to 0.358 mg/L as shown in the table below. Fifty-four other samples collected did not exceed the ADWG health guideline and are not shown in the table below. Ecosafe undertook an investigation into general water quality at the Barracks and collected samples for lead on 22 August using the 30MS method. Two samples collected from the Kingstown Inlet and Last Cold Tap exceeded the ADWG health guideline. RIA did not report these exceedances to DoH at the time of receiving the draft report on 10 September given that this testing was seen to be part of an investigation and not sampling to respond to the Incident Response Protocols.

Water-chemistry analysis confirmed that the desalinated supply is inherently soft, with low alkalinity and a negative Langelier Saturation Index (LSI), indicating a corrosive tendency. This inhibits formation of a protective carbonate scale on plumbing surfaces, leaving brass and lead-containing fittings susceptible to direct metal leaching. The exceedances were therefore attributed to the soft, corrosive nature of the supply combined with fittings that had not yet developed a protective layer.

Kingstown Lead Exceedances			
Location	**Laboratory**	**Sample Date**	**Value (mg/L)**
Kingstown Returned water	Eurofins	2/07/2025	0.043
Kingstown Inlet (2nd sample)	Eurofins	14/07/2025	0.040
Kingstown Inlet (1st sample)	Eurofins	16/07/2025	0.1
Kingstown Fire Hydrant (1st sample)	Eurofins	18/07/2025	0.023
Kingstown Inlet (1st sample)	Eurofins	19/07/2025	0.014
Kingstown Inlet (1st sample)	Eurofins	23/07/2025	0.062
Kingstown Inlet (2nd sample)	Eurofins	23/07/2025	0.011
Kingstown First Hot Tap (1st sample)	Eurofins	23/07/2025	0.042
Kingstown Last Cold Tap (1st sample)	Eurofins	23/07/2025	0.026
Kingstown Inlet (1st sample)	Eurofins	25/07/2025	0.028
Kingstown Inlet (1st sample)	Eurofins	30/07/2025	0.038
Kingstown Last Cold Tap (1st sample)	Eurofins	30/07/2025	0.041
Kingstown Inlet (1st sample)	ALS	1/08/2025	0.020
Kingstown Last Cold Tap (1st sample)	Eurofins	8/08/2025	0.31
Kingstown Last Cold Tap (1st sample)	ALS	8/08/2025	0.358
Kingstown Last Cold Tap (2nd sample)	ALS	8/08/2025	0.011
Kingstown Inlet (1st sample)	Eurofins	18/08/2025	0.016
Kingstown Inlet (1st sample)	ALS	18/08/2025	0.016
Kingstown First Cold Tap (1st sample)	Eurofins	18/08/2025	0.030
Kingstown First Cold Tap (1st sample)	ALS	18/08/2025	0.036
Kingstown Last Cold Tap (1st sample)	Eurofins	18/08/2025	0.053
Kingstown Last Cold Tap (1st sample)	ALS	18/08/2025	0.054
Kingstown Last Hot Tap (1st sample)	Eurofins	18/08/2025	0.026
Kingstown Last Hot Tap (1st sample)	ALS	18/08/2025	0.031
Kingstown Inlet (1st sample) **	EcoSafe	22/08/2025	0.020
Kingstown Last Cold Tap (1st sample)**	EcoSafe	22/08/2025	0.030

** RIA did not report these exceedances to DoH at the time of receiving the draft report on 10 September given that this testing was part of an investigation and not sampling to respond to the Incident Response Protocols.

RIA, in collaboration with external water quality specialists EcoSafe, has conducted a comprehensive investigation into the water system. The findings and recommendations were detailed in a report prepared by EcoSafe. As a precautionary measure, bottled drinking water was provided to the caretaker who resides at the Barracks until the issue is resolved.

A series of corrective and preventative actions are being implemented to address identified concerns, including:

- Replacement of fittings and pipe sections showing signs of corrosion.
- A full assessment of internal plumbing by a hydraulic consultant.
- Installation of carbon filtration units at points of use.

Further improvements currently underway include:

- Enhancing buffering capacity and reducing corrosivity through desalination plant optimization, including calcite media replacement and chlorine dose adjustments.
- Replacing all taps within the building with stainless steel or lead-free models compliant with NCC2022 standards.
- Installing additional filtration systems at the Barracks building.

Verification sampling remains ongoing to confirm long-term system stability and the effectiveness of corrosion-control measures.

10.4 Other Sampling

10.4.1 Homestead

PFM initiated monthly sampling of a 3 kL potable water storage tank at the Rottnest Island Homestead shortly after its installation in November 2022. In February 2024, this tank was replaced with a larger 50 kL tank, which is directly supplied by the pressurised water main. The new tank is now sampled weekly for bromate levels and monthly for microbiological indicators to ensure water quality is maintained.

During the reporting period, ten bromate exceedance events were recorded above the ADWG chemical guideline value of 0.02 mg/L. These occurred on the following dates:

- 01 July 2025: Bromate level of 0.021 mg/L
- 08 July 2025: Bromate level of 0.023 mg/L
- 15 July 2025: Bromate level of 0.027 mg/L
- 22 July 2025: Bromate level of 0.029 mg/L
- 29 July 2025: Bromate level 0.039 mg/L
- 05 August 2025: Bromate level 0.022 mg/L
- 12 August 2025: Bromate level 0.029 mg/L
- 02 September 2025: Bromate level 0.032 mg/L
- 09 September 2025: Bromate level 0.034 mg/L

- 16 September 2025: Bromate level 0.031 mg/L.

In accordance with Protocol 10 – Chemical Exceedances, RIA implemented the required response actions, including immediate stakeholder notification, increased sampling frequency, and targeted flushing of the Homestead's internal system. While these actions were partially effective in reducing bromate concentrations, they did not fully prevent subsequent exceedances during the same period.

An investigation by Ecosafe indicated that bromate formation was likely occurring within the 50 kL storage tank due to water age and/or water temperature profiles.

Preventative measures have since been incorporated into the operational regime, including weekly flushing, continued weekly bromate monitoring, and the installation of an outdoor sprinkler system connected to a timer to promote turnover and maintain more consistent flow through the tank. These controls aim to minimise stagnation, stabilise disinfectant residuals, and reduce bromate formation risk during future low-demand periods.