



Programmed Facility Management

In Partnership with

Rottnest Island Authority

**Annual Drinking Water Report to
the *Department of Health* by the
Rottnest Island Authority
*July 2012 – June 2013***



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Foreword

The Rottnest Island Authority is committed to providing sustainable, high quality drinking water that consistently meets or exceeds consumer expectations, the Australian Drinking Water Guidelines, our Memorandum of Understanding and regulatory requirements.

This report is compiled as a measure of compliance with the Australian Drinking Water Guidelines and for Rottnest Island Authority customers, as a way of letting them know about the utility's ongoing commitment to supplying the highest quality drinking water possible.

The Rottnest Island Authority contracts Programmed Facility Management to operate and manage the water utility and services on Rottnest Island. Programmed have in place highly experienced Hydraulics personnel and appreciates the assistance of the WA Department of Health and Aquaterra Pty Ltd Water & Environment Consultants. This group ensures that the Rottnest Island Authority has in place and maintains the practices and processes needed to ensure high levels of drinking water quality, while being open and transparent to the community.

The Rottnest Island Authority identifies water quality as a major Key Performance Indicator, with a target to achieve 100 per cent microbiological compliance each month. To achieve this, the Rottnest Island Authority through Programmed Facility Management have identified and implemented operator training, risk management plans, monitoring plans, disaster recovery plans, and source protection.

I would like to thank the Rottnest Island Authority Staff and Programmed Facility Management for their tireless and vigilant approach to water quality, which is reflected in the results of this year's Annual Water Quality Report.

Date

18/10/2013

Signed

Paolo Amaranti

Name

Mr Paolo Amaranti

Designation

CHIEF EXECUTIVE OFFICER



Introduction

Rottnest Island is located 19 kilometres west of Fremantle, Western Australia and is 11 km long and 4.5 km at its widest point. The total land area measures 1,900 hectares. The island is an A-Class Reserve and is a popular destination for local, interstate and international tourists. The total number of visitors is 300,000 to 500,000 per annum. The number of visitors on the island is highly variable due to seasonal variations with approximately 250 permanent residents.

The Rottnest Island Authority (RIA) is responsible for the management of all utilities, including the production and distribution of drinking water to the island's residents and visitors. Drinking water is supplied to approximately 396 residential and 12 non-residential connections, owned and maintained by the RIA. Water supply facilities include fresh and saline groundwater bores, a desalination plant, water storage tanks and a network of pipes. The system is managed by Programmed Facility Management under an agreement.

The primary source of water for the island is a number of saltwater bores where it is pumped to a desalination plant and the remainder sourced from a fresh groundwater aquifer. The Rottnest Island Task Force was established in December 2003 and implementation of their recommendations commenced in 2004. Part of this program included a minor upgrade to the desalination plant in 2006, and refurbishment of water storage tanks to increase the quantity of water produced and to improve water quality.

The desalination plant enables drinking water to be produced at all times, however the volume produced requires a balance between the cost of generation and the impact on the environment. The desalination plant can produce up to 180,000 kL/year (average 493kL/day) and the freshwater bores 47,500kL/year (average 137kL/day). 2012 – 2013 total annual water production was 111,182kL which was 8,804kL less (7% reduction) than the previous year as a result of factors including continued water wise education programs, improved asset management through leak detection and repairs.

History

Drinking water supplies to Rottnest Island date back as far as the 1830's, when the water was collected in wells and from natural soaks to supply the island's penal settlement. In 1911, the newly formed West Australian Tourism Department built rainwater tanks to collect water from the roofs of buildings. Underground tanks were also constructed to store rainwater to areas like the hotel, which while not in use still exist today. Accommodation that had water supplied would often have two taps, one for delivering fresh water from the rainwater tank and one for delivering salt water which would be used in the shower and toilets.

In 1937, the Military took up occupation and built the bitumen water catchment area on Mt Hershel which fed large storage tanks. This area remained in use until 2007 when it was decommissioned. During World War II fresh water was also carted from the mainland to supply the troops stationed on the island.

Historical evidence shows that bores were drilled to source water from the fresh water lens as early

as the war. In 1976, the Wadjamup Bore field was developed and some 30 freshwater production bores were drilled in the following years of which 29 are still in operation. The desalination plant was installed in 1995 and upgraded in 2006 to produce current quality and quantities.

Commitment to Drinking Water Quality

Goals and strategies in the Rottnest Island Management Plan relevant to drinking water are:

- Rottnest Island's environment and heritage are conserved and enhanced as a model of sustainability
- The RIA conducts its business responsibly and in a way that is sustainable and beneficial to the Island.

An Asset Management Plan has been provided by Programmed Facility Management to demonstrate their strategic plan to manage the life cycle of drinking water supply (hydraulic) assets within their control and responsibility at Rottnest Island. The desired level of service contained within the plan, is to reduce the number of reactive works and incidents, and ensure that all assets that require water supply are fed continuously.

The Rottnest Island Authority will supply water that is safe for all visitors, businesses and residents to drink and that complies with the directions on drinking water quality made by the Minister for Health.

Drinking Water Quality Management

Industry best practice on water quality management is provided through the Australian Drinking Water Guidelines (ADWG) 2004 and the Memorandum of Understanding (MoU) between the Rottnest Island Authority and Department of Health which was entered in April 2012. These outline the management structure and parameters for both health related and aesthetic water quality properties. A copy of the MoU can be found on the Rottnest Island Authority Website at:

www.rottnestisland.com/policy-and-reports/rottnest-island-utility-reports

Australian Drinking Water Guidelines 2004

The "*Australian Drinking Water Guidelines*" published by the National Health and Medical Research Council, Australia's peak health research body, provides an authoritative reference on what defines safe, good quality drinking water, how it can be achieved and how it can be assured.

A key aspect of the ADWG is a risk management approach from the water source to consumption. This ensures there is a monitoring program in place with appropriate sampling points throughout the system. This will ensure a true representation of water quality throughout the distribution system.



The RIA engaged consultants to undertake a Hazard Identification and Risk Assessment of the drinking water supply system with the results being presented through the Rottneſt Island Drinking Water Quality Plan.

Memorandum of Understanding

April 2012 saw the commencement of a MOU between the Department of Health and Rottneſt Island Authority. This commitment to the MOU by both parties ensures a strong cooperative relationship for the management of drinking water and the protection of public health.

This MOU operates within the license framework as established by the Economic Regulation Authority in accordance with the *Water Services Licensing Act 1995*. The operating license together with the MOU is designed to ensure that all facets of the drinking water quality management and assurance system are implemented, monitored and reviewed on a regular basis.

This MOU also recognises the Department of Health as the regulator of drinking water quality, and as such will audit the operating licensee (RIA) on water quality, management and reporting systems to provide assurance of ongoing satisfactory performance.

In addition to the above, both parties committed to this MOU will also ensure the following:

- Provision of adequate resources to meet obligations.
- Identify responsible officers for the purpose of monitoring facilitating and reporting to their respective CEO's.
- Recognise and support the Advisory Committee for the Purity of Water.
More information on the Advisory Committee for the Purity of Water can be found at: www.public.health.wa.gov.au/3/1585/2/committees_and_advisory_bodies.pm
- Develop and Improve Drinking Water Quality Regulation.
- Promote ongoing cooperation by both parties to ensure protection to drinking water catchment areas by promoting the importance of protecting water quality over other activities in water catchment areas.
- Minimise the risk from Pesticides to drinking water by encouraging involvement of key stakeholders
- Commitment by the licensee for ensuring employees, contractors involved with treatment of drinking water are trained, experienced and competent.

Section 3.7 refers to employee awareness and training. Programmed Facility Management compile a comprehensive Training Matrix for all staff which alerts management as to when training is required. Staff are provided with the necessary ongoing training on a regular basis specific to the job requirements.

Another important aspect to this MOU is the requirement for the Licensee (RIA) to notify the Department of Health of other forms of Water Supply that is not for drinking purposes. The following requirements are stipulated within the MOU for this case and are as follows:

- Ensure advice is given to customers and their tenants or guests that this water supply is not to be used for drinking or cooking purposes.
- Annual requirement by way of written reminders of water quality. Inspections to ensure taps



are labelled with appropriate info "non drinking water".

- If the Licensee provides non drinking water to open public space, areas accessible to general public or via standpipes then adequate signage advising not suitable for drinking is required.

The MOU requires the Licensee to maintain a Water Quality Committee to provide a forum for meetings to occur every 4 months for the purpose of reviewing water quality data and any issues associated with drinking water as supplied by the licensee. Members of the forum include officers from Rottnest Island Authority, Programmed Facilities Management and Department of Health.

Annually, members from this forum congregate to execute a potable water desk top scenario to test the interagency incident response plans. The licensee shall incorporate these exercises into its Business Continuity Plan scenario testing in conjunction with the RiskCover Division of the Insurance Commission of Western Australia. From the scenario conducted during this reporting period the Rottnest Island Authority learnt that the RIA Risk Management Plan requires some minor amendments to be actioned by the Risk Coordinator. It was also further identified that staff at the Rottnest Island Visitor Centre require some further training in the handling of an emergency situation pertaining to potable water. The Accommodation Services Manager has been assigned this action item.

1.0 Water provider information

Rottnest Island Authority Contact Details		
Name of Company	Rottnest Island Authority	
Company Address	1st Floor E – Shed, Victoria Quay, Fremantle WA 6160	
Company Phone	Ph (08) 9432 9300	Fax (08) 9432 9301
Company Website	www.rotnnestisland.com	
Company Email	enquiries@rotnnestisland.com	
Chief Executive Officer	Paolo Amaranti	
Manager Major Contracts	Tracey Hornsey	
Compliance & Utilities Manager (PFM)	Justin Franklin	

1.1 System Information

1.1.1 Consumers

The water demand is related to tenancy and is highly seasonal, being low in winter and high in summer. The average annual visitation over the past five years is 314,188 people with a low season average of 16,157 visitors/month (June) and a high season average of 38,876 visitors/month (January).

The number of beds on the island for guests totals 2150, with the average length of stay being 3.5 nights. In addition there are approximately 250 permanent residents on the island, which will also fluctuate in accordance with peak and low periods. This does not include visitors arriving by private vessels who generally stay onboard.

1.1.2 Distribution System & Water Supply

The Rottneest Island distribution system is relatively small, consisting of approximately 20 km of mains which deliver to 396 dwellings, 9 shops and 3 public drinking fountains.

Drinking water is currently sourced from 29 freshwater bores* and five saltwater (seawater) bores located in the sand dunes of Longreach Bay. The freshwater bore field produces approximately 25% of the island's water while the saltwater bores feed into the desalination plant producing the other 75% of required water.

*The freshwater bores are shut down for winter months, as water quantity requirements are lower than the summer period (fewer visitors on the island) and it allows the bores to recharge.

Water from the saltwater bores is filtered prior to the desalination plant to remove particle matter such as sand where it is then fed into mixing tanks with water from the freshwater bores. The mixed water is transferred and disinfected through the primary and secondary chlorine pump stations.

The combined storage capacity is 14,000kL which is able to maintain at least 17 days water storage. The water demand is highly seasonal, with the monthly consumption ranging from 7,000 kL in June to 24,000kL in January.

The islands bitumen catchment runoff collection system was decommissioned in 2010 from supplying the potable water storage tanks. Tank six had minor structural repairs in 2012 whilst tank three was refurbished early 2013 and are used to store irrigation water for the golf course. Water is collected from bitumen catchment runoff area and topped up from the desalination plant. Water from Tanks Three and six is not used for drinking water purposes

There are several remote locations outside the main settlement such as; toilets, Wadjemup lighthouse and Research House which are supplied water via tanker. Such areas are deemed not suitable for drinking and are sign posted accordingly. The Rottneest Island Authority has ensured that requirements as stipulated in the MOU regarding water not suitable for drinking are enforced.



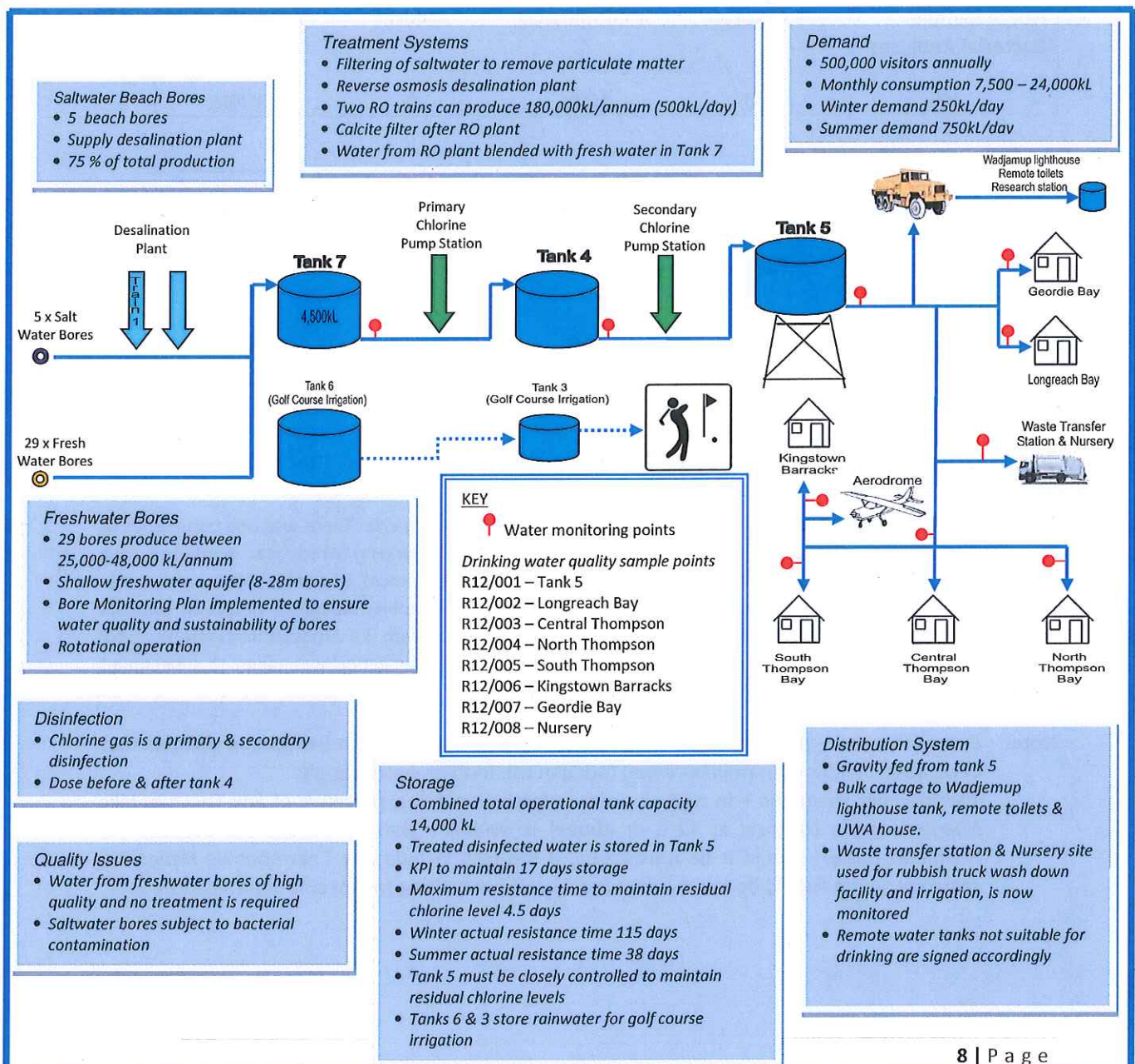
1.1.3 Sampling Schedule & Procedure

The sampling schedule has been set out in the Drinking Water Quality Plan for Rottneest Island prepared by Aquaterra Water & Environment Consultants.

The sampling points are R12/001, R12/002, R12/003, R12/004, R12/005, R12/006, R12/007 and R12/008 as shown in table 1 – Diagram of Rottneest Island Water Distribution System.

The sampling procedure is carried out in accordance with Programmed Facilities Management *Work Method Statement - TPL-PFM-ROT-HYD-7.01 Drinking Water Sampling procedure.*

Table 1: Rottneest Island Water Distribution System



2.0 Microbial performance

The results as presented in the below tables reflect the excellent effort in recording a 100% compliance rating during the reporting period. Analysis from samples submitted for testing achieved all the microbiological requirements as set out in the ADWG for drinking water supplied to our customers

2.1 Microbiological – Compliance Summary

No. of Sample Bacterial Analyses	<u>Total Coliforms</u>		<u>E.coli</u>	
	Failures	% Compliance	Failures	% Compliance
109	0	100%	0	100%

No. of Sample Amoebae Analyses	<u>Thermophilic Amoeba</u>		<u>Thermophilic Naegleria</u>	
	Failures	% Compliance	Failures	% Compliance
105	1	99%	0	100%

2.2 Microbiological Incident Specific Information

A failure is defined as the detection of any *E.coli* or any Thermophilic *Naegleria*. There was one occurrence of Thermophilic Amoeba detected in 12/008 (waste station transfer & nursery) which was attributed to a handling error in June, 2013. The MoU refers to the Ameoba Response Protocol, December 2010 which states under section 3.3, Reporting Protocol that only in the event of Thermophilic *Naegleria* detection requires notification to be reported to the Department of Health. In accordance with 3.4 Amoeba Response Protocol Flowchart, Thermophilic *Naegleria* was not detected therefore no further action was taken. A subsequent sample was taken with no detection of Thermophilic Amoeba recorded.

Note: *Escherichia coli* – (*E.coli*) is a bacteria found in the colon of human beings and animals that becomes a serious contaminant when found in the food or water supply.

Thermophilic *Naegleria* – In routine or investigative analyses, presence of any Thermophilic *Naegleria* (able to grow at 42°C or above) is evidence that conditions are suitable for *Naegleria fowleri* should it be introduced. If samples include any Thermophilic *Naegleria*, remedial action should be taken immediately without waiting for specific identification.

3.0 Chemical – health related performance

3.1 Chemical – Health Related – Chart

Rottnest Island Distribution System 2012 - 2013					
Health Characteristic	ADWG Compliance Guideline Maximum Value (mg/L)	Number of Analyses	Number of Analyses Complying with ADWG	% Compliance with ADWG	Maximum Value of Analysis (mg/L)
Nitrate (NO ₃)	50	50	50	100%	7
Nitrite (NO ₂)	3	49	49	100%	0.8
Fluoride (F)	1.5	35	35	100%	0.6
Copper (Cu)	2	49	49	100%	0.4
Cadmium (Cd)	0.002	15	15	100%	<0.01
Manganese (Mn)	0.5	104	104	100%	0.027
Nickel (Ni)	0.02	10	10	100%	<0.02
Lead (Pb)	0.01	49	49	100%	<0.03
Boron (B)	4	29	29	100%	1
Antimony (Sb)	0.003	10	10	100%	<0.01
Sulphate	500	3	3	100%	9
Chlorine (Cl ₂)	5	206	206	100%	0.93
Trihalomethanes THMs	0.25	42	42	100%	0.044

Note: Fluoride – is sometimes naturally occurring in groundwater. On Rottnest groundwater and seawater desalination is combined to supply drinking water. Fluoride is not added to the drinking water.

3.2 Chemical - Health Related - Incident Specific Information

These results also reflect the strong commitment undertaken to provide the best possible drinking water quality on Rottnest Island.

4.0 Chemical - aesthetic performance

4.1 Chemical - Aesthetic – Chart

Rottneest Island Distribution System 2012 - 2013					
Aesthetic Characteristic	ADWG Compliance Guideline Maximum Value (mg/L)	Number of Analyses	Analyses Complying with ADWG	% Compliance with ADWG	Maximum Value of Analysis (mg/L)
Aluminium (Al)	0.2	13	13	100%	0.01
Chloride (Cl)	250	112	90	80%	550
Colour	15 HZU	76	76	100%	12
Hardness (CaCO ₃)	200	13	13	100%	120
Manganese (Mn)	0.1	104	104	100%	0.027
Iron (Fe)	0.3	100	100	100%	0.29
pH	6.5><8.5 units	127	109	86%	9.2
Sodium (Na)	180	3	3	100%	92
Sulphate (SO ₄)	250	3	3	100%	9
Ammonia (NH ₄)	0.5	49	49	100%	0.03
TDS	600	7	7	100%	582
Turbidity	5 NTU	72	72	100%	3.5
Hydrogen Sulphide (H ₂ S)	0.05	45	45	100%	0.05
Zinc (Zn)	3	49	49	100%	0.13

Note: HZU - Hazen Units is a measurement of discolouration of water.

NTU - Nephelometric Turbidity Units is measured from a calibrated nephelometer which measures light refraction through water.

TDS – Total Dissolved Solids is a measurement of dissolved substances in water, generally made up of inorganic salts such as sodium, potassium, magnesium and chlorides etc. TDS levels give a general guide for water quality, with levels in the vicinity of 300-600mg/L being described as good quality drinking water.

4.2 Chemical - Aesthetic - Incident Specific Information

Chloride levels – 20% of total samples analysed were above drinking water guideline values (250mg/L) with the highest level measuring 550mg/L. As suggested in the *Australian Drinking Water Guidelines 2004* higher concentrations of chloride are common in groundwater supplies. Chloride in

groundwater is known to have higher concentrations, particularly if there is salt water intrusion. Chloride is essential for humans and animals. It contributes to the osmotic activity of body fluids. There is no data to suggest that chloride causes health problems, hence no guideline value based on health considerations is warranted. Samples were above due to maintenance on the desalination plant and increased groundwater extraction over the peak months to cope with operational demand.

pH levels – 14% of samples were outside of the prescribed guidelines ranging between 5.6 and 9.2. The distribution system is partly constructed of concrete tanks with cement-mortar lined pipes and as indicated by the *Australian Drinking Water Guidelines 2004*, these can significantly increase the pH. This therefore suggests being one of the reasons behind the higher pH levels together with groundwater having naturally high pH. These elevated pH values do not pose any health concerns.

Chlorine levels – Current practise is to maintain free chlorine residual in Tank 5 to maintain minimal residuals of no less than 0.2mg/L at the extremities of the water mains. In order to ensure safe water supply, health compliance requirements may necessitate increasing chlorine residuals, taking precedence over any aesthetic requirements.

All the above are considered to be aesthetic matters and do not have any health related significance.

5.0 Radiological – Performance

Radiological Testing is undertaken on a Biannual basis (odd years only). There was no radiological testing during this reporting period with the next scheduled testing is during the October to December 2013 quarter.

Note: Radiological testing - Radium isotopes are formed as a result of radioactive decay of uranium-238 and thorium-232, both of which occur naturally in the environment.

6.0 Planned Sample Summary

To ensure drinking water quality is maintained and compliant with regulations, a process of monitoring, sampling and analysis from throughout the entire water supply network is required to ensure safe drinking water is continuously available to consumers. An annual sampling schedule is required for the purpose of identifying where samples are to be collected from, what needs to be analysed and at what frequency. The table below indicates sample schedule requirements for the reporting period, together with number of actual samples collected and analysed. Full compliance achieved for number of samples collected compared with planned, to ensure all health and aesthetic testing related to microbiological, chemical and radiological analysis is undertaken.

2012 - 2013								
Microbiological			Chemical			Radiological		
Planned*	Taken	% Taken	Planned*	Taken	% Taken	Planned*	Taken	% Taken
290	290	100%	1447	1447	100%	0	0	100%

*Both Chlorine and Manganese are measured for Health and Aesthetic purposes.

Further to the above summary of both health and aesthetic analysis statistics, the MOU requires that the Rottnest Island Authority have in place an incident management procedure to ensure the timely reporting of any incidents regarding drinking water quality to the Department of Health. The Rottnest Island Authority is pleased to inform that there were no reportable incidents during the reporting period.

7.0 Customer Service

7.1 Customer Service Charter

Rottnest Island Authority reviewed its Customer Service Charter in 2009, which sets out the principles terms and conditions upon which the Rottnest Island Authority intends to provide water services to its customers in accordance with the License issued to Rottnest Island by the Economic Regulation Authority under the *Water Services Licensing Act 1995*.

The charter informs the customers of Rottnest Island of their rights in accordance with the provision of the license, including service interruptions, levels of service, and complaint procedures.

A copy of the operating license is available on request from the Rottnest Island Authority or from the Economic Regulation Authority.

7.2 Customer Complaints

The Rottnest Island Authority and Programmed Facility Management are committed to handling complaints and enquiries in a courteous and efficient manner.

Programmed Facility Management can be contacted for complaints via the 24 hour call centre on **1300 044 534**.

Alternatively written complaints can be mailed to:
Rottnest Island Authority
PO Box 693
Fremantle WA 6959

Each complaint is assigned unique identification number and delegated to an appropriate person to resolve. Any complaints are monitored continuously to identify any trends and areas for improvement.

In 2012/2013 the Rottnest Island Authority and Programmed Facility Management received one (1) customer complaint relating to the water supply system. The complaint was received in November 2012 from a guest questioning the water quality whilst staying in Longreach Bay.

On receiving the complaint the Senior Contract Manager and Compliance & Utilities Manager immediately began the investigation. The previous water samples were analysed and all samples were found to be within the Australian Drinking Water Guidelines. Subsequent water samples were taken and the water quality was found to be compliant with guidelines. There were no other complaints at the same time from any location. The complaint was closed out eight days after being made with no further complaints received to date.

8.0 Acknowledgements

The Rottnest Island Authority acknowledges the cooperation and assistance provided throughout the year by:

- Programmed Facility Management Pty Ltd
- Aquaterra Pty Ltd Water & Environment Consultants
- Department of Health

