

**Torres Strait Island Regional Council**

**Service Provider No 500**

**Drinking Water Quality Management Plan Report**

**2015/2016**

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Glossary of terms

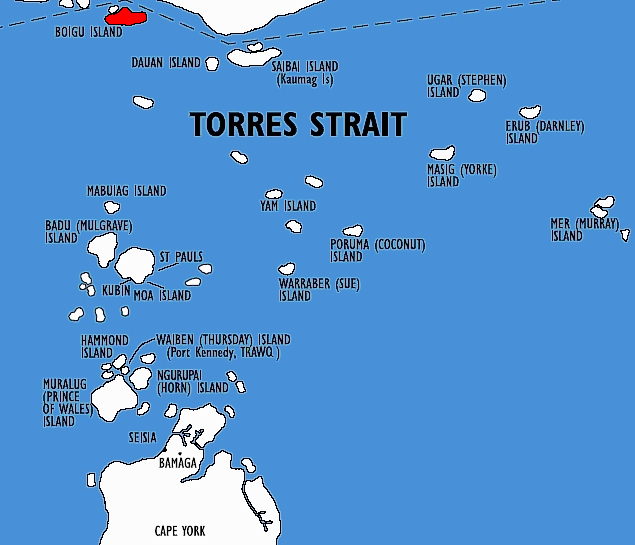
|  |  |
| --- | --- |
| ADWG 2004 | Australian Drinking Water Guidelines (2004). Published by the National Health and Medical Research Council of Australia |
| ADWG 2011 | Australian Drinking Water Guidelines (2011). Published by the National Health and Medical Research Council of Australia |
| *E. coli* | *Escherichia coli*, a bacterium which is considered to indicate the presence of faecal contamination and therefore potential health risk |
| HACCP | Hazard Analysis and Critical Control Points certification for protecting drinking water quality |
| mg/L | Milligrams per litre |
| NTU | Nephelometric Turbidity Units |
| Pt/Co | Platinum-Cobalt scale |
| MPN/100mL | Most probable number per 100 millilitres |
| CFU/100mL | Colony forming units per 100 millilitres |
| < | Less than |
| > | Greater than |
| RO | Reverse Osmosis |
| SCADA | Supervisory Control and Data Acquisition system |
| TI | Thursday Island |
| WTP | Water treatment plant |

1. Introduction

Torres Strait Island Regional Council (TSIRC) is the registered water service provider to 15 Divisions Water Supply Schemes that supply reticulated potable water to the 15 Communities of:

* Division 1 Boigu
* Division 2 Dauan
* Division 3 Saibai
* Division 4 Mabuiag
* Division 5 Badu
* Division 6 Kubin
* Division 7 St Pauls
* Division 8 Kiriri
* Division 9 Iama
* Division 10 Warraber
* Division 11 Poruma
* Division 12 Masig
* Division 13 Ugar
* Division 14 Erub
* Division 15 Mer

Figure 1 Torres Strait Islands Regional Council Water Supply Schemes Locality Map



As required under the *Water Supply (Safety and Reliability) Act 2008* (the Act), Torres Strait Islands Regional Council developed a Drinking Water Quality Management Plan (DWQMP) that met the requirements of the Act. The DWQMP was approved in November 2013. This report is a regulatory requirement that details how Council has implemented the DWQMP, and provides details of the verification monitoring undertaken in our drinking water schemes.

The structure of this report follows the requirements of S142 of the Act.

1. Actions taken to implement the Plan

*S142(3)(b) the actions the provider took to implement the plan.*

The Torres Strait Islands Regional Council DWQMP describes how we operate the drinking water services for each of the 15 drinking water schemes, and details the operational steps that we take to ensure that our customers receive safe drinking water.

During 2015/2016 Torres Strait Islands Regional Council operated our services as described in the DWQMP. This includes:

* The new E. coli testing laboratory set up at Iama Water Treatment Plant (WTP), to test more TSIRC water samples in-house.
* Daily chlorine, pH and turbidity monitoring
* Monthly E.Coli monitoring
* Bi-annual verification monitoring
* A database has been established to identify and track outstanding reactive maintenance for water and wastewater. The database assists with identifying resourcing shortfalls for completion of maintenance, determine the cost and scale of reactive maintenance works, and help TSIRC to monitor whether the maintenance status of assets is improving or declining.
* Eleven Permanent RO desalination plants in place at the following islands:
  + 3 at Boigu (running)
  + 2 at Iama (running)
  + 1 at Masig (running)
  + 3 at Mer (running)
  + 1 at Poruma (running)
  + 1 at Warraber (running)
* 8 Mobile RO desalination plants operating during periods of severe water shortage at the following islands:
  + 2 at Dauan (2x 70kL/day) (running)
  + 2 at Erub (1x 70kL/day & 1x150kl/day)(running)
  + 1 at Iama (running)
  + 0 at Saibai (all 4 units which were at Saibai earlier this year are in use elsewhere)
  + 1 at St Pauls (running)
  + 1 at Ugar (1x 17kL/day) (running)
* A two year contract in place for the bi-annual maintenance and service of all the RO desalination plants with Northern Water
* A two year contract in place for the supply of consumables and chemicals for all the RO desalination plants with Northern Water
* Implementation of SCADA upgrade for water infrastructure which includes a SCADA system on TSIRCS 15 water schemes.
* A Waterwise presentation for students and teachers at Masig communicating waterwise practices with the community.
* Water main upgrades
  + Replacement of aged sections of reticulation mains on Badu and Erub, and replacement of a section of the failed rising mains at Iama.
* Council approved for GDT Linings to complete maintenance and repairs to the Erub and Warraber Lagoon Liners which includes repairs to holes and tears in the lagoon liners and lagoon covers, as well as cleaning of the covers and repairs to floating walkways, pump sumps and perimeter fixing steel.
* GDT Linings completed repair to the Dauan Lagoon Cover and Liner, which were burnt during the fire last year. The scope of the repairs included plugging 52 holes in the lagoon cover, 3 holes in the lagoon liner, complete replacement of the lagoon liner perimeter.
* Investigation and scoping at Dauan for outstanding maintenance items across all water assets including maintenance at the 3 x wells, water treatment plant, lagoon, 2x reservoirs and the mobile desalination plant.
* Electrical and instrumentation maintenance works on Dauan, which included installation of new automated control of the water treatment plant pumps and pumps at Well 1 and Well 2.
* Maintenance works at the Erub Water Treatment Plant and Mogor Well. Mogor Well, which operated 5 years ago, was repaired and reinstated so that the well pumps could again pump up to the water treatment plant while running in automatic. A new receiving tank and automated pump skid were installed at the water treatment plant, which receive water from Mogor Well and pump it into Mogor Dam. A new receiving tank and automated pump skid were installed at the water treatment plant and a variety of maintenance tasks were undertaken at the water treatment plant, including replacement of automated and manual valves, replacement of all flow meters, replacement of cracked pipe and pipe fittings, top-up of media, replacement of dosing lines, cleaning of the floculant tank and unblocking of pipework.
* Water Infrastructure works at Boigu
  + Maintenance work at Boigu which included upgrading the gearboxes and motors on the raw water pumps. This work was conducted because the raw water pumps were only capable of supplying enough raw water to run two of three desalination plants simultaneously. The day before mobilising to site, one raw water pump failed and Northern water were therefore only able to upgrade one of the two raw water pumps. This raw water pumps are now capable of supplying three desalination plants and the second pump was replaced during a subsequent trip.
  + Replacement of the lagoon fence.
  + Replacement of the intake pipe and supports for the raw water pump station.
  + Automatic Lamella Scour Valve to improve operation of the lamella.
  + Upgrade of the raw water pump station.
* Water main inspections and leak detections
* Replacement of faulty water meters
* Carried out reactive repair to water main leaks in various communities.
* Engineering services continue to provide newly qualified plumbers the opportunity to work with licenced plumbers from Building Unit in order to gain practical plumbing work experience. Plumbers were engaged by Building Unit to work on the water tank upgrade project at Mer.
* Twelve TSIRC trainees were nominated for the Certificate II Water Operation by RTO Opus/The Learning Collaborative.

Further, TSIRC implemented many of the actions that were identified in the Risk Management Improvement Program to ensure that we continually improved our processes, and as a result, the water quality to our customers.

Notable improvements that have been undertaken include:

1. Initiate raw and clear water testings for pH, turbidity and conductivity at the water treatment plants
2. Engineering officers to submit daily pH, turbidity and conductivity log sheets on weekly basis
3. Water sample tests can be carried out using in-house water sample testing facility at Iama Island engineering office
4. Replaced faulty chlorine dosing pumps with automatic air vent type
5. Improved the telemetry communication between reservoir and water treatment plant in Badu, Kubin, St Pauls, Hammond and Ugar
6. Improved the telemetry communication between Boigu raw water intake and the desalination plant
7. Stock up essential equipment and supplies in TI office to facilitate response to mobilising and setting up the emergency desalination plant
8. Completed TSIRC Water Customer Service Standard.
9. Reviews

*S142(3)(c) the outcome of any review of the plan in the financial year and how the provider has addressed matters raised in the review.*

Torres Strait Island Regional Council was not required to review the DWQMP in 2015/2016.

1. Audits

*S142(3)(d) if a drinking water quality management plan audit report has been prepared for the financial year—a summary of its findings and any recommendations.*

Torres Strait Island Regional Council was not required to arrange an audit of the DWQMP in 2015/2016.

1. Drinking water incidents

*S142(3)(e) details of any information the provider gave the regulator under sections 102 and 102A in the financial year.*

Section 102 of the Act refers to the reporting requirements when a provider is aware that their water quality exceeds the water quality criteria. The water quality criteria refer to the health guideline values in the current version of the Australian Drinking Water Guidelines, plus any other requirement from Queensland Department of Health or the Department of Energy and Water Supply as stated in their regulations.

Torres Strait Islands Regional Council undertook significant verification monitoring during 2015-2016. Our verification monitoring results are detailed in the following section.

During the course of 2014-2015 TSIRC had (number) of incidents. These are detailed below:

|  |  |  |  |
| --- | --- | --- | --- |
| **Scheme** | **Date** | **Issue** | **Actions taken to resolve** |
| Iama  (00046) | 8/7/16 | E. coli | E.Coli was detected at a level of 4CFMU at the Iama school.  The engineering officer monitored free chlorine levels which ranged from 0.26 to 0.38mg/L. The sample at the school was taken from the school tank during the school holidays when the usage was low. It was determined that the chlorine had most likely burned off in the tank due to low usage levels. Hypo 10 was added to the school storage tank. The sampling point was also moved to a location before the water storage tank.  The boil water alert was removed in August 2015. |
| Dauan  (00047) | 14/09/15 | E. coli | E.Coli was detected at levels of 36.4CFMU at the Aquis sampling point and 9.9CFMU at N. Mooka’s house.  A Boil Water Alert was issued on 15/01/16 and this still remains in place as of 19/12/16. A new water officer was hired recently and the water officer’s competence is currently being assessed to determine if the Boil Water Alert can be removed. |
| Hammond  (00048) | 9/12/15 | E. coli | E.Coli was detected at all 5 sample points at levels of between 1 and 5 CFMU.  It was much later confirmed that the numerous errors with chlorine sampling were being made and the water officer underwent retraining. The chlorine pump was gassing up and needed to be checked regularly.  The Boil Water Notification was removed on 5/01/16. |
| Hammond  (0049) | 12/01/16 | E. coli | E.Coli was detected at 3/5 locations – Water Shed, M.Loban house and Village tap. E.Coli levels were between 2 and 4.1CFMU.  E.Coli failures were ongoing throughout 2016 which were largely caused by chorine dosing issues, but high turbidity of the filtered well water was also thought to be a contributing factor for some failures which reduce the effectiveness of chlorination. Numerous errors in the chlorine sampling technique resulted a failure to identify the inadequate chlorination. It is suspected that there is an issue with the media filters, which is due to be addressed early in 2017.  The Boil Water Notice at Hammond was in place from 13/01/2016 to 21/11/16. The Boil Water Notice was lifted under the condition that the well water would not be used. |
| Saibai  (00500) | 20/01/16 | E. coli | E.Coli was detected at 4/5 locations and the failed readings were between 15 and 94.5 CFMU MPN.  It was found that there was inadequate chlorination, incorrect use of the pocket colorimeter and high turbidity through the mains. The high turbidity in the mains resulted from using water from the mud lagoons while their level was low, with a raw water turbidity which was too great for the single media filter to tolerate.  The Boil Water Notice at Saibai commenced on 20/01/16 and remains in place as of 19/12/16. |
| St Pauls  (0052) | 17/6/16 | E. coli | E.Coli with a level of 1 CFMU was recorded at V.Joseph’s house.  It was found that the chlorine was not monitored for 3 weeks by the realised water officer. The chlorine pump had gassed up and this hadn’t been realised by the relieving water officer.  The boil water alert at St Pauls was removed on 26/8/16. |
| Erub  (0053) | 29/06 | E. coli | E.Coli with a level of 71CFMU was detected at the Council office on 29/06/16.  It was suspected that that the sample water was contaminated, since E.Coli was not detected at other sites. There were also reported issues with the PaCl dosing at the WTP which were reported as a potential cause. Further follow up investigations in December revealed that water was being samped from property tanks rather than the mains, because the mains water was typically only turned on 1 day per week to fill the tanks. This incorrect procedure was corrected while the desal plant was operating, because this was constantly pumping water into the mains.  The Boil Water Alert at Erub was removed on 26/08/16. |

1. Water quality information

*S142(3)(f) details of the provider’s compliance with water quality criteria for drinking water.*

Torres Strait Islands Regional Council undertakes significant amounts of water quality monitoring to ensure that the water quality that we provide to our customers is safe. The approved verification monitoring program includes monitoring for:

* E coli
* Manganese
* Iron
* Sodium
* Total Hardness
* Turbidity
* Apparent Colour
* pH
* Sulphur
* Chloride
* Fluoride

The following pages provide detail of the treated/ reticulated water quality for 2015/16 for the range of parameters tested.

The following incidents occurred where tested clear water was outside of the ADWG parameters;

* Badu – pH was recorded as 4.6, which is below the lower limit of 6.5
* Kubin – pH was recorded as 6.4, which is below the lower limit of 6.5
* Mer – The chloride levels were elevated for 2 separate tests, where they recorded 280 and 260 mg/L, which is above the guideline of 250mg/L.
  1. Water Quality Tables – Verification monitoring results

Table 1 Treated and Reticulated water quality(All results produced by Cairns Regional Council Laboatory)

| **Scheme name** | **Scheme component** | **Parameter** | **Units** | **Frequency of sampling** | **Total No. samples collected** | **No. of samples in which parameter was detected** | **No. of samples exceeding water quality criteria** | **Result** | **ADWG Guideline** | **LOR** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Badu | Reticulation | Sulphate | mg/L | Bi-annual | 1 | 1 | 0 | 22 | 250 | <1 |
| Badu | Reticulation | Chloride | mg/L | Bi-annual | 1 | 1 | 0 | 8.8 | 250 | <0.1 |
| Badu | Reticulation | Total Dissolved Salts (calc) | mg/L | Bi-annual | 1 | 1 | 0 | 43 | N/A | <1 |
| Badu | Reticulation | Apparent Colour | Pt/Co units | Bi-annual | 1 | 1 | 0 | 9.7 | 15 | <1 |
| Badu | Reticulation | Fluoride | mg/L | Bi-annual | 1 | 1 | 0 | <0.02 | 1.5 | <0.02 |
| Badu | Reticulation | Electrical Conductance | µS/cm | Bi-annual | 1 | 1 | 0 | 93 | 1000 | <1 |
| Badu | Reticulation | pH | nil | Bi-annual | 1 | 1 | 1 | 4.6 | 6.5 - 8.5 | <0.1 |
| Badu | Reticulation | Total Alkalinity | mg CaCO3 / L | Bi-annual | 1 | 1 | 0 | <1.5 | N/A | <1.5 |
| Badu | Reticulation | Turbidity | NTU | Bi-annual | 1 | 1 | 0 | 1.4 | 5 | <0.1 |
| Badu | Reticulation | ICPOES Iron | mg/L | Bi-annual | 1 | 1 | 0 | 0.056 | 0.3 | <0.020 |
| Badu | Reticulation | ICPOES Manganese | mg/L | Bi-annual | 1 | 1 | 0 | <0.010 | 0.5 | <0.010 |
| Badu | Reticulation | ICPOES Silicon | mg/ L SiO2 | Bi-annual | 1 | 1 | 0 | 2.6 | 80 | <0.10 |
| Badu | Reticulation | Calcium | mg/L | Bi-annual | 1 | 1 | 0 | <0.20 | N/A | <0.20 |
| Badu | Reticulation | Magnesium | mg/L | Bi-annual | 1 | 1 | 0 | 0.44 | N/A | <0.10 |
| Badu | Reticulation | Potassium | mg/L | Bi-annual | 1 | 1 | 0 | 0.18 | N/A | <0.10 |
| Badu | Reticulation | Sodium | mg/L | Bi-annual | 1 | 1 | 0 | 8.4 | 180 | <1 |
| Badu | Reticulation | Total Hardness | mg CaCO3 / L | Bi-annual | 1 | 1 | 0 | 2.3 | 200 | <1 |
| Iama | Reticulation | Fluoride | mg/L | Bi-annual | 1 | 1 | 0 | <0.02 | 1.5 | <0.02 |
| Iama | Reticulation | Electrical Conductance | µS/cm | Bi-annual | 1 | 1 | 0 | 410 | 1000 | <1 |
| Iama | Reticulation | pH | nil | Bi-annual | 1 | 1 | 0 | 7 | 6.5 - 8.5 | <0.1 |
| Iama | Reticulation | Total Alkalinity | mg CaCO3 / L | Bi-annual | 1 | 1 | 0 | 2.3 | N/A | <1.5 |
| Iama | Reticulation | Turbidity | NTU | Bi-annual | 1 | 1 | 0 | 0.1 | 5 | <0.1 |
| Iama | Reticulation | Sulphate | mg/L | Bi-annual | 1 | 1 | 0 | 1.1 | 250 | <1 |
| Iama | Reticulation | Chloride | mg/L | Bi-annual | 1 | 1 | 0 | 130 | 250 | <0.1 |
| Iama | Reticulation | Apparent Colour | Pt/Co units | Bi-annual | 1 | 1 | 0 | 1.2 | 15 | <1 |
| Iama | Reticulation | Total Dissolved Salts (calc) | mg/L | Bi-annual | 1 | 1 | 0 | 200 | N/A | <1 |
| Iama | Reticulation | ICPOES Iron | mg/L | Bi-annual | 1 | 1 | 0 | <0.020 | 0.3 | <0.020 |
| Iama | Reticulation | ICPOES Manganese | mg/L | Bi-annual | 1 | 1 | 0 | <0.010 | 0.5 | <0.010 |
| Iama | Reticulation | ICPOES Silicon | mg/ L SiO2 | Bi-annual | 1 | 1 | 0 | <0.10 | 80 | <0.10 |
| Iama | Reticulation | Calcium | mg/L | Bi-annual | 1 | 1 | 0 | 0.22 | N/A | <0.20 |
| Iama | Reticulation | Magnesium | mg/L | Bi-annual | 1 | 1 | 0 | 0.57 | N/A | <0.10 |
| Iama | Reticulation | Potassium | mg/L | Bi-annual | 1 | 1 | 0 | 2.7 | N/A | <0.10 |
| Iama | Reticulation | Sodium | mg/L | Bi-annual | 1 | 1 | 0 | 66 | 180 | <1 |
| Iama | Reticulation | Total Hardness | mg CaCO3 / L | Bi-annual | 1 | 1 | 0 | 2.9 | 200 | <1 |
| Kubin | Reticulation | Sulphate | mg/L | Bi-annual | 1 | 1 | 0 | 2 | 250 | <1 |
| Kubin | Reticulation | Chloride | mg/L | Bi-annual | 1 | 1 | 0 | 16 | 250 | <0.1 |
| Kubin | Reticulation | Total Dissolved Salts (calc) | mg/L | Bi-annual | 1 | 1 | 0 | 47 | N/A | <1 |
| Kubin | Reticulation | Apparent Colour | Pt/Co units | Bi-annual | 1 | 1 | 0 | 3.3 | 15 | <1 |
| Kubin | Reticulation | Fluoride | mg/L | Bi-annual | 1 | 1 | 0 | 0.03 | 1.5 | <0.02 |
| Kubin | Reticulation | Electrical Conductance | µS/cm | Bi-annual | 1 | 1 | 0 | 78 | 1000 | <1 |
| Kubin | Reticulation | pH | nil | Bi-annual | 1 | 1 | 1 | 6.4 | 6.5 - 8.5 | <0.1 |
| Kubin | Reticulation | Total Alkalinity | mg CaCO3 / L | Bi-annual | 1 | 1 | 0 | 11 | N/A | <1.5 |
| Kubin | Reticulation | Turbidity | NTU | Bi-annual | 1 | 1 | 0 | 0.7 | 5 | <0.1 |
| Kubin | Reticulation | ICPOES Silicon | mg/ L SiO2 | Bi-annual | 1 | 1 | 0 | 9.5 | 80 | <0.10 |
| Kubin | Reticulation | Calcium | mg/L | Bi-annual | 1 | 1 | 0 | 0.98 | N/A | <0.20 |
| Kubin | Reticulation | Magnesium | mg/L | Bi-annual | 1 | 1 | 0 | 0.97 | N/A | <0.10 |
| Kubin | Reticulation | Potassium | mg/L | Bi-annual | 1 | 1 | 0 | 0.97 | N/A | <0.10 |
| Kubin | Reticulation | Sodium | mg/L | Bi-annual | 1 | 1 | 0 | 11 | 180 | <1 |
| Kubin | Reticulation | Total Hardness | mg CaCO3 / L | Bi-annual | 1 | 1 | 0 | 6.4 | 200 | <1 |
| Kubin | Reticulation | Fluoride | mg/L | Bi-annual | 1 | 1 | 0 | 0.02 | 1.5 | <0.02 |
| Kubin | Reticulation | Electrical Conductance | µS/cm | Bi-annual | 1 | 1 | 0 | 59 | 1000 | <1 |
| Kubin | Reticulation | pH | nil | Bi-annual | 1 | 1 | 1 | 6.4 | 6.5 - 8.5 | <0.1 |
| Kubin | Reticulation | Total Alkalinity | mg CaCO3 / L | Bi-annual | 1 | 1 | 0 | 5.1 | N/A | <1.5 |
| Kubin | Reticulation | Turbidity | NTU | Bi-annual | 1 | 1 | 0 | 0.4 | 5 | <0.1 |
| Kubin | Reticulation | Sulphate | mg/L | Bi-annual | 1 | 1 | 0 | 1.7 | 250 | <1 |
| Kubin | Reticulation | Chloride | mg/L | Bi-annual | 1 | 1 | 0 | 14 | 250 | <0.1 |
| Kubin | Reticulation | Apparent Colour | Pt/Co units | Bi-annual | 1 | 1 | 0 | 2.3 | 15 | <1 |
| Kubin | Reticulation | Total Dissolved Salts (calc) | mg/L | Bi-annual | 1 | 1 | 0 | 33 | N/A | <1 |
| Kubin | Reticulation | ICPOES Iron | mg/L | Bi-annual | 1 | 1 | 0 | 0.028 | 0.3 | <0.020 |
| Kubin | Reticulation | ICPOES Manganese | mg/L | Bi-annual | 1 | 1 | 0 | <0.010 | 0.5 | <0.010 |
| Kubin | Reticulation | ICPOES Silicon | mg/ L SiO2 | Bi-annual | 1 | 1 | 0 | 4.6 | 80 | <0.10 |
| Kubin | Reticulation | Calcium | mg/L | Bi-annual | 1 | 1 | 0 | 0.66 | N/A | <0.20 |
| Kubin | Reticulation | Magnesium | mg/L | Bi-annual | 1 | 1 | 0 | 0.69 | N/A | <0.10 |
| Kubin | Reticulation | Potassium | mg/L | Bi-annual | 1 | 1 | 0 | 0.77 | N/A | <0.10 |
| Kubin | Reticulation | Sodium | mg/L | Bi-annual | 1 | 1 | 0 | 8.1 | 180 | <1 |
| Kubin | Reticulation | Total Hardness | mg CaCO3 / L | Bi-annual | 1 | 1 | 0 | 4.5 | 200 | <1 |
| Mabuiag | Reticulation | ICPOES Iron | mg/L | Bi-annual | 1 | 1 | 0 | <0.020 | 0.3 | <0.020 |
| Mabuiag | Reticulation | ICPOES Manganese | mg/L | Bi-annual | 1 | 1 | 0 | <0.010 | 0.5 | <0.010 |
| Mabuiag | Reticulation | ICPOES Silicon | mg/ L SiO2 | Bi-annual | 1 | 1 | 0 | 7.9 | 80 | <0.10 |
| Mabuiag | Reticulation | Calcium | mg/L | Bi-annual | 1 | 1 | 0 | 1.3 | N/A | <0.20 |
| Mabuiag | Reticulation | Magnesium | mg/L | Bi-annual | 1 | 1 | 0 | 0.95 | N/A | <0.10 |
| Mabuiag | Reticulation | Potassium | mg/L | Bi-annual | 1 | 1 | 0 | 1.6 | N/A | <0.10 |
| Mabuiag | Reticulation | Sodium | mg/L | Bi-annual | 1 | 1 | 0 | 12 | 180 | <1 |
| Mabuiag | Reticulation | Total Hardness | mg CaCO3 / L | Bi-annual | 1 | 1 | 0 | 7.2 | 200 | <1 |
| Mabuiag | Reticulation | Sulphate | mg/L | Bi-annual | 1 | 1 | 0 | 3.1 | 250 | <1 |
| Mabuiag | Reticulation | Chloride | mg/L | Bi-annual | 1 | 1 | 0 | 19 | 250 | <0.1 |
| Mabuiag | Reticulation | Total Dissolved Salts (calc) | mg/L | Bi-annual | 1 | 1 | 0 | 49 | N/A | <1 |
| Mabuiag | Reticulation | Apparent Colour | Pt/Co units | Bi-annual | 1 | 1 | 0 | 1.5 | 15 | <1 |
| Mabuiag | Reticulation | Fluoride | mg/L | Bi-annual | 1 | 1 | 0 | 0.02 | 1.5 | <0.02 |
| Mabuiag | Reticulation | Electrical Conductance | µS/cm | Bi-annual | 1 | 1 | 0 | 90 | 1000 | <1 |
| Mabuiag | Reticulation | pH | nil | Bi-annual | 1 | 1 | 0 | 6.6 | 6.5 - 8.5 | <0.1 |
| Mabuiag | Reticulation | Total Alkalinity | mg CaCO3 / L | Bi-annual | 1 | 1 | 0 | 4.8 | N/A | <1.5 |
| Mabuiag | Reticulation | Turbidity | NTU | Bi-annual | 1 | 1 | 0 | 0.1 | 5 | <0.1 |
| Masig | Reticulation | ICPOES Iron | mg/L | Bi-annual | 1 | 1 | 1 | <0.020 | 0.3 | <0.020 |
| Masig | Reticulation | ICPOES Manganese | mg/L | Bi-annual | 1 | 1 | 1 | <0.010 | 0.5 | <0.010 |
| Masig | Reticulation | ICPOES Silicon | mg/ L SiO2 | Bi-annual | 1 | 1 | 0 | 0.17 | 80 | <0.10 |
| Masig | Reticulation | Calcium | mg/L | Bi-annual | 1 | 1 | 0 | 1.2 | N/A | <0.20 |
| Masig | Reticulation | Magnesium | mg/L | Bi-annual | 1 | 1 | 0 | 0.2 | N/A | <0.10 |
| Masig | Reticulation | Potassium | mg/L | Bi-annual | 1 | 1 | 0 | 1.3 | N/A | <0.10 |
| Masig | Reticulation | Sodium | mg/L | Bi-annual | 1 | 1 | 0 | 31 | 180 | <1 |
| Masig | Reticulation | Total Hardness | mg CaCO3 / L | Bi-annual | 1 | 1 | 0 | 3.8 | 200 | <1 |
| Mer | Reticulation | Fluoride | mg/L | Bi-annual | 1 | 1 | 1 | <0.02 | 1.5 | <0.02 |
| Mer | Reticulation | Electrical Conductance | µS/cm | Bi-annual | 1 | 1 | 0 | 840 | 1000 | <1 |
| Mer | Reticulation | pH | nil | Bi-annual | 1 | 1 | 0 | 7.1 | 6.5 - 8.5 | <0.1 |
| Mer | Reticulation | Total Alkalinity | mg CaCO3 / L | Bi-annual | 1 | 1 | 0 | 6.4 | N/A | <1.5 |
| Mer | Reticulation | Turbidity | NTU | Bi-annual | 1 | 1 | 0 | 0.1 | 5 | <0.1 |
| Mer | Reticulation | Sulphate | mg/L | Bi-annual | 1 | 1 | 0 | 5.4 | 250 | <1 |
| Mer | Reticulation | Chloride | mg/L | Bi-annual | 1 | 1 | 1 | 280 | 250 | <0.1 |
| Mer | Reticulation | Total Dissolved Salts (calc) | mg/L | Bi-annual | 1 | 1 | 0 | 450 | N/A | <1 |
| Mer | Reticulation | Apparent Colour | Pt/Co units | Bi-annual | 1 | 1 | 1 | <1 | 15 | <1 |
| Mer | Reticulation | ICPOES Iron | mg/L | Bi-annual | 1 | 1 | 1 | <0.04 | 0.3 | <0.04 |
| Mer | Reticulation | ICPOES Manganese | mg/L | Bi-annual | 1 | 1 | 1 | <0.02 | 0.5 | <0.02 |
| Mer | Reticulation | ICPOES Silicon | mg/ L SiO2 | Bi-annual | 1 | 1 | 1 | <0.2 | 80 | <0.2 |
| Mer | Reticulation | Calcium | mg/L | Bi-annual | 1 | 1 | 0 | 1.1 | N/A | <0.4 |
| Mer | Reticulation | Magnesium | mg/L | Bi-annual | 1 | 1 | 0 | 2.7 | N/A | <0.2 |
| Mer | Reticulation | Potassium | mg/L | Bi-annual | 1 | 1 | 0 | 6 | N/A | <0.2 |
| Mer | Reticulation | Sodium | mg/L | Bi-annual | 1 | 1 | 0 | 150 | 180 | <2 |
| Mer | Reticulation | Total Hardness | mg CaCO3 / L | Bi-annual | 1 | 1 | 0 | 14 | 200 | <1 |
| Mer | Reticulation | Sulphate | mg/L | Bi-annual | 1 | 1 | 0 | 5.6 | 250 | <1 |
| Mer | Reticulation | Chloride | mg/L | Bi-annual | 1 | 1 | 1 | 260 | 250 | <0.1 |
| Mer | Reticulation | Total Dissolved Salts (calc) | mg/L | Bi-annual | 1 | 1 | 0 | 410 | N/A | <1 |
| Mer | Reticulation | Apparent Colour | Pt/Co units | Bi-annual | 1 | 1 | 0 | <1 | 15 | <1 |
| Mer | Reticulation | Fluoride | mg/L | Bi-annual | 1 | 1 | 0 | <0.02 | 1.5 | <0.02 |
| Mer | Reticulation | Electrical Conductance | µS/cm | Bi-annual | 1 | 1 | 0 | 840 | 1000 | <1 |
| Mer | Reticulation | pH | nil | Bi-annual | 1 | 1 | 0 | 7.1 | 6.5 - 8.5 | <0.1 |
| Mer | Reticulation | Total Alkalinity | mg CaCO3 / L | Bi-annual | 1 | 1 | 0 | 6.5 | N/A | <1.5 |
| Mer | Reticulation | Turbidity | NTU | Bi-annual | 1 | 1 | 0 | 0.1 | 5 | <0.1 |
| Mer | Reticulation | ICPOES Iron | mg/L | Bi-annual | 1 | 1 | 0 | <0.04 | 0.3 | <0.04 |
| Mer | Reticulation | ICPOES Manganese | mg/L | Bi-annual | 1 | 1 | 0 | <0.02 | 0.5 | <0.02 |
| Mer | Reticulation | ICPOES Silicon | mg/ L SiO2 | Bi-annual | 1 | 1 | 0 | <0.2 | 80 | <0.2 |
| Mer | Reticulation | Calcium | mg/L | Bi-annual | 1 | 1 | 0 | 0.95 | N/A | <0.4 |
| Mer | Reticulation | Magnesium | mg/L | Bi-annual | 1 | 1 | 0 | 2.4 | N/A | <0.2 |
| Mer | Reticulation | Potassium | mg/L | Bi-annual | 1 | 1 | 0 | 5.3 | N/A | <0.2 |
| Mer | Reticulation | Sodium | mg/L | Bi-annual | 1 | 1 | 0 | 130 | 180 | <2 |
| Mer | Reticulation | Total Hardness | mg CaCO3 / L | Bi-annual | 1 | 1 | 0 | 12 | 200 | <1 |
| Saibai | Reticulation - Desal | ICPOES Silicon | mg/ L SiO2 | Bi-annual | 1 | 1 | 0 | <0.10 | 80 | <0.10 |
| Saibai | Reticulation - Desal | Calcium | mg/L | Bi-annual | 1 | 1 | 0 | 0.34 | N/A | <0.20 |
| Saibai | Reticulation - Desal | Magnesium | mg/L | Bi-annual | 1 | 1 | 0 | 0.9 | N/A | <0.10 |
| Saibai | Reticulation - Desal | Potassium | mg/L | Bi-annual | 1 | 1 | 0 | 5.3 | N/A | <0.10 |
| Saibai | Reticulation - Desal | Sodium | mg/L | Bi-annual | 1 | 1 | 0 | 120 | 180 | <1 |
| Saibai | Reticulation - Desal | Total Hardness | mg CaCO3 / L | Bi-annual | 1 | 1 | 0 | 4.6 | 200 | <1 |
| Saibai | Reticulation - Desal | ICPMS Aluminium | mg/L | Bi-annual | 1 | 1 | 0 | <0.005 | 0.2 | <0.005 |
| Saibai | Reticulation - Desal | ICPMS Antimony | mg/L | Bi-annual | 1 | 1 | 0 | <0.001 | 0.003 | <0.001 |
| Saibai | Reticulation - Desal | ICPMS Arsenic | mg/L | Bi-annual | 1 | 1 | 0 | 0.001 | 0.01 | <0.001 |
| Saibai | Reticulation - Desal | ICPMS Barium | mg/L | Bi-annual | 1 | 1 | 0 | <0.001 | 2 | <0.001 |
| Saibai | Reticulation - Desal | ICPMS Beryllium | mg/L | Bi-annual | 1 | 1 | 0 | <0.001 | 0.06 | <0.001 |
| Saibai | Reticulation - Desal | ICPMS Boron | mg/L | Bi-annual | 1 | 1 | 0 | 1.17 | 4 | <0.05 |
| Saibai | Reticulation - Desal | ICPMS Cadmium | mg/L | Bi-annual | 1 | 1 | 0 | <0.0001 | 0.002 | <0.0001 |
| Saibai | Reticulation - Desal | ICPMS Chromium | mg/L | Bi-annual | 1 | 1 | 0 | <0.001 | 0.05 | <0.001 |
| Saibai | Reticulation - Desal | ICPMS Cobalt | mg/L | Bi-annual | 1 | 1 | 0 | <0.001 | N/A | <0.001 |
| Saibai | Reticulation - Desal | ICPMS Copper | mg/L | Bi-annual | 1 | 1 | 0 | <0.001 | 1 | <0.001 |
| Saibai | Reticulation - Desal | ICPMS Iron | mg/L | Bi-annual | 1 | 1 | 0 | <0.01 | 0.3 | <0.01 |
| Saibai | Reticulation - Desal | ICPMS Lead | mg/L | Bi-annual | 1 | 1 | 0 | <0.001 | 0.01 | <0.001 |
| Saibai | Reticulation - Desal | ICPMS Manganese | mg/L | Bi-annual | 1 | 1 | 0 | <0.001 | 0.1 | <0.001 |
| Saibai | Reticulation - Desal | ICPMS Molybdenum | mg/L | Bi-annual | 1 | 1 | 0 | <0.005 | 0.05 | <0.005 |
| Saibai | Reticulation - Desal | ICPMS Nickel | mg/L | Bi-annual | 1 | 1 | 0 | <0.001 | 0.02 | <0.001 |
| Saibai | Reticulation - Desal | ICPMS Selenium | mg/L | Bi-annual | 1 | 1 | 0 | <0.005 | 0.01 | <0.005 |
| Saibai | Reticulation - Desal | ICPMS Silver | mg/L | Bi-annual | 1 | 1 | 0 | <0.001 | 0.1 | <0.001 |
| Saibai | Reticulation - Desal | ICPMS Thallium | mg/L | Bi-annual | 1 | 1 | 0 | <0.001 | N/A | <0.001 |
| Saibai | Reticulation - Desal | ICPMS Thorium | mg/L | Bi-annual | 1 | 1 | 0 | <0.005 | N/A | <0.005 |
| Saibai | Reticulation - Desal | ICPMS Tin | mg/L | Bi-annual | 1 | 1 | 0 | <0.001 | N/A | <0.001 |
| Saibai | Reticulation - Desal | ICPMS Titanium | mg/L | Bi-annual | 1 | 1 | 0 | <0.001 | N/A | <0.001 |
| Saibai | Reticulation - Desal | ICPMS Uranium | mg/L | Bi-annual | 1 | 1 | 0 | <0.005 | 0.017 | <0.005 |
| Saibai | Reticulation - Desal | ICPMS Vanadium | mg/L | Bi-annual | 1 | 1 | 0 | <0.001 | N/A | <0.001 |
| Saibai | Reticulation - Desal | ICPMS Zinc | mg/L | Bi-annual | 1 | 1 | 0 | <0.005 | 3 | <0.005 |
| Saibai | Reticulation - Desal | Mercury | µg/L | Bi-annual | 1 | 1 | N/A | <0.1 | 0.001 | <0.1 |
| Saibai | Reticulation - Desal | Sulphate | mg/L | Bi-annual | 1 | 1 | 0 | 1.8 | 250 | <1 |
| Saibai | Reticulation - Desal | Chloride | mg/L | Bi-annual | 1 | 1 | 0 | 180 | 250 | <0.1 |
| Saibai | Reticulation - Desal | Total Dissolved Salts (calc) | mg/L | Bi-annual | 1 | 1 | 0 | 310 | N/A | <1 |
| Saibai | Reticulation - Desal | Apparent Colour | Pt/Co units | Bi-annual | 1 | 1 | 0 | <1 | 15 | <1 |
| Saibai | Reticulation - Desal | Fluoride | mg/L | Bi-annual | 1 | 1 | 0 | <0.02 | 1.5 | <0.02 |
| Saibai | Reticulation - Desal | Electrical Conductance | µS/cm | Bi-annual | 1 | 1 | 0 | 640 | 1000 | <1 |
| Saibai | Reticulation - Desal | pH | nil | Bi-annual | 1 | 1 | 0 | 6.8 | 6.5 - 8.5 | <0.1 |
| Saibai | Reticulation - Desal | Total Alkalinity | mg CaCO3 / L | Bi-annual | 1 | 1 | 0 | 2.5 | N/A | <1.5 |
| Saibai | Reticulation - Desal | Turbidity | NTU | Bi-annual | 1 | 1 | 0 | <0.1 | 5 | <0.1 |
| St Pauls | Reticulation | Sulphate | mg/L | Bi-annual | 1 | 1 | 0 | 9 | 250 | <1 |
| St Pauls | Reticulation | Chloride | mg/L | Bi-annual | 1 | 1 | 0 | 21 | 250 | <0.1 |
| St Pauls | Reticulation | Apparent Colour | Pt/Co units | Bi-annual | 1 | 1 | 0 | 12 | 15 | <1 |
| St Pauls | Reticulation | Fluoride | mg/L | Bi-annual | 1 | 1 | 0 | 0.04 | 1.5 | <0.02 |
| St Pauls | Reticulation | Electrical Conductance | µS/cm | Bi-annual | 1 | 1 | 0 | 100 | 1000 | <1 |
| St Pauls | Reticulation | pH | nil | Bi-annual | 1 | 1 | 0 | 7 | 6.5 - 8.5 | <0.1 |
| St Pauls | Reticulation | Total Alkalinity | mg CaCO3 / L | Bi-annual | 1 | 1 | 0 | 13 | N/A | <1.5 |
| St Pauls | Reticulation | Turbidity | NTU | Bi-annual | 1 | 1 | 0 | 3.1 | 5 | <0.1 |

Table 2 Reticulation E. coli verification monitoring















Table 3 Chlorine Monitoring – 2015-2016 Financial Year

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Island** | **Monthly Chlorine Log Sheet Submission (#/12)** | **Chlorine Log Sheet Quality** | **Minimum Reticulation Reading Recorded for Year (mg/L)** | **Maximum Reticulation Reading Recorded for Year (mg/L)** | **Number of '0' Chlorine Readings Recorded on Submitted Log Sheets** |
| Badu | 7 | Average | 0.1 | 0.8 | 0 |
| Boigu | 6 | Average or Good | 0.17 | 3.7 | 0 |
| Dauan | 6 | Poor | 0 | 2 | 37 |
| Erub | 0 | MD | MD | MD | MD |
| Hammond | 11 | Poor to Good | 0.19 | 4 | 0\* |
| Iama | 6 | Average or Good | 0 | 1.03 | 1 |
| Kubin | 4 | Poor | 0.3 | 1.2 | 0 |
| Mabuiag | 5 | Good | 0.1 | 1.06 | 0 |
| Masig | 8 | Good | 0.05 | 0.73 | 0 |
| Mer | 4 | Poor | 0 | 0.8 | 2 |
| Poruma | 7 | Average | 0.2 | 1.5 | 0 |
| Saibai | 9 | Poor or Average | 0 | 2.9 | 4 |
| St Pauls | 6 | Poor or average | 0.17 | 1.07 | 0\*\* |
| Warraber | 1 | Poor | 0.4 | 0.5 | 0 |
| Ugar | 11 | Avg to Good | 0.02 | 3 | 0 |

\*Chlorine meter was used incorrectly - errors included wrong setting on meter, using a stained pink tube and use of the wrong reagent. It was confirmed by tech officer that there was no chlorine in the lines during a visit - although this was not recorded on log sheets.

\*\*In June there was a sampling failure and it was identified that there was no chlorine in the mains however a log sheet was not submitted for this month.

1. Customer Complaints

*S142(3)(g) if the provider supplies drinking water to customers—details of any complaints to the provider about the provider’s drinking water service.*

There were three complaints in 2015-2016 that related to water quality and water supply.

These are detailed below:

Table 3 Complaints about water quality and water supply

|  |  |  |  |
| --- | --- | --- | --- |
| Scheme | Date Range | Complaint Type | Resolution |
| St Pauls | January to March | Complaint of odour in the water at St Pauls on 23/2 at Lots 230, 237 and 51. |  |
| Saibai | October to November | Aesthetically poor colouration in resident’s tap water. | Checked water turbidity at treatment plant and at resident’s kitchen tap. Turbidity readings were low. Flushed reticulation at the hydrants as well as increase chlorine dosing. Issue was resolved. |