

Annual Drinking Water Quality Report 2017-18

Section A – Summary



Declaration

I declare that the information provided in this Annual Drinking Water Quality Report for TasWater ABN 47 162 220 653 in its capacity as a water and sewerage corporation licensed under the *Water and Sewerage Industry Act 2008* is complete and accurate.

A handwritten signature in blue ink, appearing to read 'Michael Brewster', is positioned above the printed name and title.

Michael Brewster
Chief Executive Officer
Date: 28 September 2018

Document approval and issue notice

This is a managed document. Changes will only be issued as a complete replacement document. Recipients should remove superseded versions from circulation. This document is authorised for release once all signatures have been obtained.

Prepared: (for release)	Donna Hollis (Data Scientist)	Date: 13/08/2018
Endorsed: (for acceptance)	Luc Richard (Leader Water System Performance)	Date: 31/08/2018
Endorsed: (for acceptance)	Frances Smith (Acting Department Manager System Performance & Productivity)	Date: 31/08/2018
Endorsed: (for acceptance)	Dharma Dharmabalan (General Manager, System Performance and Major Projects)	Date: 28/09/2018
Approved: (for acceptance)	Michael Brewster (Chief Executive Officer)	Date: 28/09/2018

Build status:

Version	Date	Author	Reason	Sections
1.0	24/09/2018	Michael Brewster	Final for submission to DoH	Section A
2.0	1/12/2018	Donna Hollis	Final with amendments	Section A & B

Amendments in this release:

Section title	Section number	Amendment summary
Section A & B		Updates from DoH review

Distribution:

Copy number	Version	Issue date	Issued to
1	2.0	18/12/2018	DoH

Table of Contents

Declaration	ii
Document approval and issue notice	iii
Introduction	1
Executive summary	2
Capital investments	2
Drinking water risk reduction	2
Customer impacts	2
Looking Forward	3
1. Approach to drinking water quality management	4
2. Drinking water risk management plan audit	4
1. Drinking water supply systems	5
1.1 List of potable drinking water supply systems	5
1.2 List of drinking water supply systems on public health alert	8
1.3 Location of drinking water supply systems	9
1.4 Systems removed from serviced land layer	10
1.5 Potable tanks to communities (temporary)	10
1.6 Source water catchments	10
2. Quality of drinking water for FY2017-18	11
2.1 Potable system performance	11
2.2 PHA system performance	13
2.3 Microbiological performance	13
2.4 Metals performance	14
2.5 Disinfection-by-product performance	15
2.6 Fluoride performance	16
2.7 Maintaining water quality to customer tap	16
2.8 Aesthetic quality	17
2.9 Customer complaints	17
3. Future planning and works	20
3.1 Regional towns water supply improvement program	20
3.2 Water system optimisation program	20
3.3 Reporting transparency	20
4. Reporting methodology	21
4.1 Understanding this report	21
4.2 Compliance sampling program	21
4.3 Assessing compliance against health targets	21
4.4 System issues	22
4.5 Public health warnings issued	22
5. Appendices	23
5.1 Appendix A - Summary of ADWG health, physico-chemical and aesthetic limits	23
5.2 Appendix B - Summary of <i>E.coli</i> detections in potable systems	24
5.3 Appendix C - Summary of metals exceedances	25
5.4 Appendix D - Summary of disinfection-by-product exceedances	26
6. List of acronyms/terms of reference	27

Introduction

We are pleased to provide our FY2017-18 Annual Drinking Water Quality Report (ADWQR) as required under the Public Health Act 1997 (specifically pursuant to Section 129B of the Act) and specified under the Tasmanian Drinking Water Quality Guidelines 2015 Section 13 (TDWQG). The report sets out the performance against targets set out in the Australian Drinking Water Guidelines 2011 (ADWG).

The FY2017-18 ADWQR is comprised of two sections:

- Section A – provides a state-wide overview of our drinking water supply systems and FY2017-18 performance against the ADWG, as well as detailing our strategies to improve drinking water quality performance
- Section B – contains a detailed summary of each drinking water supply system and a detailed assessment of performance against ADWG.

All supporting data used in this report is available on our website.

Executive summary

Capital investments

In 2017/18 TasWater invested \$89.6M in capital renewals and upgrades associated with drinking water supply systems. Key projects completed during the year include:

- Construction of 13¹ new Water Treatment Plants (WTP) and associated network upgrades
- Three new drinking water pipelines and associated network upgrades to service Judbury, Epping Forest and Colebrook
- Installation of a temporary WTP and network upgrades at Gretna to overcome long standing water quality issues
- Major upgrade to Conglomerate Creek dam to comply with dam safety regulations
- Completion of two new 20 ML drinking water storage reservoirs at Tolosa Street, Glenorchy
- Scamander WTP redundancy upgrade
- Bryn Estyn WTP PAC dosing plant installation.

Drinking water risk reduction

Across the course of the year we have focused heavily on reducing drinking water risks for our customers. Notable outcomes for the year include:

- Completion of 35 raw water catchment investigations to assist with assessing the need for future upgrades to existing drinking water systems
- Completion of an independent external audit of our Drinking Water Quality Risk Management Plan (DWQRMP)
- Establishment of a dedicated state-wide sampling team as a key enabler to improve the quality, consistency and effectiveness of sampling
- Application of the ADWG approach to risk management through ongoing risk assessments, process audits, catchment surveys and increased monitoring of water treatment plant critical control points
- Improvements to underperforming chlorination and fluoridation systems
- Ongoing improvements in our approach to risk management saw a continuation of the reduction in the number of E.coli detections in potable systems with six recorded, a reduction from nine in the previous year and twenty seven in the prior year.

Customer impacts

Our focus for this year has been to reduce the number of Public Health Alerts (PHAs) and address the key source of customer complaints related to drinking water.

Fourteen health alerts were removed this year including the removal of two systems from the serviced land layer.

Three incident based boil water alerts (BWAs) were issued for potable water systems (South Hobart, Mole Creek and Risdon Vale). Each incident was formally reviewed for the purposes of determining root causes and to facilitate targeted improvements in our processes and infrastructure with a view to minimising the risk of a repeat. In each case, the incident review included an assessment of the

¹Ringarooma, Bronte Park, Conara, Cornwall, Gladstone, Herrick, Mathinna, Rossarden, Wayatinah, Fentonbury, Maydena, National Park and Rocky Creek

risk that such an incident could occur in our other systems across the state. Where the level of risk warrants it, plans have been put in place to minimise such risks.

Significant effort has been invested in addressing the root cause of our drinking water quality complaints. The majority of complaints relate to three factors; discoloured water, poor tasting water and odorous water. While positive gains have been made in terms of setting up programs to reduce the number of complaints, their impact is yet to be seen in the number of complaints recorded with complaint numbers continuing to be above target. We are however confident that the programs that have been set up will result in significant reductions over the coming years.

Compliance outcomes

The percentage of potable systems compliant with ADWG microbiological guidelines system was 100 per cent, consistent with last year's result and met the target for 100 per cent of samples to be free of *E. coli*. The percentage of our serviced population that received microbiological compliant water across potable and PHA systems was 99.8 per cent.

While there were no detections of fluoride above the ADWG limit of 1.5 mg/L. The percentage of compliant fluoride systems was 97.4 per cent and above the 90 per cent compliance target. Investments are underway to upgrade the underperforming fluoride dosing system at Swansea which has driven this result.

Two potable systems (Rosebery and Zeehan) experienced issues with metals concentration above ADWG limits. A new WTP is nearing completion at Rosebery which is expected to address the metals concentration in the raw water at Rosebery. The operation of the Zeehan WTP is being reviewed to identify possible operational improvements to reduce the risk of further metal concentration exceedances.

Two potable systems (Coles Bay and Ellendale) recorded disinfection-by-products (DBPs) above ADWG health limits. Upgrades are planned for both systems which will address the exceedances.

Looking Forward

Over the course of FY2018/19 we are targeting further improvements in drinking water quality and associated reporting including:

- The removal of all remaining (ten) long standing Public Health Alerts
- Reduction in the number of drinking water complaints
- Investment in ultraviolet systems to meet Health Based Target log reduction targets in ten systems
- Construction of a new WTP and pipeline to service Currie and Grassy on King Island
- Commencement of upgrades to our 17 highest risk potable drinking water systems at Adventure Bay, Bothwell, Bracknell, Bridport, Coles Bay, Deloraine, Dover, Ellendale, Glen Huon, Longford, Oatlands, Scottsdale, St Helens, St Marys, Strahan, Westbury and Yolla
- Commencement of planning for major upgrades to the Bryn Estyn and Forth WTPs
- Improved visibility of water quality data to be published monthly on our website

1. Approach to drinking water quality management

Water is our most important product, as a trusted and respected provider of essential services to homes and businesses across Tasmania we are committed to supplying safe and good quality drinking water.

To ensure consistent management of drinking water from catchment to customer, we adopted the ADWG risk management principles outlined in our Drinking Water Quality Risk Management Plan (DWQRMP). We conducted a review of our DWQRMP and released an amended version that was approved by our CEO on 10/11/2017

The DWQRMP identifies risks to drinking water systems and management practices in accordance with the 12 element framework outlined in the ADWG.

The ADWG provide definitions for two sets of guideline values:

- Health-related guideline value - the concentration or measure of a water quality characteristic that, based on present knowledge, does not result in any significant risk to the health of the consumer over a lifetime of consumption
- Aesthetic guideline value - the concentration or measure of a water quality characteristic that is associated with the acceptability of water to the consumer e.g. taste and odour.

2. Drinking water risk management plan audit

Between 12 November 2017 and 1 December 2017, we engaged an independent auditor from Bligh Tanner. A requirement under the Public Health Act 1997, the audits covered the implementation of our DWQRMP against the 12 element framework in the ADWG.

The scope of the audit covered the common elements of the DWQRMP and individual elements as they apply to the selection of WTPs from across Tasmania. The following sites were selected for the 2017 audit:

- Gormanston and Rossarden as raw water sources
- Epping Forest and Maydena as disinfection only schemes
- Bridport, Bryn Estyn, Conglomerate Creek, Gretna and Pet River as full treatment WTPs.

During the audit no major non-conformances with several minor non-compliances identified currently being worked through and monitored by DoH.

1. Drinking water supply systems

We source drinking water from 76 catchments located around Tasmania across a range of geographic and climatic zones.

As of the 30 June 2018 we managed 64 drinking water supply systems:

- 54 potable systems supplied safe drinking water directly to our customers
- 10 of the systems were on Public Health Alerts (PHAs).

[Table 1](#) provides an overview of the 54 potable drinking water supply systems and [Table 2](#) shows an overview of the 10 systems on PHAs either Boil Water Alert (BWA) or Do Not Consume (DNC).

1.1 List of potable drinking water supply systems

Table 1: Potable drinking water supply systems with status as of 30th June 2018

System	Status	Status Changes	Catchment/ water source	Connections	Population	Treatment Process	Fluoridated supply
Adventure Bay	Potable		Bore	1	1	Disinfection only	No
Bicheno	Potable		Aspley River	873	960	Full treatment	Yes
Bothwell	Potable		Clyde River	293	527	Full treatment	No
Bracknell	Potable		Liffey River	194	504	Full treatment	No
Bridport	Potable		Brid River	1153	1499	Full treatment	Yes
Cam River	Potable		Cam River	4516	9484	Full treatment	Yes
Campbell Town	Potable		Elizabeth River	843	1602	Full treatment	Yes
Coles Bay	Potable		Saltwater Creek	292	204	Full treatment	No
Cornwall	Potable	BWA removed 15/6/18	Fanshaft Spring/ unnamed watercourse	46	83	Full treatment	No
Currie	Potable		Bore	529	952	Disinfection only	No
Deep Creek	Potable		Deep Creek	2378	4994	Full treatment	Yes
Deloraine	Potable		Meander River	1325	2783	Full treatment	Yes
Distillery Creek	Potable		Distillery Creek / St Patricks River	18183	38184	Full treatment	Yes
Dover	Potable		Esperance River	673	1211	Full treatment	Yes
Dowlings Creek	Potable		Dowlings Creek	103	247	Full treatment	No
Ellendale	Potable		Jones River	89	169	Full treatment	No
Fingal	Potable		South Esk River	436	828	Full treatment	No
Forth River	Potable		Forth River	17691	37151	Full treatment	Yes
Gawler River	Potable		Gawler River	5988	12575	Full treatment	Yes
Gladstone	Potable	BWA removed	Ringarooma	92	147	Full	No

System	Status	Status Changes	Catchment/ water source	Connections	Population	Treatment Process	Fluoridated supply
		19/6/18	River			treatment	
Grassy	Potable		Grassy River	112	224	Full treatment	No
Greater Hobart	Potable	BWA applies to towns of National Park, Fentonbury and Westerway for FY17-18. BWA applied to South Hobart 25/4/18-26/4/18. BWA applied to Risdon Vale 28/12/17-1/1/18.	Multiple Sources	99650	223991	Full treatment	Yes
Gretna	Potable	BWA removed 24/11/17	Derwent River	59	136	Full treatment	No
Huon Valley	Potable		Huon River	3679	8136	Full treatment	Yes
Lady Barron	Potable	BWA removed 19/7/17	Bore	119	179	Full treatment	Yes
Lake Barrington	Potable		Lake Barrington	1132	2490	Full treatment	Yes
Leven River	Potable		Leven River	2177	4789	Full treatment	Yes
Longford	Potable		Macquarie River	4494	9887	Full treatment	Yes
Manuka River	Potable		Manuka River	570	855	Full treatment	Yes
Maydena	Potable		Unnamed tributary	148	222	Disinfection only	No
Mole Creek	Potable	BWA removed 7/7/2017 then BWA from 28/12/2017-1/1/2018	Weir	256	486	Full treatment	No
North Esk	Potable		North Esk	15703	34547	Full treatment	Yes
Oatlands	Potable		Blackman River	495	941	Full treatment	Yes
Orford	Potable		Prosser River	1028	720	Full treatment	Yes
Ouse and Hamilton	Potable		Derwent River	242	387	Full treatment	No
Pet River	Potable		Pet River	8695	18260	Full treatment	Yes
Queenstown	Potable		Conglomerate Creek	1446	2314	Full treatment	Yes
Ringarooma System	Potable	BWA removed 26/7/17 ²	Dunn's Creek Dam/ Ringarooma River	711	1209	Full treatment	Yes
Rosebery	Potable		Mountain Creek / Stitt River	676	811	Full treatment	Yes
Scamander	Potable		Scamander River	585	819	Full treatment	Yes
Scottsdale	Potable		Great Forester	1347	2963	Full	Yes

² Ringarooma system had BWA removed for Ringarooma and Legerwood on 26/7/2017, Branxholm and Derby on 7/8/2017 and the PHA for Winnaleah on 10/8/2017.

System	Status	Status Changes	Catchment/ water source	Connections	Population	Treatment Process	Fluoridated supply
			River / Brid River			treatment	
South Esk	Potable		Lake Trevallyn	5459	12556	Full treatment	Yes
St Helens	Potable		Georges River	2070	2898	Full treatment	Yes
St Marys	Potable		Bore	401	722	Full treatment	Yes
Swansea	Potable		Swan River / Meredith River	742	965	Full treatment	Yes
Triabunna	Potable		Maclaines Creek / Brady's Creek	458	870	Full treatment	Yes
Tullah	Potable		Lake Rosebery	226	226	Full treatment	No
Tunbridge	Potable		Blackman River	117	222	Full treatment	No
Waratah	Potable		Waratah River	137	219	Full treatment	Yes
Wayatinah	Potable	BWA removed 25/6/18	Lake Liapootah	64	38	Full treatment	No
West Tamar	Potable		Lake Trevallyn	10138	23317	Full treatment	Yes
Westbury	Potable		Meander River	1170	2457	Full treatment	Yes
Whitemark	Potable		Pats River	205	308	Full treatment	No
Zeehan	Potable		Parting Creek	630	1008	Full treatment	Yes
Total	54			220,839	474,277		

1.2 List of drinking water supply systems on public health alert

Table 2: Drinking water supply systems on PHA with status as of 30th June 2018

System	Status	Status Changes	Catchment/ water source	Connections	Population	Treatment Process	Fluoridated supply
Bronte Park	BWA		Bronte Canal	50	25	Upgraded - Chlorine disinfection	No
Colebrook	BWA		Stainers Creek	99	208	N/A	No
Conara	BWA		South Esk River	46	133	Upgraded - Chlorine disinfection	No
Epping Forest	BWA		South Esk River	27	54	N/A	No
Gormanston	BWA		Unnamed basin	34	31	N/A	No
Herrick	BWA		Irrigation scheme	26	47	Upgraded - Chlorine disinfection	No
Judbury	BWA		Dora Creek	98	265	N/A	No
Mathinna	BWA		South Esk River	96	154	Upgraded - Chlorine disinfection	No
Rocky Creek	BWA		Rocky Creek	503	1207	Upgraded - Chlorine disinfection	Yes
Rossarden	DNC		Aberfoyle Creek	58	104	Upgraded - Chlorine disinfection	No
Total	10			1,037	2,228		

1.4 Systems removed from serviced land layer

Following community consultation and approval from the Tasmanian Economic Regulator (TER), we completed Service Replacement Programs for the Mountain River and Pioneer systems (refer to [Table 3](#)). Once removed from the Serviced Land Layer DoH no longer required the BWA for Mountain River and Pioneer.

Table 3: List of systems removed from service during FY18

System	Status	Catchment/water source	Date Replaced
Mountain River	-	Stephenson's Creek	September 2017
Pioneer	-	Unnamed Creek / Ringarooma River	September 2017

1.5 Potable tanks to communities (temporary)

During the construction of the WTP for National Park and Rossarden, potable water was provided to the communities (refer to [Table 4](#)) from potable water tanks. These were located in public areas and were monitored weekly with levels maintained according to community demand.

Table 4: Systems supplied with potable water tanks during FY18

System	Status	Tank water source	Improvements
National Park	BWA	New Norfolk	Construction of a new WTP
Rossarden	DNC	Campbell Town or Longford	Construction of a new WTP

1.6 Source water catchments

The drinking water catchments for each drinking water system are shown in [Table 1](#) and [Table 2](#). We have a comprehensive catchment water quality monitoring program which includes specific monitoring for pesticides and herbicides as well as other potential hazards within the catchments.

In 2015, we commenced a program to update all of our catchment surveys. During the 2017-18 reporting period, we finalised the remaining 35 drinking water catchment surveys. This information is used to ensure that our water treatment solutions are capable of addressing catchment water quality risks. This information is also used to inform the construction and upgrade of WTPs.

2. Quality of drinking water for FY2017-18

Routine monitoring of water supply systems was conducted throughout 2017-18. Water sampling was undertaken based on analysis of the ADWG and risk assessments to ensure a good representation of the water quality received by customers.

The frequency of monitoring is established in the compliance program, which has been designed in accordance with the recommendations in the ADWG. A risk-based approach was used to specify the parameters included in the monitoring program.

The supply compliance program includes health (microbiological, metals, disinfection-by-products) and aesthetic (e.g. chlorine residual, turbidity, pH and colour) parameters (see [Appendix A](#) for individual parameter guideline limits). All samples were analysed by National Association of Testing Authorities (NATA) accredited laboratories.

2.1 Potable system performance

Table 5: High level health performance outcome for potable drinking water supply systems (against ADWG health-regulated parameters e.g. fluoride health limit it 1.5 mg/L) (☑ = compliant, ☒ = non-compliant)

System	Status	Status changes	Compliance program completeness	Microbiological performance	Fluoride performance	Metals performance	DBP performance
Adventure Bay	Potable		☑	☑	n/a	☑	☑
Bicheno	Potable		☑	☑	☑	☑	☑
Bothwell	Potable		☑	☑	n/a	☑	☑
Bracknell	Potable		☑	☑	n/a	☑	☑
Bridport	Potable		☑	☑	☑	☑	☑
Cam River	Potable		☑	☑	☑	☑	☑
Campbell Town	Potable		☑	☑	☑	☑	☑
Coles Bay	Potable		☑	☑	n/a	☑	☒
Cornwall	Potable	BWA removed 15/6/18	☑	☒	n/a	☑	☑
Currie	Potable		☑	☑	n/a	☑	☑
Deep Creek	Potable		☑	☑	☑	☑	☑
Deloraine	Potable		☑	☑	☑	☑	☑
Distillery Creek	Potable		☑	☑	☑	☑	☑
Dover	Potable		☑	☑	☑	☑	☑
Dowlings Creek	Potable		☑	☑	n/a	☑	☑
Ellendale	Potable		☑	☑	n/a	☑	☒
Fingal	Potable		☑	☑	n/a	☑	☑
Forth River	Potable		☑	☑	☑	☑	☑
Gawler River	Potable		☑	☑	☑	☑	☑
Gladstone	Potable	BWA removed 19/6/18	☑	☒	n/a	☑	☑
Grassy	Potable		☑	☑	n/a	☑	☑
Greater Hobart	Potable	BWA applies to towns of National Park, Fentonbury and Westerway for FY17-18. BWA applied to South Hobart 25/4/18-26/4/18. BWA applied to Risdon Vale 28/12/17-1/1/18.	☑	☑	☑	☑	☑

System	Status	Status changes	Compliance program completeness	Microbiological performance	Fluoride performance	Metals performance	DBP performance
Gretna	Potable	BWA removed 23/11/17	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	n/a	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Huon Valley	Potable		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Lady Barron	Potable	BWA removed 19/7/17	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Lake Barrington	Potable		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Leven River	Potable		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Longford	Potable		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Manuka River	Potable		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Maydena	Potable		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	n/a	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Mole Creek	Potable	BWA removed 7/7/2017 then BWA from 28/12/2017-1/1/2018	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	n/a	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
North Esk	Potable		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Oatlands	Potable		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Orford	Potable		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Ouse and Hamilton	Potable		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	n/a	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Pet River	Potable		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Queenstown	Potable		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Ringarooma	Potable	BWA removed 26/7/17	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Rosebery	Potable		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Scamander	Potable		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Scottsdale	Potable		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
South Esk	Potable		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
St Helens	Potable		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
St Marys	Potable		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Swansea	Potable		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Triabunna	Potable		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Tullah	Potable		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	n/a	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Tunbridge	Potable		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	n/a	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Waratah	Potable		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Wayatinah	Potable	BWA removed 25/6/18	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	n/a	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
West Tamar	Potable		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Westbury	Potable		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Whitemark	Potable		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	n/a	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Zeehan	Potable		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

2.2 PHA system performance

Table 6: High level health performance outcome for PHA drinking water supply systems (against ADWG health-regulated parameters) (☑ = compliant, ☒ = non-compliant)

System	Status	Status changes	Compliance program completeness	Microbiological performance	Fluoride performance	Metals performance	DBP performance
Bronte Park	BWA		☑	☒	n/a	☑	☑
Colebrook	BWA		☑	☑	n/a	☑	☒
Conara	BWA		☑	☑	n/a	☑	☒
Epping Forest	BWA		☑	☑	n/a	☑	☒
Gormanston	BWA		☑	☒	n/a	☑	n/a
Herrick	BWA		☑	☒	n/a	☑	☑
Judbury	BWA		☑	☒	n/a	☑	☑
Mathinna	BWA		☑	☒	n/a	☑	☑
Rocky Creek	BWA		☑	☑	☑	☑	☑
Rossarden	DNC		☑	☑	n/a	☑	☑

2.3 Microbiological performance

We have a comprehensive microbiological monitoring program to evaluate the performance of our drinking water systems. A drinking water system is sampled in accordance with the sampling frequency specified in the compliance sampling program and is assessed to which the requirements were met.

A drinking water system is to be assessed for microbiological contamination in relation to *E.coli* and a system is deemed to have passed if greater than 98 per cent of samples over 12 months are free of *E.coli* (Section 13, TDWG)

Our FY2017-18 microbiological performance was assessed against two indicators:

- 100.0 per cent (54 of 54) of our potable systems met microbiological compliance (greater than 98 per cent of samples in systems when classified as potable were free of *E.coli*)
- 99.8 per cent of our serviced population achieved microbiological compliance (relates to the population across potable and PHA systems).

There were 5 drinking water systems subject to BWA during the reporting period that did not meet the 98 per cent compliance target, the details of which are provided in [Table 8](#).

Table 8: Overview of microbiologically non-compliant systems on BWA

System name	Status	Connected Population	Planned improvements	FY Outcome
Bronte Park	BWA	25	Construction of a new WTP at Bronte Park will provide treated drinking water to residents.	87.3%
Gormanston	BWA	31	The system is managed under a BWA. A service replacement program is underway.	66.7%
Herrick	BWA	47	Construction of a new WTP is now providing treated drinking water to residents.	66.6%
Judbury	BWA	265	Construction of a pressurised pipeline from the Glen Huon WTP to a new reservoir which includes a re-chlorination station provides treated drinking water to residents.	33.3%
Mathinna	BWA	154	Construction of a new WTP is now providing treated drinking water to residents.	66.7%

It should be noted that there were 3 systems that had their classification changed from BWAs to Potable during the reporting period. For the period they were subject to BWA they performed unfavourably against the compliance target of 98 per cent. However, for the period they were deemed potable they were 100.0 per cent compliant with no *E.coli* detections (refer to [Table 9](#)).

Table 8: Overview of microbiologically non-compliant systems that changed from BWA to potable

System	Status	Dates when PHA lifted	Connections	Planned improvements	FY Outcome
Cornwall	BWA to Potable	15 June 2018	83	<i>E.coli</i> detections occurred during the period the system was subject to a BWA. A newly constructed WTP provides treated water, after a rigorous testing program in consultation with DoH. The BWA was removed 15 June 2018 and met the microbiological compliance target when Potable.	91.7%
Gladstone	BWA to Potable	19 June 2018	147	<i>E.coli</i> detections occurred during the period the system was subject to a BWA. A newly constructed WTP provides treated drinking water customers and the BWA was lifted 19 June 2018 and met the microbiological compliance target when Potable.	50.0%
Gretna	BWA to Potable	23 November 2017	136	<i>E.coli</i> detections occurred during the period the system was subject to a BWA. A newly constructed WTP provides treated water, after a rigorous testing program in consultation with DoH the BWA was lifted 23 November 2017 and met the microbiological compliance target when Potable.	92.8%

In the FY2017-18 reporting period three BWAs in potable systems were issued to mitigate risks to the water supply while investigation and remediation actions took place (refer to [Table 9](#)). In the event of an *E.coli* detection and BWA, the impacted drinking water system is reviewed by an external auditor. The aim of the review is to highlight the root cause of the contamination and to determine the action/s necessary to reduce the risk of future contaminations.

Table 9: List of BWAs issued by DoH in the 2017-18 reporting period

Town	System	Dates	Nature of event
Risdon Vale	Greater Hobart	31 October 2017 – 2 November 2017	A BWA was issued for the Risdon Vale area on 31 October 2017 due to <i>E.coli</i> detected in a routine monitoring sample. Remedial actions included flushing and scouring the affected area, isolating the Risdon Brook Reservoir for inspection and cleaning. Samples taken on 31 October and 1 November were clear of <i>E.coli</i> .
South Hobart	Greater Hobart	25-27 April 2018	A BWA was issued on 25 April 2018 due to an <i>E.coli</i> detection in the South Hobart area (a sub-section of the Greater Hobart system). The root cause was an opened valve causing unchlorinated water to flow into the reticulated system. Flushing and dosing of the system was carried out and further testing demonstrated that the water was safe to consume and the BWA was removed on 27 April.
Mole Creek	Mole Creek	28 December 2017 – 1 January 2018	A routine sample taken on 28 December 2017 returned a positive <i>E.coli</i> detection. A BWA was issued. Sample Taken on 31 December 2017 and 1 January 2018 were clear of <i>E.coli</i> and the BWA was removed on 1 January 2018.

A detailed summary of *E.coli* detections in potable systems are described in Appendix B.

2.4 Metals performance

Monitoring for the presence of metals is a requirement under the TDWQG and is undertaken in line with the risk based approach promoted by the ADWG. Sampling programs are designed specifically for each drinking water system based on the site specific risks.

During FY2017-18 there were 2 exceedances of metals against the ADWG health limits occurring at Rosebery and Zeehan for which those systems are classified as non-compliant for metals (refer to [Table 10](#)).

The details of each metal exceedance are described in [Appendix C](#).

Table 10: Systems with metals non-compliances against health targets

System name	Status	Connected Population	Exceedances	Planned improvements	Outcome
Rosebery	Potable	811	1	Construction of a new WTP	99.9%
Zeehan	Potable	1008	1	Optimisation of the system	97.9%

2.5 Disinfection-by-product performance

Disinfectants such as chlorine are used to make drinking water safe from pathogenic microorganisms such as bacteria; however the disinfection process can cause by-products (ADWG, 2011, p.81). Disinfection-by-products (DBPs) form as a result of the reactions between disinfectants such as chlorine and naturally occurring organic material, resulting from the decay of vegetable and animal matter.

We take action to reduce the concentration of DBPs by balancing the requirement to ensure that the disinfection is still effective and the risk of microbiological contamination does not increase.

The key DBPs performance outcomes for the FY2017-18 reporting period:

- 2 (2 of 54) *potable* systems (Coles Bay and Ellendale) experienced issues with disinfection-by-product concentrations above the ADWG limits
- 3 (3 of 10) *BWA* systems (Colebrook, Conara and Epping Forest) recorded disinfection-by-product concentrations above the ADWG limits.

The above systems are classified as non-compliant for DBPs. In addition, Lake Barrington, Tullah and Ringarooma didn't meet their sampling frequency requirements and therefore were deemed compliance unknown for DBPs.

Each affected system currently has projects underway to address the issues (refer to [Table 11](#) and [Table 12](#)). Details of each DBP exceedance are described in [Appendix D](#).

Table 11: Potable systems with DBP exceedances against health targets

System name	Status	Connected Population	Planned improvements	Outcome	Exceedances
Coles Bay	Potable	204	Upgrade chlorination station	87.5%	6 Total Trihalomethanes exceedances
Ellendale	Potable	169	Upgrade to weir	97.9%	1 Trichloroacetic acid exceedance

Table 12: Systems on BWA with DBP exceedances against health targets

System name	Status	Connected Population	Planned improvements	Outcome	Exceedances
Colebrook	BWA	208	Transfer pipeline and associated infrastructure, upgrade reticulation network	97.9%	1 Total Trihalomethane exceedance
Conara	BWA	133	New WTP and associated infrastructure	87.5%	1 Trichloroacetic acid exceedance, 1 Total Trihalomethane exceedance
Epping	BWA	54	Transfer pipeline and associated infrastructure, upgrade reticulation network	87.5%	1 Dichloroacetic acid exceedance, 2 Trichloroacetic acid exceedances

During 2017-18, the Water Systems Optimisation Department (WSO) developed a strategy to improve chemical compliance through investigation of DBP exceedances and identification of processes requiring capital expenditure (CAPEX) for improvements. For example, the Coles Bay supply system was investigated due to elevated Total Trihalomethanes. DBP performance for this

system has shown significant improvements, through optimisation of the coagulation system and chlorine disinfection process.

2.6 Fluoride performance

We are required to add fluoride to drinking water supplies when directed by the Minister for Health under the Fluoridation Act of Tasmania 1968, Fluoridation (Interim) Regulations 2009 (Regulations) and specified in the Tasmanian Code of Practice for the Fluoridation of Public Water Supplies 2018 (CoP).

In order to simplify the presentation of statistics for fluoride, the WTP dosing station performance is presented in this Section (A) of the report to meet the regulatory reporting requirements. The WTP operational performance is calculated from daily operational fluoride samples taken at the dosing station producing fluoridated water.

Fluoride health compliance is assessed against the ADWG health limit of 1.5 mg/L. In addition, the Regulations specify that compliance of fluoride dosing stations is measured against the requirement to have more than 90 per cent of all fluoride samples fall within the fluoride concentration range of 0.8 – 1.2 mg/L. Another measure of performance is the metric that examines the average fluoride concentration taken over the reporting period.

At the end of FY2017-18 we managed 38 fluoride dosing stations across Tasmania. An assessment of the three metrics described above for fluoride performance is available in [Table 13](#).

Table 13: Regulatory outcome for fluoridation stations in FY2017-18

Metric	Compliant	Non-compliant
No sample should exceed 1.5 mg/L (ADWG limit)	38	0
90% of all [F] samples within the 0.8-1.2 mg/L range	33	5
Average of all [F] samples within the 0.8 -1.2 mg/L range	37	1

All WTP fluoride dosing station non-compliances are listed in [Table 14](#).

Table 14: Non-compliances against fluoride metrics in FY2017-18

Fluoridated water supply	Average of all [F] samples within the 0.8-1.2 mg/L range	90% of all [F] samples within the 0.8-1.2 mg/L range
Bicheno	Compliant	89.6%
Greater Hobart – National Park	Compliant	81.6%
Scamander	Compliant	85.1%
Swansea	0.5 mg/L	3.2%
Whitehills	Compliant	88.6%

2.7 Maintaining water quality to customer tap

Chlorine is widely used in the treatment of drinking water throughout the world to control microbiological contaminants such as bacteria and viruses. Chlorine has an important role to play in maintaining the microbiological quality of water from the WTP to the customer tap.

We set a minimum operational target of 0.2 mg/L and maximum 0.8 mg/L; however we aim to have chlorine residual levels reach the customer at a range between 0.3 mg/L to 0.6 mg/L. This range ensures adequate microbiological protection against chlorine sensitive pathogens while minimising taste and odour impacts. Furthermore, the ADWG recommends chlorine residual is below the 0.6 mg/L aesthetic guideline.

In the 2017-18 reporting period, the average chlorine residual across sampling locations were well below the ADWG health guideline level (5 mg/L). The chlorine residual averages were maintained within the operational range for the majority of systems and all potable systems were above the critical lower limit of 0.2 mg/L. However, 9 systems showed average chlorine residual above our maximum operational target of 0.8 mg/L while still being below the ADWG health guideline limit. This provides an opportunity for improvement in chlorine dosing management to improve taste and odour, which is planned and underway.

Turbidity (sediment) is routinely monitored across our drinking water networks as part of the compliance sampling program as well as additional real-time operational monitoring. According to ADWG (2011), a health guideline target for turbidity of less than 1 NTU is desirable at the time of disinfection as high turbidity has been shown to shield microorganisms from the action of disinfectants.

The ADWG recommends maintaining pH levels within a range of 6.5-8.5. At levels above 8.5 pH units chlorine disinfection has been proven to be less effective. At levels below 6.5 pH units corrosion of assets can be accelerated. Ultimately this can lead to asset life reduction and potential leaching of metals in the pipe network.

pH levels within our drinking water systems were typically within the range of 6.5 -8.5, with one system (Gormanston) recording an average pH outside of the optimum range. Gormanston is a raw water system with no ability to control pH. A service replacement program is underway in consultation with the community and TER.

2.8 Aesthetic quality

The aesthetic quality of drinking water is not a health concern. Common aesthetic considerations include discolouration and cloudiness, taste and odour. However, this does have the potential to significantly affect the community acceptance of water.

Discolouration and cloudiness is commonly caused by turbidity or small particles of sediment suspended in water. The accumulation of sediment within the mains is often attributed to corrosion of distribution assets particularly where there's aging infrastructure is often attributed to the accumulation of sediment within the mains. During disturbances such as flushing of the mains or change in flow rate or flow direction in the pipes sediment may become mobilised. These issues are not considered harmful to health, but we do appreciate that a supply which is discoloured in this manner can be aesthetically unacceptable.

Taste and odour can vary significantly, impacting consumers differently depending on individual sensitivities. We encourage customers to contact us so we can assist with identifying the cause. Taste and odour problems will occasionally originate from either the source water or distribution network. Of the numerous descriptions, "earthy", "musty" or "chlorine" were the most commonly encountered in 2017-18.

Earthy/musty issues impacting entire towns are typically caused by algae or bacteria metabolites in the source water. At certain periods in their seasonal lifecycle typically in warmer months they can release small amounts of the chemicals 2-Methylisoborneol (MIB) and Geosmin. These compounds may be noticeable by consumers at levels as low as five parts per billion. These levels are not harmful to human health but can taste unpleasant.

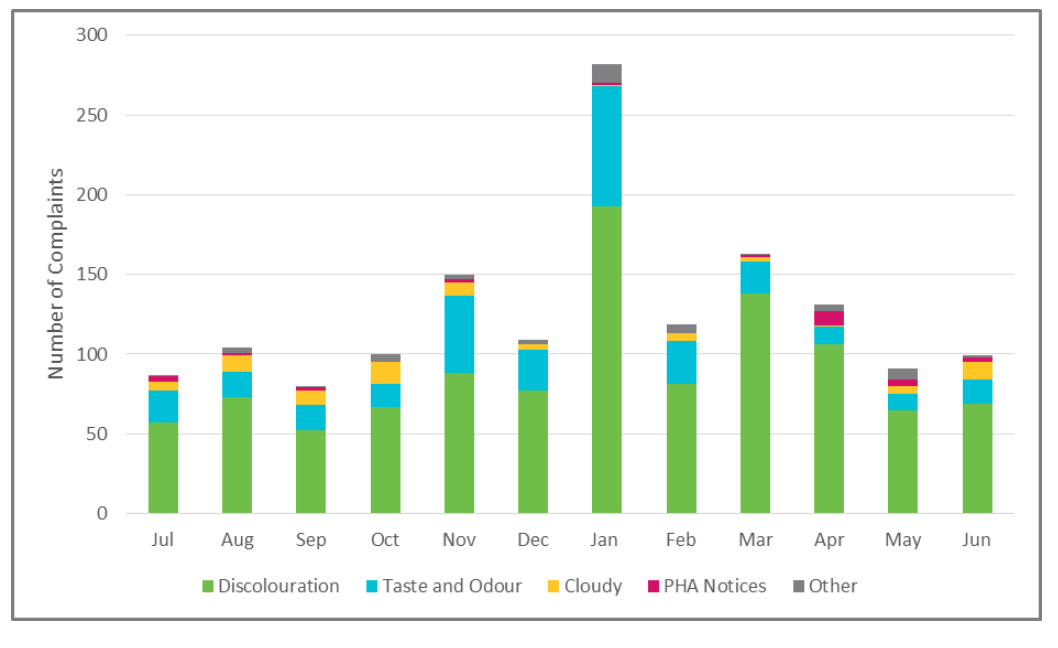
2.9 Customer complaints

This section details the customer complaints we received on drinking water quality during the FY2017-18 reporting period. We received a total of 1,514 customer complaints relating to drinking

water quality, which relates to complaints received via our call centre, website or in writing (including Ombudsman enquires).

1,066 complaints were received regarding discolouration, 299 regarding taste/odour issues, 76 related to cloudy water, 26 related to PHAs and 47 that were unable to be classified into the previous categories, the majority of these complaints relate to PHAs (see Figure 2).

Figure 2: Types of customer complaints grouped by month for the 2017-18 reporting period



The highest number of water quality complaints related to discoloured water of which Greater Hobart had 243 complaints with an average of 20 per month. The majority of these complaints were associated with water breaks and works in the area. Burnie had 177 discoloured water complaints with 147 identified relating to a scouring program and break on a trunk main. Devonport and Ulverstone also showed a high number of discoloured water complaints.

As part of our strategic aim, we will increase our focus on reducing water quality complaints. During FY2017-18 an Aesthetic Task Force was established to provide a proactive and preventative response to aesthetic water quality issues with the objective of improving water quality and reducing water quality complaints. While the target reduction in total water quality complaints was not met, the establishment of the Aesthetic Task Force has identified a number of key learnings which will be incorporated into our strategic initiatives in FY2018-19:

- The establishment of an internal Taste Panel provides an early warning system for the detection of taste and odour compounds that enable early mobilisation of carbon dosing to prevent or mitigate customer impacts
- Targeted programmed maintenance (cleaning) of water mains improves aesthetic water quality by removing sediments that can deplete chlorine residuals; this allows us to reduce chlorine dosing while maintaining disinfection. Communication to our customers will be a high priority using multiple media platforms detailing maintenance activities and their impacts
- Development of a customer complaints heat map and comparison of pipe types and existing flushing programs has assisted us to make informed decisions and develop targeted strategies to reduce water quality complaints going forward.

The focus in FY2018-19 will be to build on the previous year's learnings with further initiatives better designed to achieve our strategic aim to reduce water quality complaints.

Further details on complaints received are listed in the relevant individual system performance reports ([Section B](#)).

3. Future planning and works

3.1 Regional towns water supply improvement program

We made a commitment to accelerate our program addressing water quality issues faced by regional towns under our Regional Towns Water Supply Improvement Program (RTWSIP). This program was designed to systematically remove PHAs as quickly as possible. Since the program launch we have expanded the program to include the and added the towns of Bronte Park, Colebrook, Conara, Epping Forest, Herrick, Judbury, Mathinna, Rocky Creek, and Rossarden. Furthermore, the communities of National Park, Fentonbury and Westerway (currently part of the Greater Hobart system and subject to BWA) will receive potable drinking water in FY2018-19.

As part of the overall improvement in water quality compliance the expansion of the RTWSIP intends to address 17 high priority drinking water supply systems with significant upgrades to existing or new fully functioning WTP systems for the communities of Adventure Bay, Bothwell, Bracknell, Bridport, Coles Bay, Deloraine, Dover, Ellendale, Glen Huon, Longford, Oatlands, Scottsdale, St Helens, St Marys, Strahan, Westbury and Yolla. This includes investments in new WTPs, UV disinfection systems, clarifiers, filtering and chlorination dosing.

FY2018-19 will see work on two strategic projects at Bryn Estyn WTP and Forth WTP to continue providing safe drinking water into the future. The WTPs are high priority due to the Health Based Target short-fall and population serviced by the plants. The upgrades are designed to increase capacity to deliver required demand, meet all water quality targets as well as reduce the potential for taste and odour issues.

Work will continue on the King Island Infrastructure Improvement Project to upgrade the treated water services on King Island to ensure the water supply meets ADWG. The project includes construction of a new WTP at Grassy and construction of a treated water pipeline to deliver treated water from the new WTP to the towns of Grassy and Currie.

3.2 Water system optimisation program

Our Water System Optimisation Department (WSO) identifies risks and issues and provides recommendations to improve compliance, safety, reliability and operability of our water supply systems.

Key activities of the WSO that will continue throughout FY2018-19 include:

- Critical control point (CCP) identification and implementation of the Hazard Analysis Critical Control Point (HACCP) principles to enhance the delivery of safe drinking water
- Assessment of the risks and recommendations for installation of ultra violet (UV) units at selected sites to improve disinfection as a preventative action
- Assessment of coagulation/flocculation and filtration processes at WTPs to improve the treatment of drinking water
- Improved network monitoring of chlorine residual to improve compliance
- Assistance in water quality incidents and follow-up actions including a risk assessment tool to determine the likelihood of having a water quality incident.

3.3 Reporting transparency

To improve reporting transparency we will increase the availability of access to drinking water data through an interactive map web-based platform. The website will enable public access to all of our drinking water supply system results across the state and an assessment of water quality against the ADWG on a monthly basis. The public interface is designed to streamline the way we share our water quality data.

4. Reporting methodology

This section is intended to assist the reader with interpreting drinking water health and system performance statistics referred to throughout this document with the intent to provide clear and transparent information.

4.1 Understanding this report

This report meets the requirements specified under the relevant legislation as well as providing transparency of water quality information to all Tasmanians.

For the purpose of this report, all data is assessed in relation to the health and aesthetic guidelines specified in the ADWG. The ADWG provide an authoritative reference to the water supply industry on what defines safe, good quality water, how it can be achieved and how it can be assured.

In addition, each of the 64 drinking water systems described throughout this document is addressed in detail to meet the requirements specified under the TDWQG. The TDWQG establish best practice frameworks to effectively manage drinking water quality. The requirements are legally enforceable and provide detailed specifics for managing and controlling water so it does not pose a risk to public health.

4.2 Compliance sampling program

Compliance monitoring is conducted in the distribution network and is a verification of the water quality the customers receive. DoH assesses us on the completeness of the sampling program and all compliance samples must be taken at an agreed frequency or rescheduled if operational issues arise. DoH must be notified if a sample is unable to be taken and depending on the circumstances, a dispensation for DoH may be issued.

Drinking water quality monitoring confirms the final quality of water that is supplied to consumers. Therefore, the sampling needs to be undertaken throughout the distribution network. This is done at points reflective of the quality of water supplied to consumers' properties (e.g. at or close to water meters). The location and number of sampling points within a distribution system are determined by the complexity of the drinking water system. The compliance program considers populations and uses ADWG methodology.

To improve sampling consistency and completeness a state-wide sampling team was established in FY2017-18. A strategic aim of the team is to ensure all required samples are taken as scheduled and sampling compliance frequency is met. The team enables state-wide sampling standards with improved planning and coordination and training. This will reduce the risk in response to events and ensure sampling frequency requirements are met.

4.3 Assessing compliance against health targets

Health performance indicators refer to compliance with the relevant ADWG health guideline targets and the extent to which the compliance sampling program complied with the sampling frequency requirement.

Health-based targets are an essential component of the drinking water safety framework and take into account the overall public health situation ensuring access to water for all consumers (World Health Organisation, 2017). The health-based targets in Tasmania are set out to protect public health and the targets are measurable and based on scientific data (see [Appendix A](#)).

Microbiological compliance is assessed as the extent the drinking water complied with the ADWG value (*E. coli* of <1 MPN/100mL) attaining a 98 per cent compliance rate measured over 12 months.

A drinking water system is deemed compliant against the requirement of the TDWQG if *E. coli* is absent in greater than 98 per cent of all microbiological compliance samples. This requirement excludes retest and investigation samples from the overall result.

Fluoride compliance is assessed against the ADWG health limit of 1.5 mg/L. Samples were collected weekly in compliance with the requirements of the DRAFT Tasmanian Code of Practice for the Fluoridation of Public Water Supplies 2013 -2017. Fluoride exceedances are based on the ADWG health limit of 1.5 mg/L.

Metals compliance is total compliance of all ADWG health-regulated metals. Individual programs may differ between systems dependent on risk. For historic trends, performance figures, where available, are entered from previous annual reports. It is noted that previous programs may differ from those defined in this year's report. To achieve compliance, 100% of the samples tested must comply with the ADWG health targets

Disinfection-by-product compliance is total compliance of all ADWG health-regulated disinfection-by-products. Individual programs may differ between systems dependent on risk. For historic trends, performance figures, where available, are entered from previous annual reports. It is noted that previous programs may differ from those defined in this year's report. To achieve compliance, 100 per cent of the samples tested must comply with the ADWG health target.

4.4 System issues

We maintain a record of incidents and issues reported throughout the year and how they were addressed stored in an Incident Reporting Information System (IRIS). System incidents relate to laboratory test exceedances above the health limits in the ADWG including those exceedances that relate to the catchment or water source and fluoridation issues.

4.5 Public health warnings issued

If a drinking water supply becomes non-compliant with ADWG values a health warning can be issued. If a PHA has occurred during the reporting period it is listed in [Table 1](#) and in [Section B](#) under the relevant drinking water system.

5. Appendices

5.1 Appendix A - Summary of ADWG health, physico-chemical and aesthetic limits

Parameter	Operational target	ADWG health	ADWG aesthetic	Comment
Microbiological				
Escherichia coli (<i>E. coli</i>) (MPN/100mL)	<1	<1	–	TDWQG guideline for microbial quality <1 MPN/100mL
Metals ADWG health regulated				
Antimony total (mg/L)	–	0.003	–	ADWG Health
Arsenic inorganic (mg/L)	–	0.01	–	ADWG Health
Barium total (mg/L)	–	2	–	ADWG Health
Boron (mg/L)	–	4	–	ADWG Health
Cadmium total (mg/L)	–	0.002	–	ADWG Health
Chromium (mg/L)	–	0.05	–	ADWG Health
Copper total (mg/L)	–	2	1	ADWG Health
Lead total (mg/L)	–	0.01	–	ADWG Health
Manganese total (mg/L)	–	0.5	0.1	ADWG Health
Mercury total (mg/L)	–	0.001	–	ADWG Health
Molybdenum total (mg/L)	–	0.05	–	ADWG Health
Nickel total (mg/L)	–	0.02	–	ADWG Health
Selenium total (mg/L)	–	0.01	–	ADWG Health
Disinfection by-products				
Chloroacetic acid (mg/L)	–	0.15	–	ADWG Health
Dichloroacetic acid (mg/L)	–	0.1	–	ADWG Health
Trichloroacetic acid (mg/L)	–	0.1	–	ADWG Health
Total trihalomethanes (mg/L)	–	0.25	–	ADWG Health
Fluoride				
Fluoride (mg/L)	>0.8 to <1.2	<1.5	–	DoH regulations & ADWG Health
General physico-chemical parameters				
Chlorine residual (mg/L)	> 0.2 to <0.8	< 5	0.6	ADWG Aesthetic
pH (pH Units)	6.5 to 8.5	N/A	NA	–
Turbidity (NTU)	<1	N/A	< 5	–

5.2 Appendix B - Summary of *E.coli* detections in potable systems

System	Treatment process	Detection date	Mitigating actions	Outcomes
Greater Hobart	Full treatment	31/10/2017	Weekly sample detected <i>E.coli</i> of 51 MPN/100mL at CLSTE153. An incident was declared and DoH was immediately notified. Assessment of other samples in the zone showed no further contamination. Reconfiguration of the network was performed to isolate Risdon Vale. After discussion with DoH a boil water alert was issued to the suburb of Risdon Vale. Flushing of the network was performed and resampling showed CLSTE153 was clear of <i>E.coli</i> .	Reported to DOH
				Boil Water Notice issued
				System flushed with clean water
				Subsequent sample clear of <i>E.coli</i>
Adventure Bay	Disinfection	8/12/2017	Weekly sample detected <i>E.coli</i> of 1 MPN/100mL at ABSTE288. An incident was declared and DoH was immediately notified. The system was isolated in order to avoid issuing a BWA. Customers were notified (direct and water carters) and bottled water was provided. A dispatch crew was sent to perform resampling and isolate and inspect the system. Subsequent sampling showed ABSTE288 was clear of <i>E.coli</i> , however <i>E.coli</i> of 2 MPN/100mL was detected in the tank. Water carters advised to utilise Electrona Fill Station until a new chlorinator installed, commissioned and system back online.	Reported to DOH
				Site inspected and tank drained, cleaned and refilled
				New chlorine pump and analyser installed
				Subsequent sample clear of <i>E.coli</i>
Mole Creek	Full Treatment	28/12/2017	Weekly sample detected <i>E.coli</i> of 48.3 MPN/100mL at MCW51W01. An incident was declared and DoH was immediately notified. A BWA was implemented and customers were notified. Most likely cause was contamination during sampling.. BWA was lifted after two subsequent clear samples.	Reported to DOH
				Boil Water Notice issued
				Incident investigation
				Subsequent sample clear of <i>E.coli</i>
Westbury	Full Treatment	28/12/2018	Weekly sample detected <i>E.coli</i> of 4.1 MPN/100mL at WHW51W01. An incident was declared and DoH notified. Investigation showed samples taken in the system were free of <i>E.coli</i> . The sample was believed to be compromised as it was contained within the same esky as the MCW51W01 detection. Retest was free of <i>E.coli</i> .	Reported to DOH
				Incident investigation and resampling
				Subsequent sample clear of <i>E.coli</i>
Forth River (Devonport)	Full Treatment	28/03/2018	Weekly operational sample detected <i>E.coli</i> of 1 MPN/100mL at 083PASPO101. DoH notified. Investigation of the network was undertaken and an external root cause analysis. Subsequent samples were clear of <i>E.coli</i> .	Reported to DOH
				Investigation of network
				External root cause analysis
				Subsequent sample clear of <i>E.coli</i>
Greater Hobart (Hobart)	Full treatment	24/04/2018	Weekly sample detected <i>E.coli</i> of 18.7 MPN/100mL at HDSTE158. An incident was declared and DoH notified. An instant Boil Water Alert was declared on a large part of South Hobart area. Reason for the contamination was the cross connection of unchlorinated water to the distribution system. The cross connection was isolated and the system flushed with clean water. Subsequent samples clear of <i>E.coli</i> .	Reported to DOH
				Boil Water Notice issued
				Incident investigation and resampling
				Subsequent sample clear of <i>E.coli</i>
				Boil Water Notice lifted

5.3 Appendix C - Summary of metals exceedances

System	Parameter	Detection date	Mitigating actions
Rosebery	Mercury	29/09/2017	Routine sampling detected 0.00114 mg/L of Mercury at 174RBSP0401 – resampled with results below the ADWG health limit.
Zeehan	Lead	30/01/2018	Routine sampling detected 0.0108 mg/L of Lead at 164ZESP0201 – resampled with results below the ADWG health limit.

5.4 Appendix D - Summary of disinfection-by-product exceedances

System	Treatment process	Detection date	Detection details	Outcomes
Colebrook	Chlorine disinfection	6/02/2018	1 Total Trihalomethane exceedance at COSTE81 of 251 ug/L	Reported to DoH Resampled Connected to the Greater Hobart system via a transfer pipeline (Regional towns program).
Coles Bay	Conventional media filtration, chlorine disinfection and fluoridation	14/11/2017	Total Trihalomethane exceedance at GCSTE86 of 271 ug/L	Reported to DoH Resampled Chlorine dosing project underway. Investigating the options to reduce organics in the treated water.
		12/12/2017	Total Trihalomethane exceedance at GCSTE86 of 331 ug/L	
		13/02/2018	Total Trihalomethane exceedance at GCSTE86 of 335 ug/L	
		13/03/2018	Total Trihalomethane exceedance at GCSTE86 of 290 ug/L	
		10/04/2018	Total Trihalomethane exceedance at GCSTE86 of 283 ug/L	
Conara	Chlorine disinfection	12/06/2018	Trichloroacetic acid exceedance at CNW51W03 of 130 ug/L	Reported to DoH Resampled Chlorine dosing reduced. New water treatment plant constructed (Regional towns program).
		1/09/2017	Trichloroacetic acid exceedance at CNW51W03 of 157 ug/L	
Ellendale	Membrane filtration and chlorine disinfection	21/09/2017	Trichloroacetic acid exceedance at EDSTE62 of 116 ug/L	Reported to DoH Resampled Chlorine dosing optimised. Investigating system upgrades.
		12/10/2017	Trichloroacetic acid exceedance at EDSTE62 of 104 ug/L	
Epping	Chlorine disinfection	1/09/2017	Dichloroacetic acid exceedance at EP51W01 of 108 ug/L	Reported to DoH Resampled Chlorine dosing reduced. Connected to the Conara system via a transfer pipeline (Regional towns program).
		1/09/2017	Trichloroacetic acid exceedance at EP51W01 of 169 ug/L	

6. List of acronyms/terms of reference

Acronym/term	Definition
ADWG	Australian Drinking Water Guidelines
BWA	Boil Water Alert
CAPEX	Capital expenditure
CCP	Critical control points
CoP	Tasmanian Code of Practise for the Fluoridation of Public Water Supplies 2018
DNC	Do Not Consume
DBPs	Disinfection by-products
DoH	Department of Health
DWQRMP	Drinking Water Quality Risk Management Plan
<i>E.coli</i>	Escherichia coli
FY	Financial year
HACCP	Hazard Analysis Critical Control Point
IRIS	Incident Reporting Information System
mg/L	Milligrams per litre
MIB	2-Methylisoborneol
MPN/100mL	Most probable number per 100 millilitres
NATA	National Association of Testing Authorities
NHMRC	National Health and Medical Research Council
NTU	Nephelometric turbidity unit (measure of turbidity)
PHA	Public Health Alert
Physico-chemical	Physical and chemical properties
Potable	Water classified fit for consumption by DoH
RTWSP	Regional Towns Water Supply Program
TDWQG	Tasmanian Drinking Water Quality Guidelines
TER	Tasmanian Economic Regulator
µg/L	Micrograms per litre
UV	Ultra violet
WTPs	Water treatment plants



Annual Drinking Water Quality Report 2017-18

Section B – Drinking Water Systems



Table of Contents

List of Acronyms/terms of reference	iii
Introduction	1
1. Adventure Bay drinking water system	2
2. Bicheno drinking water system.....	7
3. Bothwell drinking water system	13
4. Bracknell drinking water system.....	18
5. Bridport drinking water system	23
6. Bronte Park drinking water system.....	29
7. Cam River drinking water system	35
8. Campbell Town drinking water system.....	42
9. Colebrook drinking water system	49
10. Coles Bay drinking water system	55
11. Conara drinking water system	60
12. Cornwall drinking water system	67
13. Currie drinking water system.....	72
14. Deep Creek drinking water system	77
15. Deloraine drinking water system	83
16. Distillery Creek drinking water system	88
17. Dover drinking water system	96
18. Dowlings Creek (Yolla) drinking water system.....	101
19. Ellendale drinking water system	108
20. Epping Forest drinking water system.....	114
21. Fingal drinking water system	119
22. Forth River drinking water system.....	126
23. Gawler River drinking water system	132
24. Gladstone drinking water system	138
25. Gormanston drinking water system	144
26. Grassy drinking water system	150
27. Greater Hobart drinking water system	155
28. Gretna drinking water system	186
29. Herrick drinking water system	192
30. Huon Valley drinking water system	199
31. Judbury drinking water system.....	206
32. Lady Barron drinking water system	212
33. Lake Barrington drinking water system	217

34. Leven River drinking water system	223
35. Longford drinking water system	229
36. Manuka River drinking water system	236
37. Mathinna drinking water system	241
38. Maydena drinking water system.....	248
39. Mole Creek drinking water system	253
41. North Esk drinking water system	266
42. Oatlands drinking water system	273
43. Orford drinking water system	280
44. Ouse and Hamilton drinking water system.....	286
45. Pet River drinking water system	293
46. Pioneer drinking water system	301
47. Potable Tanks (multiple drinking water systems).....	306
48. Queenstown (Conglomerate Creek) drinking water system	309
49. Ringarooma System drinking water system	317
50. Rocky Creek drinking water system	324
51. Rosebery drinking water system.....	329
52. Rossarden drinking water system.....	337
53. Scamander drinking water system.....	343
54. Scottsdale drinking water system	349
55. South Esk drinking water system	356
56. St Helens drinking water system.....	363
57. St Marys drinking water system.....	368
58. Swansea drinking water system.....	373
59. Triabunna drinking water system	378
60. Tullah drinking water system.....	384
61. Tunbridge drinking water system	392
62. Waratah drinking water system.....	397
63. Wayatinah drinking water system	402
64. West Tamar drinking water system	408
65. Westbury drinking water system	416
66. Whitemark drinking water system.....	422
67. Zeehan drinking water system.....	429

List of Acronyms/terms of reference

Acronym/term	Definition
ADWG	Australian Drinking Water Guidelines
BWA	Boil Water Alert
Clarification	Remove of particles, sediments, oil, natural organic matter and colour
DAFF	Dissolved air flotation to remove suspended matter
DBPs	Disinfection by-products
DNC	Do Not Consume
DoH	Department of Health
<i>E.coli</i>	Escherichia coli
Flocculation	The removal of fine particles
FSA	Fluoro silicic acid
GAC	Granular Activated Carbon Filter
Gas Cl	Gaseous chlorine
HU	Hazen unit (measure of true colour)
Max	Maximum measurement
Mean	Average measurement
Mg/L	Milligrams per litre
Min	Minimum measurement
ML	Mega litres
MPN/100mL	Most probable number per 100 millilitres
n/a	Not applicable
NaF	Sodium fluoride
Nanofiltration	Filtration of nanoparticles
NTU	Nephelometric turbidity unit
PAC	Powdered Activated Carbon
PHA	Public Health Alert
Potable	Water classified fit for consumption by DoH
TBA	To be advised
UF Membrane	Ultrafiltration membrane
TDWG	Tasmanian Drinking Water Guidelines

Introduction

Section B of the FY18 Annual Drinking Water Quality Report (ADWQR) and accompanying raw data contains the information and data requirements specified under the *Tasmanian Drinking Water Guidelines 2015, Section 13 (TDWQG)*.

This reports provides detailed summary of each drinking water supply system, a detailed assessment of performance against targets set out in the *Australian Drinking Water Guidelines 2011* (refer to Section A, Appendix A).

For further information of the reporting methodology used refer to Section A; Chapter 4.

All supporting data used in this report available on our website.

1. Adventure Bay drinking water system

1.1. System summary (2017-18)

Adventure Bay drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	1
Population serviced	1
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	98.0%	<input checked="" type="checkbox"/>	98.0%	51	1
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0
DBPs	100.0%	<input checked="" type="checkbox"/>	100.0%	2	0

Compliant Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	1	<i>E. coli</i> exceedance/investigation
Public health warnings issued	0	
Notifications made to DoH	1	<i>E. coli</i> exceedance/investigation
Customer complaints	0	

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
Regional Towns Water Supply Program	WTP improvements	Not Started	TBA	TBA
Bruny Island Improvement	Remote monitoring of raw water infrastructure	In Progress	December 2018	\$60,000
Bruny Island Water Supply	Chlorination at Adventure Bay	Complete	December 2017	\$147,660

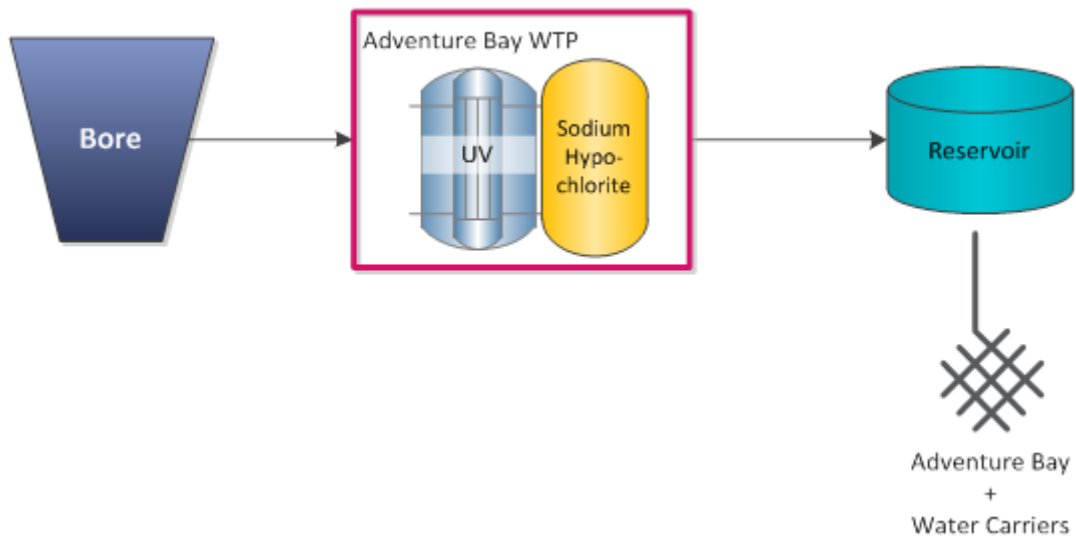


Figure 1.1-a Adventure Bay system schematic

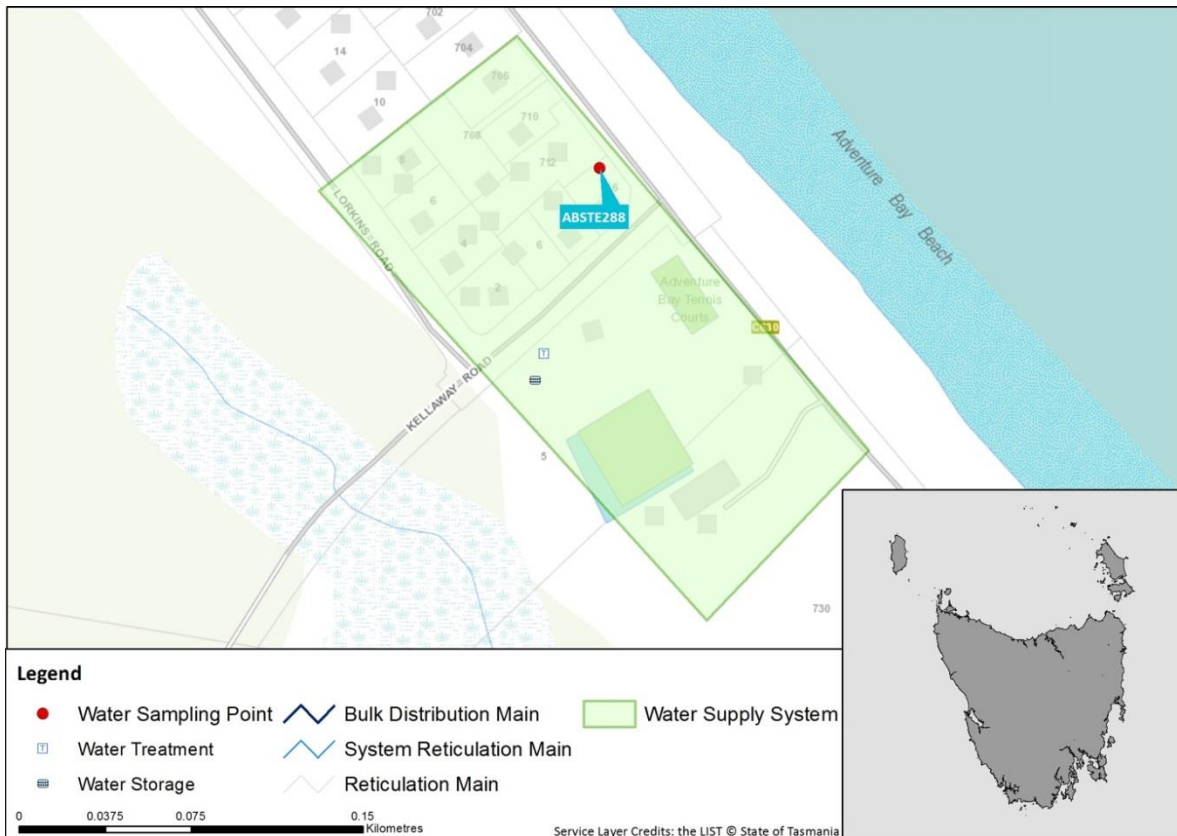


Figure 1.1-b Map of Adventure Bay monitoring system

1.2. Summary of annual reticulation compliance (2017–18)

Table 1.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Shop Sample Tap	ABSTE288	W	Q	Q ¹	Q	n/a
Number Planned Samples		52	4	2	4	n/a
Number Samples Tested		51 ²	4	2	4	n/a

1.3. Summary of current and historic performance (2013-18)

Table 1.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	99.5%	100.0%	100.0%	100.0%	98.0%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	n/a	n/a	n/a	n/a	100.0%

■ Compliant ■ Non-compliant

1.4. Analysis of current health performance (2017-18)

Table 1.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
<i>E. coli</i>	8/12/2018	<i>E. coli</i> of 1 MPN/100mL in weekly compliance sample	✓

¹ System chlorinated from 14th December 2017 – DBPs tested from this date

² Weekly compliance sample due week of 11th December 2017 not taken due to system being isolated for investigation

Figure 1.4-b Microbiological non-compliances by month

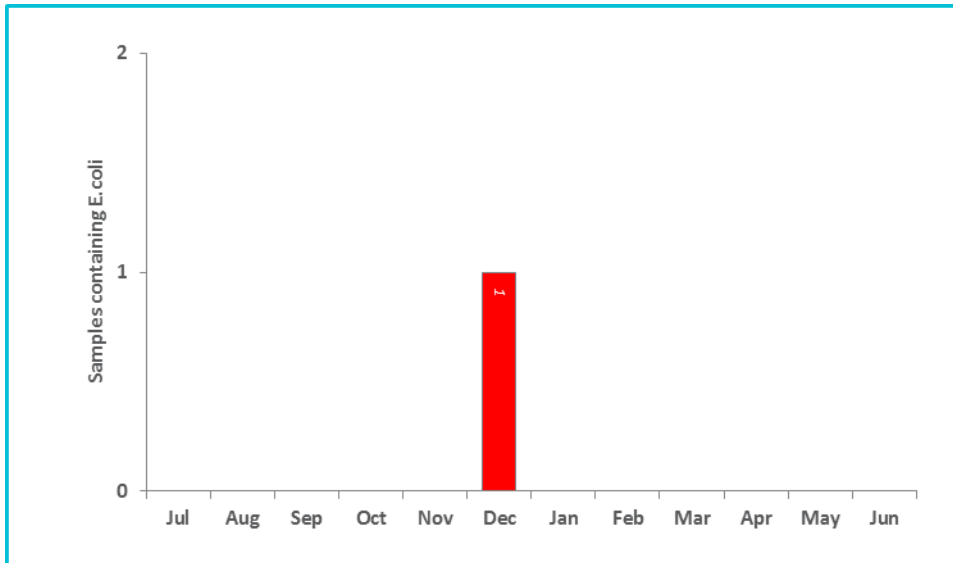


Table 1.4-b Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	<0.0003	<0.0003	0.0003
Barium	2	mg/L	4	0	100	0.001	0.001	0.001
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	0.00055	0.0004	0.0007
Copper	2	mg/L	4	0	100	0.04655	0.0194	0.0797
Lead	0.01	mg/L	4	0	100	0.00095	0.0005	0.0014
Manganese	0.5	mg/L	4	0	100	0.0103	0.0052	0.0215
Mercury	0.001	mg/L	4	0	100	<0.00003	<0.00003	<0.00003
Molybdenum	0.05	mg/L	4	0	100	0.00065	0.0004	0.0009
Nickel	0.02	mg/L	4	0	100	0.0005	0.0003	0.0007
Selenium	0.01	mg/L	4	0	100	0.00006	<0.0001	0.0001

Table 1.4-c Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	2	0	100	6.67	<1	19
Monochloroacetic acid	150	µg/L	2	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	2	0	100	8	<1	23
Total trihalomethanes	250	µg/L	2	0	100	24	4	59

Table 1.4-d General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.23	0.02	2.2
Colour True	HU	15	5.25	2	7
pH	Units	6.5 – 8.5	6.86	6.26	7.39
Turbidity	NTU	1	0.48	0	1.8

1.5. Analysis of overall system performance (2017-18)

Table 1.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
8/12/2017	Weekly sample detected <i>E. coli</i> of 1 MPN/100mL at ABSTE288. An incident was declared and DoH was immediately notified. Customers were notified (direct and water carters) and bottled water was provided. A dispatch crew was sent to perform resampling and isolate and inspect the system. Subsequent sampling showed ABSTE288 was clear of <i>E. coli</i> ; however the tank sampled detected <i>E. coli</i> of 2 MPN/100mL. Water carters advised to utilise Electrona Fill Station until a new chlorinator installed, commissioned and system back online.	✓	✓

2. Bicheno drinking water system

2.1. System summary (2017-18)

Bicheno drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	873
Population serviced	960
Fluoride	Sodium Fluoride

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	<input checked="" type="checkbox"/>	98.0%	52	0
Fluoride	100.0%	<input checked="" type="checkbox"/>	100.0%	335	0
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0
DBPs	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	2	Discolouration

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
No projected capital investment				

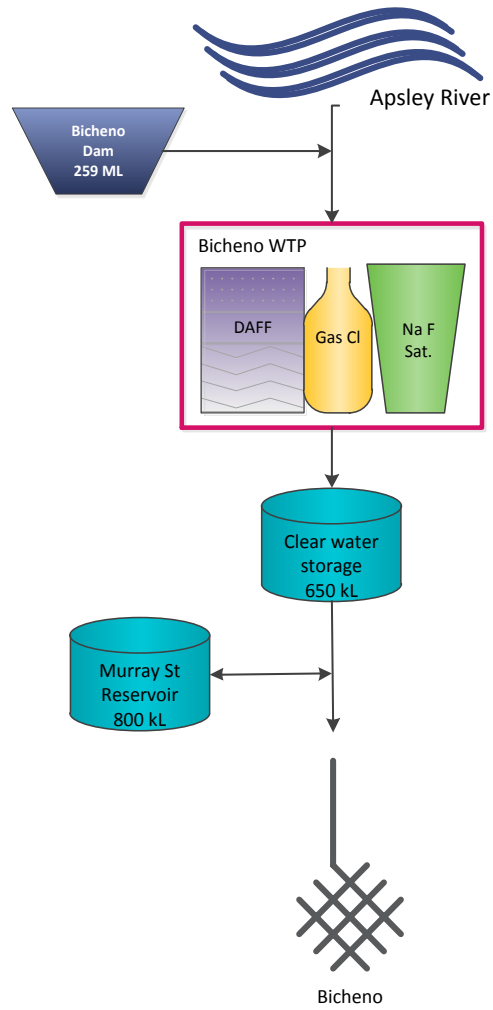


Figure 2.1-a Bicheno system schematic

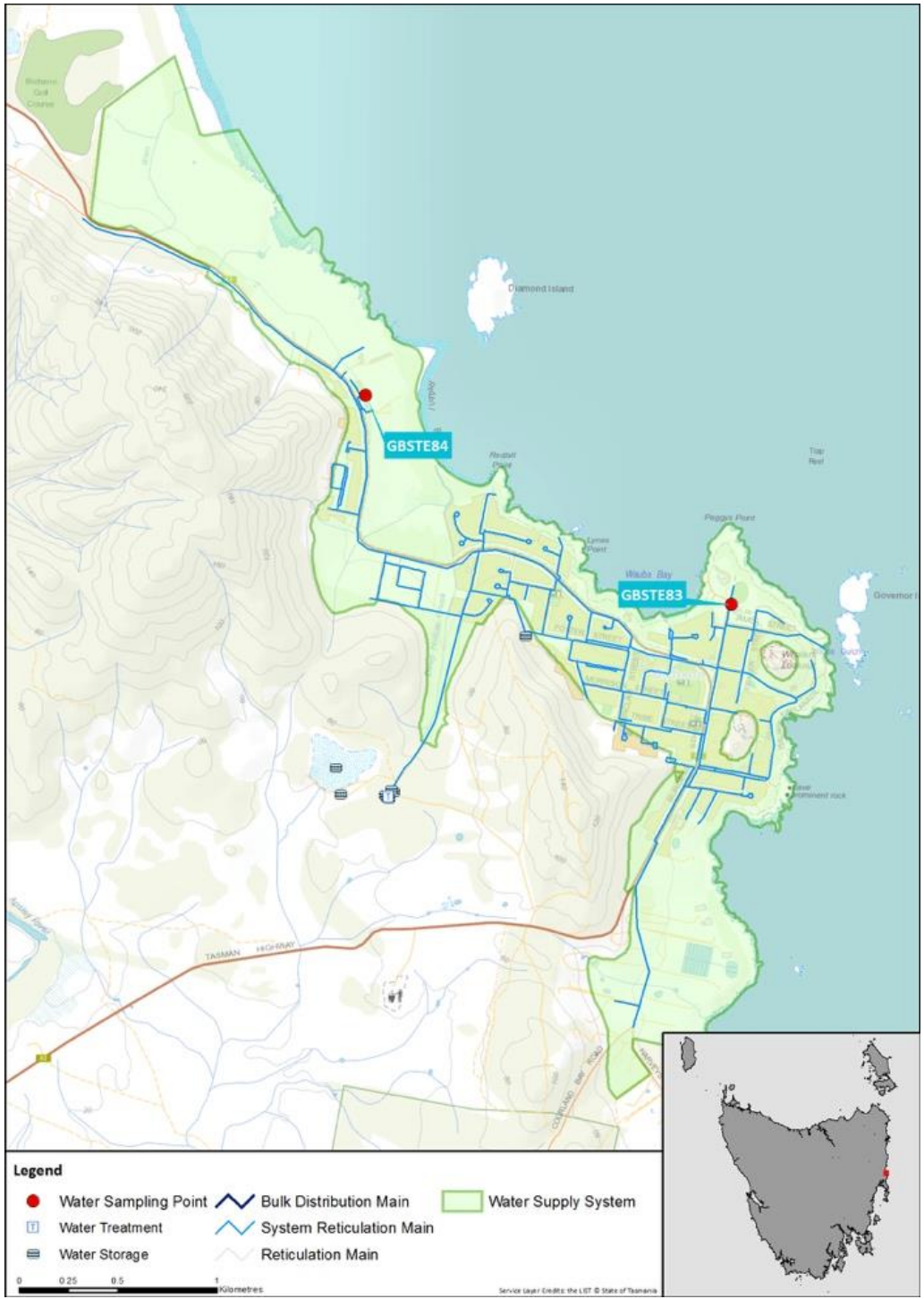


Figure 2.1-b Map of Bicheno monitoring system

2.2. Summary of annual reticulation compliance (2017–18)

Table 2.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Bicheno Primary School/Garden Tap	GBSTE83	W	Q	Q	Q	n/a
Bicheno/47 Tasman Hwy next to SPS	GBSTE84	n/a	n/a	n/a	n/a	n/a
Number Planned Samples		52	4	4	4	n/a
Number Samples Tested		52	4	4	4	n/a

2.3. Summary of current and historic performance (2013-18)

Table 2.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100.0%	100.0%	100.0%	100.0%	100.0%
Fluoride	n/a	n/a	100.0%	100.0%	100.0%
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

2.4. Analysis of current health performance (2017-18)

Table 2.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 2.4-b Fluoride operational performance

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	89.6% ³
Mean dose (mg/L)	0.87

Table 2.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	<0.0003	<0.0003	<0.0003
Barium	2	mg/L	4	0	100	0.003	0.002	0.003
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Copper	2	mg/L	4	0	100	0.0044	0.0042	0.0049
Lead	0.01	mg/L	4	0	100	0.0001	<0.0001	0.0002
Manganese	0.5	mg/L	4	0	100	0.0006	0.0004	0.0008
Mercury	0.001	mg/L	4	0	100	0.00016	<0.00003	0.00061
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	0.0001	<0.0001	0.0002
Selenium	0.01	mg/L	4	0	100	0.0003	<0.0001	0.0009

Table 2.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	4	0	100	1.5	1	2
Monochloroacetic acid	150	µg/L	4	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	4	0	100	2	1	3
Total trihalomethanes	250	µg/L	4	0	100	30.5	26	36

³ Fluoride dose system pump issues throughout FY2017-18 (DoH notified)

Table 2.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.2	0.01	0.47
Colour True	HU	15	1.75	<1	4
pH	Units	6.5 – 8.5	7.1	6.63	7.29
Turbidity	NTU	1	0.31	0.06	2.46

2.5. Analysis of overall system performance (2017-18)

Table 2.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

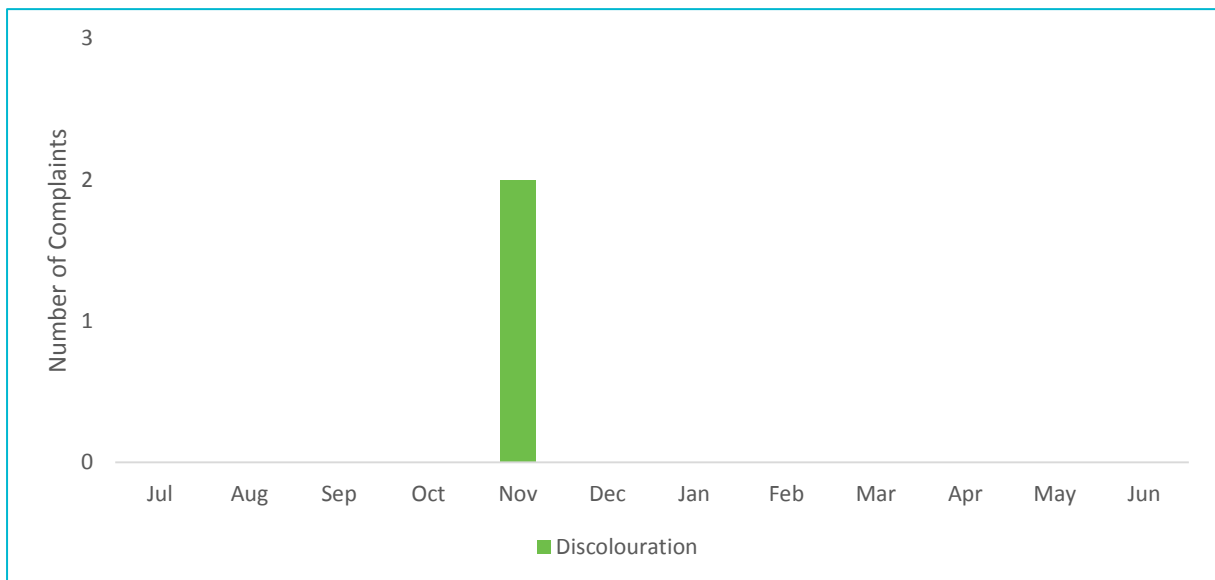


Figure 2.5-b Water quality customer complaints by month and type

3. Bothwell drinking water system

3.1. System summary (2017-18)

Bothwell drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	293
Population serviced	527
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	<input checked="" type="checkbox"/>	98.0%	52	0
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0
DBPs	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	9	Taste and Odour

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
Regional Towns Water Supply Program	Major WTP improvements	Not started	TBA	TBA

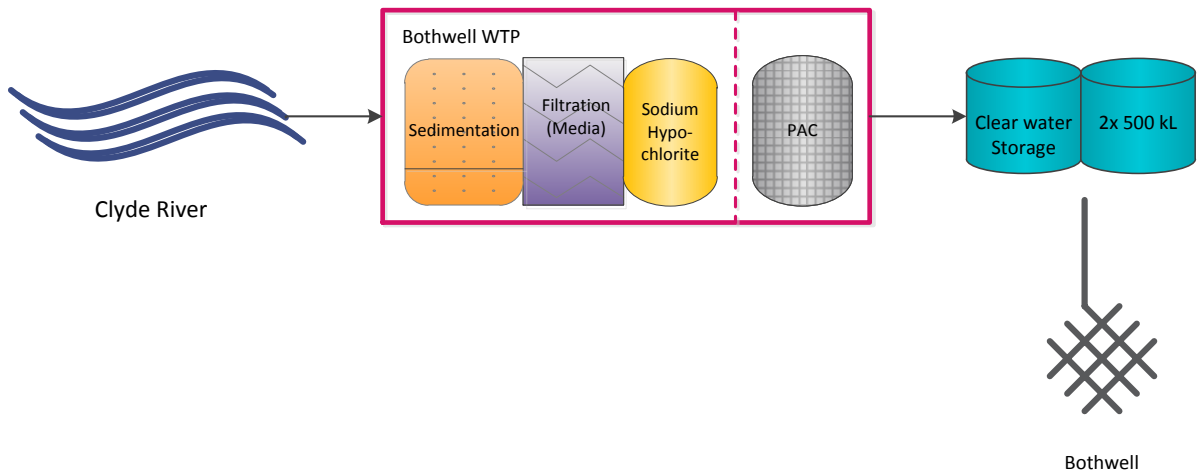


Figure 3.1-a Bothwell system schematic

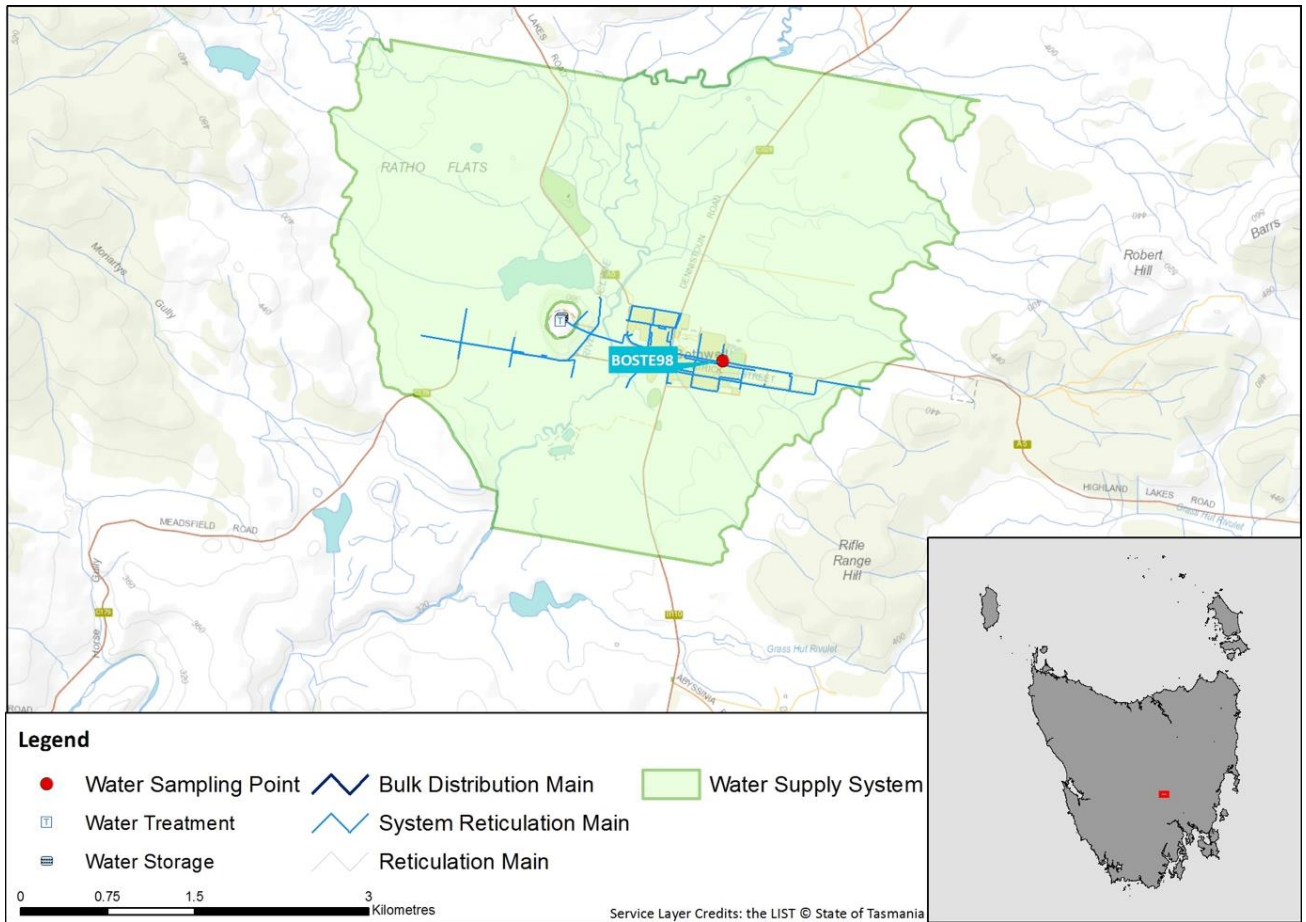


Figure 3.1-b Map of Bothwell monitoring system

3.2. Summary of annual reticulation compliance (2017–18)

Table 3.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Bothwell/Michael St, Sample Tap	BOSTE98	W	Q	Q	Q	n/a
Number Planned Samples		52	4	4	4	n/a
Number Samples Tested		52	4	4	4	n/a

3.3. Summary of current and historic performance (2013-18)

Table 3.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	99.5%	100.0%	100.0%	100.0%	100.0%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

3.4. Analysis of current health performance (2017-18)

Table 3.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 3.4-b Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	0.00019	<0.0003	0.0003
Barium	2	mg/L	4	0	100	0.019	0.017	0.024
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Copper	2	mg/L	4	0	100	0.00308	0.0012	0.0037
Lead	0.01	mg/L	4	0	100	0.00019	<0.0001	0.0003
Manganese	0.5	mg/L	4	0	100	0.0206	0.0023	0.0698
Mercury	0.001	mg/L	4	0	100	0.000021	<0.00003	0.00004
Molybdenum	0.05	mg/L	4	0	100	0.0001	<0.0001	0.0002
Nickel	0.02	mg/L	4	0	100	0.00065	0.0004	0.0011
Selenium	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001

Table 3.4-c Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	4	0	100	9	3	15
Monochloroacetic acid	150	µg/L	4	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	4	0	100	7.25	3	12
Total trihalomethanes	250	µg/L	4	0	100	73.5	45	99

Table 3.4-d General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.37	0.05	0.8
Colour True	HU	15	0.63	<1	1
pH	Units	6.5 – 8.5	7.08	6.25	7.72
Turbidity	NTU	1	0.51	0.13	4.47

3.5. Analysis of overall system performance (2017-18)

Table 3.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

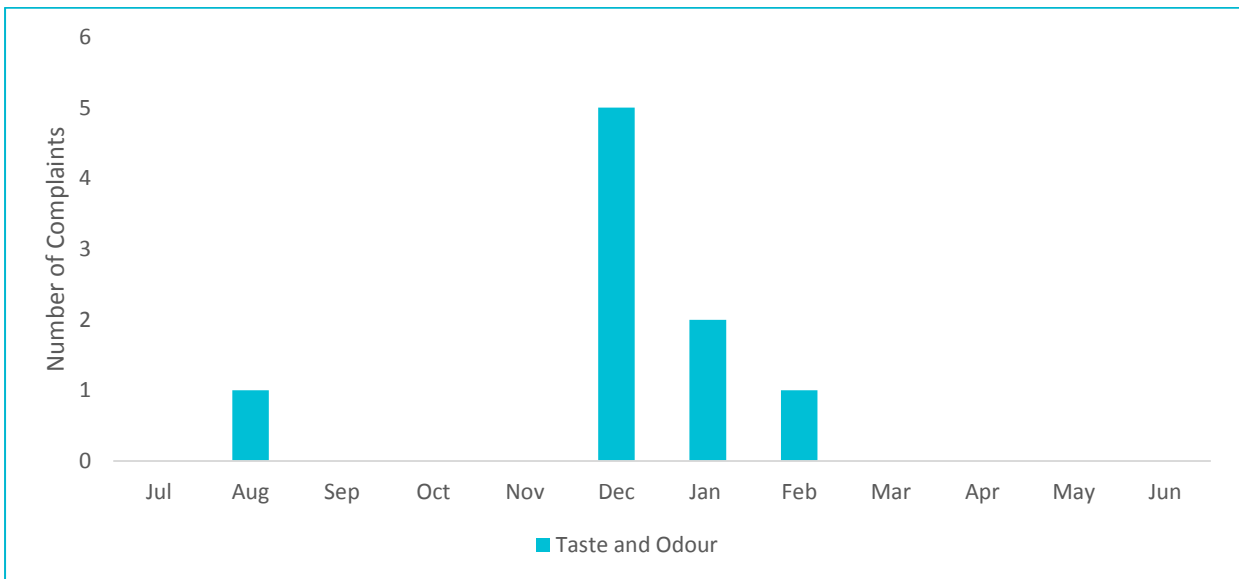


Figure 3.5-b Water quality customer complaints by month and type

4. Bracknell drinking water system

4.1. System summary (2017-18)

Bracknell drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	194
Population serviced	504
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	<input checked="" type="checkbox"/>	98.0%	52	0
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0
DBPs	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	0	

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
Regional Towns Water Supply Program	UV disinfection system	Not started	TBA	TBA

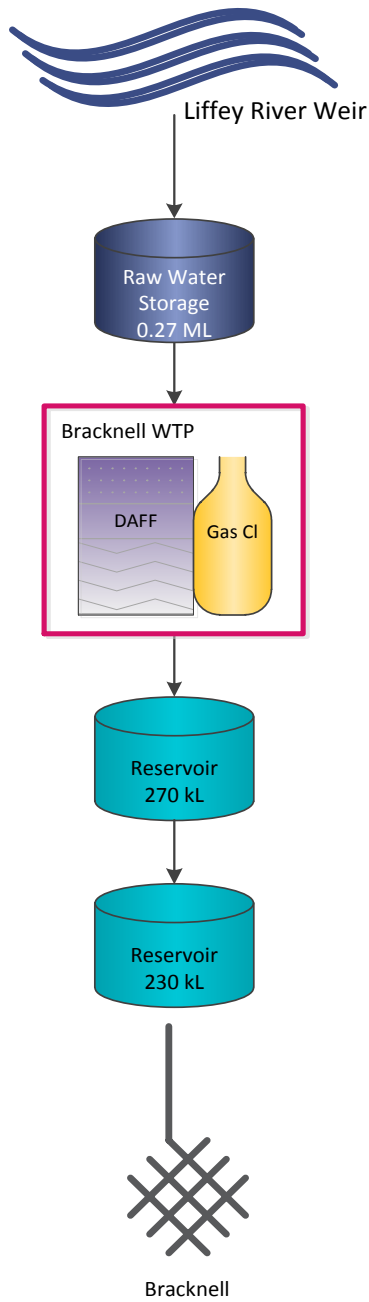


Figure 4.1-a Bracknell system schematic

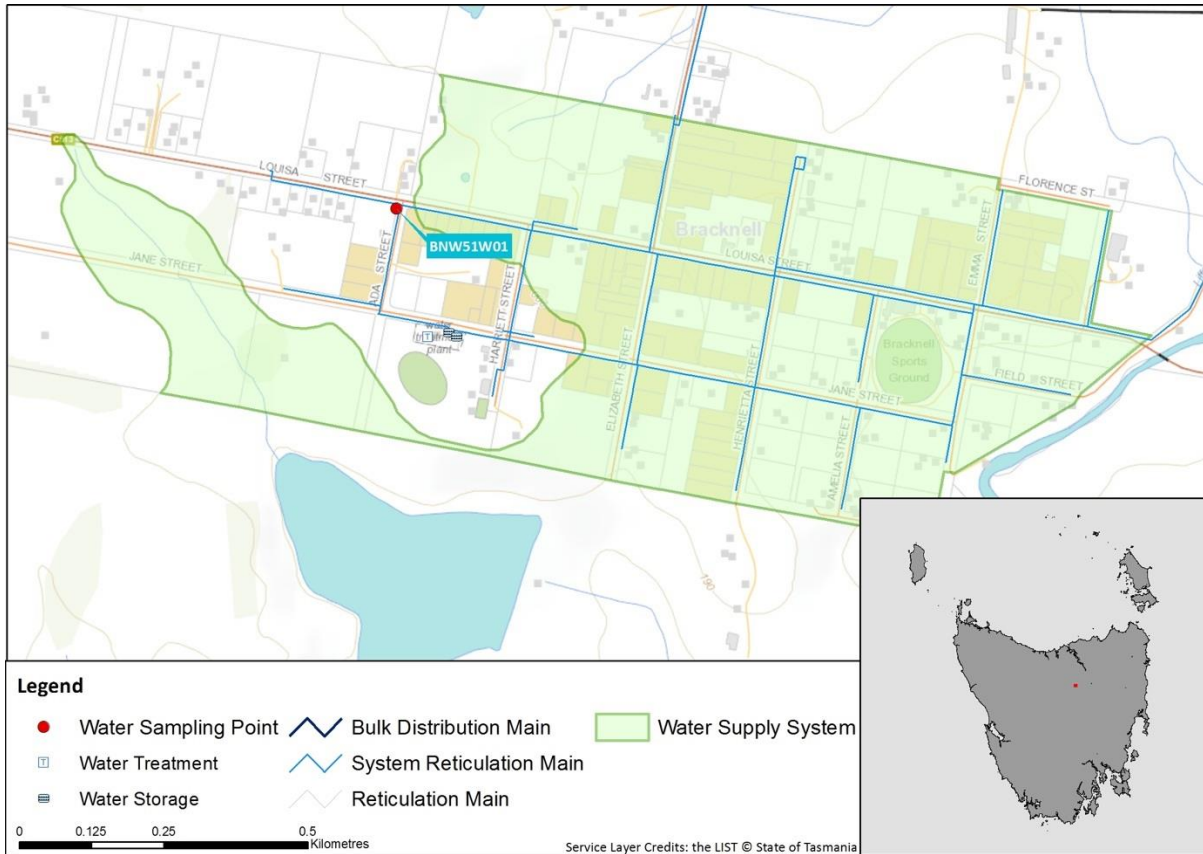


Figure 4.1-b Map of Bracknell monitoring system

4.2. Summary of annual reticulation compliance (2017–18)

Table 4.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Bracknell/Louisa Street	BNW51W01	W	Q	Q	Q	n/a
Number Planned Samples		52	4	4	4	n/a
Number Samples Tested		52	4	4	4	n/a

4.3. Summary of current and historic performance (2013-18)

Table 4.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100.0%	100.0%	100.0%	100.0%	100.0%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

4.4. Analysis of current health performance (2017-18)

Table 4.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 4.4-b Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	<0.0003	<0.0003	<0.0003
Barium	2	mg/L	4	0	100	0.007	0.005	0.008
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Copper	2	mg/L	4	0	100	0.00263	0.0018	0.0033
Lead	0.01	mg/L	4	0	100	0.0003	0.0002	0.0005
Manganese	0.5	mg/L	4	0	100	0.0023	0.0011	0.003
Mercury	0.001	mg/L	4	0	100	0.00004	<0.00003	0.00009
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	0.00022	0.0002	0.0003
Selenium	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001

Table 4.4-c Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	4	0	100	6.5	4	10
Monochloroacetic acid	150	µg/L	4	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	4	0	100	9.5	4	18
Total trihalomethanes	250	µg/L	4	0	100	17.25	14	24

Table 4.4-d General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.83	0.29	1.15
Colour True	HU	15	0.88	<1	2
pH	Units	6.5 – 8.5	7.39	6.55	8.1
Turbidity	NTU	1	0.26	0.08	0.88

4.5. Analysis of overall system performance (2017-18)

Table 4.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

5. Bridport drinking water system

5.1. System summary (2017-18)

Bridport drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	1153
Population serviced	1499
Fluoride	Fluorosilicic acid

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	<input checked="" type="checkbox"/>	98.0%	104	0
Fluoride	100.0%	<input checked="" type="checkbox"/>	100.0%	311	0
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0
DBPs	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	13	Discolouration

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
Bridport Fluoride Upgrade	Upgrade to fluoride dosing station	In progress	June 2019	\$118,000
Regional Towns Water Supply Program	Upgrade UV disinfection system	Not started	TBA	TBA

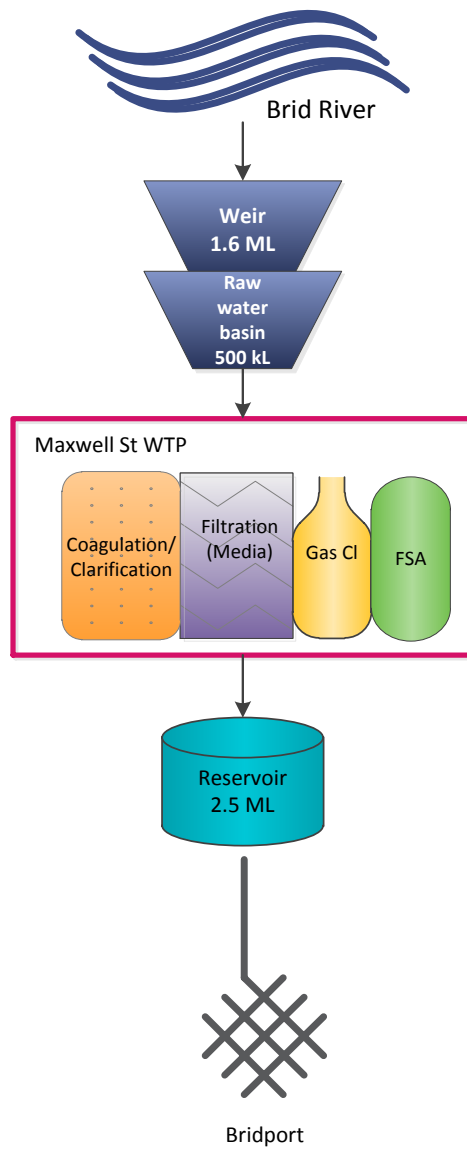


Figure 5.1-a Bridport system schematic



Figure 5.1-b Map of Bridport monitoring system

5.2. Summary of annual reticulation compliance (2017–18)

Table 5.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Bridport/Visitor Centre	BRW51W01	W	Q	Q	Q	n/a
Bridport/Old Pier Bentley St	BRW51W02	W	n/a	n/a	n/a	n/a
Number Planned Samples		104	4	4	4	n/a
Number Samples Tested		104	4	4	4	n/a

5.3. Summary of current and historic performance (2013-18)

Table 5.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100.0%	100.0%	100.0%	100.0%	100.0%
Fluoride	100.0%	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

5.4. Analysis of current health performance (2017-18)

Table 5.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 5.4-b Fluoride operational performance

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	92%
Mean dose (mg/L)	0.91
■ Compliant ■ Non-compliant	

Table 5.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	<0.0003	<0.0003	<0.0003
Barium	2	mg/L	4	0	100	0.016	0.015	0.018
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Copper	2	mg/L	4	0	100	0.0045	0.0031	0.0056
Lead	0.01	mg/L	4	0	100	0.00018	0.0001	0.0002
Manganese	0.5	mg/L	4	0	100	0.0214	0.011	0.0456
Mercury	0.001	mg/L	4	0	100	0.00007	<0.00003	0.00015
Molybdenum	0.05	mg/L	4	0	100	0.00006	<0.0001	0.0001
Nickel	0.02	mg/L	4	0	100	0.00038	0.0003	0.0004
Selenium	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001

Table 5.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	4	0	100	6.75	4	10
Monochloroacetic acid	150	µg/L	4	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	4	0	100	8	7	10
Total trihalomethanes	250	µg/L	4	0	100	73.25	58	100

Table 5.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.47	0	1.13
Colour True	HU	15	<1	<1	<1
pH	Units	6.5 – 8.5	7.29	6.75	7.9
Turbidity	NTU	1	0.34	0.06	1.76

5.5. Analysis of overall system performance (2017-18)

Table 5.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

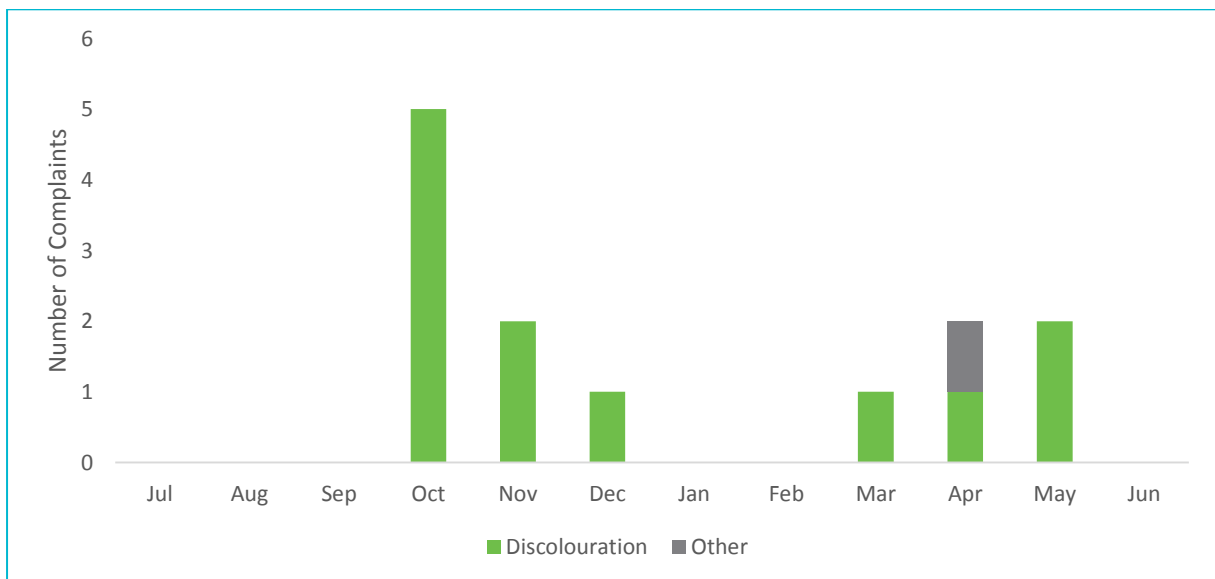







Figure 5.5-b Water quality customer complaints by month and type

6. Bronte Park drinking water system

6.1. System summary (2017-18)

Bronte Park drinking water system	
System status (as at 30 June 2018)	BWA
Total number of connections	50
Population serviced	25
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	90.4%		98.0%	52	5
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%		100.0%	4	0
DBPs	100.0%		100.0%	4	0

 Compliant  Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	5	<i>E. coli</i> exceedances
Public health warnings issued	1	Subject to PHA since 28/07/2016
Notifications made to DoH	5	<i>E. coli</i> exceedances
Customer complaints	0	

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
Regional Towns Water Supply Program	Upgrade to WTP and associated infrastructure	In progress	August 2018	\$2,989,919
Regional Towns Water Supply Program	Upgrade to reticulation network	In progress	August 2018	\$625,943

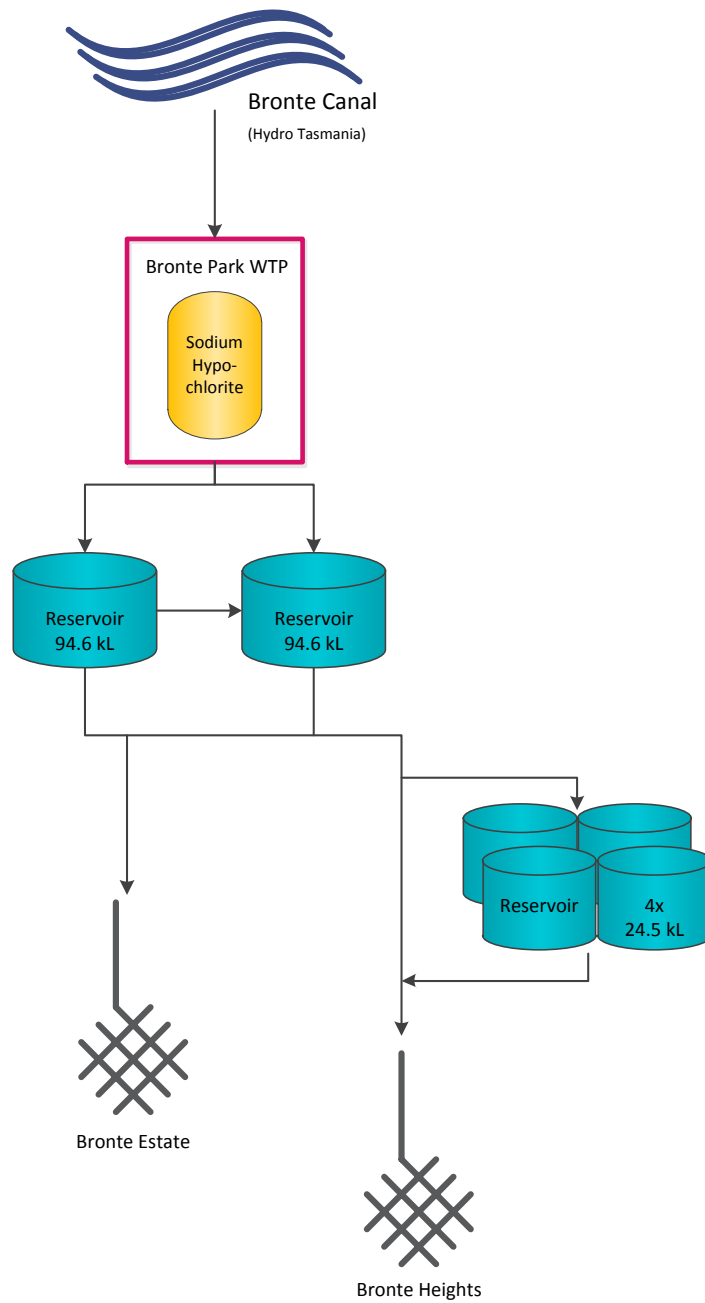


Figure 6.1-a Bronte Park system schematic

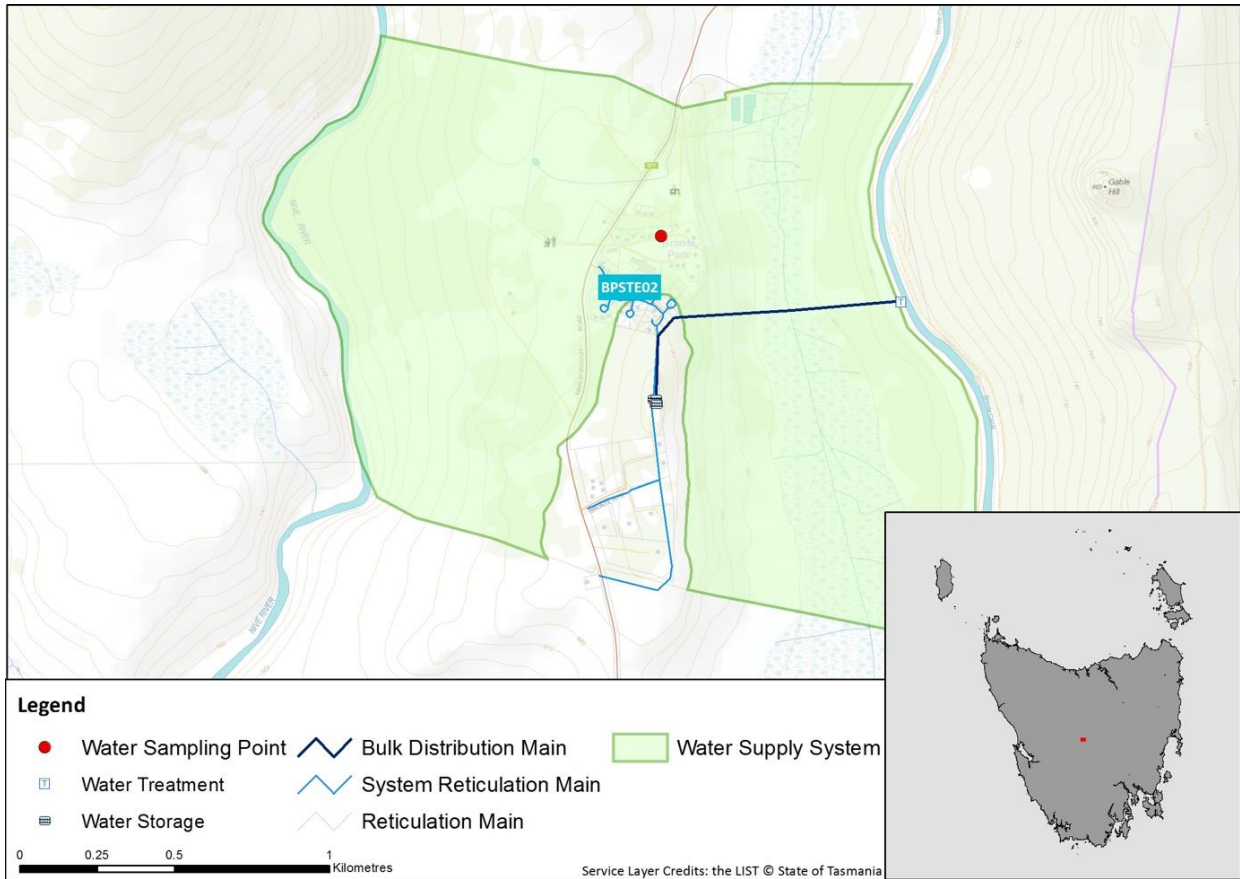


Figure 6.1-b Map of Bronte Park monitoring system

6.2. Summary of annual reticulation compliance (2017–18)

Table 6.2-a Sampling program

Planned compliance sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Bronte Park/Sample Tap	BPSTE02	W	Q	Q	Q	n/a
Number Planned Samples		52	4	4	4	n/a
Number Samples Tested		52	4	4	4	n/a

6.3. Summary of current and historic performance (2013-18)

Table 6.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	n/a	n/a	n/a	80.8%	90.4%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	n/a	n/a	n/a	100.0%	100.0%
Disinfection by products	n/a	n/a	n/a	91.7%	100.0%

■ Compliant ■ Non-compliant

6.4. Analysis of current health performance (2017-18)

Table 6.4-a Summary of health guideline exceedances

Summary of health guideline exceedances ⁴			
Parameter Exceeding	Date	Details	Resampled
<i>E. coli</i>	28/05/2018	Detection of 1 MPN/100mL at BPSTE02	☒
<i>E. coli</i>	04/06/2018	Detection of 4.1 MPN/100mL at BPSTE02	☒
<i>E. coli</i>	12/06/2018	Detection of 3 MPN/100mL at BPSTE02	☒
<i>E. coli</i>	18/06/2018	Detection of 3.1 MPN/100mL at BPSTE02	☒
<i>E. coli</i>	25/06/2018 10:48	Detection of 1 MPN/100mL at BPSTE03 (investigation sample)	☒
<i>E. coli</i>	25/06/2018 10:50	Detection of 6.3 MPN/100mL at BPSTE03 (investigation sample)	☒
<i>E. coli</i>	25/06/2018 10:57	Detection of 6.3 MPN/100mL at BPSTE02	☒

Figure 6.4-b Microbiological non-compliances by month

⁴ System subject to PHA, retesting not required.

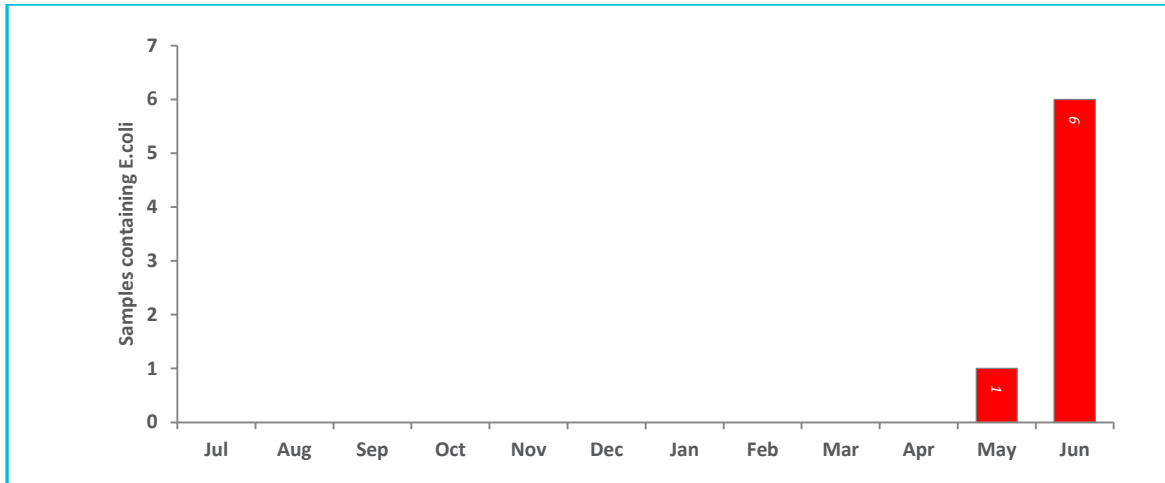


Table 6.4-e Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	<0.0003	<0.0003	<0.0003
Barium	2	mg/L	4	0	100	0.0007	0.0005	0.0008
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Copper	2	mg/L	4	0	100	0.00507	0.0041	0.0064
Lead	0.01	mg/L	4	0	100	0.0002	0.0001	0.0002
Manganese	0.5	mg/L	4	0	100	0.0039	0.0011	0.0085
Mercury	0.001	mg/L	4	0	100	<0.00003	<0.00003	0.00012
Molybdenum	0.05	mg/L	4	0	100	0.00006	<0.0001	0.0001
Nickel	0.02	mg/L	4	0	100	0.00006	<0.0001	0.0001
Selenium	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001

Table 6.4-f Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	4	0	100	16.8	4	40
Monochloroacetic acid	150	µg/L	4	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	4	0	100	49.3	33	65
Total trihalomethanes	250	µg/L	4	0	100	81	75	86

Table 6.4-g General physical performance

General physical parameters

Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.3	0	2.2
Colour True	HU	15	5.33	2	11
pH	Units	6.5 – 8.5	7.42	6.89	9.17
Turbidity	NTU	1	1.43	0.31	15.4

6.5. Analysis of overall system performance (2017-18)

Table 6.5-a Summary of system issues/public health warnings with notification details

Summary of system issues/public health warnings

Date	Description	DoH notification required	DoH notification complete
28/07/2016	PHA issued in FY2016-17 (current as of 30 June 2018) (part of Regional Towns Program)	✓	✓
28/05/2018	Weekly sample detected <i>E. coli</i> – system subject to PHA	✓	✓
04/06/2018	Weekly sample detected <i>E. coli</i> – system subject to PHA	✓	✓
12/06/2018	Weekly sample detected <i>E. coli</i> – system subject to PHA	✓	✓
18/06/2018	Weekly sample detected <i>E. coli</i> – system subject to PHA	✓	✓
25/06/2018 10:48	Investigation sample detected <i>E. coli</i> – system subject to PHA	✓	✓
25/06/2018 10:50	Investigation sample detected <i>E. coli</i> – system subject to PHA	✓	✓
25/06/2018 10:57	Weekly sample detected <i>E. coli</i> – system subject to PHA	✓	✓

7. Cam River drinking water system

7.1. System summary (2017-18)

Cam River drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	4516
Population serviced	9484
Fluoride	Fluorosilicic acid

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	<input checked="" type="checkbox"/>	98.0%	208	0
Fluoride	100.0%	<input checked="" type="checkbox"/>	100.0%	104	0
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	8	0
DBPs	100.0%	<input checked="" type="checkbox"/>	100.0%	8	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	32	Discolouration, taste & odour and other

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
No projected capital investment				

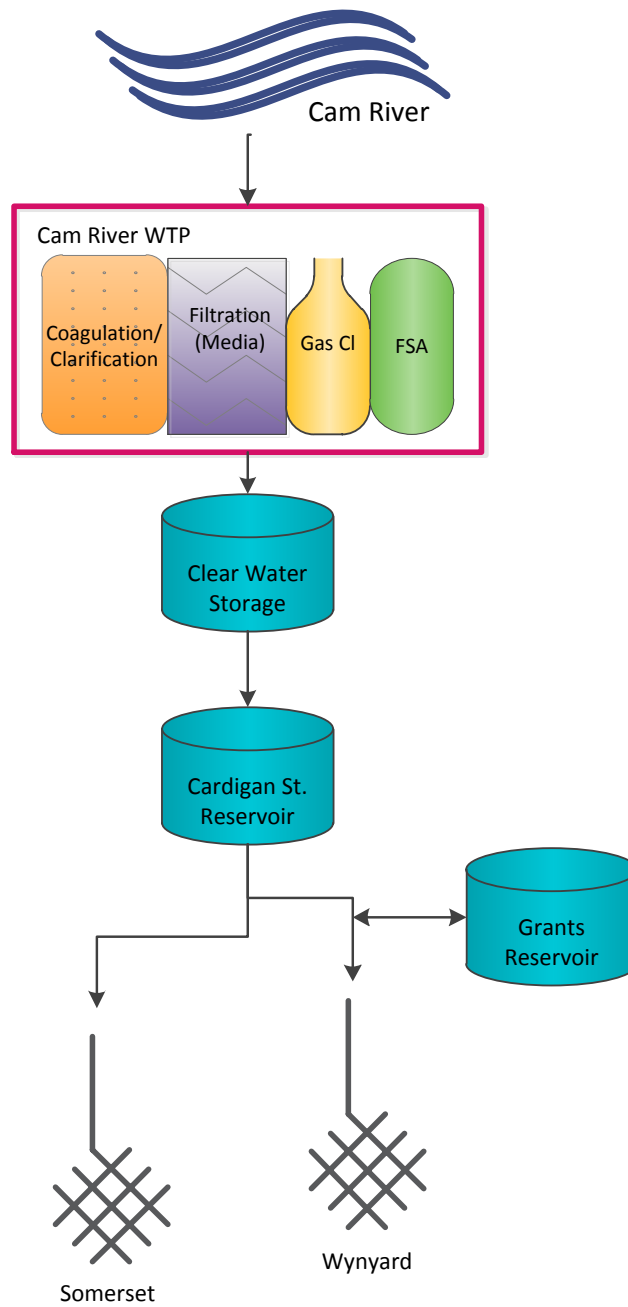


Figure 7.1-a Cam River system schematic



Figure 7.1-b Map of Cam River monitoring system

7.2. Summary of annual reticulation compliance (2017–18)

Table 7.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Wynyard/Wynyard Grants Reservoir	033WYSP0002	W	n/a	n/a	n/a	n/a
Somerset/Murchison Highway Sampling Point	034SSSP0007	W	n/a	n/a	n/a	n/a
Somerset/Somerset Surf Club	034SSSP0008	W	Q	Q	n/a	n/a
Wynyard/Big Creek Sampling Point	034WYSP0002	W	Q	Q	Q	n/a
Number Planned Samples		208	8	8	4	n/a
Number Samples Tested		208	8	8	4	n/a

7.3. Summary of current and historic performance (2013-18)

Table 7.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	99.7%	99.7%	99.4%	100.0%	100.0%
Fluoride	n/a	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

7.4. Analysis of current health performance (2017-18)

Table 7.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 7.4-b Fluoride operational performance

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	93.6%
Mean dose (mg/L)	0.89

■ Compliant ■ Non-compliant

Table 7.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	8	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	8	0	100	0.00071	<0.0003	0.0037
Barium	2	mg/L	8	0	100	0.007	0.006	0.008
Cadmium	0.002	mg/L	8	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	8	0	100	0.00018	<0.0001	0.0003
Copper	2	mg/L	8	0	100	0.00205	0.0006	0.0032
Lead	0.01	mg/L	8	0	100	0.00036	<0.0001	0.0009
Manganese	0.5	mg/L	8	0	100	0.0039	0.0014	0.0074
Mercury	0.001	mg/L	8	0	100	0.000122	<0.00003	0.00028
Molybdenum	0.05	mg/L	8	0	100	0.00006	<0.0001	0.0001
Nickel	0.02	mg/L	8	0	100	0.00041	<0.0001	0.0007
Selenium	0.01	mg/L	8	0	100	0.00006	<0.0001	0.0001

Table 7.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	8	0	100	7.13	3	11
Monochloroacetic acid	150	µg/L	8	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	8	0	100	8.75	3	19
Total trihalomethanes	250	µg/L	8	0	100	44.25	33	57

Table 7.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.64	0.12	1.13
Colour True	HU	15	<1	<1	<1
pH	Units	6.5 – 8.5	7.48	7.07	7.86
Turbidity	NTU	1	0.37	0.14	0.98

7.5. Analysis of overall system performance (2017-18)

Table 7.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

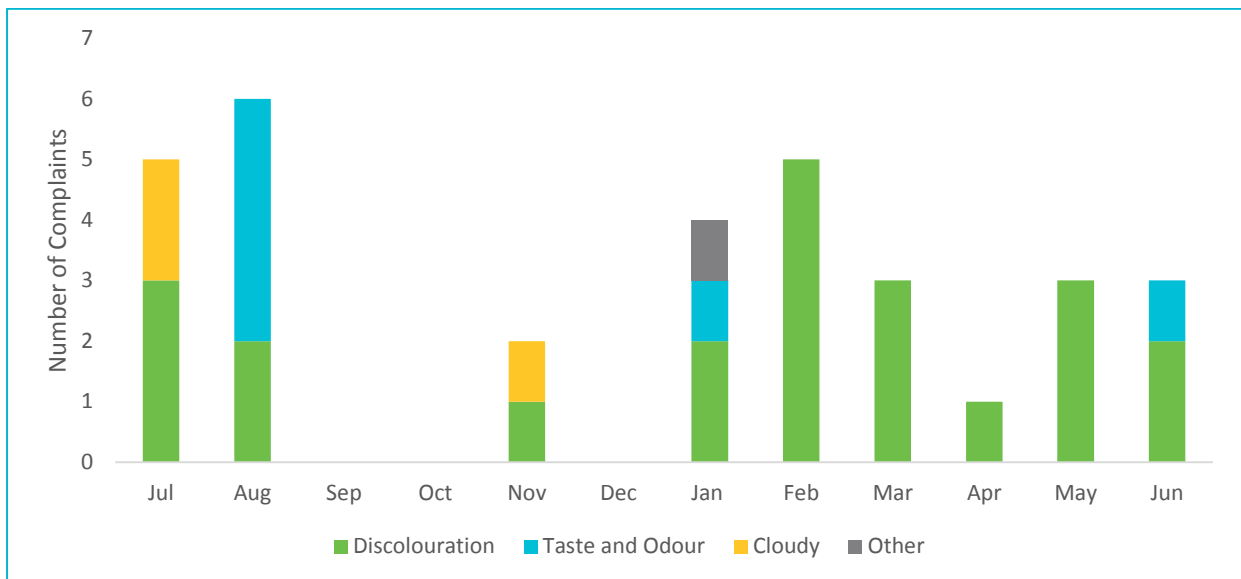


Figure 7.5-b Water quality customer complaints by month and type

8. Campbell Town drinking water system

8.1. System summary (2017-18)

Campbell Town drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	843
Population serviced	1602
Fluoride	Sodium Fluoride

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	☑	98.0%	104	0
Fluoride	100.0%	☑	100.0%	362	0
Metals	100.0%	☑	100.0%	4	0
DBPs	100.0%	☑	100.0%	4	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	3	Discolouration, taste & odour

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
Campbell Town WTP	Fluoride analyser and mixer	Complete	December 2017	\$20,000

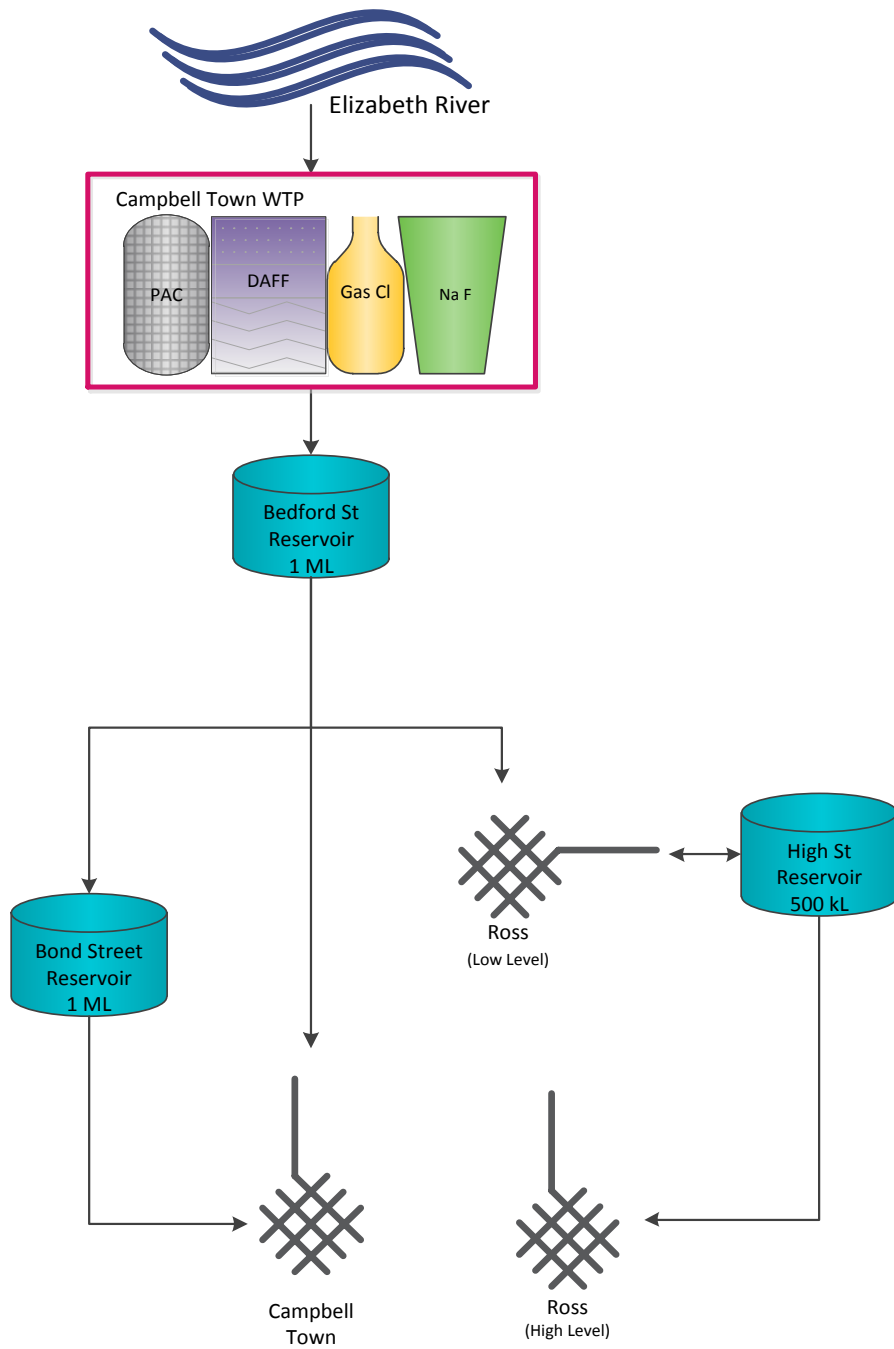


Figure 8.1-a Campbell Town system schematic

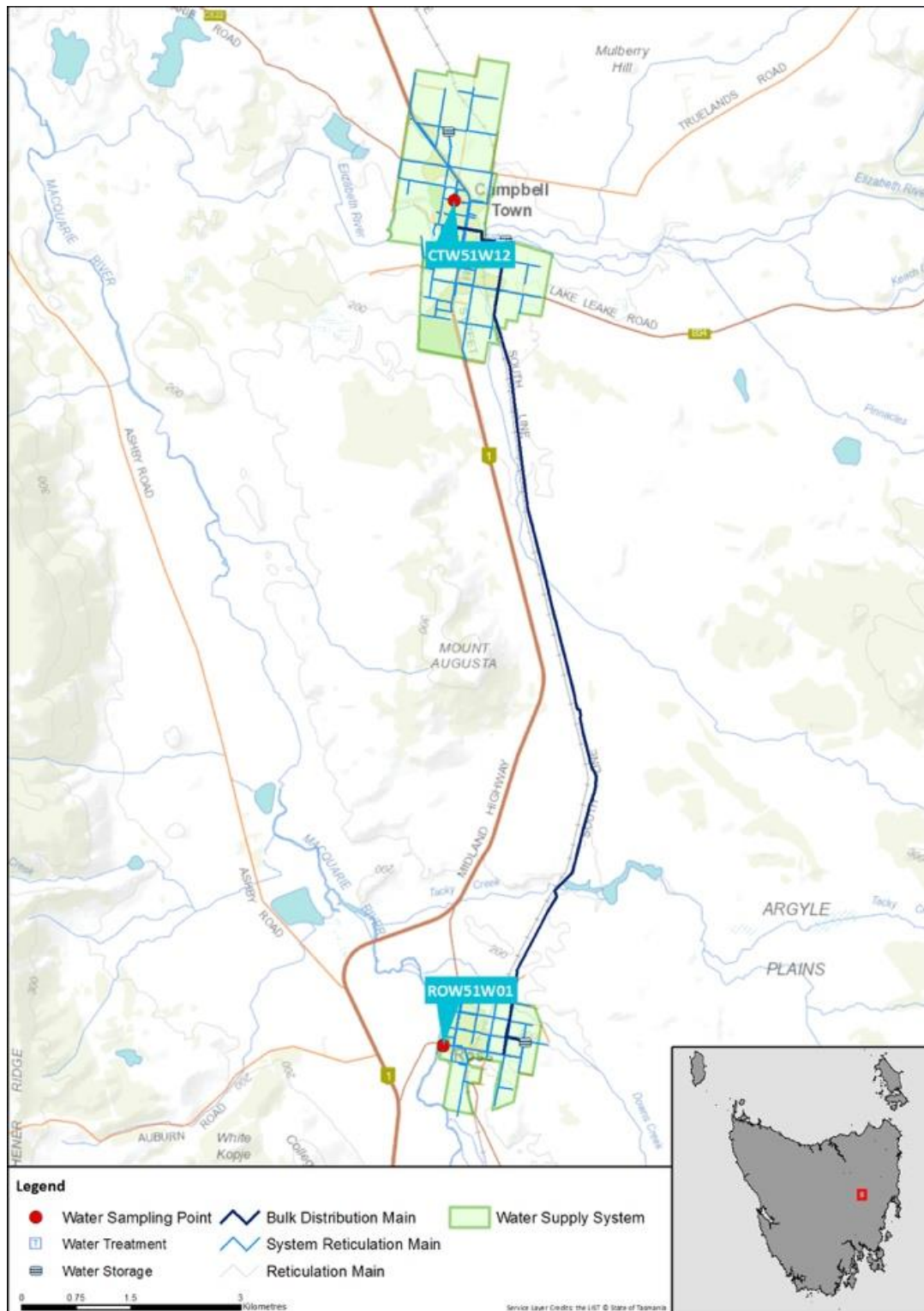


Figure 8.1-b Map of Campbell Town monitoring system

8.2. Summary of annual reticulation compliance (2017–18)

Table 8.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Campbell Town/Cnr Bridge St & Hamilton St (#2)	CTW51W12 ⁵	W	n/a	n/a	n/a	n/a
Ross/ Bridge St SPS	ROW51W01	W	Q	Q	Q	n/a
Number Planned Samples		104	4	4	4	n/a
Number Samples Tested		104	4	4	4	n/a

8.3. Summary of current and historic performance (2013-18)

Table 8.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100.0%	100.0%	100.0%	100.0%	100.0%
Fluoride	100.0%	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

8.4. Analysis of current health performance (2017-18)

Table 8.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

⁵ CTW51W01 replaced with CTW51W12 11/07/2017

Table 8.4-b Fluoride operational performance

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	98.1%
Mean dose (mg/L)	0.94
■ Compliant ■ Non-compliant	

Table 8.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	<0.0003	<0.0003	<0.0003
Barium	2	mg/L	4	0	100	0.01	0.007	0.016
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Copper	2	mg/L	4	0	100	0.00483	0.0022	0.0072
Lead	0.01	mg/L	4	0	100	0.00038	0.0002	0.0005
Manganese	0.5	mg/L	4	0	100	0.0017	0.0003	0.0027
Mercury	0.001	mg/L	4	0	100	0.000074	<0.00003	0.00011
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	0.00015	<0.0001	0.0003
Selenium	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001

Table 8.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	4	0	100	10.5	3	16
Monochloroacetic acid	150	µg/L	4	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	4	0	100	13	7	18
Total trihalomethanes	250	µg/L	4	0	100	67.5	59	82

Table 8.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.53	0.01	0.99
Colour True	HU	15	1.38	<1	4
pH	Units	6.5 – 8.5	7.39	6.74	7.76
Turbidity	NTU	1	0.32	0.06	7.72

8.5. Analysis of overall system performance (2017-18)

Table 8.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

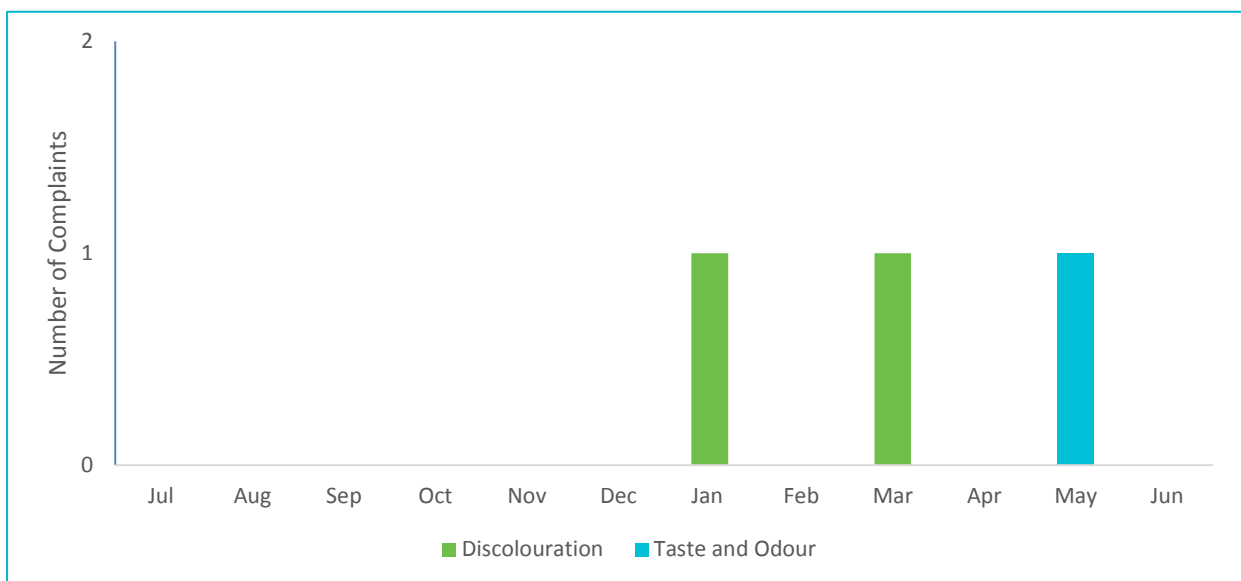


Figure 8.5-b Water quality customer complaints by month and type

9. Colebrook drinking water system

9.1. System summary (2017-18)

Colebrook drinking water system	
System status (as at 30 June 2018)	BWA
Total number of connections	99
Population serviced	208
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	<input checked="" type="checkbox"/>	98.0%	52	0
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0
DBPs	97.9%	<input type="checkbox"/>	100.0%	12	1

Compliant Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	1	Total Trihalomethane exceedance
Public health warnings issued	1	Subject to PHA since 7/6/2016
Notifications made to DoH	1	Total Trihalomethane exceedance
Customer complaints	1	Taste & Odour

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
Regional Towns Program	Transfer pipeline and associated infrastructure	In progress	August 2018	\$8,400,000
Regional Towns Program	Reticulation upgrade	In progress	August 2018	\$318,776

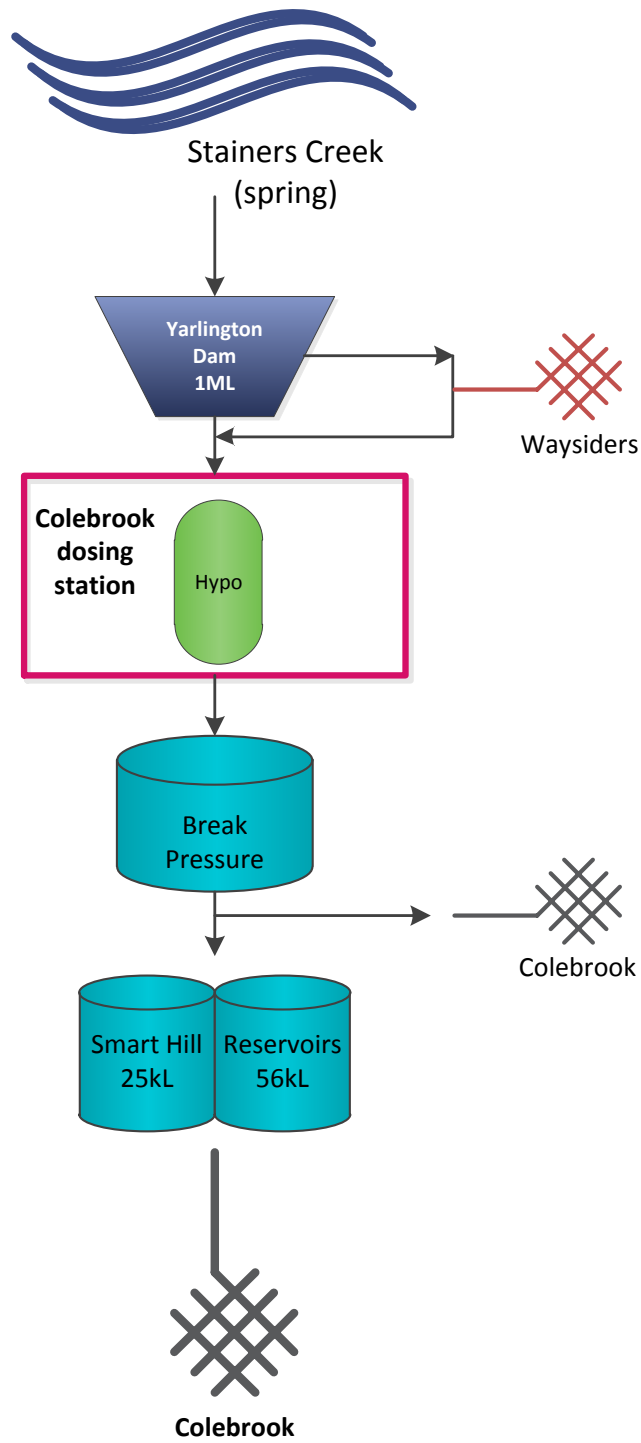


Figure 9.1-a Colebrook system schematic

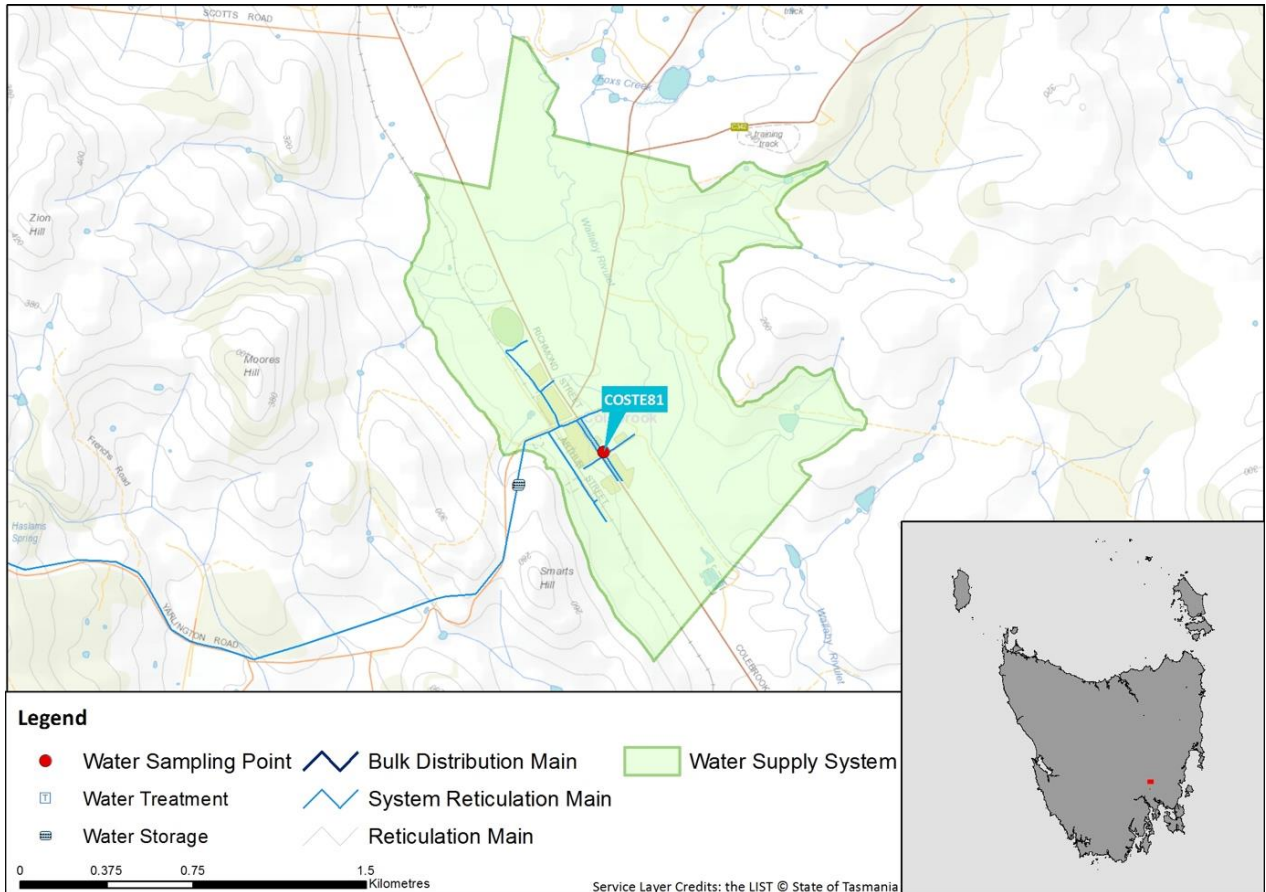


Figure 9.1-b Map of Colebrook monitoring system

9.2. Summary of annual reticulation compliance (2017–18)

Table 9.2-a Sampling program

Planned compliance sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Colebrook/14 Richmond Street	COSTE81	W	Q	M	Q	n/a
Number Planned Samples		52	4	12	4	n/a
Number Samples Tested		52	4	12	4	n/a

9.3. Summary of current and historic performance (2013-18)

Table 9.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	95.0%	98.1%	94.2%	100.0%	100.0%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	72.0%	62.8%	60.0%	100.0%	97.9%

■ Compliant ■ Non-compliant

9.4. Analysis of current health performance (2017-18)

Table 9.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
Total Trihalomethanes	6/02/2018	Exceedance of 251 µg/L at COSTE81	✓

Table 9.4-b Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	0.00025	<0.0003	0.0005
Barium	2	mg/L	4	0	100	0.005	0.003	0.006
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	0.00051	<0.0001	0.0012
Copper	2	mg/L	4	0	100	0.00646	0.0011	0.024
Lead	0.01	mg/L	4	0	100	0.00019	<0.0001	0.0007
Manganese	0.5	mg/L	4	0	100	0.0033	0.0008	0.0142
Mercury	0.001	mg/L	4	0	100	0.000059	<0.00003	0.00011
Molybdenum	0.05	mg/L	4	0	100	0.00016	<0.0001	0.0005
Nickel	0.02	mg/L	4	0	100	0.00044	<0.0001	0.0011
Selenium	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001

Table 9.4-c Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	12	0	100	34.9	<1	90
Monochloroacetic acid	150	µg/L	12	0	100	3.5	<3	12
Trichloroacetic acid	100	µg/L	12	0	100	33.7	7	55
Total trihalomethanes	250	µg/L	12	1	91.7	142.3	25	251

Table 9.4-d General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.4	0.01	1.34
Colour True	HU	15	1.83	<1	8
pH	Units	6.5 – 8.5	8.42	6.82	9.98 ⁶
Turbidity	NTU	1	1.39	0.2	3.13

9.5. Analysis of overall system performance (2017-18)

Table 9.5-a Summary of system issues/public health warnings with notification details

Summary of system issues/public health warnings			
Date	Description	DoH notification required	DoH notification complete
7/06/2016	PHA issued followed by an investigation that showed pH and turbidity issues in the raw water – added to Regional Towns Program (current as of 30 June 2018)	✓	✓
6/02/2018	Monthly sample detected a Total Trihalomethane exceedance at COSTE81. The system was resampled.	✓	✓

⁶ High pH and turbidity identified in raw water, treated with chlorine, however not able to mitigate adverse disinfection conditions with chlorine disinfection.

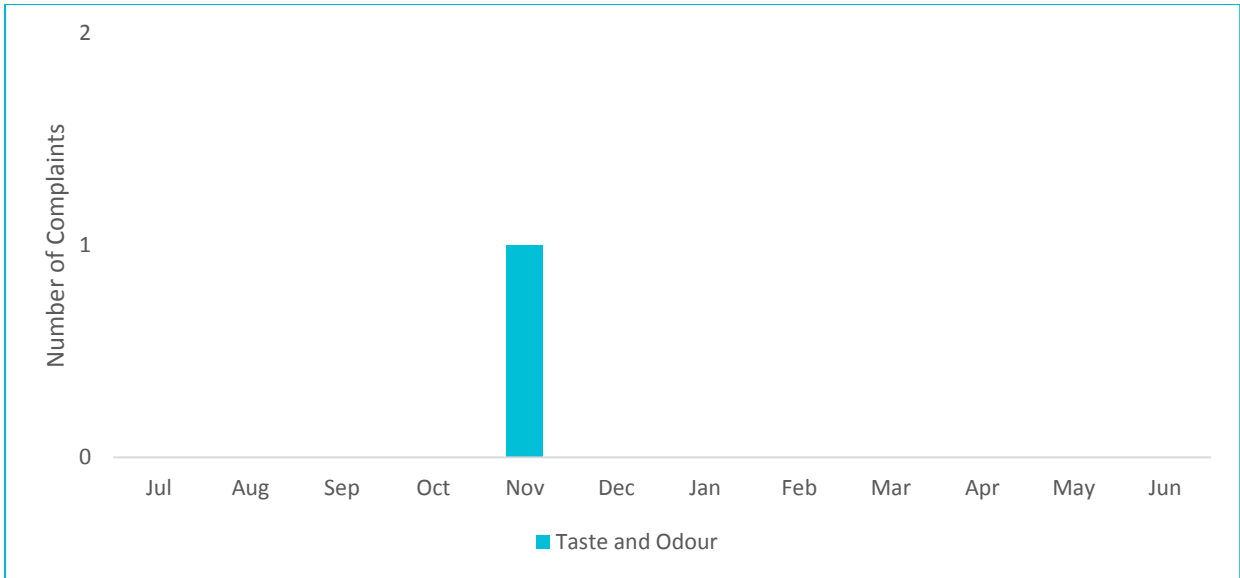


Figure 9.5-b Water quality customer complaints by month and type

10. Coles Bay drinking water system

10.1. System summary (2017-18)

Coles Bay drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	292
Population serviced	204
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	<input checked="" type="checkbox"/>	98.0%	52	0
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0
DBPs	87.5%	<input type="checkbox"/>	100.0%	12	6

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	6	Total Trihalomethane exceedances
Public health warnings issued	0	
Notifications made to DoH	6	Total Trihalomethane exceedances
Customer complaints	2	Discolouration

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
Regional Towns Water Supply Program	New WTP infrastructure	Not started	TBA	TBA

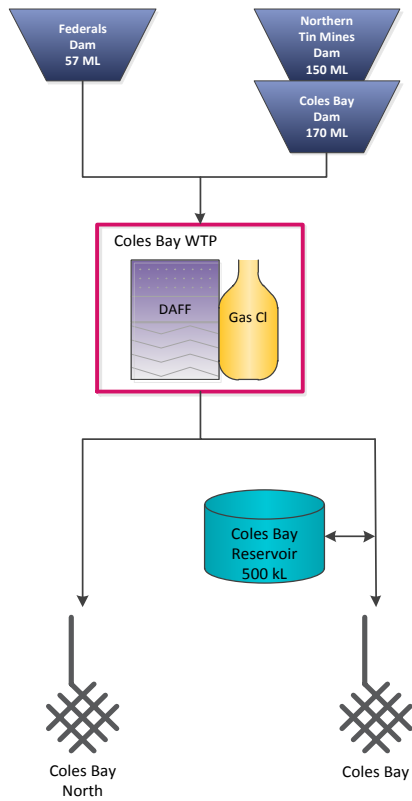


Figure 10.1-a Coles Bay system schematic

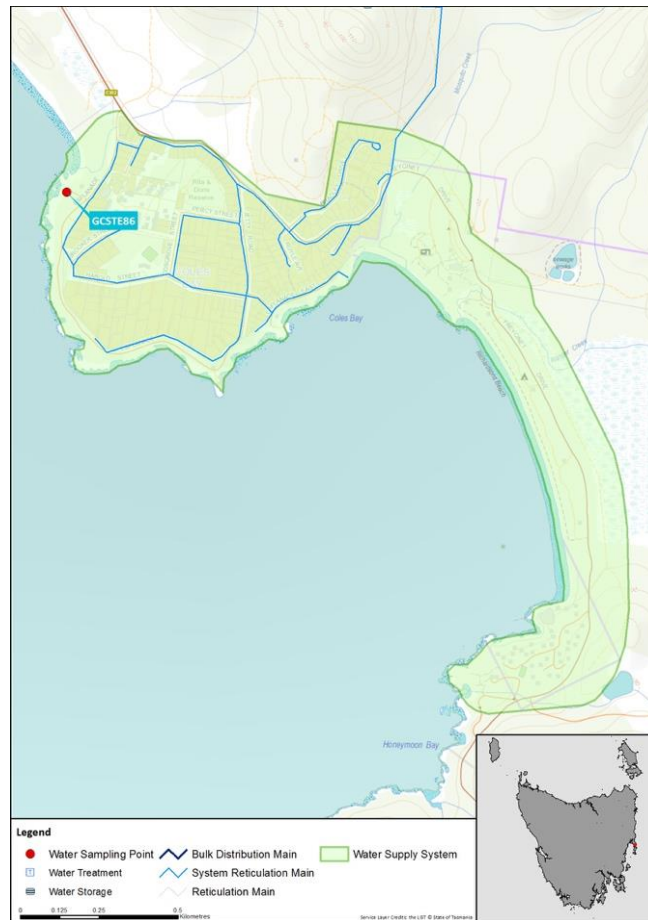


Figure 10.1-b Map of Coles Bay monitoring system

10.2. Summary of annual reticulation compliance (2017–18)

Table 10.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Coles Bay/Park Esp. NEW Sample Tap	GCSTE86	W	Q	M	Q	n/a
Number Planned Samples		52	4	12	4	n/a
Number Samples Tested		52	4	12	4	n/a

10.3. Summary of current and historic performance (2013-18)

Table 10.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	99.5%	100.0%	100.0%	100.0%	100.0%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	94.0%	90.0%	87.5% ⁷

■ Compliant ■ Non-compliant

⁷ Capital improvements identified to improve ongoing disinfection-by-product compliance

10.4. Analysis of current health performance (2017-18)

Table 10.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
Total Trihalomethane	14/11/2017	Exceedance of 271 µg/L at GCSTE86	✓
Total Trihalomethane	12/12/2017	Exceedance of 331 µg/L at GCSTE86	✓
Total Trihalomethane	13/02/2018	Exceedance of 335 µg/L at GCSTE86	✓
Total Trihalomethane	13/03/2018	Exceedance of 290 µg/L at GCSTE86	✓
Total Trihalomethane	10/04/2018	Exceedance of 283 µg/L at GCSTE86	✓
Total Trihalomethane	15/05/2018	Exceedance of 254 µg/L at GCSTE86	✓

Table 10.4-b Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	0.0003	<0.0003	0.0005
Barium	2	mg/L	4	0	100	0.004	0.003	0.006
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	0.00006	<0.0001	0.0001
Copper	2	mg/L	4	0	100	0.00148	0.0006	0.0021
Lead	0.01	mg/L	4	0	100	0.00018	0.0001	0.0003
Manganese	0.5	mg/L	4	0	100	0.0036	0.0011	0.0066
Mercury	0.001	mg/L	4	0	100	<0.00003	<0.00003	<0.00003
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	0.00014	<0.0001	0.0002
Selenium	0.01	mg/L	4	0	100	0.00011	<0.0001	0.0003

Table 10.4-c Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	12	0	100	18.4	5	46
Monochloroacetic acid	150	µg/L	12	0	100	<3	<3	9
Trichloroacetic acid	100	µg/L	12	0	100	27.1	7	49
Total trihalomethanes	250	µg/L	12	6	50	250.5	132	335

Table 10.4-d General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.29	0	1.15
Colour True	HU	15	2.25	2	3
pH	Units	6.5 – 8.5	7.18	6.67	7.98
Turbidity	NTU	1	0.6	0.2	1.65

10.5. Analysis of overall system performance (2017-18)

Table 10.5-a Summary of system issues/public health warnings

Summary of system issues/public health warnings				
Date	Type	Description	DoH notification required	DoH notification complete
14/11/2017	Exceedance	Monthly sample detected a Total Trihalomethane exceedance at GCSTE86. The system was resampled.	✓	✓
12/12/2017	Exceedance	Monthly sample detected a Total Trihalomethane exceedance at GCSTE86. The system was resampled.	✓	✓
13/02/2018	Exceedance	Monthly sample detected a Total Trihalomethane exceedance at GCSTE86. The system was resampled.	✓	✓
13/03/2018	Exceedance	Monthly sample detected a Total Trihalomethane exceedance at GCSTE86. The system was resampled.	✓	✓
10/04/2018	Exceedance	Monthly sample detected a Total Trihalomethane exceedance at GCSTE86. The system was resampled.	✓	✓
15/05/2018	Exceedance	Monthly sample detected a Total Trihalomethane exceedance at GCSTE86. The system was resampled.	✓	✓

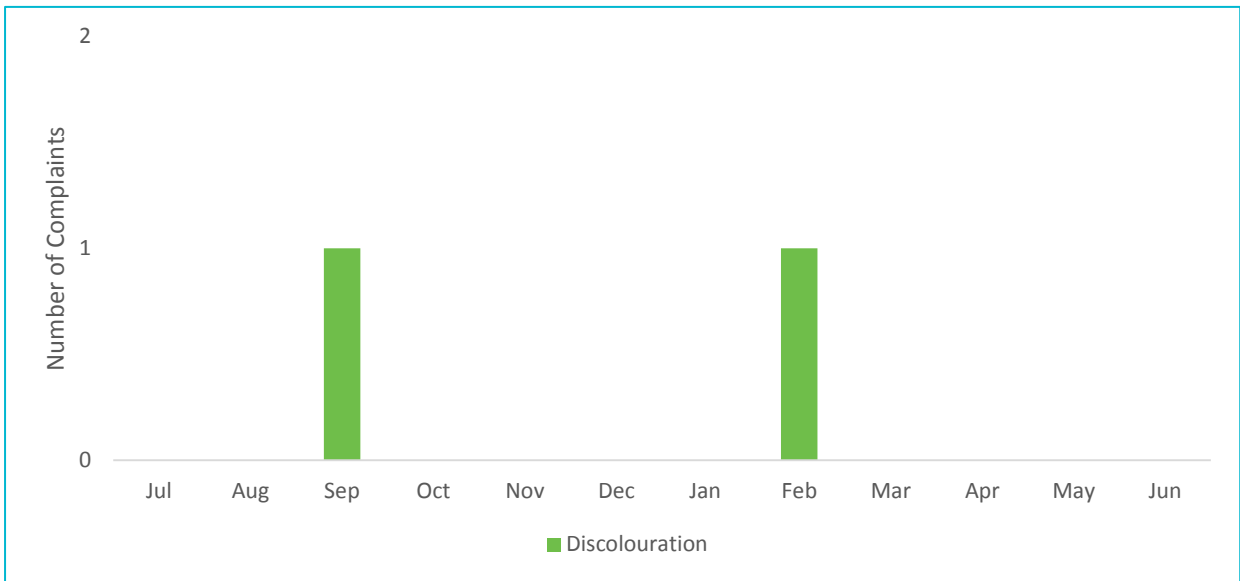


Figure 10.5-b Water quality customer complaints by month and type

11. Conara drinking water system

11.1. System summary (2017-18)

Conara drinking water system	
System status (as at 30 June 2018)	BWA
Total number of connections	46
Population serviced	133
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	98.1%	<input checked="" type="checkbox"/>	98.0%	53	1
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0
DBPs	87.5%	<input type="checkbox"/>	100.0%	4	2

Compliant Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	3	<i>E. coli</i> and Trichloroacetic acid exceedances
Public health warnings issued	1	Subject to PHA since 2011
Notifications made to DoH	3	<i>E. coli</i> and Trichloroacetic acid exceedances
Customer complaints	0	

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend (\$'000)
Regional Towns Water Supply Program	Conara WTP and associated upgrades	In progress	August 2018	\$5,572,919
Regional Towns Water Supply Program	Conara Reticulation upgrade	In progress	August 2018	\$1,145,472

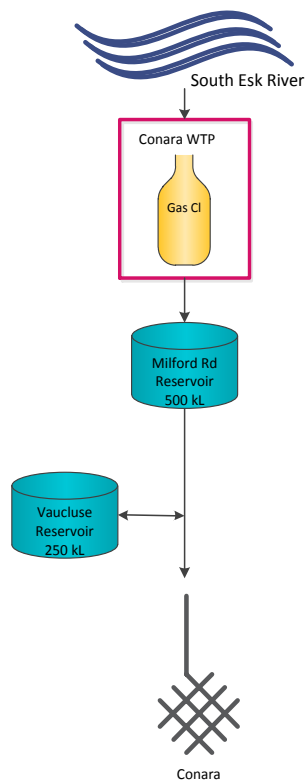


Figure 11.1-a Conara system schematic

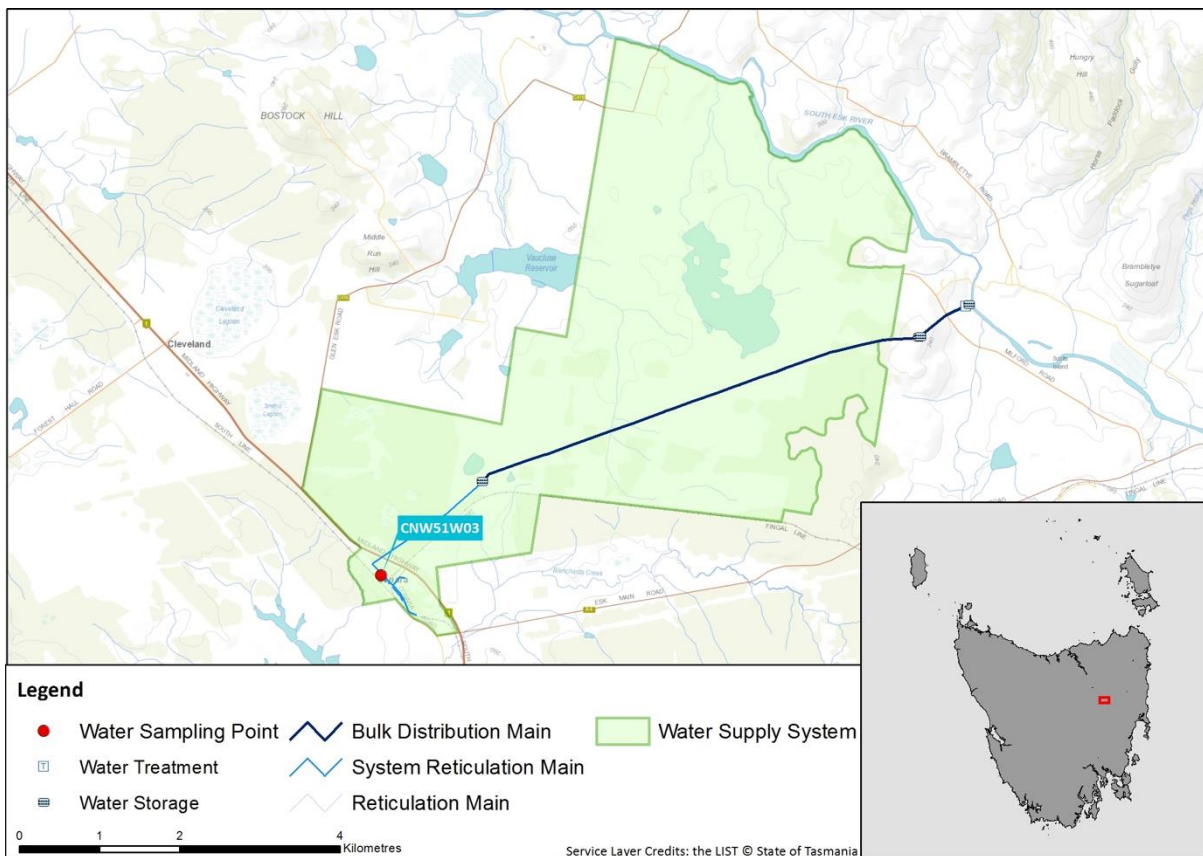


Figure 11.1-b Map of Conara monitoring system

11.2. Summary of annual reticulation compliance (2017–18)

Table 11.2-a Sampling program

Planned compliance sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Conara/Conara Rd near SPS	CNW51W03	W	Q	Q	Q	n/a
Number Planned Samples		52	4	4	4	n/a
Number Samples Tested		53	4	4	4	n/a

11.3. Summary of current and historic performance (2013-18)

Table 11.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100%	100%	100%	100%	98.1%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100%	100%	100%	97.9%	100.0%
Disinfection by products	100%	100%	81.0%	75.0%	87.5% ⁸

■ Compliant ■ Non-compliant

11.4. Analysis of current health performance (2017-18)

Table 11.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
<i>E. coli</i>	27/02/2018	<i>E. coli</i> of 25.9 MPN/100mL in weekly compliance sample	✓
Trichloroacetic acid	12/06/2018	Trichloroacetic acid exceedance of 130 µg/L in compliance sample	✓

⁸ Planned improvements to WTP to improve disinfection of raw water when turbidity increases during flood events and improve disinfection-by-product compliance

Trichloroacetic acid	01/09/2017	Trichloroacetic acid exceedance of 157 µg/L in compliance sample	✓
Dichloroacetic acid	15/08/2017	Exceedance of 130 µg/L in resample	☒
Trichloroacetic acid	15/08/2017	Exceedance of 162 µg/L in resample	☒

Figure 11.4-b Microbiological non-compliances by month

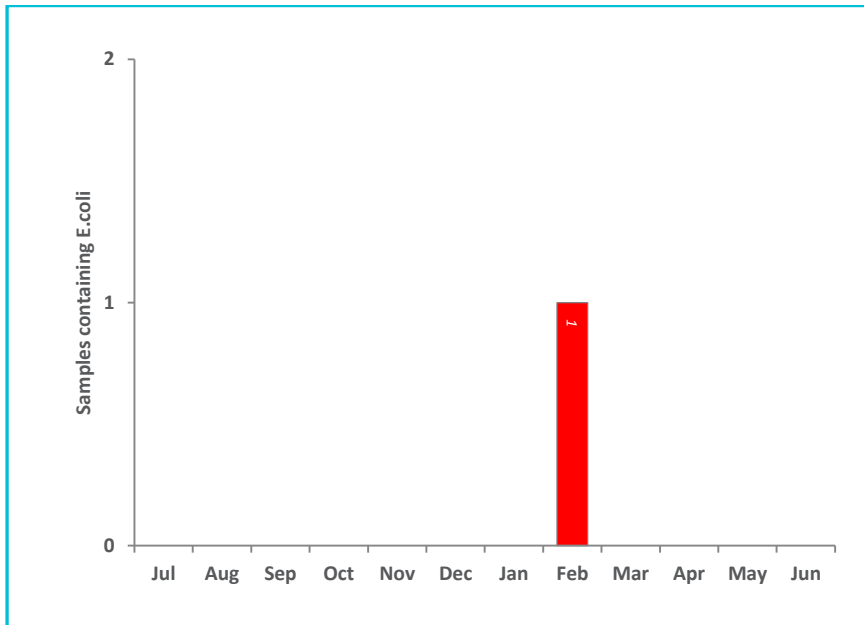


Table 11.4-c Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	0.00045	<0.0003	0.0005
Barium	2	mg/L	4	0	100	0.0070	0.0052	0.0082
Cadmium	0.002	mg/L	4	0	100	0.00035	0.0003	0.0007
Chromium	0.05	mg/L	4	0	100	0.00033	0.0001	0.0006
Copper	2	mg/L	4	0	100	0.0217	0.0146	0.0264
Lead	0.01	mg/L	4	0	100	0.0014	0.0012	0.0018
Manganese	0.5	mg/L	4	0	100	0.0195	0.0047	0.0507
Mercury	0.001	mg/L	4	0	100	0.000022	<0.00003	0.00005
Molybdenum	0.05	mg/L	4	0	100	0.00006	<0.0001	0.0001
Nickel	0.02	mg/L	4	0	100	0.00055	0.0004	0.0008
Selenium	0.01	mg/L	4	0	100	0.00006	<0.0001	0.0001

Table 11.4-d Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	4	0	100	42.4	<1	96
Monochloroacetic acid	150	µg/L	4	0	100	<3	<3	5
Trichloroacetic acid	100	µg/L	4	2	75	77.6	<1	157
Total trihalomethanes	250	µg/L	4	0	75	111.5	86	154

Table 11.4-e General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.51	0.01	1.91
Colour True	HU	15	10.44	<1	43
pH	Units	6.5 – 8.5	7.03	6.25	7.85
Turbidity	NTU	1	2.93	0.22	17.7

11.5. Analysis of overall system performance (2017-18)

Table 11.5-a Summary of system issues/public health warnings with notification details

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
12/06/2018	Quarterly sample detected Trichloroacetic acid at 130 µg/L at CNW51W03	✓	✓
27/02/2018	Weekly sample detected <i>E. coli</i> of 25.9 MPN/100mL at CNW51W03. The system is subject to PHA.	✓	✓
01/09/2017	Quarterly sample detected Trichloroacetic acid at 157 µg/L at CNW51W03	✓	✓
15/08/2017	Exceedance in resample Dichloroacetic acid 130 µg/L	✓	✓
15/08/2017	Exceedance in resample Trichloroacetic acid 162 µg/L	✓	✓

12. Cornwall drinking water system

12.1. System summary (2017-18)

Cornwall drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	46
Population serviced	83
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	92.9%	<input type="checkbox"/>	98.0%	14	1
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0
DBPs	n/a	n/a	n/a	n/a	n/a

Compliant Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	1	<i>E. coli</i> exceedance
Public health warnings issued	1	PHA removed 15 June 2018
Notifications made to DoH	1	<i>E. coli</i> exceedance
Customer complaints	1	Taste and Odour

Current and future planned capital investment					
Project	Overview	Progress	Est. Delivery	Est. Spend (\$'000)	
Regional Towns Water Supply Program	Cornwall WTP and associated upgrades	Completed	Completed	\$1,916,290	
Regional Towns Water Supply Program	Cornwall Reticulation upgrade	Completed	Completed	\$666,742	

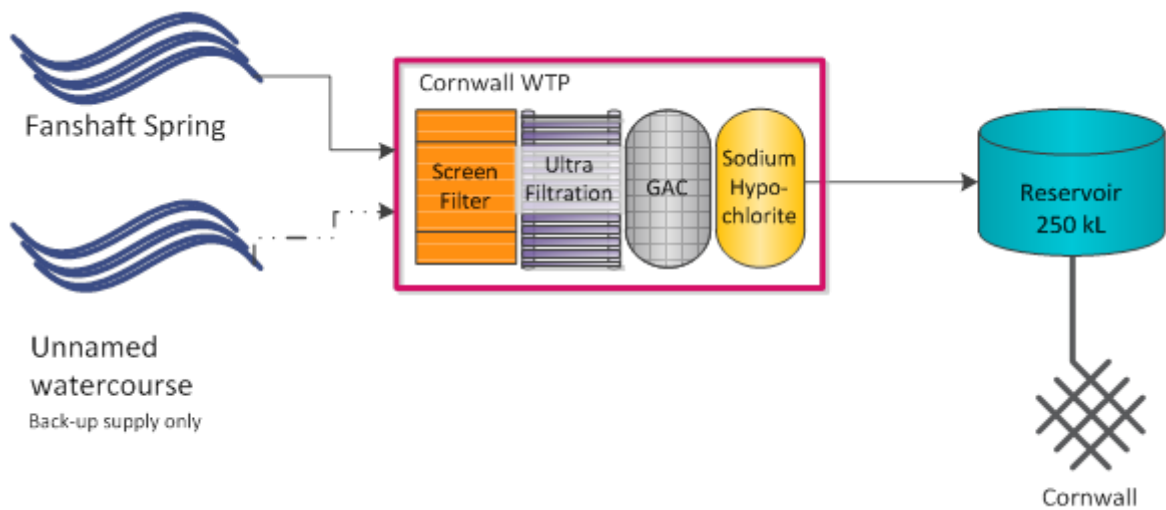


Figure 12.1-a Cornwall system schematic

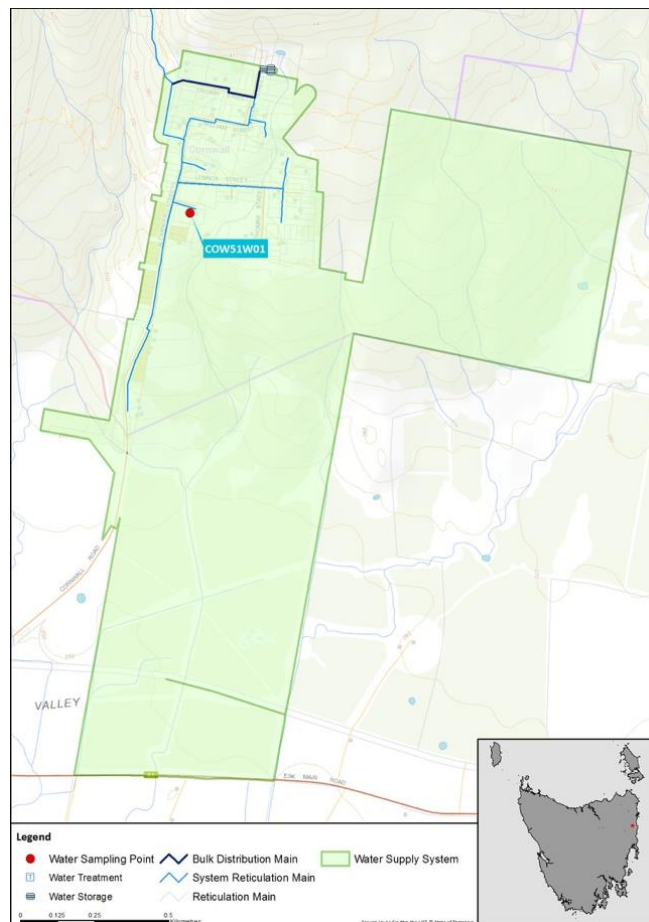


Figure 12.1-b Map of Cornwall monitoring system

12.2. Summary of annual reticulation compliance (2017–18)

Table 12.2-a Sampling program

Planned compliance sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Cornwall/Miners Park	COW51W01	M	Q	n/a	Q	n/a
Number Planned Samples		12	4	n/a	4	n/a
Number Samples Tested		12	4	n/a	4	n/a

12.3. Summary of current and historic performance (2013-18)

Table 12.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	64.0%	58.0%	67.0%	91.7%	92.9% ⁹
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	98.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	n/a	n/a	n/a	n/a	n/a

■ Compliant ■ Non-compliant

12.4. Analysis of current health performance (2017-18)

Table 12.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
<i>E. coli</i>	20/03/2018	<i>E. coli</i> of 4.1 MPN/100mL in monthly compliance sample	✓

⁹ System was subject to PHA when *E. coli* exceeded ADWG

Figure 12.4-b Microbiological non-compliances by month

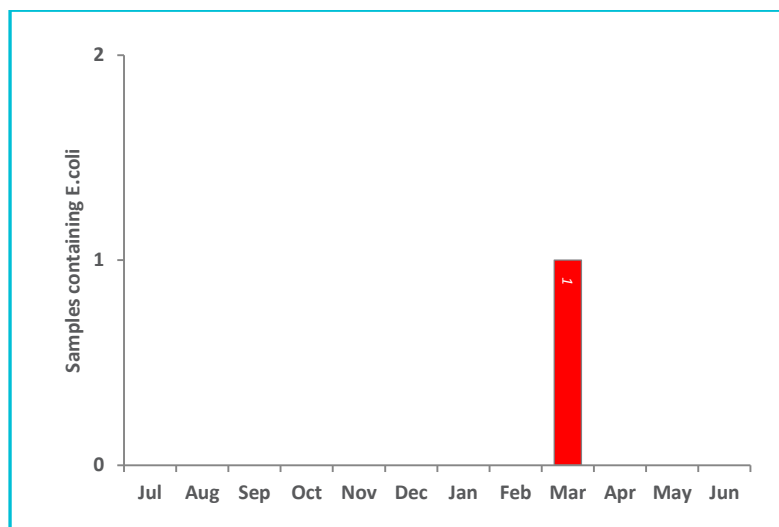


Table 12.4-c Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	14	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	14	0	100	0.0005	<0.0003	0.0008
Barium	2	mg/L	14	0	100	0.150	0.1249	0.1646
Cadmium	0.002	mg/L	14	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	14	0	100	0.00006	<0.0001	0.0002
Copper	2	mg/L	14	0	100	0.0075	0.007	0.03
Lead	0.01	mg/L	14	0	100	0.00055	0.0007	0.0022
Manganese	0.5	mg/L	14	0	100	0.0001	<0.0001	0.0005
Mercury	0.001	mg/L	14	0	100	<0.00003	<0.00003	<0.00003
Molybdenum	0.05	mg/L	14	0	100	0.00023	0.0005	0.0009
Nickel	0.02	mg/L	14	0	100	0.0001	<0.0001	0.0004
Selenium	0.01	mg/L	14	0	100	<0.0001	<0.0001	<0.0001

Table 12.4-d General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.79	0.62	1.06
Colour True	HU	15	1.1	<1	2
pH	Units	6.5 – 8.5	7.69	6.7	8.35

Turbidity	NTU	1	0.37	0	2.15
-----------	-----	---	------	---	------

12.5. Analysis of overall system performance (2017-18)

Table 12.5-a Summary of system issues/public health warnings with notification details

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
FY2017-18	The system was subject to PHA for many years and the majority of FY2017-18 – the PHA was removed by DoH on 15 June 2018	✓	✓
20/03/2018	Monthly sample detected <i>E. coli</i> of 4.1 MPN/100mL at COW51W01. The system was subject to PHA when the exceedance occurred.	✓	✓

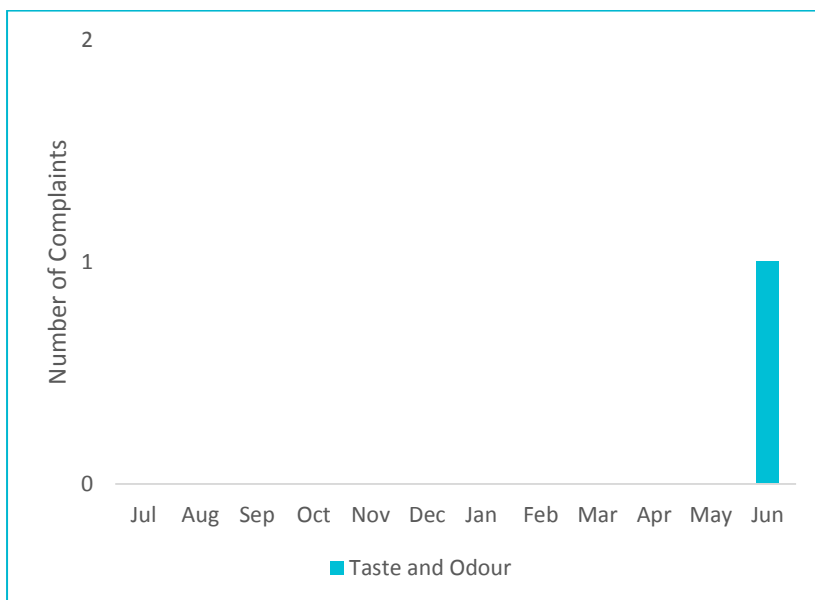


Figure 12.5-b Water quality customer complaints by month and type

13. Currie drinking water system

13.1. System summary (2017-18)

Currie drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	529
Population serviced	952
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	<input checked="" type="checkbox"/>	98.0%	104	0
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0
DBPs	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	0	

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
King Island Upgrade	WTP Upgrade, treated water reservoirs and pump station	In progress	May 2019	\$10,473,597

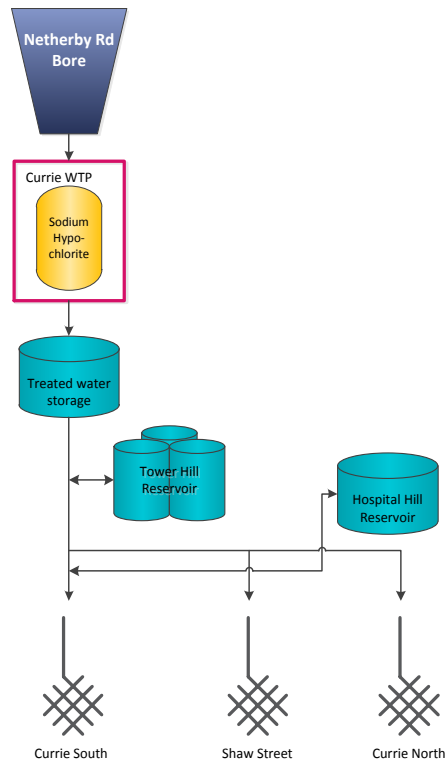


Figure 13.1-a Currie system schematic

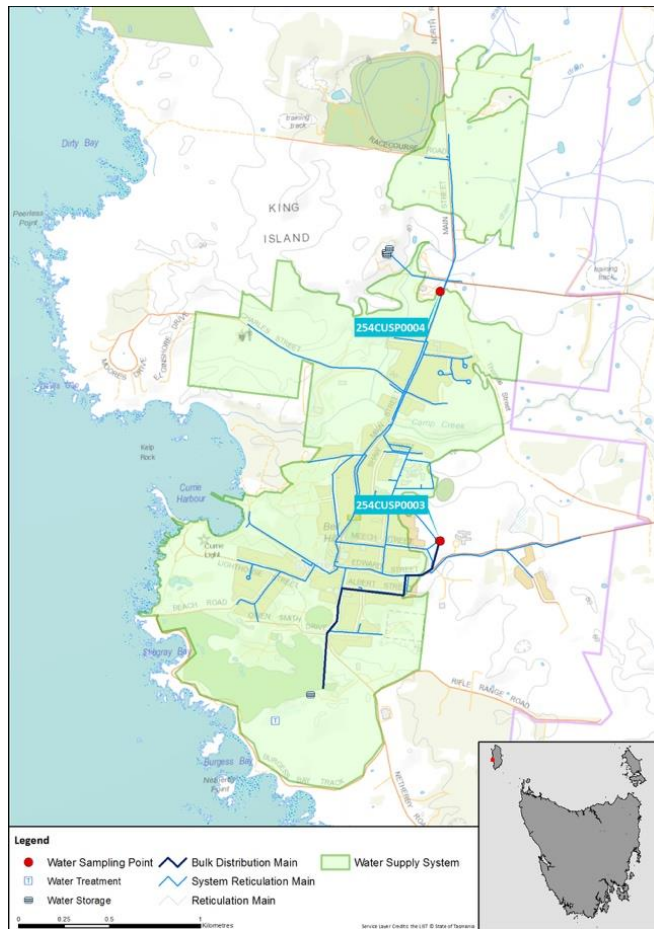


Figure 13.1-b Map of Currie monitoring system

13.2. Summary of annual reticulation compliance (2017–18)

Table 13.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Currie/Hospital Tank Site 2	254CUSP0003	W	Q	Q	Q	n/a
Currie/Depot Site 3	254CUSP0004	W	n/a	n/a	n/a	n/a
Number Planned Samples		104	4	4	4	n/a
Number Samples Tested		104	4	4	4	n/a

13.3. Summary of current and historic performance (2013-18)

Table 13.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100.0%	100.0%	100.0%	100.0%	100.0%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	95.2%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

13.4. Analysis of current health performance (2017-18)

Table 13.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 13.4-b Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	0.00163	0.001	0.0028
Barium	2	mg/L	4	0	100	0.012	0.01.11	0.014
Cadmium	0.002	mg/L	4	0	100	0.00009	<0.0001	0.0002
Chromium	0.05	mg/L	4	0	100	0.00014	<0.0001	0.0002
Copper	2	mg/L	4	0	100	0.00415	0.0002	0.0149
Lead	0.01	mg/L	4	0	100	0.00028	<0.0001	0.0006
Manganese	0.5	mg/L	4	0	100	0.0022	0.0005	0.0057
Mercury	0.001	mg/L	4	0	100	0.000108	0.00005	0.00023
Molybdenum	0.05	mg/L	4	0	100	0.00047	0.0004	0.0006
Nickel	0.02	mg/L	4	0	100	0.0027	0.0002	0.01
Selenium	0.01	mg/L	4	0	100	0.00072	0.0007	0.0008

Table 13.4-c Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	4	0	100	1	<1	2
Monochloroacetic acid	150	µg/L	4	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	4	0	100	<1	<1	<1
Total trihalomethanes	250	µg/L	4	0	100	86	65	123

Table 13.4-d General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.27	0.14	0.56
Colour True	HU	15	1.25	<1	3
pH	Units	6.5 – 8.5	7.49	7.28	7.72
Turbidity	NTU	1	0.13	0.04	0.16

13.5. Analysis of overall system performance (2017-18)

Table 13.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

14. Deep Creek drinking water system

14.1. System summary (2017-18)

Deep Creek drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	2378
Population serviced	4994
Fluoride	Fluorosilicic acid

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	<input checked="" type="checkbox"/>	98.0%	208	0
Fluoride	100.0%	<input checked="" type="checkbox"/>	100.0%	179	0
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	12	0
DBPs	100.0%	<input checked="" type="checkbox"/>	100.0%	12	0

Compliant Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DOH	0	
Customer complaints	14	Discolouration

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
Irishtown Project	Water supply and chlorine booster	In progress	December 2018	\$486,000
Smithton WTP	Re-chlorination of treated water to Massey Reservoir	Complete	Complete	\$80,000

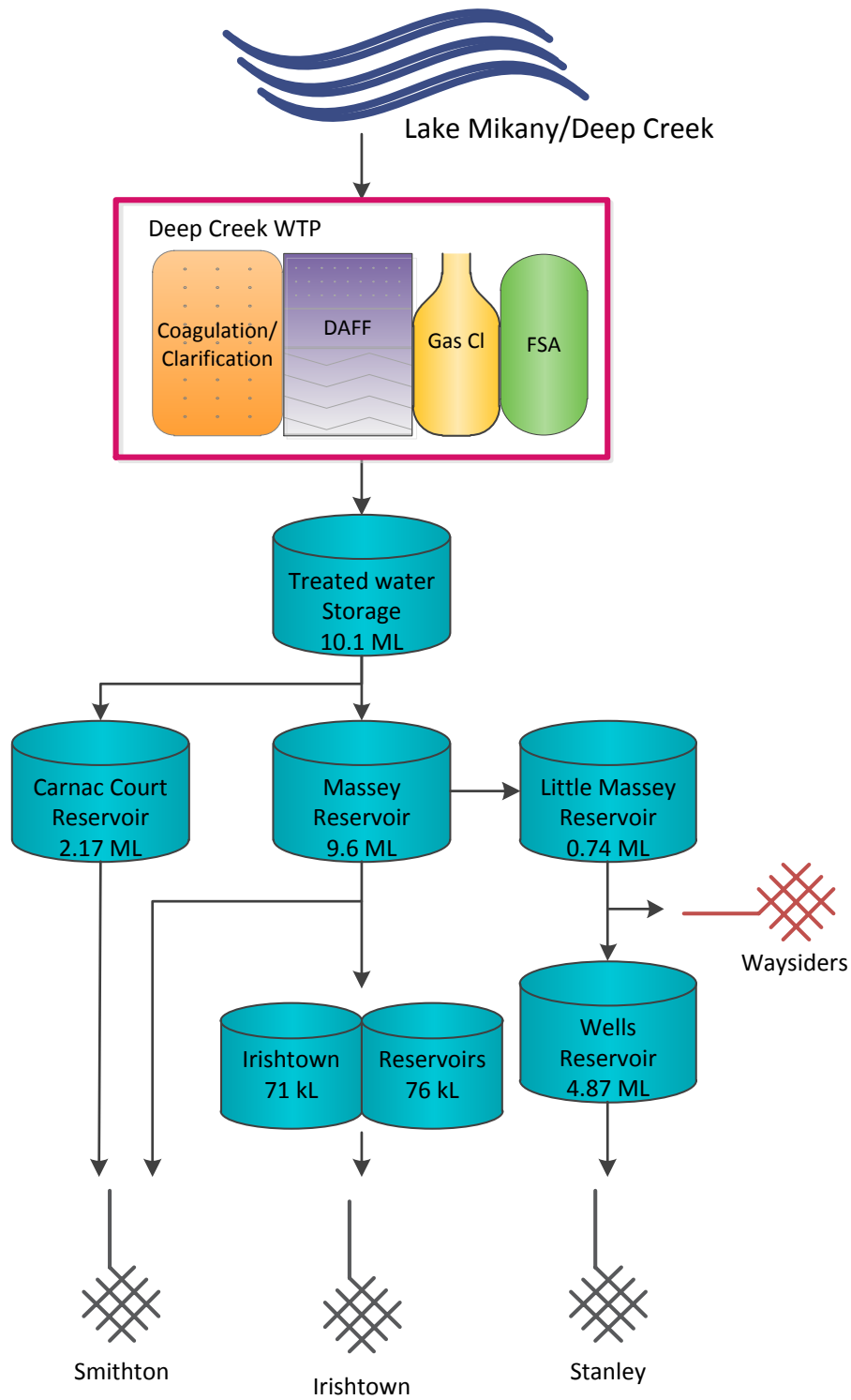


Figure 14.1-a Deep Creek system schematic

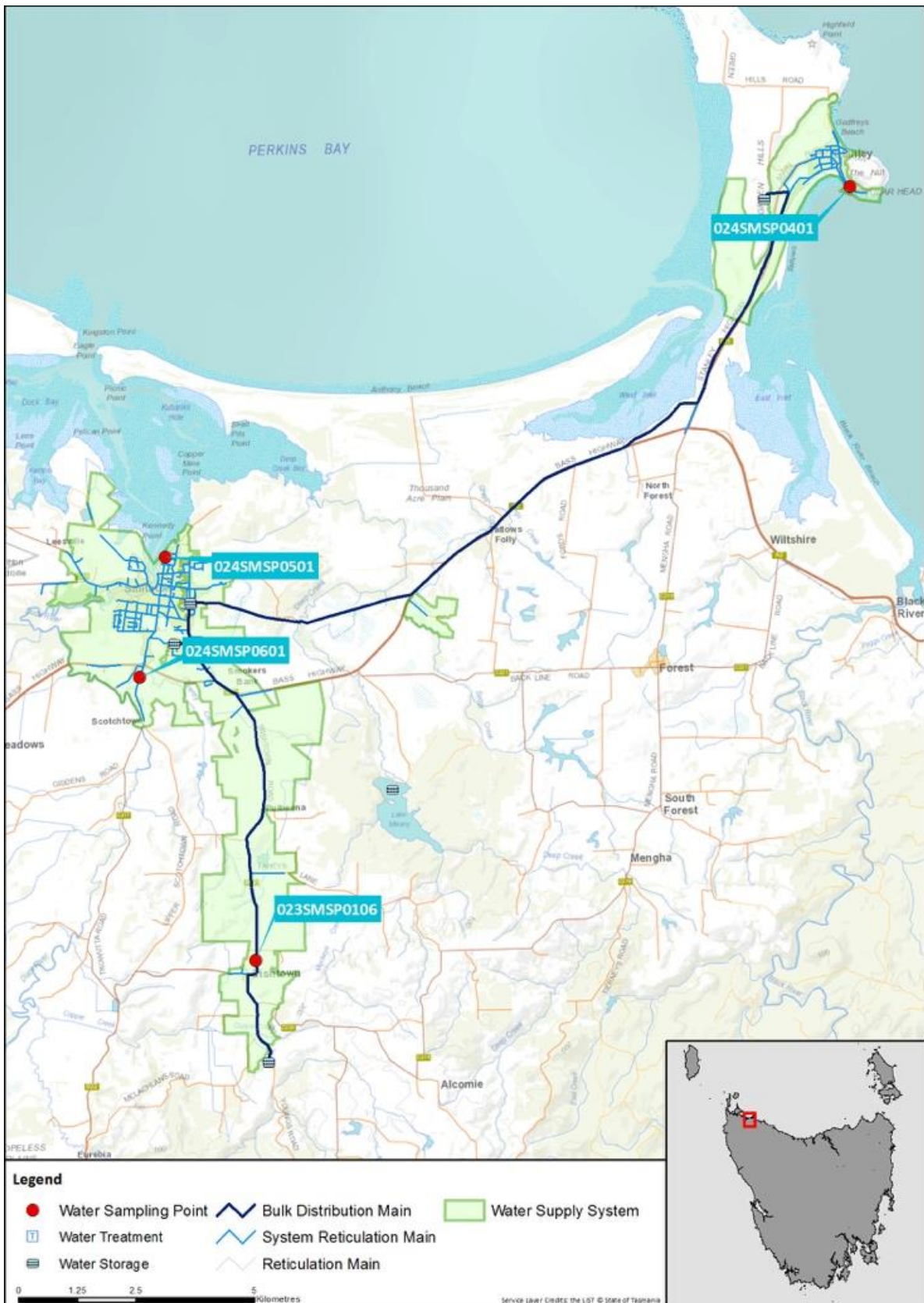


Figure 14.1-b Map of Deep Creek monitoring system

14.2. Summary of annual reticulation compliance (2017–18)

Table 14.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Smithton/Irishtown Fire Station#	023SMSP0106	W	Q	Q	n/a	n/a
Smithton/Marine Park Sample Point (Stanley)	024SMSP0401	W	Q	Q	Q	n/a
Smithton/Nelson St Sample Point	024SMSP0501	W	n/a	n/a	n/a	n/a
Smithton/Scotchtown Rd Sample Point	024SMSP0601	W	Q	Q	Q	n/a
Number Planned Samples		208	12	12	8	n/a
Number Samples Tested		208	12	12	8	n/a

14.3. Summary of current and historic performance (2013-18)

Table 14.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	99.2%	99.4%	99.0%	100.0%	100.0%
Fluoride	n/a	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

14.4. Analysis of current health performance (2017-18)

Table 14.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 14.4-b Fluoride operational performance

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	100%
Mean dose (mg/L)	0.94

■ Compliant ■ Non-compliant

Table 14.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	12	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	12	0	100	0.00025	<0.0003	0.0006
Barium	2	mg/L	12	0	100	0.009	0.006	0.012
Cadmium	0.002	mg/L	12	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	12	0	100	0.00018	<0.0001	0.0003
Copper	2	mg/L	12	0	100	0.00105	0.0004	0.0016
Lead	0.01	mg/L	12	0	100	0.00025	<0.0001	0.0006
Manganese	0.5	mg/L	12	0	100	0.0063	0.0012	0.0268
Mercury	0.001	mg/L	12	0	100	0.00006	<0.00003	0.00015
Molybdenum	0.05	mg/L	12	0	100	0.00007	<0.0001	0.0001
Nickel	0.02	mg/L	12	0	100	0.00065	<0.0001	0.0013
Selenium	0.01	mg/L	12	0	100	<0.0001	<0.0001	<0.0001

Table 14.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	12	0	100	4.75	<1	12
Monochloroacetic acid	150	µg/L	12	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	12	0	100	4.79	<1	1.11
Total trihalomethanes	250	µg/L	12	0	100	80.42	47	125

Table 14.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.29	0.01	1.3
Colour True	HU	15	<1	<1	<1
pH	Units	6.5 – 8.5	7.58	7.07	8.07
Turbidity	NTU	1	0.3	0.07	1.16

14.5. Analysis of overall system performance (2017-18)

Table 14.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

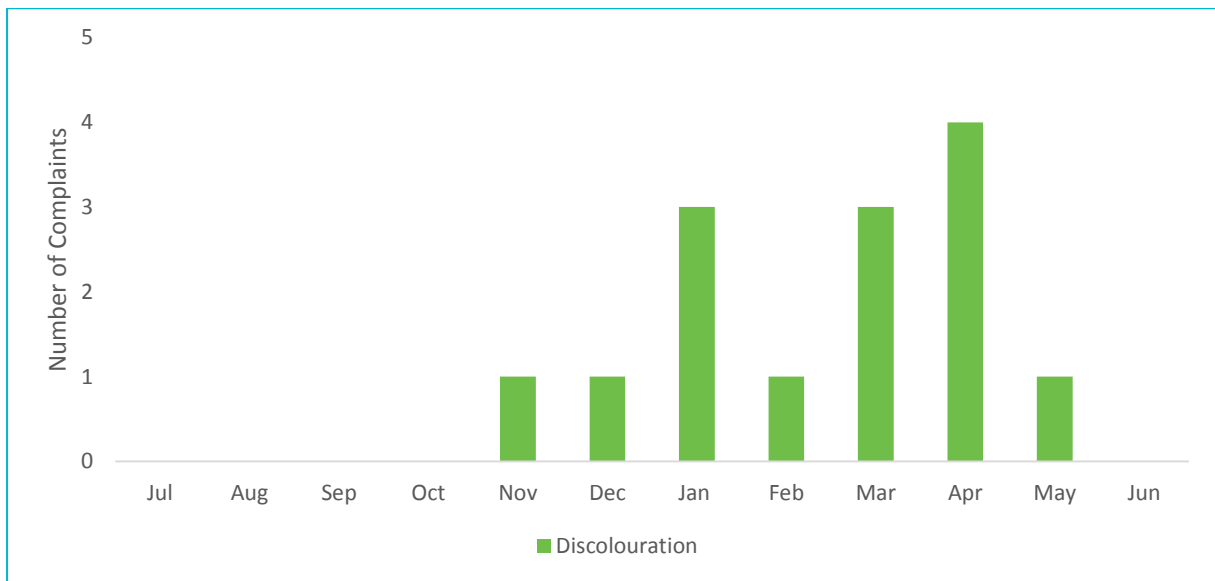


Figure 14.5-b Water quality customer complaints by month and type

15. Deloraine drinking water system

15.1. System summary (2017-18)

Deloraine drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	1325
Population serviced	2783
Fluoride	Fluorosilicic acid

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	<input checked="" type="checkbox"/>	98.0%	104	0
Fluoride	100.0%	<input checked="" type="checkbox"/>	100.0%	194	0
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	8	0
DBPs	100.0%	<input checked="" type="checkbox"/>	100.0%	8	0

Compliant Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	7	Discolouration, Taste & Odour

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
Regional Towns Water Supply Program	UV disinfection	Not started	TBA	TBA

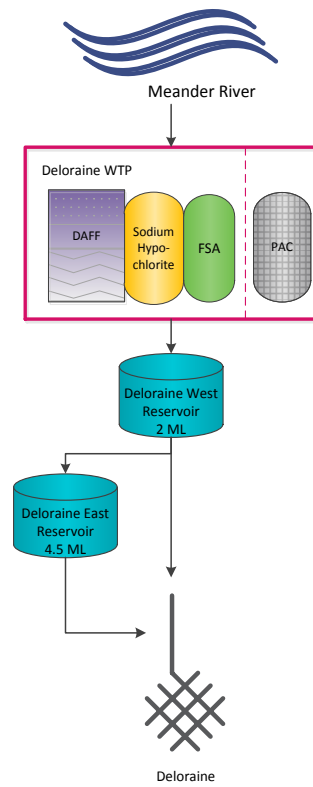


Figure 15.1-a Deloraine system schematic

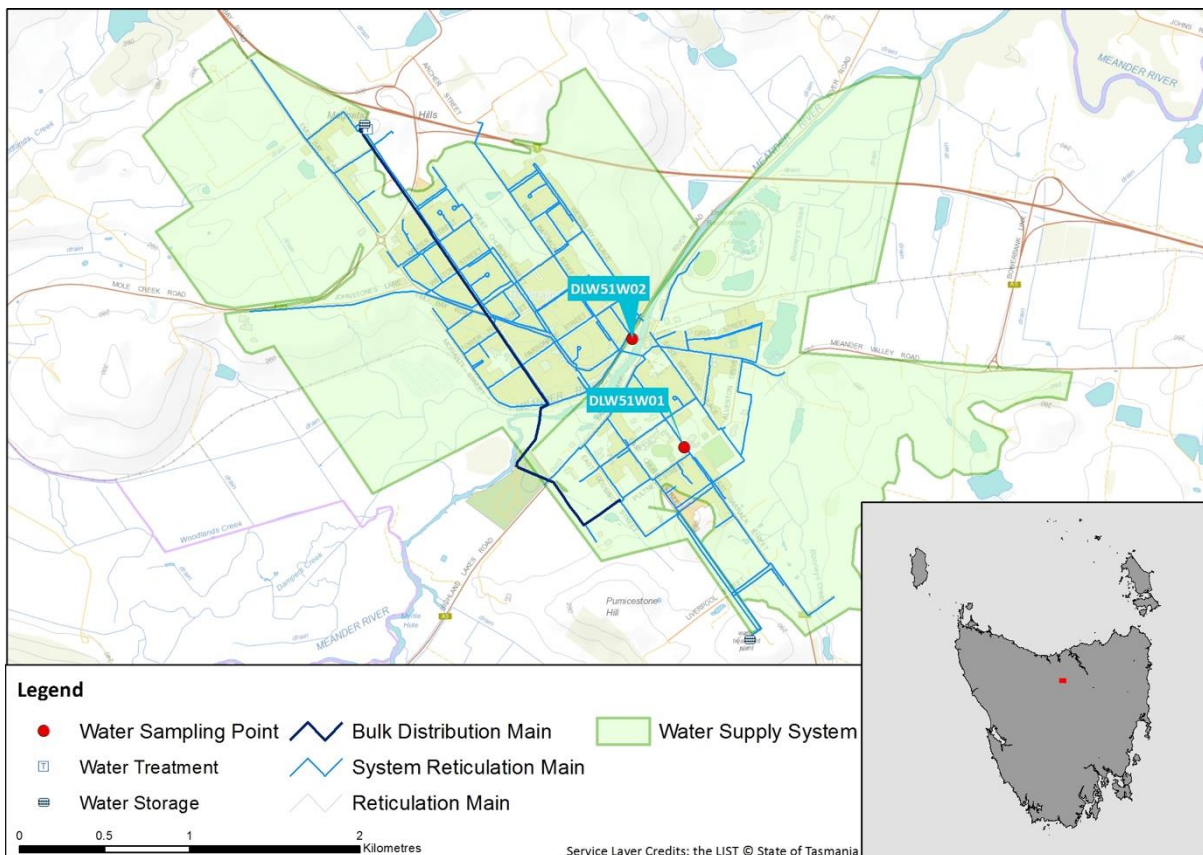


Figure 15.1-b Map of Deloraine monitoring system

15.2. Summary of annual reticulation compliance (2017–18)

Table 15.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Deloraine/Deloraine, Barrack St	DLW51W01	W	Q	Q	Q	n/a
Deloraine/Deloraine, Train Park	DLW51W02	W	Q	Q	Q	n/a
Number Planned Samples		104	8	8	8	n/a
Number Samples Tested		104	8	8	8	n/a

15.3. Summary of current and historic performance (2013-18)

Table 15.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100.0%	100.0%	100.0%	100.0%	100.0%
Fluoride	100.0%	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

15.4. Analysis of current health performance (2017-18)

Table 15.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 15.4-b Fluoride operational performance

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	94.8%
Mean dose (mg/L)	0.97
■ Compliant ■ Non-compliant	

Table 15.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	8	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	8	0	100	0.00018	<0.0003	0.0004
Barium	2	mg/L	8	0	100	0.007	0.006	0.009
Cadmium	0.002	mg/L	8	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	8	0	100	0.00008	<0.0001	0.0002
Copper	2	mg/L	8	0	100	0.00187	0.0007	0.0029
Lead	0.01	mg/L	8	0	100	0.00012	<0.0001	0.0003
Manganese	0.5	mg/L	8	0	100	0.0047	0.0019	0.0159
Mercury	0.001	mg/L	8	0	100	0.00007	<0.00003	0.0002
Molybdenum	0.05	mg/L	8	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	8	0	100	0.00013	<0.0001	0.0003
Selenium	0.01	mg/L	8	0	100	<0.0001	<0.0001	<0.0001

Table 15.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	8	0	100	5.75	2	1.11
Monochloroacetic acid	150	µg/L	8	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	8	0	100	9.13	5	15
Total trihalomethanes	250	µg/L	8	0	100	22.25	13	30

Table 15.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.64	0.12	1.23
Colour True	HU	15	0.69	<1	2
pH	Units	6.5 – 8.5	7.46	6.55	8.08
Turbidity	NTU	1	0.31	0.06	1.05

15.5. Analysis of overall system performance (2017-18)

Table 15.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DOH notification required	DOH notification complete
No system issues or public health warnings issued			

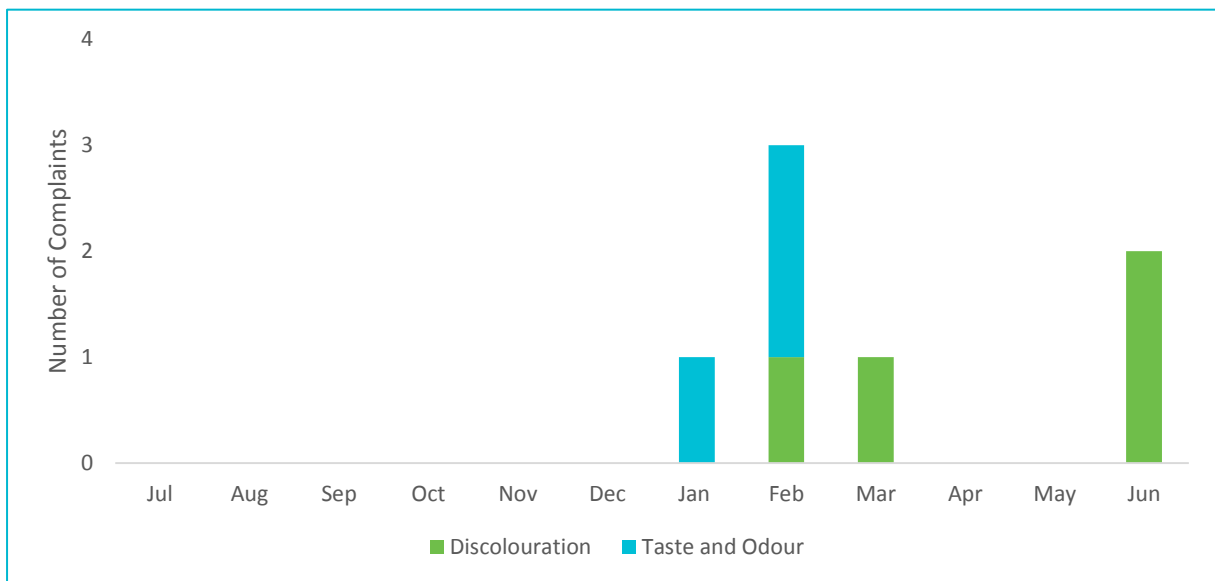


Figure 15.5-b Water quality customer complaints by month and type

16. Distillery Creek drinking water system

16.1. System summary (2017-18)

Distillery Creek drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	18183
Population serviced	38184
Fluoride	Fluorosilicic acid

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	☑	98.0%	468	0
Fluoride	100.0%	☑	100.0%	328	0
Metals	100.0%	☑	100.0%	4	0
DBPs	100.0%	☑	100.0%	4	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DOH	0	
Customer complaints	100	Discoloration, Taste & Odour, Cloudy Water

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
No projected capital investment				

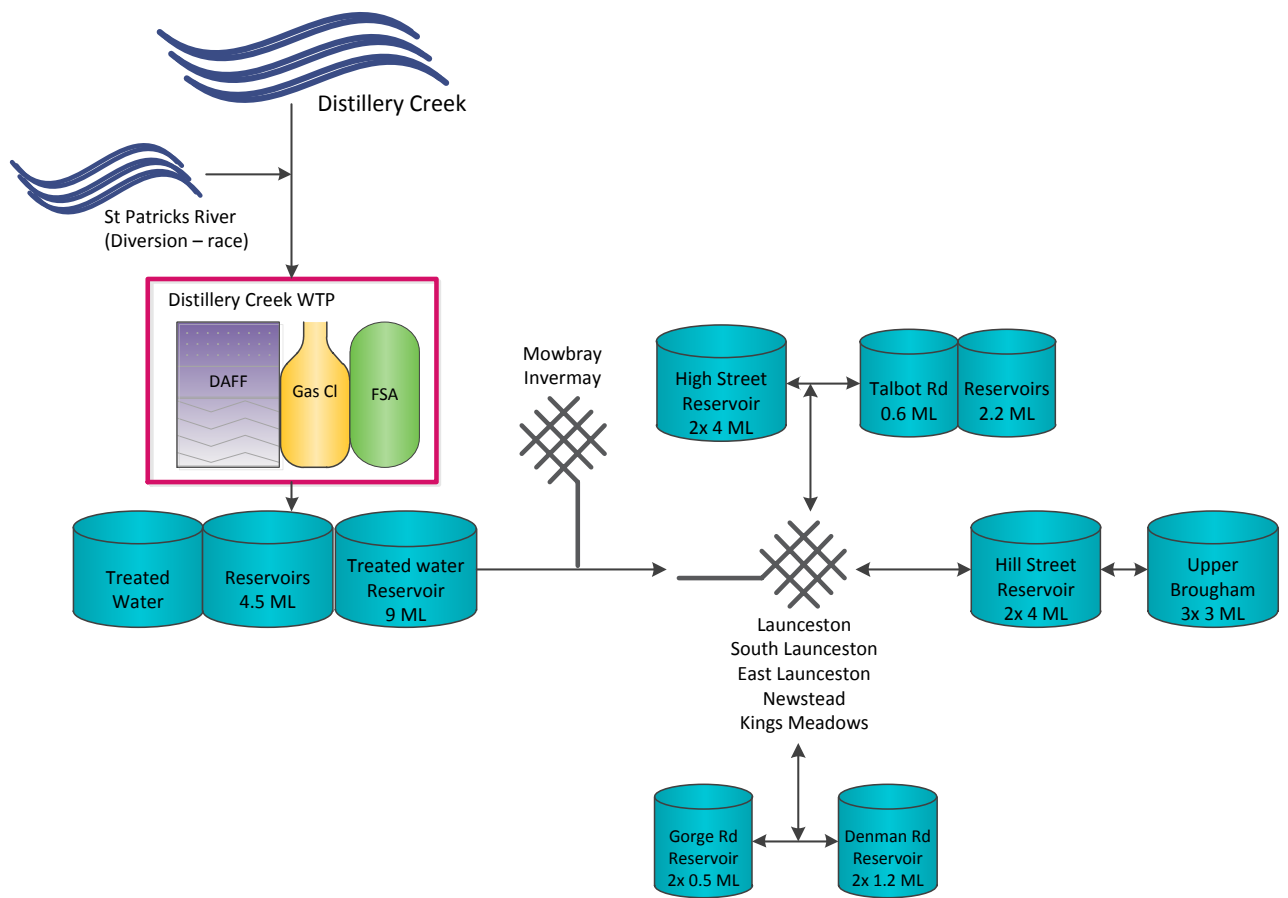


Figure 16.1-a Distillery Creek system schematic

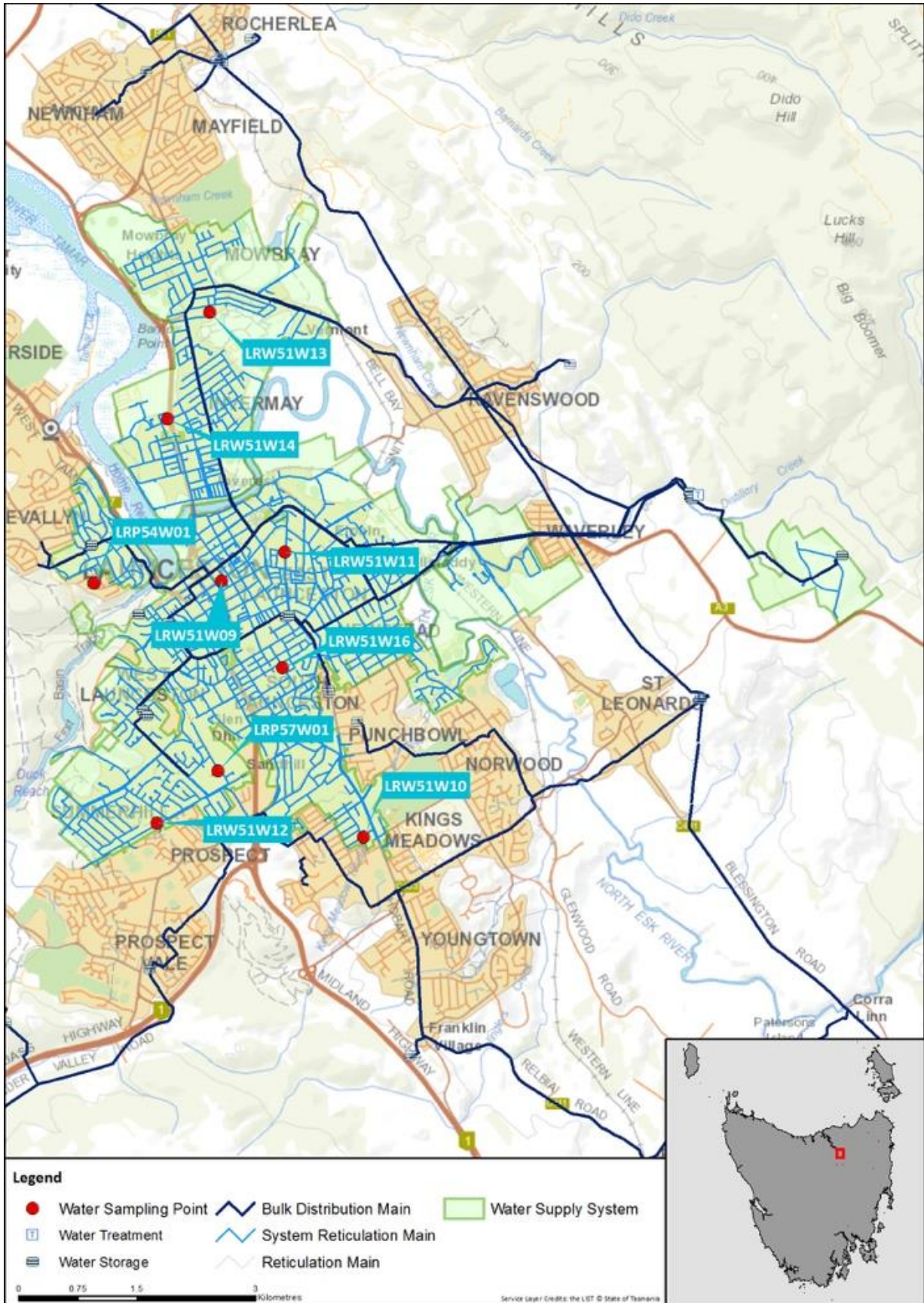


Figure 16.1-b Map of Distillery Creek monitoring system

16.2. Summary of annual reticulation compliance (2017–18)

Table 16.2.a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Denman Rd PS	LRP54W01	W	n/a	n/a	n/a	n/a
Kings Meadows, 9/1.11 Blaydon St	LRW51W10	W	n/a	n/a	n/a	n/a
East Launceston, Crn High & Adelaide St	LRW51W111	W	n/a	n/a	n/a	n/a
Invermay, Mayne St	LRW51W14	W	n/a	n/a	n/a	n/a
Launceston, York Street Public Toilets	LRW51W09	W	n/a	n/a	n/a	n/a
Mowbray, 7 Derby St	LRW51W13	W	n/a	n/a	n/a	n/a
South Launceston, Mulgrave St Park	LRW51W16	W	Q	Q	Q	n/a
Summerhill, 194 Peel St	LRW51W12	W	n/a	n/a	n/a	n/a
West Launceston, Granville St	LRP57W01	W	n/a	n/a	n/a	n/a
Number Planned Samples		468	4	4	4	12
Number Samples Tested		468	4	4	4	12

16.3. Summary of current and historic performance (2013-18)

Table 16.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	99.0%	99.0%	100.0%	100.0%	100.0%
Fluoride	100.0%	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

16.4. Analysis of current health performance (2017-18)

Table 16.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 16.4-b Fluoride operational performance

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	97%
Mean dose (mg/L)	0.98
■ Compliant ■ Non-compliant	

Table 16.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	<0.0003	<0.0003	<0.0003
Barium	2	mg/L	4	0	100	0.013	0.006	0.016
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Copper	2	mg/L	4	0	100	0.00972	0.0023	0.0195
Lead	0.01	mg/L	4	0	100	0.00018	<0.0001	0.0003
Manganese	0.5	mg/L	4	0	100	0.013	0.0033	0.0372
Mercury	0.001	mg/L	4	0	100	0.000029	<0.00003	0.00007
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	0.00026	<0.0001	0.0005
Selenium	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001

Table 16.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	4	0	100	7.75	5	16
Monochloroacetic acid	150	µg/L	4	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	4	0	100	8	4	14
Total trihalomethanes	250	µg/L	4	0	100	25.75	19	40

Table 16.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.55	0	1.1
Colour True	HU	15	<1	<1	<1
pH	Units	6.5 – 8.5	7.19	6.07	7.96
Turbidity	NTU	1	0.28	0.1	1.06

16.5. Analysis of overall system performance (2017-18)

Table 16.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

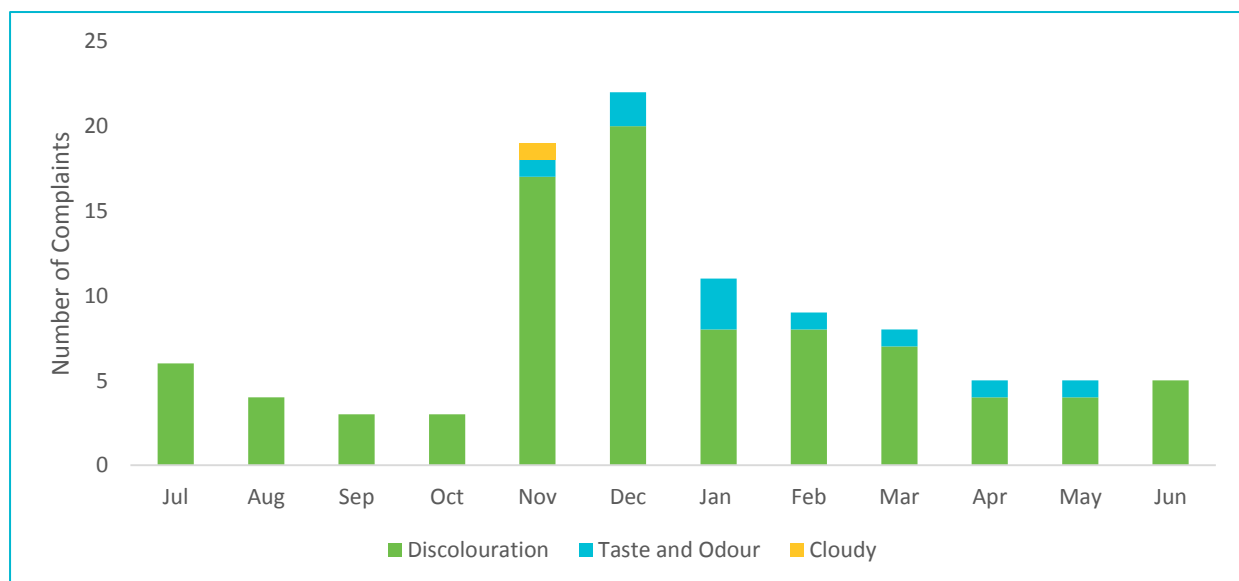


Figure 16.5-b Water quality customer complaints by month and type

17. Dover drinking water system

17.1. System summary (2017-18)

Dover drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	673
Population serviced	1211
Fluoride	NaF

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	☑	98.0%	52	0
Fluoride	100.0%	☑	100.0%	362	0
Metals	100.0%	☑	100.0%	4	0
DBPs	100.0%	☑	100.0%	4	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DOH	0	
Customer complaints	0	

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
Regional Towns Water Supply Program	Major WTP upgrade	Not started	TBA	TBA

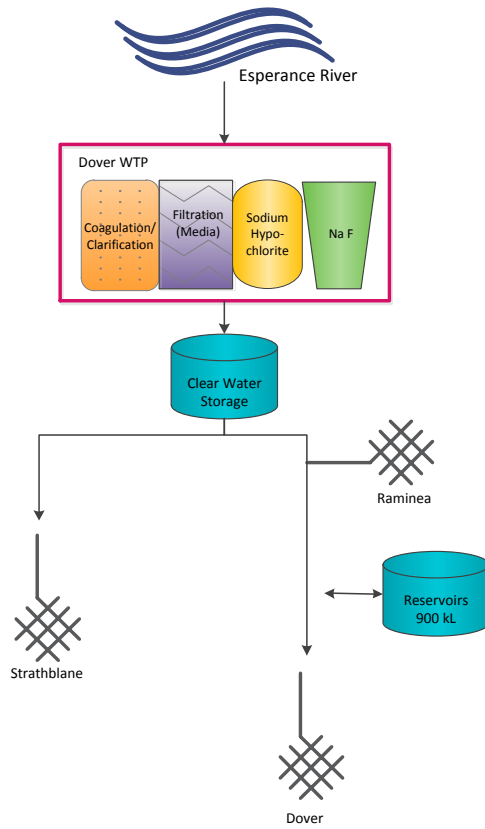


Figure 17.1-a Dover system schematic

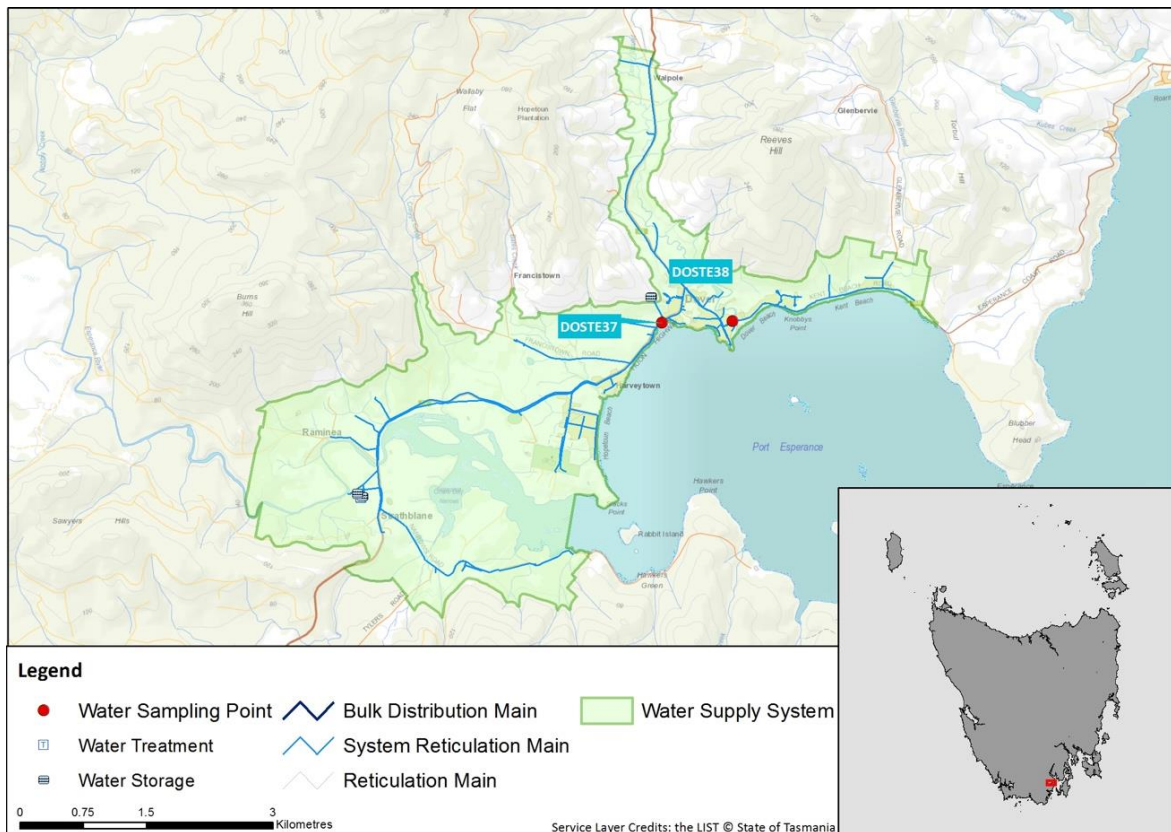


Figure 17.1-b Map of Dover monitoring system

17.2. Summary of annual reticulation compliance (2017–18)

Table 17.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Dover/Sample Tap	DOSTE37	W	Q	Q	Q	n/a
Dover/No.4 P/S Kent Beach Rd	DOSTE38	n/a	n/a	n/a	n/a	n/a
Number Planned Samples		52	4	4	4	n/a
Number Samples Tested		52	4	4	4	n/a

17.3. Summary of current and historic performance (2013-18)

Table 17.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100.0%	100.0%	100.0%	100.0%	100.0%
Fluoride	100.0%	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

17.4. Analysis of current health performance (2017-18)

Table 17.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 17.4-b Fluoride operational performance

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	95.6%
Mean dose (mg/L)	0.95
■ Compliant ■ Non-compliant	

Table 17.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	<0.0003	<0.0003	<0.0003
Barium	2	mg/L	4	0	100	0.006	0.006	0.007
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	0.00014	<0.0001	0.0002
Copper	2	mg/L	4	0	100	0.0137	0.01.115	0.0162
Lead	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Manganese	0.5	mg/L	4	0	100	0.0024	0.0012	0.004
Mercury	0.001	mg/L	4	0	100	0.000025	<0.00003	0.00004
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	0.00018	<0.0001	0.0003
Selenium	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001

Table 17.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	4	0	100	10.5	6	16
Monochloroacetic acid	150	µg/L	4	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	4	0	100	17.25	13	26
Total trihalomethanes	250	µg/L	4	0	100	50	43	57

Table 17.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.35	0.02	0.8
Colour True	HU	15	1.38	<1	4
pH	Units	6.5 – 8.5	7.35	6.09	8.01
Turbidity	NTU	1	0.46	0.16	0.97

17.5. Analysis of overall system performance (2017-18)

Table 17.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DOH notification required	DOH notification complete
No system issues or public health warnings issued			

18. Dowlings Creek (Yolla) drinking water system

18.1. System summary (2017-18)

Dowlings Creek drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	103
Population serviced	247
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	<input checked="" type="checkbox"/>	98.0%	52	0
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0
DBPs	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	2	Taste & Odour

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend (\$'000)
Regional Towns Water Supply Program	UV disinfection system	Not started	TBA	TBA

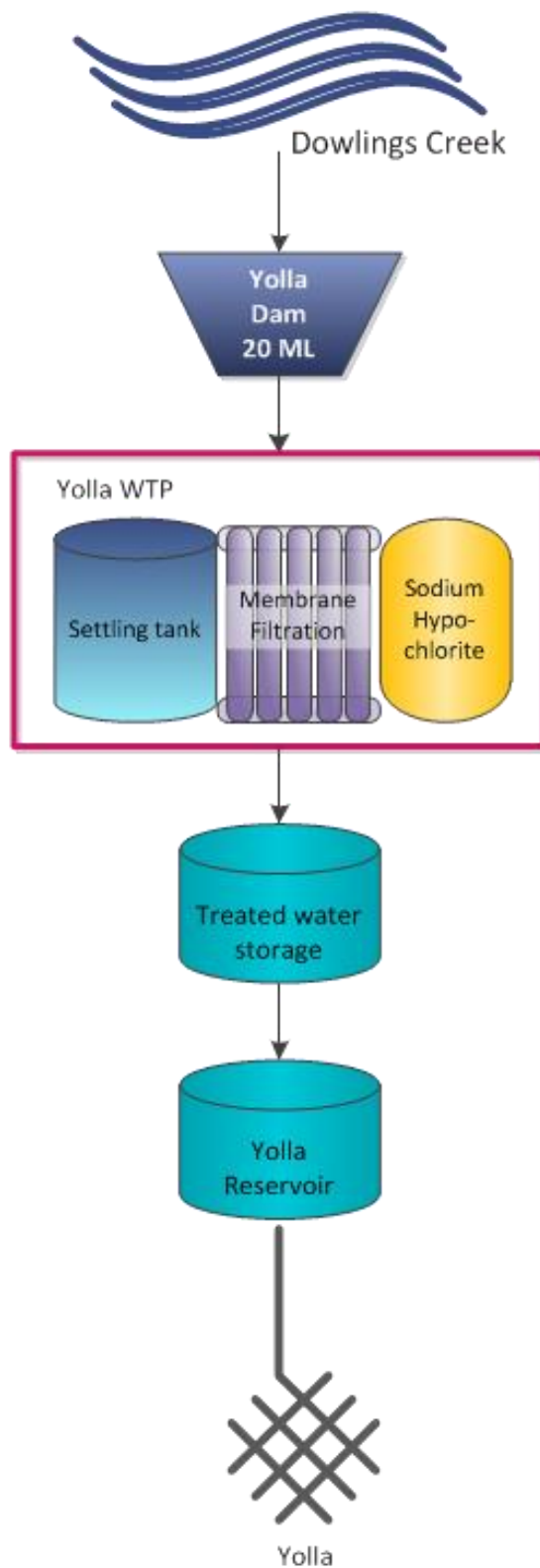


Figure 18.1-a Dowlings Creek system schematic

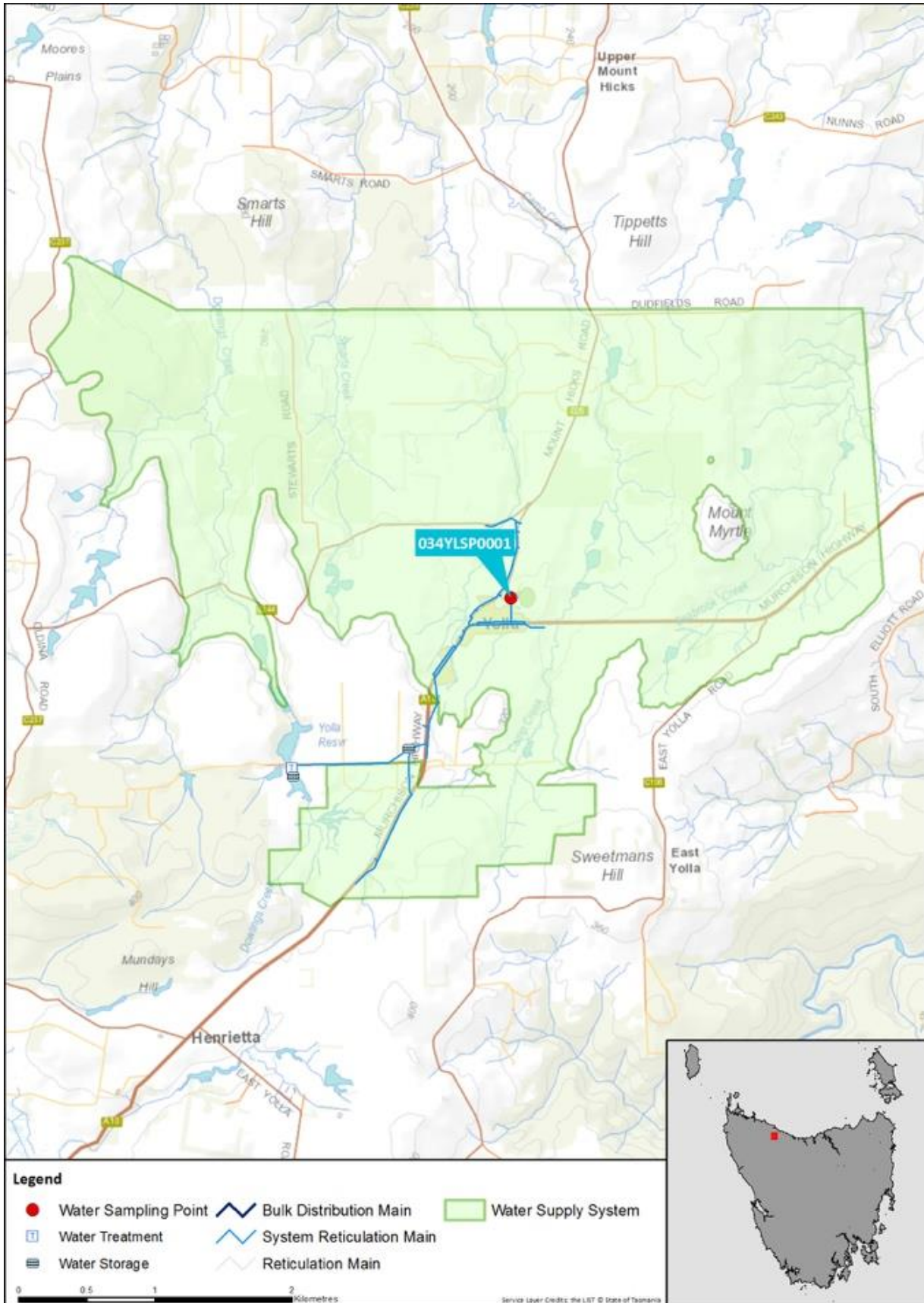


Figure 18.1-b Map of Dowlings Creek monitoring system

18.2. Summary of annual reticulation compliance (2017–18)

Table 18.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Yolla/School Sample Point	034YLSP0001	W	Q	Q	Q	n/a
Number Planned Samples		52	4	4	4	n/a
Number Samples Tested		52	4	4	4	n/a

18.3. Summary of current and historic performance (2013-18)

Table 18.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100.0%	100.0%	99.3%	100.0%	100.0%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	100.0%	99.3%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

18.4. Analysis of current health performance (2017-18)

Table 18.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 18.4-b Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	<0.0003	<0.0003	<0.0003
Barium	2	mg/L	4	0	100	0.004	0.003	0.005
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	0.00006	<0.0001	0.0001
Copper	2	mg/L	4	0	100	0.01232	0.004	0.018
Lead	0.01	mg/L	4	0	100	0.00053	0.0002	0.0009
Manganese	0.5	mg/L	4	0	100	0.0313	0.0079	0.0459
Mercury	0.001	mg/L	4	0	100	0.00005	<0.00003	0.00013
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	0.00034	<0.0001	0.0005
Selenium	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001

Table 18.4-c Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	4	0	100	18.25	3	28
Monochloroacetic acid	150	µg/L	4	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	4	0	100	32.75	26	39
Total trihalomethanes	250	µg/L	4	0	100	82	60	107

Table 18.4-d General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.56	0.09	4
Colour True	HU	15	4.5	2	7
pH	Units	6.5 – 8.5	7.41	6.71	7.75
Turbidity	NTU	1	0.32	0.16	0.57

18.5. Analysis of overall system performance (2017-18)

Table 18.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

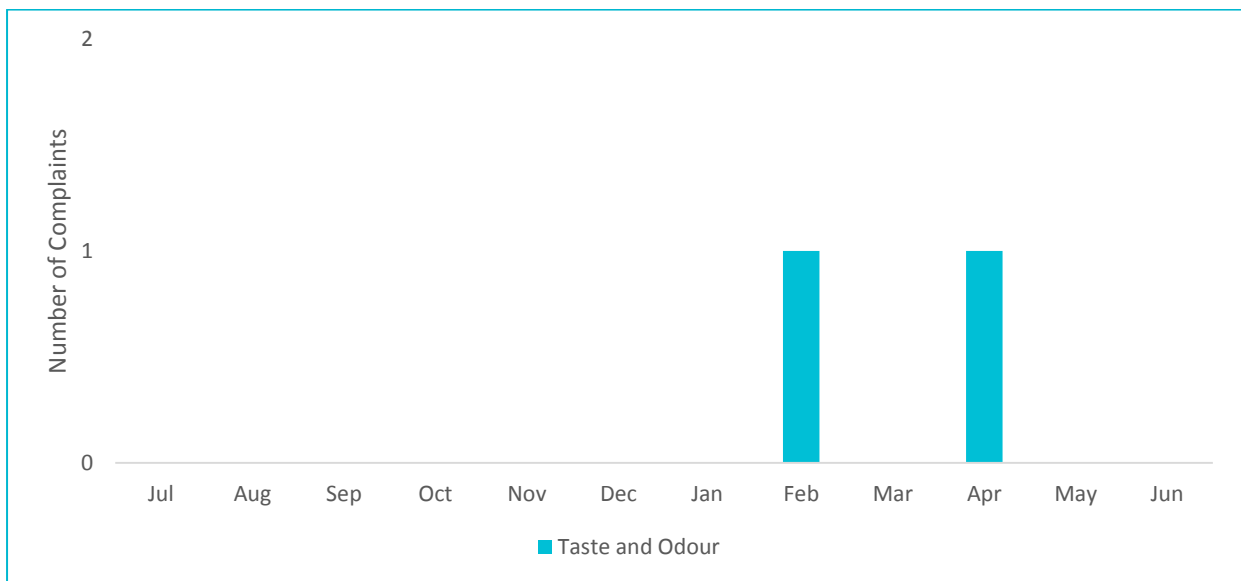


Figure 18.5-b Water quality customer complaints by month and type

19. Ellendale drinking water system

19.1. System summary (2017-18)

Ellendale drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	89
Population serviced	169
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	<input checked="" type="checkbox"/>	98.0%	52	0
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0
DBPs	97.9%	<input type="checkbox"/>	100.0%	12	1

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	1	Trichloroacetic acid exceedance
Public health warnings issued	0	
Notifications made to DOH	1	Trichloroacetic acid exceedance
Customer complaints	0	n/a

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend (\$'000)
Regional Towns Water Supply Program	WTP replacement	Not started	TBA	TBA

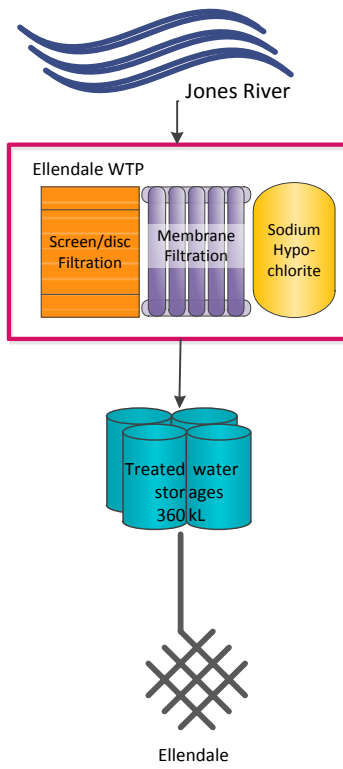


Figure 19.1-a Ellendale system schematic

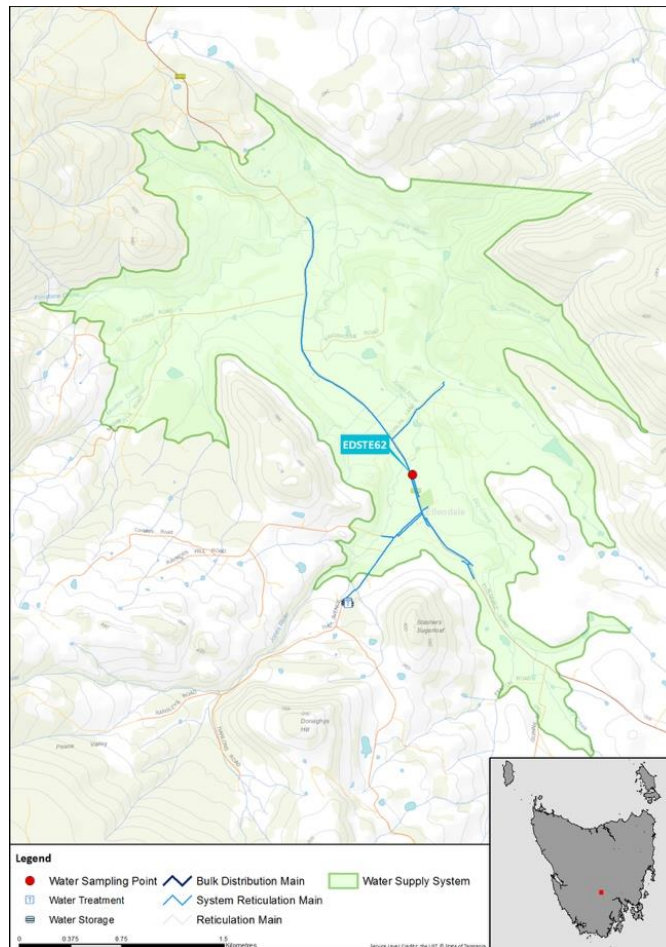


Figure 19.1-b Map of Ellendale monitoring system

19.2. Summary of annual reticulation compliance (2017–18)

Table 19.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Ellendale/Sample Tap	EDSTE62	W	Q	M	Q	n/a
Number Planned Samples		52	4	12	4	n/a
Number Samples Tested		52	4	12	4	n/a

19.3. Summary of current and historic performance (2013-18)

Table 19.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100.0%	100.0%	100.0%	100.0%	100.0%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	95.0%	95.8%	97.9%

■ Compliant ■ Non-compliant

19.4. Analysis of current health performance (2017-18)

Table 19.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
<i>Trichloroacetic acid</i>	21/09/2017	Exceedance of 116 µg/L in monthly compliance sample	✓
<i>Trichloroacetic acid</i>	12/10/2017	Exceedance of 104 µg/L in investigation sample (not included in compliance statistics) resampling not required.	☒

Table 19.4-b Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	<0.0003	<0.0003	<0.0003
Barium	2	mg/L	4	0	100	0.004	0.002	0.006
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	0.00022	0.0002	0.0003
Copper	2	mg/L	4	0	100	0.00245	0.0018	0.0033
Lead	0.01	mg/L	4	0	100	0.00009	<0.0001	0.0002
Manganese	0.5	mg/L	4	0	100	0.0008	0.0005	0.0014
Mercury	0.001	mg/L	4	0	100	0.000028	<0.00003	0.00005
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	0.00009	<0.0001	0.0002
Selenium	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001

Table 19.4-c Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	12	0	100	26.3	6	59
Monochloroacetic acid	150	µg/L	12	0	100	<3	<3	4
Trichloroacetic acid	100	µg/L	12	1	91	67.25	43	116
Total trihalomethanes	250	µg/L	12	0	100	91.3	72	120

Table 19.4-d General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.45	0.06	0.86
Colour True	HU	15	5	2	10
pH	Units	6.5 – 8.5	7.56	7.02	8
Turbidity	NTU	1	0.24	0.08	1.13

19.5. Analysis of overall system performance (2017-18)

Table 19.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
21/09/2017	Monthly sample detected <i>Trichloroacetic acid</i> of 116 µg/L at EDSTE62. The system was resampled.	✓	✓
12/10/2017	Investigation sample detected <i>Trichloroacetic acid</i> of 104 µg/L at EDSTE62.	✓	✓

20. Epping Forest drinking water system

20.1. System summary (2017-18)

Epping Forest drinking water system	
System status (as at 30 June 2018)	BWA
Total number of connections	27
Population serviced	54
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	<input checked="" type="checkbox"/>	98.0%	52	0
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0
DBPs	87.5%	<input type="checkbox"/>	100.0%	4	2

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	2	Dichloroacetic acid and Trichloroacetic acid exceedance
Public health warnings issued	0	
Notifications made to DoH	2	Dichloroacetic acid and Trichloroacetic acid exceedance
Customer complaints	0	

Current and future planned capital investment					
Project	Overview	Progress	Est. Delivery	Est. Spend (\$'000)	
Regional Towns Water Supply Program	Transfer pipeline and associated infrastructure	In progress	August 2018	\$3,350,000	
Regional Towns Water Supply Program	Reticulation upgrade	In progress	August 2018	\$439,384	

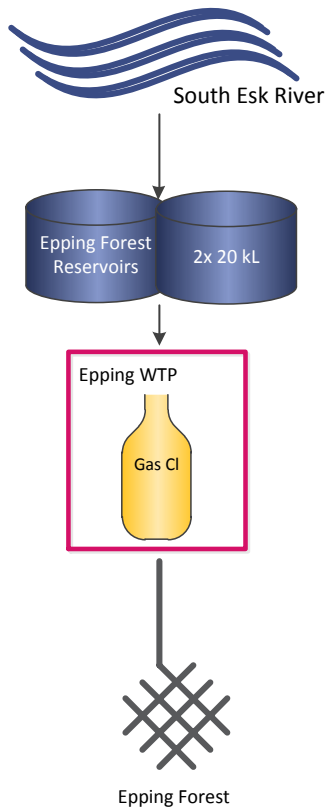


Figure 20.1-a Epping Forest system schematic

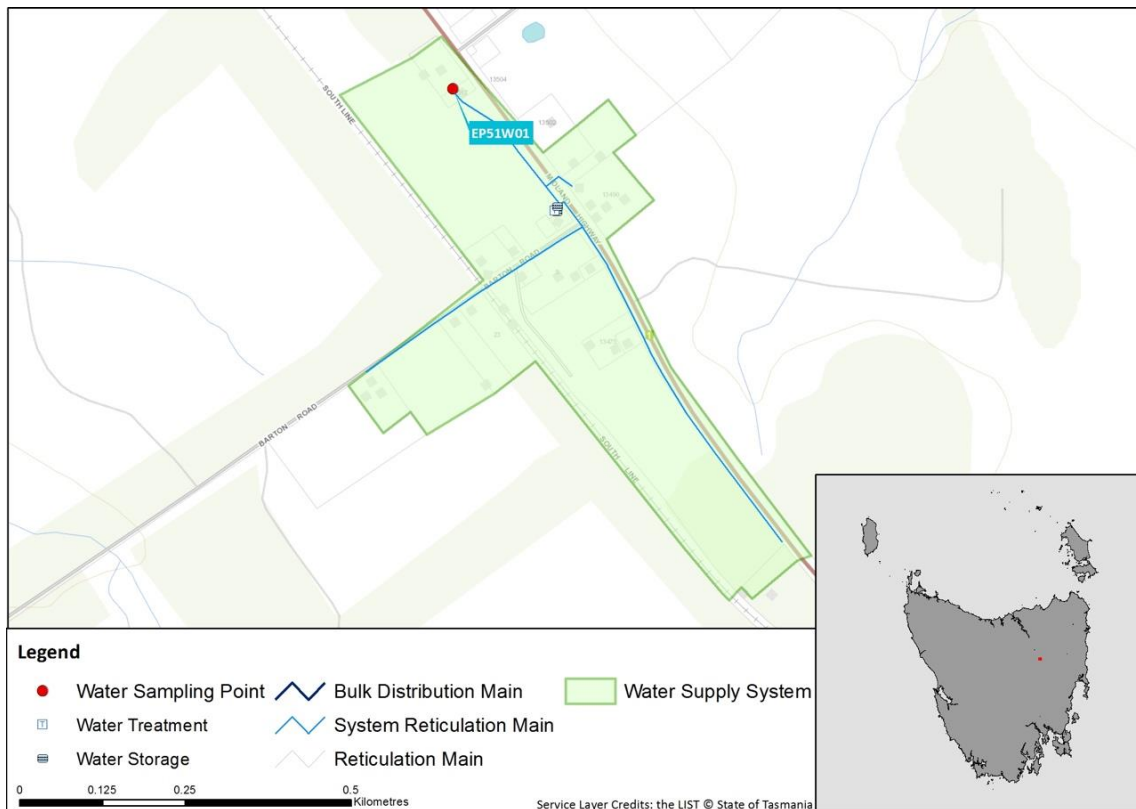


Figure 20.1-b Map of Epping Forest monitoring system
20.2. Summary of annual reticulation compliance (2017–18)

Table 20.2-a Sampling program

Planned compliance sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Epping/Epping Forest, Behind Hall	EP51W01	W	Q	Q	Q	n/a
Number Planned Samples		52	4	4	4	n/a
Number Samples Tested		52	4	4	4	n/a

20.3. Summary of current and historic performance (2013-18)

Table 20.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100.0%	96.0%	96.2%	100.0%	100.0%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	88.0%	75.0%	87.5%

■ Compliant ■ Non-compliant

20.4. Analysis of current health performance (2017-18)

Table 20.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
<i>Dichloroacetic acid</i>	01/09/2017	Exceedance of 108 µg/L in monthly compliance sample	✓
<i>Trichloroacetic acid</i>	01/09/2017	Exceedance of 169 µg/L in monthly compliance sample	✓
<i>Trichloroacetic acid</i>	15/08/2017	Exceedance of 115 µg/L in investigation sample (not included in compliance statistics)	☒

Table 20.4-b Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	0.00048	0.0004	0.0006
Barium	2	mg/L	4	0	100	0.0074	0.0052	0.01
Cadmium	0.002	mg/L	4	0	100	0.00043	<0.0001	0.001
Chromium	0.05	mg/L	4	0	100	0.00033	0.0001	0.0006
Copper	2	mg/L	4	0	100	0.019	0.0053	0.0299
Lead	0.01	mg/L	4	0	100	0.0012	0.0007	0.0021
Manganese	0.5	mg/L	4	0	100	0.015	0.0049	0.0251
Mercury	0.001	mg/L	4	0	100	0.000033	<0.00003	0.00004
Molybdenum	0.05	mg/L	4	0	100	0.00012	<0.0001	0.0002
Nickel	0.02	mg/L	4	0	100	0.00058	0.0001	0.001.11
Selenium	0.01	mg/L	4	0	100	0.0001	<0.0001	0.0001

Table 20.4-c Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	4	1	75	31	1	108
Monochloroacetic acid	150	µg/L	4	0	100	<3	<3	6
Trichloroacetic acid	100	µg/L	4	1	75	50.4	<1	169
Total trihalomethanes	250	µg/L	4	0	100	1.116.3	46	167

Table 20.4-d General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.62	0.03	2.2
Colour True	HU	15	6.73	<1	32
pH	Units	6.5 – 8.5	7.22	6.38	8.33
Turbidity	NTU	1	1.67	0.17	9.39

20.5. Analysis of overall system performance (2017-18)

Table 20.5-a Summary of system issues/public health warnings with notification details

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
01/09/2017	Monthly sample detected <i>Trichloroacetic acid</i> of 169 µg/L at EPW51W01. The system was resampled with no further exceedances identified.	✓	✓
01/09/2017	Monthly sample detected <i>Dichloroacetic acid</i> of 108 µg/L at EPW51W01. The system was resampled with no further exceedances identified.	✓	✓

21. Fingal drinking water system

21.1. System summary (2017-18)

Fingal drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	436
Population serviced	828
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	<input checked="" type="checkbox"/>	98.0%	116	0
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	28	0
DBPs	100.0%	<input checked="" type="checkbox"/>	100.0%	17	0

■ Compliant
 ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	3	Discolouration, Taste & Odour, PHA Notices

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
No projected capital investment				

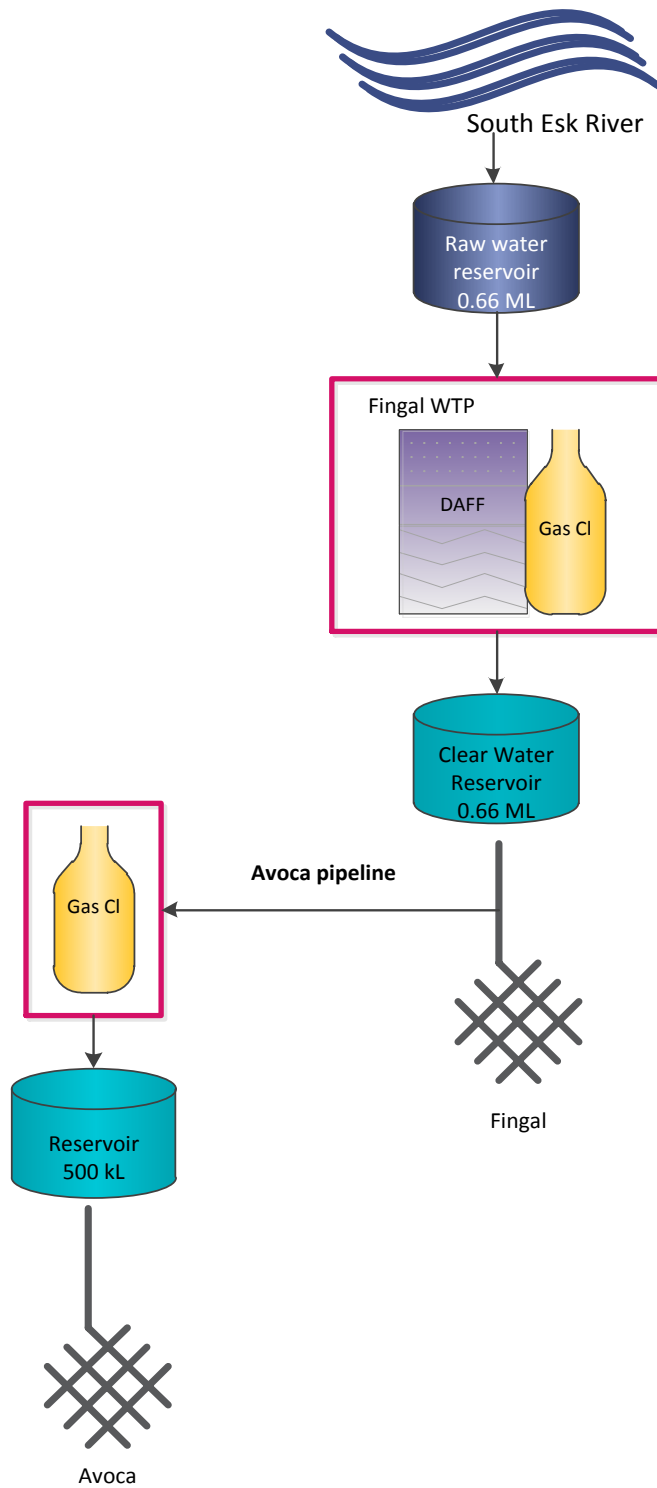


Figure 21.1-a Fingal system schematic

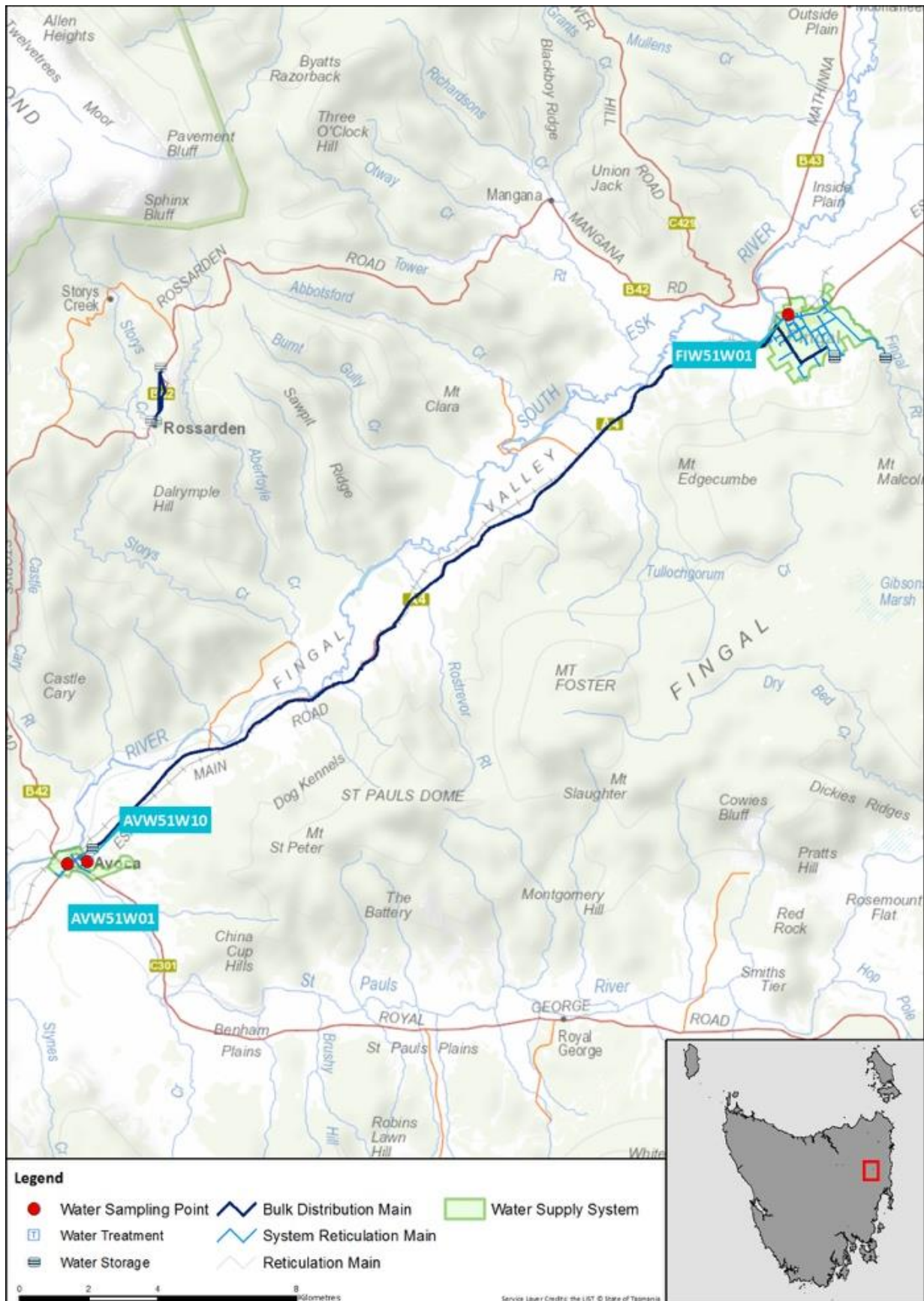


Figure 21.1-b Map of Fingal monitoring system

21.2. Summary of annual reticulation compliance (2017–18)

Table 21.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Avoca/crn Falmouth & Arthur St	AVW51W01	W	M	M	Q	M
Avoca/Fire Station	AVW51W10	n/a	M	n/a	Q	n/a
Fingal/Miners Park	FIW51W01	W	Q	Q	Q	n/a
Number Planned Samples		104	28	16	12	12
Number Samples Tested		104	28	17	12	12

21.3. Summary of current and historic performance (2013-18)

Table 21.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	29.0%	97.0%	100.0%	100.0%	100.0%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	98.0%	100.0%	100.0%	100.0%
Disinfection by products	n/a	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

21.4. Analysis of current health performance (2017-18)

Table 21.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 21.4-b Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	28	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	28	0	100	0.00024	<0.0003	0.0006
Barium	2	mg/L	28	0	100	0.007	0.005	0.009
Cadmium	0.002	mg/L	28	0	100	<0.0001	<0.0001	0.0001
Chromium	0.05	mg/L	28	0	100	0.00008	<0.0001	0.0004
Copper	2	mg/L	28	0	100	0.0041	0.0015	0.0097
Lead	0.01	mg/L	28	0	100	0.00026	<0.0001	0.0015
Manganese	0.5	mg/L	28	0	100	0.0012	0.0001	0.0034
Mercury	0.001	mg/L	28	0	100	0.000062	<0.00003	0.00033
Molybdenum	0.05	mg/L	28	0	100	0.00008	<0.0001	0.0002
Nickel	0.02	mg/L	28	0	100	0.00015	<0.0001	0.0007
Selenium	0.01	mg/L	28	0	100	0.00015	<0.0001	0.0007

Table 21.4-c Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	17	0	100	13.53	2	30
Monochloroacetic acid	150	µg/L	17	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	17	0	100	20.53	6	37
Total trihalomethanes	250	µg/L	17	0	100	48.35	27	68

Table 21.4-d General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.66	0.1	1.35
Colour True	HU	15	1.13	<1	8
pH	Units	6.5 – 8.5	7.43	6.82	8.29
Turbidity	NTU	1	0.41	0.01	5.55

21.5. Analysis of overall system performance (2017-18)

Table 21.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

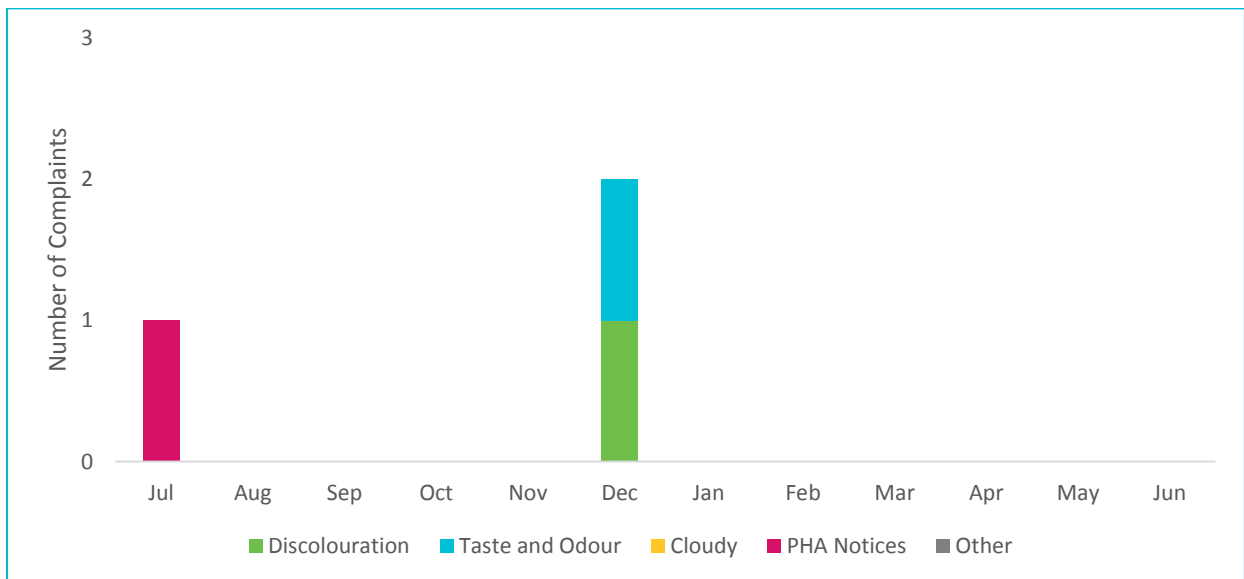


Figure 21.5-b Water quality customer complaints by month and type

22. Forth River drinking water system

22.1. System summary (2017-18)

Forth River drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	17691
Population serviced	37151
Fluoride	Fluorosilicic acid

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	99.7%	<input checked="" type="checkbox"/>	98.0%	365	1
Fluoride	100.0%	<input checked="" type="checkbox"/>	100.0%	238	0
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	16	0
DBPs	100.0%	<input checked="" type="checkbox"/>	100.0%	12	0

Compliant Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	1	<i>E.coli</i> exceedance
Public health warnings issued	0	
Notifications made to DoH	1	<i>E.coli</i> exceedance
Customer complaints	89	Discolouration, Taste & Odour, Cloudy Water, Other

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
Forth WTP	WTP upgrade	In progress	June 2021	\$800,000

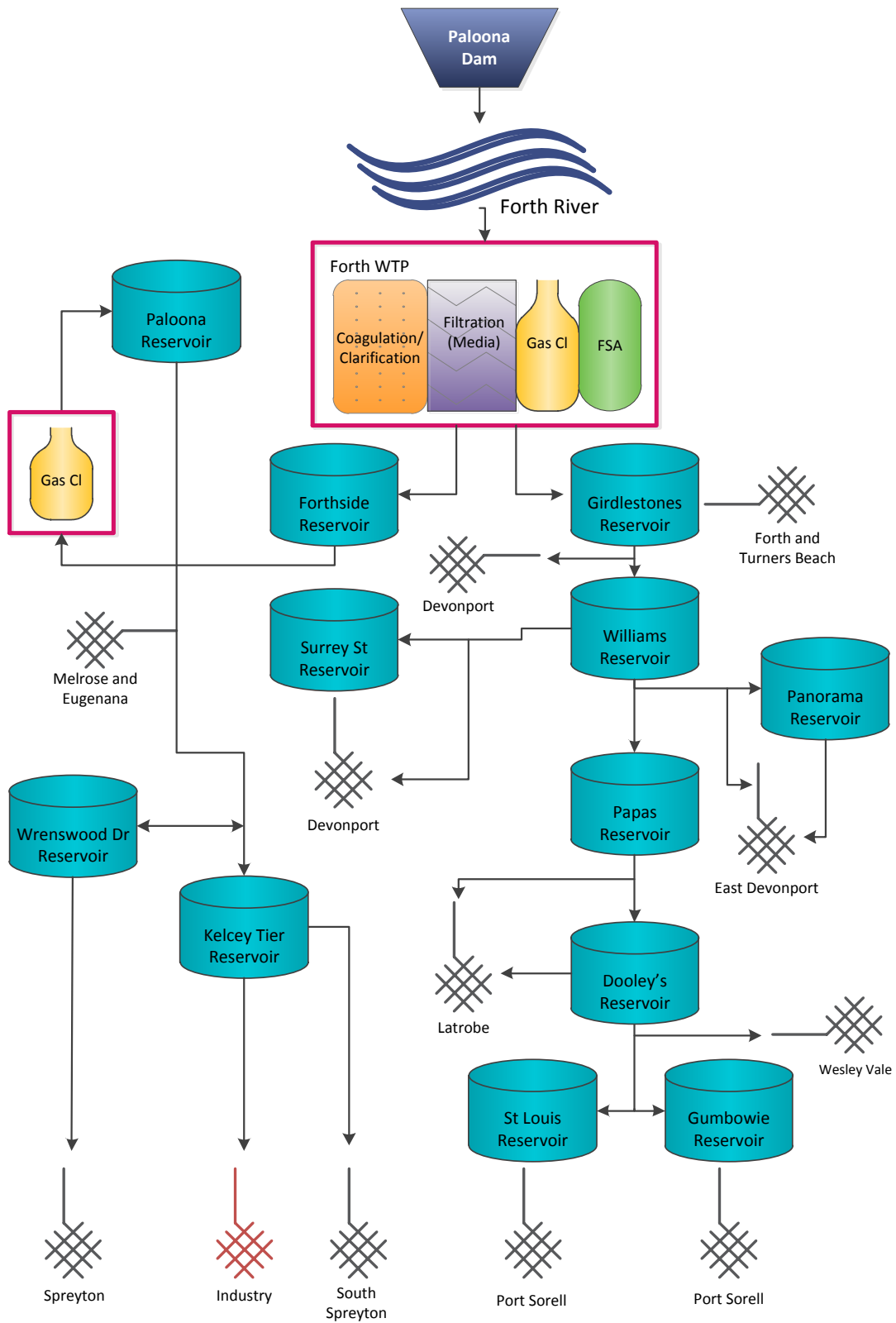


Figure 22.1-a Forth River system schematic

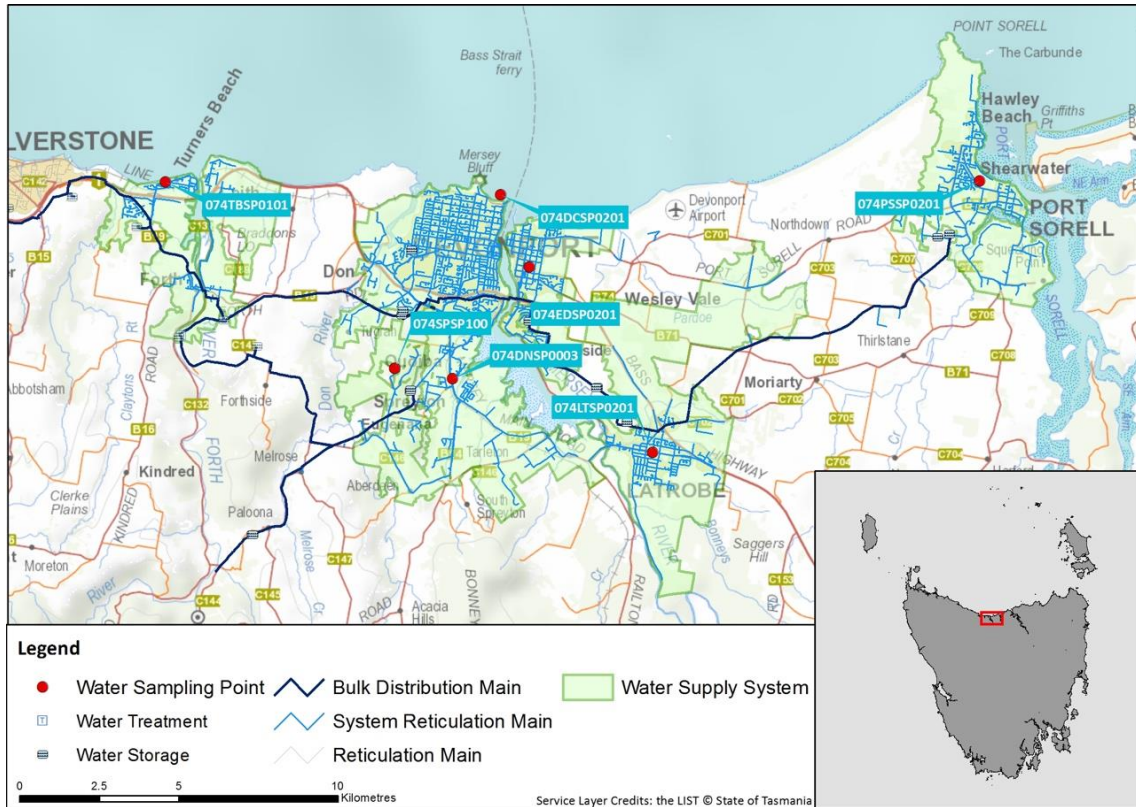


Figure 22.1-b Map of Forth River monitoring system

22.2. Summary of annual reticulation compliance (2017–18)

Table 22.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Fluoride (Field)	Process Chemicals
Forth/Spreyton Memorial Hall	074DNSP0003	W	n/a	n/a	n/a	n/a
Forth/Mersey Bluff Surf Club Sample Point	074DCSP0201	W	Q	Q	n/a	n/a
Forth/Wright St Sample Point	074EDSP0201	W	Q	n/a	n/a	n/a
Forth/Latrobe Town Hall Sample Point	074LTSP0201	W	n/a	n/a	W	n/a
Forth/Port Sorell Surf Club Sample Point	074PSSP0201	W	Q	Q	W	n/a
Gawler/Turners Beach Esplanade	074TBSP0101	W	n/a	n/a	n/a	n/a
Forth/Wrenswood Drv Res Sample Point	074SPSP100	W	Q	Q	n/a	n/a
Number Planned Samples		364	16	12	104	n/a

Number Samples Tested	364	16	12	102	n/a
-----------------------	-----	----	----	-----	-----

22.3. Summary of current and historic performance (2013-18)

Table 22.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	99.8%	100.0%	100.0%	100.0%	99.7%
Fluoride	n/a	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	99.4%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

22.4. Analysis of current health performance (2017-18)

Table 22.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
<i>E.coli</i>	28/3/2017	<i>E. coli</i> of 1 MPN/100mL in weekly operational sample	✓

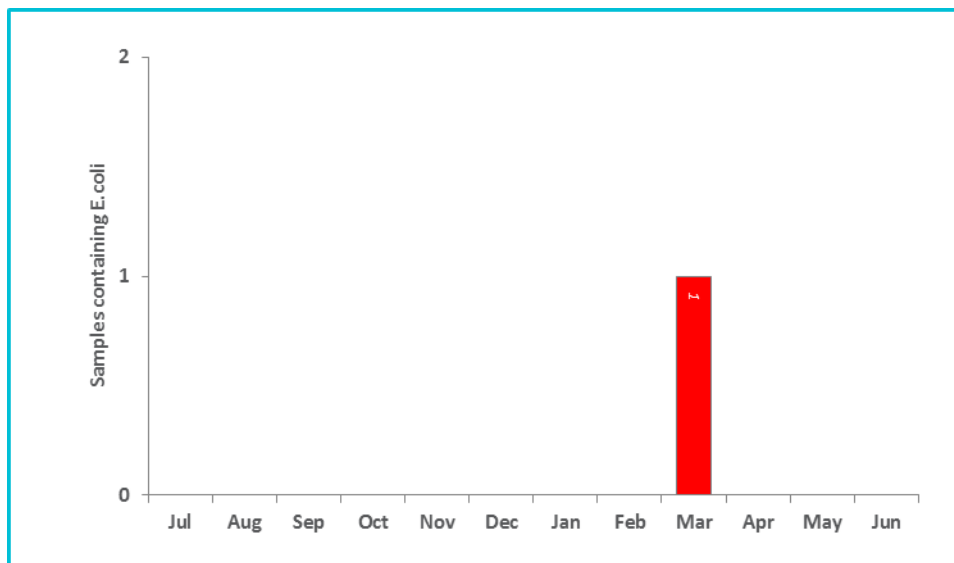


Figure 22.4-b Microbiological non-compliances by month

Table 22.4-b Fluoride distribution performance

Distribution fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	96.2%
Mean dose (mg/L)	0.94
■ Compliant ■ Non-compliant	

Table 22.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	16	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	16	0	100	0.00022	<0.0003	0.0005
Barium	2	mg/L	16	0	100	0.007	0.005	0.009
Cadmium	0.002	mg/L	16	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	16	0	100	0.00011	<0.0001	0.0003
Copper	2	mg/L	16	0	100	0.02309	0.00005	0.0757
Lead	0.01	mg/L	16	0	100	0.00035	<0.0001	0.0012
Manganese	0.5	mg/L	16	0	100	0.0034	0.0008	0.0156
Mercury	0.001	mg/L	16	0	100	0.00004	<0.00003	0.00017
Molybdenum	0.05	mg/L	16	0	100	0.00006	<0.0001	0.0002
Nickel	0.02	mg/L	16	0	100	0.00016	<0.0001	0.0006
Selenium	0.01	mg/L	16	0	100	<0.0001	<0.0001	<0.0001

Table 22.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	12	0	100	6.83	2	17
Monochloroacetic acid	150	µg/L	12	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	12	0	100	20.33	14	27
Total trihalomethanes	250	µg/L	12	0	100	61.17	43	86

Table 22.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.31	0	1.19
Colour True	HU	15	0.92	<1	2
pH	Units	6.5 – 8.5	7.38	5.77	9.46
Turbidity	NTU	1	0.64	0.13	12.4

22.5. Analysis of overall system performance (2017-18)

Table 22.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
23/3/2018	Weekly operational sample detected <i>E.coli</i> of 1 MPN/100mL at 083PASPO101. DoH notified. Investigation of the network was undertaken and an external root cause analysis. Subsequent samples were clear of <i>E.coli</i> .	✓	✓

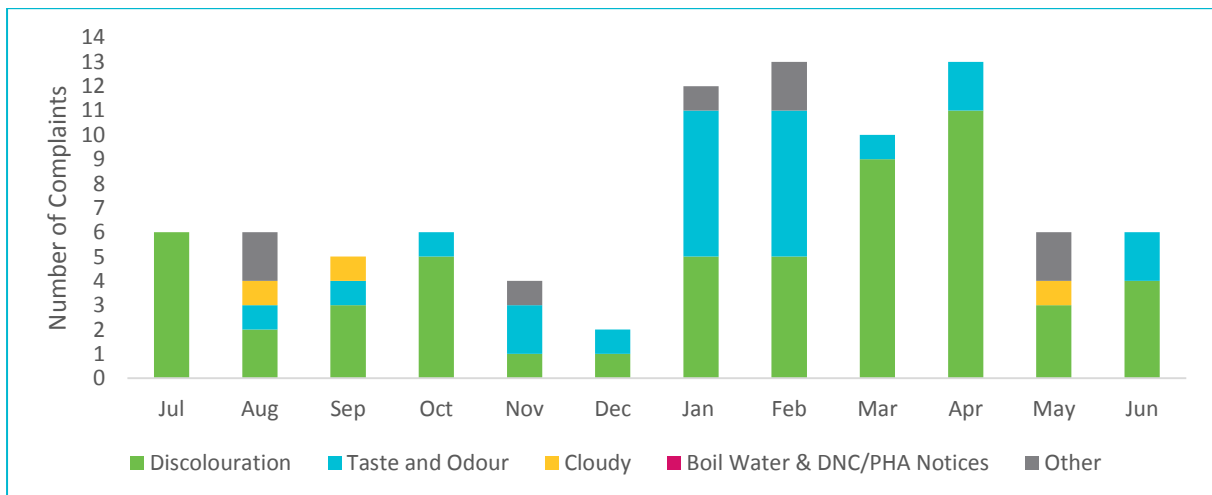


Figure 22.5-b Water quality customer complaints by month and type

23. Gawler River drinking water system

23.1. System summary (2017-18)

Gawler River drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	5988
Population serviced	12575
Fluoride	Fluorosilicic acid

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	☑	98.0%	156	0
Fluoride	100.0%	☑	100.0%	178	0
Metals	100.0%	☑	100.0%	8	0
DBPs	100.0%	☑	100.0%	4	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	105	Discolouration, Taste & Odour, Cloudy Water, Other (stained washing).

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
No projected capital investment				

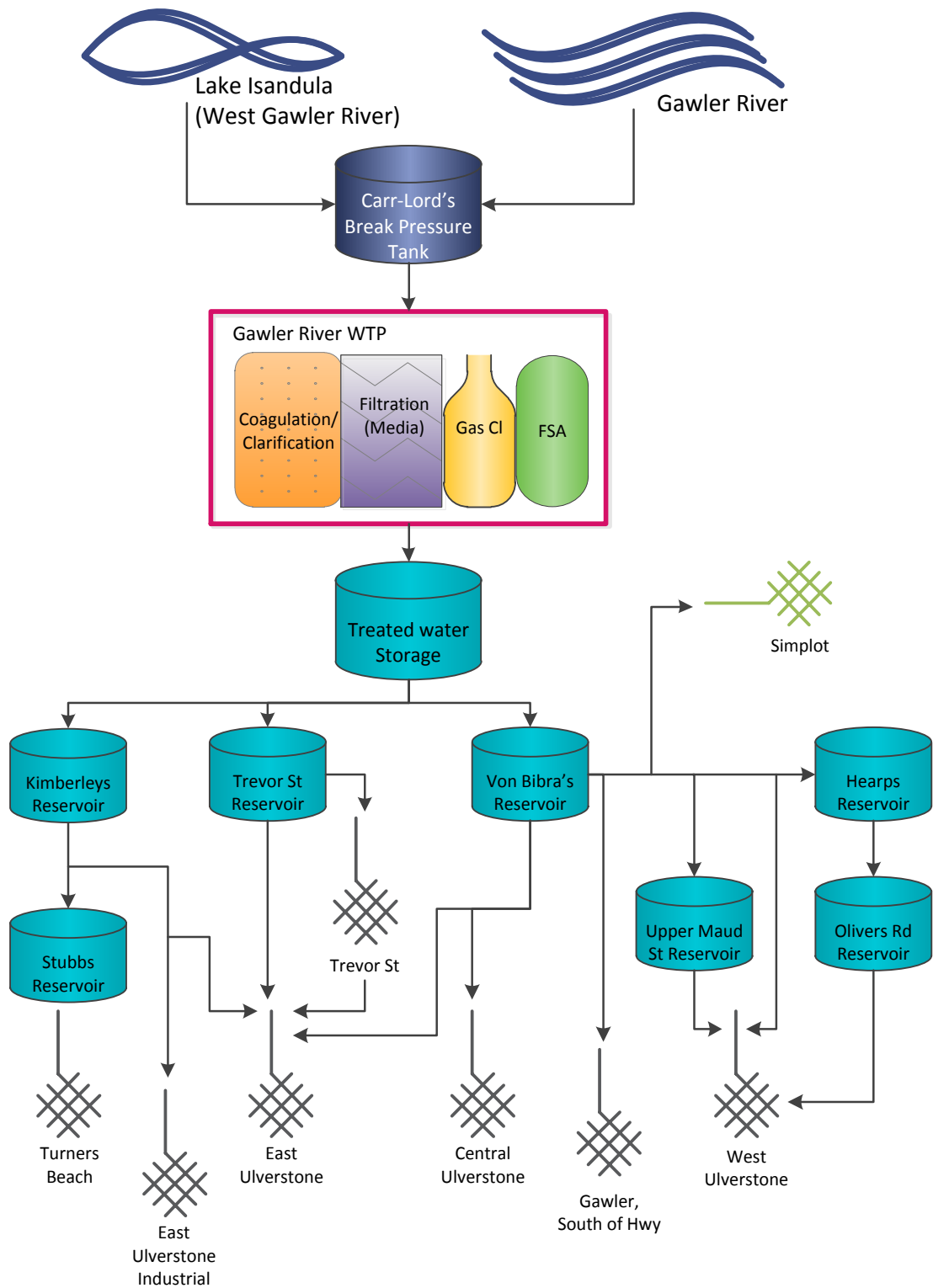


Figure 23.1-a Gawler River system schematic

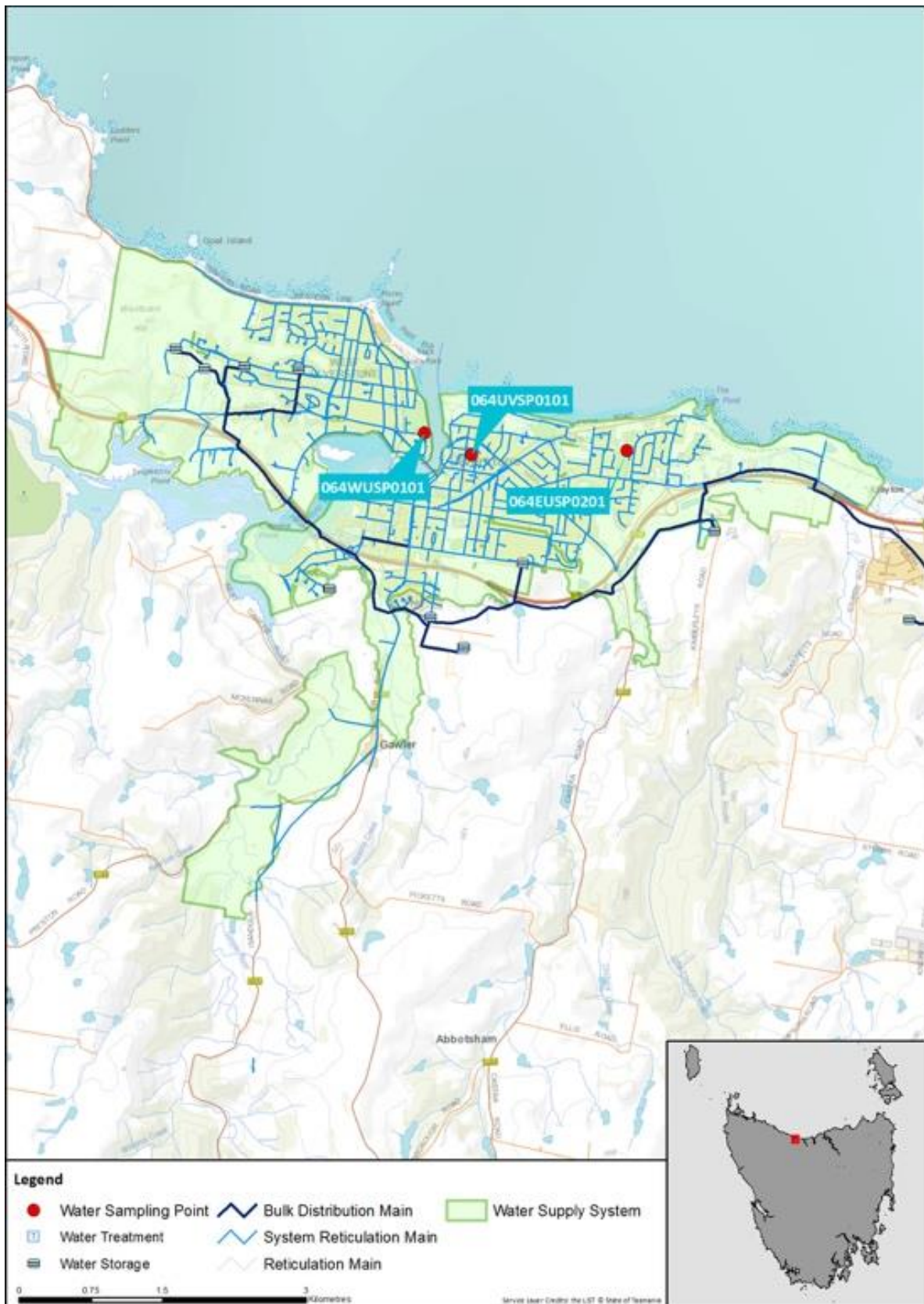


Figure 23.1-b Map of Gawler River monitoring system

23.2. Summary of annual reticulation compliance (2017–18)

Table 23.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Gawler/Ulverstone Swimming Pool	064EUSP0201	W	Q	Q	Q	n/a
Gawler/Ulverstone Council Chambers Sample Tap	064UVSP0101	W	n/a	n/a	n/a	n/a
Gawler/Flora St Wst Ulverstone Sample Point	064WUSP0101	W	Q	n/a	Q	n/a
Number Planned Samples		156	8	4	8	n/a
Number Samples Tested		156	8	4	8	n/a

23.3. Summary of current and historic performance (2013-18)

Table 23.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100.0%	99.75%	99.8%	100.0%	100.0%
Fluoride	n/a	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

23.4. Analysis of current health performance (2017-18)

Table 23.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 23.4-b Fluoride distribution performance

Distribution fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	98.3%
Mean dose (mg/L)	1.03
■ Compliant ■ Non-compliant	

Table 23.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	8	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	8	0	100	<0.0003	<0.0003	<0.0003
Barium	2	mg/L	8	0	100	0.016	0.012	0.021
Cadmium	0.002	mg/L	8	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	8	0	100	0.00013	<0.0001	0.0005
Copper	2	mg/L	8	0	100	0.00581	0.002	0.0105
Lead	0.01	mg/L	8	0	100	0.00019	<0.0001	0.0004
Manganese	0.5	mg/L	8	0	100	0.0099	0.0033	0.0243
Mercury	0.001	mg/L	8	0	100	0.000038	<0.00003	0.00014
Molybdenum	0.05	mg/L	8	0	100	0.00006	<0.0001	0.0001
Nickel	0.02	mg/L	8	0	100	0.00069	<0.0001	0.0012
Selenium	0.01	mg/L	8	0	100	<0.0001	<0.0001	<0.0001

Table 23.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	4	0	100	1.8	<1	3
Monochloroacetic acid	150	µg/L	4	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	4	0	100	16.3	11	24
Total trihalomethanes	250	µg/L	4	0	100	73.7	50	93

Table 23.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.22	0	0.75
Colour True	HU	15	0.94	<1	2
pH	Units	6.5 – 8.5	7.22	6.23	8.86
Turbidity	NTU	1	0.83	0.16	8.47

23.5. Analysis of overall system performance (2017-18)

Table 23.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

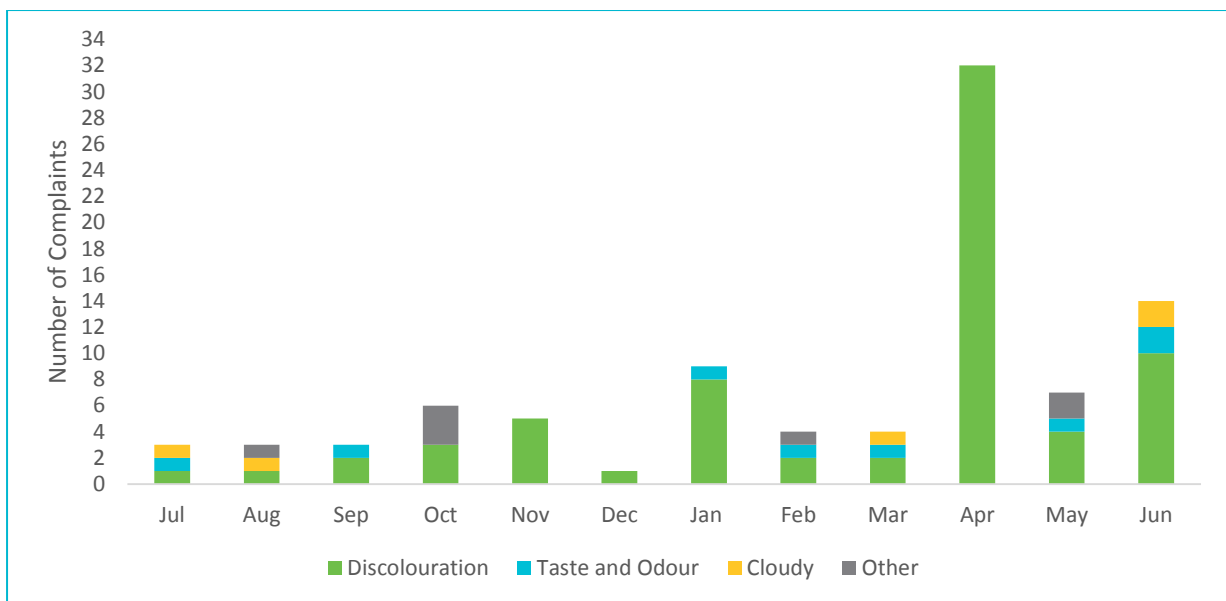






Figure 23.5-b Water quality customer complaints by month and type

24. Gladstone drinking water system

24.1. System summary (2017-18)

Gladstone drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	92
Population serviced	147
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	57.1%		98.0%	14	6
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%		100.0%	4	0
DBPs	n/a	n/a	n/a	n/a	n/a

 Compliant  Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	6	<i>E. coli</i> exceedances
Public health warnings issued	1	Subject to PHA until 19/6/2018
Notifications made to DoH	6	<i>E. coli</i> exceedances
Customer complaints	1	Discolouration

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend (\$'000)
Regional Towns Water Supply Program	WTP and associated infrastructure	Complete	June 2018	\$2,245,495
Regional Towns Water Supply Program	Reticulation upgrade	Complete	June 2018	\$445,823

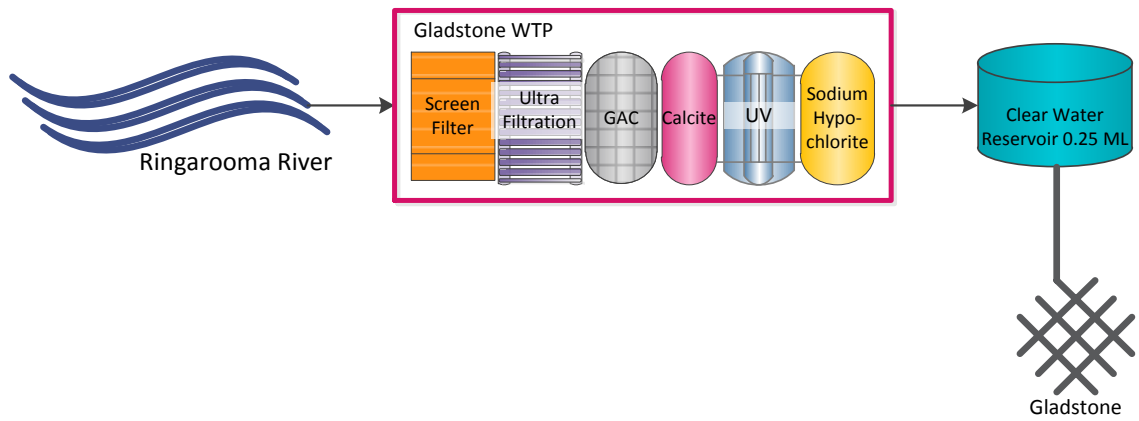


Figure 24.1-a Gladstone system schematic

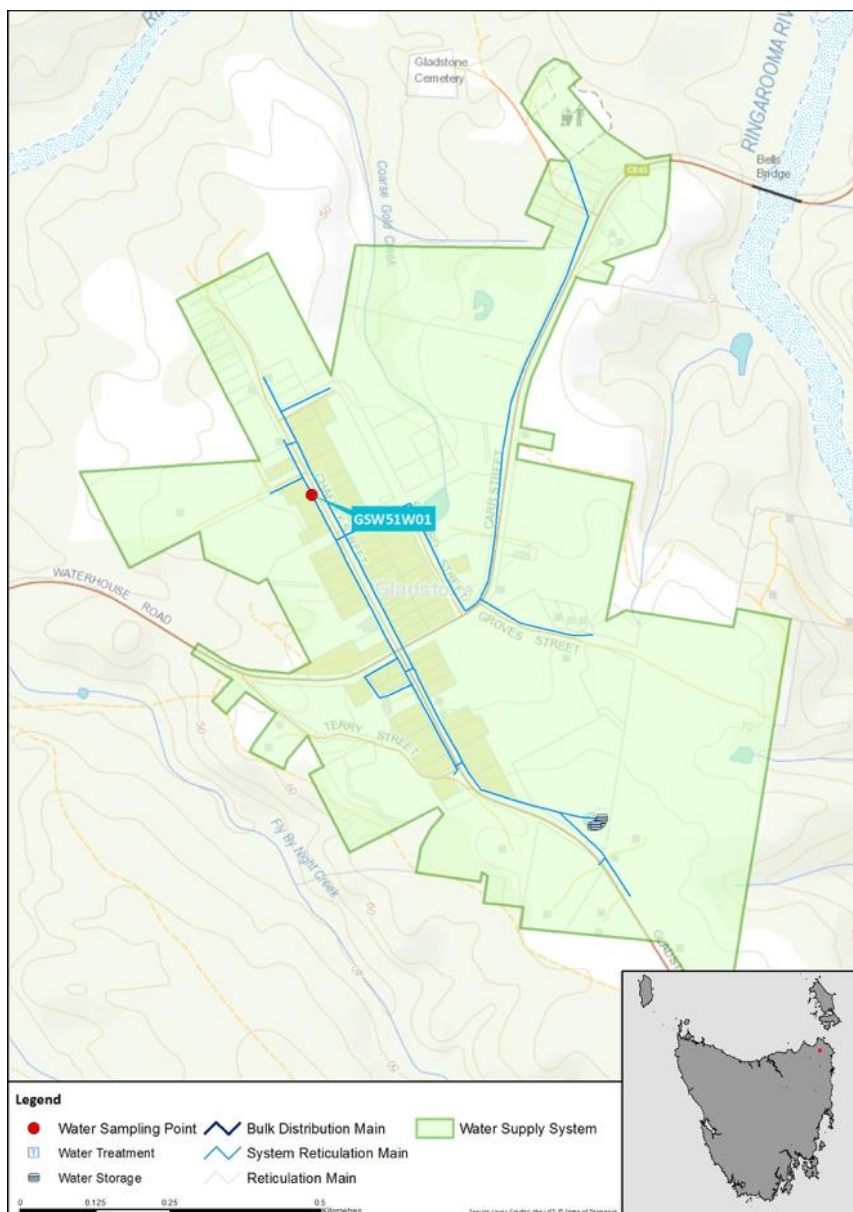


Figure 24.1-b Map of Gladstone monitoring system

24.2. Summary of annual reticulation compliance (2017–18)

Table 24.2-a Sampling program

Planned compliance sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Gladstone/Fire Station	GSW51W01	M	Q	n/a	Q	n/a
Number Planned Samples		12	4	n/a	4	n/a
Number Samples Tested		12	4	n/a	4	n/a

24.3. Summary of current and historic performance (2013-18)

Table 24.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	99.5%	36.9%	33.3%	16.7%	57.1%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	n/a	n/a	n/a	n/a	n/a

■ Compliant ■ Non-compliant

24.4. Analysis of current health performance (2017-18)

Table 24.4-a Summary of health guideline exceedances¹⁰

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
<i>E.coli</i>	11/7/2017	<i>E.coli</i> of 1 MPN/100mL in monthly compliance sample	☒
<i>E.coli</i>	8/8/2017	<i>E.coli</i> of 1 MPN/100mL in monthly compliance sample	☒
<i>E.coli</i>	12/12/2017	<i>E.coli</i> of 8.6 MPN/100mL in monthly compliance sample	☒
<i>E.coli</i>	14/02/2018	<i>E.coli</i> of 10.3 MPN/100mL in monthly compliance sample	☒
<i>E.coli</i>	13/03/2018	<i>E.coli</i> of 1 MPN/100mL in monthly compliance sample	☒

¹⁰ The system was subject to PHA until 19/6/2018. Resampling was not required whilst system on PHA.

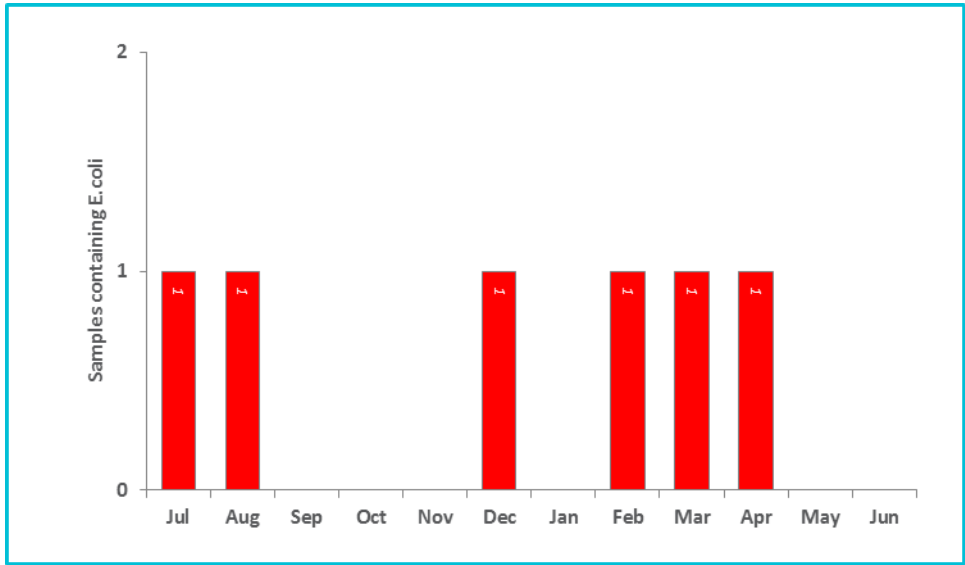


Figure 24.4-b Microbiological non-compliances by month

Table 24.4-c Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	0.00019	<0.0003	0.0006
Barium	2	mg/L	4	0	100	0.019	0.003	0.068
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	<0.0001	<0.0001	0.0001
Copper	2	mg/L	4	0	100	0.01231	0.0045	0.0269
Lead	0.01	mg/L	4	0	100	0.00079	0.0002	0.0022
Manganese	0.5	mg/L	4	0	100	0.0201	0.0016	0.0948
Mercury	0.001	mg/L	4	0	100	0.000038	<0.00003	0.00008
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	0.00108	<0.0001	0.0042
Selenium	0.01	mg/L	4	0	100	<0.0001	<0.0001	0.0001

Table 24.4-d General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.56	0.26	0.94
Colour True	HU	15	2.86	<1	13
pH	Units	6.5 – 8.5	7.36	6.4	8
Turbidity	NTU	1	0.42	0.1	1.57

24.5. Analysis of overall system performance (2017-18)

Table 24.5-a Summary of system issues/public health warnings with notification details

Summary of system issues			
Date	Description	DHHS notification required	DHHS notification complete
Pre 2009	Subject to PHA until 19/6/2018	✓	✓
11/7/2017	Monthly sample detected <i>E. coli</i> – system subject to PHA	✓	✓
8/8/2017	Monthly sample detected <i>E. coli</i> – system subject to PHA	✓	✓
12/12/2017	Monthly sample detected <i>E. coli</i> – system subject to PHA	✓	✓
14/2/2018	Monthly sample detected <i>E. coli</i> – system subject to PHA	✓	✓
13/3/2018	Monthly sample detected <i>E. coli</i> – system subject to PHA	✓	✓
9/4/2018	Monthly sample detected <i>E. coli</i> – system subject to PHA	✓	✓

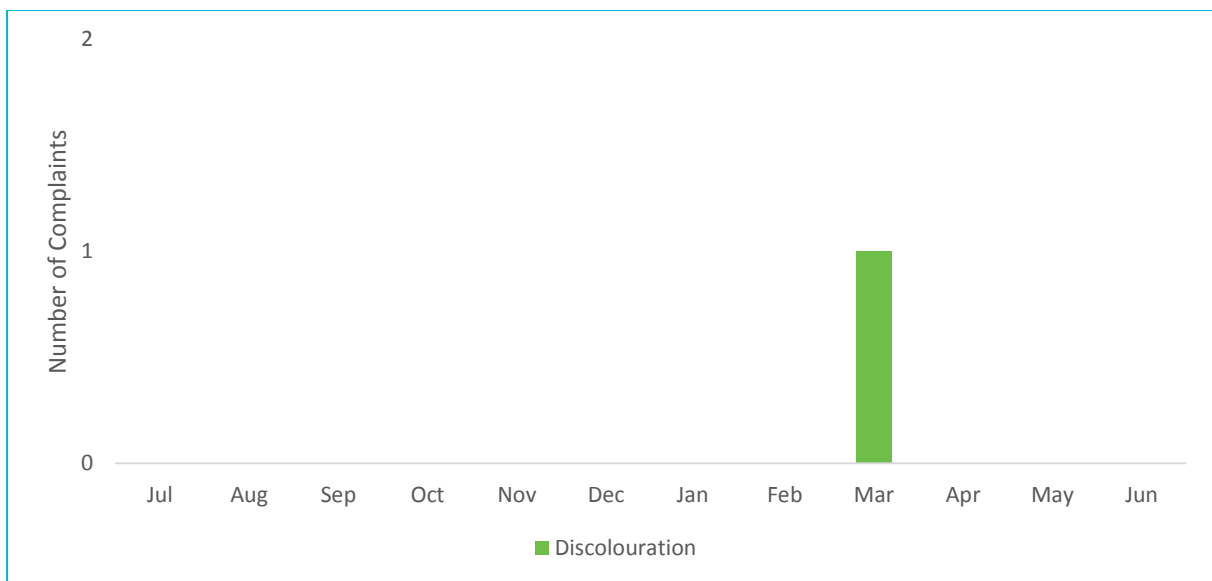






Figure 24.5-b Water quality customer complaints by month and type

25. Gormanston drinking water system

25.1. System summary (2017-18)

Gormanston drinking water system	
System status (as at 30 June 2018)	BWA
Total number of connections	34
Population serviced	31
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	66.7%		98.0%	12	4
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%		100.0%	4	0
DBPs	n/a	n/a	n/a	n/a	n/a

 Compliant
  Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	4	<i>E. coli</i> exceedances
Public health warnings issued	1	Subject to PHA
Notifications made to DoH	4	<i>E. coli</i> exceedances
Customer complaints	0	

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
No projected capital investment				

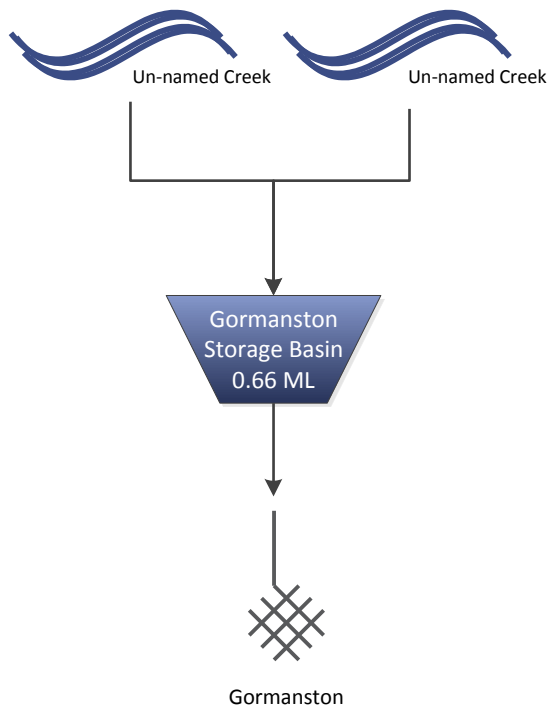


Figure 25.1-a Gormanston system schematic

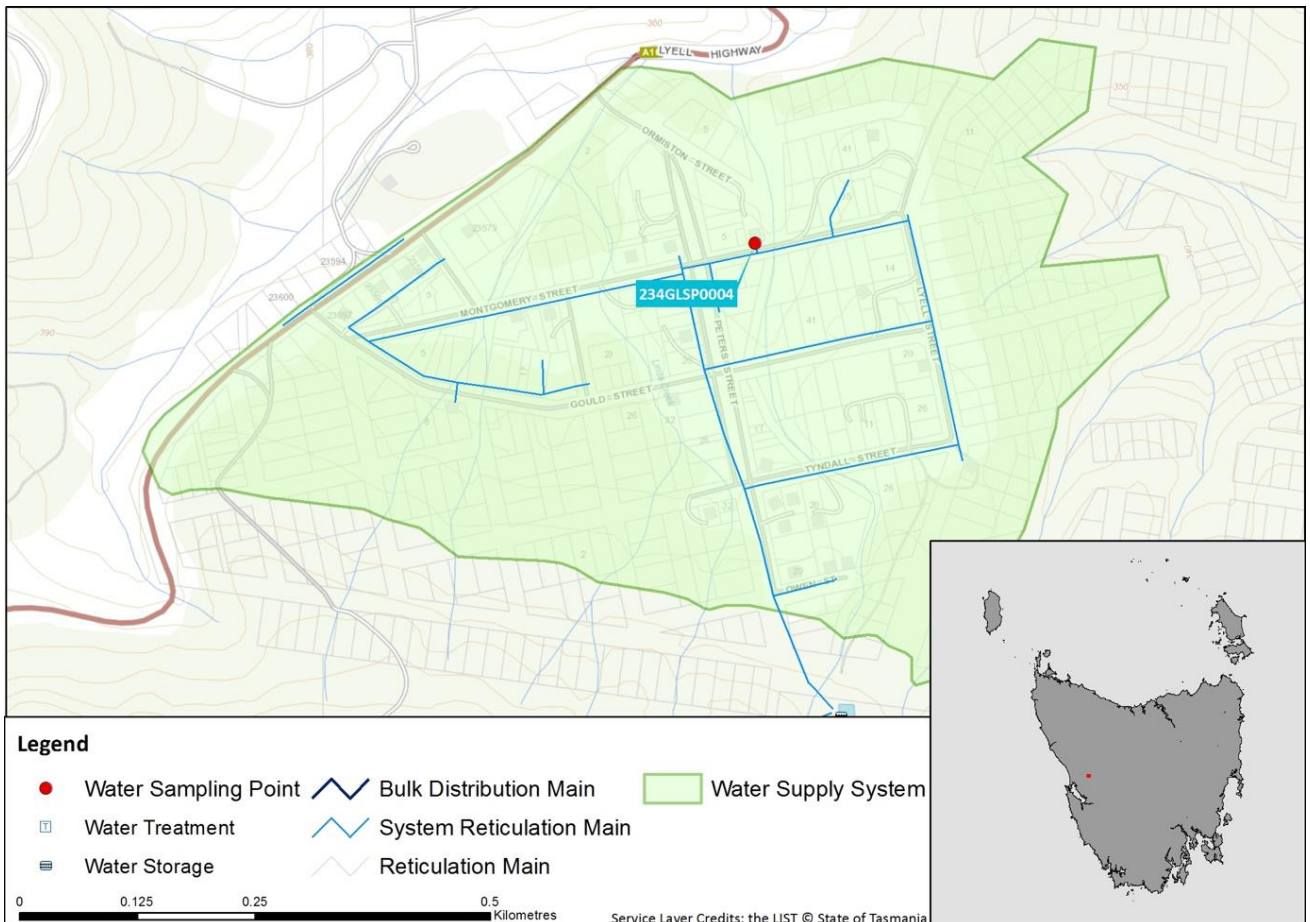


Figure 25.1-b Map of Gormanston monitoring system

25.2. Summary of annual reticulation compliance (2017–18)

Table 25.2-a Sampling program

Planned compliance sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Gormanston/Mongomery St.	234GLSP0004	M	Q	n/a	Q	n/a
Number Planned Samples		12	4	n/a	4	n/a
Number Samples Tested		12	4	n/a	4	n/a

25.3. Summary of current and historic performance (2013-18)

Table 25.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100.0%	84.6%	48.0%	50.0%	66.7%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	100.0%	97.7%	100.0%	100.0%
Disinfection by products	n/a	n/a	n/a	n/a	n/a

■ Compliant ■ Non-compliant

25.4. Analysis of current health performance (2017-18)

Table 25.4-a Summary of health guideline exceedances ¹¹

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
<i>E.coli</i>	5/12/2017	<i>E.coli</i> of 7.3 MPN/100mL in monthly compliance sample	<input checked="" type="checkbox"/>
<i>E.coli</i>	2/1/2018	<i>E.coli</i> of 4.1 MPN/100mL in monthly compliance sample	<input checked="" type="checkbox"/>
<i>E.coli</i>	6/2/2018	<i>E.coli</i> of 2 MPN/100mL in monthly compliance sample	<input checked="" type="checkbox"/>
<i>E.coli</i>	4/4/2018	<i>E.coli</i> of 1 MPN/100mL in monthly compliance sample	<input checked="" type="checkbox"/>

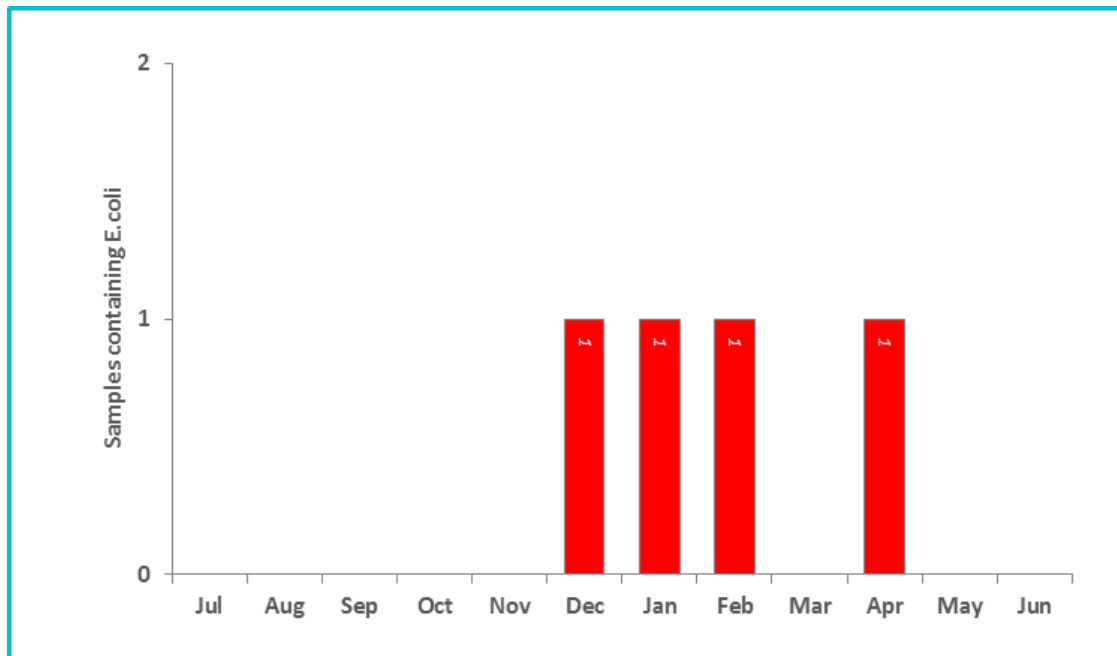


Figure 25.4-b Microbiological non-compliances by month

¹¹ System subject to PHA, resampling not required

Table 25.4-c Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	0.00049	<0.0003	0.0008
Barium	2	mg/L	4	0	100	0.002	0.002	0.002
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	0.00025	0.0002	0.0003
Copper	2	mg/L	4	0	100	0.02363	0.0175	0.0267
Lead	0.01	mg/L	4	0	100	0.0015	0.0011	0.0018
Manganese	0.5	mg/L	4	0	100	0.0109	0.0081	0.0124
Mercury	0.001	mg/L	4	0	100	0.000041	<0.00003	0.00012
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Selenium	0.01	mg/L	4	0	100	0.00019	<0.0001	0.0003

Table 25.4-d General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	n/a	n/a	n/a
Colour True	HU	15	34	27	38
pH	Units	6.5 – 8.5	5.43	4.2	5.81
Turbidity	NTU	1	1.79	0.87	4.77

25.5. Analysis of overall system performance (2017-18)

Table 25.5-a Summary of system issues/public health warnings with notification details

Summary of system issues				
Date	Description	DHHS notification required	DHHS notification complete	
Pre 2011	Subject to PHA	✓	✓	
5/12/2017	Monthly sample detected <i>E. coli</i> – system subject to PHA	✓	✓	
2/1/2018	Monthly sample detected <i>E. coli</i> – system subject to PHA	✓	✓	
6/2/2018	Monthly sample detected <i>E. coli</i> – system subject to PHA	✓	✓	

4/4/2018	Monthly sample detected <i>E. coli</i> – system subject to PHA	✓	✓
----------	--	---	---

26. Grassy drinking water system

26.1. System summary (2017-18)

Grassy drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	112
Population serviced	224
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	☑	98.0%	104	0
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	☑	100.0%	4	0
DBPs	100.0%	☑	100.0%	4	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	0	

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
King Island Upgrade	WTP Upgrade, treated water reservoirs and pump station	In progress	May 2019	\$10,473,597

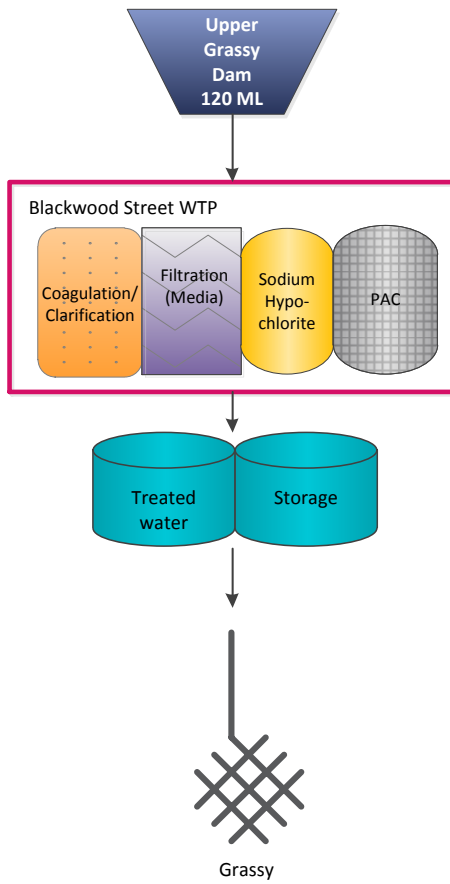


Figure 26.1-a Grassy system schematic

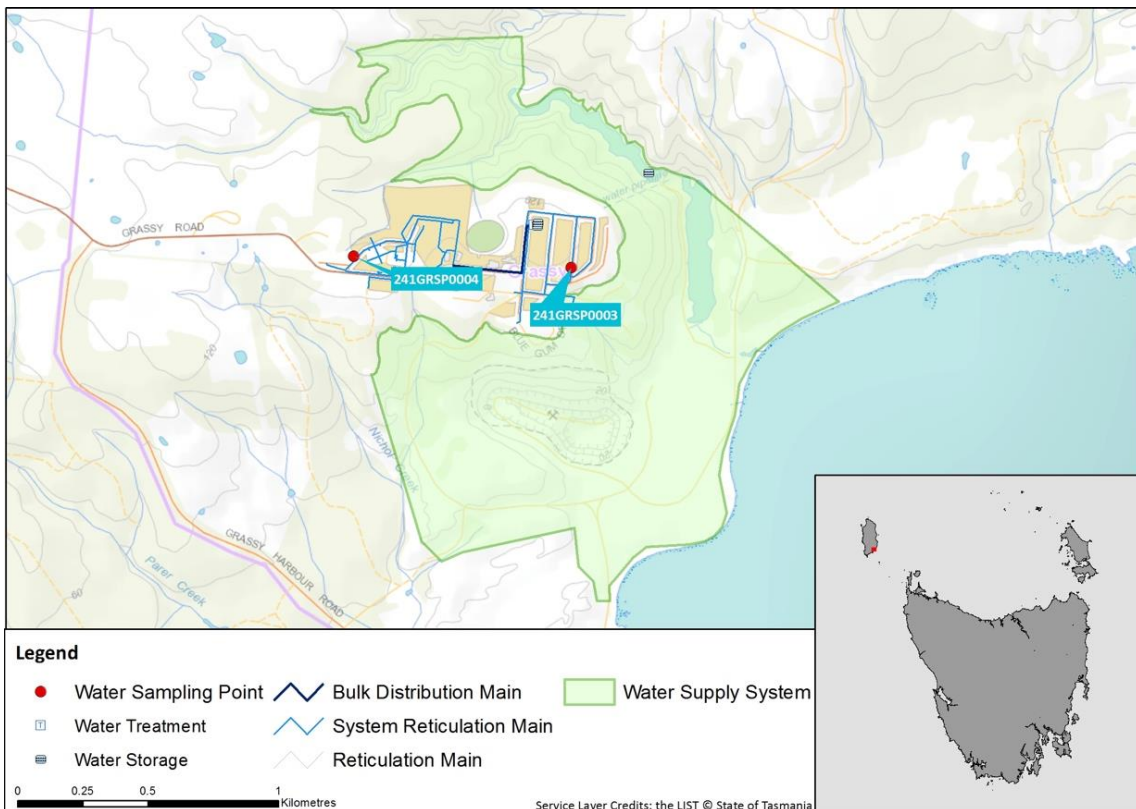


Figure 26.1-b Map of Grassy monitoring system

26.2. Summary of annual reticulation compliance (2017–18)

Table 26.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Grassy/Sassafrass St Site 2	241GRSP0003	W	n/a	n/a	n/a	n/a
Grassy/Ti Tree Drive Site 3	241GRSP0004	W	Q	Q	Q	n/a
Number Planned Samples		104	4	4	4	n/a
Number Samples Tested		104	4	4	4	n/a

26.3. Summary of current and historic performance (2013-18)

Table 26.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100.0%	99.4%	100.0%	100.0%	100.0%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

26.4. Analysis of current health performance (2017-18)

Table 26.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 26.4-b Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0003	<0.0003	<0.0003
Arsenic	0.01	mg/L	4	0	100	<0.0003	<0.0003	<0.0003
Barium	2	mg/L	4	0	100	0.004	0.003	0.005
Cadmium	0.002	mg/L	4	0	100	0.00008	<0.0001	0.0001
Chromium	0.05	mg/L	4	0	100	0.00008	<0.0001	0.0001
Copper	2	mg/L	4	0	100	0.0169	0.006	0.0233
Lead	0.01	mg/L	4	0	100	0.00016	<0.0001	0.0005
Manganese	0.5	mg/L	4	0	100	0.0144	0.0092	0.0254
Mercury	0.001	mg/L	4	0	100	0.000059	<0.00003	0.0001
Molybdenum	0.05	mg/L	4	0	100	0.00505	0.0018	0.0091
Nickel	0.02	mg/L	4	0	100	0.0011	0.0007	0.0016
Selenium	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001

Table 26.4-c Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	4	0	100	6.63	<1	14
Monochloroacetic acid	150	µg/L	4	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	4	0	100	4.63	<1	11
Total trihalomethanes	250	µg/L	4	0	100	106.75	89	142

Table 26.4-d General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.38	0.09	1.02
Colour True	HU	15	<1	<1	<1
pH	Units	6.5 – 8.5	7.34	7.15	7.56
Turbidity	NTU	1	0.11	0.03	0.48

26.5. Analysis of overall system performance (2017-18)

Table 26.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

27. Greater Hobart drinking water system

27.1. System summary (2017-18)

Greater Hobart drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	99,650
Population serviced	223,991
Fluoride	Lake Fenton: Sodium fluoride All others: Fluorosilicic acid

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	☑	98.0%	5700	2
Fluoride	100.0%	☑	100.0%	1014	0
Metals	100.0%	☑	100.0%	54	0
DBPs	100.0%	☑	100.0%	54	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	2	<i>E. coli</i> exceedance
Public health warnings issued	3	PHA in Risdon Vale (31/10/2017-2/11/2017) PHA in South Hobart (25/4/2018-27/4/2018) National Park subject to PHA since 15/7/2016
Notifications made to DoH	6	<i>E. coli</i> exceedances followed by temporary PHAs
Customer complaints	496	Discoloured water, taste & odour, cloudy, PHA notices, other (illness from water).

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
Bryn Estyn Upgrade	Upgrade to WTP	In progress	June 2022	\$500,000
Merton Fluoride	Dosing replacement	In progress	April 2019	\$183,000
Regional Towns Water Supply Program	WTP and associated infrastructure	In progress	August 2018	\$2,997,646
Regional Towns Water Supply Program	Fentonbury-Westerway WTP and associated infrastructure	In progress	August 2018	\$3,698,930

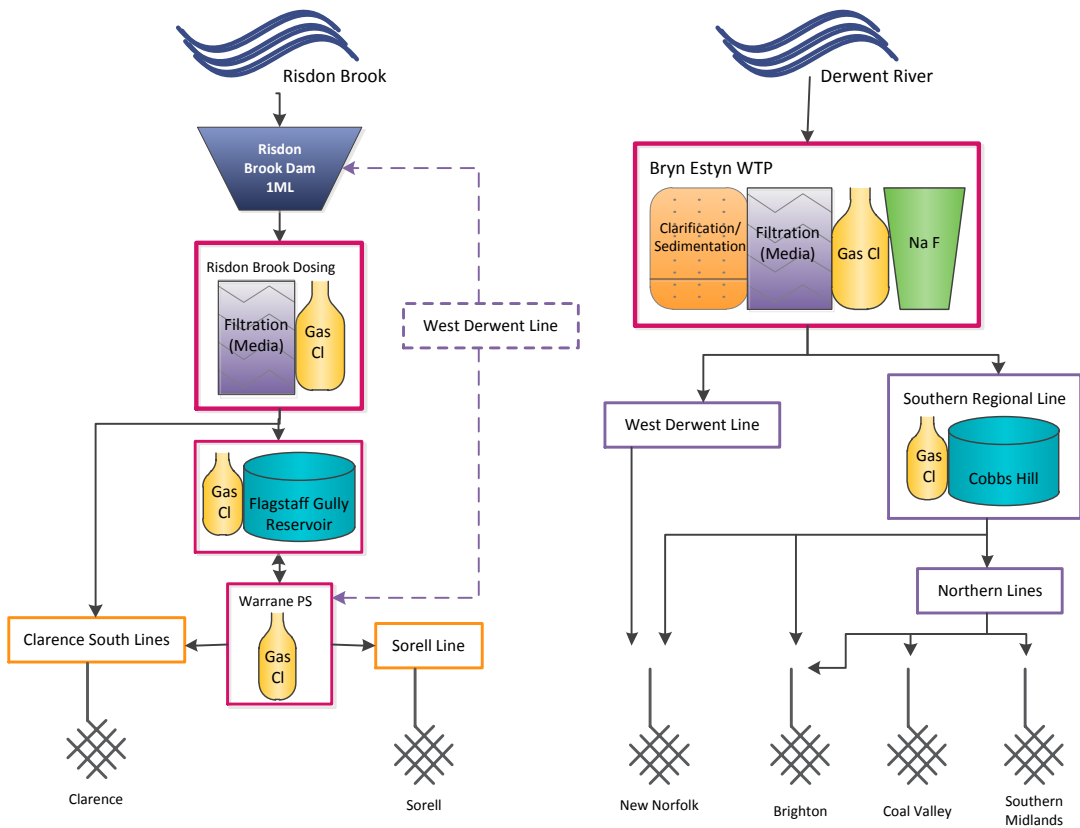
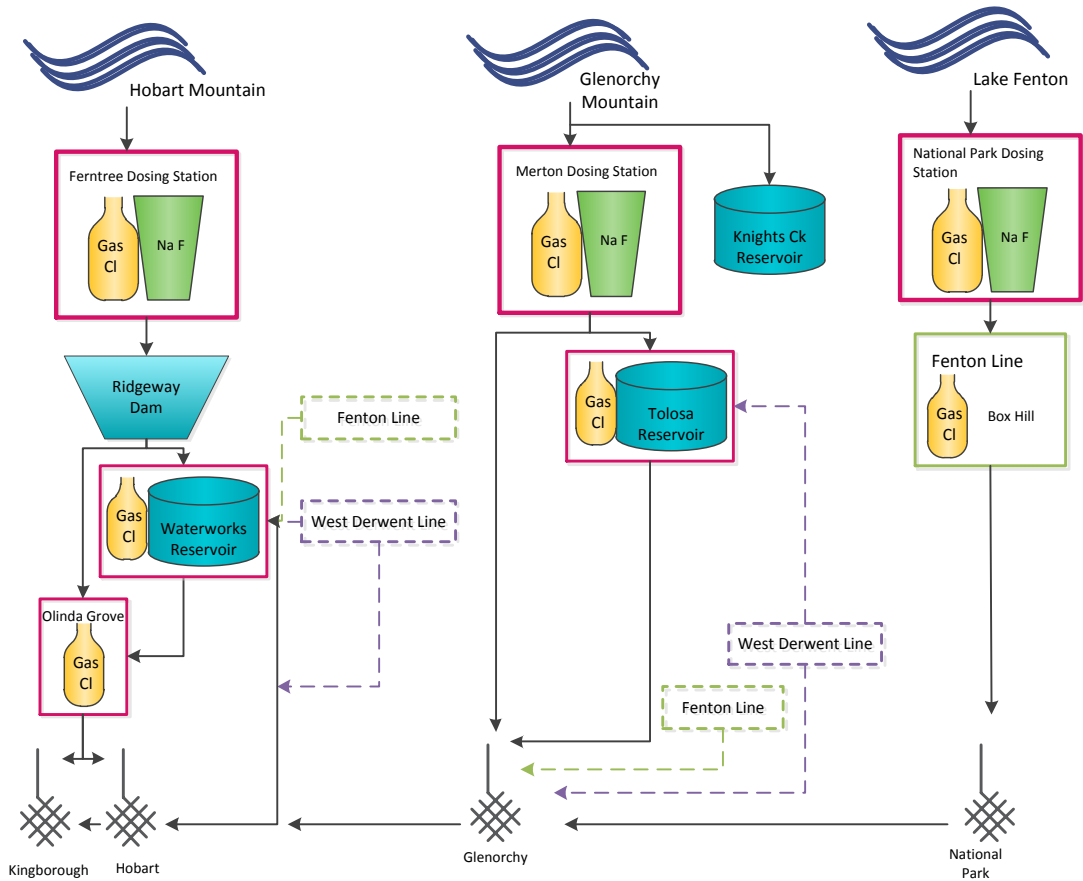


Figure 27.1-a Greater Hobart system schematic

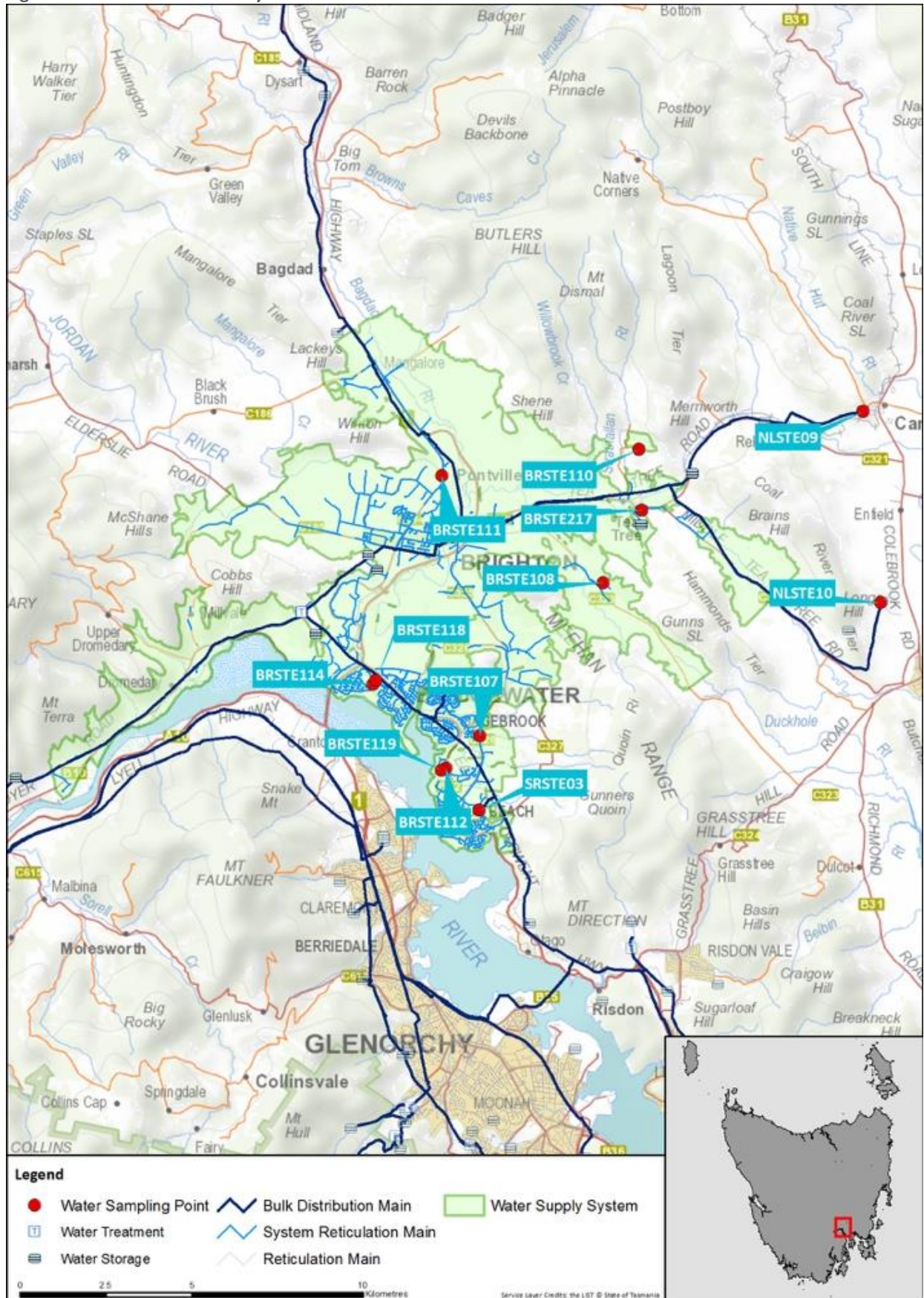


Figure 27.1-b Map of Greater Hobart – Brighton monitoring system

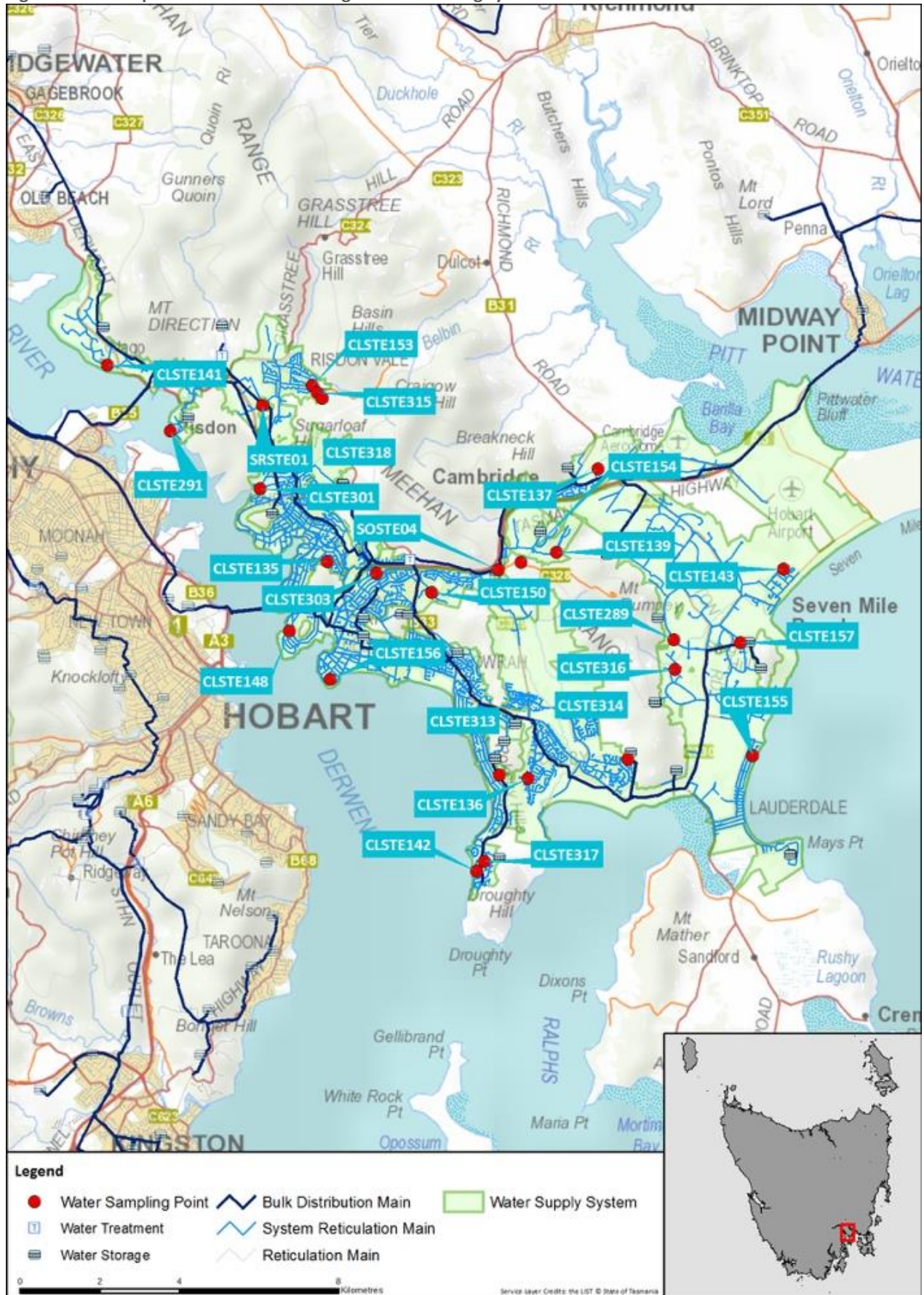


Figure 27.1-c Map of Greater Hobart – Clarence monitoring system

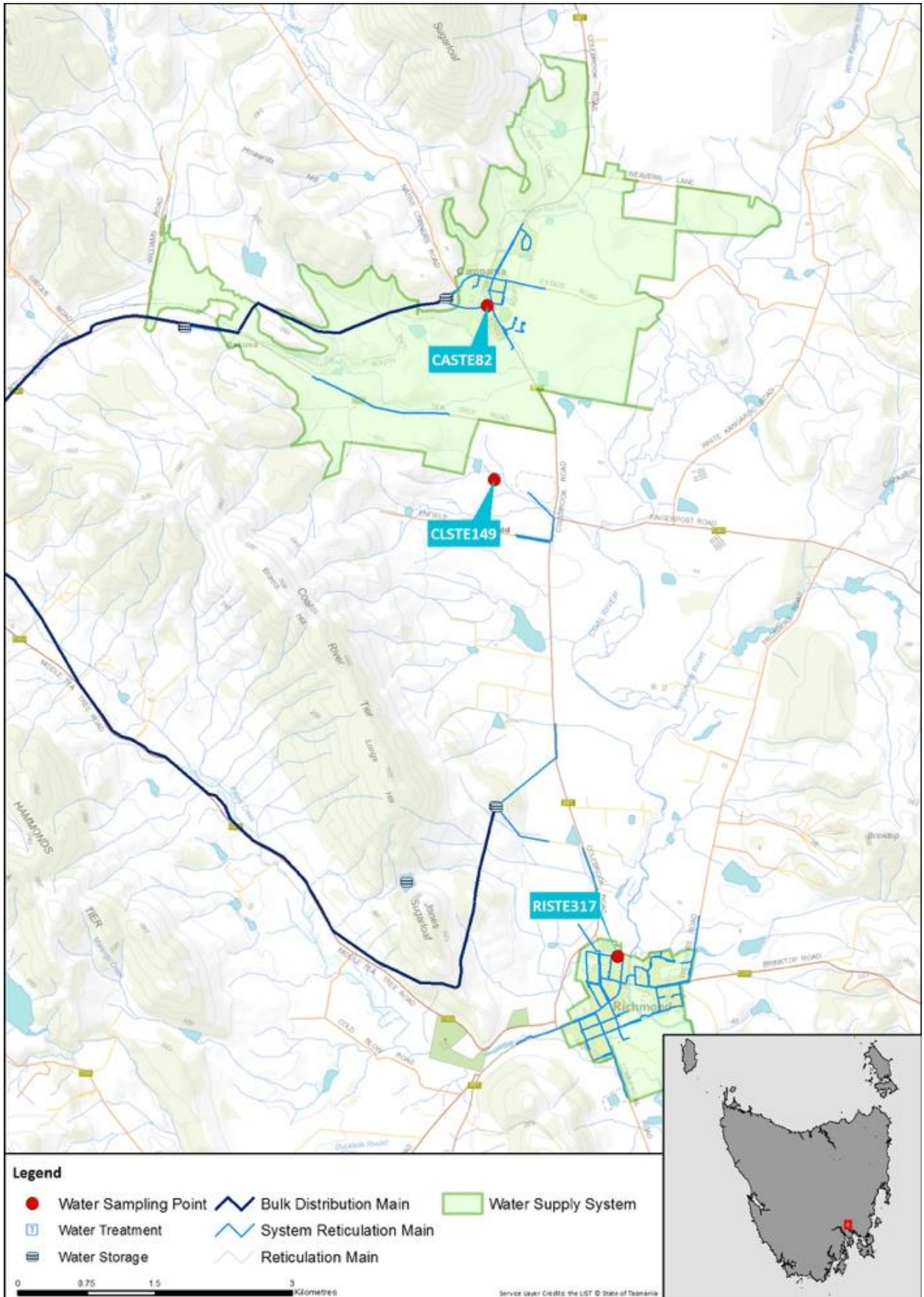


Figure 27.1-d Map of Greater Hobart – Coal Valley monitoring system

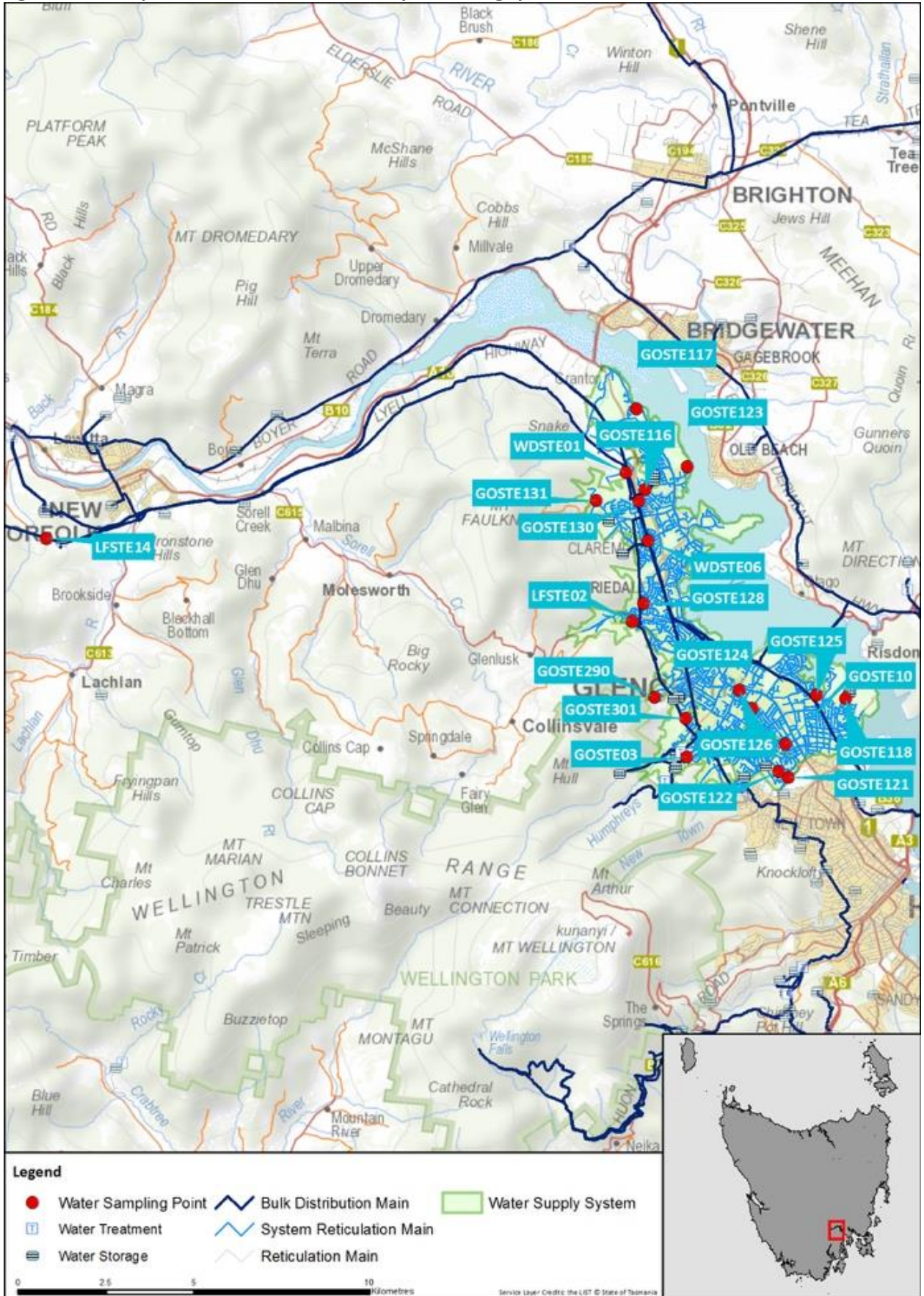


Figure 27.1-e Map of Greater Hobart – Glenorchy monitoring system

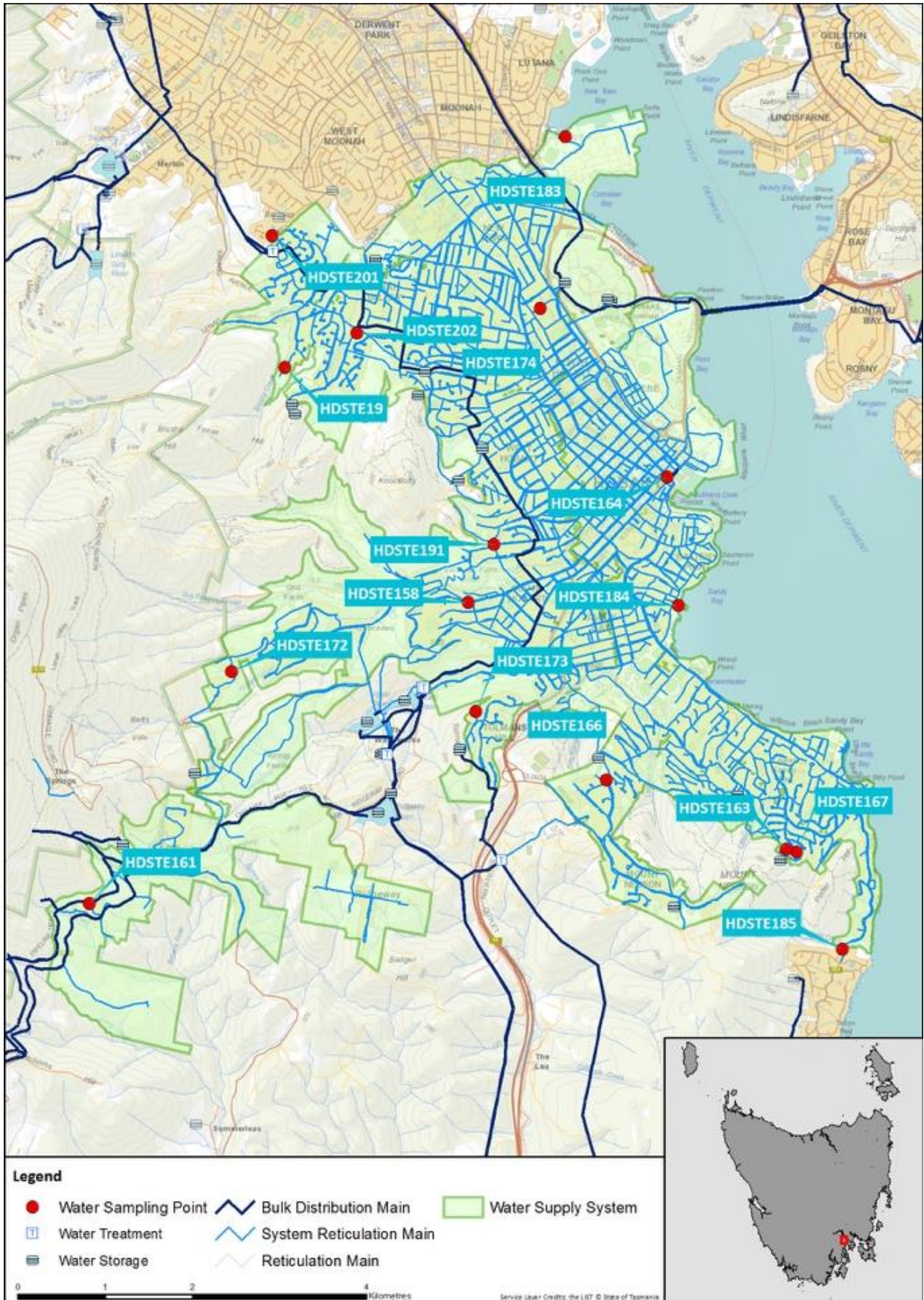


Figure 27.1-f Map of Greater Hobart – Hobart monitoring system

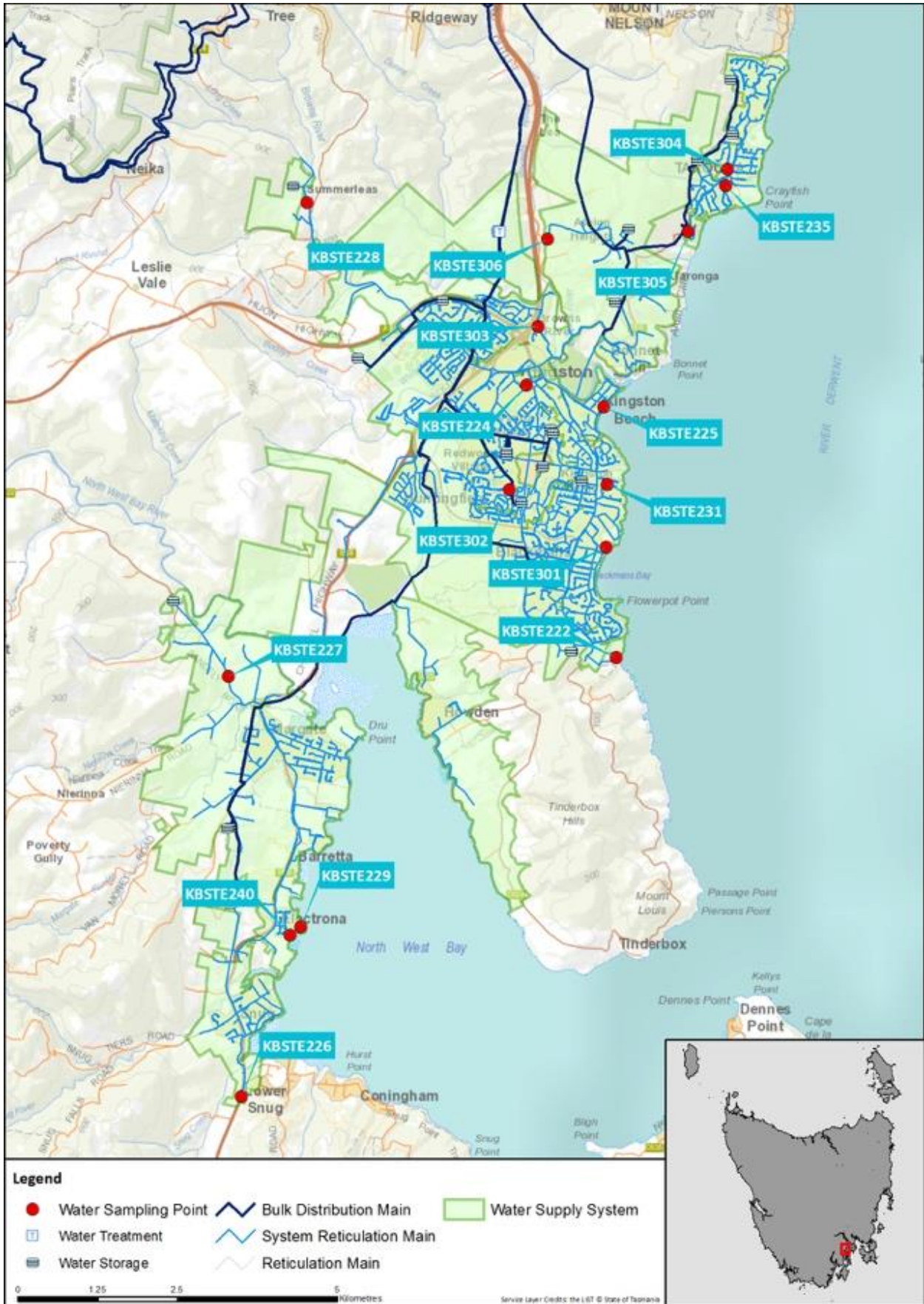


Figure 27.1-g Map of Greater Hobart – Kingborough monitoring system

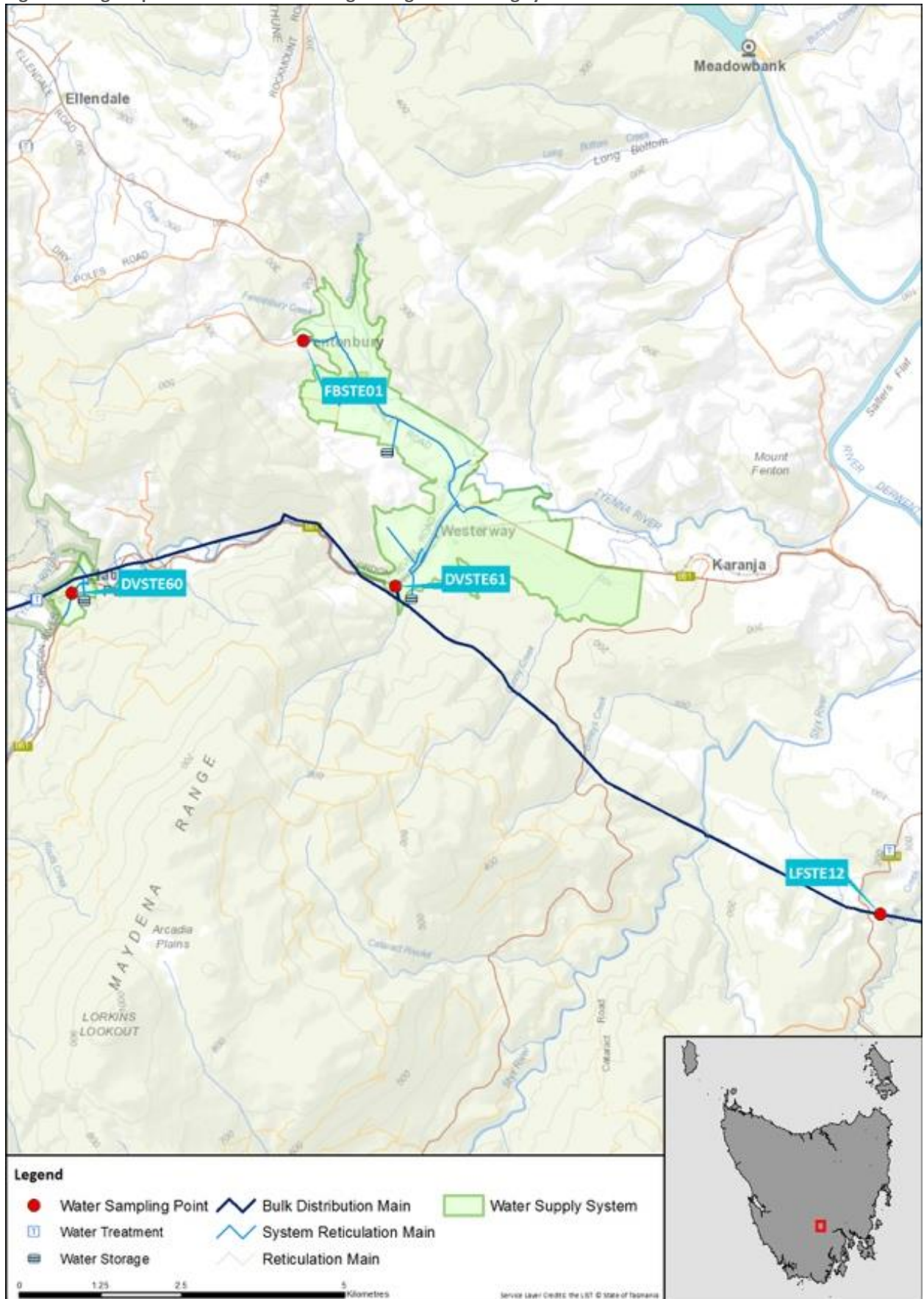


Figure 27.1-h Map of Greater Hobart – National Park monitoring system

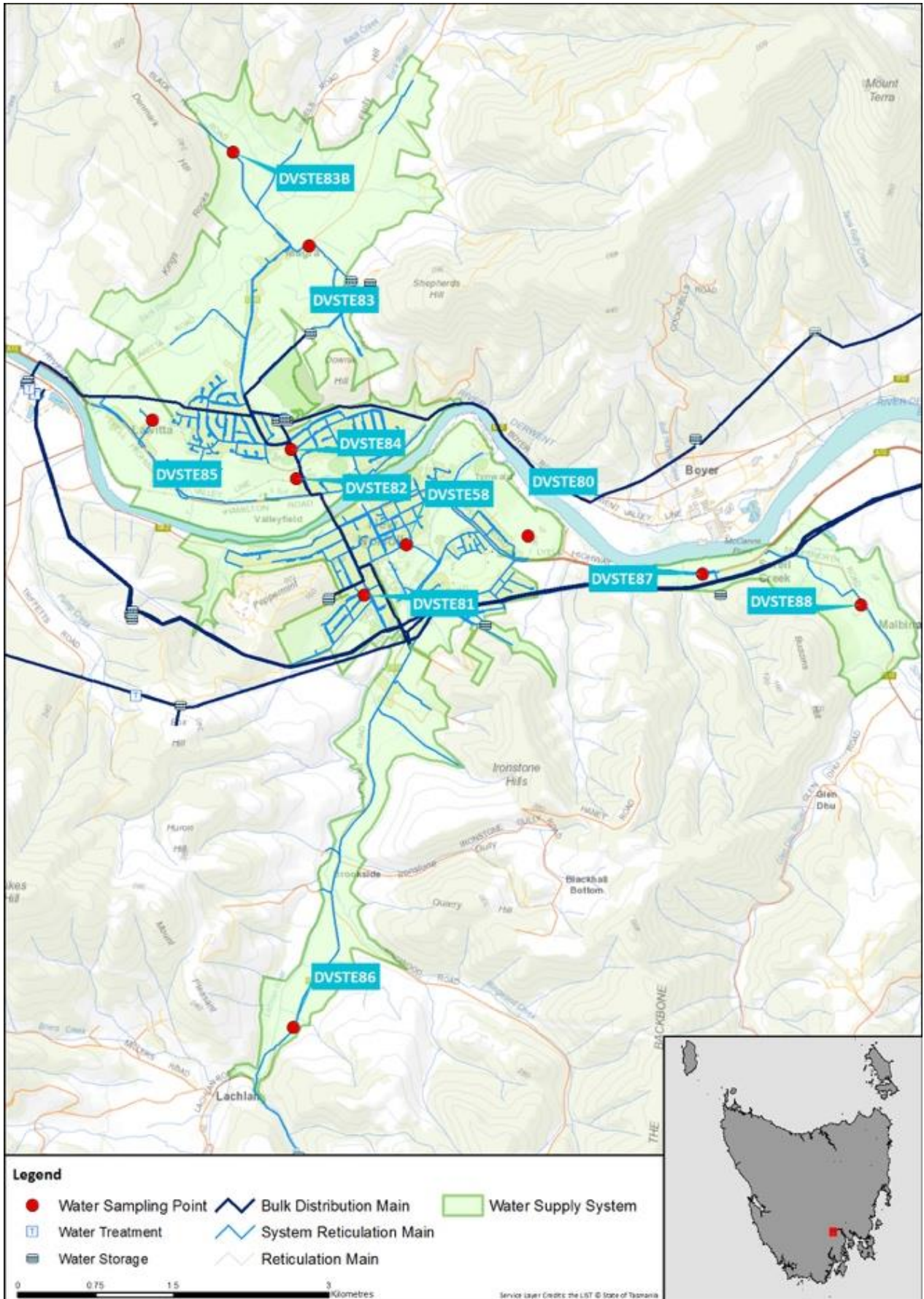


Figure 27.1-i Map of Greater Hobart – New Norfolk monitoring system

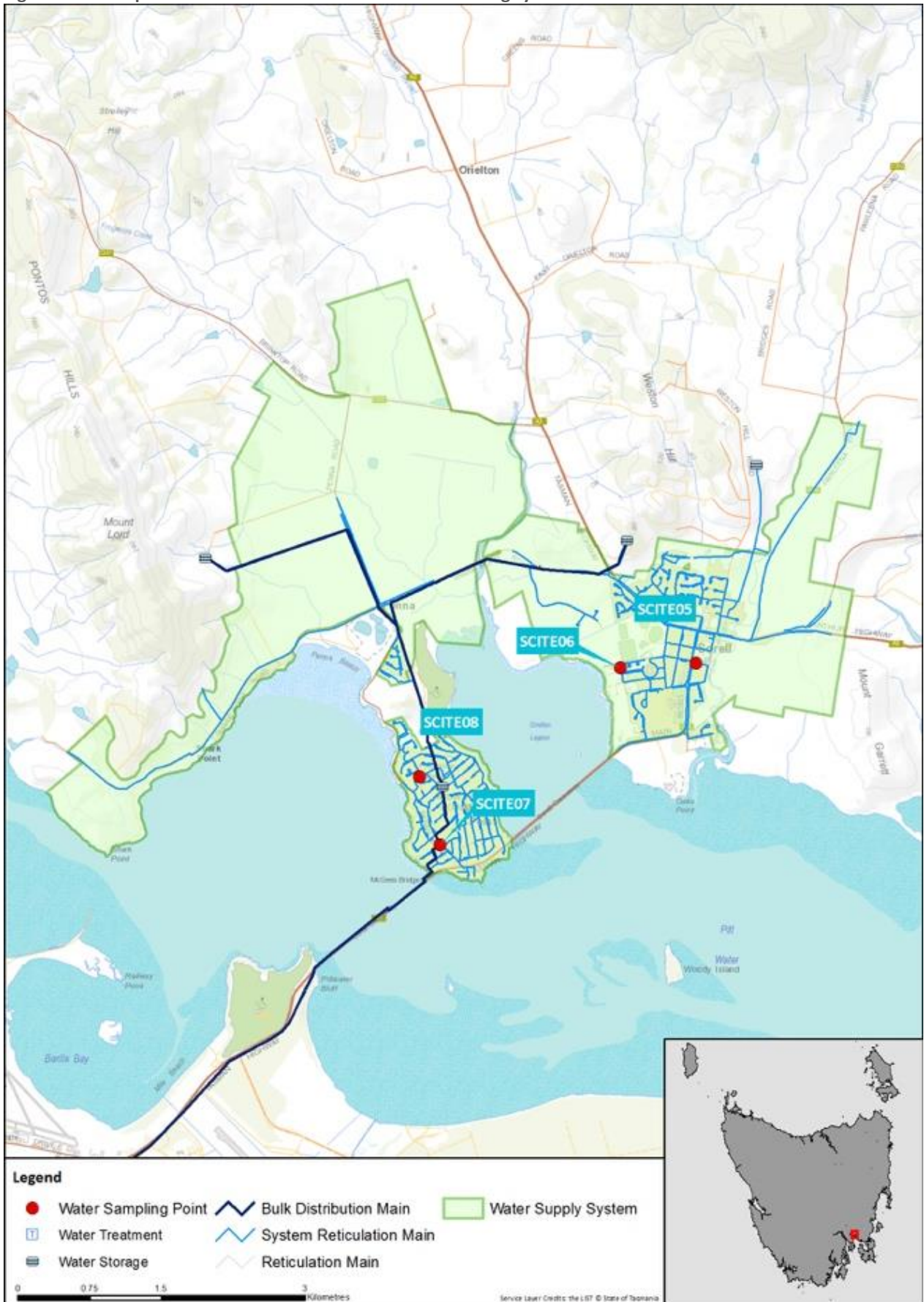


Figure 27.1-j Map of Greater Hobart – Sorell monitoring system

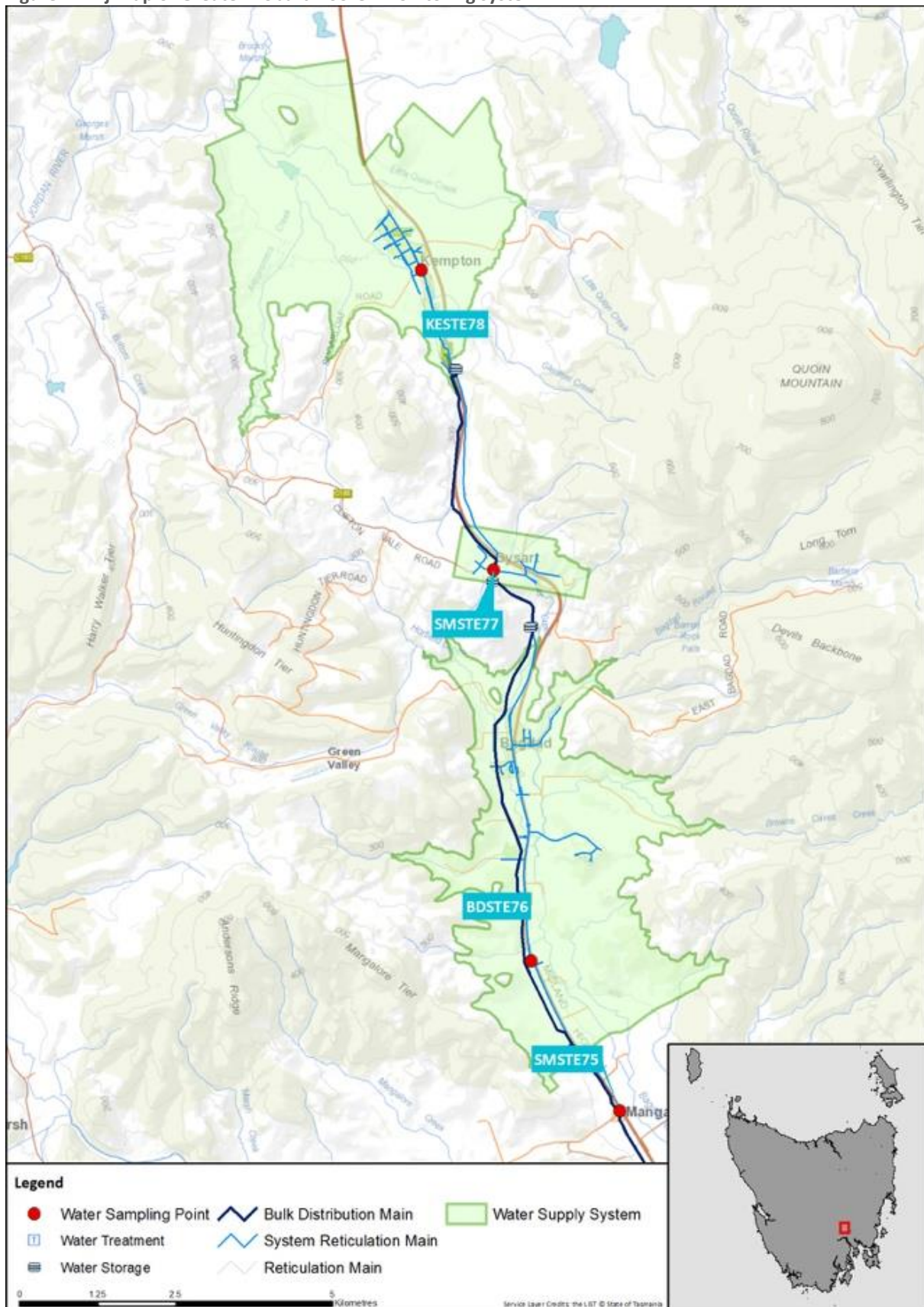


Figure 27.1-k Map of Greater Hobart – Southern Midlands monitoring system

27.2. Summary of annual reticulation compliance (2017–18)

Table 27.2-a Sampling program – Brighton

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Old Beach/238 Old Beach Rd, Sample Tap	BRSTE107	W	n/a	n/a	n/a	n/a
Tea Tree/Glen Rose Dr, Sample Tap	BRSTE108	W	n/a	n/a	n/a	n/a
Tea Tree/Merrieworth Rd, Sample tap	BRSTE110	W	n/a	n/a	n/a	n/a
Pontville, Old council chambers/Sample tap	BRSTE111	W	Q	Q	Q	n/a
Compton Downs, St Anne's/Sample Tap	BRSTE112 ¹²	W	n/a	n/a	n/a	n/a
Jordan River/School, Sample Tap	BRSTE114 ¹³	W	n/a	n/a	n/a	n/a
Vineyard Dr Tanks	BRSTE217	W	n/a	n/a	n/a	n/a
Campania Res	NLSTE09	W	n/a	n/a	n/a	n/a
Richmond Res	NLSTE10	W	n/a	n/a	n/a	n/a
Old Beach Res Sample Tap	SRSTE03	W	n/a	n/a	n/a	n/a
Bridgewater/Dental Clinic Opp Bus Stop 57	BRSTE118 ¹⁴	W	n/a	n/a	n/a	n/a
Compton Downs, St Anne's/NEW Street Entrance	BRSTE119 ¹⁵	W	n/a	n/a	n/a	n/a
Number Planned Samples		520	4	4	4	n/a
Number Samples Tested		520	4	4	4	n/a

¹² Replaced with BRSTE119 from 21/5/2018

¹³ Replaced with BRSTE118 from 23/4/2018

¹⁴ Replaced with BRSTE114 from 23/4/2018

¹⁵ Replaced with BRSTE112 from 21/5/2018

Table 27.2-b Sampling program – Clarence

Planned sampling program (2017-18)							
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals	
Lindisfarne, 11 Elwood Drive/Sample Tap	CLSTE135	W	n/a	n/a	n/a	n/a	n/a
Rokeby, 126 Tollard Drive/Sample Tap	CLSTE136	W	n/a	n/a	n/a	n/a	n/a
Cambridge, 13 Maxwells Rd/Sample Tap	CLSTE137	W	n/a	n/a	n/a	n/a	n/a
Mt Rumney, 193 Grahams Rd/Sample Tap	CLSTE139	W	n/a	n/a	n/a	n/a	n/a
Otago, 21 Otago Bay Rd/Sample Tap	CLSTE141	W	n/a	n/a	n/a	n/a	n/a
Tranmere, 21 Vaughan Court/Sample Tap	CLSTE142	W	Q	Q	Q	Q	n/a
Seven Mile Beach, 24 Leyden Avenue/Sample Tap	CLSTE143	W	n/a	n/a	n/a	n/a	n/a
Rosny, 5 Heskett court/Sample Tap	CLSTE148	W	n/a	n/a	n/a	n/a	n/a
Mornington ,54 Mornington Rd /Sample Tap	CLSTE150	W	n/a	n/a	n/a	n/a	n/a
Risdon Vale, 87 Gardenia Rd/Sample Tap	CLSTE153 ¹⁶	W	n/a	n/a	n/a	n/a	n/a
Mount Rumney (private water supply) /Sample Tap	CLSTE154	W	n/a	n/a	n/a	n/a	n/a
Lauderdale, crn Balook st & Hadlow St/Sample Tap	CLSTE155	W	Q	Q	Q	Q	n/a
Bellerive, 20 Gunning St/Sample Tap	CLSTE156	W	n/a	n/a	n/a	n/a	n/a
Acton Park, 222 Acton Drive/PRV Shed Sample Tap	CLSTE289	W	n/a	n/a	n/a	n/a	n/a
Risdon, 26 Saundersons Rd/Sample tap	CLSTE291	W	n/a	n/a	n/a	n/a	n/a
Geilston Bay, Boat Club	CLSTE301	W	n/a	n/a	n/a	n/a	n/a
Warrane Sports Centre crn Dampier & Blight St	CLSTE303	W	n/a	n/a	n/a	n/a	n/a
10 Spinnaker	CLSTE317	W	n/a	n/a	n/a	n/a	n/a
598 Oceana Drive	CLSTE313	W	n/a	n/a	n/a	n/a	n/a
21 Niranda Court	CLSTE314	W	n/a	n/a	n/a	n/a	n/a
Matipo St Risdon Vale PS	CLSTE315 ¹⁷	W	n/a	n/a	n/a	n/a	n/a
Matipo Street/Matipo Res	CLSTE318 ¹⁸	W	n/a	n/a	n/a	n/a	n/a
118 Tara Drive	CLSTE316	W	n/a	n/a	n/a	n/a	n/a
Tunnel Hill RES	SOSTE04	W	n/a	n/a	n/a	n/a	n/a
Risdon Vale RES	SRSTE01	W	n/a	n/a	n/a	n/a	n/a
Acton Park, 111 Cahill Pl	CLSTE157 ¹⁹	W	n/a	n/a	n/a	n/a	n/a
Number Planned Samples		1233	8	8	8	8	n/a
Number Samples Tested		1235	8	8	8	8	n/a

¹⁶ Replaced with a new sample tap from 27/11/17 – Matipo St, Risdon

¹⁷ New sample tap from 27/11/17

¹⁸ New sample tap from 27/11/17

¹⁹ New sample tap from 21/5/2018 – new subdivision with new reservoir

Table 27.2-c Sampling program – Coal Valley

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Richmond, 12 Victoria St/Fire Station Sample Tap	RISTE317	W	Q	Q	Q	n/a
Campania/Tennis Court	CASTE82	W	Q	Q	Q	n/a
Campania, 505 Colebrook Rd/Sample tap	CLSTE149	W	n/a	n/a	n/a	n/a
Number Planned Samples		156	8	8	8	n/a
Number Samples Tested		156	8	8	8	n/a

Table 27.2-d Sampling program – Glenorchy

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Glenorchy, 22 Jackson Rd	GOSTE301	W	n/a	n/a	n/a	n/a
Glenorchy High Level Sample Tap	GOSTE03	W	n/a	n/a	n/a	n/a
St Thereses/Sample Tap	GOSTE10	W	n/a	n/a	n/a	n/a
Claremont, 12 Chatterton Crt/Sample Tap	GOSTE116	W	n/a	n/a	n/a	n/a
Austins Ferry, 1 Sharron Drive/Sample Tap	GOSTE117	W	n/a	n/a	n/a	n/a
Lutana, 10 Birch Rd/Sample Tap	GOSTE118	W	n/a	n/a	n/a	n/a
Moonah, 2 Gerrard St/Sample Tap	GOSTE121	W	Q	Q	Q	n/a
Moonah, 2/10 Dawkins Court/Sample Tap	GOSTE122	W	n/a	n/a	n/a	n/a
Austins Ferry, 20 Wendourie Parade/Sample Tap	GOSTE123	W	n/a	n/a	n/a	n/a
Derwent Park, 49 Windsor St/Sample Tap	GOSTE124	W	n/a	n/a	n/a	n/a
Goodwood, Gepp Parade Outside Public Toilets/Sample tap	GOSTE125	W	n/a	n/a	n/a	n/a
Glenorchy City Council chambers/Sample Tap	GOSTE126	W	n/a	n/a	n/a	n/a
Chigwell, Shop 2 Allunga Rd /Sample Tap	GOSTE128	W	n/a	n/a	n/a	n/a
Austins Ferry Primary School/New Sample Tap	GOSTE130	W	Q	Q	Q	n/a
Claremont, 59 Toffolis Road/Garden Tap	GOSTE131	W	n/a	n/a	n/a	n/a
Montrose, 1 Beneve Court/Sample Tap	GOSTE290	W	n/a	n/a	n/a	n/a
Chigwell, Res	LFSTE02	W	n/a	n/a	n/a	n/a
Box Hill Fenton Res	LFSTE14	W	n/a	n/a	n/a	n/a
Hilton Rd	WDSTE01	W	n/a	n/a	n/a	n/a
Claremont/Box Hill Road	WDSTE06	W	n/a	n/a	n/a	n/a
Number Planned Samples		1040	8	8	8	n/a
Number Samples Tested		1040	8	8	8	n/a

Table 27.2-e Sampling program – Hobart

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
South Hobart/Opp 132 Forest Rd	HDSTE191 ²⁰	W	n/a	n/a	n/a	n/a
Bentley Pk crn Girrabong & Bentley Rd	HDSTE201	W	n/a	n/a	n/a	n/a
50B Pottery Rd	HDSTE202	W	n/a	n/a	n/a	n/a
Sth Hobart, 56 Cascade Rd/Sample Tap	HDSTE158	W	n/a	n/a	n/a	n/a
Fern Tree, 9 Grays Rd/Sample tap	HDSTE161	W	n/a	n/a	n/a	n/a
Sandy Bay, 8 Lindeith Crt/Sample tap	HDSTE163	W	n/a	n/a	n/a	n/a
Hobart/Argyle St Sample Tap	HDSTE164	W	n/a	n/a	n/a	n/a
Mt Nelson, Nelson Rd/Tangara Rd /Sample tap	HDSTE166	W	n/a	n/a	n/a	n/a
Sandy Bay, 26 Nicholas Drive/Sample tap	HDSTE167	W	n/a	n/a	n/a	n/a
Sandy Bay, Marieville Esp/Sample tap	HDSTE184	W	n/a	n/a	n/a	n/a
Sandy Bay, Channel Hwy, Opp No1 Trugganni Track	HDSTE185 ²¹	W	Q	Q	Q	n/a
Sth Hobart, 317 Strickland Ave /Sample Tap	HDSTE172	W	n/a	n/a	n/a	n/a
Tolmans Hill/9 Woodridge Rd Sample tap	HDSTE173	W	n/a	n/a	n/a	n/a
Hobart/Boa Vista Rd	HDSTE174	W	n/a	n/a	n/a	n/a
New Town, SP Lab	HDSTE183	W	n/a	n/a	n/a	n/a
Lenah Valley/opp 70 Brushy Creek Rd	HDSTE19	W	n/a	n/a	n/a	n/a
South Hobart/Wellesley Park	HDSTE190	W	n/a	n/a	n/a	n/a
Number Planned Samples		832	4	4	8	n/a
Number Samples Tested		836	4	4	8	n/a

²⁰ New site from 22/8/17 – previously HDSTE190

²¹ Site change from 1/7/17 – previous HDSTE171 – access issues

Table 27.2-f Sampling program – Kingborough

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Blackmans Bay Beach opp 2 Esplanade	KBSTE301	W	n/a	n/a	n/a	n/a
Kingston Fire & Ambulance Station, crn Redwood Rd & Hawthorn Drive	KBSTE302	W	n/a	n/a	n/a	n/a
Tradelink 50 Browns Road	KBSTE303	W	n/a	n/a	n/a	n/a
St Lukes Church 2 Coolamon Rd	KBSTE304	W	n/a	n/a	n/a	n/a
Baringa Rd Bus Stop	KBSTE305	W	n/a	n/a	n/a	n/a
28 Albion Heights Drive	KBSTE306	W	n/a	n/a	n/a	n/a
Blackmans Bay/Sample Tap (at STP)	KBSTE222	W	n/a	n/a	n/a	n/a
Kingston Primary School, Boronia Low Level/Sample tap	KBSTE224	W	n/a	n/a	n/a	n/a
Kingston Beach/Foreshore Sample Tap	KBSTE225	W	Q	Q	Q	n/a
Snug, Frosts Rd - Museum Channel Highway,/Sample tap	KBSTE226	W	n/a	n/a	n/a	n/a
Margate, Sandfly Rd, Margate Cemetry/Sample tap	KBSTE227	W	n/a	n/a	n/a	n/a
Kingborough, Scotts Rd/Sample tap	KBSTE228	W	n/a	n/a	n/a	n/a
Electrona/Dickson St (at STP)	KBSTE229 ²²	W	n/a	n/a	n/a	n/a
Electrona/Waterfront - 35 Staff Rd	KBSTE240 ²³	W	n/a	n/a	n/a	n/a
Kingston Beach, St Aloysius, Mirramar Park/Sample tap	KBSTE231	W	n/a	n/a	n/a	n/a
Taroona/Bachelor Way	KBSTE235 ²⁴	W	Q	Q	Q	n/a
Blackmans Bay, 41 Estuary Driver	KBSTE307 ²⁵	W	n/a	n/a	n/a	n/a
Number Planned Samples		775	8	8	8	n/a
Number Samples Tested		775	8	8	8	n/a

²² Replaced site KBSTE229 with KBSTE240 from 15/1/2018 due to no access during construction of STP pump station

²³ Tested from week of 15/1/2018

²⁴ Replaced site KBSTE234 from 7/8/2017

²⁵ Replaced KBSTE222 from July 2018

Table 27.2-g Sampling program – National Park

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
National Park Hotel/Sample Tap	DVSTE60	W	n/a	n/a	n/a	n/a
Westerway 1579 Gordon River Rd	DVSTE61	W	Q	Q	Q	n/a
Fentonbury Ellendale Rd	FBSTE01	W	n/a	n/a	n/a	n/a
Uxbridge Rd Airstrip	LFSTE12	W	n/a	n/a	n/a	n/a
Number Planned Samples		208	8	8	4	n/a
Number Samples Tested		208	8	8	4	n/a

Table 27.2-h Sampling program – New Norfolk

Planned sampling program (2017-18)

Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
New Norfolk, George St/Sample Tap	DVSTE58	W	Q	Q	Q	n/a
Corumbene Nursing Home	DVSTE80	W	n/a	n/a	n/a	n/a
New Norfolk High School	DVSTE81	W	n/a	n/a	n/a	n/a
New Norfolk Fire Station	DVSTE82	W	n/a	n/a	n/a	n/a
Magra Fire Station	DVSTE83 ²⁶	W	n/a	n/a	n/a	n/a
Magra House (102 Blackhills Rd) ^b	DVSTE83B	W	n/a	n/a	n/a	n/a
Fairview Primary School	DVSTE84	W	n/a	n/a	n/a	n/a
crn Goldsmith & Bastian St Lawitta	DVSTE85	W	n/a	n/a	n/a	n/a
385 Lachlan Rd	DVSTE86	W	n/a	n/a	n/a	n/a
1267 Lyell Hwy Sorell Creek	DVSTE87	W	n/a	n/a	n/a	n/a
Molesworth Rd Cemetary	DVSTE88	W	n/a	n/a	n/a	n/a
Magra/Fire Hydrant	DVSTE83a ²⁷	W	n/a	n/a	n/a	n/a
Number Planned Samples		520	4	4	4	n/a
Number Samples Tested		520	4	4	4	n/a

²⁶ Site access issues sampled from DVSTE83B during the access issue

²⁷ Sampled in December 2017

Table 27.2-i Sampling program – Sorell

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Sorell/10 Sommerville St	SCITE05	W	Q	Q	Q	n/a
Sorell/William Street	SCITE06	W	n/a	n/a	n/a	n/a
Midway Point/24 Penna Road	SCITE07	W	n/a	n/a	n/a	n/a
Midway Point/24 Honolulu St	SCITE08	W	n/a	n/a	n/a	n/a
Sorell/Horizon Driver	SCITE09 ²⁸	W				
Number Planned Samples		208	4	4	4	n/a
Number Samples Tested		208	4	4	4	n/a

Table 27.2-j Sampling program – Southern Midlands

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Bagdad, Caltex Fuel stop shop/Sample Post	BDSTE76	W	Q	Q	Q	n/a
Kempton, Caravan Parking Bay/Sample Post on Street	KESTE78	W	n/a	n/a	n/a	n/a
Mangalore/Park Sample Post	SMSTE75	W	n/a	n/a	n/a	n/a
Dysart/Crn Ely & Church Lane	SMSTE77	W	n/a	n/a	n/a	n/a
Number Planned Samples		208	4	4	4	n/a
Number Samples Tested		208	4	4	4	n/a

²⁸ Replaced SCITE06 from May 2018

27.3. Summary of current and historic performance (2013-18)

Table 27.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	99.5%	>99.9%	100.0%	99.9%	99.9%
Fluoride	n/a	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	100.0%	100.0%	99.9%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

27.4. Analysis of current health performance (2017-18)

Table 27.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
<i>E.coli</i>	24/4/2018	<i>E.coli</i> of 18.7 MPN/100mL in weekly compliance sample at HDSTE158	✓
<i>E.coli</i>	25/4/2018 12:05	<i>E.coli</i> of 14 MPN/100mL in resample at HDSTE158	✓
<i>E.coli</i>	25/4/2018 14:05	<i>E.coli</i> of 9.8 MPN/100mL in resample at HDSTE158	✓
<i>E.coli</i>	30/4/2018	<i>E.coli</i> of 51.2 MPN/100mL in weekly compliance sample at CLSTE153	✓

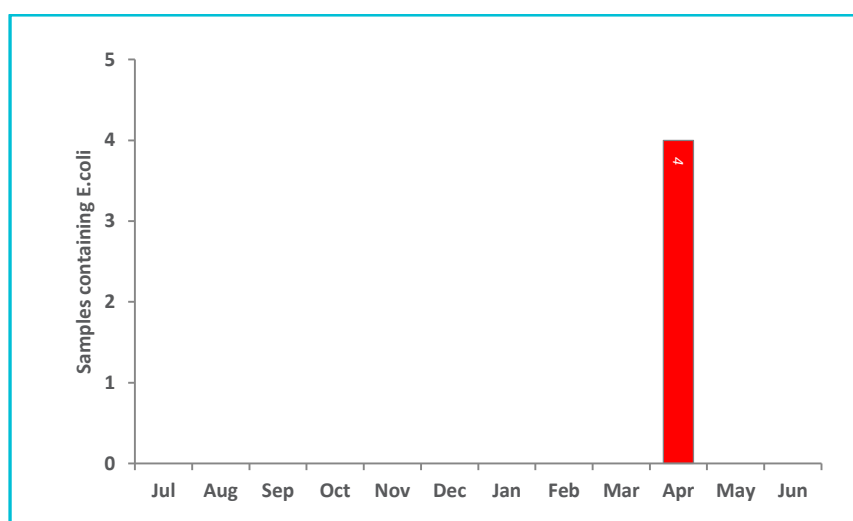


Figure 27.4-b Microbiological non-compliances by month

Table 27.4-b-i Fluoride distribution performance – Bryn Estyn WTP

Distribution fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	92.4%
Mean dose (mg/L)	0.94
■ Compliant ■ Non-compliant	

Table 27.4-b-ii Fluoride distribution performance – Fern Tree WTP

Distribution fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	98.9%
Mean dose (mg/L)	0.99
■ Compliant ■ Non-compliant	

Table 27.4-b-iii Fluoride distribution performance – National Park WTP

Distribution fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	81.6%
Mean dose (mg/L)	0.92
■ Compliant ■ Non-compliant	

Table 27.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	28	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	28	0	100	0.00019	<0.0003	0.0009
Barium	2	mg/L	28	0	100	0.007	0.001	0.019
Cadmium	0.002	mg/L	28	0	100	<0.0001	<0.0001	0.0002
Chromium	0.05	mg/L	28	0	100	0.00015	<0.0001	0.0015
Copper	2	mg/L	28	0	100	0.01908	0.00005	0.1886
Lead	0.01	mg/L	28	0	100	0.00037	<0.0001	0.0022
Manganese	0.5	mg/L	28	0	100	0.0036	0.0003	0.0633
Mercury	0.001	mg/L	28	0	100	0.00007	<0.00003	0.0004
Molybdenum	0.05	mg/L	28	0	100	0.00006	<0.0001	0.0005
Nickel	0.02	mg/L	28	0	100	0.0001	<0.0001	0.0004
Selenium	0.01	mg/L	28	0	100	0.00006	<0.0001	0.0006

Table 27.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	28	0	100	7.84	<1	43
Monochloroacetic acid	150	µg/L	28	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	28	0	100	19.21	<1	49
Total trihalomethanes	250	µg/L	28	0	100	41.67	4	75

Table 27.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.36	0	10.04
Colour True	HU	15	1.49	<1	10
pH	Units	6.5 – 8.5	7.34	4.75	9.99
Turbidity	NTU	1	0.54	0.04	10.01

27.5. Analysis of overall system performance (2017-18)

Table 27.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
30/10/2017	Weekly sample detected <i>E.coli</i> of 51 MPN/100mL at CLSTE153. An incident was declared and DoH was immediately notified. Assessment of other samples in the zone showed no further contamination. Reconfiguration of the network was performed to isolate Risdon Vale. After discussion with DoH a PHA was issued to the suburb of Risdon Vale. Flushing of the network was performed and resampling showed CLSTE153 was clear of <i>E.coli</i> .	✓	✓
31/10/2017 -2/11/2017	A PHA was issued for the Risdon Vale area on 31 October 2017 due to <i>E.coli</i> detected in a routine monitoring sample. Remedial actions included flushing and scouring the affected area, isolating the Risdon Brook Reservoir for inspection and cleaning. Samples taken on 31 October and 1 November were clear of <i>E.coli</i> .	✓	✓
24/4/2018	Weekly sample detected <i>E.coli</i> of 18.7 MPN/100mL at HDSTE158. An incident was declared and DoH notified. DoH called an instant PHA on a large part of South Hobart area. Reason for the contamination was the cross connection of unchlorinated water to the distribution system. The system was resampled on the 25/4/18 and <i>E.coli</i> was still detected. The cross connection was isolated and the system flushed with clean water. Subsequent samples clear of <i>E.coli</i> .	✓	✓
25/4/2018-27/4/2018	A PHA was issued on 25 April 2018 due to <i>E.coli</i> detection in the South Hobart area (a sub-section of the Greater Hobart system). The root cause was an opened valve causing unchlorinated water to flow into the reticulated system. Flushing and dosing of the system was carried out and further testing demonstrated that the water was safe to consume and the PHA was removed on 27 April.	✓	✓

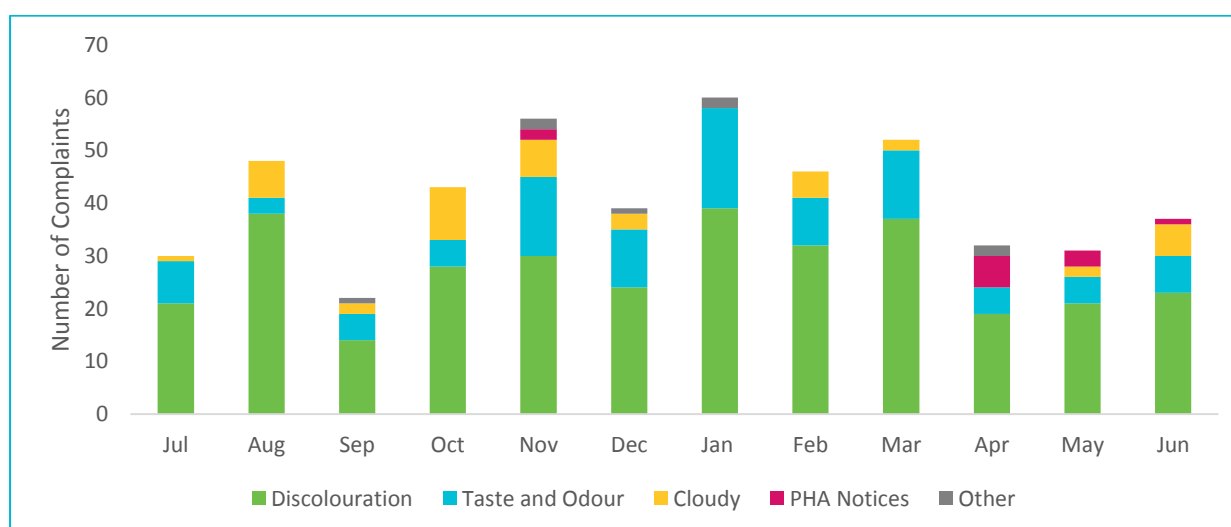


Figure 27.5-b Water quality customer complaints by month and type

28. Gretna drinking water system

28.1. System summary (2017-18)

Gretna drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	59
Population serviced	136
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	92.8%	<input type="checkbox"/>	98.0%	69	4
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	6	0
DBPs	100.0%	<input checked="" type="checkbox"/>	100.0%	5	0

Compliant Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	4	<i>E. coli</i> exceedances
Public health warnings issued	1	Subject to PHA until 23/11/2017
Notifications made to DoH	4	<i>E. coli</i> exceedances
Customer complaints	0	n/a

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
No projected capital investment				

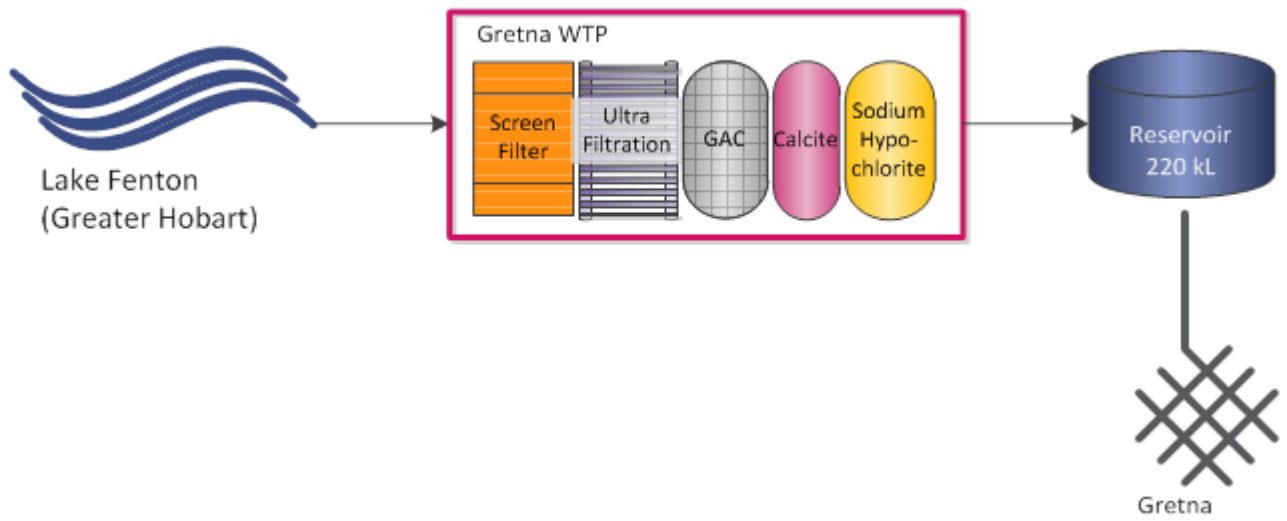


Figure 28.1-a Gretna system schematic



Figure 28.1-b Map of Gretna monitoring system

28.2. Summary of annual reticulation compliance (2017–18)

Table 28.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Gretna Picnic Grounds/Sample Tap	GRSTE103 ²⁹	M	Q	n/a	Q	n/a
Gretna/CWS	GRSTE107	W	Q	Q	Q	n/a
Gretna/Opp. 3449 Lyell Hwy	GRSTE108	W	Q	Q	Q	n/a
Number Planned Samples		69	6	5	6	n/a
Number Samples Tested		69	6	5	6	n/a

28.3. Summary of current and historic performance (2013-18)

Table 28.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	0.0%	7.0%	2.1%	8.3%	92.8%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	n/a	n/a	n/a	n/a	100.0%

■ Compliant ■ Non-compliant

²⁹ Changed to GRSTE107 and GRSTE108 20th November 2017

28.4. Analysis of current health performance (2017-18)

Table 28.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
<i>E.coli</i>	27/7/2017	<i>E.coli</i> of 1 MPN/100mL in monthly compliance sample. System subject to PHA.	<input checked="" type="checkbox"/>
<i>E.coli</i>	24/8/2017	<i>E.coli</i> of 2 MPN/100mL in monthly compliance sample. System subject to PHA.	<input checked="" type="checkbox"/>
<i>E.coli</i>	21/9/2017	<i>E.coli</i> of 5.2 MPN/100mL in monthly compliance sample. System subject to PHA.	<input checked="" type="checkbox"/>
<i>E.coli</i>	19/10/2017	<i>E.coli</i> of 1 MPN/100mL in monthly compliance sample. System subject to PHA.	<input checked="" type="checkbox"/>
<i>E.coli</i>	24/10/2017	<i>E.coli</i> of 1 MPN/100mL in investigation sample. System subject to PHA.	<input checked="" type="checkbox"/>

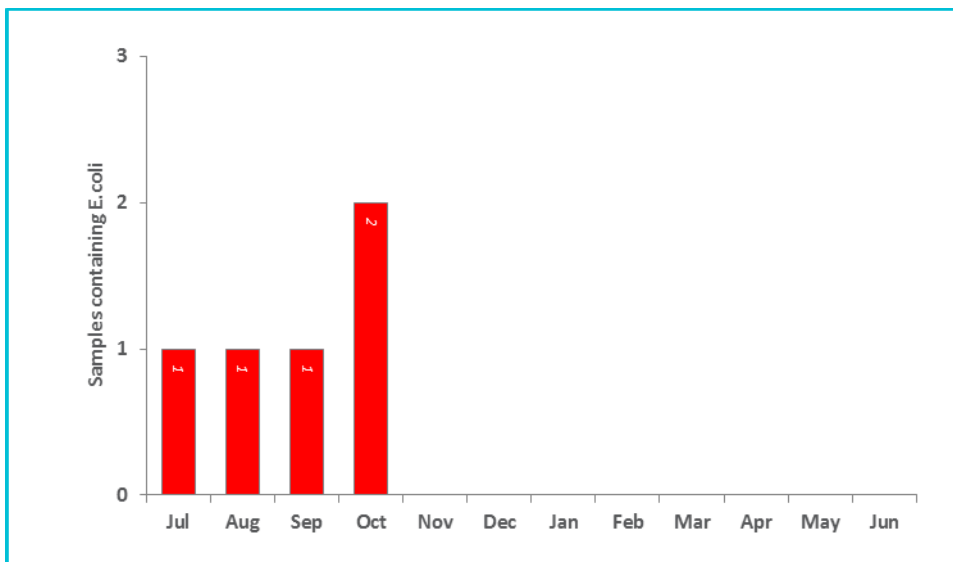


Figure 28.4-b Microbiological non-compliances by month

Table 28.4-b Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	6	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	6	0	100	0.00016	<0.0003	0.0003
Barium	2	mg/L	6	0	100	0.005	0.002	0.011
Cadmium	0.002	mg/L	6	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	6	0	100	0.00007	<0.0001	0.0003
Copper	2	mg/L	6	0	100	0.01679	0.0039	0.0591
Lead	0.01	mg/L	6	0	100	0.00101	<0.0001	0.0028
Manganese	0.5	mg/L	6	0	100	0.0061	0.001	0.0627
Mercury	0.001	mg/L	6	0	100	0.000044	<0.00003	0.00017
Molybdenum	0.05	mg/L	6	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	6	0	100	0.00077	<0.0001	0.002
Selenium	0.01	mg/L	6	0	100	0.00009	<0.0001	0.0005

Table 28.4-c Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	5	0	100	10.9	<1	16
Monochloroacetic acid	150	µg/L	5	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	5	0	100	15.5	<1	23
Total trihalomethanes	250	µg/L	5	0	100	28	<4	41

Table 28.4-d General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.69	0.02	1.55
Colour True	HU	15	5.14	<1	55
pH	Units	6.5 – 8.5	7.38	6.48	7.78
Turbidity	NTU	1	0.42	0.1	3.37

28.5. Analysis of overall system performance (2017-18)



Table 28.5-a Summary of system issues/public health warnings



Summary of system issues			
Date	Description	DHHS notification required	DHHS notification complete
Pre 2013 - 23/11/2017	Long-term PHA lifted	✓	✓
27/7/2017	Monthly compliance sample detected <i>E.coli</i>	✓	✓
24/8/2017	Monthly compliance sample detected <i>E.coli</i>	✓	✓
21/9/2017	Monthly compliance sample detected <i>E.coli</i>	✓	✓
19/10/2017	Monthly compliance sample detected <i>E.coli</i>	✓	✓
24/10/2017	Investigation sample detected <i>E.coli</i>	✓	✓

29. Herrick drinking water system

29.1. System summary (2017-18)

Herrick drinking water system	
System status (as at 30 June 2018)	BWA
Total number of connections	26
Population serviced	47
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	66.7%		98.0%	18	6
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%		100.0%	14	0
DBPs	n/a	n/a	n/a	n/a	n/a

 Compliant
  Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	6	<i>E. coli</i> exceedances
Public health warnings issued	1	Subject to PHA since pre-2013
Notifications made to DoH	6	<i>E. coli</i> exceedances
Customer complaints	1	Taste & Odour

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend (\$'000)
Regional Towns Water Supply Program	WTP and associated infrastructure	In progress	August 2018	\$1,959,772
Regional Towns Water Supply Program	Reticulation upgrade	In progress	August 2018	\$557,364

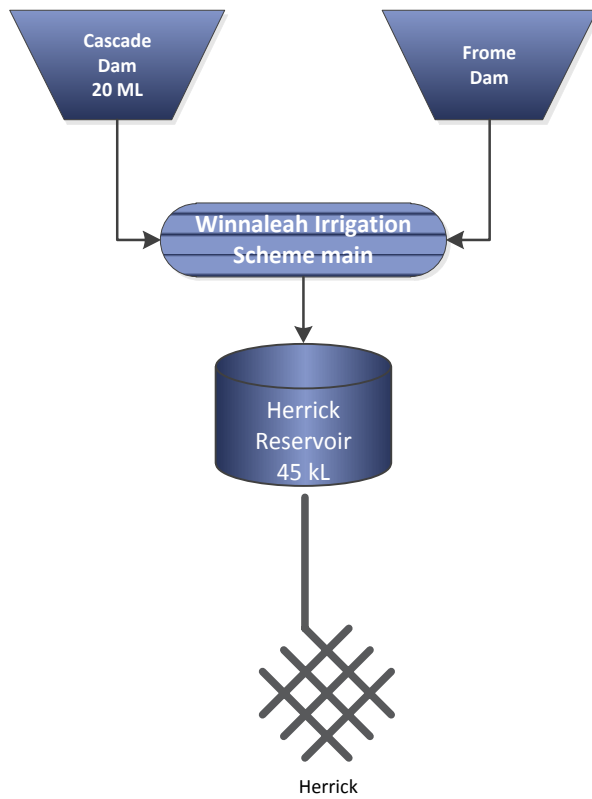


Figure 29.1-a Herrick system schematic

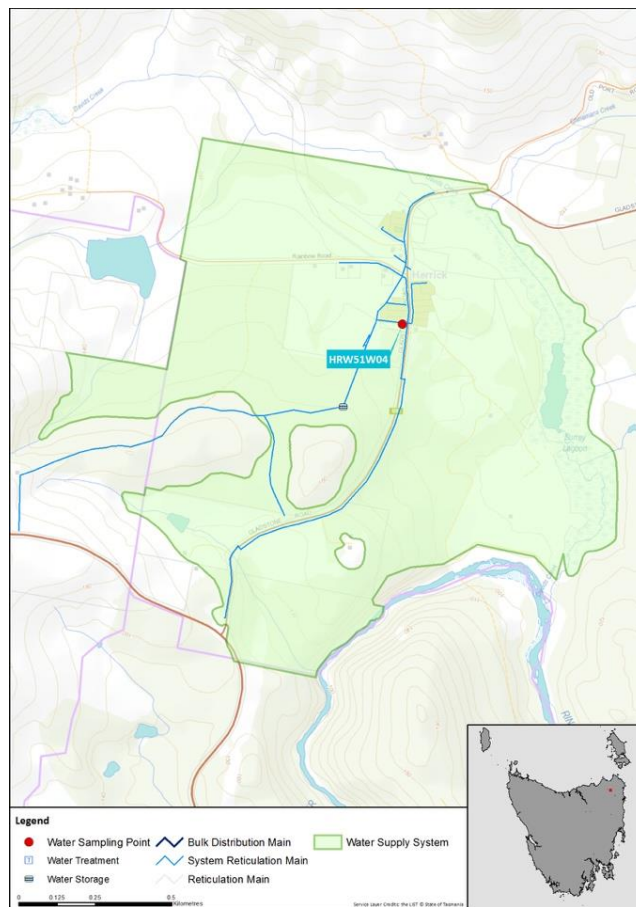


Figure 29.1-b Map of Herrick monitoring system

29.2. Summary of annual reticulation compliance (2017–18)

Table 29.2-a Sampling program

Planned compliance sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Herrick/Old Service Station	HRW51W04	M	Q	n/a	Q	n/a
Number Planned Samples		18	4	n/a	4	n/a
Number Samples Tested		18	4	n/a	4	n/a

29.3. Summary of current and historic performance (2013-18)

Table 29.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	64.0%	64.7%	66.7%	58.3%	66.7%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	n/a	n/a	n/a	n/a	n/a

■ Compliant ■ Non-compliant

29.4. Analysis of current health performance (2017-18)

Table 29.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
<i>E.coli</i>	11/7/2017	<i>E.coli</i> of 1 MPN/100mL in monthly compliance sample. System subject to PHA.	<input checked="" type="checkbox"/>
<i>E.coli</i>	16/1/2018	<i>E.coli</i> of 178.5 MPN/100mL in monthly compliance sample. System subject to PHA.	<input checked="" type="checkbox"/>
<i>E.coli</i>	14/2/2018	<i>E.coli</i> of 6.2 MPN/100mL in monthly compliance sample. System subject to PHA.	<input checked="" type="checkbox"/>
<i>E.coli</i>	13/3/2018	<i>E.coli</i> of 4.1 MPN/100mL in monthly compliance sample. System subject to PHA.	<input checked="" type="checkbox"/>
<i>E.coli</i>	9/4/2018	<i>E.coli</i> of 2 MPN/100mL in monthly compliance sample. System subject to PHA.	<input checked="" type="checkbox"/>
<i>E.coli</i>	15/5/2018	<i>E.coli</i> of 2 MPN/100mL in monthly compliance sample. System subject to PHA.	<input checked="" type="checkbox"/>

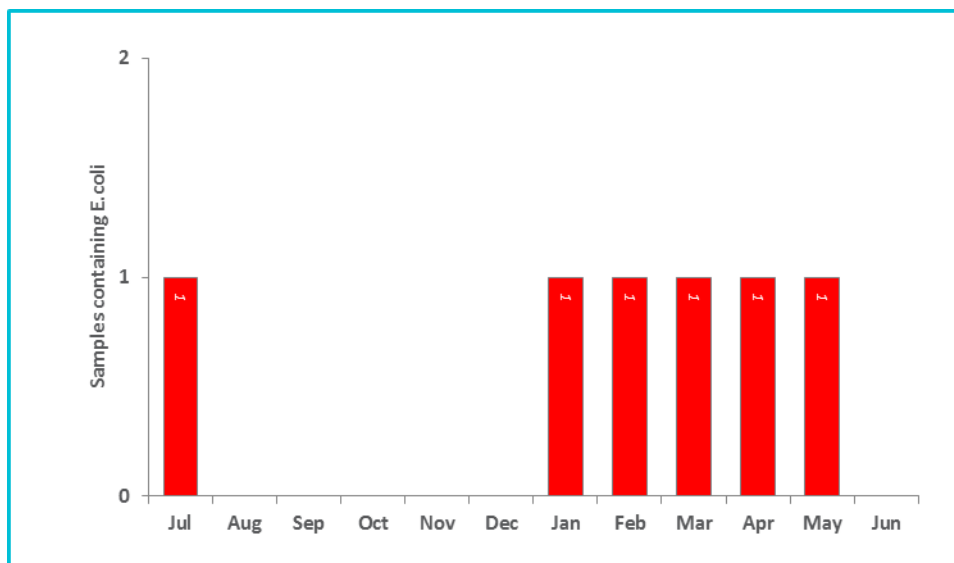


Figure 29.4-b Microbiological non-compliances by month

Table 29.4-c Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	0.00026	<0.0003	0.0006
Barium	2	mg/L	4	0	100	0.043	0.002	0.063
Cadmium	0.002	mg/L	4	0	100	0.00006	<0.0001	0.0002
Chromium	0.05	mg/L	4	0	100	0.00013	<0.0001	0.0005
Copper	2	mg/L	4	0	100	0.00477	0.0002	0.0183
Lead	0.01	mg/L	4	0	100	0.00095	<0.0001	0.0037
Manganese	0.5	mg/L	4	0	100	0.009	0.0032	0.0344
Mercury	0.001	mg/L	4	0	100	0.000046	<0.00003	0.00012
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	0.00029	<0.0001	0.001
Selenium	0.01	mg/L	4	0	100	0.00006	<0.0001	0.0002

Table 29.4-d General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.38	0.05	1.03
Colour True	HU	15	10.32	<1	49
pH	Units	6.5 – 8.5	7.72	6.13	9.8
Turbidity	NTU	1	1.4	0.18	8.29

29.5. Analysis of overall system performance (2017-18)

Table 29.5-a Summary of system issues/public health warnings with notification details

Summary of system issues			
Date	Description	DHHS notification required	DHHS notification complete
Pre 2013	System subject to long-term PHA	✓	✓
11/7/2017	Monthly compliance sample detected <i>E.coli</i> at HRW51W04	✓	✓
16/1/2018	Monthly compliance sample detected <i>E.coli</i> at HRW51W04	✓	✓
14/2/2018	Monthly compliance sample detected <i>E.coli</i> at HRW51W04	✓	✓
13/3/2018	Monthly compliance sample detected <i>E.coli</i> at HRW51W04	✓	✓
9/4/2018	Monthly compliance sample detected <i>E.coli</i> at HRW51W04	✓	✓
15/5/2018	Monthly compliance sample detected <i>E.coli</i> at HRW51W04	✓	✓

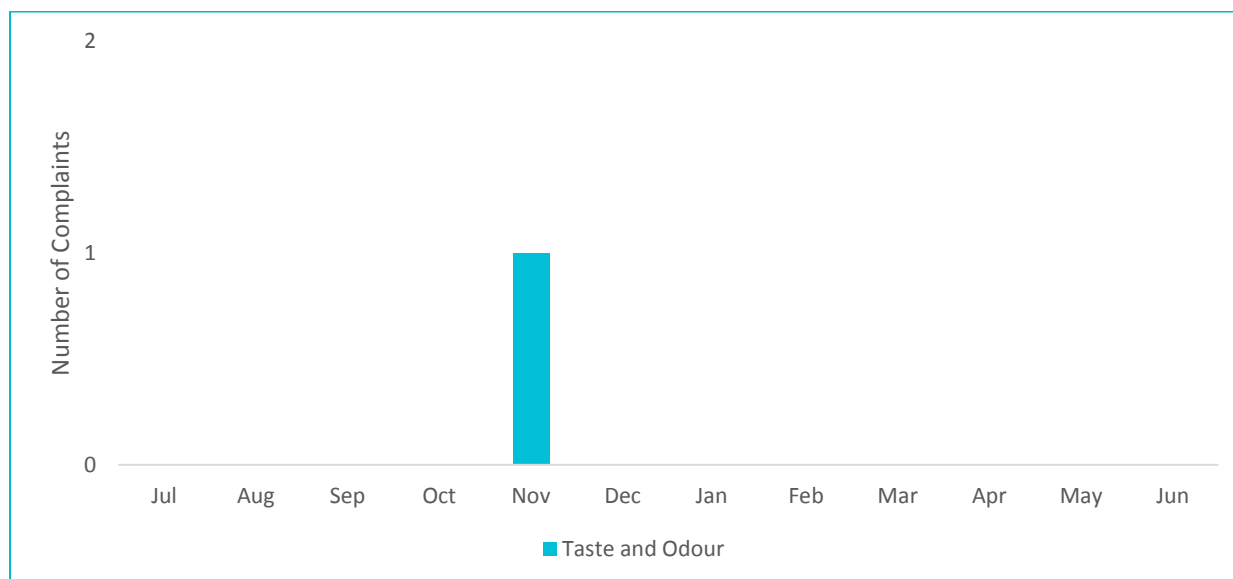


Figure 29.5-b Water quality customer complaints by month and type

30. Huon Valley drinking water system

30.1. System summary (2017-18)

Huon Valley drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	3679
Population serviced	8136
Fluoride	Sodium fluoride

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	☑	98.0%	416	0
Fluoride	100.0%	☑	100.0%	363	0
Metals	100.0%	☑	100.0%	8	0
DBPs	100.0%	☑	100.0%	24	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	10	Discolouration, Taste & Odour, Cloudy Water

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend (\$'000)
Regional Towns Water Supply Program	UV disinfection system	Not started	TBA	TBA

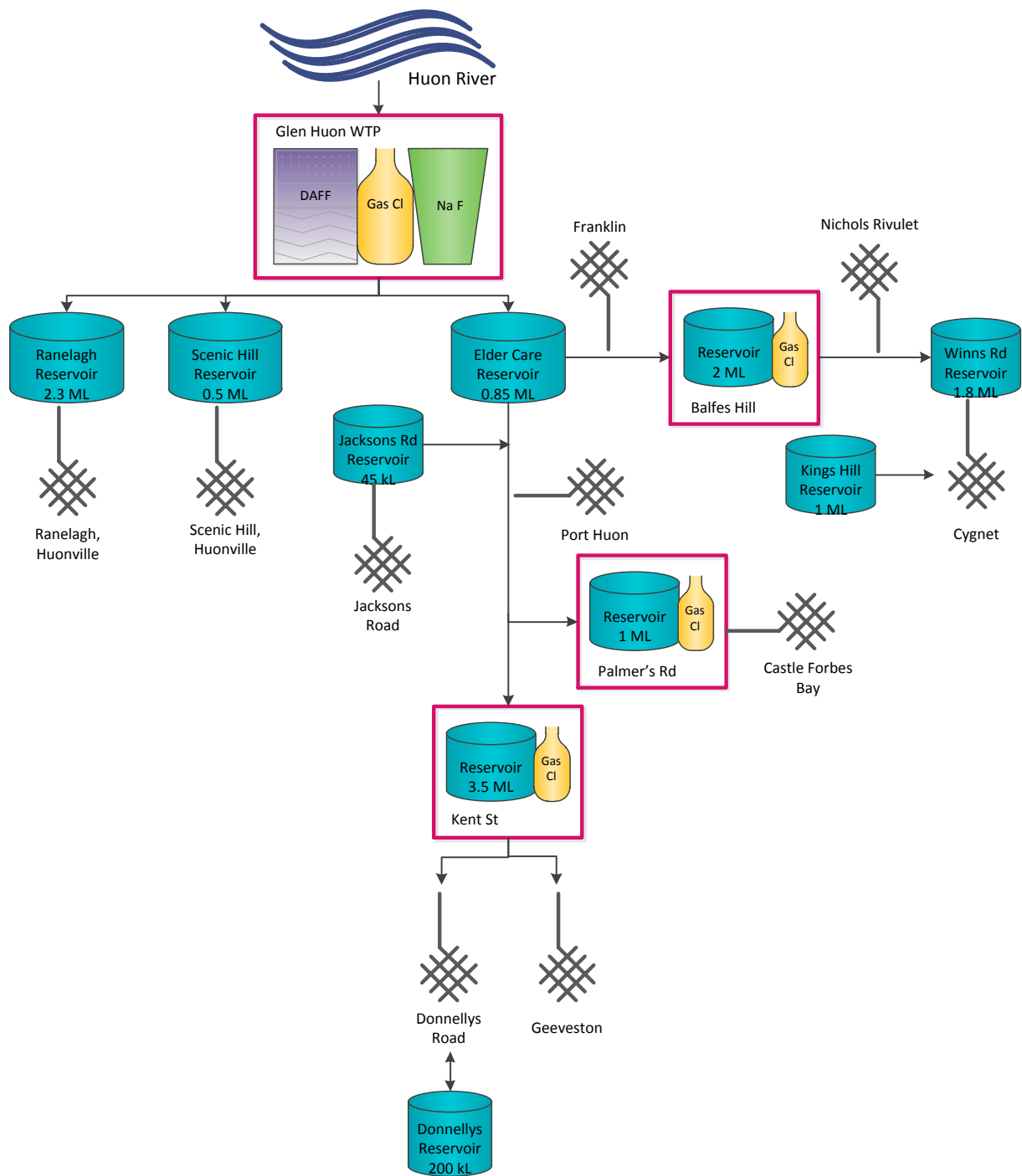


Figure 30.1-a Huon Valley system schematic

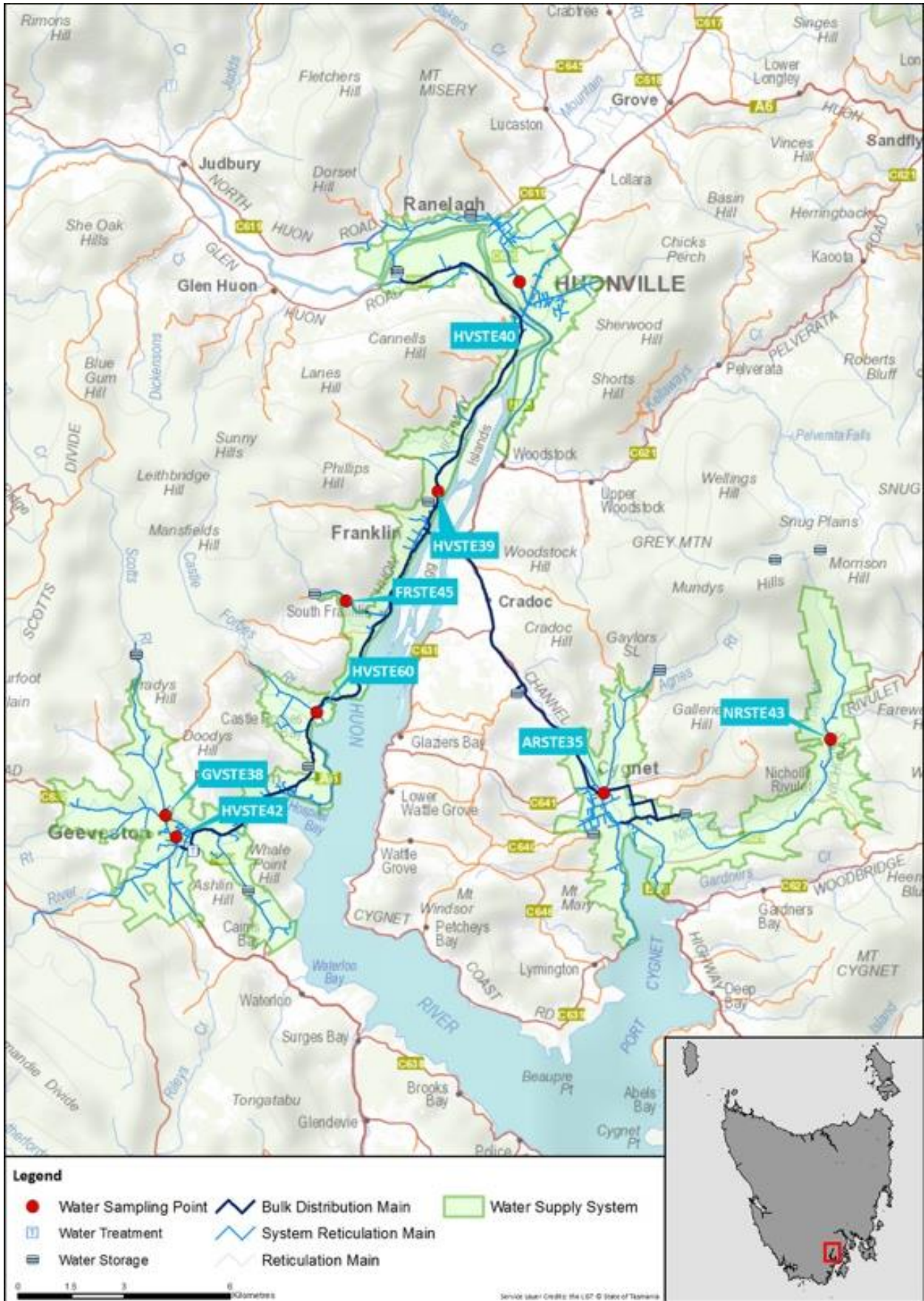


Figure 30.1-b Map of Huon Valley monitoring system
30.2. Summary of annual reticulation compliance (2017–18)

Table 30.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Cygnets/Football Ground, Bridge Sample Tap	ARSTE35	W	n/a	Q	n/a	n/a
South Franklin, Jacksons Rd/Sample Tap	FRSTE45	W	n/a	Q	n/a	n/a
Franklin Retic/Opposite No. 1 PS, Sample Tap	HVSTE39	W	n/a	Q	n/a	n/a
Huonville Retic/Football Club Entrance, Wilmot Rd, Sample Tap	HVSTE40	W	Q	Q	Q	n/a
Geeveston/Intersection Bridge, School Rd, Main Rd	HVSTE42	W	Q	Q	Q	n/a
Geeveston/Fourfoot Rd 1st Bridge	GVSTE38	W	n/a	n/a	n/a	n/a
4046 Huon Hwy, Castle Forbes Bay	HVSTE60	W	n/a	n/a	n/a	n/a
Nicholls Rivulet, Sample Tap	NRSTE43	W	n/a	Q	n/a	n/a
Number Planned Samples		416	8	24	12	n/a
Number Samples Tested		416	8	24	12	n/a

30.3. Summary of current and historic performance (2013-18)

Table 30.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	99.5%	100.0%	99.7%	99.7%	100.0%
Fluoride	100.0%	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

30.4. Analysis of current health performance (2017-18)

Table 30.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 30.4-b Fluoride distribution performance

Distribution fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	98.4%
Mean dose (mg/L)	0.96
■ Compliant ■ Non-compliant	

Table 30.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	8	0	100	0.0003	<0.0005	0.0009
Arsenic	0.01	mg/L	8	0	100	<0.0003	<0.0003	<0.0003
Barium	2	mg/L	8	0	100	0.006	0.003	0.011
Cadmium	0.002	mg/L	8	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	8	0	100	0.00008	<0.0001	0.0002
Copper	2	mg/L	8	0	100	0.00592	0.0006	0.0354
Lead	0.01	mg/L	8	0	100	0.0003	<0.0001	0.0029
Manganese	0.5	mg/L	8	0	100	0.0009	0.0004	0.0022
Mercury	0.001	mg/L	8	0	100	0.000065	<0.00003	0.00026
Molybdenum	0.05	mg/L	8	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	8	0	100	0.0001	<0.0001	0.0002
Selenium	0.01	mg/L	8	0	100	<0.0001	<0.0001	<0.0001

Table 30.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	24	0	100	6.27	<1	18
Monochloroacetic acid	150	µg/L	24	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	24	0	100	26.44	<1	48
Total trihalomethanes	250	µg/L	24	0	100	58.46	43	93

Table 30.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.23	0.01	0.95
Colour True	HU	15	0.79	<1	2
pH	Units	6.5 – 8.5	7.56	6.03	9.1
Turbidity	NTU	1	0.4	0.02	1.24

30.5. Analysis of overall system performance (2017-18)

Table 30.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

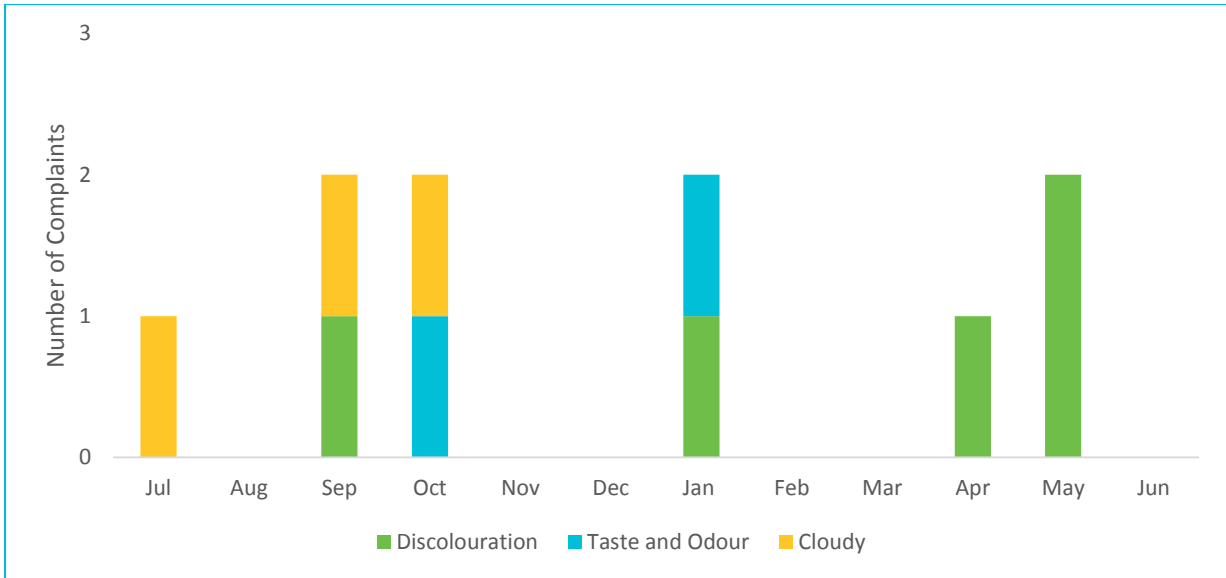






Figure 30.5-b Water quality customer complaints by month and type

31. Judbury drinking water system

31.1. System summary (2017-18)

Judbury drinking water system	
System status (as at 30 June 2018)	BWA
Total number of connections	98
Population serviced	265
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	33.3%		98.0%	12	8
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%		100.0%	4	0
DBPs	n/a	n/a	n/a	n/a	n/a

 Compliant  Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	8	<i>E. coli</i> exceedances
Public health warnings issued	1	Subject to long-term PHA
Notifications made to DoH	9	<i>E. coli</i> exceedances
Customer complaints	8	Discoloration, PHA notices

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend (\$'000)
Regional Towns Water Supply Program	Reticulation upgrade	In progress	Aug 2018	\$779,471
Regional Towns Water Supply Program	WTP upgrade and treated water reservoirs and pump station	In progress	Aug 2018	\$10,473,597

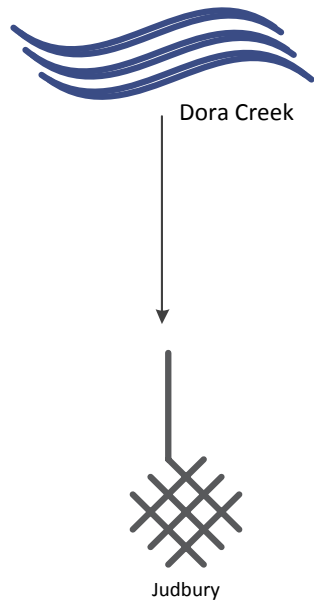


Figure 31.1-a Judbury system schematic

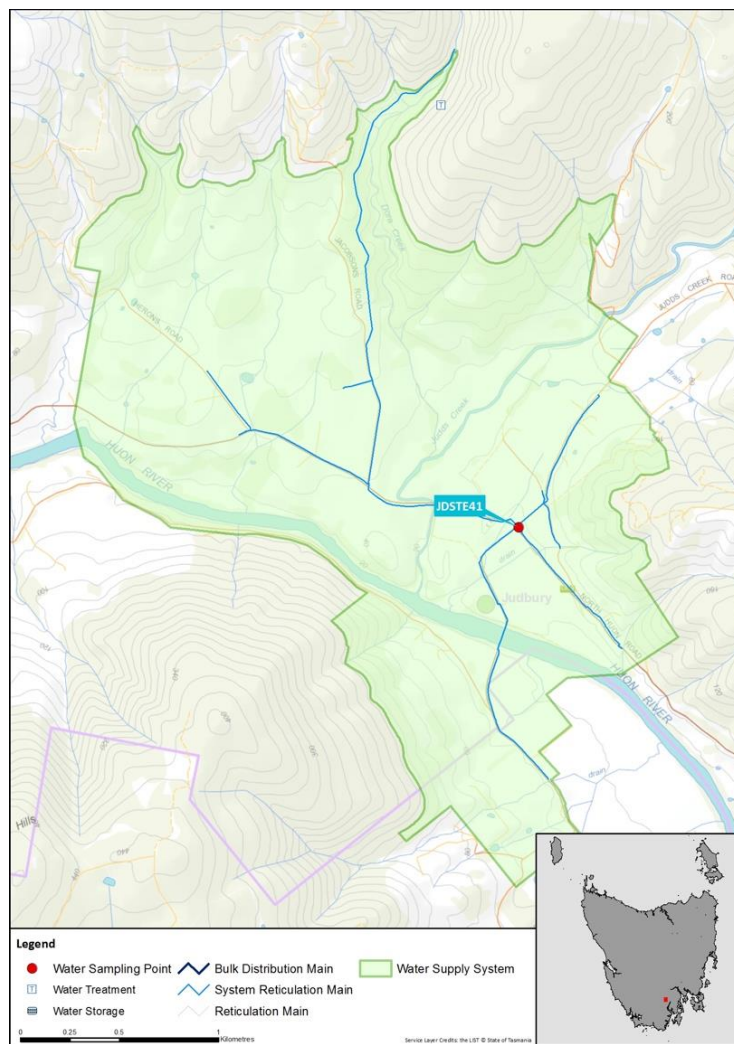


Figure 31.1-b Map of Judbury monitoring system

31.2. Summary of annual reticulation compliance (2017–18)

Table 31.2-a Sampling program

Planned compliance sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Judbury Hall/Sample Tap	JDSTE41	M	Q	n/a	Q	n/a
Number Planned Samples		12	4	n/a	4	n/a
Number Samples Tested		12	4	n/a	4	n/a

31.3. Summary of current and historic performance (2013-18)

Table 31.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	41.7%	8.3%	25.5%	25.0%	33.3%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	100.0%	100%	100.0%	100.0%
Disinfection by products	n/a	n/a	n/a	n/a	n/a

■ Compliant ■ Non-compliant

31.4. Analysis of current health performance (2017-18)

Table 31.4-a Summary of health guideline exceedances³⁰

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
<i>E.coli</i>	5/7/2017	<i>E.coli</i> of 7.5 MPN/100mL in monthly compliance sample	☒
<i>E.coli</i>	6/9/2017	<i>E.coli</i> of 32.7 MPN/100mL in monthly compliance sample	☒
<i>E.coli</i>	4/10/2017	<i>E.coli</i> of 3.1 MPN/100mL in monthly compliance sample	☒
<i>E.coli</i>	6/12/2017	<i>E.coli</i> of 16 MPN/100mL in monthly compliance sample	☒
<i>E.coli</i>	3/01/2018	<i>E.coli</i> of 1 MPN/100mL in monthly compliance sample	☒
<i>E.coli</i>	7/02/2018	<i>E.coli</i> of 18 MPN/100mL in monthly compliance sample	☒
<i>E.coli</i>	7/03/2018	<i>E.coli</i> of 24.3 MPN/100mL in monthly compliance sample	☒
<i>E.coli</i>	6/6/2018	<i>E.coli</i> of 1 MPN/100mL in monthly compliance sample	☒
<i>E.coli</i>	25/6/2018	<i>E.coli</i> of 2 MPN/100mL in investigation sample at JDSTE42	☒

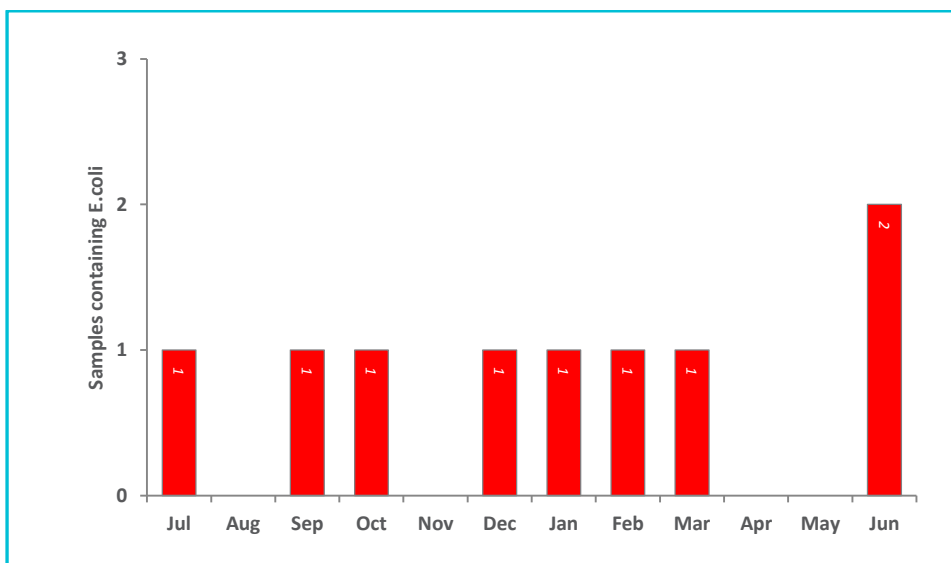


Figure 31.4-b Microbiological non-compliances by month

³⁰ System subject to PHA, resampling not required

Table 31.4-c Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	<0.0003	<0.0003	<0.0003
Barium	2	mg/L	4	0	100	0.003	0.002	0.004
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	0.00011	<0.0001	0.0002
Copper	2	mg/L	4	0	100	0.00643	0.006	0.0073
Lead	0.01	mg/L	4	0	100	0.0004	0.0003	0.0005
Manganese	0.5	mg/L	4	0	100	0.0023	0.0009	0.0045
Mercury	0.001	mg/L	4	0	100	0.000029	<0.00003	0.00007
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	0.00013	<0.0001	0.0002
Selenium	0.01	mg/L	4	0	100	0.00006	<0.0001	0.0001

Table 31.4-d General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.05	0.05	0.05
Colour True	HU	15	41	17	73
pH	Units	6.5 – 8.5	7.17	6.21	7.47
Turbidity	NTU	1	1.57	0.37	4.89

31.5. Analysis of overall system performance (2017-18)

Table 31.5-a Summary of system issues/public health warnings with notification details

Summary of system issues			
Date	Description	DHHS notification required	DHHS notification complete
Long-term	System subject to PHA	✓	✓
5/7/2017	Monthly sample detected <i>E. coli</i> – system subject to PHA	✓	✓
6/9/2017	Monthly sample detected <i>E. coli</i> – system subject to PHA	✓	✓
4/10/2017	Monthly sample detected <i>E. coli</i> – system subject to PHA	✓	✓
6/12/2017	Monthly sample detected <i>E. coli</i> – system subject to PHA	✓	✓
3/1/2018	Monthly sample detected <i>E. coli</i> – system subject to PHA	✓	✓
7/2/2018	Monthly sample detected <i>E. coli</i> – system subject to PHA	✓	✓
7/3/2018	Monthly sample detected <i>E. coli</i> – system subject to PHA	✓	✓
6/6/2018	Monthly sample detected <i>E. coli</i> – system subject to PHA	✓	✓
25/6/2018	Investigation sample detected <i>E. coli</i> – system subject to PHA	✓	✓

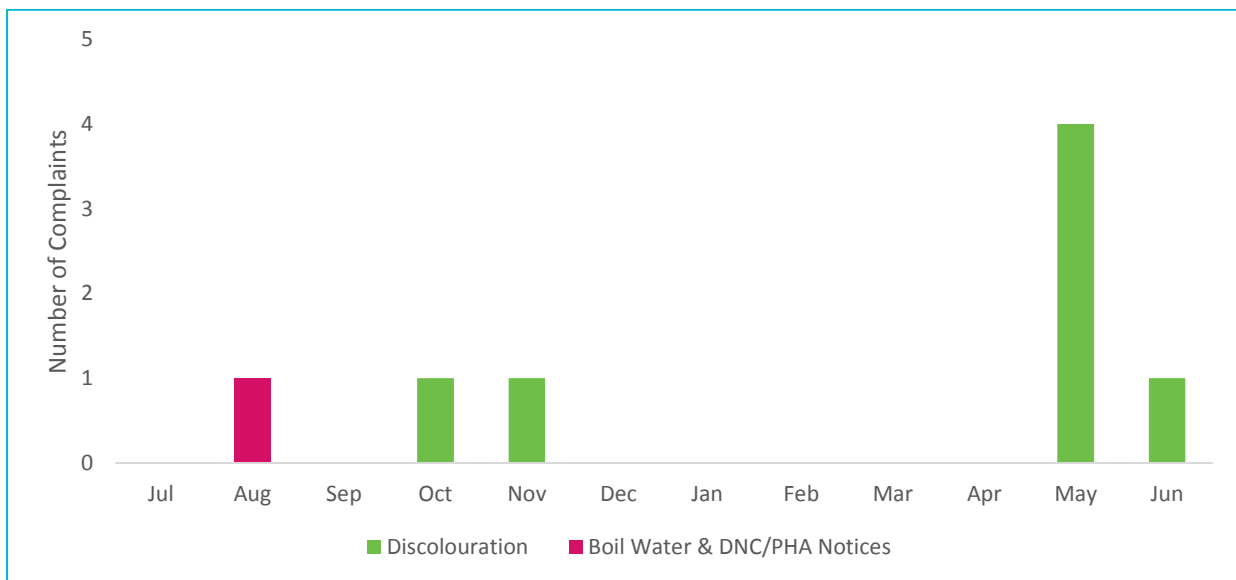


Figure 31.5-b Water quality customer complaints by month and type

32. Lady Barron drinking water system

32.1. System summary (2017-18)

Lady Barron drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	119
Population serviced	179
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	<input checked="" type="checkbox"/>	98.0%	104	0
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	8	0
DBPs	100.0%	<input checked="" type="checkbox"/>	100.0%	8	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	1	Discolouration

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
No projected capital investment				

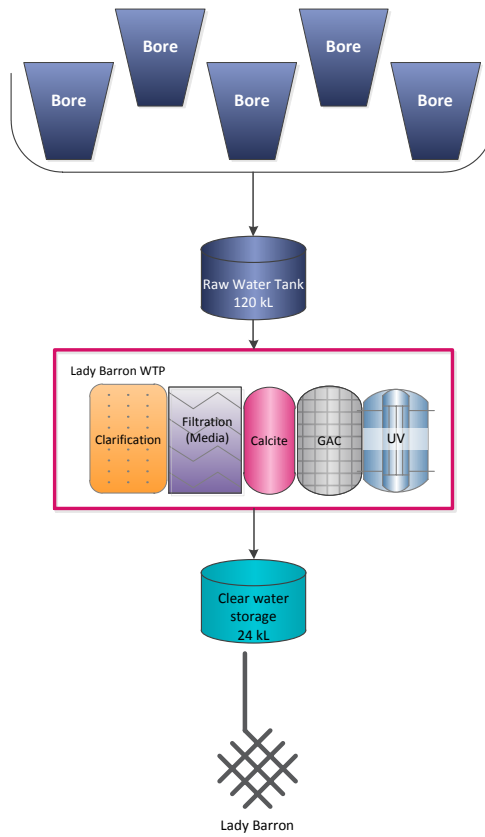


Figure 32.1-a Lady Barron system schematic



Figure 32.1-b Map of Lady Barron monitoring system
32.2. Summary of annual reticulation compliance (2017–18)

Table 32.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Lady Barron/Police Station	LBW51W01	W	Q	Q	Q	n/a
Lady Barron/45-47 Franklin Parade (650160)	LBW51W06	W	Q	Q	Q	n/a
Number Planned Samples		104	8	8	8	n/a
Number Samples Tested		104	8	8	8	n/a

32.3. Summary of current and historic performance (2013-18)

Table 32.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100.0%	95.0%	91.7%	100.0%	100.0%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	n/a	n/a	n/a	n/a	100.0%

■ Compliant ■ Non-compliant

32.4. Analysis of current health performance (2017-18)

Table 32.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 32.4-b Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	8	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	8	0	100	0.00021	<0.0003	0.0004
Barium	2	mg/L	8	0	100	0.031	0.024	0.048
Cadmium	0.002	mg/L	8	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	8	0	100	0.00015	0.0001	0.0002
Copper	2	mg/L	8	0	100	0.00243	0.0009	0.0047
Lead	0.01	mg/L	8	0	100	0.0005	0.0001	0.0008
Manganese	0.5	mg/L	8	0	100	0.009	0.002	0.0276
Mercury	0.001	mg/L	8	0	100	0.000039	<0.00003	0.00013
Molybdenum	0.05	mg/L	8	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	8	0	100	0.00053	0.0002	0.0009
Selenium	0.01	mg/L	8	0	100	<0.0001	<0.0001	<0.0001

Table 32.4-c Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	8	0	100	4.0	2	8
Monochloroacetic acid	150	µg/L	8	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	8	0	100	2.8	<1	6
Total trihalomethanes	250	µg/L	8	0	100	145.0	84	191

Table 32.4-d General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.23	0	1.03
Colour True	HU	15	1.25	<1	2
pH	Units	6.5 – 8.5	7.13	6.89	7.53
Turbidity	NTU	1	0.93	0.13	58

32.5. Analysis of overall system performance (2017-18)

Table 32.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

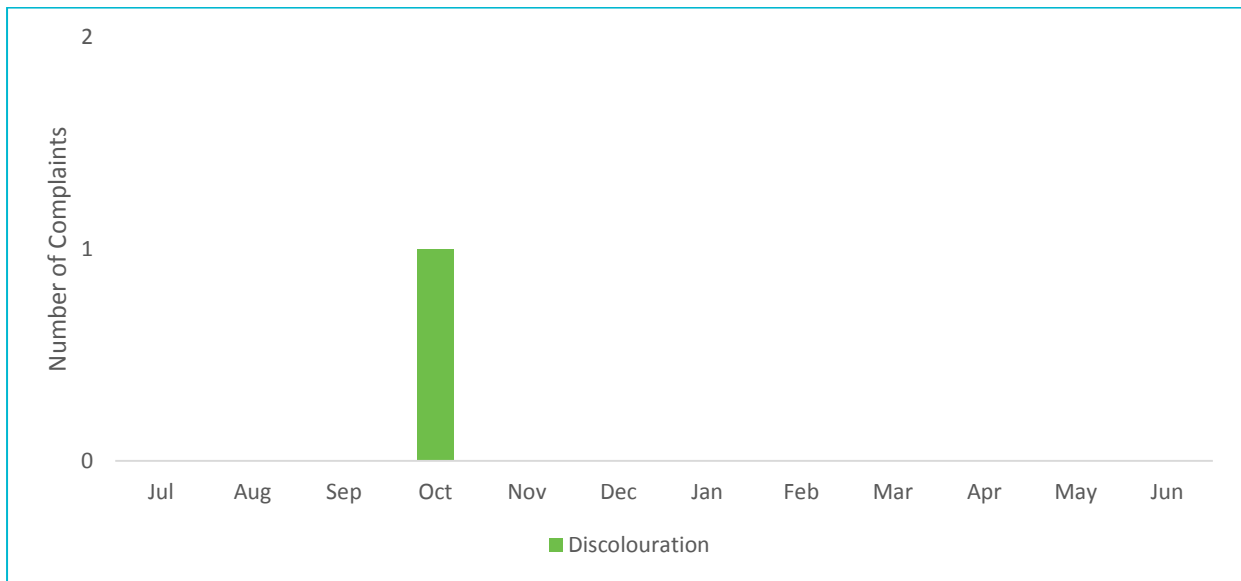


Figure 32.5-b Water quality customer complaints by month and type

33. Lake Barrington drinking water system

33.1. System summary (2017-18)

Lake Barrington drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	1132
Population serviced	2490
Fluoride	Sodium fluoride

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	☑	98.0%	104	0
Fluoride	100.0%	☑	100.0%	170	0
Metals	100.0%	☑	100.0%	8	0
DBPs	100.0%	☒	100.0%	8	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	1	Sampling incomplete for DBPs (missed test)
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	5	Discolouration, Taste & Odour

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
No projected capital investment				

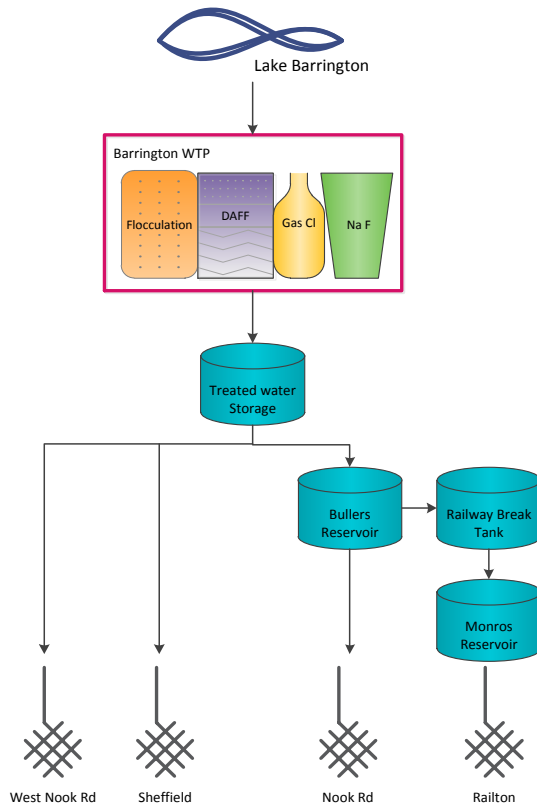


Figure 33.1-a Lake Barrington system schematic

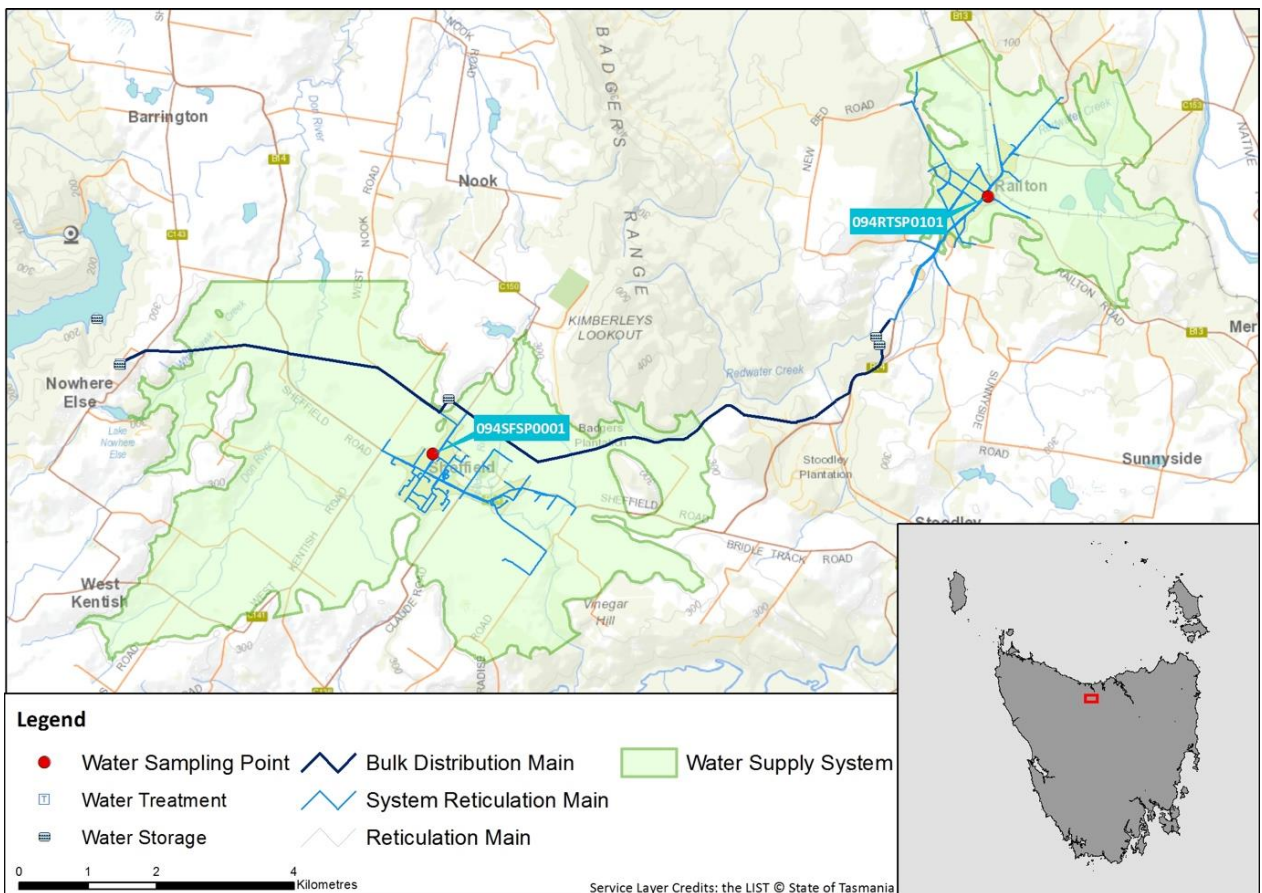


Figure 33.1-b Map of Lake Barrington monitoring system

33.2. Summary of annual reticulation compliance (2017–18)

Table 33.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Barrington/Railton Park Sample Tap	094RTSP0101	W	Q	Q	Q	n/a
Barrington/Sheffield Council Office Sample Tap	094SFSP0001	W	Q	Q	Q	n/a
Number Planned Samples		104	8	8	8	n/a
Number Samples Tested		104	8	8³¹	8	n/a

33.3. Summary of current and historic performance (2013-18)

Table 33.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	99.6%	100.0%	100.0%	100.0%	100.0%
Fluoride	n/a	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	99.9%	99.9%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant
 ■ Non-compliant
 ■ Compliance unknown

33.4. Analysis of current health performance (2017-18)

Table 33.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

³¹ Total Trihalomethane not tested on 5/4/2018. DBP program incomplete.

Table 33.4-b Fluoride operational performance

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	100%
Mean dose (mg/L)	0.99
■ Compliant ■ Non-compliant	

Table 33.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	8	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	8	0	100	0.00022	<0.0003	0.0004
Barium	2	mg/L	8	0	100	0.007	0.006	0.009
Cadmium	0.002	mg/L	8	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	8	0	100	0.00009	<0.0001	0.0002
Copper	2	mg/L	8	0	100	0.00138	0.0003	0.0055
Lead	0.01	mg/L	8	0	100	0.0001	<0.0001	0.0002
Manganese	0.5	mg/L	8	0	100	0.0031	0.0011	0.006
Mercury	0.001	mg/L	8	0	100	0.00012	<0.00003	0.00036
Molybdenum	0.05	mg/L	8	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	8	0	100	0.00009	<0.0001	0.0003
Selenium	0.01	mg/L	8	0	100	<0.0001	<0.0001	<0.0001

Table 33.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	8	0	100	12.29	2	23
Monochloroacetic acid	150	µg/L	8	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	8	0	100	27.29	12	48
Total trihalomethanes	250	µg/L	7	0	100	47.43	26	65

Table 33.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.6	0.08	1.25
Colour True	HU	15	0.64	<1	1
pH	Units	6.5 – 8.5	7.51	6.66	8.95
Turbidity	NTU	1	0.41	0.17	1.68

33.5. Analysis of overall system performance (2017-18)

Table 33.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
5/4/2018	Total Trihalomethane test missed at 094SFS0001, DBP sampling incomplete.	✓	✓

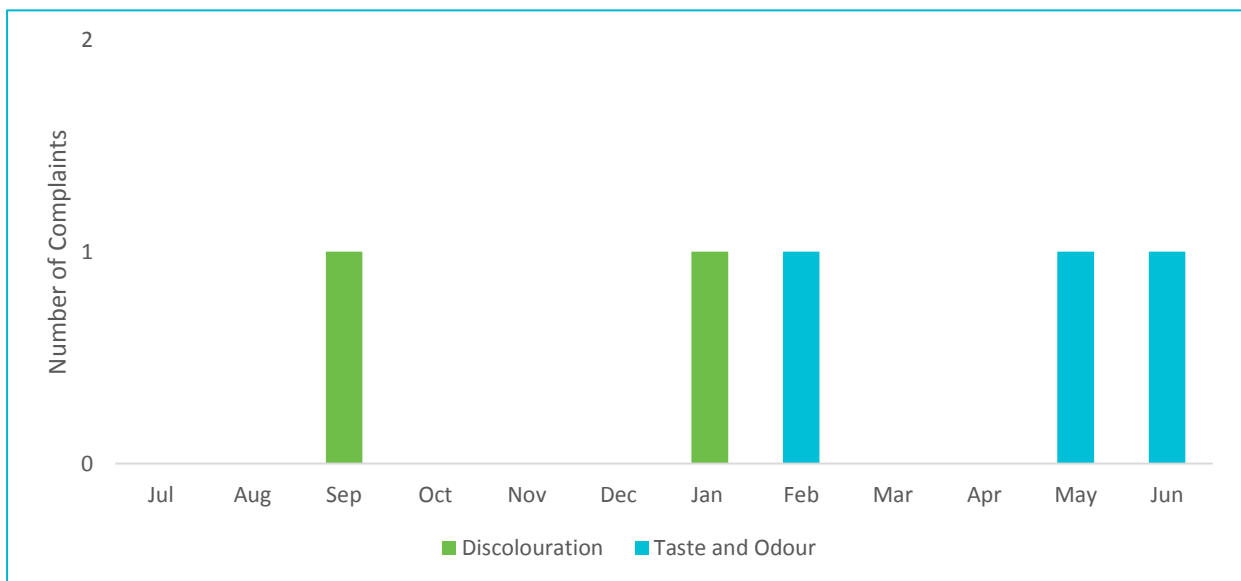


Figure 33.5-b Water quality customer complaints by month and type

34. Leven River drinking water system

34.1. System summary (2017-18)

Leven River drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	2177
Population serviced	4789
Fluoride	Fluorosilicic acid

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	☑	98.0%	156	0
Fluoride	100.0%	☑	100.0%	35	0
Metals	100.0%	☑	100.0%	8	0
DBPs	100.0%	☑	100.0%	8	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	59	Discolouration, Taste & Odour, Other (illness)

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
No projected capital investment				

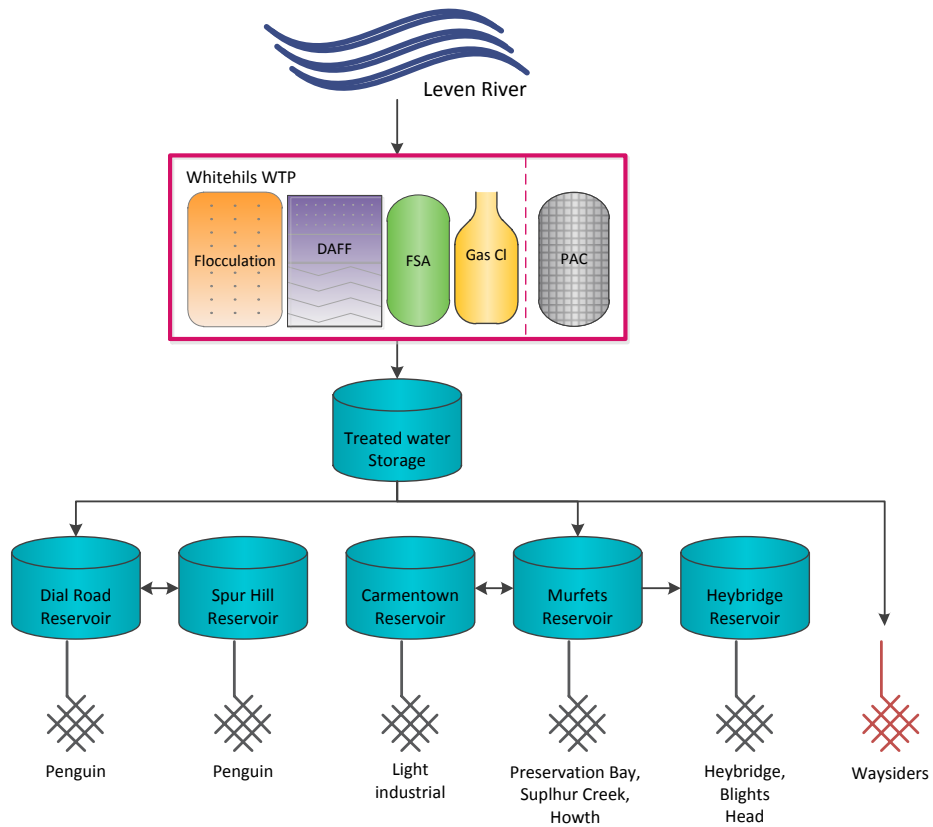


Figure 34.1-a Leven River system schematic

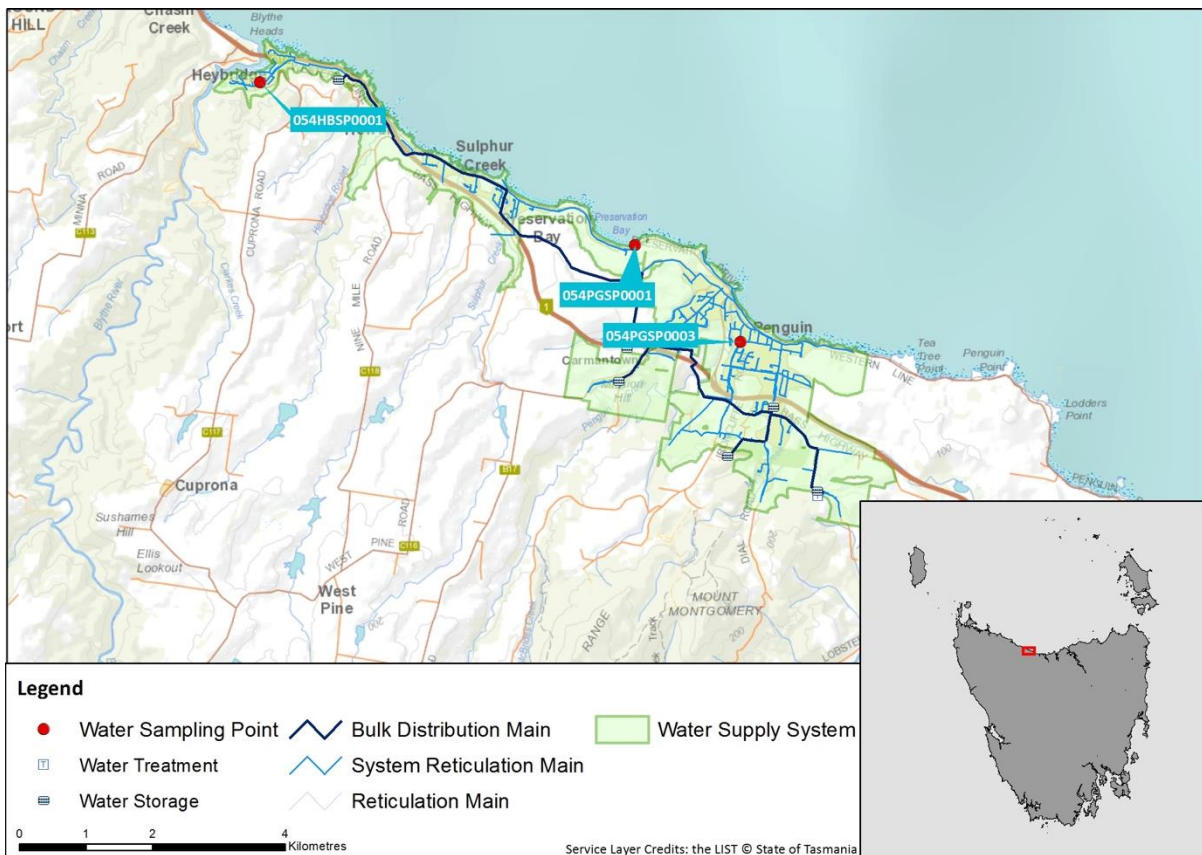


Figure 34.1-b Map of Leven River monitoring system
34.2. Summary of annual reticulation compliance (2017–18)

Table 34.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Whitehills/Heybridge Fire Station Tap	054HBSP0001	W	Q	Q	Q	n/a
Whitehills/Penguin Surf Club Tap	054PGSP0001	W	n/a	n/a	n/a	n/a
Whitehills/Patrick St Clinic Sample Point	054PGSP0003	W	Q	Q	Q	n/a
Number Planned Samples		156	8	8	8	n/a
Number Samples Tested		156	8	8	8	n/a

34.3. Summary of current and historic performance (2013-18)

Table 34.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100.0%	100.0%	99.6%	100.0%	100.0%
Fluoride	n/a	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	100.0%	100.0%	99.5%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

34.4. Analysis of current health performance (2017-18)

Table 34.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 34.4-b Fluoride operational performance

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	88.6%
Mean dose (mg/L)	0.92
■ Compliant ■ Non-compliant	

Table 34.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	8	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	8	0	100	0.00017	<0.0003	0.0003
Barium	2	mg/L	8	0	100	0.016	0.01	0.022
Cadmium	0.002	mg/L	8	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	8	0	100	0.00023	<0.0001	0.0008
Copper	2	mg/L	8	0	100	0.0186	0.0008	0.0959
Lead	0.01	mg/L	8	0	100	0.00027	<0.0001	0.0008
Manganese	0.5	mg/L	8	0	100	0.0132	0.0008	0.0843
Mercury	0.001	mg/L	8	0	100	0.000043	<0.00003	0.00014
Molybdenum	0.05	mg/L	8	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	8	0	100	0.00029	<0.0001	0.001
Selenium	0.01	mg/L	8	0	100	<0.0001	<0.0001	<0.0001

Table 34.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	8	0	100	3.94	<1	10
Monochloroacetic acid	150	µg/L	8	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	8	0	100	8.81	<1	39
Total trihalomethanes	250	µg/L	8	0	100	48.63	15	84

Table 34.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.27	0	1.5
Colour True	HU	15	1.69	<1	7
pH	Units	6.5 – 8.5	7.79	6.87	9.38
Turbidity	NTU	1	0.83	0.04	7.7

34.5. Analysis of overall system performance (2017-18)

Table 34.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

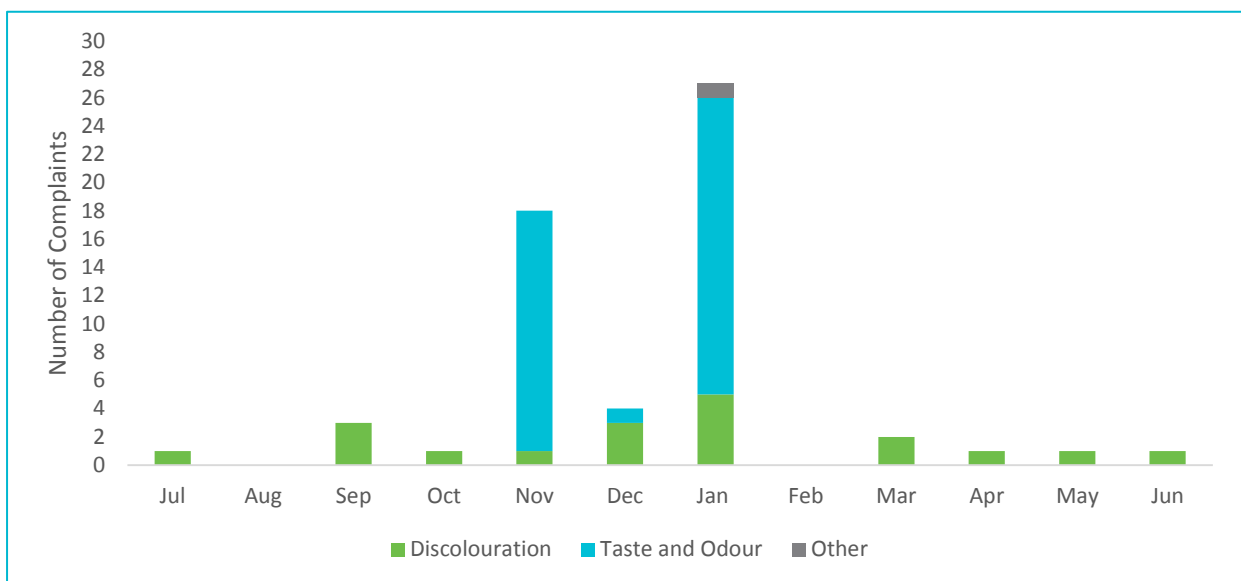


Figure 34.5-b Water quality customer complaints by month and type

35. Longford drinking water system

35.1. System summary (2017-18)

Longford drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	4494
Population serviced	9887
Fluoride	Fluorosilicic acid

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	☑	98.0%	208	0
Fluoride	100.0%	☑	100.0%	284	0
Metals	100.0%	☑	100.0%	8	0
DBPs	100.0%	☑	100.0%	8	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	48	Discolouration, Taste & Odour, Cloudy Water, Other (illness)

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend (\$'000)
Regional Towns Water Supply Program	UV disinfection system	Not started	TBA	TBA

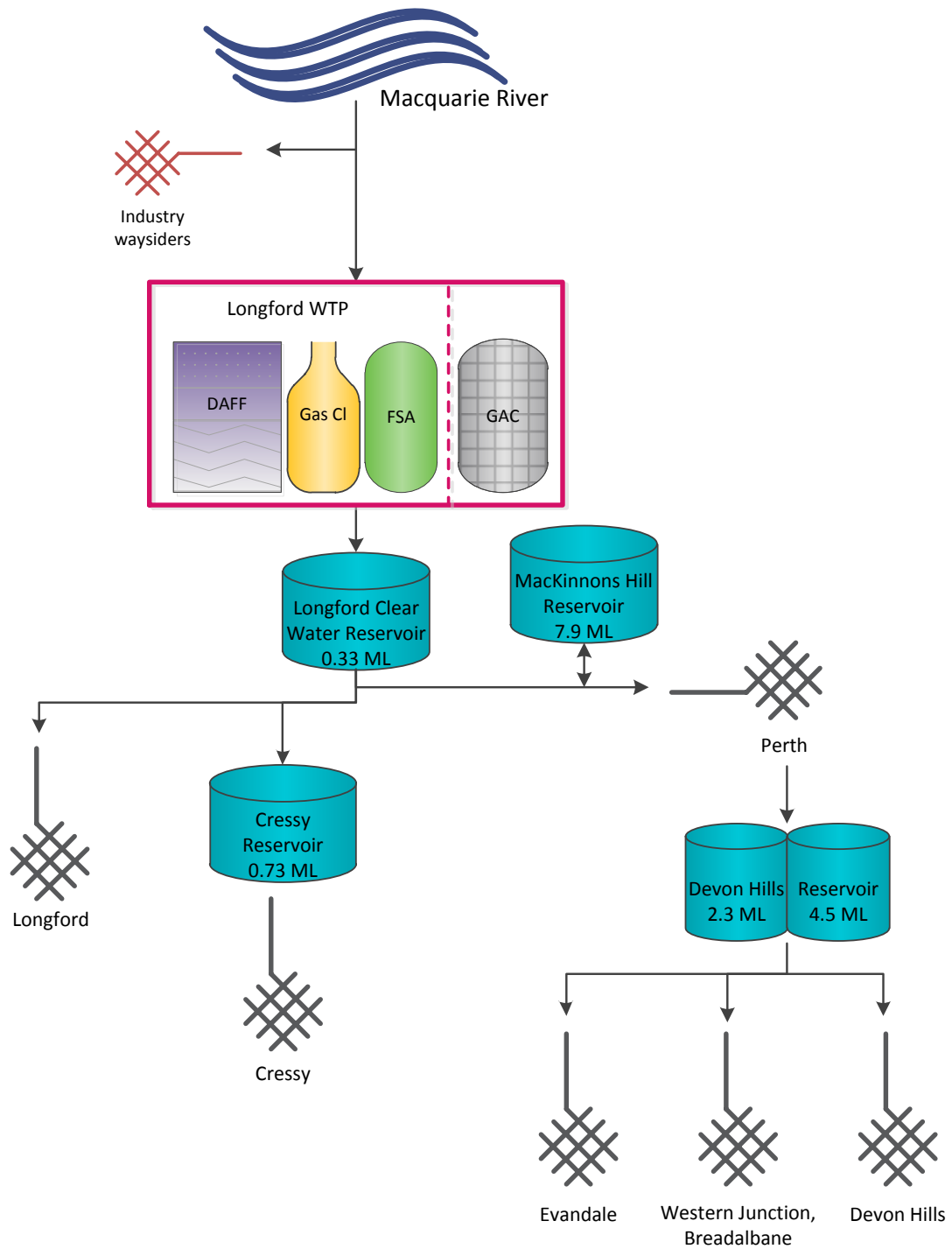


Figure 35.1-a Longford system schematic

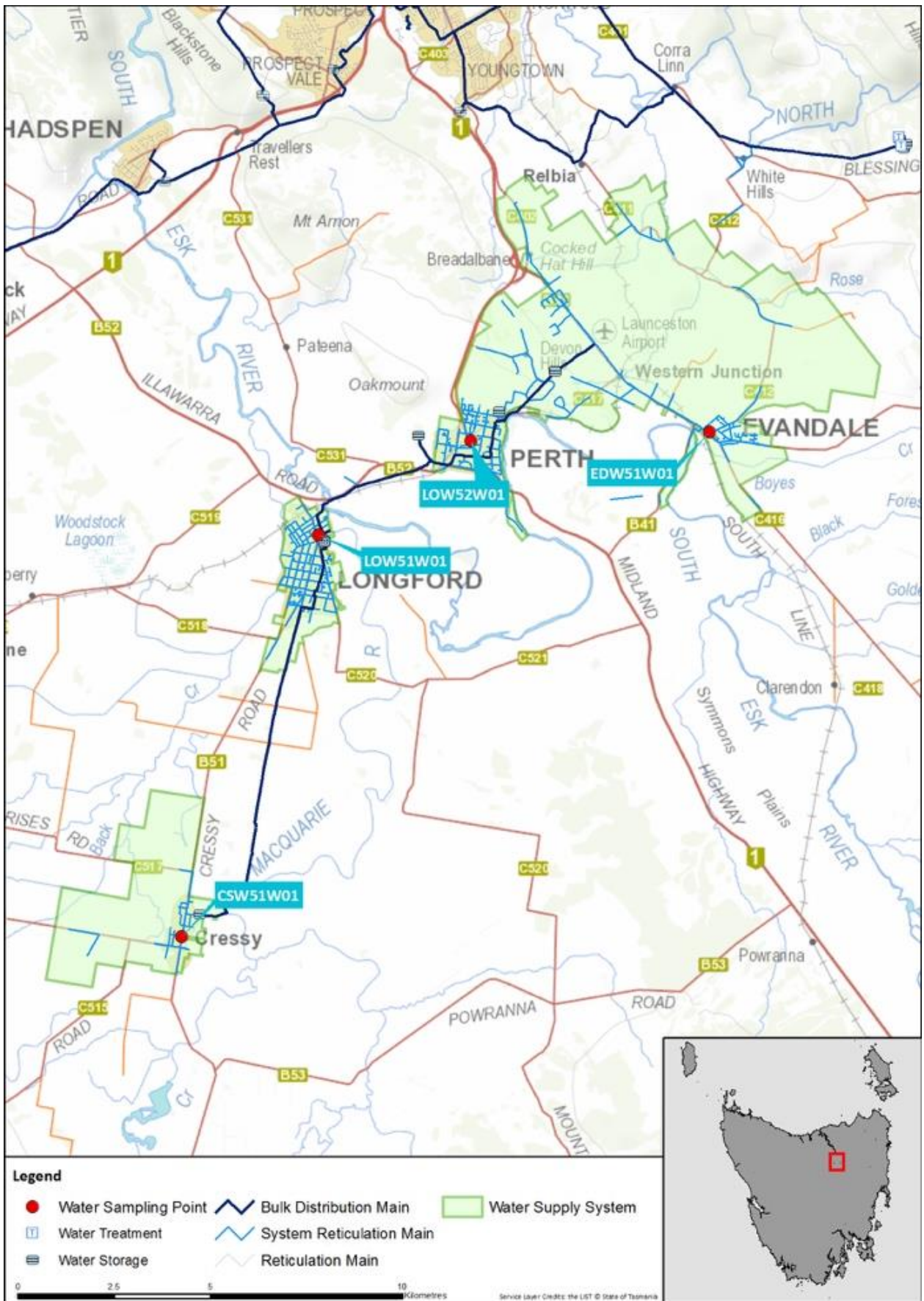


Figure 35.1-b Map of Longford monitoring system

35.2. Summary of annual reticulation compliance (2017–18)

Table 35.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Longford/Cressy Public Toilets	CSW51W01	W	Q	Q	Q	n/a
Longford/Evandale History Centre, High St	EDW51W01	W	Q	Q	Q	n/a
Longford/Lyttleton St Toilets	LOW51W01	W	n/a	n/a	n/a	n/a
Longford/Perth, Little Mulgrave St	LOW52W01	W	n/a	n/a	n/a	n/a
Number Planned Samples		208	8	8	8	n/a
Number Samples Tested		208	8	8	8	n/a

35.3. Summary of current and historic performance (2013-18)

Table 35.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100.0%	99.5%	100.0%	99.5%	100.0%
Fluoride	100.0%	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

35.4. Analysis of current health performance (2017-18)

Table 35.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 35.4-b Fluoride operational performance

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	91.9%
Mean dose (mg/L)	0.95
■ Compliant ■ Non-compliant	

Table 35.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	8	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	8	0	100	<0.0003	<0.0003	<0.0003
Barium	2	mg/L	8	0	100	0.012	0.005	0.024
Cadmium	0.002	mg/L	8	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	8	0	100	0.00011	<0.0001	0.0003
Copper	2	mg/L	8	0	100	0.00681	0.0018	0.0146
Lead	0.01	mg/L	8	0	100	0.00018	<0.0001	0.0004
Manganese	0.5	mg/L	8	0	100	0.0086	0.0025	0.0274
Mercury	0.001	mg/L	8	0	100	0.000033	<0.00003	0.00009
Molybdenum	0.05	mg/L	8	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	8	0	100	0.00013	<0.0001	0.0003
Selenium	0.01	mg/L	8	0	100	<0.0001	<0.0001	<0.0001

Table 35.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	8	0	100	5.63	3	7
Monochloroacetic acid	150	µg/L	8	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	8	0	100	5.75	3	7
Total trihalomethanes	250	µg/L	8	0	100	21	13	27

Table 35.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.82	0.31	1.5
Colour True	HU	15	0.69	<1	2
pH	Units	6.5 – 8.5	7.29	6.68	7.84
Turbidity	NTU	1	0.28	0.06	2.2

35.5. Analysis of overall system performance (2017-18)

Table 35.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

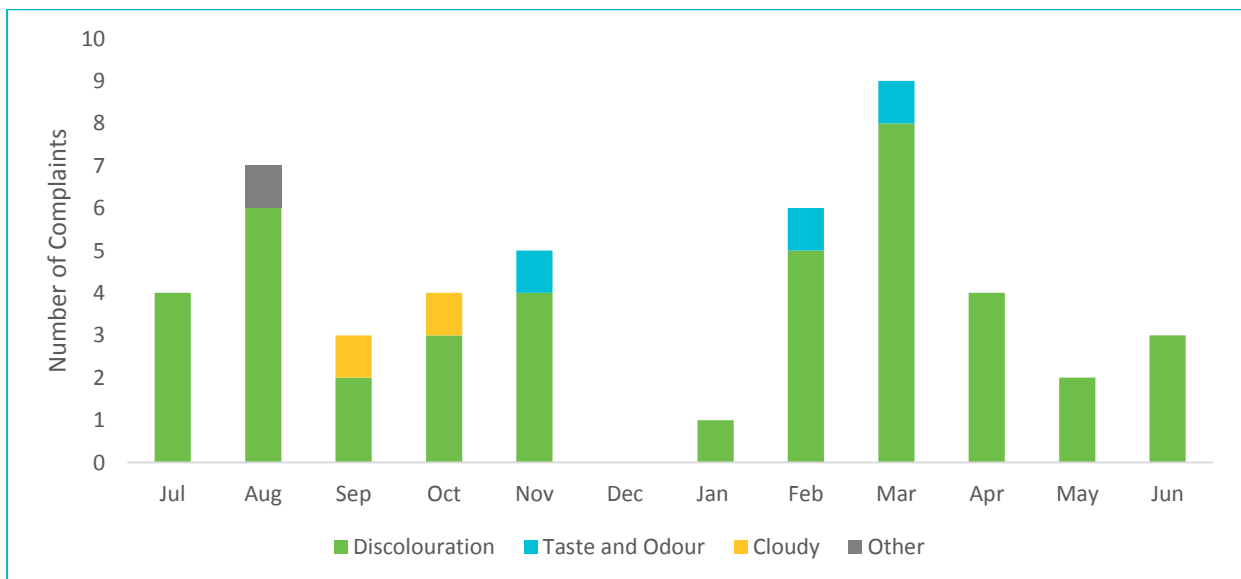


Figure 35.5-b Water quality customer complaints by month and type

36. Manuka River drinking water system

36.1. System summary (2017-18)

Manuka River drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	570
Population serviced	855
Fluoride	Sodium fluoride

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	☑	98.0%	151	0
Fluoride	100.0%	☑	100.0%	361	0
Metals	100.0%	☑	100.0%	8	0
DBPs	100.0%	☑	100.0%	8	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	4	Discolouration, Cloudy Water

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend (\$'000)
Regional Towns Water Supply Program	UV disinfection system	Not started	TBA	TBA

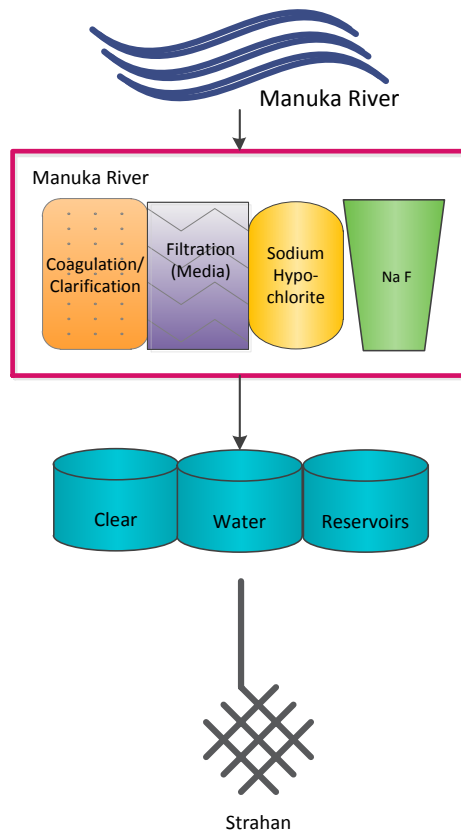


Figure 36.1-a Manuka River system schematic



Figure 36.1-b Map of Manuka River monitoring system
36.2. Summary of annual reticulation compliance (2017–18)

Table 36.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Strahan/Letts Bay Sample Point ^a	204SNSP0001 ³²	W	n/a	n/a	n/a	n/a
Strahan/Harvey St Sample Point	204SNSP0003	W	Q	Q	Q	n/a
Strahan/Regatta Point Sample Point ^b	204SNSP0004 ³³	W	Q	Q	n/a	n/a
Strahan/Lot 1 Lowana Rd (WWTP Entrance)	204SNSP0008	W	Q	Q	n/a	n/a
Number Planned Samples		150	8	8	4	n/a
Number Samples Tested		151	8	8	4	n/a

36.3. Summary of current and historic performance (2013-18)

Table 36.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100.0%	99.6%	99.3%	99.6%	100.0%
Fluoride	n/a	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

36.4. Analysis of current health performance (2017-18)

Table 36.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled

³² Removed and replaced with 204SNSP0003

³³ Removed and replaced with 204SNSP0008 May 11th 2018

No ADWG exceedances

Table 36.4-b Fluoride operational performance

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	99.2%
Mean dose (mg/L)	0.98
■ Compliant ■ Non-compliant	

Table 36.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	8	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	8	0	100	<0.0003	<0.0003	<0.0003
Barium	2	mg/L	8	0	100	0.006	0.006	0.007
Cadmium	0.002	mg/L	8	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	8	0	100	<0.0001	<0.0001	<0.0001
Copper	2	mg/L	8	0	100	0.01229	0.0058	0.022
Lead	0.01	mg/L	8	0	100	0.0005	0.0002	0.001
Manganese	0.5	mg/L	8	0	100	0.0038	0.001	0.0146
Mercury	0.001	mg/L	8	0	100	0.000031	<0.00003	0.00006
Molybdenum	0.05	mg/L	8	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	8	0	100	0.00109	0.0007	0.0013
Selenium	0.01	mg/L	8	0	100	0.00006	<0.0001	0.0001

Table 36.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	8	0	100	19.71	1	31
Monochloroacetic acid	150	µg/L	8	0	100	<3	<3	4
Trichloroacetic acid	100	µg/L	8	0	100	27.21	<1	40
Total trihalomethanes	250	µg/L	8	0	100	79.29	62	99

Table 36.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.62	0	1.42
Colour True	HU	15	<1	<1	<1
pH	Units	6.5 – 8.5	7.4	6.93	7.98
Turbidity	NTU	1	0.58	0.1	16.3

36.5. Analysis of overall system performance (2017-18)

Table 36.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

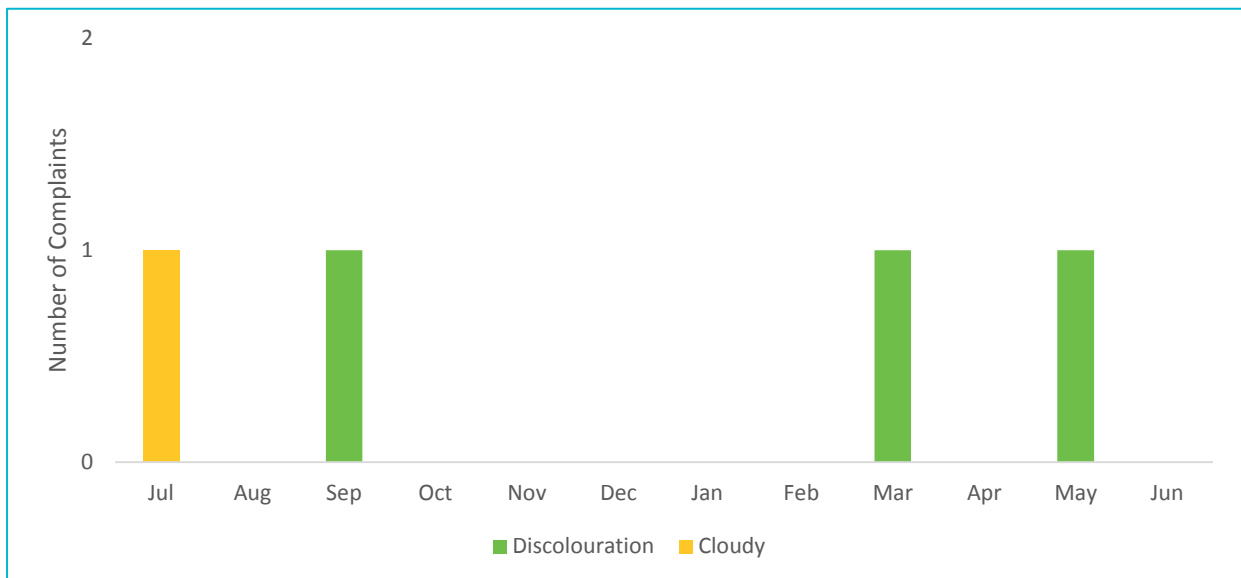






Figure 36.5-b Water quality customer complaints by month and type

37. Mathinna drinking water system

37.1. System summary (2017-18)

Mathinna drinking water system	
System status (as at 30 June 2018)	BWA
Total number of connections	96
Population serviced	154
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	66.7%		98.0%	18	6
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%		100.0%	4	0
DBPs	n/a	n/a	n/a	n/a	n/a

 Compliant  Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	6	<i>E. coli</i> exceedances
Public health warnings issued	1	Subject to long-term PHA
Notifications made to DoH	6	<i>E. coli</i> exceedances
Customer complaints	4	Discolouration, PHA Notices

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend (\$'000)
Regional Towns Water Supply Program	WTP and associated infrastructure	In progress	August 2018	\$2,377,263
Regional Towns Water Supply Program	Reticulation upgrade	In progress	August 2018	\$750,736

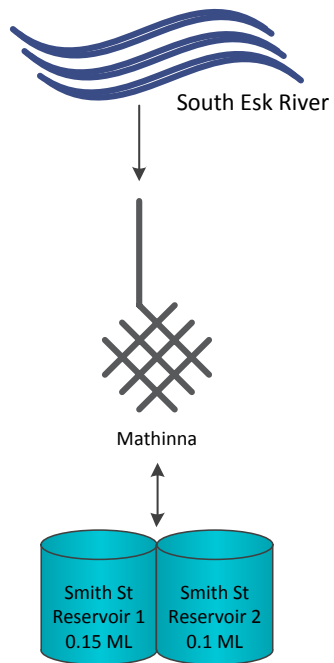


Figure 37.1-a Mathinna system schematic

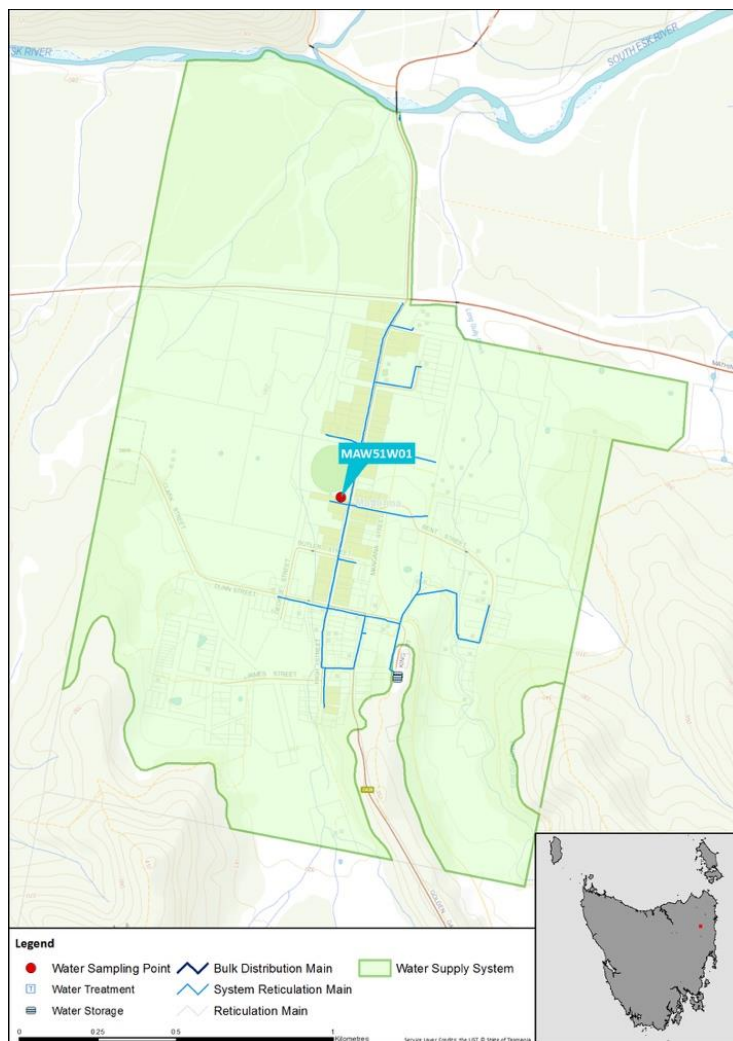


Figure 37.1-b Map of Mathinna monitoring system
37.2. Summary of annual reticulation compliance (2017–18)

Table 37.2-a Sampling program

Planned compliance sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Mathinna/Rec Ground Recreation Ground	MAW51W01	M	Q	n/a	Q	n/a
Number Planned Samples		18	4	n/a	4	n/a
Number Samples Tested		18	4	n/a	4	n/a

37.3. Summary of current and historic performance (2013-18)

Table 37.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	21.0%	17.0%	33.0%	16.7%	66.7%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	n/a	n/a	n/a	n/a	n/a

■ Compliant ■ Non-compliant

37.4. Analysis of current health performance (2017-18)

Table 37.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
<i>E.coli</i>	19/9/2017	<i>E.coli</i> of 1 MPN/100mL in monthly compliance sample. System subject to PHA.	<input checked="" type="checkbox"/>
<i>E.coli</i>	17/10/2017	<i>E.coli</i> of 11 MPN/100mL in monthly compliance sample. System subject to PHA.	<input checked="" type="checkbox"/>
<i>E.coli</i>	15/11/2017	<i>E.coli</i> of 2 MPN/100mL in monthly compliance sample. System subject to PHA.	<input checked="" type="checkbox"/>
<i>E.coli</i>	20/2/2018	<i>E.coli</i> of 3.1 MPN/100mL in monthly compliance sample. System subject to PHA.	<input checked="" type="checkbox"/>
<i>E.coli</i>	20/3/2018	<i>E.coli</i> of 3.1 MPN/100mL in monthly compliance sample. System subject to PHA.	<input checked="" type="checkbox"/>
<i>E.coli</i>	17/4/2018	<i>E.coli</i> of 9.8 MPN/100mL in monthly compliance sample. System subject to PHA.	<input checked="" type="checkbox"/>

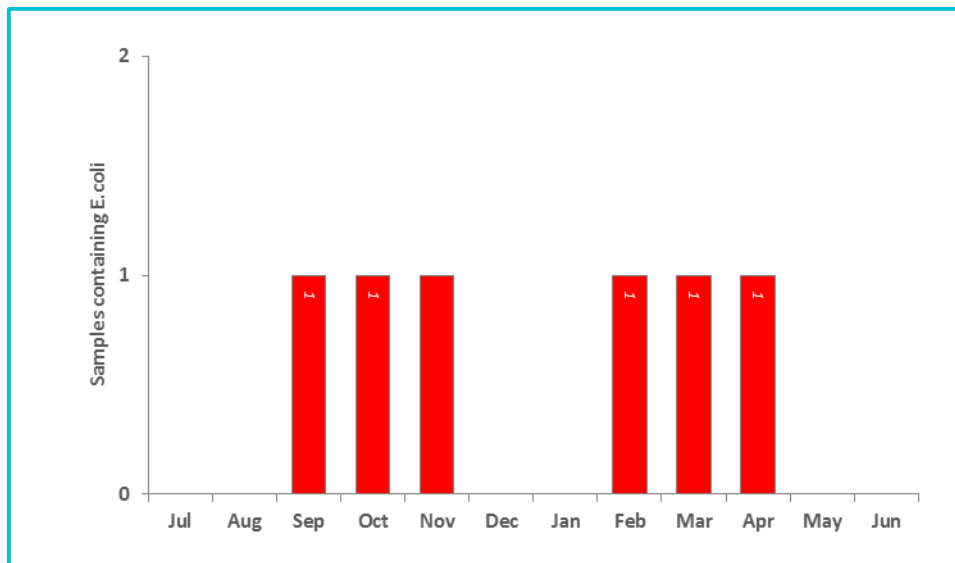


Figure 37.4-b Microbiological non-compliances by month

Table 37.4-c Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	0.00024	<0.0003	0.0004
Barium	2	mg/L	4	0	100	0.016	0.003	0.033
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	0.00017	<0.0001	0.0004
Copper	2	mg/L	4	0	100	0.00559	0.0022	0.0088
Lead	0.01	mg/L	4	0	100	0.001	0.0002	0.0041
Manganese	0.5	mg/L	4	0	100	0.0068	0.0008	0.0147
Mercury	0.001	mg/L	4	0	100	0.000041	<0.00003	0.0001
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	0.00019	<0.0001	0.0004
Selenium	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001

Table 37.4-d General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.89	0.75	1.2
Colour True	HU	15	7.08	<1	28
pH	Units	6.5 – 8.5	7.37	6.57	7.9
Turbidity	NTU	1	0.56	0.14	1.38

37.5. Analysis of overall system performance (2017-18)

Table 37.5-a Summary of system issues/public health warnings with notification details

Summary of system issues			
Date	Description	DHHS notification required	DHHS notification complete
Pre 2013	System subject to long-term PHA	✓	✓
19/9/2017	Monthly compliance sample detected <i>E.coli</i>	✓	✓
17/10/2017	Monthly compliance sample detected <i>E.coli</i>	✓	✓
15/11/2017	Monthly compliance sample detected <i>E.coli</i>	✓	✓
20/2/2018	Monthly compliance sample detected <i>E.coli</i>	✓	✓
20/3/2018	Monthly compliance sample detected <i>E.coli</i>	✓	✓
17/4/2018	Monthly compliance sample detected <i>E.coli</i>	✓	✓

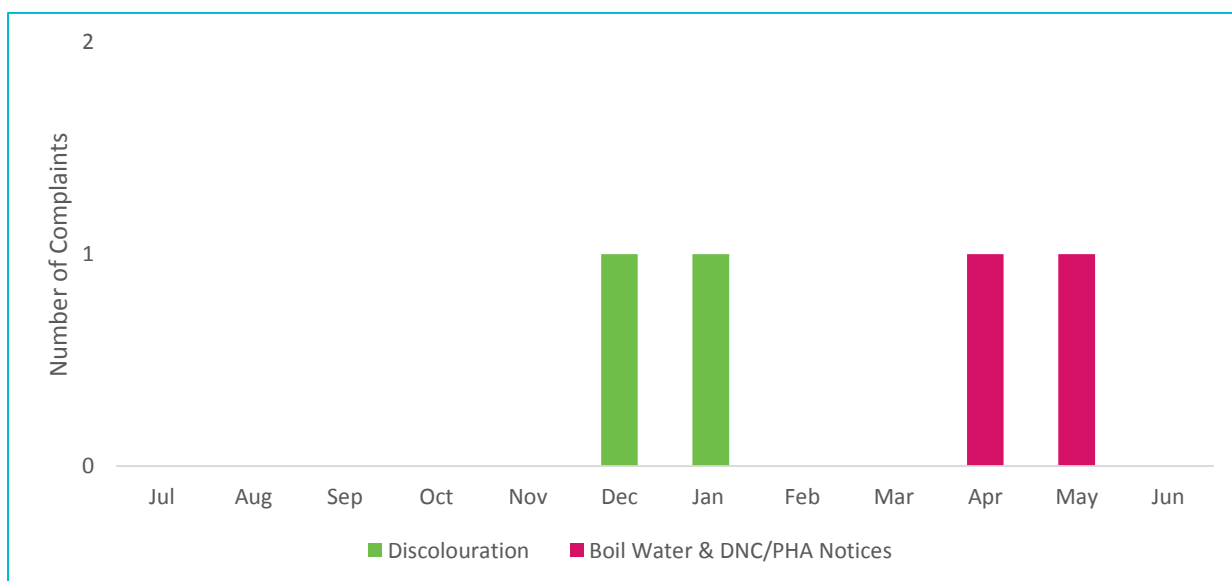


Figure 37.5-b Water quality customer complaints by month and type

38. Maydena drinking water system

38.1. System summary (2017-18)

Maydena drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	148
Population serviced	222
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	<input checked="" type="checkbox"/>	98.0%	53	0
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0
DBPs	100.0%	<input checked="" type="checkbox"/>	100.0%	12	0

■ Compliant
 ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	3	Discolouration

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend (\$'000)
Regional Towns Water Supply Program	WTP and associated infrastructure	In progress	Aug 2018	\$3,759,393

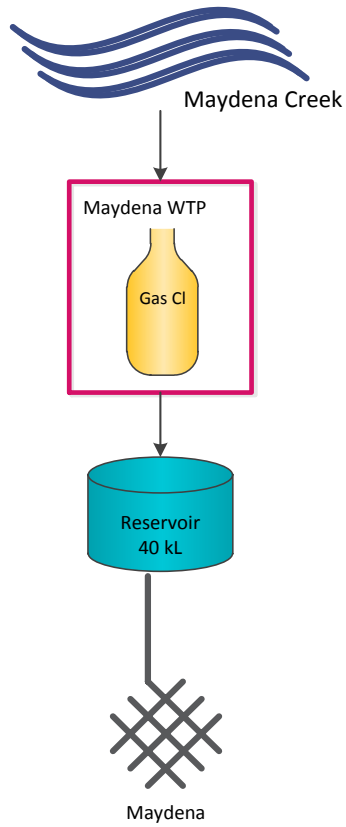


Figure 38.1-a Maydena system schematic

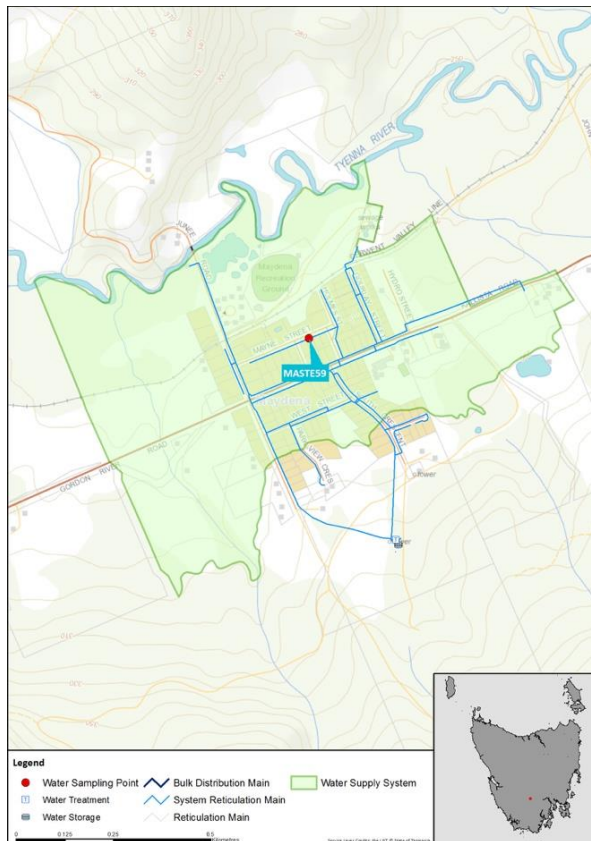


Figure 38.1-b Map of Maydena monitoring system

38.2. Summary of annual reticulation compliance (2017–18)

Table 38.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Maydena/12 Mayne St	MASTE59	W	Q	M	Q	n/a
Number Planned Samples		52	4	12	4	n/a
Number Samples Tested		53	4	12	4	n/a

38.3. Summary of current and historic performance (2013-18)

Table 38.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	98.0%	100.0%	98.0%	100.0%	100.0%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

38.4. Analysis of current health performance (2017-18)

Table 38.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 38.4-b Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	0.00039	<0.0003	0.0021
Barium	2	mg/L	4	0	100	0.004	0.002	0.009
Cadmium	0.002	mg/L	4	0	100	0.00009	<0.0001	0.0002
Chromium	0.05	mg/L	4	0	100	0.00048	<0.0001	0.0008
Copper	2	mg/L	4	0	100	0.00212	0.0011	0.0032
Lead	0.01	mg/L	4	0	100	0.00016	<0.0001	0.0005
Manganese	0.5	mg/L	4	0	100	0.0015	0.0002	0.0038
Mercury	0.001	mg/L	4	0	100	0.000058	<0.00003	0.00012
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	0.0003	<0.0001	0.0019
Selenium	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001

Table 38.4-c Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	12	0	100	15.57	<1	46
Monochloroacetic acid	150	µg/L	12	0	100	<3	<3	4
Trichloroacetic acid	100	µg/L	12	0	100	17.23	<1	46
Total trihalomethanes	250	µg/L	12	0	100	29.25	4	68

Table 38.4-d General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.7	0.12	1.29
Colour True	HU	15	1.15	<1	3
pH	Units	6.5 – 8.5	7.39	6.85	8
Turbidity	NTU	1	0.71	0.13	3.1

38.5. Analysis of overall system performance (2017-18)

Table 38.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

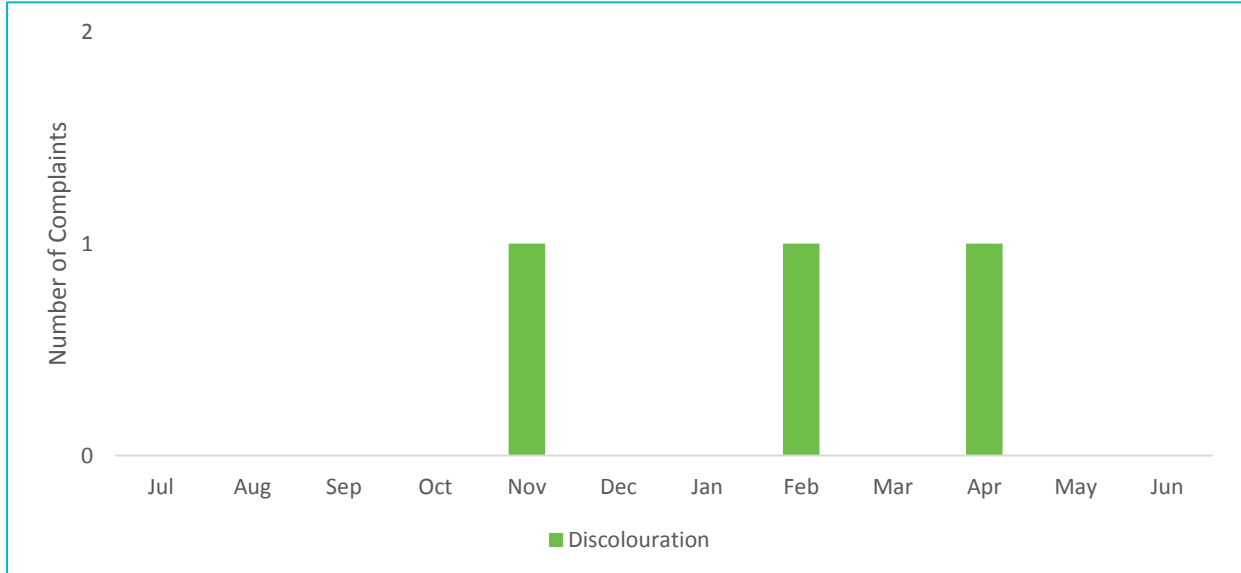


Figure 38.5-b Water quality customer complaints by month and type

39. Mole Creek drinking water system

39.1. System summary (2017-18)

Mole Creek drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	256
Population serviced	486
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	99.0%	<input checked="" type="checkbox"/>	98.0%	104	1
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	12	0
DBPs	100.0%	<input checked="" type="checkbox"/>	100.0%	12	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	1	<i>E. coli</i> exceedance
Public health warnings issued	2	PHA removed 7/7/2018, subject to PHA from 28/12/2017 - 1/1/2018
Notifications made to DoH	1	<i>E. coli</i> exceedance
Customer complaints	4	Discolouration, PHA Notices

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
No projected capital investment				

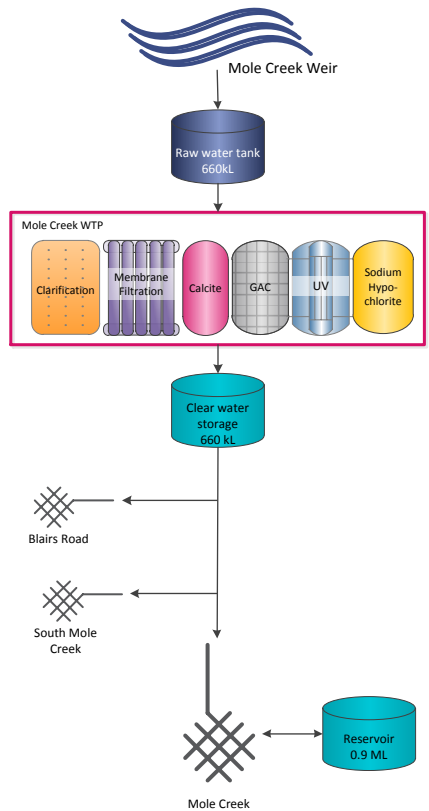


Figure 39.1-a Mole Creek system schematic

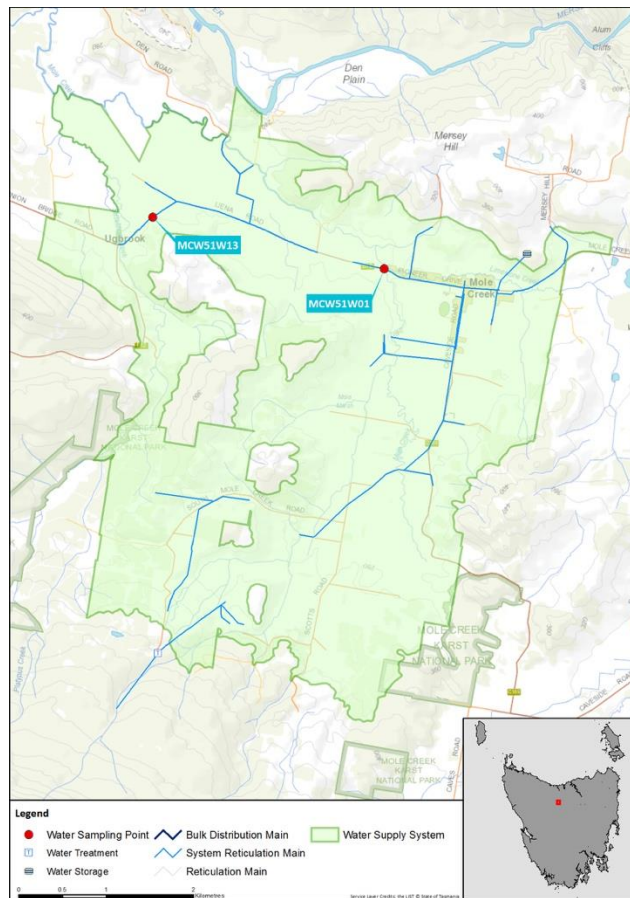


Figure 39.1-b Map of Mole Creek monitoring system
39.2. Summary of annual reticulation compliance (2017–18)

Table 39.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Mole Creek/Pioneer Drive (650094)	MCW51W01	W	Q	M	Q	n/a
Mole Creek/291 Liena Road	MCW51W13	W	Q	n/a	Q	n/a
Number Planned Samples		104	12	12	8	n/a
Number Samples Tested		104	12	12	8	n/a

39.3. Summary of current and historic performance (2013-18)

Table 39.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	10.0%	7.0%	17.4%	50.0%	99.0%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	n/a	n/a	n/a	n/a	100.0%

■ Compliant ■ Non-compliant

39.4. Analysis of current health performance (2017-18)

Table 39.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
<i>E.coli</i>	28/12/2017	Weekly compliance sample detected <i>E.coli</i> of 48.3 MPN/100mL at MCW51W01	✓

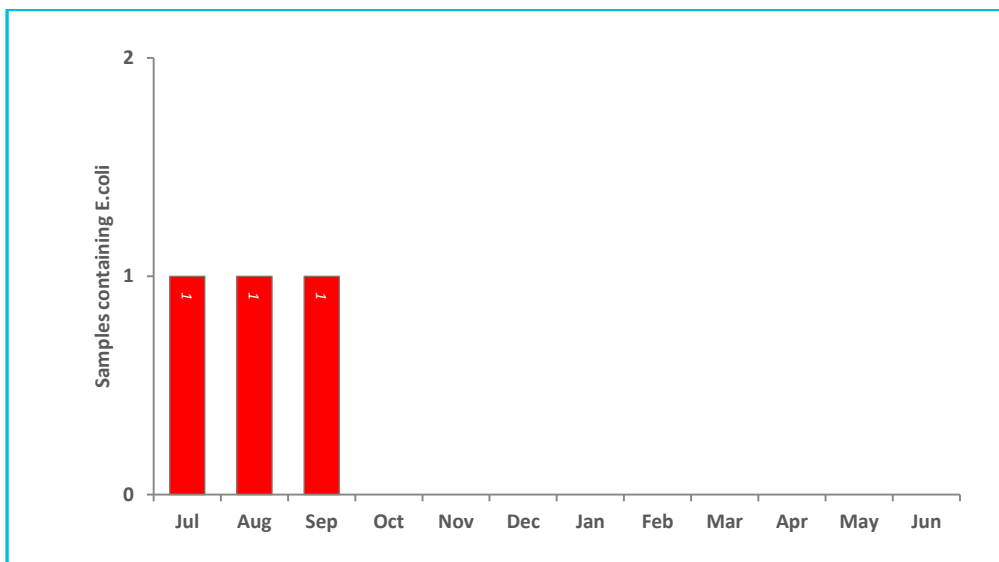


Figure 39.4-b Microbiological non-compliances by month

Table 39.4-b Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	<0.0003	<0.0003	<0.0003
Barium	2	mg/L	4	0	100	0.0035	0.0033	0.0037
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	0.0001	<0.0001	0.0002
Copper	2	mg/L	4	0	100	0.0012	0.0005	0.0024
Lead	0.01	mg/L	4	0	100	0.0001	<0.0001	0.0003
Manganese	0.5	mg/L	4	0	100	0.0017	0.0003	0.0057
Mercury	0.001	mg/L	4	0	100	0.00008	0.00003	0.00013
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	0.00013	<0.0001	<0.0001
Selenium	0.01	mg/L	4	0	100	0.00013	<0.0001	0.0009

Table 39.4-c Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	12	0	100	3.71	<0.5	12
Monochloroacetic acid	150	µg/L	12	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	12	0	100	3.17	<1	14
Total trihalomethanes	250	µg/L	12	0	100	12.12	<4	30

Table 39.4-d General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.71	0.24	1.15
Colour True	HU	15	0.71	<1	2
pH	Units	6.5 – 8.5	7.43	6.2	7.97
Turbidity	NTU	1	0.4	0.09	2.6

39.5. Analysis of overall system performance (2017-18)

Table 39.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DHHS notification required	DHHS notification complete
Pre 2009 – 7/7/2017	System subject to long-term PHA	✓	✓
28/12/2017	Weekly sample detected <i>E.coli</i> of 48.3 MPN/100mL at MCW51W01. An incident was declared and DoH was immediately notified. A BWA was implemented and customers were notified. Most likely cause was contamination during sampling.. BWA was lifted after two subsequent clear samples.	✓	✓
28/12/2017 – 1/1/2018	System subject to PHA	✓	✓

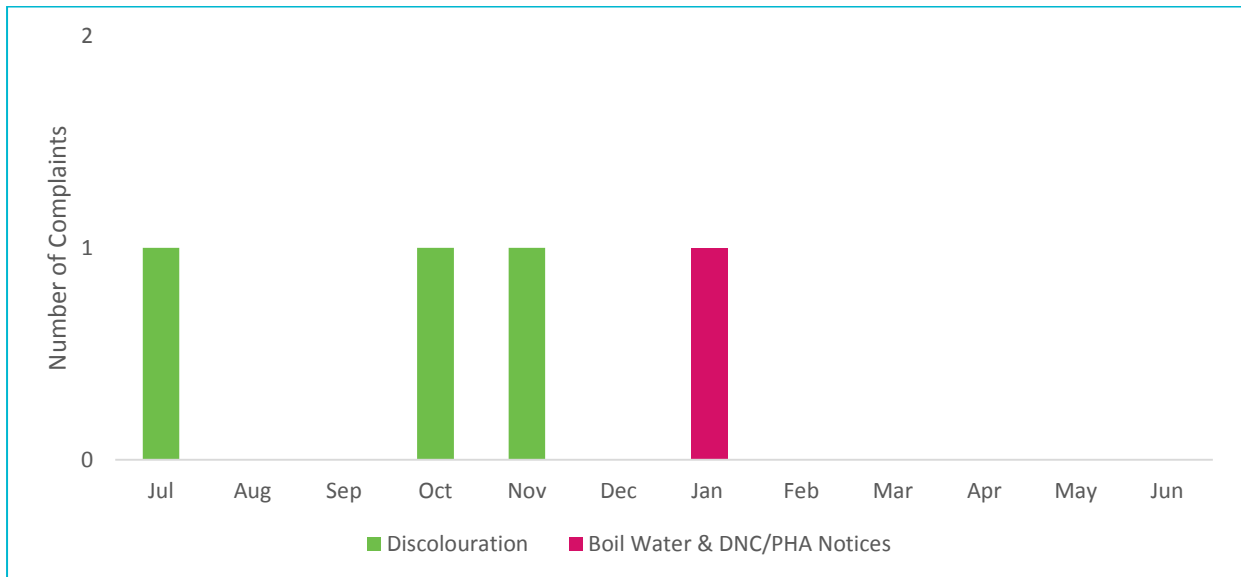







Figure 39.5-b Water quality customer complaints by month and type

40. Mountain River drinking water system

40.1. System summary (2017-18)

Mountain River drinking water system	
System status (as at 30 June 2018)	Service replaced
Total number of connections	n/a
Population serviced	n/a
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	25.0%		98.0%	4	3
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%		100.0%	1	0
DBPs	100.0%		100.0%	1	0

 Compliant  Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	3	<i>E.coli</i> exceedances
Public health warnings issued	1	System subject to long-term PHA
Notifications made to DoH	0	
Customer complaints	0	

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
Service replacement	Approval from Tasmanian Economic Regulator for Service Replacement Program	Complete	September 2017	n/a

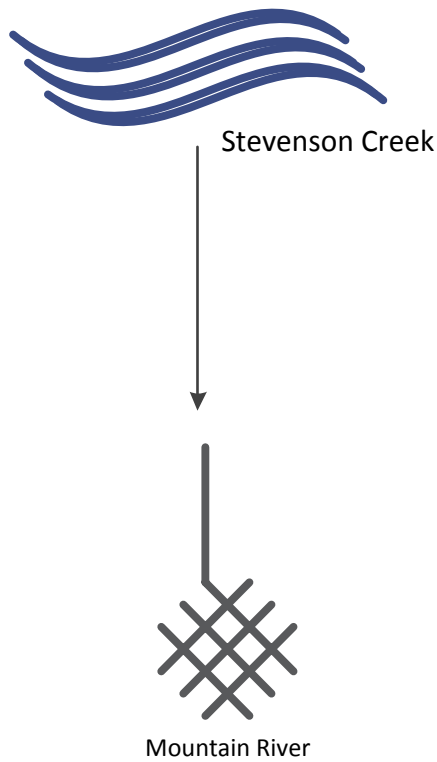


Figure 40.1-a Mountain River system schematic

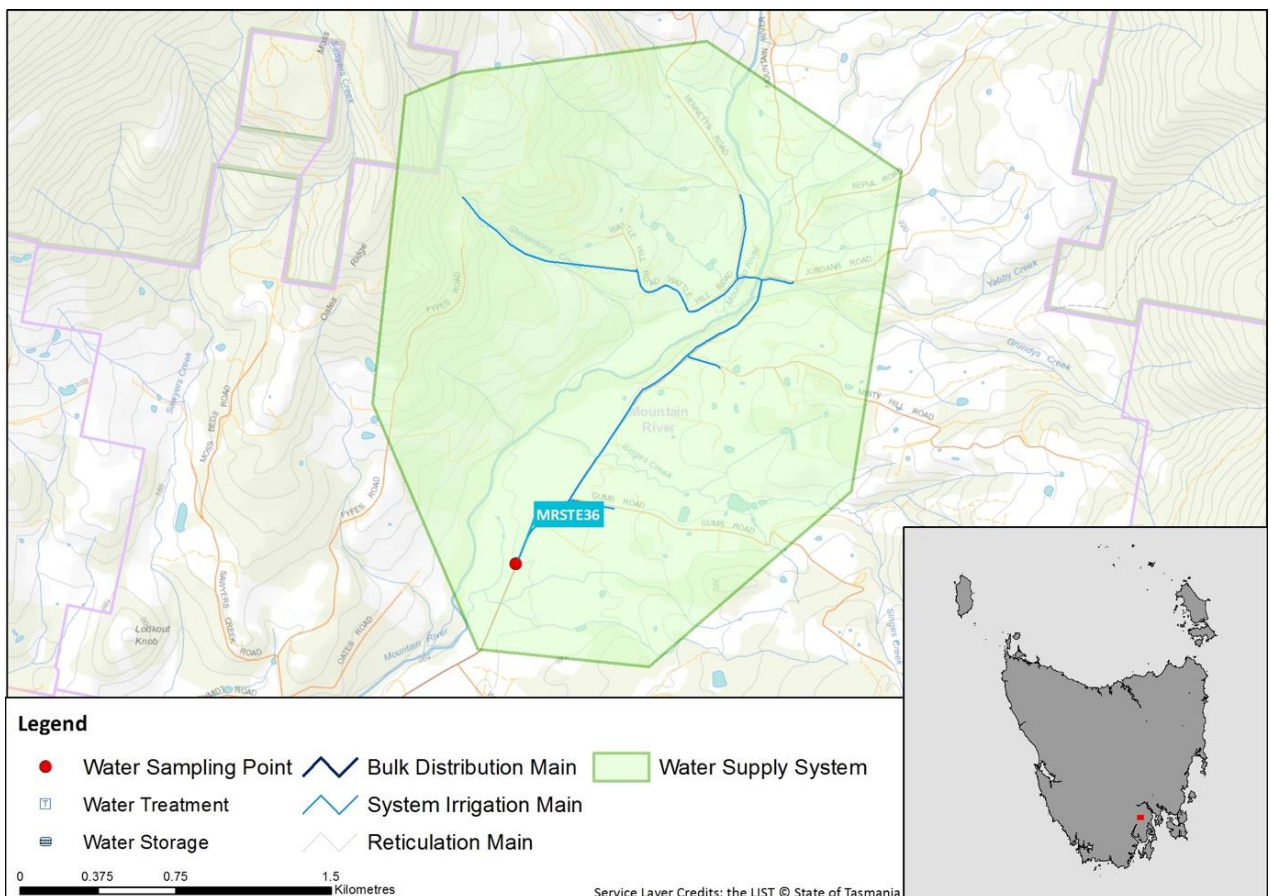


Figure 40.1-b Map of Mountain River monitoring system

40.2. Summary of annual reticulation compliance (2017–18)

Table 40.2-a Sampling program³⁴

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Mountain River/431 Mountain River Rd, Sample tap	MRSTE36	M	M	Q	Q	n/a
Number Planned Samples		4	1	1	1	n/a
Number Samples Tested		4	1	1	1	n/a

40.3. Summary of current and historic performance (2013-18)

Table 40.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	8.3%	41.0%	23.4%	41.7%	25.0%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	n/a	n/a	n/a	n/a	100.0%

■ Compliant ■ Non-compliant

³⁴ Sampling program active until October 2017

40.4. Analysis of current health performance (2017-18)

Table 40.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
<i>E.coli</i>	5/7/2017	<i>E.coli</i> of 1 MPN/100mL in monthly compliance sample	<input checked="" type="checkbox"/>
<i>E.coli</i>	9/8/2017	<i>E.coli</i> of 9.8 MPN/100mL in monthly compliance sample	<input checked="" type="checkbox"/>
<i>E.coli</i>	6/9/2017	<i>E.coli</i> of 6.9 MPN/100mL in monthly compliance sample	<input checked="" type="checkbox"/>

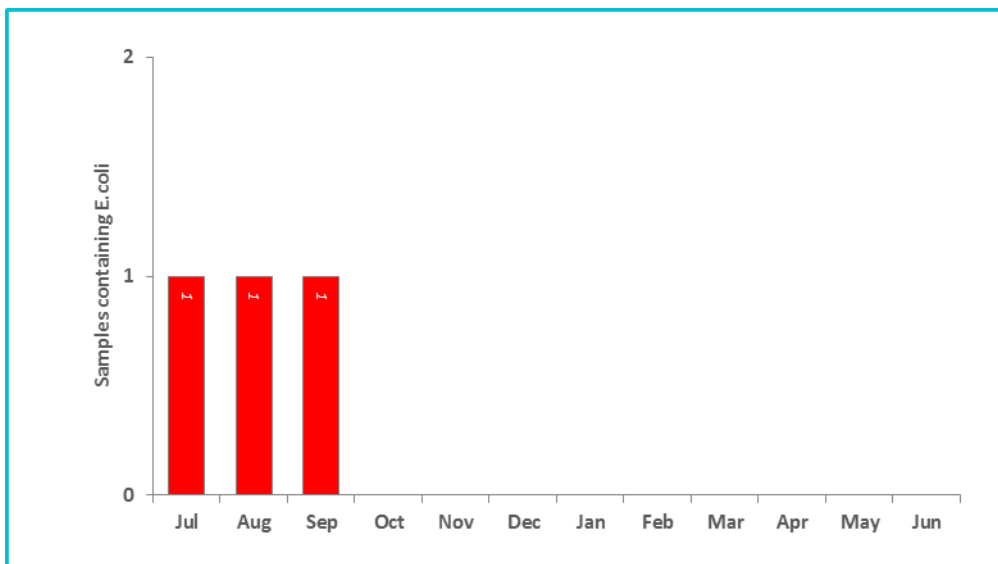


Figure 40.4-b Microbiological non-compliances by month

Table 40.4-b Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	1	0	100	0.0005	0.0005	0.0005
Arsenic	0.01	mg/L	1	0	100	<0.0003	<0.0003	<0.0003
Barium	2	mg/L	1	0	100	0.009	0.009	0.009
Cadmium	0.002	mg/L	1	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	1	0	100	0.0005	0.0005	0.0005
Copper	2	mg/L	1	0	100	0.0049	0.0049	0.0049
Lead	0.01	mg/L	1	0	100	0.0003	0.0003	0.0003
Manganese	0.5	mg/L	1	0	100	0.0038	0.0038	0.0038
Mercury	0.001	mg/L	1	0	100	0.00004	0.00004	0.00004
Molybdenum	0.05	mg/L	1	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	1	0	100	<0.0001	<0.0001	<0.0001
Selenium	0.01	mg/L	1	0	100	0.0001	0.0001	0.0001

Table 40.4-c Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	1	0	100	<1	<1	<1
Monochloroacetic acid	150	µg/L	1	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	1	0	100	<1	<1	<1
Total trihalomethanes	250	µg/L	1	0	100	4	4	4

Table 40.4-d General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	n/a	n/a	n/a
Colour True	HU	15	61	61	61
pH	Units	6.5 – 8.5	6.66	6.16	6.87
Turbidity	NTU	1	6.3	4.35	7.71

40.5. Analysis of overall system performance (2017-18)

Table 40.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DHHS notification required	DHHS notification complete
Pre 2013 – September 2017	System subject to long-term PHA	✓	✓
5/7/2017	Monthly compliance sample detected <i>E.coli</i>	✓	✓
9/8/2017	Monthly compliance sample detected <i>E.coli</i>	✓	✓
6/9/2017	Monthly compliance sample detected <i>E.coli</i>	✓	✓

41. North Esk drinking water system

41.1. System summary (2017-18)

North Esk drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	15,703
Population serviced	34,547
Fluoride	Fluorosilicic acid

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	<input checked="" type="checkbox"/>	98.0%	676	0
Fluoride	100.0%	<input checked="" type="checkbox"/>	100.0%	361	0
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0
DBPs	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0

■ Compliant
 ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	67	Discolouration, Taste & Odour, Cloudy Water

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend (\$'000)
Regional Towns Water Supply Program	Major improvements to WTP	Not started	TBA	TBA

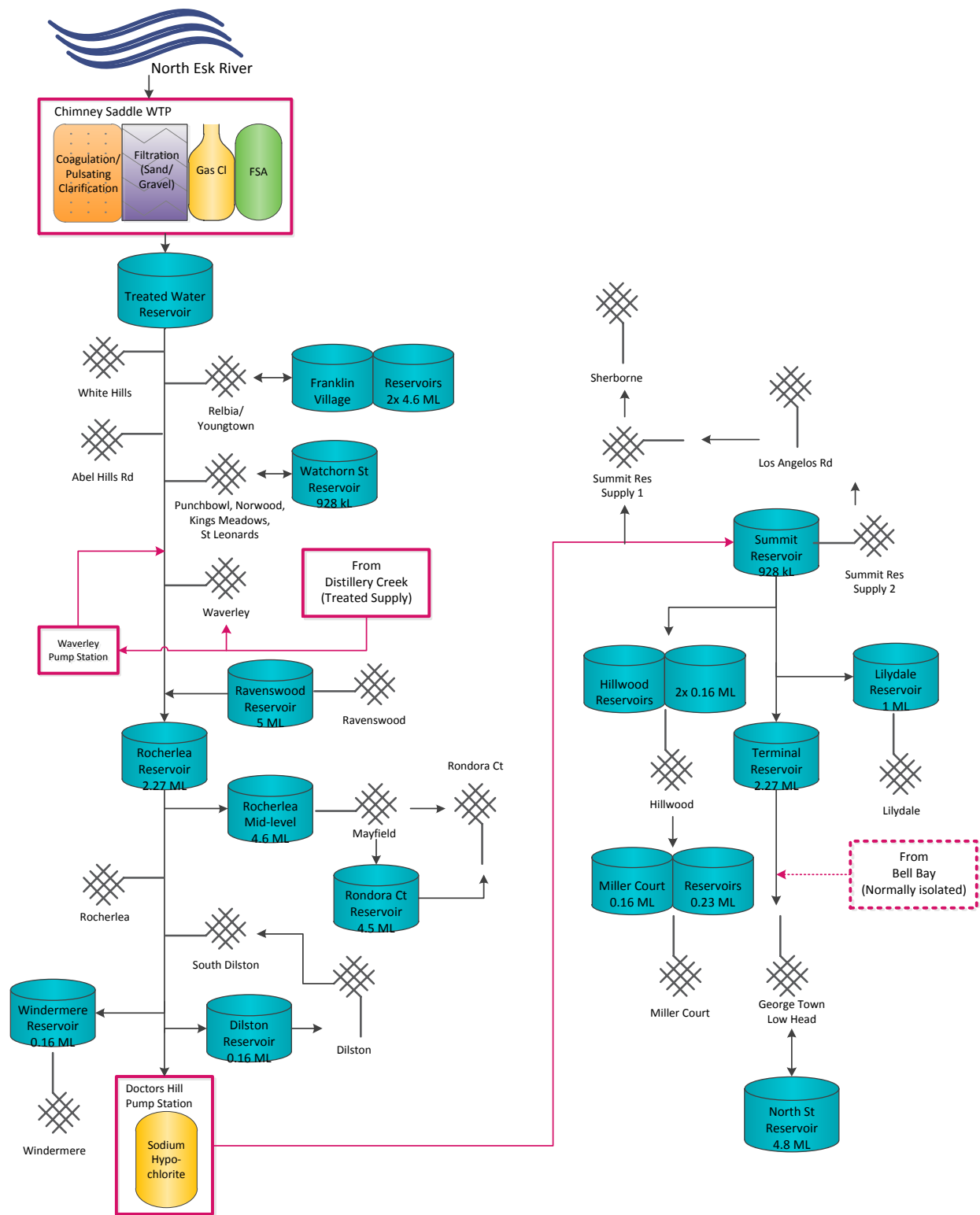


Figure 41.1-a North Esk system schematic

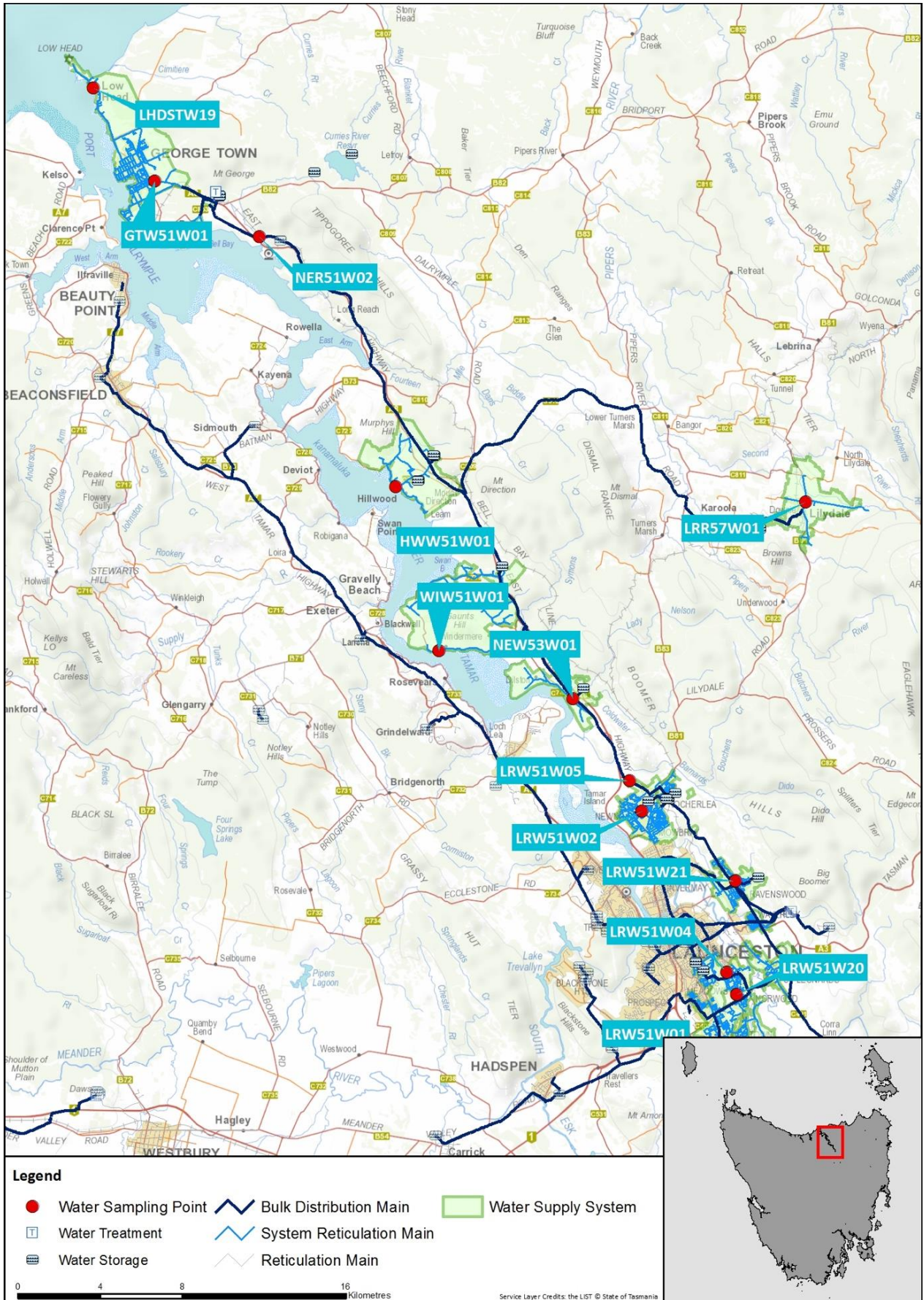


Figure 41.1-b Map of North Esk monitoring system

41.2. Summary of annual reticulation compliance (2017–18)

Table 41.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Youngtown, Poplar Parade	LRW51W01	W	n/a	n/a	n/a	n/a
Norwood, Charlton Park	LRW51W20	W	n/a	n/a	n/a	n/a
Norwood, Leith St	LRW51W04	W	n/a	n/a	n/a	n/a
Ravenswood, Primary School	LRW51W21	W	n/a	n/a	n/a	n/a
Newnham, Franmaree St	LRW51W02	W	n/a	n/a	n/a	n/a
Rocherlea, TasWater Depot	LRW51W05	W	n/a	n/a	n/a	n/a
Dilston Hall	NEW53W01	W	n/a	n/a	n/a	n/a
Windermere, Church	WIW51W01	W	n/a	n/a	n/a	n/a
Hillwood, Jetty	HWW51W01	W	n/a	n/a	n/a	n/a
Lilydale, 1972 Lilydale Rd (Public Toilets)	LRR57W01	W	n/a	n/a	n/a	n/a
George Town, Information Centre	GTW51W01	W	Q	Q	Q	n/a
Low Head Park Toilet	LHDSTW19	W	n/a	n/a	n/a	n/a
Bell Bay Interconnector	NER51W02	W	n/a	n/a	n/a	n/a
Number Planned Samples		676	4	4	4	12
Number Samples Tested		676	4	4	4	12

41.3. Summary of current and historic performance (2013-18)

Table 41.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	99.0%	99.0%	99.0%	100.0%	100.0%
Fluoride	100.0%	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

41.4. Analysis of current health performance (2017-18)

Table 41.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 41.4-b Fluoride operational performance

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	99.7%
Mean dose (mg/L)	0.98
■ Compliant ■ Non-compliant	

Table 41.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	0.00025	<0.0003	0.0004
Barium	2	mg/L	4	0	100	0.009	0.007	0.011
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	0.00008	<0.0001	0.0001
Copper	2	mg/L	4	0	100	0.0042	0.0026	0.0067
Lead	0.01	mg/L	4	0	100	0.00013	<0.0001	0.0003
Manganese	0.5	mg/L	4	0	100	0.0024	0.0006	0.0064
Mercury	0.001	mg/L	4	0	100	0.000029	<0.00003	0.00007
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Selenium	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001

Table 41.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	4	0	100	5.5	4	7
Monochloroacetic acid	150	µg/L	4	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	4	0	100	12.5	10	16
Total trihalomethanes	250	µg/L	4	0	100	30.25	26	38

Table 41.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.53	0.08	1.15
Colour True	HU	15	0.63	<1	1
pH	Units	6.5 – 8.5	7.21	6.63	8
Turbidity	NTU	1	0.22	0.02	1.1

41.5. Analysis of overall system performance (2017-18)

Table 41.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

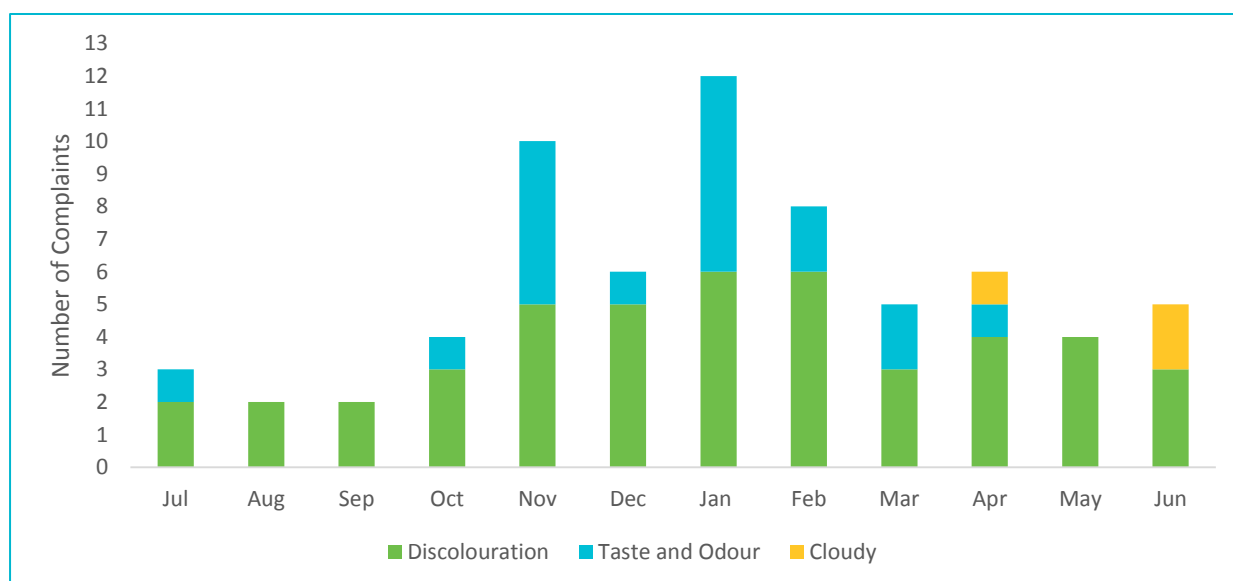


Figure 41.5-b Water quality customer complaints by month and type

42. Oatlands drinking water system

42.1. System summary (2017-18)

Oatlands drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	495
Population serviced	941
Fluoride	Sodium fluoride

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	☑	98.0%	52	0
Fluoride	100.0%	☑	100.0%	358	0
Metals	100.0%	☑	100.0%	4	0
DBPs	100.0%	☑	100.0%	4	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	0	

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
No projected capital investment				

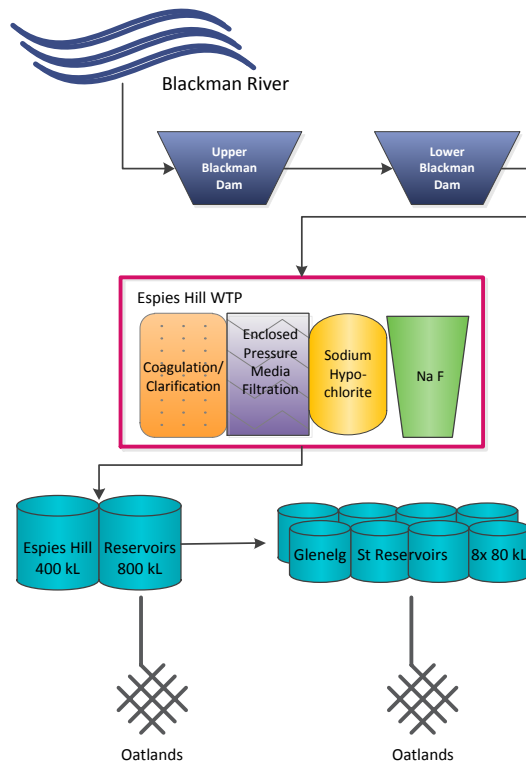


Figure 42.1-a Oatlands system schematic

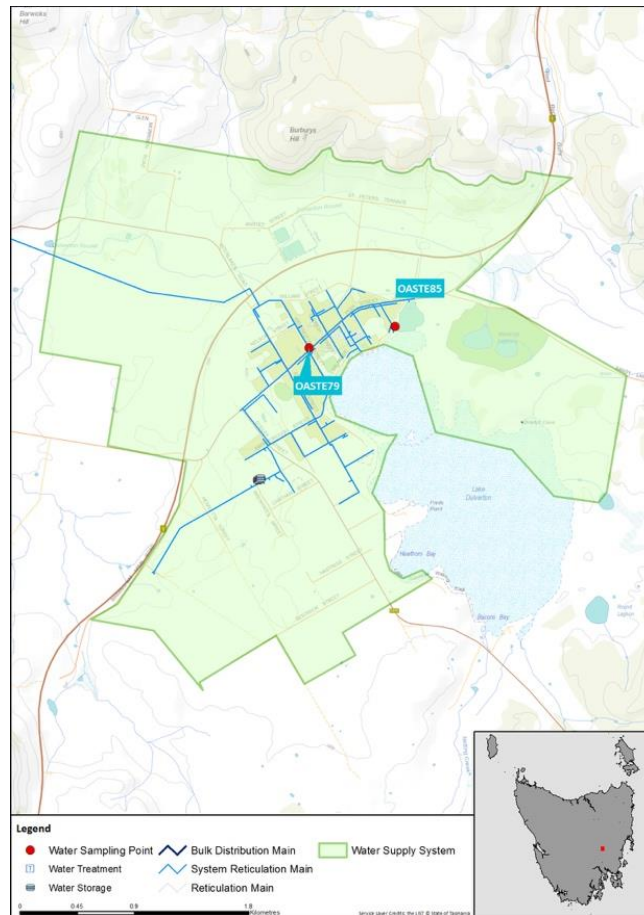


Figure 42.1-b Map of Oatlands monitoring system

42.2. Summary of annual reticulation compliance (2017–18)

Table 42.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Oatlands/Wellington St, Sample Post	OASTE79	W	Q	Q	Q	n/a
Oatlands/Lake SPS	OASTE85	n/a	n/a	n/a	n/a	n/a
Number Planned Samples		52	4	4	4	n/a
Number Samples Tested		52	4	4	4	n/a

42.3. Summary of current and historic performance (2013-18)

Table 42.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100.0%	100.0%	100.0%	100.0%	100.0%
Fluoride	100.0%	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

42.4. Analysis of current health performance (2017-18)

Table 42.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 42.4-b Fluoride operational performance

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	100%
Mean dose (mg/L)	1.04
■ Compliant ■ Non-compliant	

Table 42.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	<0.0003	<0.0003	<0.0003
Barium	2	mg/L	4	0	100	0.006	0.003	0.01
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	0.00014	<0.0001	0.0004
Copper	2	mg/L	4	0	100	0.00232	0.0015	0.0035
Lead	0.01	mg/L	4	0	100	0.00018	0.0001	0.0003
Manganese	0.5	mg/L	4	0	100	0.0165	0.0001	0.0643
Mercury	0.001	mg/L	4	0	100	0.000043	<0.00003	0.00009
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	0.00019	<0.0001	0.0004
Selenium	0.01	mg/L	4	0	100	0.00009	<0.0001	0.0002

Table 42.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	4	0	100	8.5	5	11
Monochloroacetic acid	150	µg/L	4	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	4	0	100	23.25	4	55
Total trihalomethanes	250	µg/L	4	0	100	54.75	18	111

Table 42.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.48	0.04	0.79
Colour True	HU	15	0.63	<1	1
pH	Units	6.5 – 8.5	7.32	6.87	7.61
Turbidity	NTU	1	0.24	0.11	0.83

42.5. Analysis of overall system performance (2017-18)

Table 42.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

43. Orford drinking water system

43.1. System summary (2017-18)

Orford drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	1028
Population serviced	720
Fluoride	Sodium fluoride

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	<input checked="" type="checkbox"/>	98.0%	52	0
Fluoride	100.0%	<input checked="" type="checkbox"/>	100.0%	338	0
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0
DBPs	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0

■ Compliant
 ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	5	Discolouration, Taste & Odour, Cloudy Water

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
Orford WTP	Orford WTP upgrade	Complete	May 2018	\$539,300
Orford Fluoride Project	Upgrade to fluoride dosing	In progress	May 2019	\$190,000

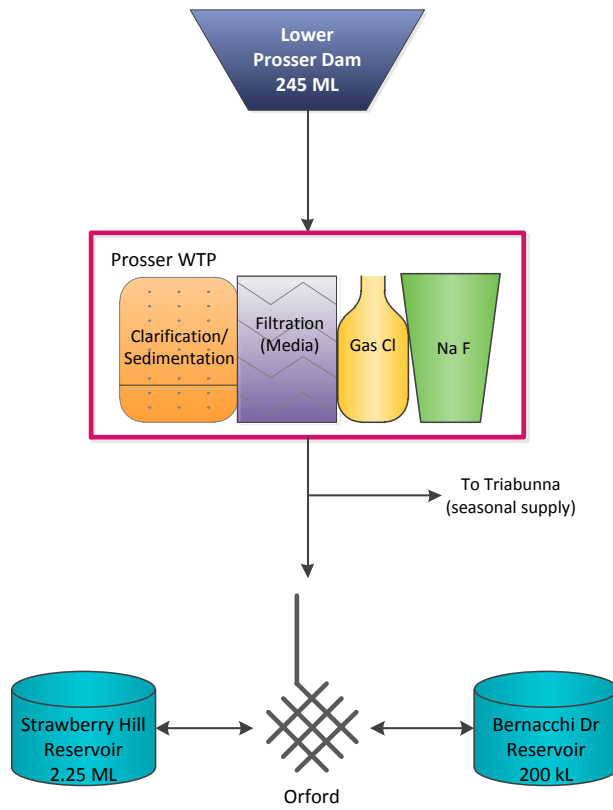


Figure 43.1-a Orford system schematic

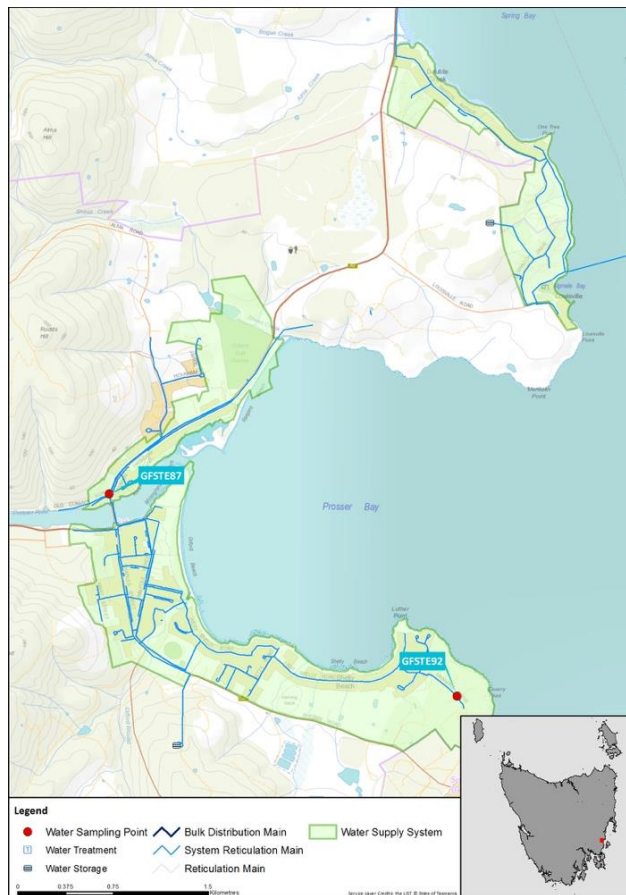


Figure 43.1-b Map of Orford monitoring system

43.2. Summary of annual reticulation compliance (2017–18)

Table 43.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Orford/Manning Drive	GFSTE92	n/a	n/a	n/a	n/a	n/a
Orford/Old Convict Rd Sample Tap	GFSTE87	W	Q	Q	Q	n/a
Number Planned Samples		52	4	4	4	n/a
Number Samples Tested		52	4	4	4	n/a

43.3. Summary of current and historic performance (2013-18)

Table 43.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100.0%	100.0%	100.0%	100.0%	100.0%
Fluoride	100.0%	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

43.4. Analysis of current health performance (2017-18)

Table 43.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 43.4-b Fluoride operational performance

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	92.9%
Mean dose (mg/L)	0.93
■ Compliant ■ Non-compliant	

Table 43.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	0.00019	<0.0003	0.0003
Barium	2	mg/L	4	0	100	0.021	0.017	0.033
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Copper	2	mg/L	4	0	100	0.00898	0.0055	0.0122
Lead	0.01	mg/L	4	0	100	0.0011	0.0006	0.0019
Manganese	0.5	mg/L	4	0	100	0.0026	0.0002	0.0085
Mercury	0.001	mg/L	4	0	100	0.000063	<0.00003	0.00018
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	0.00055	0.0001	0.001
Selenium	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001

Table 43.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	4	0	100	7.63	<1	19
Monochloroacetic acid	150	µg/L	4	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	4	0	100	11.25	2	25
Total trihalomethanes	250	µg/L	4	0	100	107	69	140

Table 43.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.55	0.01	1.77
Colour True	HU	15	1.75	<1	4
pH	Units	6.5 – 8.5	7.11	6.8	7.47
Turbidity	NTU	1	0.21	0.08	0.58

43.5. Analysis of overall system performance (2017-18)

Table 43.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

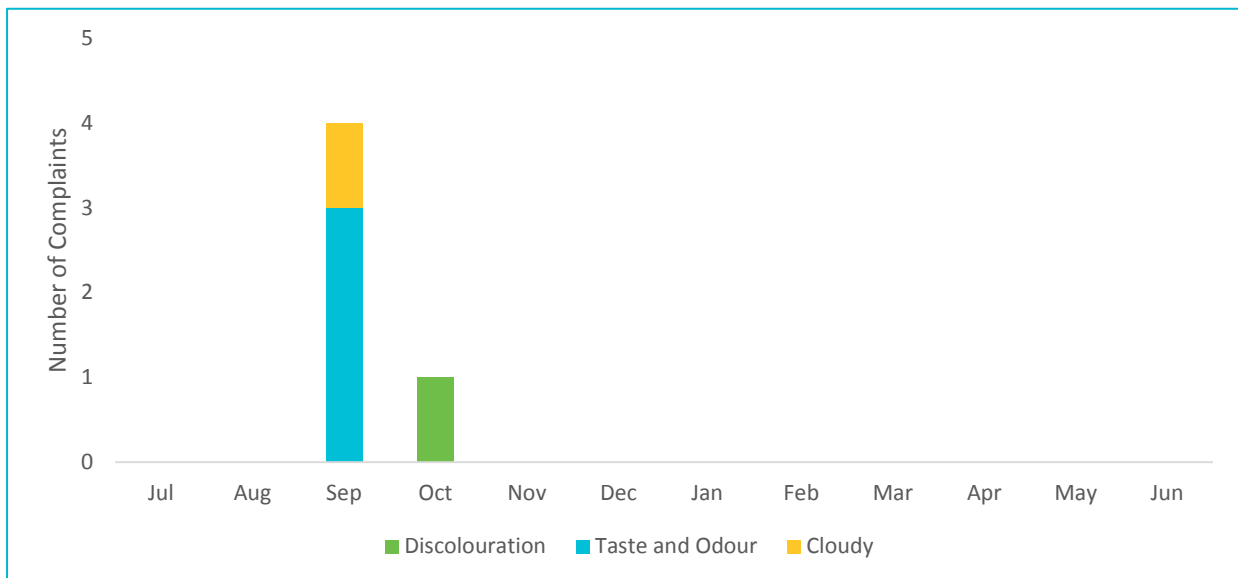


Figure 43.5-b Water quality customer complaints by month and type

44. Ouse and Hamilton drinking water system

44.1. System summary (2017-18)

Ouse and Hamilton drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	242
Population serviced	387
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	<input checked="" type="checkbox"/>	98.0%	104	0
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	8	0
DBPs	100.0%	<input checked="" type="checkbox"/>	100.0%	8	0

Compliant Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	0	

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
No projected capital investment				

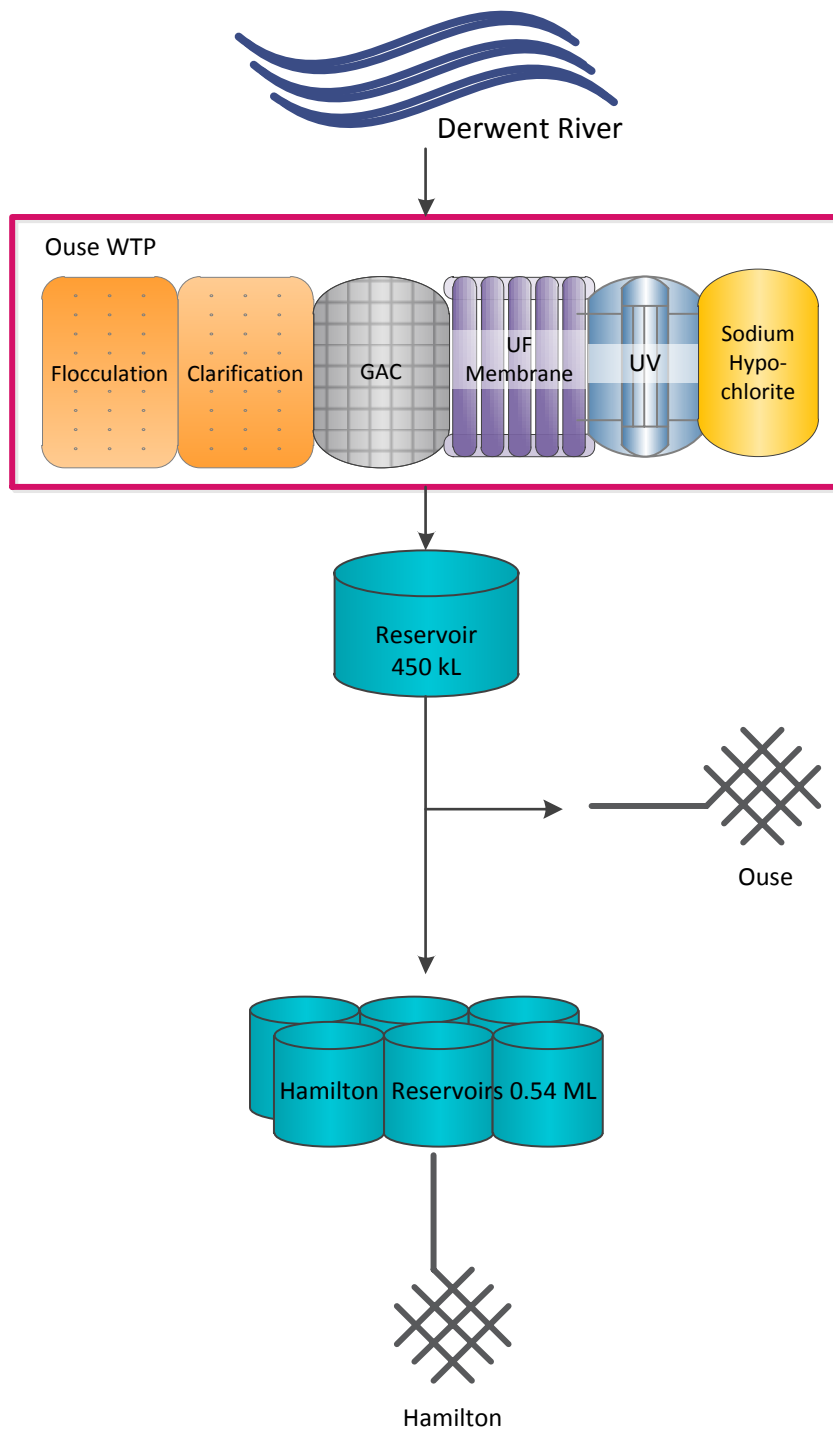


Figure 44.1-a Ouse and Hamilton system schematic

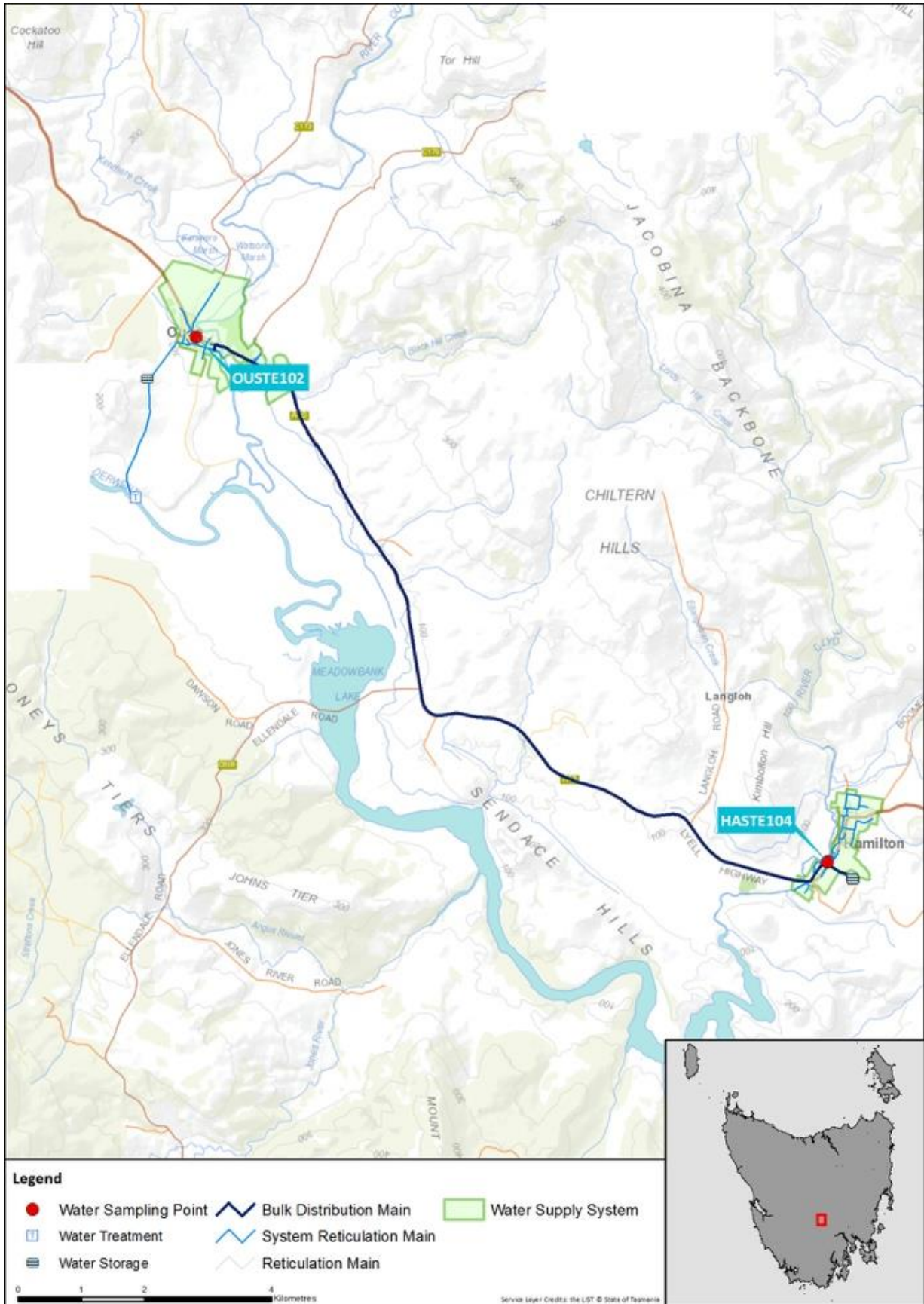


Figure 44.1-b Map of Ouse and Hamilton monitoring system

44.2. Summary of annual reticulation compliance (2017–18)

Table 44.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Ouse/Public Toilets, Sample Tap	OUSTE102	W	Q	Q	Q	n/a
Hamilton/Park, Sample Tap	HASTE104	W	Q	Q	Q	n/a
Number Planned Samples		104	8	8	8	n/a
Number Samples Tested		104	8	8	8	n/a

44.3. Summary of current and historic performance (2013-18)

Table 44.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100.0%	100.0%	100.0%	100.0%	100.0%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

44.4. Analysis of current health performance (2017-18)

Table 44.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 44.4-b Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	8	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	8	0	100	<0.0003	<0.0003	<0.0003
Barium	2	mg/L	8	0	100	0.002	0.001	0.002
Cadmium	0.002	mg/L	8	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	8	0	100	<0.0001	<0.0001	<0.0001
Copper	2	mg/L	8	0	100	0.00505	0.004	0.0062
Lead	0.01	mg/L	8	0	100	0.0002	0.0002	0.0002
Manganese	0.5	mg/L	8	0	100	0.0008	0.0004	0.0013
Mercury	0.001	mg/L	8	0	100	0.000021	<0.00003	0.00004
Molybdenum	0.05	mg/L	8	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	8	0	100	<0.0001	<0.0001	<0.0001
Selenium	0.01	mg/L	8	0	100	<0.0001	<0.0001	<0.0001

Table 44.4-c Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	8	0	100	7	4	10
Monochloroacetic acid	150	µg/L	8	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	8	0	100	10.5	3	19
Total trihalomethanes	250	µg/L	8	0	100	25.75	9	44

Table 44.4-d General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.38	0.05	0.97
Colour True	HU	15	1.13	<1	4
pH	Units	6.5 – 8.5	6.86	6.32	8.65
Turbidity	NTU	1	0.17	0.04	1

44.5. Analysis of overall system performance (2017-18)

Table 44.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

45. Pet River drinking water system

45.1. System summary (2017-18)

Pet River drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	8695
Population serviced	18260
Fluoride	Fluorosilicic acid

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	☑	98.0%	260	0
Fluoride	100.0%	☑	100.0%	141	0
Metals	100.0%	☑	100.0%	8	0
DBPs	100.0%	☑	100.0%	8	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	262	Discolouration, Taste & Odour, Cloudy Water, Other (illness, stained washing, outage)

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
No projected capital investment				

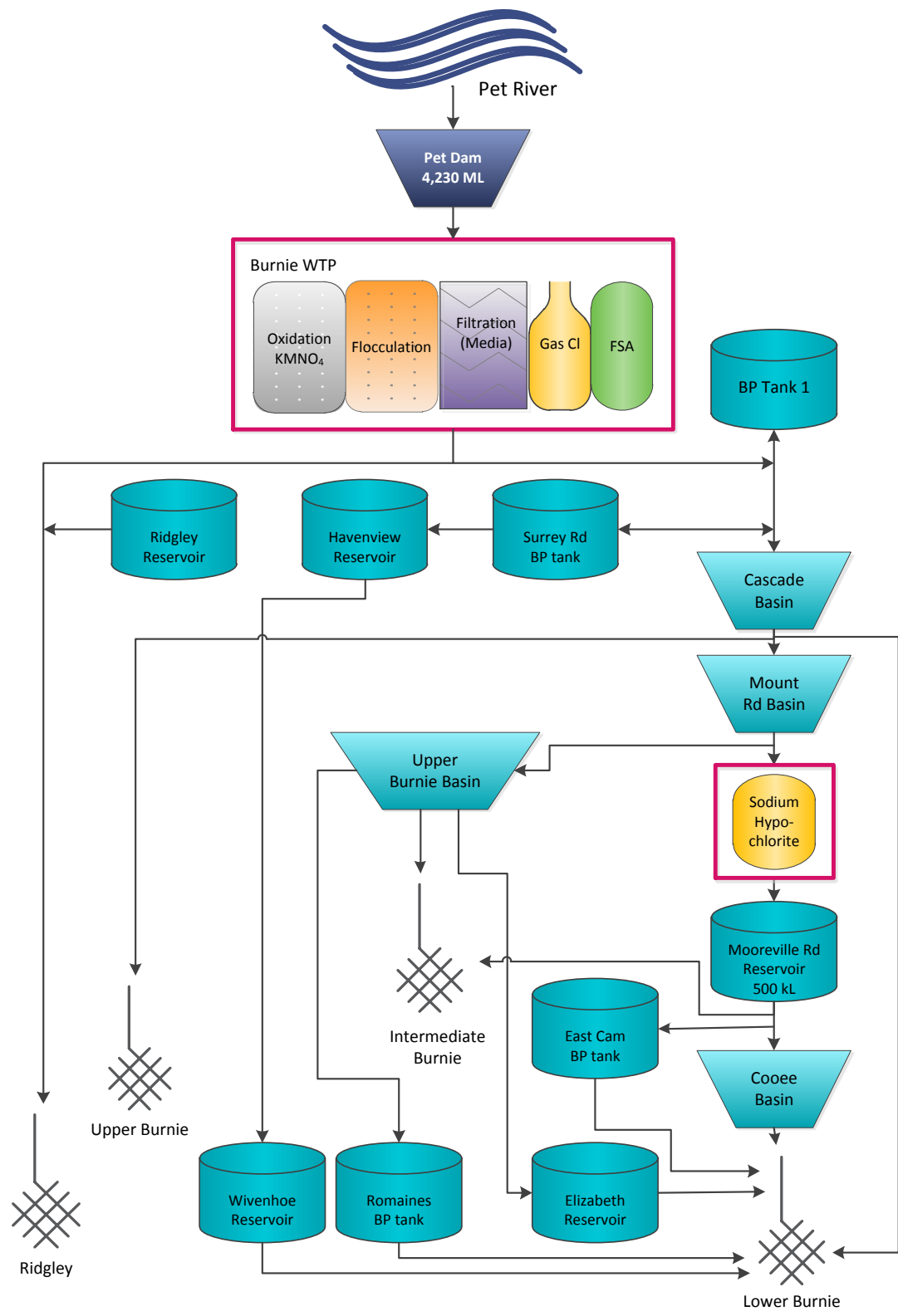


Figure 45.1-a Pet River system schematic

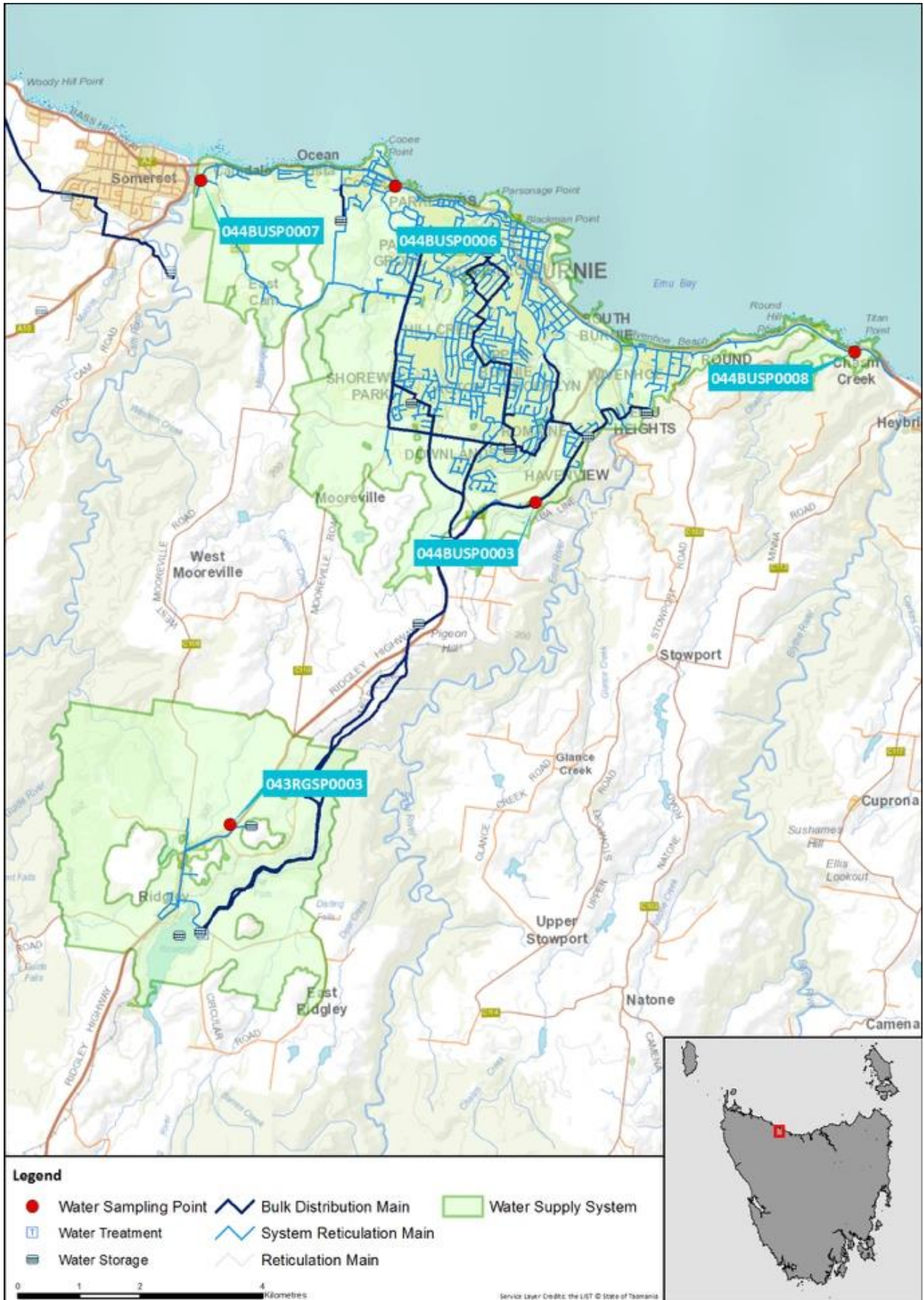


Figure 45.1-b Map of Pet River monitoring system

45.2. Summary of annual reticulation compliance (2017–18)

Table 45.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Burnie/Ridgley Mount Road	043RGSP0003	W	n/a	n/a	n/a	n/a
Burnie/Lactos Sample Point	044BUSP0003	W	n/a	n/a	n/a	n/a
Burnie/Cadburys Sample Point	044BUSP0006	W	n/a	n/a	n/a	n/a
Burnie/Scarfe St Sample Point	044BUSP0007	W	Q	Q	Q	n/a
Burnie/Chasm Cr Sample Point	044BUSP0008	W	Q	Q	Q	n/a
Number Planned Samples		260	8	8	8	n/a
Number Samples Tested		260	8	8	8	n/a

45.3. Summary of current and historic performance (2013-18)

Table 45.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100.0%	100.0%	99.8%	100.0%	100.0%
Fluoride	n/a	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	99.8%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

45.4. Analysis of current health performance (2017-18)

Table 45.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 45.4-b Fluoride operational performance

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	96.5%
Mean dose (mg/L)	0.96
■ Compliant ■ Non-compliant	

Table 45.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	8	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	8	0	100	0.00085	<0.0003	0.0031
Barium	2	mg/L	8	0	100	0.005	0.005	0.006
Cadmium	0.002	mg/L	8	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	8	0	100	0.00016	<0.0001	0.0003
Copper	2	mg/L	8	0	100	0.02269	0.00005	0.0799
Lead	0.01	mg/L	8	0	100	0.00021	<0.0001	0.0006
Manganese	0.5	mg/L	8	0	100	0.0076	0.0024	0.015
Mercury	0.001	mg/L	8	0	100	0.000036	<0.00003	0.00014
Molybdenum	0.05	mg/L	8	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	8	0	100	0.00008	<0.0001	0.0002
Selenium	0.01	mg/L	8	0	100	0.00012	<0.0001	0.0004

Table 45.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	8	0	100	3.38	<1	8
Monochloroacetic acid	150	µg/L	8	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	8	0	100	4.63	4	6
Total trihalomethanes	250	µg/L	8	0	100	57.75	44	86

Table 45.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.3	0.01	1.03
Colour True	HU	15	0.63	<1	1
pH	Units	6.5 – 8.5	8.03	6.64	9.77
Turbidity	NTU	1	0.47	0.14	4.32

45.5. Analysis of overall system performance (2017-18)

Table 45.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

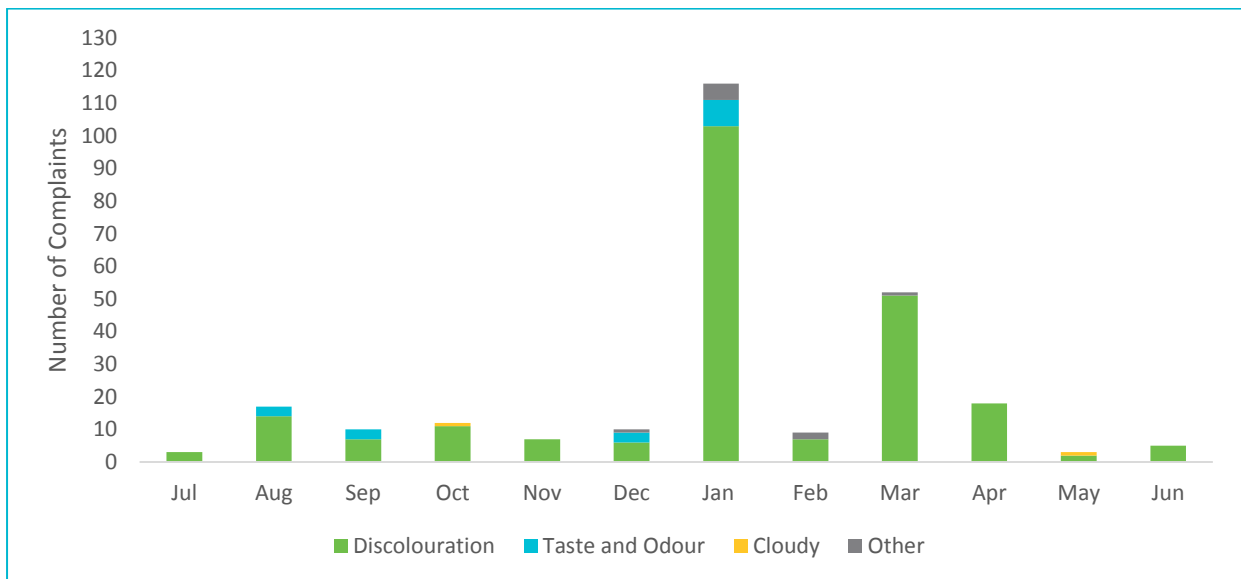


Figure 45.5-b Water quality customer complaints by month and type

46. Pioneer drinking water system

46.1. System summary (2017-18)

Pioneer drinking water system	
System status (as at 30 June 2018)	Service replacement
Total number of connections	n/a
Population serviced	n/a
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	50.0%	88	98.0%	4	2
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	n/a	n/a	n/a	n/a	n/a
DBPs	n/a	n/a	n/a	n/a	n/a

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	2	<i>E. coli</i> exceedance
Public health warnings issued	1	System subject to long-term PHA
Notifications made to DoH	2	<i>E. coli</i> exceedance
Customer complaints	1	PHA Notice

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend (\$'000)
Service Replacement Program	Tasmanian Economic Regulator approved a Service Replacement Program	Complete	September 2017	n/a

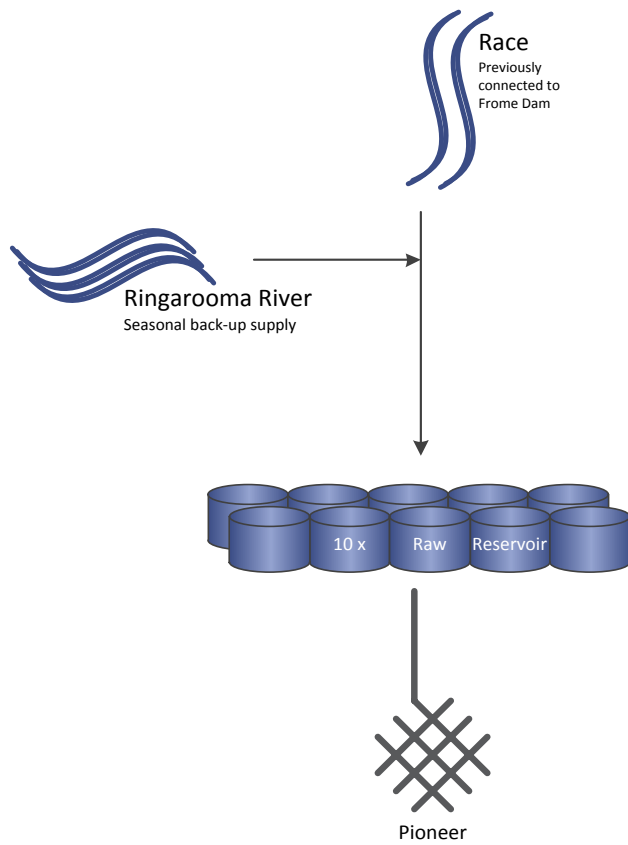


Figure 46.1-a Pioneer system schematic

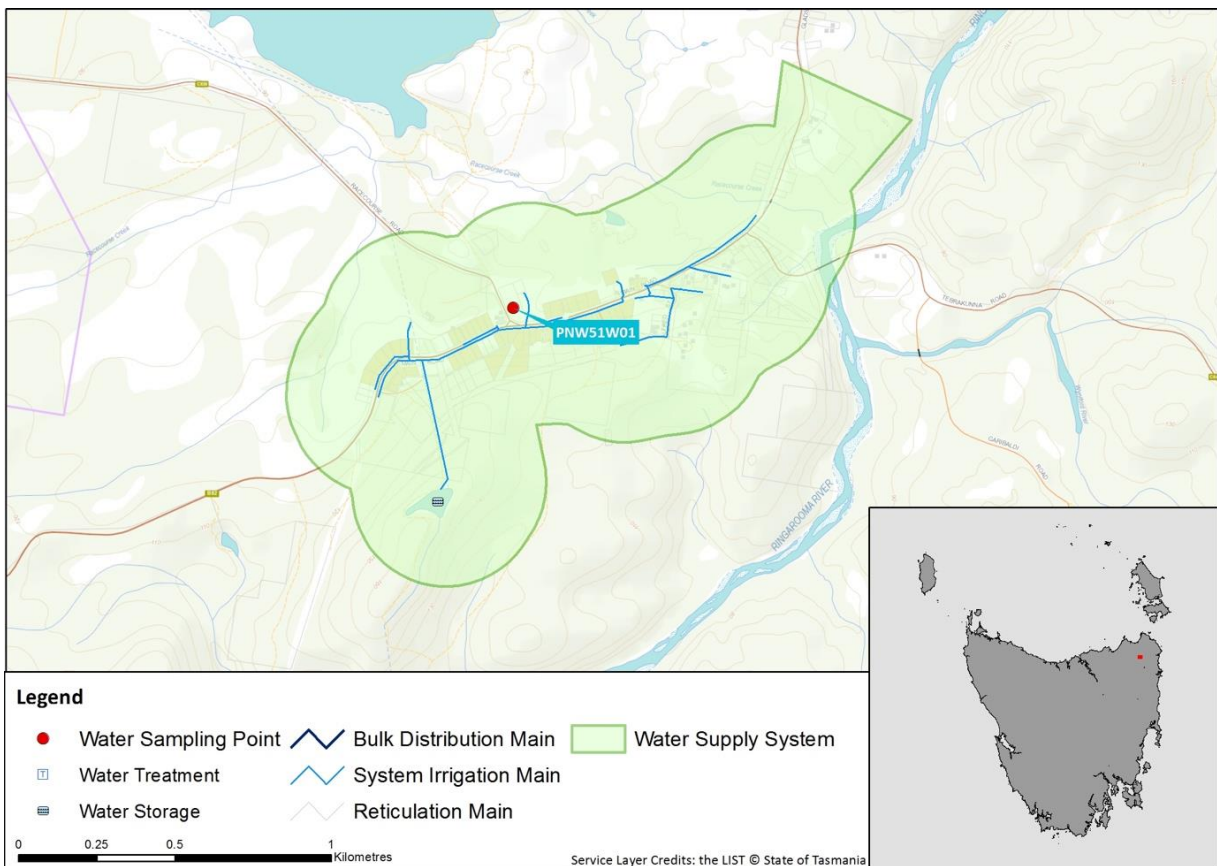


Figure 46.1-b Map of Pioneer monitoring system

46.2. Summary of current and historic performance (2013-18)

Table 46.2-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	85.0%	83.0%	33.3%	16.7%	50.0%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	n/a	n/a	n/a	n/a	n/a
Disinfection by products	n/a	n/a	n/a	n/a	n/a

■ Compliant ■ Non-compliant

46.3. Analysis of current health performance (2017-18)

Table 46.3-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
<i>E.coli</i>	11/7/2017	<i>E.coli</i> of 2 MPN/100mL in monthly compliance sample – resampling not required subject to PHA	<input checked="" type="checkbox"/>
<i>E.coli</i>	8/8/2017	<i>E.coli</i> of 3.1 MPN/100mL in monthly compliance sample - resampling not required subject to PHA	<input checked="" type="checkbox"/>

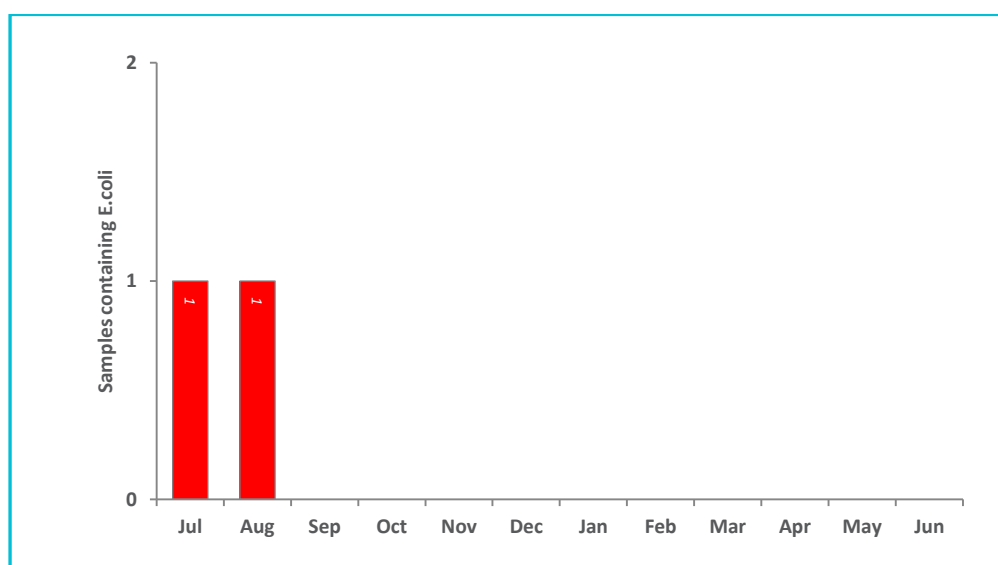


Figure 46.4-b Microbiological non-compliances by month

Table 46.3-c General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	n/a	n/a	n/a
Colour True	HU	15	n/a	n/a	n/a
pH	Units	6.5 – 8.5	6.45	6	7.4
Turbidity	NTU	1	3.6	0.87	7.74

46.4. Analysis of overall system performance (2017-18)

Table 46.4-a Summary of system issues/public health warnings with notification details

Summary of system issues			
Date	Description	DHHS notification required	DHHS notification complete
Pre 2013	System subject to long-term PHA	✓	✓
11/7/2017	Monthly compliance sample detected <i>E.coli</i> – system subject to PHA	✓	✓
8/8/2017	Monthly compliance sample detected <i>E.coli</i> – system subject to PHA	✓	✓
September 2017	System no longer under TasWater ownership (Service Replacement Program)	✓	✓

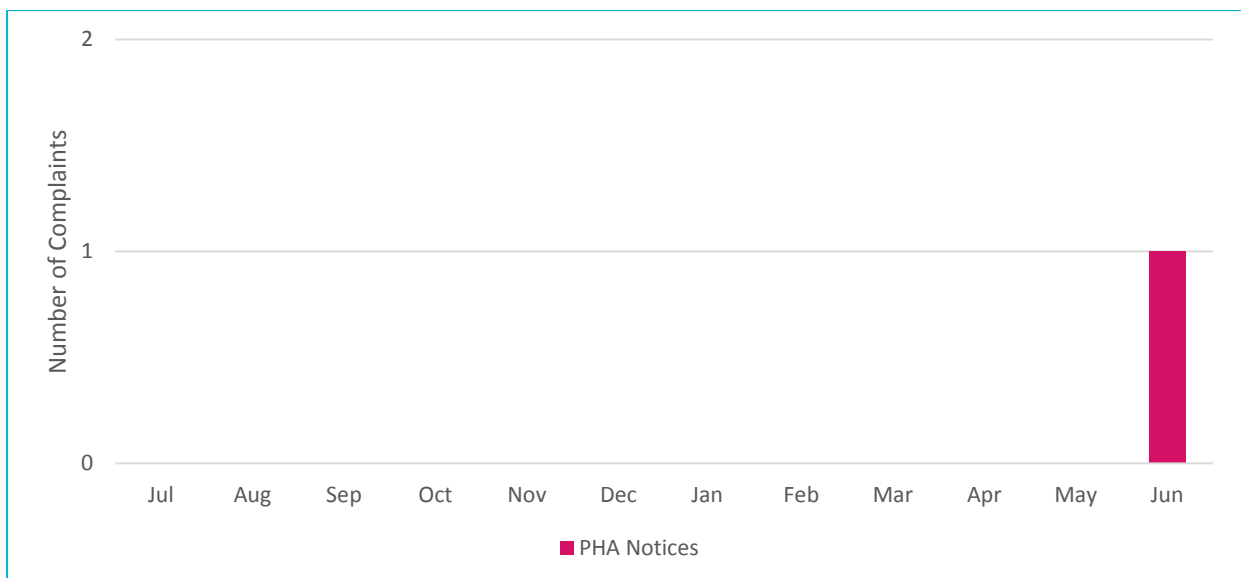


Figure 46.4-b Water quality customer complaints by month and type

47. Potable Tanks (multiple drinking water systems)

47.1. System summary (2017-18)

Potable Tanks (National Park & Rossarden) drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	n/a
Population serviced	n/a
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	99.4%	<input checked="" type="checkbox"/>	98.0%	170	1
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	n/a	n/a	n/a	n/a	n/a
DBPs	n/a	n/a	n/a	n/a	n/a

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	1	<i>E. coli</i> exceedance
Public health warnings issued	0	
Notifications made to DoH	1	<i>E. coli</i> exceedance
Customer complaints	0	n/a

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
No projected capital investment				

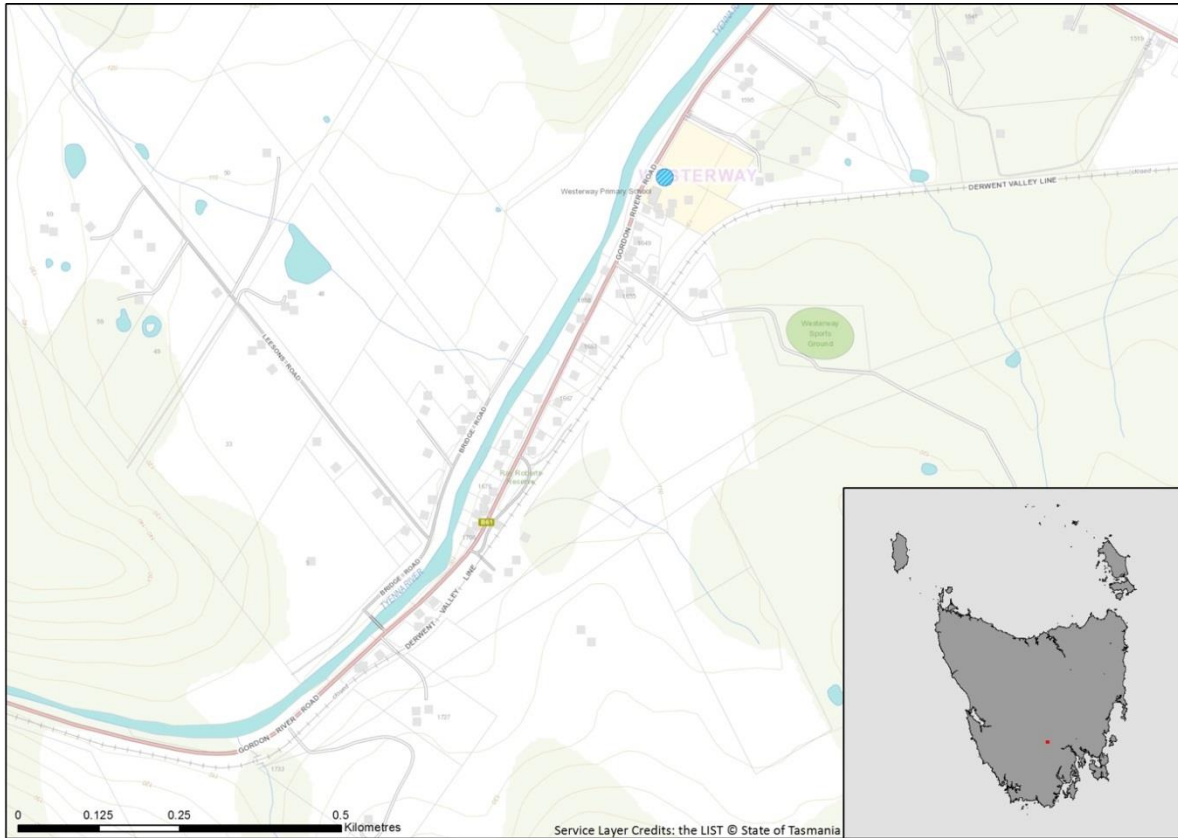


Figure 47.1-a Map of Potable Tanks at National Park

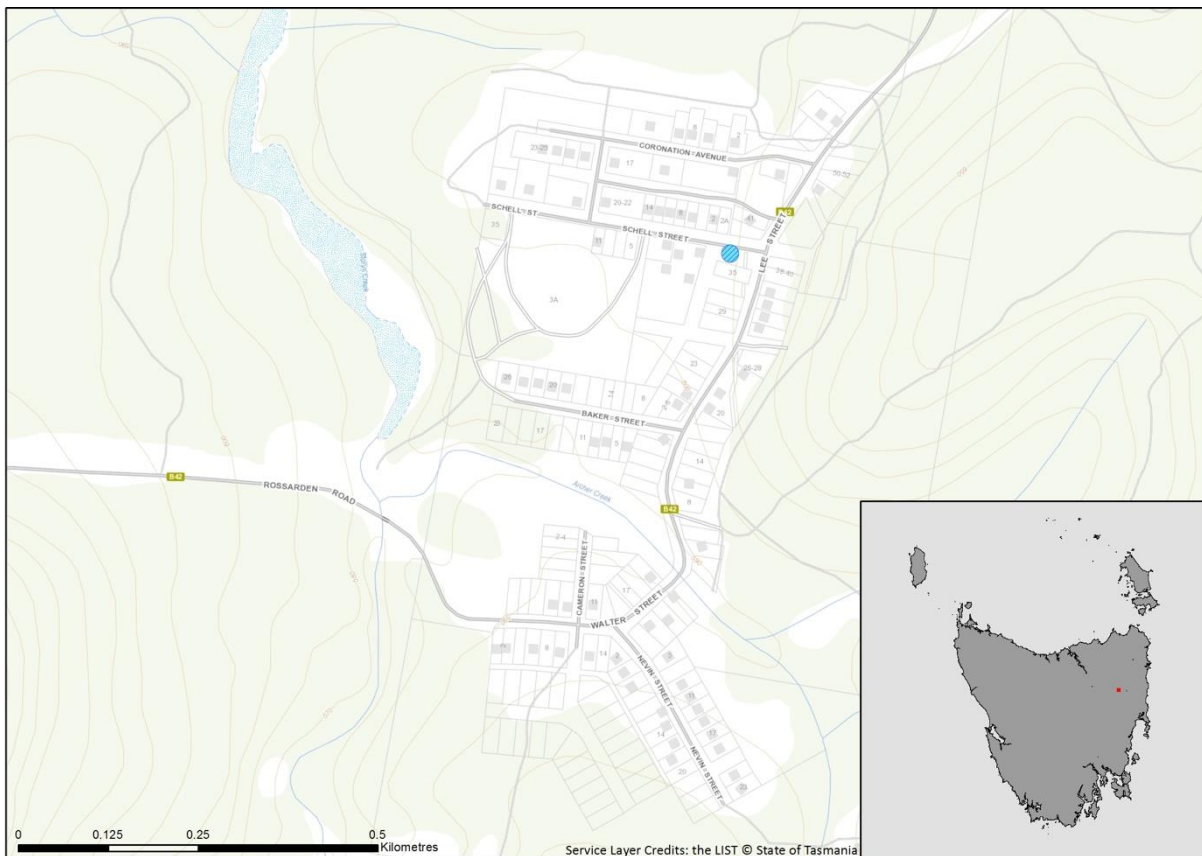


Figure 47.1-b Map of Potable Tanks at Rossarden

47.2. Summary of current and historic performance (2013-18)

Table 47.2-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	95.0%	100.0%	100.0%	100.0%	99.4%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	n/a	n/a	n/a	n/a	n/a
Disinfection by products	n/a	n/a	n/a	n/a	n/a

■ Compliant ■ Non-compliant

47.3. Analysis of current health performance (2017-18)

Table 47.3-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 47.3-b General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.5	0	2.25
Colour True	HU	15	n/a	n/a	n/a
pH	Units	6.5 – 8.5	7.32	6.66	7.9
Turbidity	NTU	1	0.47	0.04	8.54

47.4. Analysis of overall system performance (2017-18)

Table 47.4-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

48. Queenstown (Conglomerate Creek) drinking water system

Queenstown drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	1446
Population serviced	2314
Fluoride	Sodium fluoride

48.1. System summary (2017-18)

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	☑	98.0%	156	0
Fluoride	100.0%	☑	100.0%	357	0
Metals	100.0%	☑	100.0%	8	0
DBPs	100.0%	☑	100.0%	4	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	15	Discolouration, Taste & Odour, Illness from Water

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
No projected capital investment				

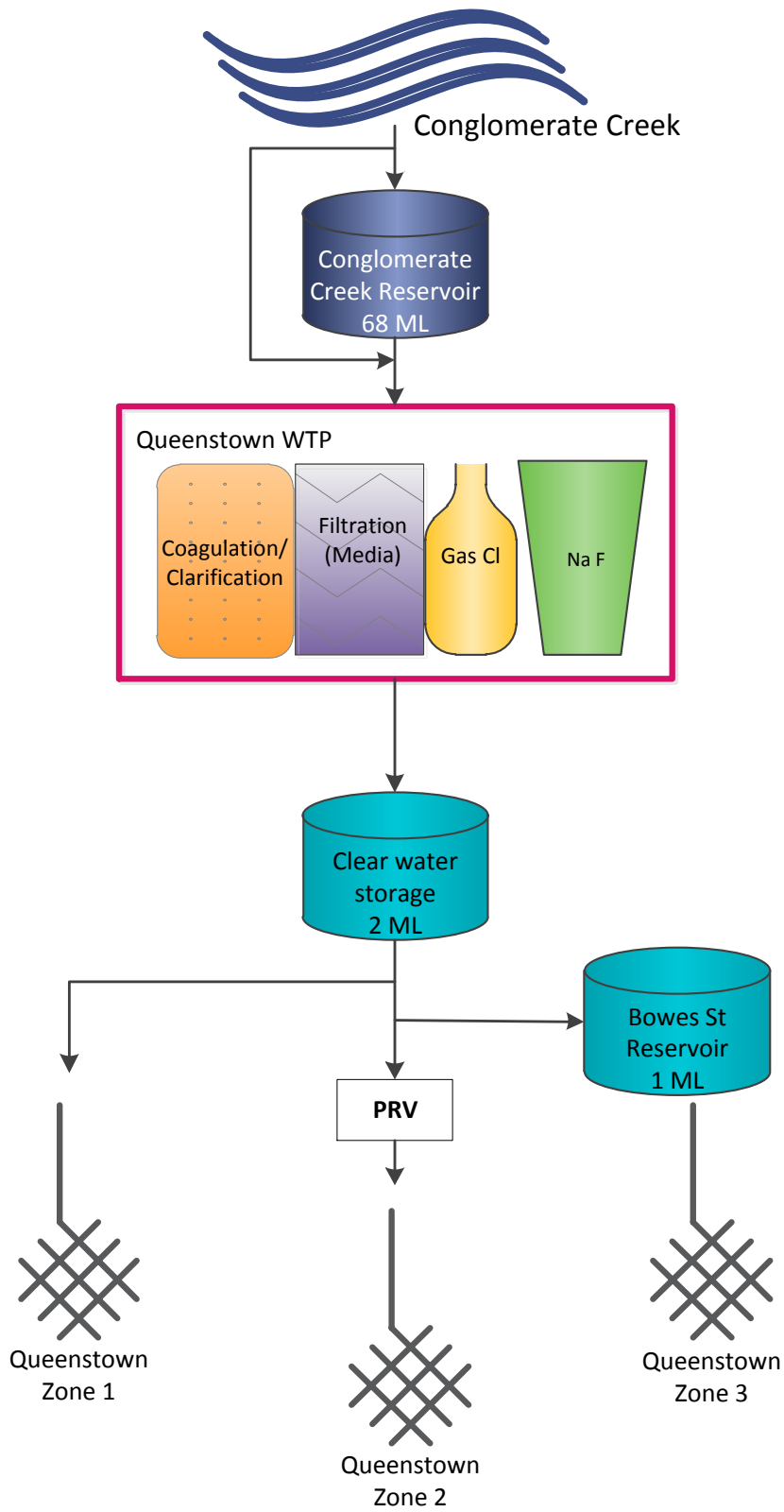


Figure 48.1-a Queenstown system schematic

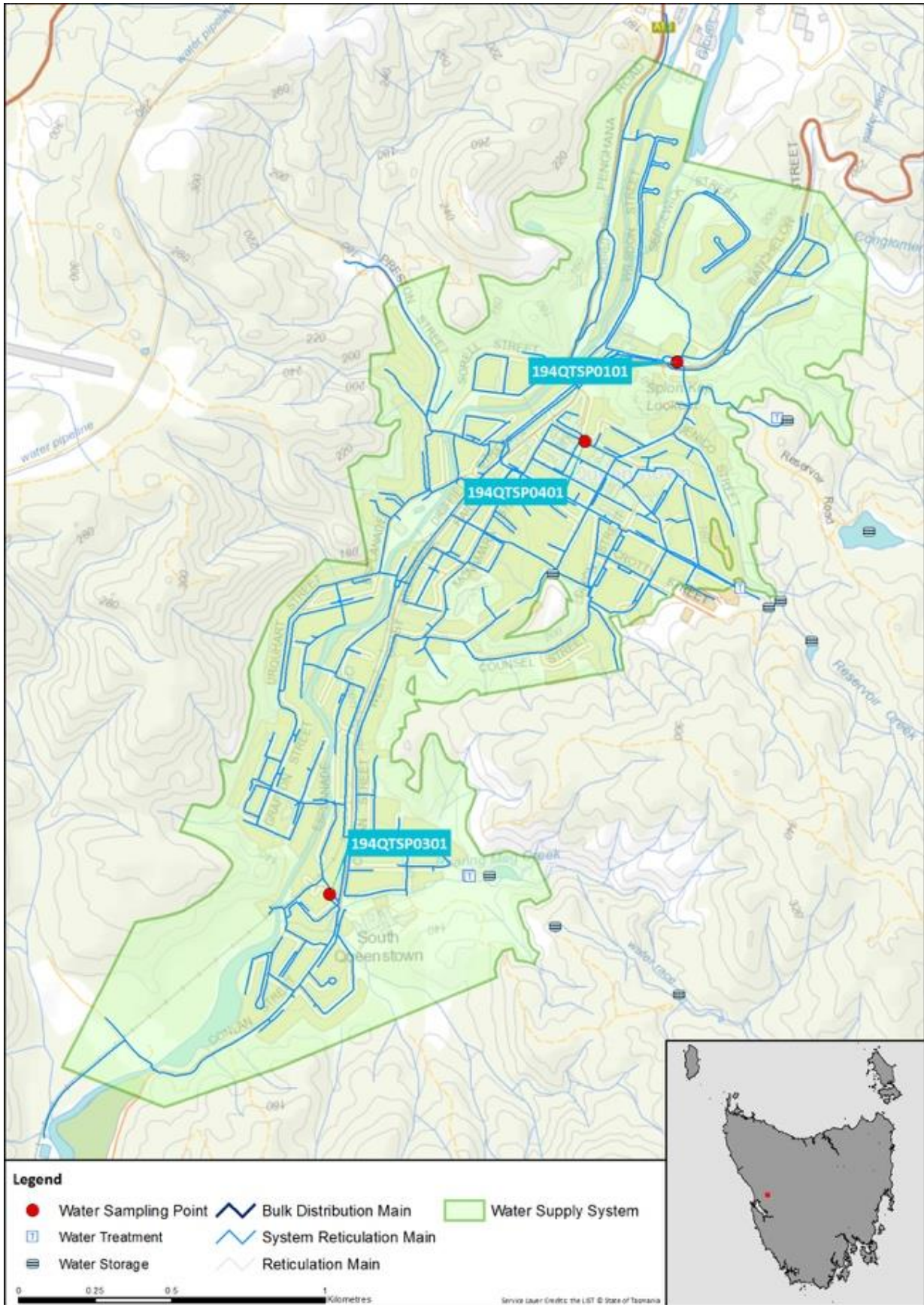


Figure 48.1-b Map of Queenstown monitoring system

48.2. Summary of annual reticulation compliance (2017–18)

Table 48.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Queenstown/Batchelor St Sample Point	194QTSP0101	W	Q	n/a	n/a	n/a
Queenstown/Murray St Sample Point	194QTSP0301	W	Q	Q	Q	n/a
Queenstown/Sticht St Sample Point	194QTSP0401	W	n/a	n/a	n/a	n/a
Number Planned Samples		156	8	4	4	n/a
Number Samples Tested		156	8	4	4	n/a

48.3. Summary of current and historic performance (2013-18)

Table 48.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	99.5%	99.5%	100.0%	100.0%	100.0%
Fluoride	n/a	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

48.4. Analysis of current health performance (2017-18)

Table 48.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 48.4-b Fluoride operational performance

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	96.1%
Mean dose (mg/L)	0.98
■ Compliant ■ Non-compliant	

Table 48.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	8	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	8	0	100	0.00043	<0.0003	0.0007
Barium	2	mg/L	8	0	100	0.02	0.015	0.024
Cadmium	0.002	mg/L	8	0	100	0.00007	<0.0001	0.0002
Chromium	0.05	mg/L	8	0	100	<0.0001	<0.0001	<0.0001
Copper	2	mg/L	8	0	100	0.04006	0.0066	0.2533
Lead	0.01	mg/L	8	0	100	0.00069	<0.0001	0.0043
Manganese	0.5	mg/L	8	0	100	0.032	0.0032	0.196
Mercury	0.001	mg/L	8	0	100	0.000046	<0.00003	0.00013
Molybdenum	0.05	mg/L	8	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	8	0	100	0.00027	<0.0001	0.0009
Selenium	0.01	mg/L	8	0	100	0.00012	<0.0001	0.0002

Table 48.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	4	0	100	69.5	56	90
Monochloroacetic acid	150	µg/L	4	0	100	4.38	<3	7
Trichloroacetic acid	100	µg/L	4	0	100	63.75	54	77
Total trihalomethanes	250	µg/L	4	0	100	115	90	180

Table 48.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.82	0.02	1.64
Colour True	HU	15	0.63	<1	1
pH	Units	6.5 – 8.5	7.45	6.82	7.96
Turbidity	NTU	1	0.53	0.11	2.62

48.5. Analysis of overall system performance (2017-18)

Table 48.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

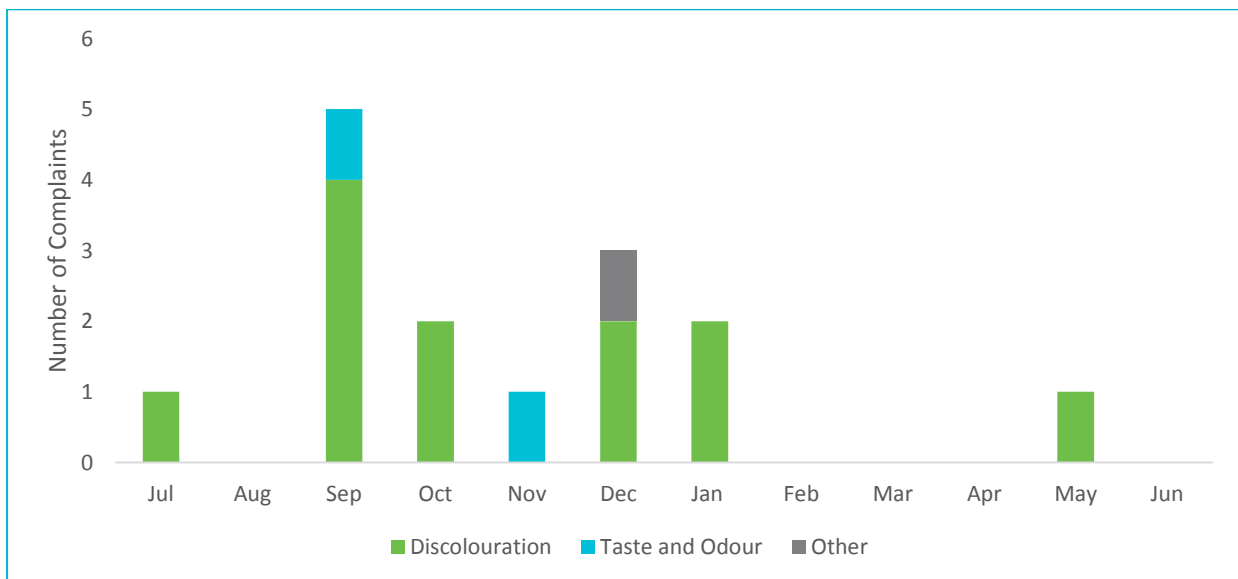


Figure 48.5-b Water quality customer complaints by month and type

49. Ringarooma System drinking water system

49.1. System summary (2017-18)

Ringarooma System drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	711
Population serviced	1209
Fluoride	NaF

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	<input checked="" type="checkbox"/>	98.0%	396	0
Fluoride	100.0%	<input checked="" type="checkbox"/>	100.0%	229	0
Metals	100.0%		100.0%	4	0
DBPs	100.0%		100.0%	41	0

■ Compliant
 ■ Non-compliant
 ■ Compliance unknown

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	9	Discolouration, Taste & Odour, Cloudy Water, Other (Chlorine general, Illness from water)

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
No projected capital investment				

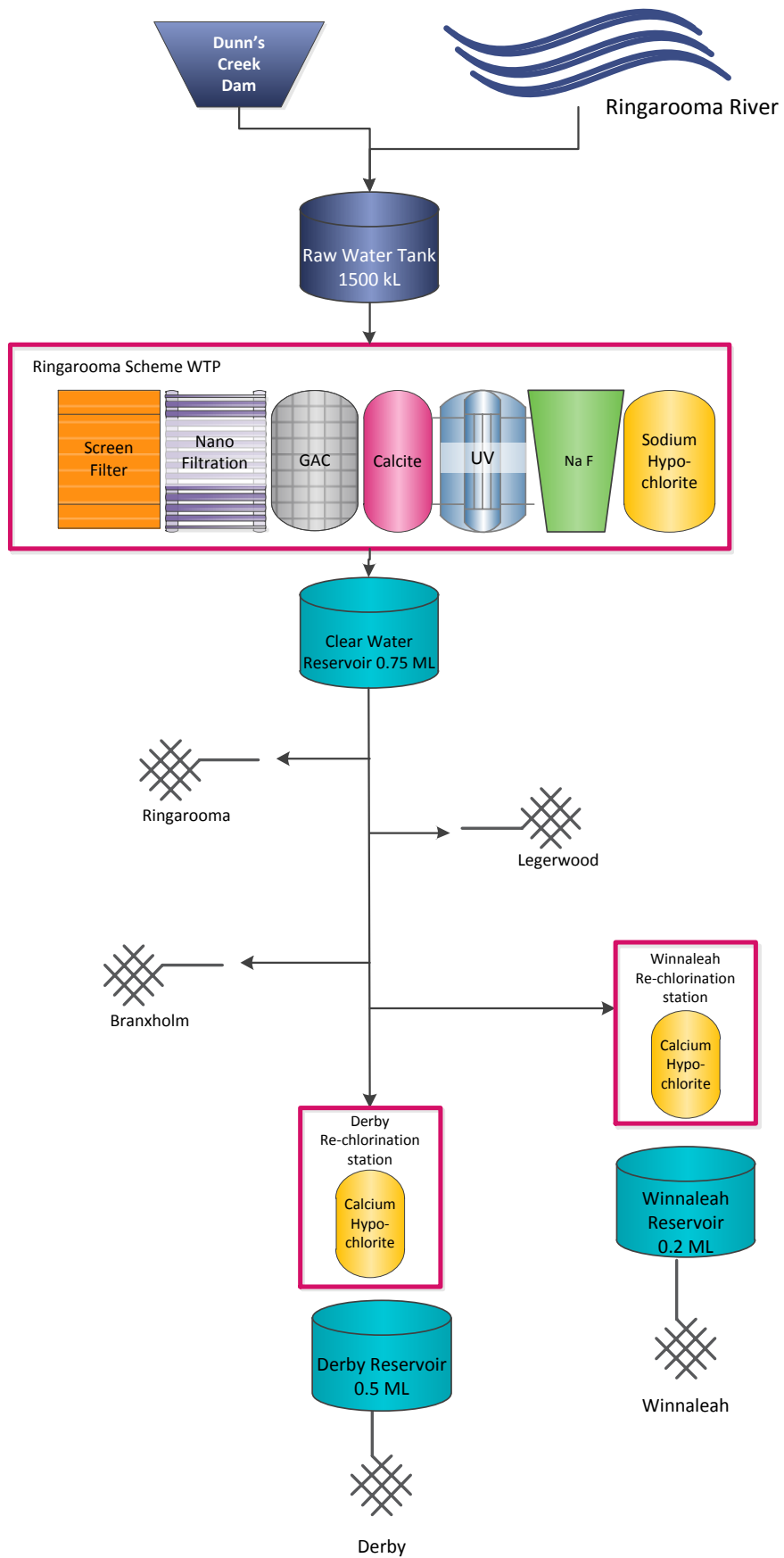


Figure 49.1-a Ringarooma System system schematic

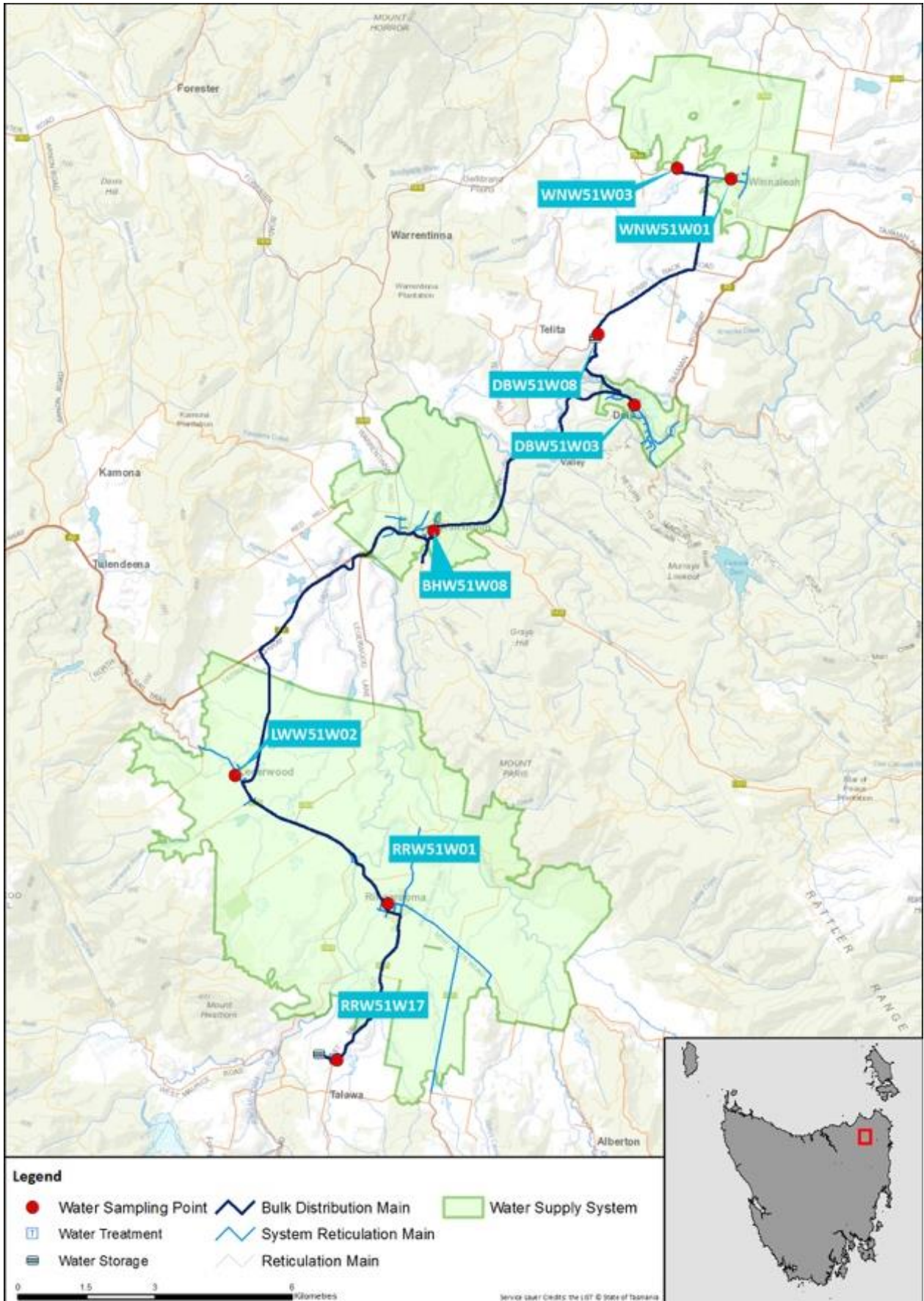


Figure 49.1-b Map of Ringarooma System monitoring system

49.2. Summary of annual reticulation compliance (2017–18)

Table 49.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Ringarooma/Opposite Police Station	RRW51W01	W	Q	Q	Q	n/a
Ringarooma/CWS	RRW51W17	W	n/a	n/a	Q	n/a
Legerwood/Carvings	LWW51W02	W	Q	Q	Q	n/a
Branxholm/17 Albert Street	BHW51W08	W	Q	Q	Q	n/a
Derby/Opp Netball Court	DBW51W03	W	Q	M	Q	n/a
Derby/Reservoir	DBW51W08	W	n/a	n/a	Q	n/a
Winnaleah/School	WNW51W01	W	M	M	Q	n/a
Winnaleah/Reservoir	WNW51W03	W	M	M	Q	n/a
Number Planned Samples		380	12	48	32	n/a
Number Samples Tested		396	11	41	32	n/a

49.3. Summary of current and historic performance (2013-18)

Table 49.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	14.0%	0.0%	0.0%	50.0%	100.0%
Fluoride	n/a	n/a	n/a	n/a	100.0%
Metals	98.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	n/a	n/a	n/a	n/a	100.0%

■ Compliant
 ■ Non-compliant
 ■ Compliance unknown

49.4. Analysis of current health performance (2017-18)

Table 49.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 49.4-b Fluoride operational performance

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	95.6%
Mean dose (mg/L)	0.91
■ Compliant ■ Non-compliant	

Table 49.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	39	0	100	<0.0005	<0.0005	0.0008
Arsenic	0.01	mg/L	39	0	100	<0.0003	<0.0003	0.0006
Barium	2	mg/L	39	0	100	0.0041	0.0032	0.0061
Cadmium	0.002	mg/L	39	0	100	<0.0001	<0.0001	0.0002
Chromium	0.05	mg/L	39	0	100	0.00015	<0.0001	0.0015
Copper	2	mg/L	39	0	100	0.0078	0.0015	0.0239
Lead	0.01	mg/L	39	0	100	0.00062	0.0001	0.001
Manganese	0.5	mg/L	39	0	100	0.0014	<0.0001	0.0057
Mercury	0.001	mg/L	39	0	100	0.00014	<0.00003	0.00061
Molybdenum	0.05	mg/L	39	0	100	<0.0001	<0.0001	0.0002
Nickel	0.02	mg/L	39	0	100	<0.0001	<0.0001	0.0002
Selenium	0.01	mg/L	39	0	100	<0.0001	<0.0001	0.0002

Table 49.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	52	0	100	11.85	5	20
Monochloroacetic acid	150	µg/L	52	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	52	0	100	17.04	8	26
Total trihalomethanes	250	µg/L	52	0	100	38	28	58

Table 49.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.66	0.02	1.33
Colour True	HU	15	0.61	<1	3
pH	Units	6.5 – 8.5	7.69	6.79	8.3
Turbidity	NTU	1	0.24	0.03	1.39

49.5. Analysis of overall system performance (2017-18)

Table 49.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

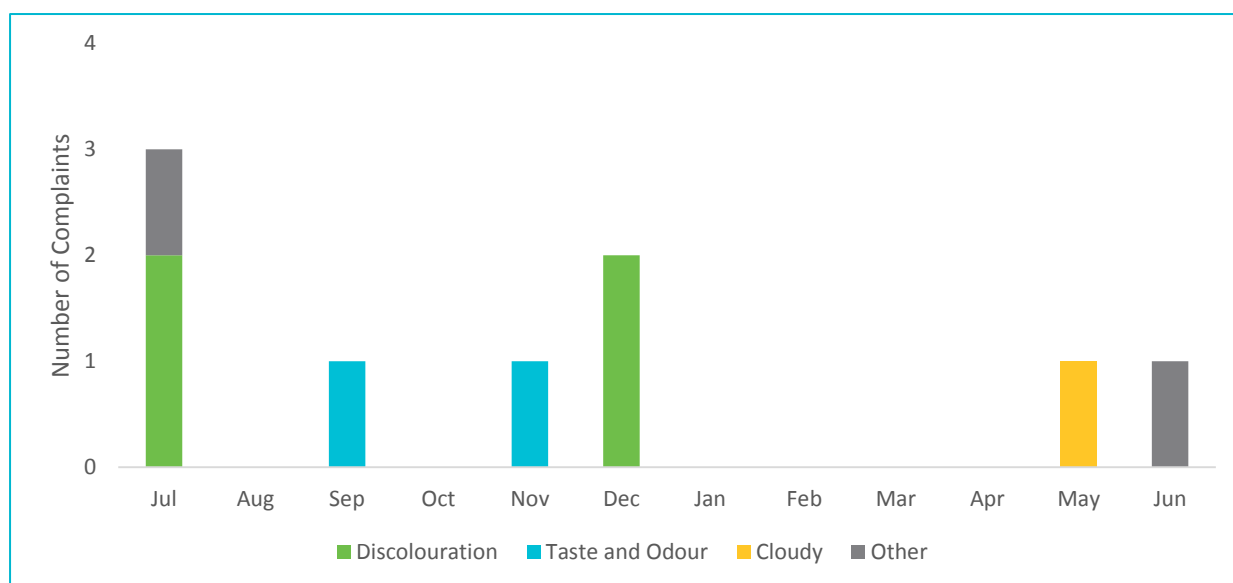


Figure 49.5-b Water quality customer complaints by month and type

50. Rocky Creek drinking water system

50.1. System summary (2017-18)

Rocky Creek drinking water system	
System status (as at 30 June 2018)	BWA
Total number of connections	503
Population serviced	1207
Fluoride	Sodium fluoride

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	<input checked="" type="checkbox"/>	98.0%	53	0
Fluoride	100.0%	<input checked="" type="checkbox"/>	100.0%	359	0
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0
DBPs	100.0%	<input checked="" type="checkbox"/>	100.0%	12	0

Compliant Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	1	Subject to PHA since September 2016
Notifications made to DoH	0	
Customer complaints	26	Discolouration, Taste & Odour, Cloudy Water, PHA Notices

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend (\$'000)
Regional Towns Water Supply Program	WTP and associated infrastructure	In progress	August 2018	\$3,608,659

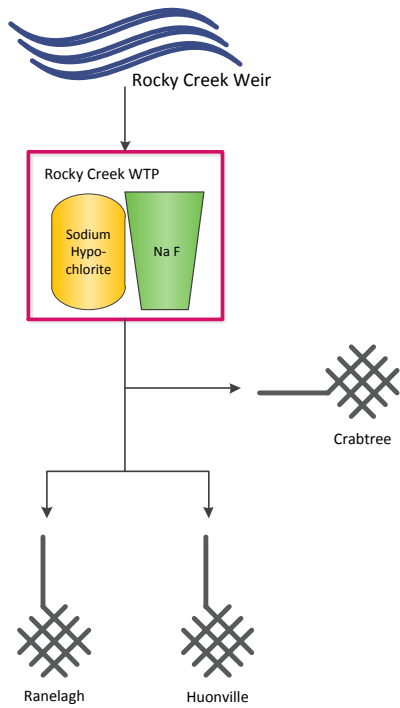


Figure 50.1-a Rocky Creek system schematic

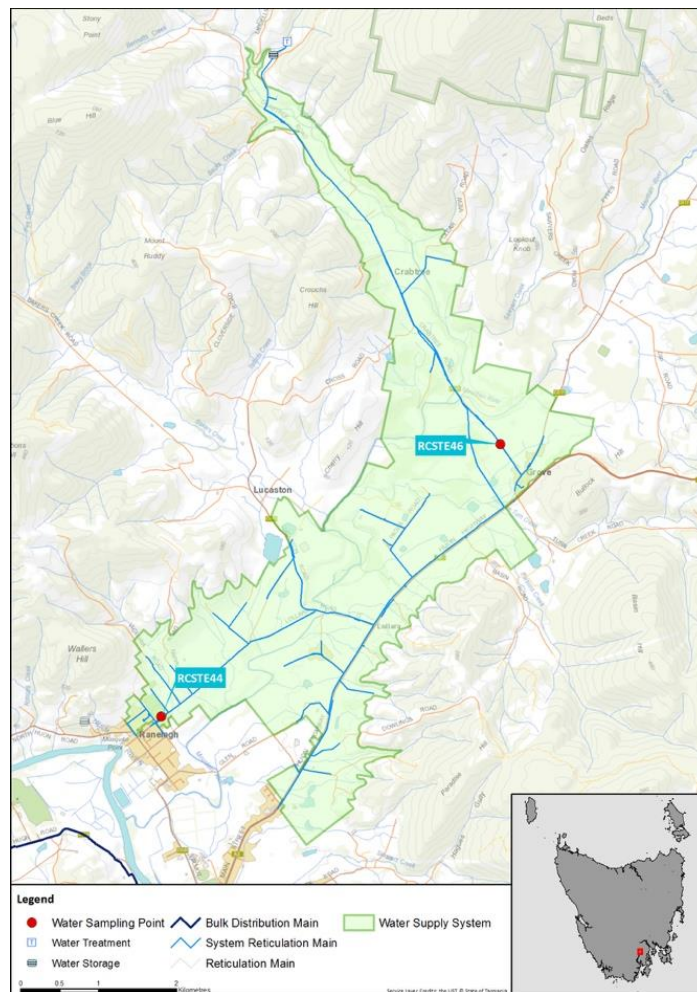


Figure 50.1-b Map of Rocky Creek monitoring system

50.2. Summary of annual reticulation compliance (2017–18)

Table 50.2-a Sampling program

Planned compliance sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Ranelagh Showgrounds/Sample Tap	RCSTE44	W	Q	M	Q	n/a
Ranelagh/Grove Fire Station	RCSTE46	n/a	n/a	n/a	n/a	n/a
Number Planned Samples		52	4	12	4	n/a
Number Samples Tested		52	4	12	4	n/a

50.3. Summary of current and historic performance (2013-18)

Table 50.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	99.5%	100.0%	98.1%	100.0%	100.0%
Fluoride	100.0%	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

50.4. Analysis of current health performance (2017-18)

Table 50.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resample
No ADWG exceedances			

Table 50.4-b Fluoride operational performance

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	90%
Mean dose (mg/L)	0.93
■ Compliant ■ Non-compliant	

Table 50.4-e Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	<0.0003	<0.0003	<0.0003
Barium	2	mg/L	4	0	100	0.002	0.001	0.003
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	0.00027	0.0001	0.0004
Copper	2	mg/L	4	0	100	0.00417	0.0023	0.0064
Lead	0.01	mg/L	4	0	100	0.00018	0.0001	0.0002
Manganese	0.5	mg/L	4	0	100	0.0019	0.0005	0.0049
Mercury	0.001	mg/L	4	0	100	<0.00003	<0.00003	<0.00003
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	0.00008	<0.0001	0.0002
Selenium	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001

Table 50.4-f Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	12	0	100	3.79	<1	24
Monochloroacetic acid	150	µg/L	12	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	12	0	100	5.79	<1	30
Total trihalomethanes	250	µg/L	12	0	100	32.74	15	63

Table 50.4-g General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.07	0	0.64
Colour True	HU	15	8.83	4	23
pH	Units	6.5 – 8.5	7.49	6.09	8.46
Turbidity	NTU	1	0.8	0.07	4.32

50.5. Analysis of overall system performance (2017-18)

Table 50.5-a Summary of system issues/public health warnings with notification details

Summary of system issues			
Date	Description	DHHS notification required	DHHS notification complete
September 2016	System subject to long-term PHA	✓	✓

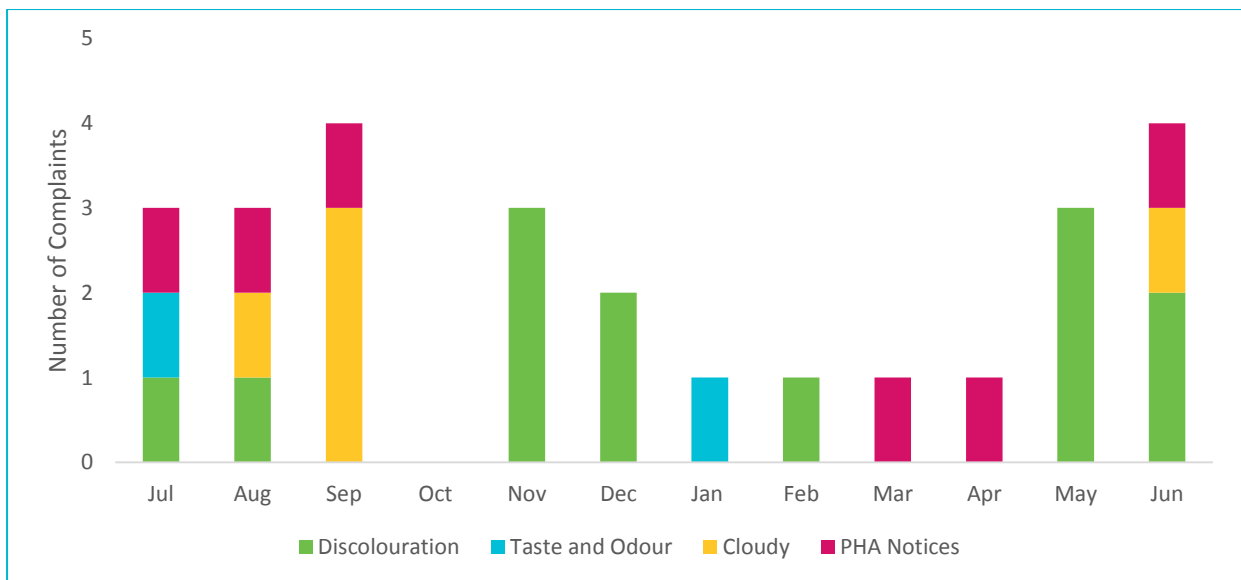


Figure 50.5-b Water quality customer complaints by month and type

51. Rosebery drinking water system

51.1. System summary (2017-18)

Rosebery drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	676
Population serviced	811
Fluoride	Sodium fluoride

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	<input checked="" type="checkbox"/>	98.0%	207	0
Fluoride	100.0%	<input checked="" type="checkbox"/>	100.0%	419	0
Metals	99.9%	<input type="checkbox"/>	100.0%	211	1
DBPs	100.0%	<input checked="" type="checkbox"/>	100.0%	16	0

Compliant Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	1	Mercury exceedance
Public health warnings issued	0	
Notifications made to DoH	1	Mercury exceedance
Customer complaints	5	Discoloration

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend (\$'000)
Rosebery Water Supply	Upgrade chlorine dosing controls	Complete	Complete	\$40,000
Rosebery WTP	New WTP	In progress	December 2018	\$8,397,728

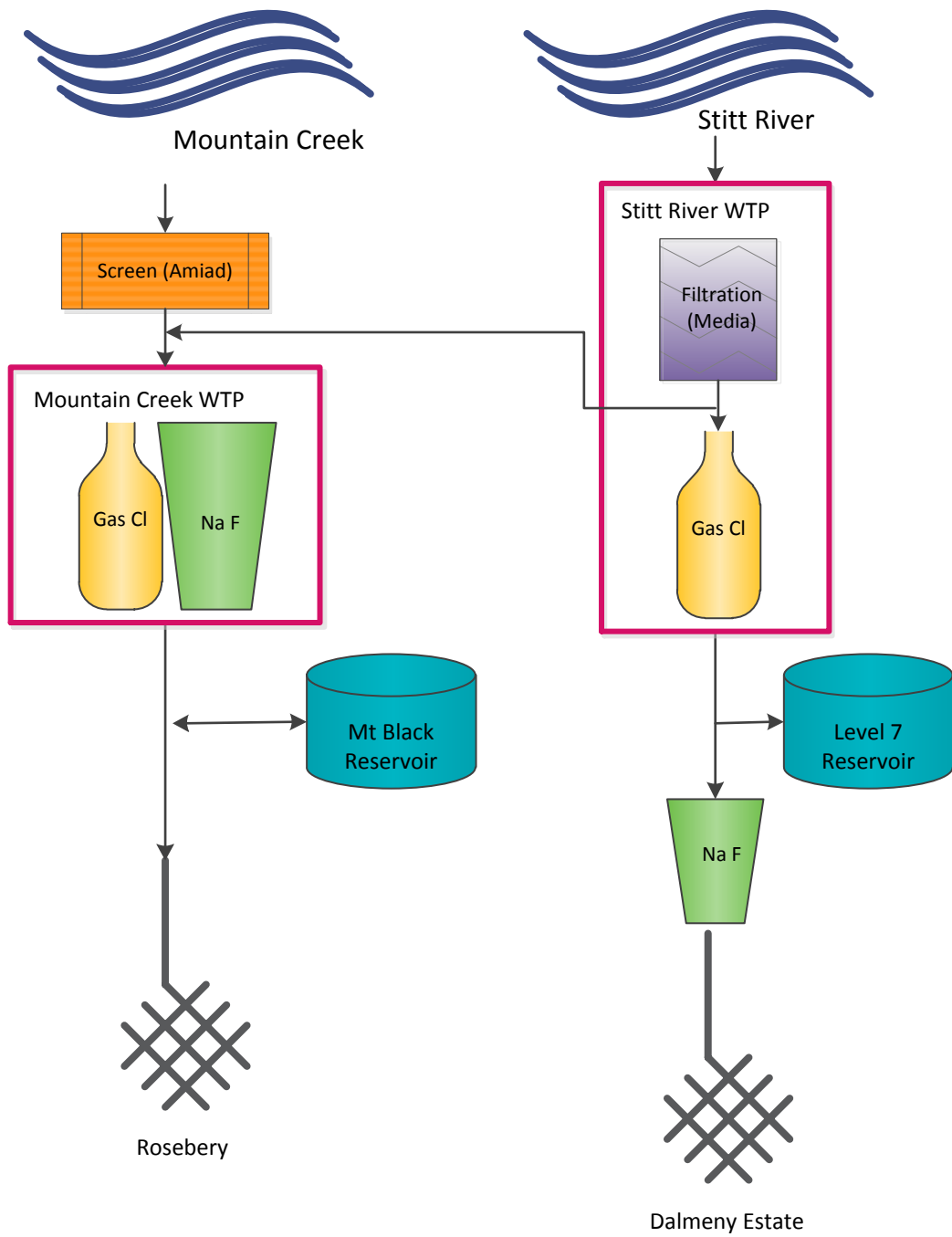


Figure 51.1-a Rosebery system schematic

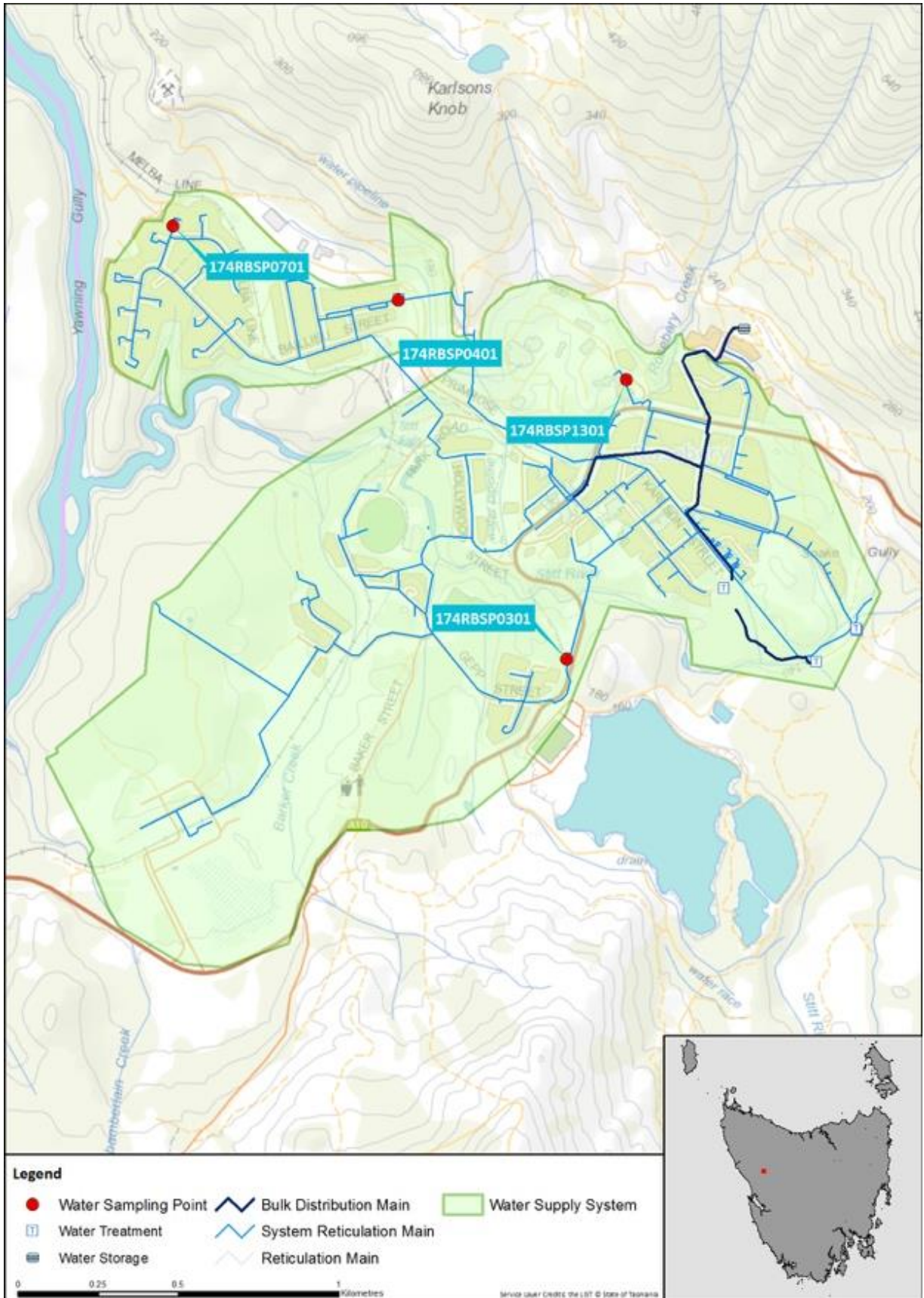


Figure 51.1-b Map of Rosebery monitoring system

51.2. Summary of annual reticulation compliance (2017–18)

Table 51.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Rosebery/Murchison Highway Tap Behind Public Toilets	174RBSP0301	W	W	Q	Q	n/a
Rosebery/Howard St Sample Point	174RBSP0401	W	W	n/a	n/a	n/a
Rosebery/Blackwood St Sample Point	174RBSP0701	W	W	M	Q	n/a
Rosebery/Rear of Hospital	174RBSP1301	W	W	n/a	n/a	n/a
Number Planned Samples		208	208	16	8	n/a
Number Samples Tested		207³⁵	211	16	8	n/a

51.3. Summary of current and historic performance (2013-18)

Table 51.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100.0%	99.6%	99.1%	100.0%	100.0%
Fluoride	n/a	100.0%	100.0%	100.0%	100.0%
Metals	99.0%	99.6%	99.9%	99.9%	99.9%
Disinfection by products	97.0%	95.4%	97.1%	100.0%	100.0%

■ Compliant ■ Non-compliant

³⁵ One missed micro sample for 174RBSP1301, DoH notified and exemption given

51.4. Analysis of current health performance (2017-18)

Table 51.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
Mercury	29/08/2017	Exceedance of 0.00114 µg/L in weekly compliance sample	✓

Table 51.4-b Fluoride operational performance (Howard St)³⁶

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	100%
Mean dose (mg/L)	0.97

■ Compliant ■ Non-compliant

Table 51.4-c Fluoride operational performance (Stirling Valley)

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	97.8%
Mean dose (mg/L)	0.99

■ Compliant ■ Non-compliant

³⁶ Rosebery was supplied by two dosing stations throughout FY2017-18.

Table 51.4-f Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	210	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	210	0	100	0.00022	<0.0003	0.0008
Barium	2	mg/L	210	0	100	0.006	0.004	0.009
Cadmium	0.002	mg/L	211	0	100	<0.0001	<0.0001	0.0002
Chromium	0.05	mg/L	211	0	100	0.00016	<0.0001	0.0059
Copper	2	mg/L	211	0	100	0.04379	0.0036	0.6637
Lead	0.01	mg/L	211	0	100	0.00097	0.0002	0.0037
Manganese	0.5	mg/L	210	0	100	0.0068	0.0023	0.056
Mercury	0.001	mg/L	210	1	99.5	0.000056	<0.00003	0.00114
Molybdenum	0.05	mg/L	210	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	211	0	100	0.00011	<0.0001	0.0037
Selenium	0.01	mg/L	210	0	100	0.00008	<0.0001	0.0012

Table 51.4-g Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	15	0	100	26.6	14	41
Monochloroacetic acid	150	µg/L	15	0	100	<3	<3	4
Trichloroacetic acid	100	µg/L	15	0	100	17.73	7	31
Total trihalomethanes	250	µg/L	15	0	100	22.73	9	46

Table 51.4-h General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.69	0.06	1.5
Colour True	HU	15	8.88	6	11
pH	Units	6.5 – 8.5	6.65	5.31	9.69
Turbidity	NTU	1	1.52	0	6.38

51.5. Analysis of overall system performance (2017-18)

Table 51.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
29/08/2017	Weekly sample detected <i>Mercury</i> of 0.00114 µg/L at 174RBSP0401. The system was resampled with no further exceedances identified.	✓	✓

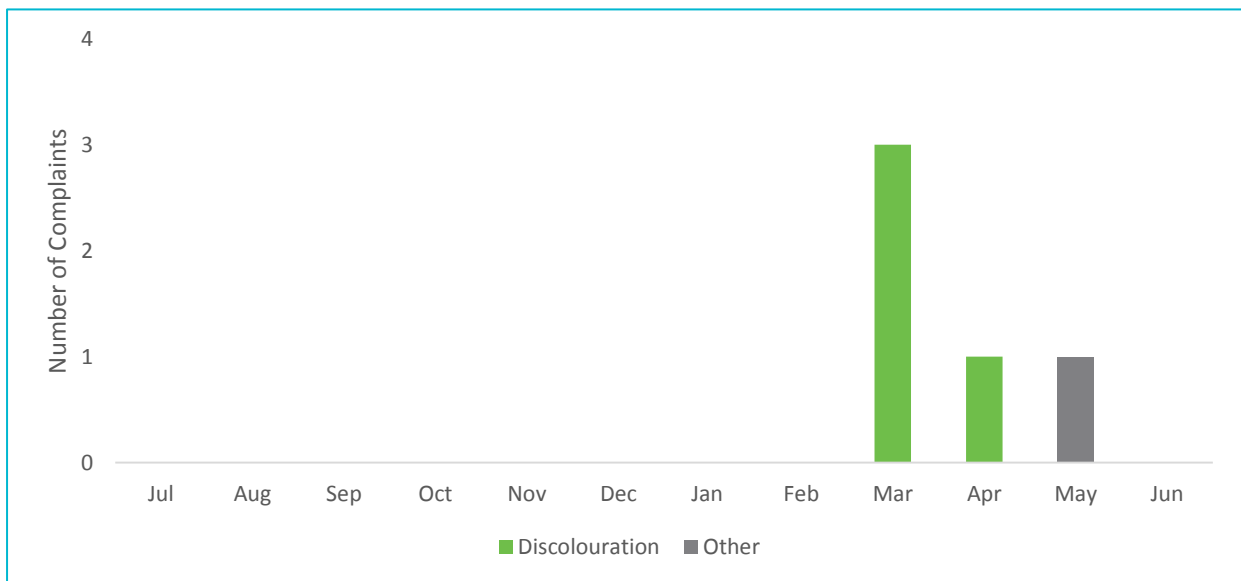


Figure 51.5-b Water quality customer complaints by month and type

52. Rossarden drinking water system

52.1. System summary (2017-18)

Rossarden drinking water system	
System status (as at 30 June 2018)	DNC
Total number of connections	58
Population serviced	104
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	<input checked="" type="checkbox"/>	98.0%	12	0
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	12	0
DBPs	n/a	n/a	n/a	n/a	n/a

Compliant Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	1	Subject to PHA (since December 2014)
Notifications made to DoH	0	
Customer complaints	3	Discolouration, Other (illness, stained washing)

Current and future planned capital investment						
Project			Overview	Progress	Est. Delivery	Est. Spend (\$'000)
Regional Supply Program	Towns	Water	WTP and associated infrastructure	In progress	August 2018	\$2,368,808
Regional Supply Program	Towns	Water	Reticulation upgrade	In progress	August 2018	\$985,212

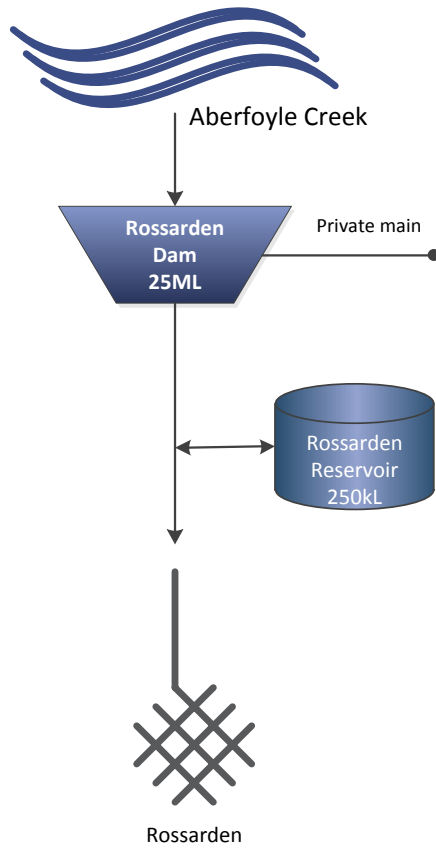


Figure 52.1-a Rossarden system schematic

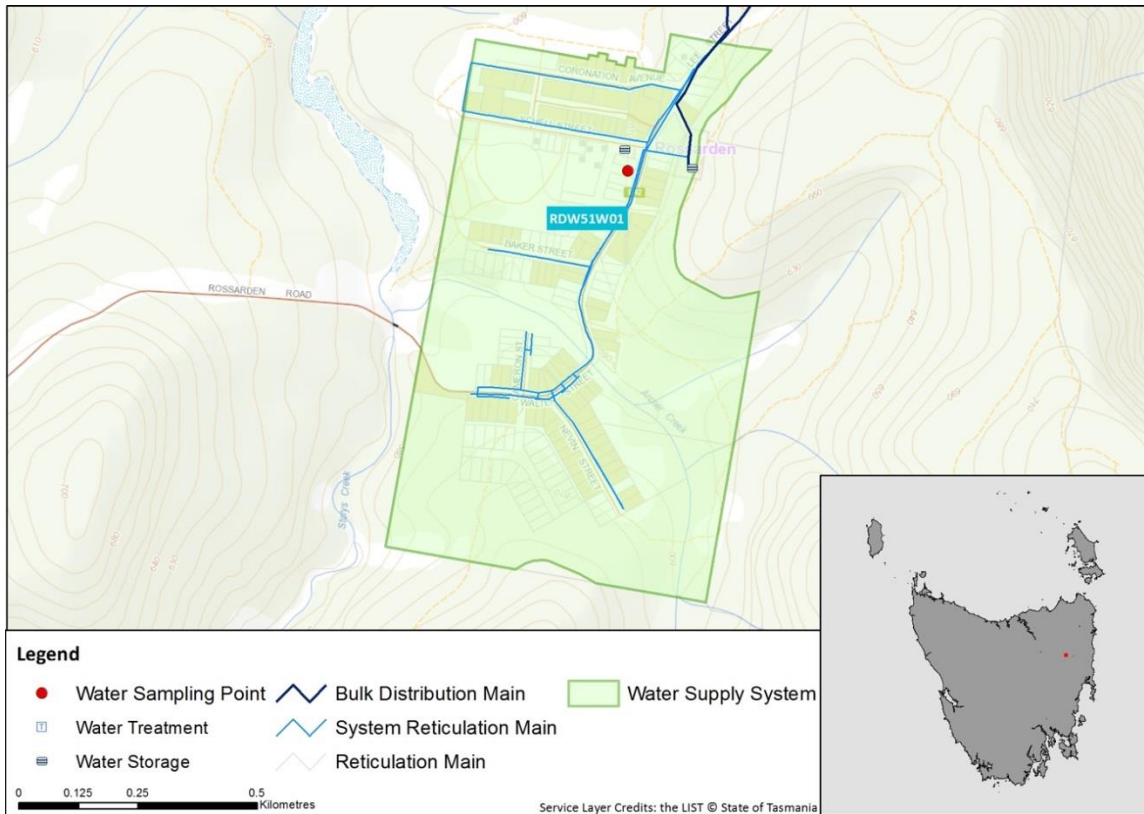


Figure 52.1-b Map of Rossarden monitoring system

52.2. Summary of annual reticulation compliance (2017–18)

Table 52.2-a Sampling program

Planned compliance sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Rossarden/Lee St BBQ Area	RDW51W01	M	M	n/a	Q	n/a
Number Planned Samples		12	12	n/a	4	n/a
Number Samples Tested		12	12	n/a	4	n/a

52.3. Summary of current and historic performance (2013-18)

Table 52.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	98.5%	96.0%	90.2%	78.0%	100.0%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	97.1%	100.0% ³⁷	100.0%	100.0% ³⁷
Disinfection by products	n/a	n/a	n/a	n/a	n/a

■ Compliant ■ Non-compliant

52.4. Analysis of current health performance (2017-18)

Table 52.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

³⁷ Compliance testing did not detect elevated metals, however >3 failures occurred at investigation sites and are not included in the compliance evaluation.

Table 52.4-b Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	12	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	12	0	100	<0.0003	<0.0003	0.0012
Barium	2	mg/L	12	0	100	0.005	0.003	0.0227
Cadmium	0.002	mg/L	12	0	100	<0.0001	<0.0001	0.0001
Chromium	0.05	mg/L	12	0	100	<0.0001	<0.0001	0.0007
Copper	2	mg/L	12	0	100	0.004	0.0012	0.0076
Lead	0.01	mg/L	12	0	100	0.0009	0.0002	0.0032
Manganese	0.5	mg/L	12	0	100	0.0407	0.0012	0.4024
Mercury	0.001	mg/L	12	0	100	<0.00003	<0.00003	0.00005
Molybdenum	0.05	mg/L	12	0	100	<0.00001	<0.0001	0.0002
Nickel	0.02	mg/L	12	0	100	0.00026	<0.0001	0.0008
Selenium	0.01	mg/L	12	0	100	<0.0001	<0.0001	0.0002

Table 52.4-c General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.83	0.04	1.24
Colour True	HU	15	1.14	<1	5
pH	Units	6.5 – 8.5	7.45	6.29	8.56
Turbidity	NTU	1	2.27	0.13	49

52.5. Analysis of overall system performance (2017-18)

Table 52.5-a Summary of system issues/public health warnings with notification details

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

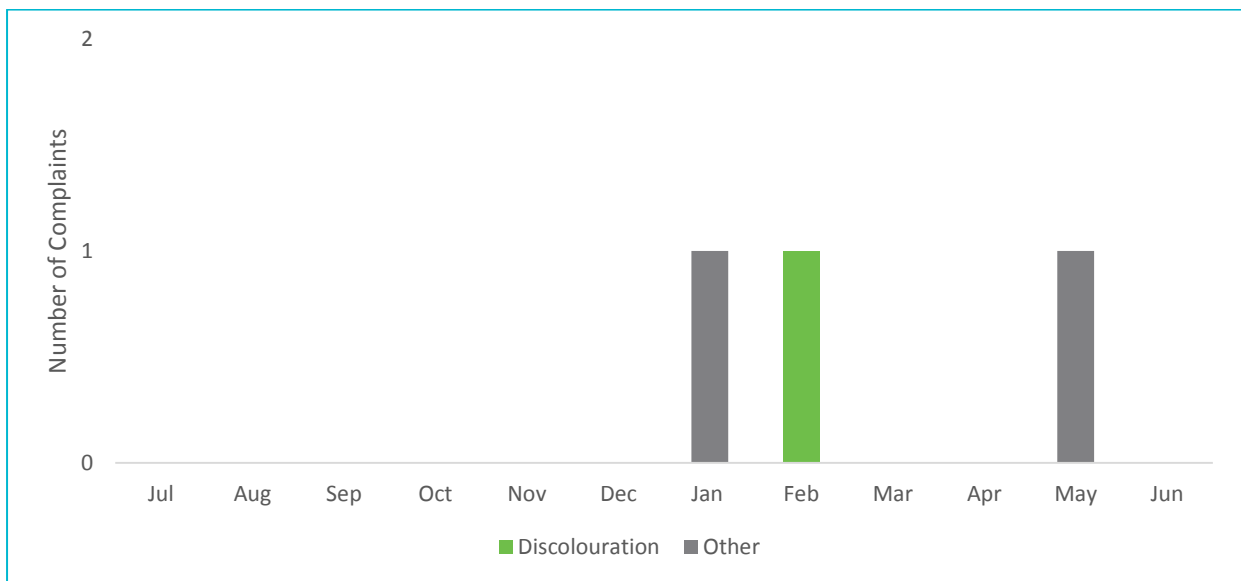


Figure 52.5-b Water quality customer complaints by month and type

53. Scamander drinking water system

53.1. System summary (2017-18)

Scamander drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	585
Population serviced	819
Fluoride	Sodium fluoride

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	☑	98.0%	52	0
Fluoride	100.0%	☑	100.0%	336	0
Metals	100.0%	☑	100.0%	4	0
DBPs	100.0%	☑	100.0%	4	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	1	Discolouration

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
No projected capital investment				

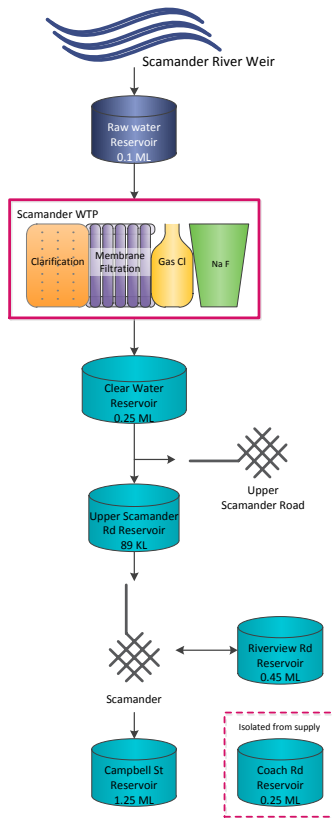


Figure 53.1-a Scamander system schematic

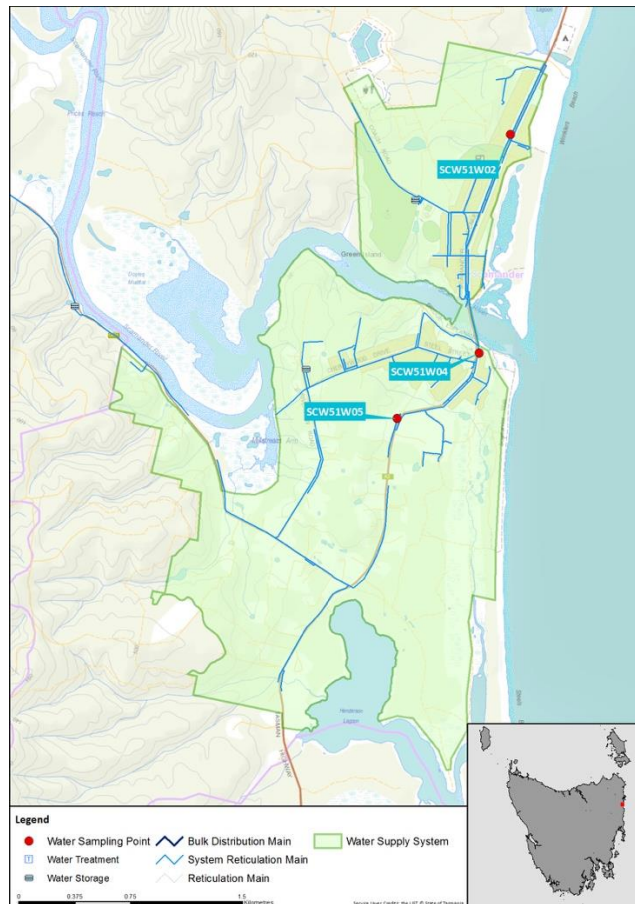


Figure 53.1-b Map of Scamander monitoring system

53.2. Summary of annual reticulation compliance (2017–18)

Table 53.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Scamander/River Mouth Carpark - 166 Scamander Ave	SCW51W04	n/a	n/a	n/a	n/a	n/a
Scamander/56 Scamander Ave	SCW51W02	W	Q	Q	Q	n/a
Scamander/"Crowys" 23377 Tasman Hwy ^a	SCW51W05	n/a	n/a	n/a	n/a	n/a
Number Planned Samples		52	4	4	4	n/a
Number Samples Tested		52	4	4	4	n/a

53.3. Summary of current and historic performance (2013-18)

Table 53.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100.0%	94.0%	100.0%	100.0%	100.0%
Fluoride	n/a	n/a	n/a	100.0%	100.0%
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

53.4. Analysis of current health performance (2017-18)

Table 53.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 53.4-b Fluoride operational performance

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	85.1%
Mean dose (mg/L)	0.91
■ Compliant ■ Non-compliant	

Table 53.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	0.0003	<0.0003	0.0006
Barium	2	mg/L	4	0	100	0.008	0.006	0.009
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	0.00014	<0.0001	0.0004
Copper	2	mg/L	4	0	100	0.00368	0.0027	0.0044
Lead	0.01	mg/L	4	0	100	0.0008	0.0006	0.0012
Manganese	0.5	mg/L	4	0	100	0.0012	0.0003	0.0019
Mercury	0.001	mg/L	4	0	100	0.000065	<0.00003	0.00018
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Selenium	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001

Table 53.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	4	0	100	8	2	16
Monochloroacetic acid	150	µg/L	4	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	4	0	100	7.5	2	17
Total trihalomethanes	250	µg/L	4	0	100	32.75	20	43

Table 53.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	1.08	0.59	1.69
Colour True	HU	15	0.88	<1	2
pH	Units	6.5 – 8.5	7.24	6.58	7.79
Turbidity	NTU	1	0.31	0.1	1.4

53.5. Analysis of overall system performance (2017-18)

Table 53.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

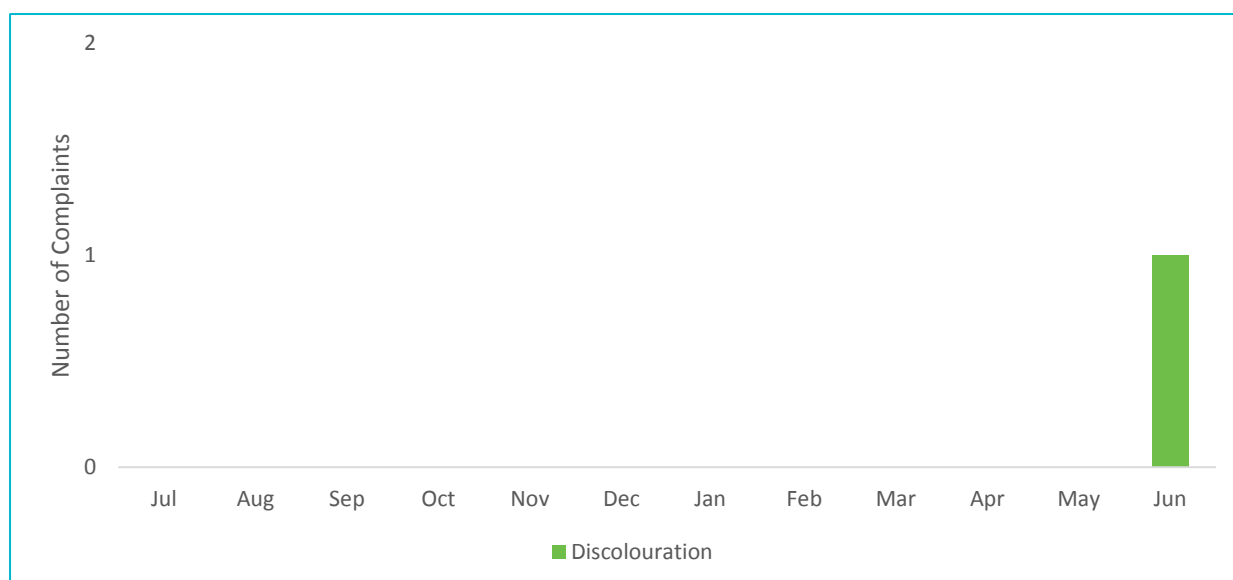


Figure 53.5-b Water quality customer complaints by month and type

54. Scottsdale drinking water system

54.1. System summary (2017-18)

Scottsdale drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	1347
Population serviced	2963
Fluoride	Sodium fluoride

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	☑	98.0%	104	0
Fluoride	100.0%	☑	100.0%	334	0
Metals	100.0%	☑	100.0%	4	0
DBPs	100.0%	☑	100.0%	4	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	2	Discolouration

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend (\$'000)
Regional Towns Water Supply Program	UV disinfection system	Not started	TBA	TBA

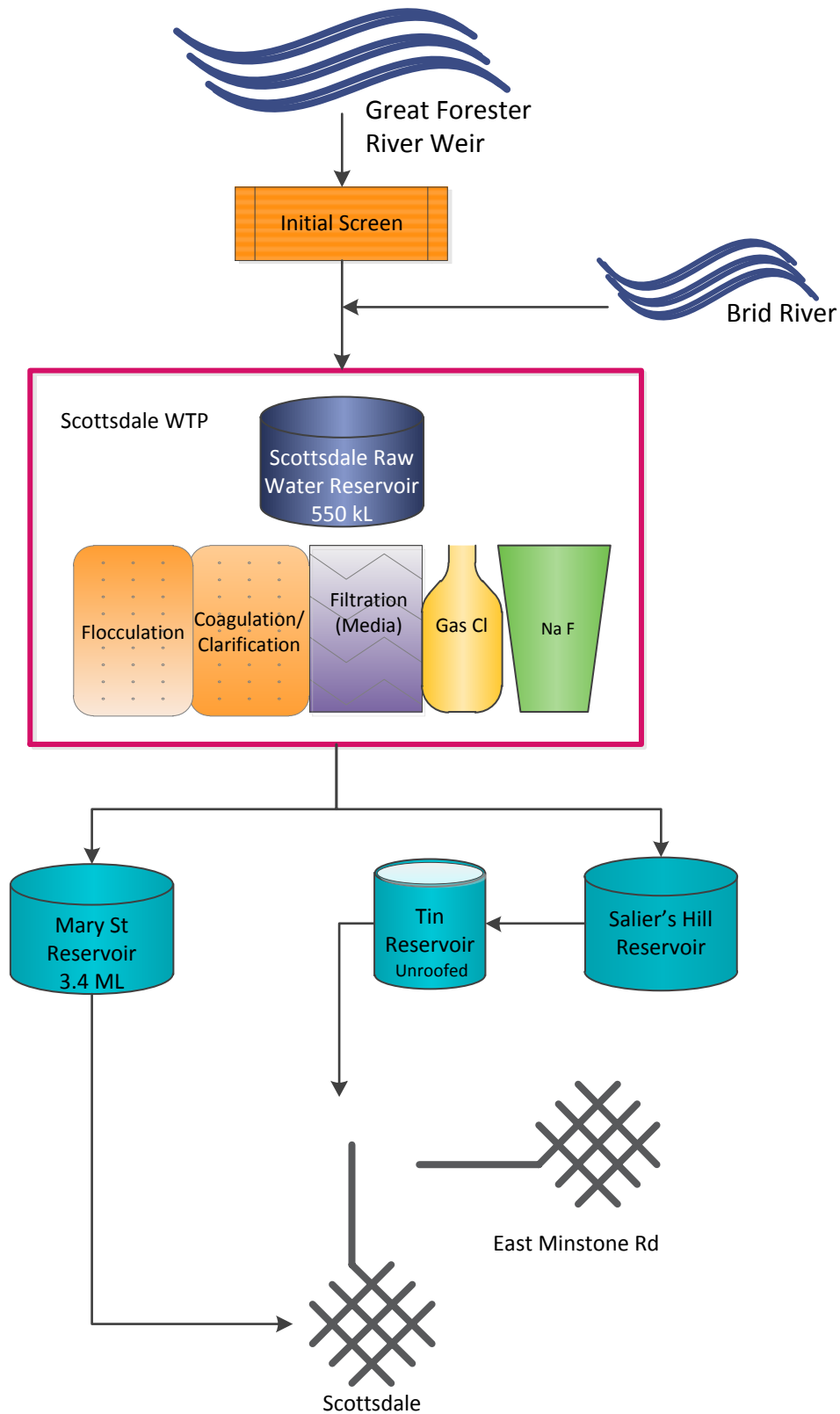


Figure 54.1-a Scottsdale system schematic

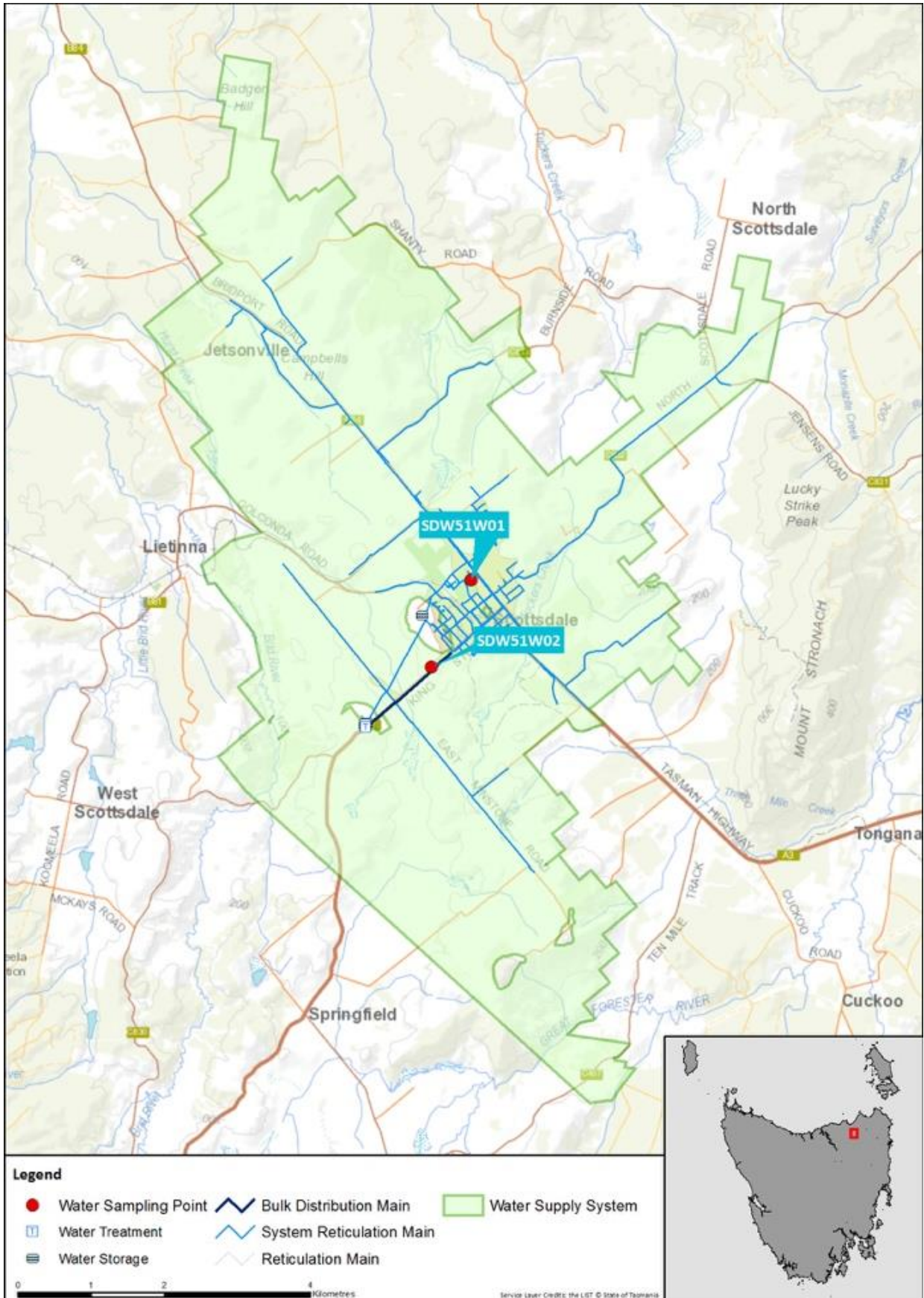


Figure 54.1-b Map of Scottsdale monitoring system

54.2. Summary of annual reticulation compliance (2017–18)

Table 54.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Scottsdale/Recreation Ground	SDW51W01	W	Q	Q	Q	n/a
Scottsdale/Visitor Info King St	SDW51W02	W	n/a	n/a	n/a	n/a
Number Planned Samples		104	4	4	4	n/a
Number Samples Tested		104	4	4	4	n/a

54.3. Summary of current and historic performance (2013-18)

Table 54.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100.0%	100.0%	99.0%	100.0%	100.0%
Fluoride	100.0%	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

54.4. Analysis of current health performance (2017-18)

Table 54.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 54.4-b Fluoride operational performance

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	91.9%
Mean dose (mg/L)	0.95
■ Compliant ■ Non-compliant	

Table 54.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	<0.0003	<0.0003	<0.0003
Barium	2	mg/L	4	0	100	0.011	0.01	0.012
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Copper	2	mg/L	4	0	100	0.0097	0.0058	0.0146
Lead	0.01	mg/L	4	0	100	0.00043	0.0003	0.0008
Manganese	0.5	mg/L	4	0	100	0.0017	0.0015	0.002
Mercury	0.001	mg/L	4	0	100	<0.00003	<0.00003	<0.00003
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Selenium	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001

Table 54.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	4	0	100	4	2	6
Monochloroacetic acid	150	µg/L	4	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	4	0	100	4	2	6
Total trihalomethanes	250	µg/L	4	0	100	18	12	23

Table 54.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.79	0.08	1.33
Colour True	HU	15	1.63	<1	5
pH	Units	6.5 – 8.5	7.22	6.8	7.5
Turbidity	NTU	1	0.22	0.07	0.45

54.5. Analysis of overall system performance (2017-18)

Table 54.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

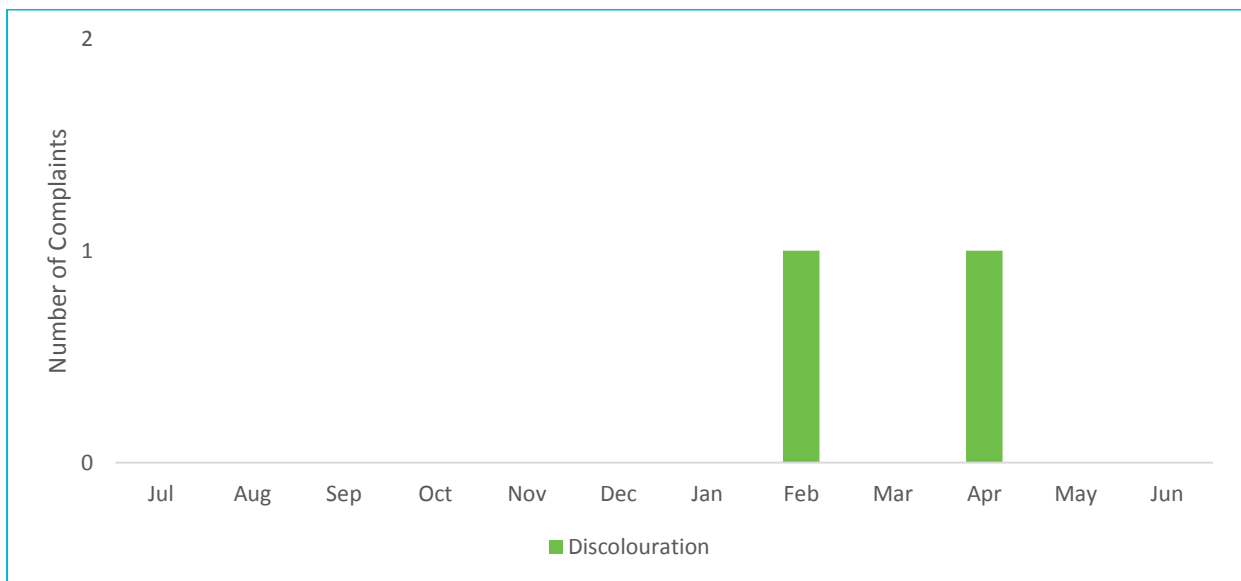


Figure 54.5-b Water quality customer complaints by month and type

55. South Esk drinking water system

55.1. System summary (2017-18)

South Esk drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	5459
Population serviced	12556
Fluoride	Fluorosilicic acid

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	<input checked="" type="checkbox"/>	98.0%	364	0
Fluoride	100.0%	<input checked="" type="checkbox"/>	100.0%	358	0
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0
DBPs	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0

Compliant Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	9	Discolouration, Taste & Odour

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
No projected capital investment				

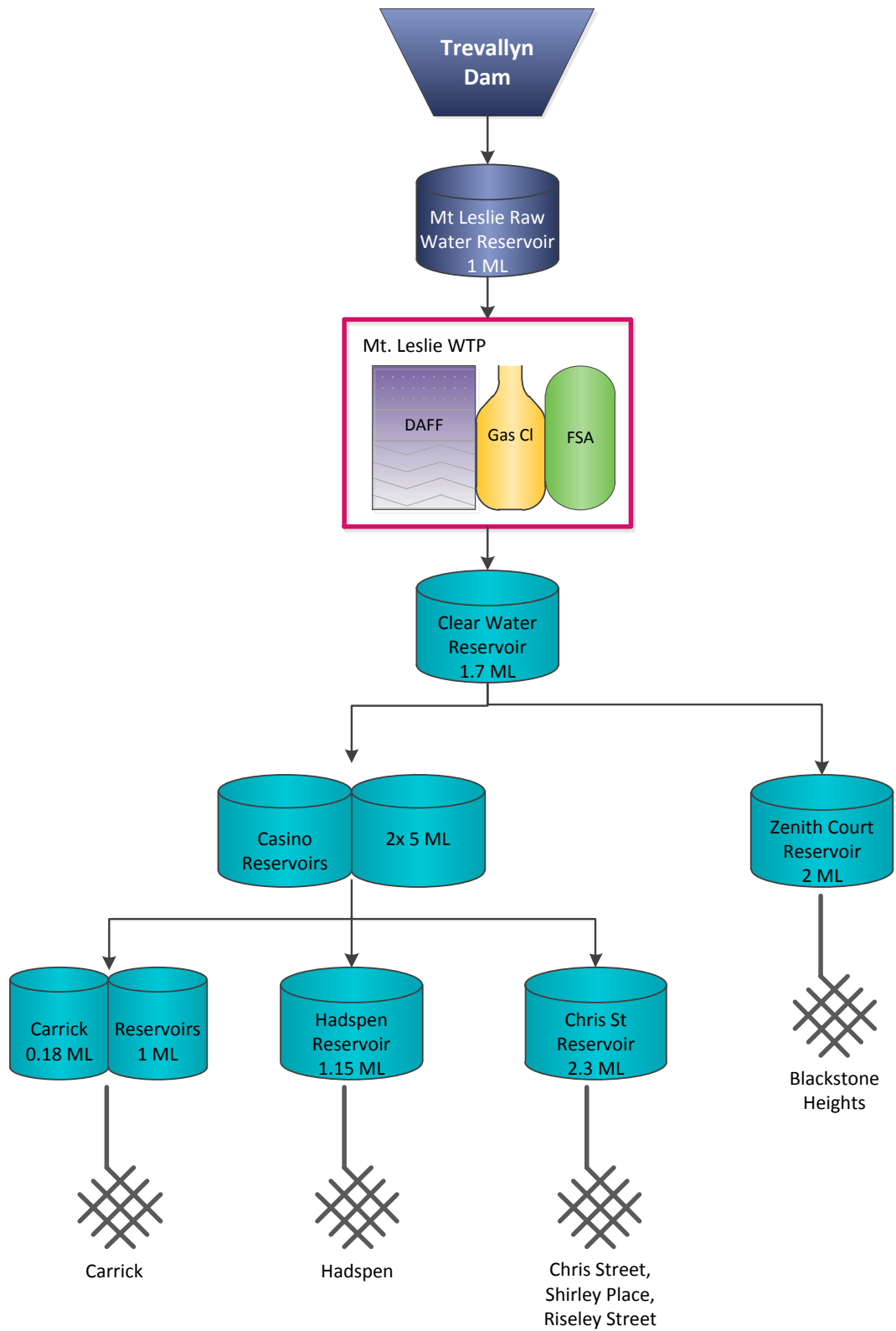


Figure 55.1-a South Esk system schematic

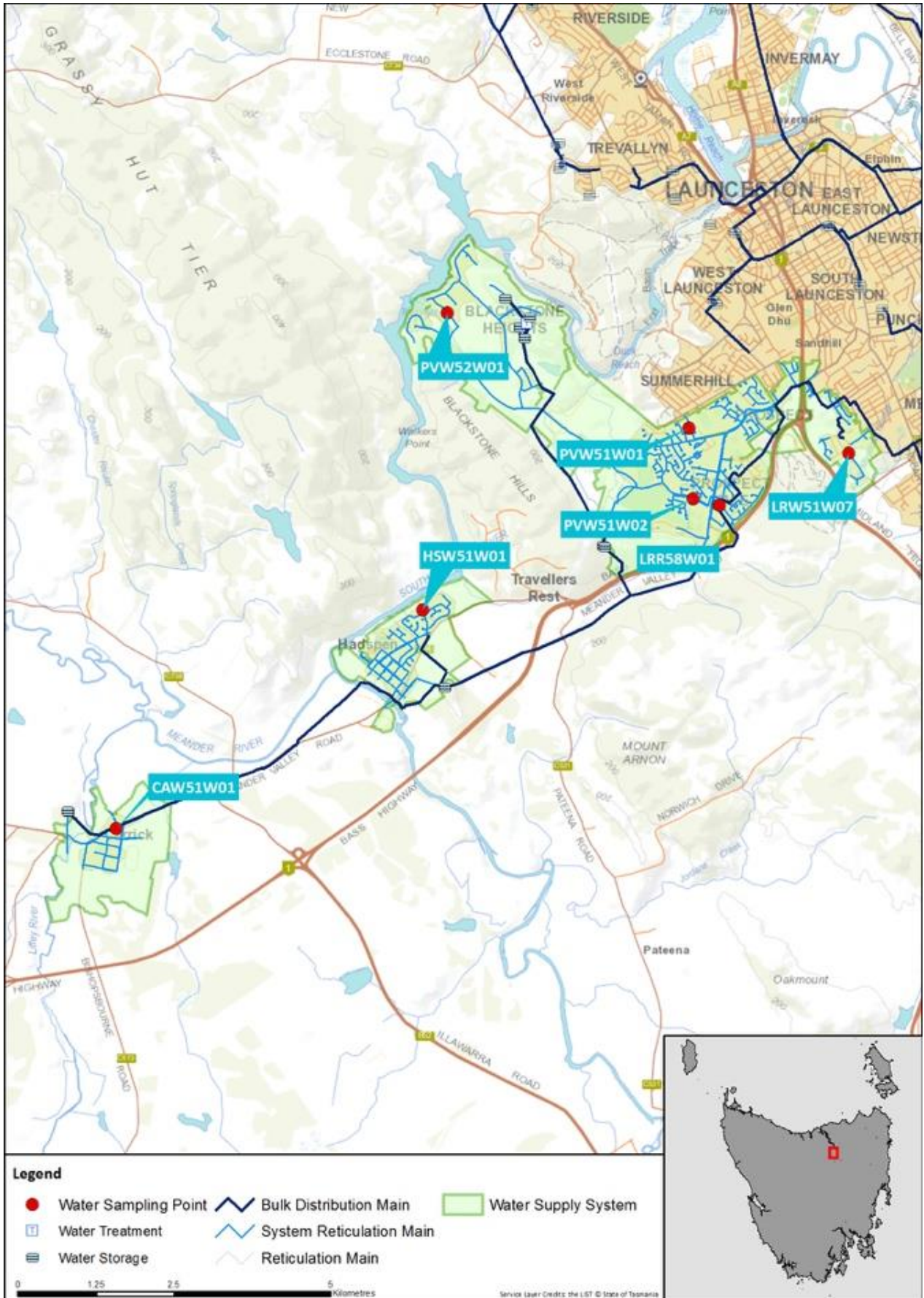


Figure 55.1-b Map of South Esk monitoring system
55.2. Summary of annual reticulation compliance (2017–18)

Table 55.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Blackstone Heights, Longvista Drive	PVW52W01	W	n/a	n/a	n/a	n/a
Prospect Vale, Country Club	PVW51W02	W	n/a	n/a	n/a	n/a
Kings Meadows, Connector Park	LRW51W07	W	n/a	n/a	n/a	n/a
Prospect Vale, Chris St Res	LRR58W01	W	n/a	n/a	n/a	n/a
Carrick, Public Hall	CAW51W01	W	n/a	n/a	n/a	n/a
Prospect Vale, Willow Lane	PVW51W01	W	n/a	n/a	n/a	n/a
Hadspen, South Esk Drive	HSW51W01	W	Q	Q	Q	n/a
Number Planned Samples		364	4	4	4	12
Number Samples Tested		364	4	4	4	12

55.3. Summary of current and historic performance (2013-18)

Table 55.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100.0%	100.0%	100.0%	100.0%	100.0%
Fluoride	100.0%	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

55.4. Analysis of current health performance (2017-18)

Table 55.4-a Summary of health guideline exceedances

Summary of health guideline exceedances

Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 55.4-b Fluoride operational performance

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	94.7%
Mean dose (mg/L)	0.96
■ Compliant ■ Non-compliant	

Table 55.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	<0.0003	<0.0003	<0.0003
Barium	2	mg/L	4	0	100	0.009	0.007	0.014
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Copper	2	mg/L	4	0	100	0.00273	0.0016	0.0036
Lead	0.01	mg/L	4	0	100	0.00045	0.0002	0.0007
Manganese	0.5	mg/L	4	0	100	0.0027	0.0019	0.0035
Mercury	0.001	mg/L	4	0	100	0.000024	<0.00003	0.00005
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	0.00011	<0.0001	0.0003
Selenium	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001

Table 55.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	4	0	100	5.5	4	6
Monochloroacetic acid	150	µg/L	4	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	4	0	100	6.25	2	8
Total trihalomethanes	250	µg/L	4	0	100	20	13	25

Table 55.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.7	0.04	1.1
Colour True	HU	15	<1	<1	<1
pH	Units	6.5 – 8.5	7.02	6.55	7.65
Turbidity	NTU	1	0.23	0.08	0.91

55.5. Analysis of overall system performance (2017-18)

Table 55.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

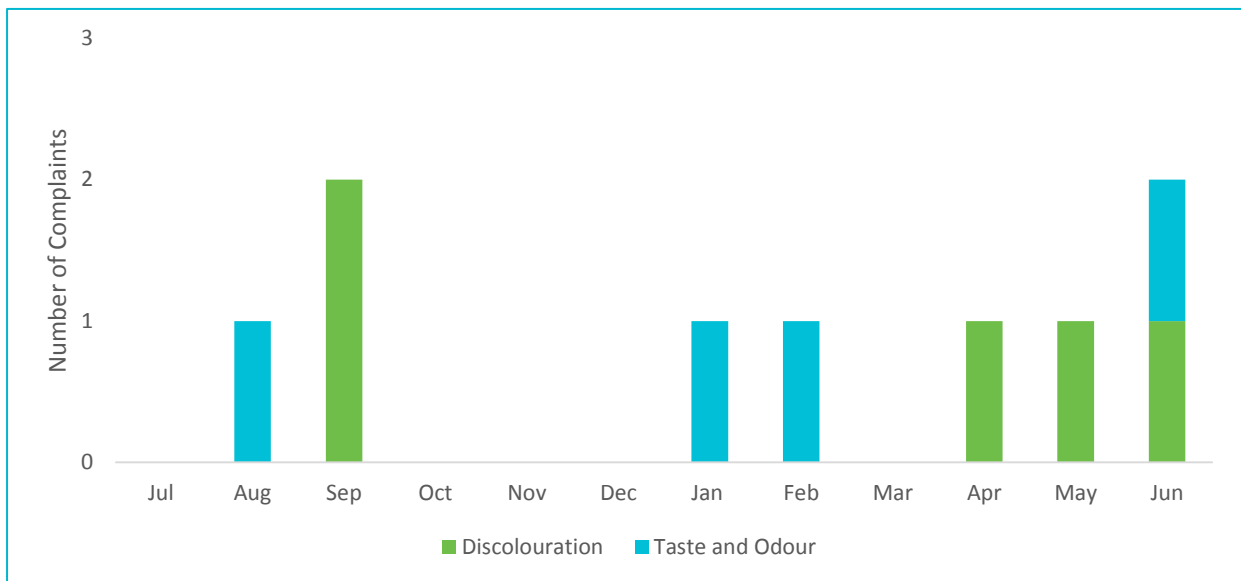


Figure 54.5-b Water quality customer complaints by month and type

56. St Helens drinking water system

56.1. System summary (2017-18)

St Helens drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	2070
Population serviced	2898
Fluoride	Sodium fluoride

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	☑	98.0%	104	0
Fluoride	100.0%	☑	100.0%	240	0
Metals	100.0%	☑	100.0%	4	0
DBPs	100.0%	☑	100.0%	4	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	2	Discolouration, Cloudy Water

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend (\$'000)
Regional Towns Water Supply Program	UV disinfection system	Not started	TBA	TBA

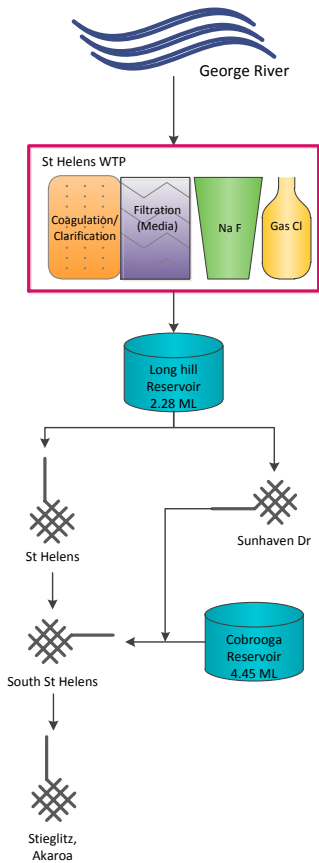


Figure 56.1-a St Helens system schematic

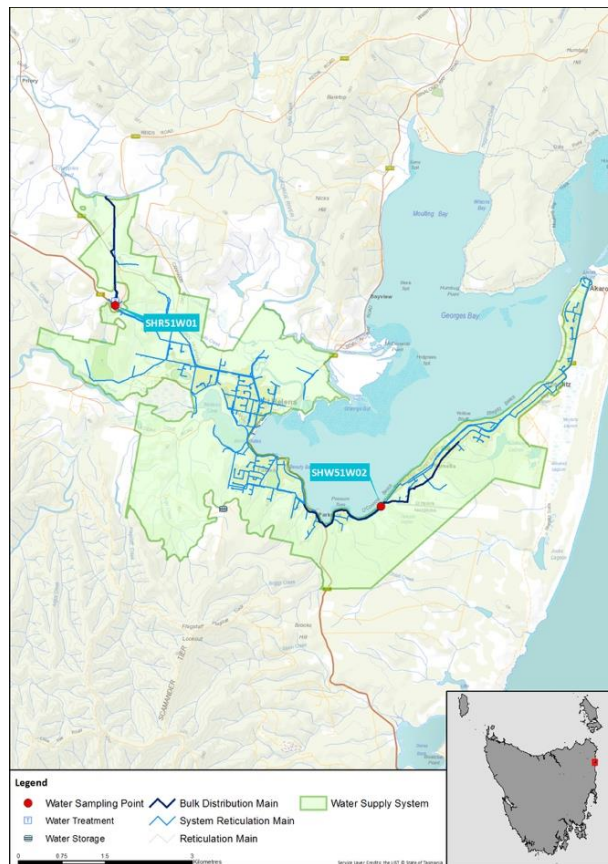


Figure 56.1-b Map of St Helens monitoring system

56.2. Summary of annual reticulation compliance (2017–18)

Table 56.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
St Helens/Longhill Reservoir	SHR51W01	W	n/a	n/a	n/a	n/a
St Helens/Stieglitz Beach	SHW51W02	W	Q	Q	Q	n/a
Number Planned Samples		104	4	4	4	n/a
Number Samples Tested		104	4	4	4	n/a

56.3. Summary of current and historic performance (2013-18)

Table 56.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	98.0%	100.0%	100.0%	100.0%	100.0%
Fluoride	100.0%	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

56.4. Analysis of current health performance (2017-18)

Table 56.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 56.4-b Fluoride operational performance

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	100%
Mean dose (mg/L)	0.99
■ Compliant ■ Non-compliant	

Table 56.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	<0.0003	<0.0003	<0.0003
Barium	2	mg/L	4	0	100	0.007	0.006	0.007
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	0.00009	<0.0001	0.0002
Copper	2	mg/L	4	0	100	0.00473	0.0002	0.0088
Lead	0.01	mg/L	4	0	100	0.0019	0.0003	0.0042
Manganese	0.5	mg/L	4	0	100	0.0019	0.0003	0.0042
Mercury	0.001	mg/L	4	0	100	0.00006	<0.00003	0.00017
Molybdenum	0.05	mg/L	4	0	100	0.00009	<0.0001	0.0002
Nickel	0.02	mg/L	4	0	100	0.00035	<0.0001	0.0012
Selenium	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001

Table 56.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	4	0	100	7.75	4	10
Monochloroacetic acid	150	µg/L	4	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	4	0	100	16.25	10	20
Total trihalomethanes	250	µg/L	4	0	100	43.5	27	53

Table 56.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.88	0.14	1.5
Colour True	HU	15	0.63	<1	1
pH	Units	6.5 – 8.5	7.13	5.83	7.81
Turbidity	NTU	1	0.18	0.04	0.39

56.5. Analysis of overall system performance (2017-18)

Table 56.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

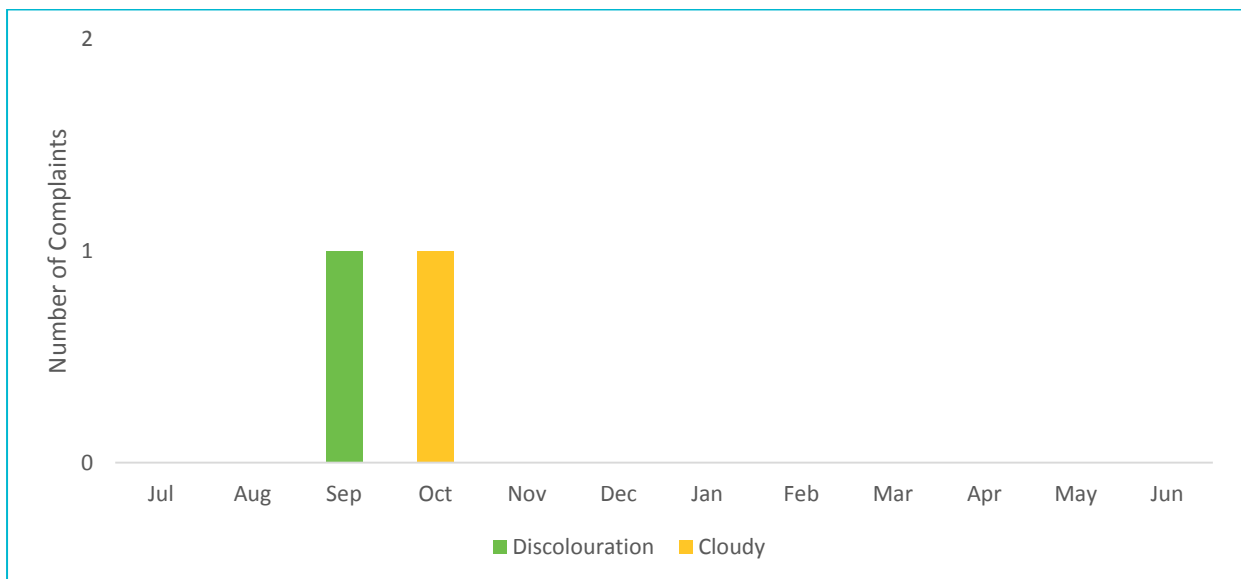


Figure 54.5-b Water quality customer complaints by month and type

57. St Marys drinking water system

57.1. System summary (2017-18)

St Marys drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	401
Population serviced	722
Fluoride	Sodium fluoride

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	☑	98.0%	52	0
Fluoride	100.0%	☑	100.0%	349	0
Metals	100.0%	☑	100.0%	4	0
DBPs	100.0%	☑	100.0%	4	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	1	General Water Quality

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend (\$'000)
Regional Towns Water Supply Program	Major upgrade to WTP	Not started	TBA	TBA

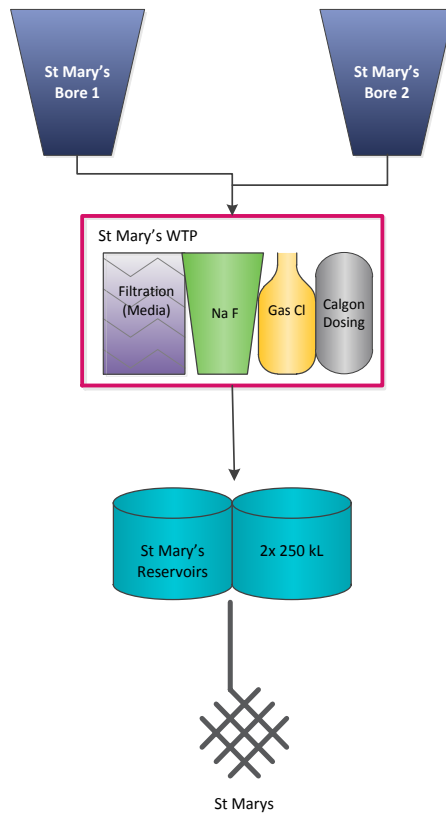


Figure 57.1-a St Marys system schematic

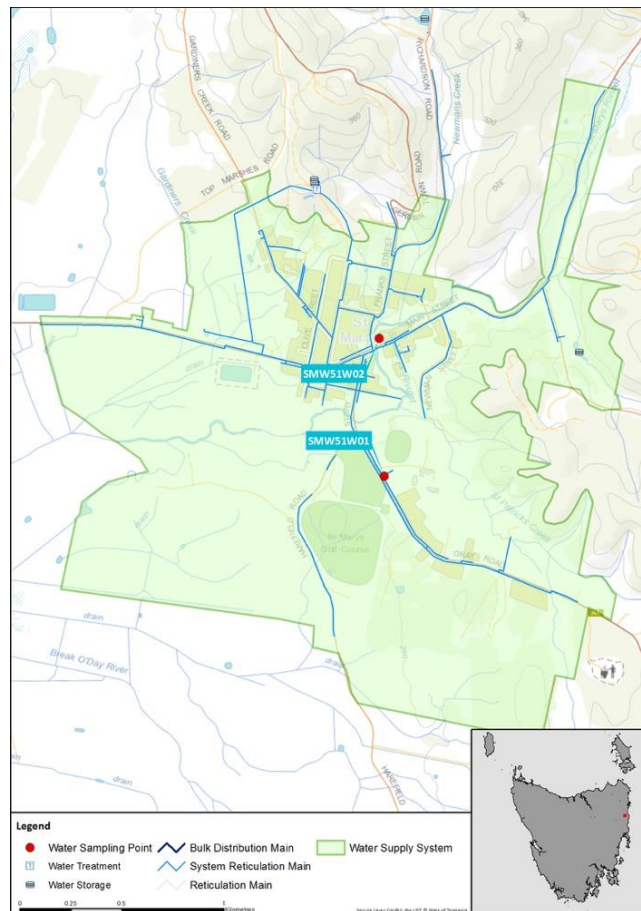


Figure 57.1-b Map of St Marys monitoring system

57.2. Summary of annual reticulation compliance (2017–18)

Table 57.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
St Marys/Park Near Library	SMW51W02	n/a	n/a	n/a	n/a	n/a
St Marys/St. Marys School	SMW51W01	W	Q	Q	Q	n/a
Number Planned Samples		52	4	4	4	n/a
Number Samples Tested		52	4	4	4	n/a

57.3. Summary of current and historic performance (2013-18)

Table 57.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100.0%	100.0%	100.0%	100.0%	100.0%
Fluoride	100.0%	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

57.4. Analysis of current health performance (2017-18)

Table 57.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 57.4-b Fluoride operational performance

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	96.6%
Mean dose (mg/L)	0.97
■ Compliant ■ Non-compliant	

Table 57.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	0.00024	<0.0003	0.0005
Barium	2	mg/L	4	0	100	0.141	0.123	0.16
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	0.00011	<0.0001	0.0003
Copper	2	mg/L	4	0	100	0.0279	0.0197	0.042
Lead	0.01	mg/L	4	0	100	0.00123	0.0011	0.0013
Manganese	0.5	mg/L	4	0	100	0.0065	0.0051	0.0094
Mercury	0.001	mg/L	4	0	100	0.000068	<0.00003	0.00014
Molybdenum	0.05	mg/L	4	0	100	0.00013	<0.0001	0.0002
Nickel	0.02	mg/L	4	0	100	0.00006	<0.0001	0.0001
Selenium	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001

Table 57.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	4	0	100	<1	<1	1
Monochloroacetic acid	150	µg/L	4	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	4	0	100	<1	<1	1
Total trihalomethanes	250	µg/L	4	0	100	15.25	13	19

Table 57.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.47	0.1	0.97
Colour True	HU	15	<1	<1	<1
pH	Units	6.5 – 8.5	7.07	6.58	7.8
Turbidity	NTU	1	1.19	0.4	12.4

57.5. Analysis of overall system performance (2017-18)

Table 57.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

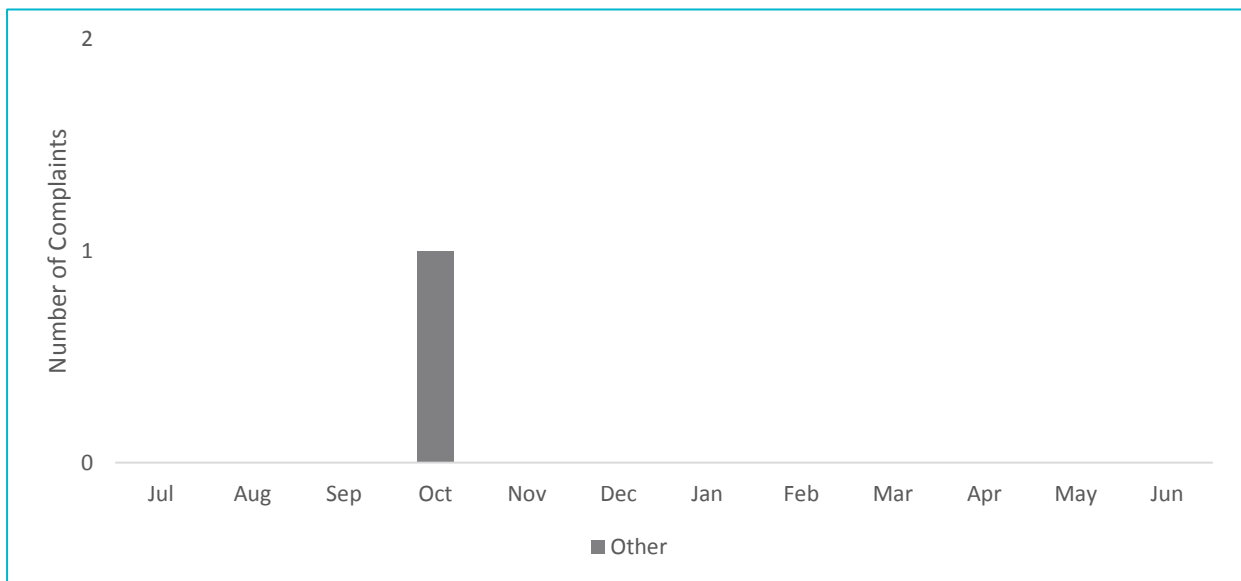


Figure 57.5-b Water quality customer complaints by month and type

58. Swansea drinking water system

58.1. System summary (2017-18)

Swansea drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	742
Population serviced	965
Fluoride	Sodium fluoride

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	☑	98.0%	104	0
Fluoride	100.0%	☑	100.0%	31	0
Metals	100.0%	☑	100.0%	4	0
DBPs	100.0%	☑	100.0%	4	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	1	Fluoride dosing off for maintenance
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	5	Discolouration, Taste & Odour, Illness from Water

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
Swansea Fluoride Project	Fluoride safety upgrade	In progress	September 2018	\$195,000

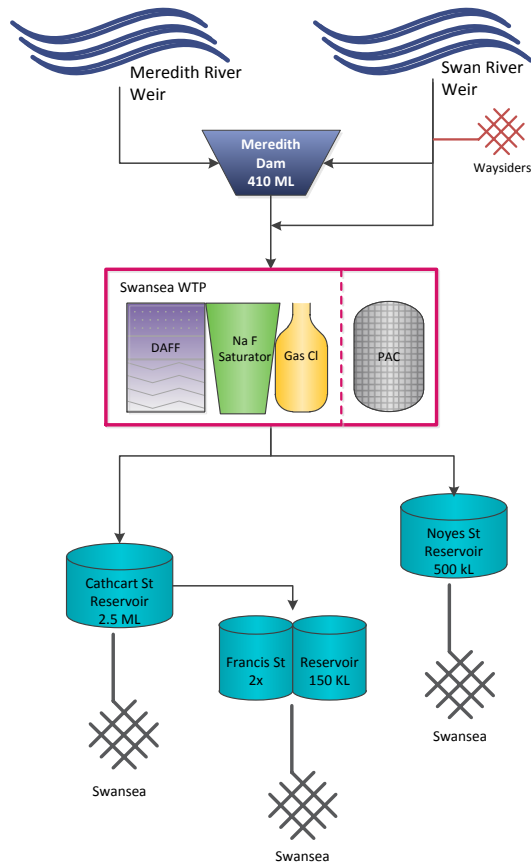


Figure 58.1-a Swansea system schematic

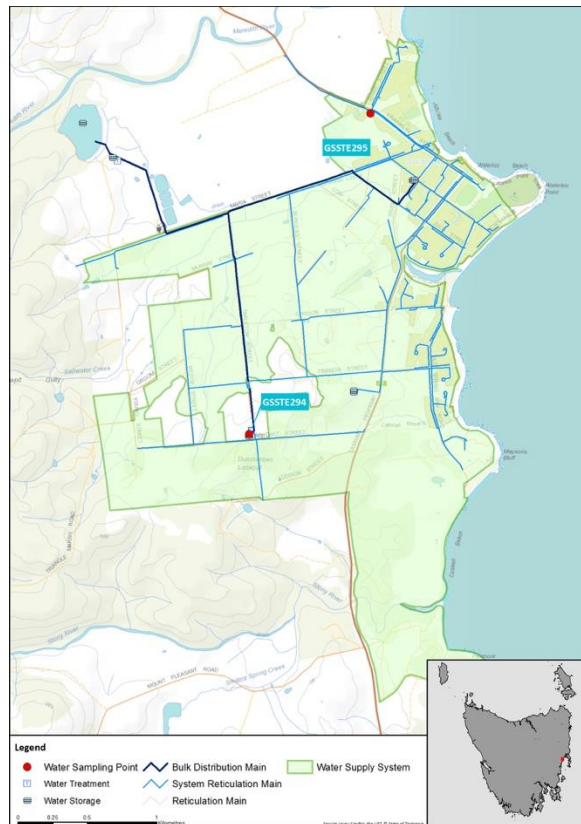


Figure 58.1-b Map of Swansea monitoring system

58.2. Summary of annual reticulation compliance (2017–18)

Table 58.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Swansea/Bark Mill	GSSTE295	W	Q	Q	Q	n/a
Swansea/Cathcart St Sampling Point	GSSTE294	W	Q	Q	Q	n/a
Number Planned Samples		104	8	8	8	n/a
Number Samples Tested		104	4	4	8	n/a

58.3. Summary of current and historic performance (2013-18)

Table 58.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	99.5%	100.0%	100.0%	100.0%	100.0%
Fluoride	100.0%	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

58.4. Analysis of current health performance (2017-18)

Table 58.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 58.4-b Fluoride operational performance

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	3.2%
Mean dose (mg/L)	0.5
■ Compliant ■ Non-compliant	

Table 58.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	<0.0003	<0.0003	<0.0003
Barium	2	mg/L	4	0	100	0.011	0.0044	0.018
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Copper	2	mg/L	4	0	100	0.0285	0.0238	0.0352
Lead	0.01	mg/L	4	0	100	0.00025	0.0002	0.0003
Manganese	0.5	mg/L	4	0	100	0.0011	0.0003	0.0023
Mercury	0.001	mg/L	4	0	100	0.000059	<0.00003	0.00014
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	0.00019	<0.0001	0.0004
Selenium	0.01	mg/L	4	0	100	0.00011	<0.0001	0.0004

Table 58.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	4	0	100	1.7	<1	3
Monochloroacetic acid	150	µg/L	4	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	4	0	100	1.5	1	2
Total trihalomethanes	250	µg/L	4	0	100	36.3	20	53

Table 58.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.65	0.03	1.44
Colour True	HU	15	<1	<1	<1
pH	Units	6.5 – 8.5	7.15	6.64	7.86
Turbidity	NTU	1	0.17	0.04	0.61

58.5. Analysis of overall system performance (2017-18)

Table 58.5-a Summary of system issues/public health warnings

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

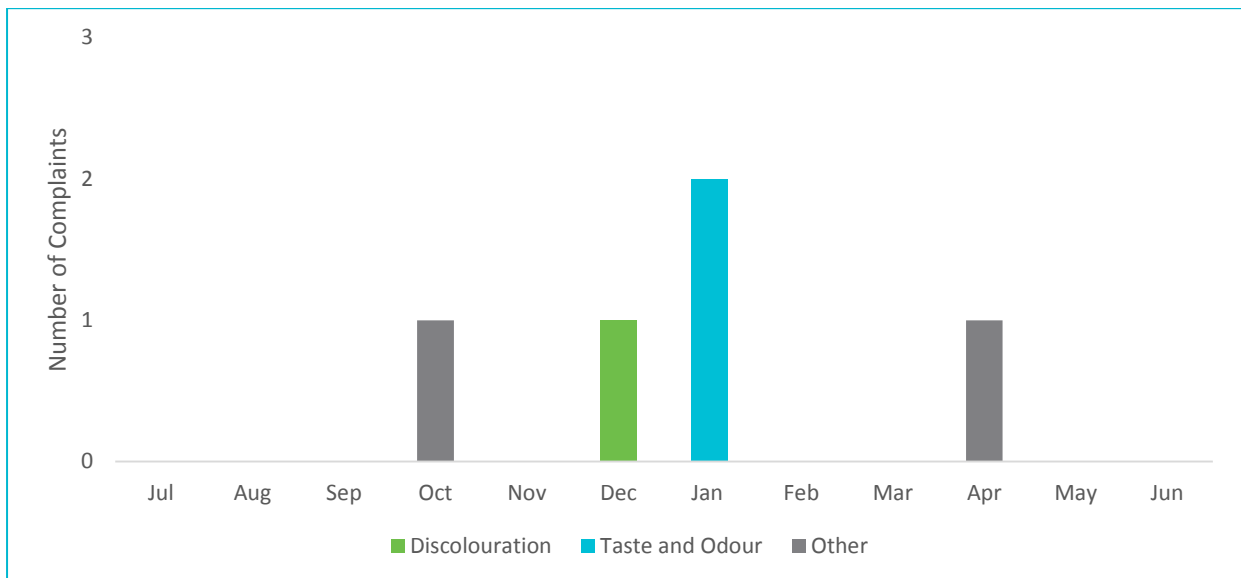


Figure 58.5-b Water quality customer complaints by month and type

59. Triabunna drinking water system

59.1. System summary (2017-18)

Triabunna drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	458
Population serviced	870
Fluoride	Sodium fluoride

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	☑	98.0%	52	0
Fluoride	100.0%	☑	100.0%	296	0
Metals	100.0%	☑	100.0%	4	0
DBPs	100.0%	☑	100.0%	4	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	7	Discolouration, Taste & Odour

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
No projected capital investment				

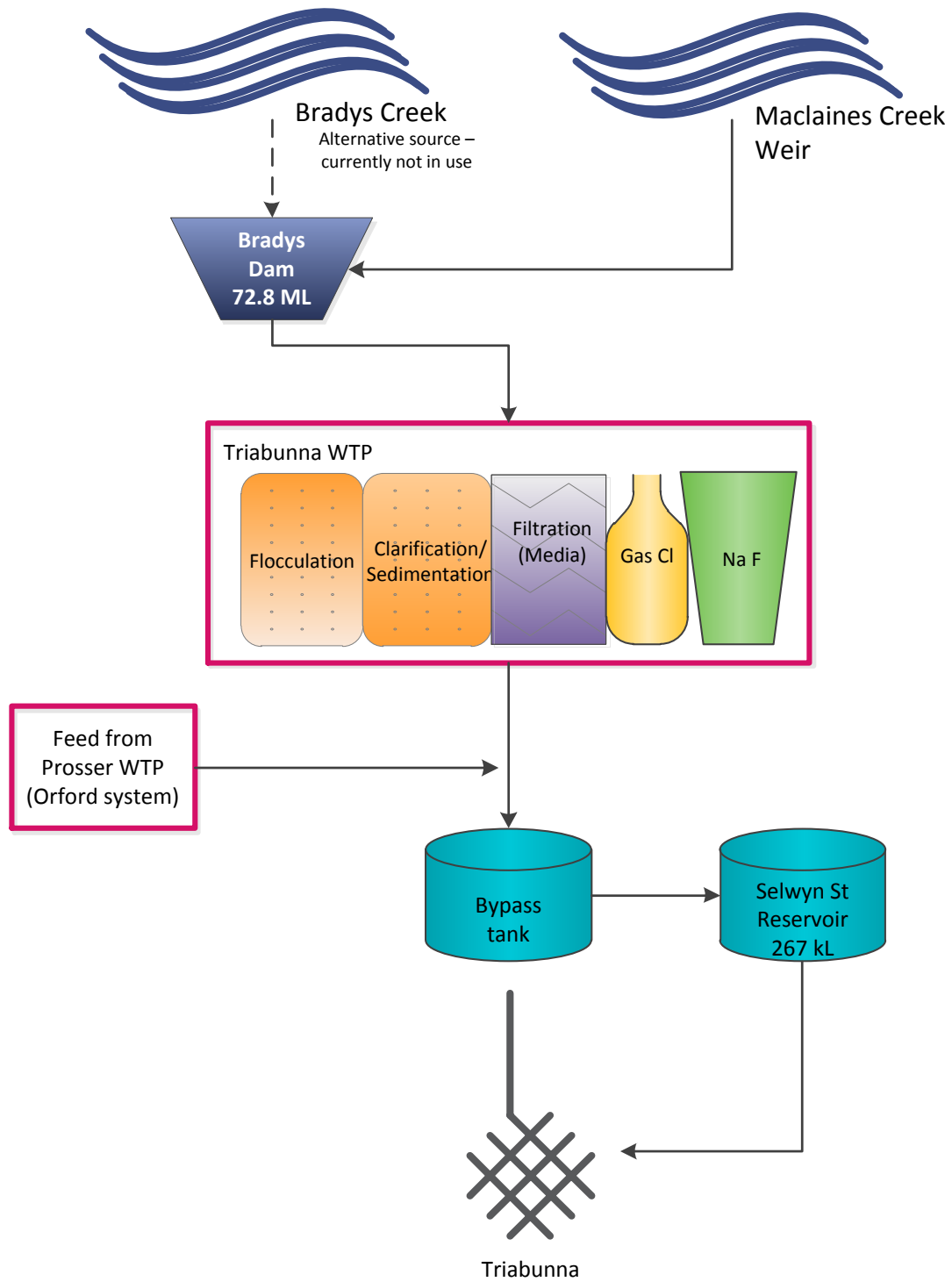


Figure 59.1-a Triabunna system schematic

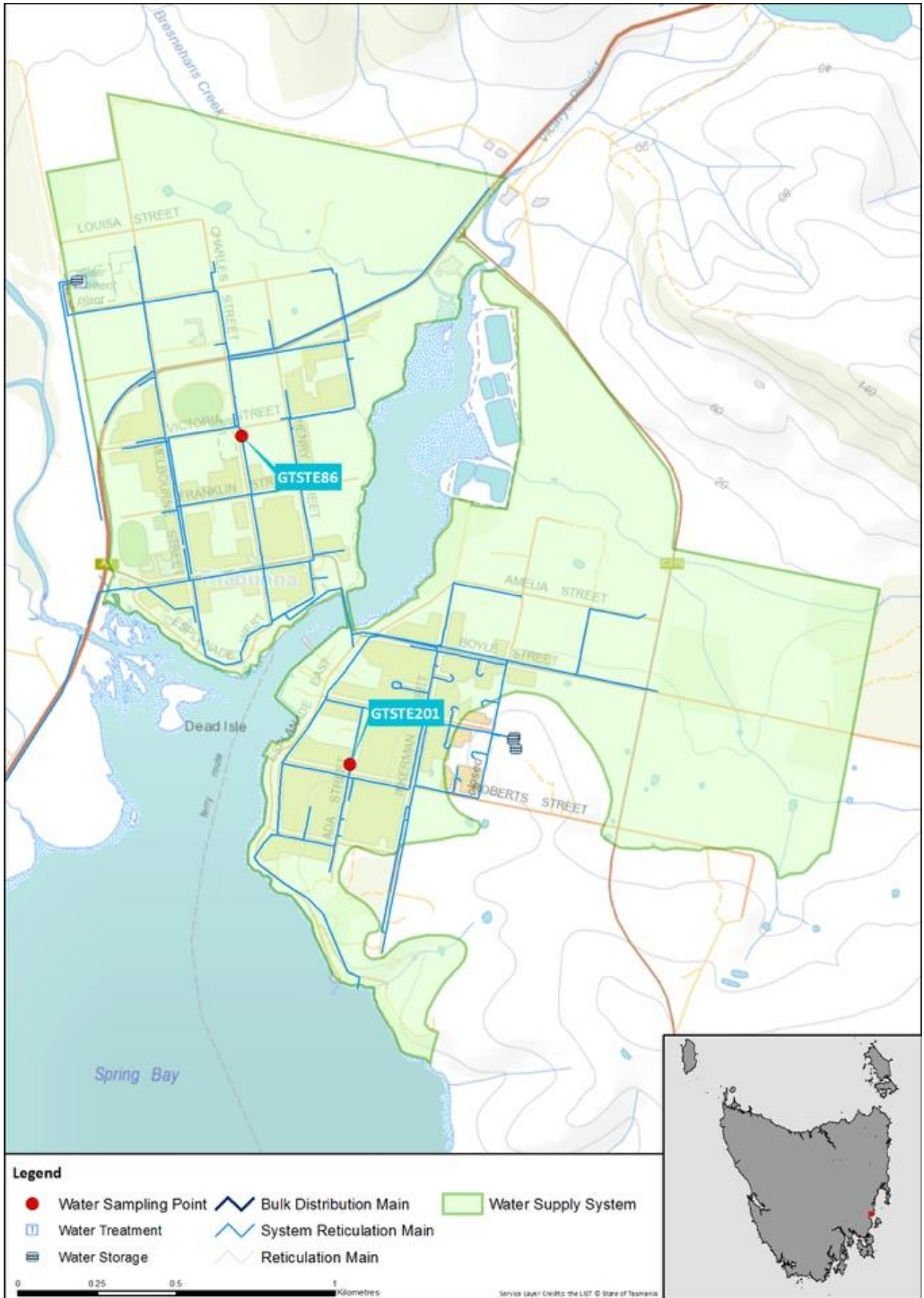


Figure 59.1-b Map of Triabunna monitoring system
59.2. Summary of annual reticulation compliance (2017–18)

Table 59.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Triabunna ada street	GTSTE201	n/a	n/a	n/a	n/a	n/a
Triabunna/Cemetery, Charles St, Sample Tap	GTSTE86	W	Q	Q	Q	n/a
Number Planned Samples		52	4	4	4	n/a
Number Samples Tested		52	4	4	4	n/a

59.3. Summary of current and historic performance (2013-18)

Table 59.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100.0%	100.0%	100.0%	100.0%	100.0%
Fluoride	100.0%	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

59.4. Analysis of current health performance (2017-18)

Table 59.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 59.4-b Fluoride operational performance

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	92.9%
Mean dose (mg/L)	0.94
■ Compliant ■ Non-compliant	

Table 59.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	<0.0003	<0.0003	<0.0003
Barium	2	mg/L	4	0	100	0.013	0.01	0.017
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Copper	2	mg/L	4	0	100	0.00417	0.0023	0.007
Lead	0.01	mg/L	4	0	100	0.00068	0.0003	0.001
Manganese	0.5	mg/L	4	0	100	0.0014	0.001	0.0023
Mercury	0.001	mg/L	4	0	100	0.000149	<0.00003	0.00045
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	0.00008	<0.0001	0.0001
Selenium	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001

Table 59.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	4	0	100	3	2	4
Monochloroacetic acid	150	µg/L	4	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	4	0	100	1.38	<1	2
Total trihalomethanes	250	µg/L	4	0	100	79	61	97

Table 59.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.78	0.25	1.39
Colour True	HU	15	0.88	<1	2
pH	Units	6.5 – 8.5	7.28	6.97	8.18
Turbidity	NTU	1	0.23	0.12	0.8

59.5. Analysis of overall system performance (2017-18)

Table 59.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

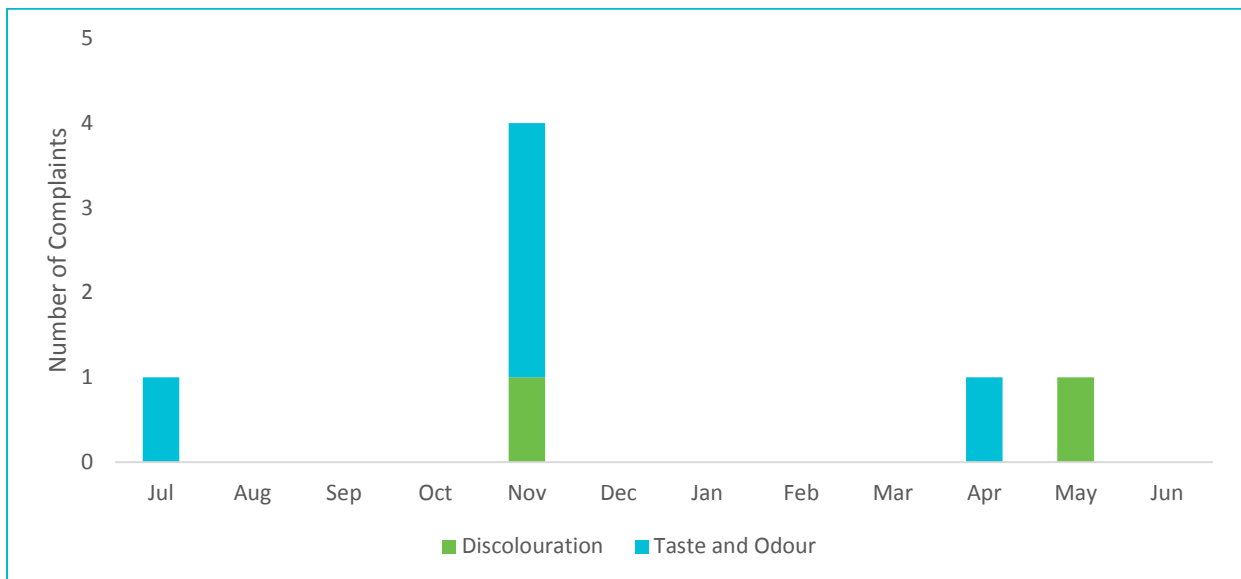


Figure 59.5-b Water quality customer complaints by month and type

60. Tullah drinking water system

60.1. System summary (2017-18)

Tullah drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	226
Population serviced	226
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	<input checked="" type="checkbox"/>	98.0%	104	0
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0
DBPs	100.0%	<input checked="" type="checkbox"/> ³⁸	100.0%	11	0

■ Compliant
 ■ Non-compliant
 ■ Compliance unknown

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	2	Taste and Odour, Chlorine General

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
No projected capital investment				

³⁸ Sampling requirements no met (missed one monthly sample)

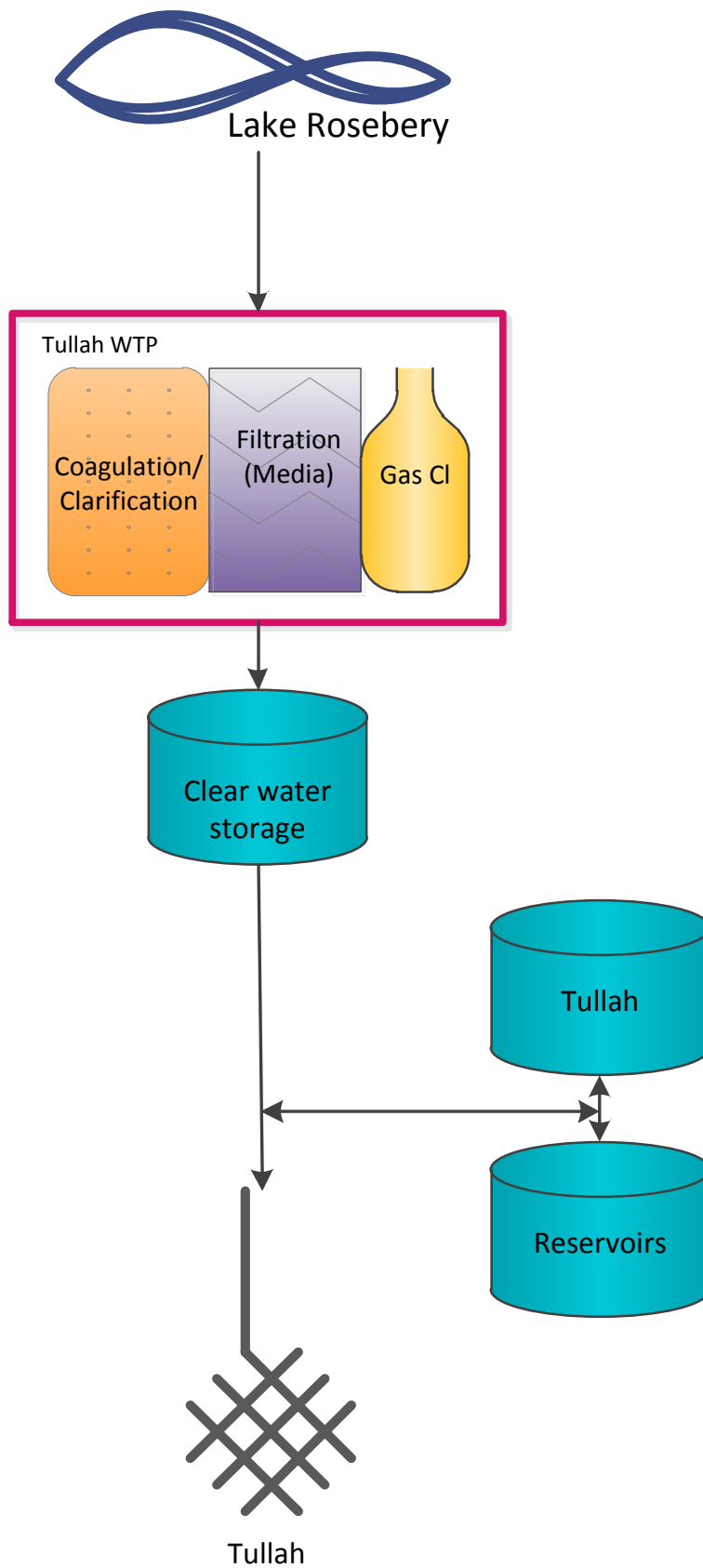


Figure 60.1-a Tullah system schematic

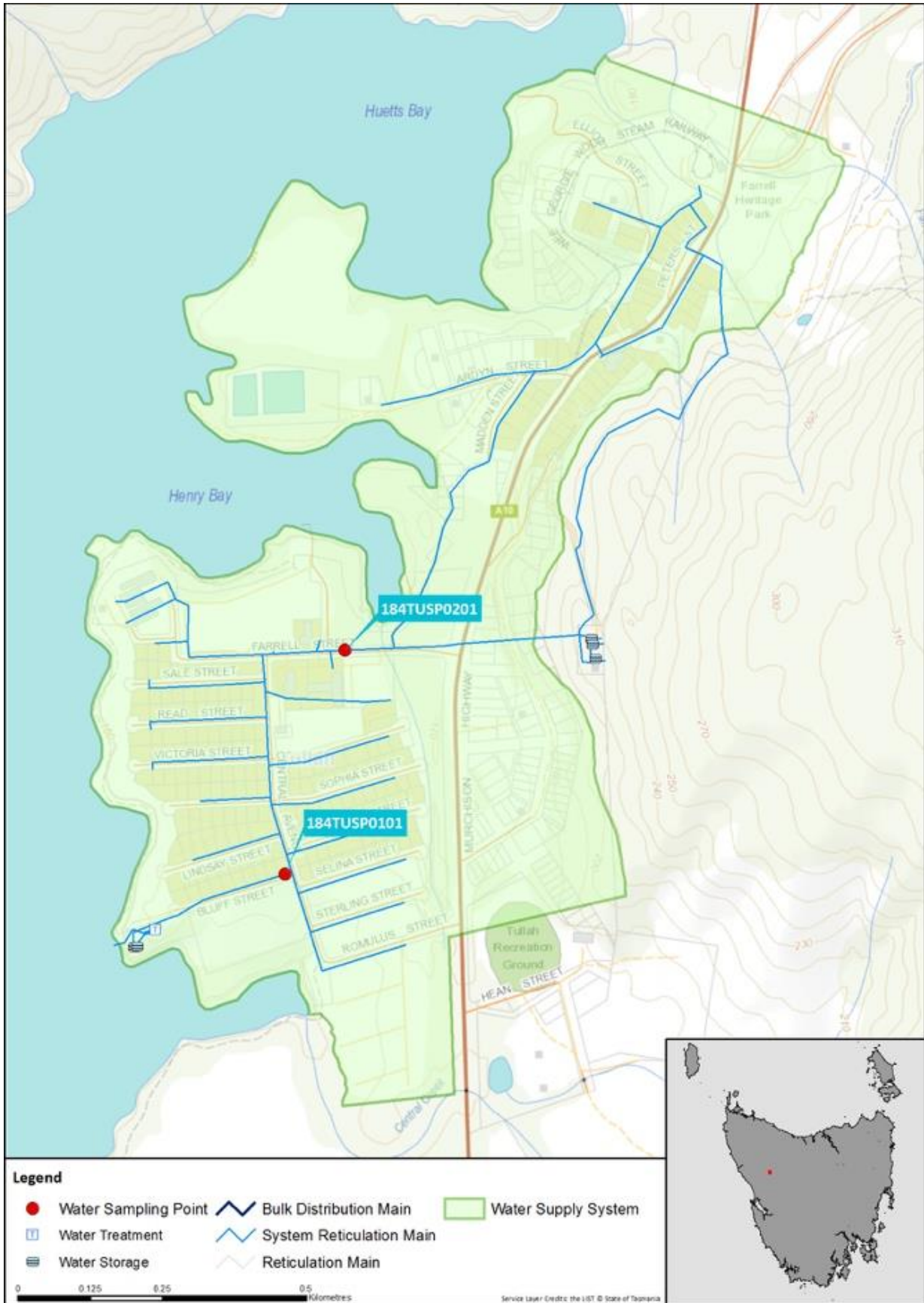


Figure 60.1-b Map of Tullah monitoring system

60.2. Summary of annual reticulation compliance (2017–18)

Table 60.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Tullah/Bluff St Sample Point 1	184TUSP0101	W	Q	n/a	Q	n/a
Tullah/Farrell Sample Point 2	184TUSP0201	W	n/a	M	n/a	n/a
Number Planned Samples		104	4	12	4	n/a
Number Samples Tested		104	4	11³⁹	4	n/a

60.3. Summary of current and historic performance (2013-18)

Table 60.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	98.9%	100.0%	100.0%	100.0%	100.0%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	99.2%	96.3%	100.0%	100.0%

■ Compliant
 ■ Non-compliant
 Compliance unknown

60.4. Analysis of current health performance (2017-18)

Table 60.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

³⁹ Sampling requirements not met (sample missed in May 2018 for DBPs)

Table 60.4-b Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	0.0004	0.0003	0.0005
Barium	2	mg/L	4	0	100	0.004	0.003	0.005
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Copper	2	mg/L	4	0	100	0.00063	0.0004	0.001
Lead	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Manganese	0.5	mg/L	4	0	100	0.0078	0.0041	0.0102
Mercury	0.001	mg/L	4	0	100	0.000046	<0.00003	0.00014
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	0.00013	<0.0001	0.0002
Selenium	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001

Table 60.4-c Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	11	0	100	9.09	1	25
Monochloroacetic acid	150	µg/L	11	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	11	0	100	37.18	29	46
Total trihalomethanes	250	µg/L	11	0	100	97.55	81	114

Table 60.4-d General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.9	0	2.55
Colour True	HU	15	1.75	<1	4
pH	Units	6.5 – 8.5	7.3	6.77	7.7
Turbidity	NTU	1	0.73	0.21	10.24

60.5. Analysis of overall system performance (2017-18)

Table 60.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

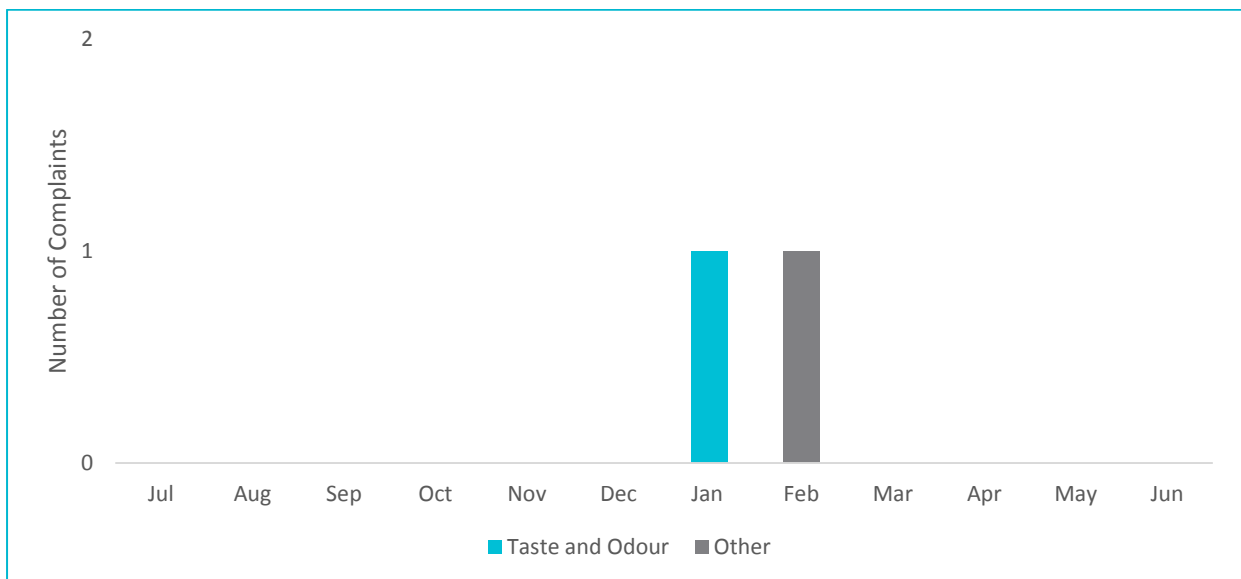


Figure 60.5-b Water quality customer complaints by month and type

61. Tunbridge drinking water system

Tunbridge drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	117
Population serviced	222
Fluoride	n/a

61.1. System summary (2017-18)

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	<input checked="" type="checkbox"/>	98.0%	52	0
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0
DBPs	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	2	Discolouration

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
No projected capital investment				

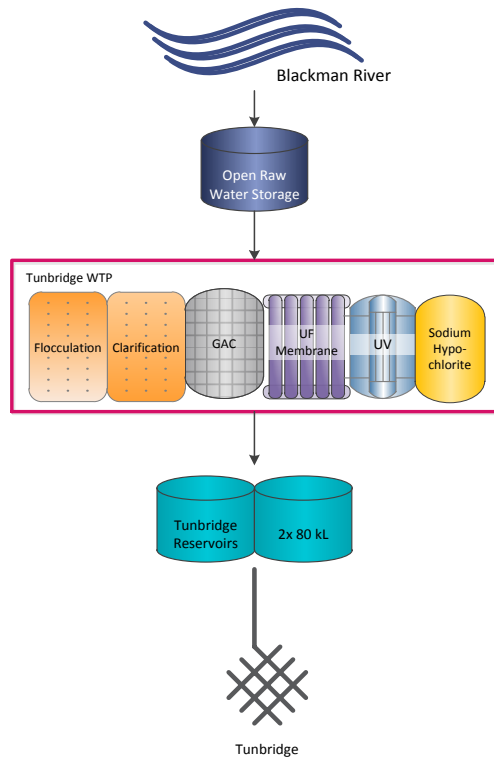


Figure 61.1-a Tunbridge system schematic

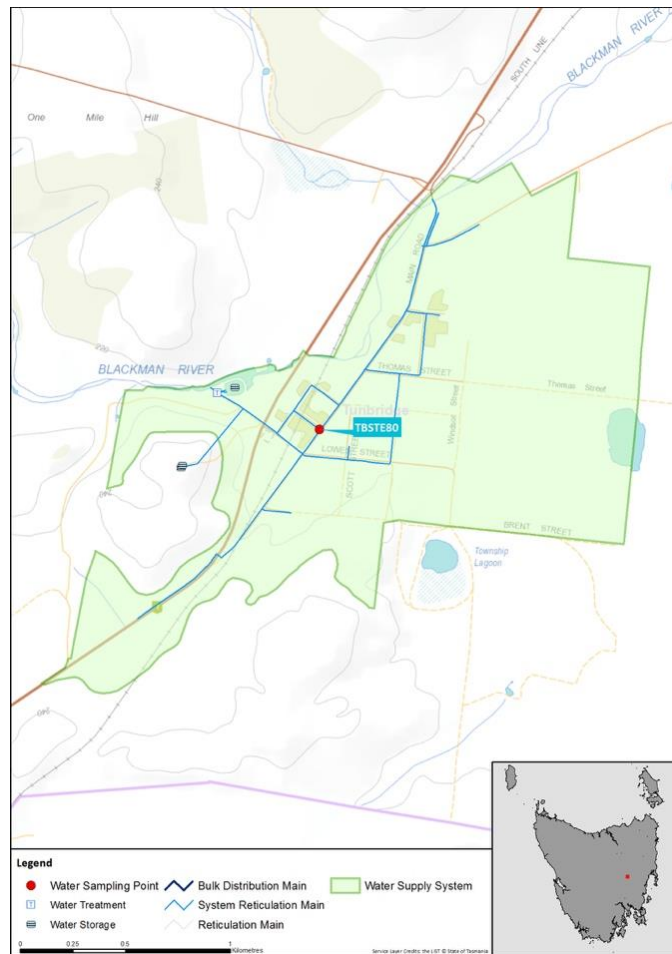


Figure 61.1-b Map of Tunbridge monitoring system

61.2. Summary of annual reticulation compliance (2017–18)

Table 61.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Tunbridge/Tunbridge St Sample Post	TBSTE80	W	Q	Q	Q	n/a
Number Planned Samples		52	4	4	4	n/a
Number Samples Tested		52	4	4	4	n/a

61.3. Summary of current and historic performance (2013-18)

Table 61.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100.0%	100.0%	100.0%	100.0%	100.0%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	98.0%	98.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

61.4. Analysis of current health performance (2017-18)

Table 61.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 61.4-b Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	0.00019	<0.0003	0.0003
Barium	2	mg/L	4	0	100	0.00019	<0.0003	0.0003
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	0.00011	<0.0001	0.0003
Copper	2	mg/L	4	0	100	0.00632	0.0045	0.0085
Lead	0.01	mg/L	4	0	100	0.00043	0.0002	0.0007
Manganese	0.5	mg/L	4	0	100	0.0151	0.0001	0.0601
Mercury	0.001	mg/L	4	0	100	0.000118	<0.00003	0.00039
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	0.00022	0.0002	0.0003
Selenium	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001

Table 61.4-c Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	4	0	100	3	2	4
Monochloroacetic acid	150	µg/L	4	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	4	0	100	<1	<1	1
Total trihalomethanes	250	µg/L	4	0	100	101.75	67	140

Table 61.4-d General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.37	0.05	0.62
Colour True	HU	15	1.13	<1	3
pH	Units	6.5 – 8.5	8.04	7.07	8.26
Turbidity	NTU	1	0.14	0.06	0.77

61.5. Analysis of overall system performance (2017-18)

Table 61.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

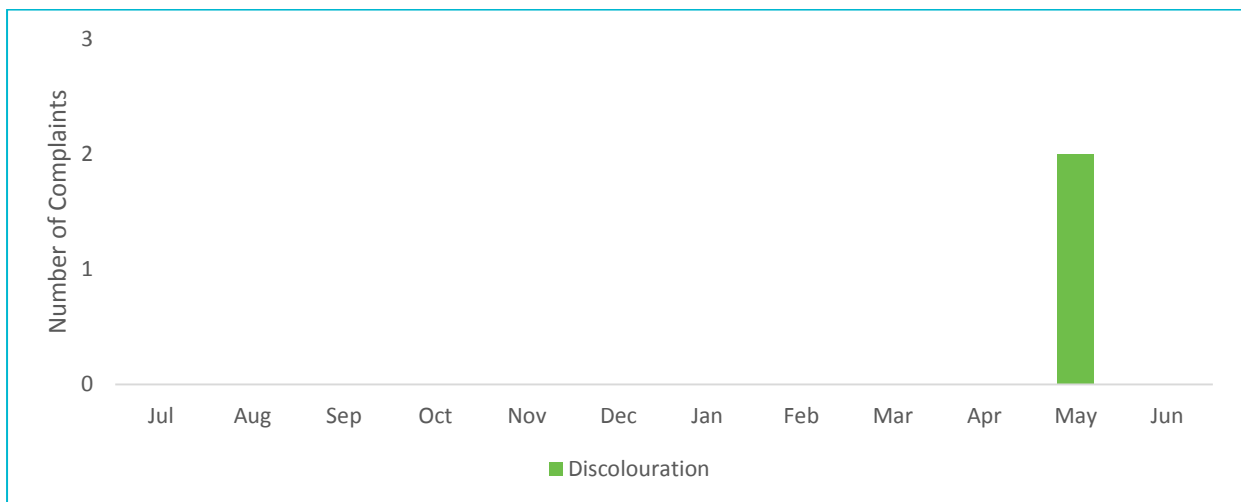


Figure 61.5-b Water quality customer complaints by month and type

62. Waratah drinking water system

62.1. System summary (2017-18)

Waratah drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	137
Population serviced	219
Fluoride	Sodium fluoride

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	☑	98.0%	52	0
Fluoride	100.0%	☑	100.0%	113	0
Metals	100.0%	☑	100.0%	4	0
DBPs	100.0%	☑	100.0%	4	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	5	Discolouration

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
No projected capital investment				

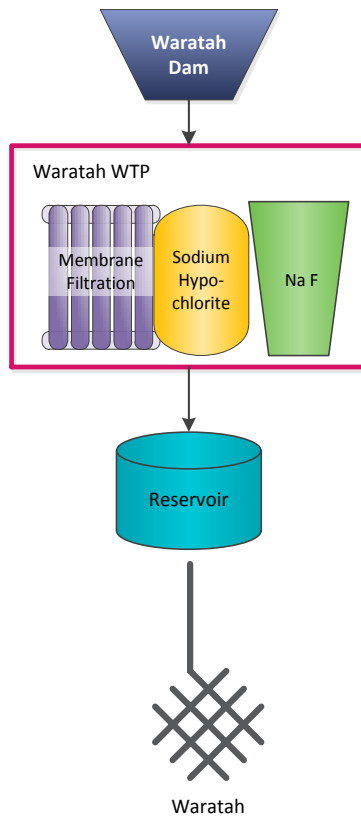


Figure 62.1-a Waratah system schematic

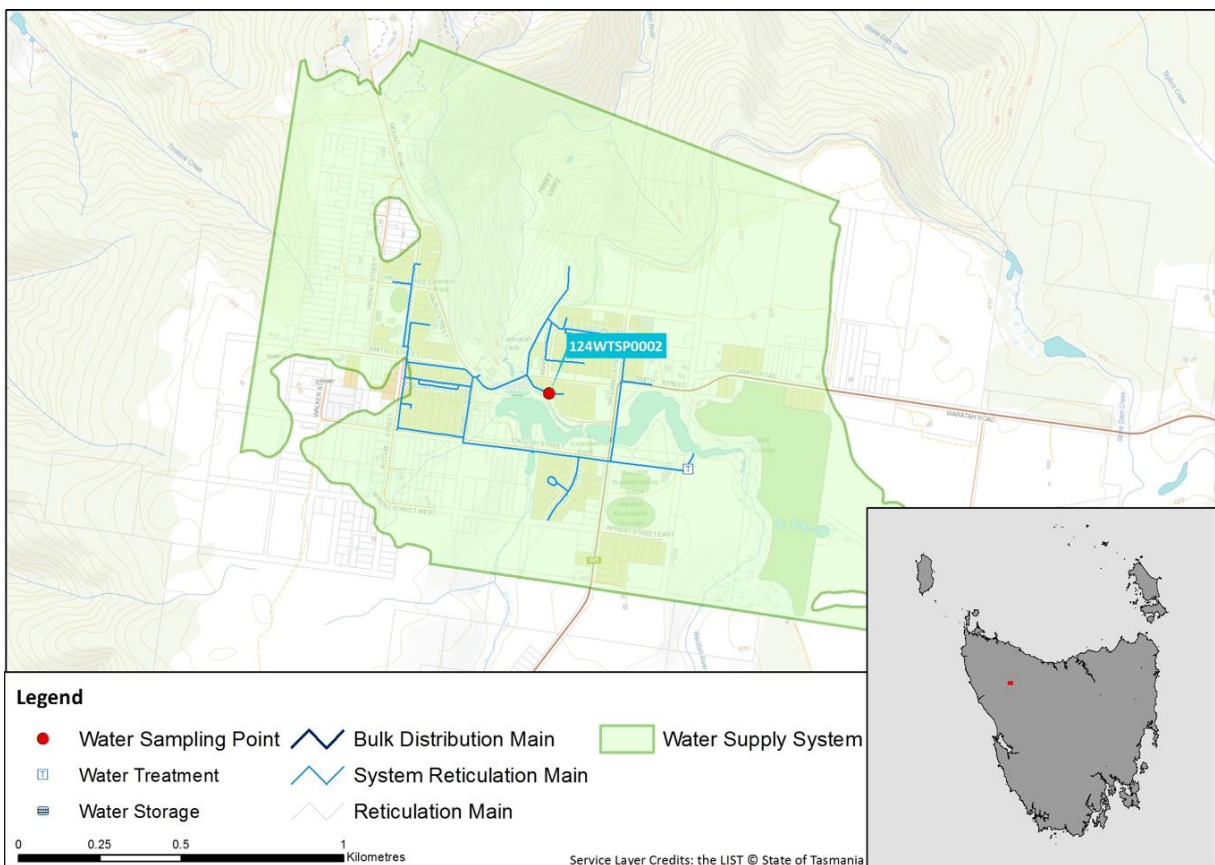


Figure 62.1-b Map of Waratah monitoring system

62.2. Summary of annual reticulation compliance (2017–18)

Table 62.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Waratah/Caravan Park Sample Point	124WTSP0002	W	Q	Q	Q	n/a
Number Planned Samples		52	4	4	4	n/a
Number Samples Tested		52	4	4	4	n/a

62.3. Summary of current and historic performance (2013-18)

Table 62.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100.0%	99.1%	100.0%	100.0%	100.0%
Fluoride	n/a	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

62.4. Analysis of current health performance (2017-18)

Table 62.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 62.4-b Fluoride operational performance

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	98.2%
Mean dose (mg/L)	0.95
■ Compliant ■ Non-compliant	

Table 62.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	0.00019	<0.0003	0.0003
Barium	2	mg/L	4	0	100	0.002	0.002	0.002
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	0.00019	<0.0001	0.0003
Copper	2	mg/L	4	0	100	0.02315	0.0181	0.0303
Lead	0.01	mg/L	4	0	100	0.00057	0.0005	0.0007
Manganese	0.5	mg/L	4	0	100	0.0071	0.001	0.0206
Mercury	0.001	mg/L	4	0	100	0.000045	<0.00003	0.00009
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	0.00009	<0.0001	0.0002
Selenium	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001

Table 62.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	4	0	100	28.25	26	33
Monochloroacetic acid	150	µg/L	4	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	4	0	100	34.75	32	37
Total trihalomethanes	250	µg/L	4	0	100	59.25	45	71

Table 62.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.35	0.04	0.78
Colour True	HU	15	1.75	<1	4
pH	Units	6.5 – 8.5	7.01	6.43	7.5
Turbidity	NTU	1	0.28	0.11	0.89

62.5. Analysis of overall system performance (2017-18)

Table 62.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

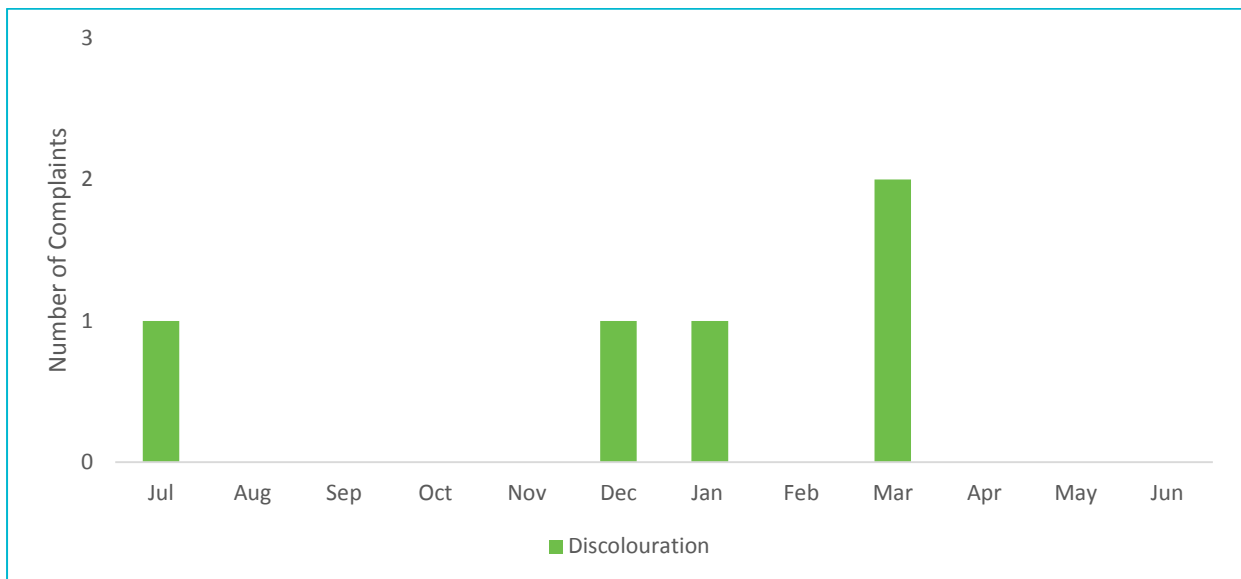


Figure 62.5-b Water quality customer complaints by month and type

63. Wayatinah drinking water system

63.1. System summary (2017-18)

Wayatinah drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	64
Population serviced	38
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	<input checked="" type="checkbox"/>	98.0%	52	0
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0
DBPs	100.0%	<input checked="" type="checkbox"/>	100.0%	12	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	1	Subject to PHA until 25 June 2018
Notifications made to DoH	0	
Customer complaints	0	

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend (\$'000)
Regional Towns Program	WTP and associated infrastructure	Complete	June 2018	\$2,734,602
Regional Towns Program	Reticulation upgrade	Complete	June 2018	\$452,011

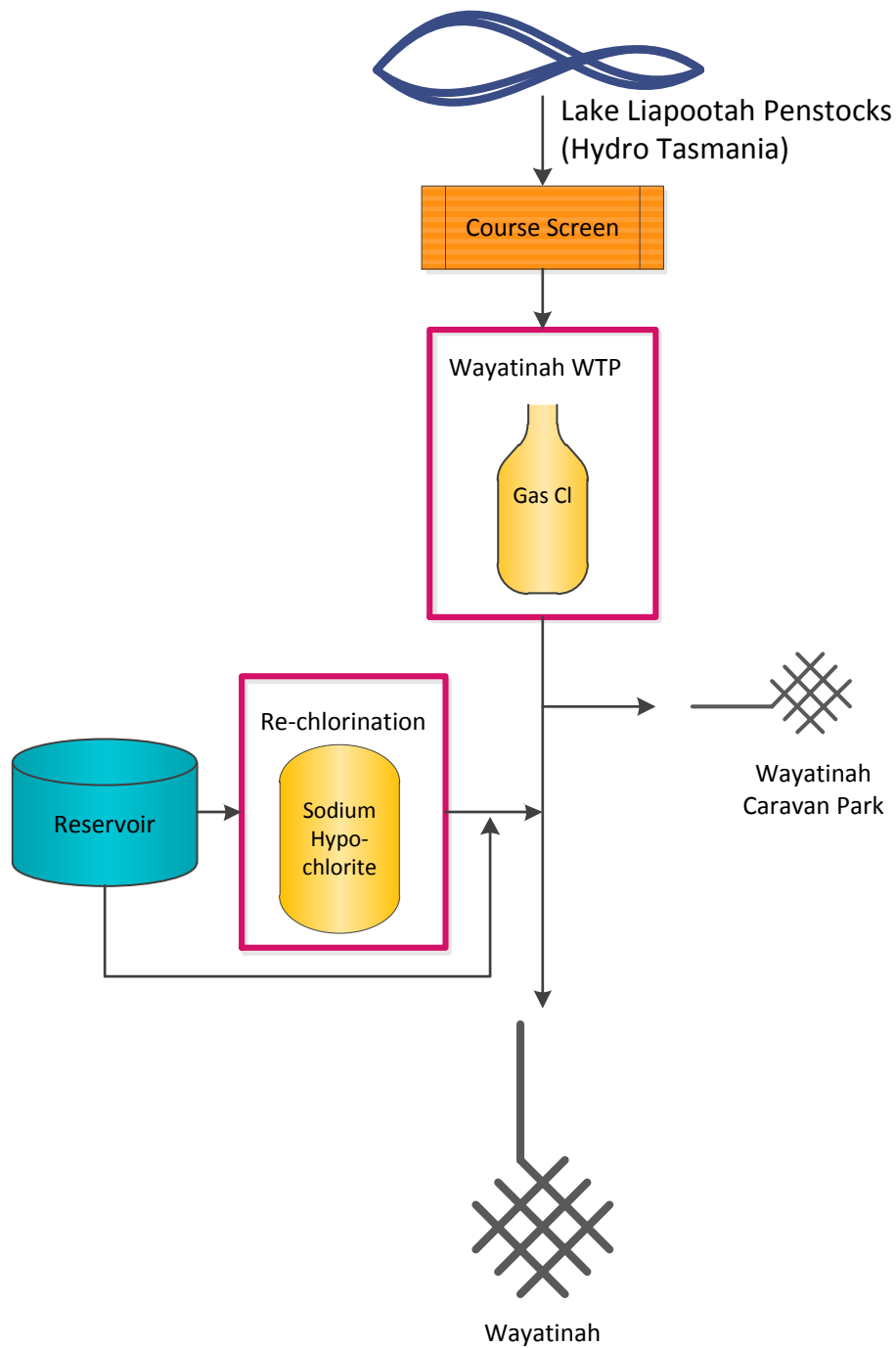


Figure 63.1-a Wayatinah system schematic

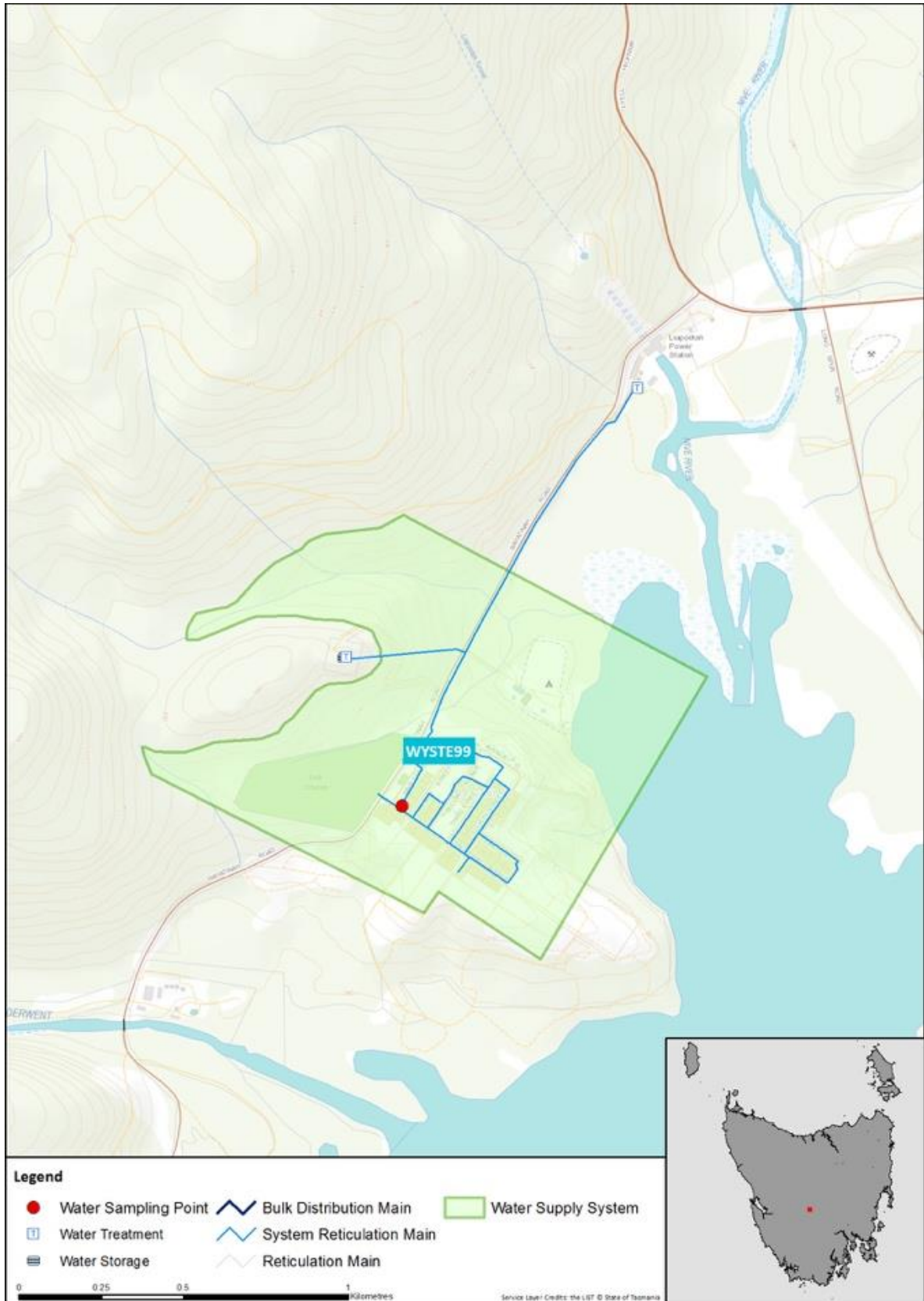


Figure 63.1-b Map of Wayatinah monitoring system

63.2. Summary of annual reticulation compliance (2017–18)

Table 63.2-a Sampling program

Planned compliance sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Wayatinah/Sample Tap	WYSTE99	W	Q	M	Q	n/a
Number Planned Samples		52	4	12	4	n/a
Number Samples Tested		52	4	12	4	n/a

63.3. Summary of current and historic performance (2013-18)

Table 63.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	99.5%	100.0%	100.0%	98.1%	100.0%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	86.0%	95.8%	100.0%

■ Compliant ■ Non-compliant

63.4. Analysis of current health performance (2017-18)

Table 63.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 63.4-b Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	0.00017	<0.0003	0.0004
Barium	2	mg/L	4	0	100	0.0025	0.0013	0.0057
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	0.00011	<0.0001	0.0002
Copper	2	mg/L	4	0	100	0.012	0.007	0.0176
Lead	0.01	mg/L	4	0	100	0.00045	0.0002	0.0007
Manganese	0.5	mg/L	4	0	100	0.0066	0.0054	0.008
Mercury	0.001	mg/L	4	0	100	<0.00003	<0.00003	<0.00003
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	<0.0001	<0.0001	0.0002
Selenium	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001

Table 63.4-c Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	12	0	100	5.2	<1	18
Monochloroacetic acid	150	µg/L	12	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	12	0	100	7.7	<1	30
Total trihalomethanes	250	µg/L	12	0	100	29	16	39

Table 63.4-d General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.36	0	2.2
Colour True	HU	15	3.5	<1	18
pH	Units	6.5 – 8.5	7.23	6.37	8.94
Turbidity	NTU	1	0.92	0.12	3.62

63.5. Analysis of overall system performance (2017-18)

Table 63.5-a Summary of system issues/public health warnings with notification details

Summary of system issues/public health warnings				
Date	Type	Description	DoH notification required	DoH notification complete
25/06/2018	PHA	PHA removed by DoH	✓	✓

64. West Tamar drinking water system

64.1. System summary (2017-18)

West Tamar drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	10138
Population serviced	23317
Fluoride	Fluorosilicic acid

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	☑	98.0%	572	0
Fluoride	100.0%	☑	100.0%	365	0
Metals	100.0%	☑	100.0%	4	0
DBPs	100.0%	☑	100.0%	4	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	64	Discolouration, Taste & Odour, PHA Notices

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
No projected capital investment				

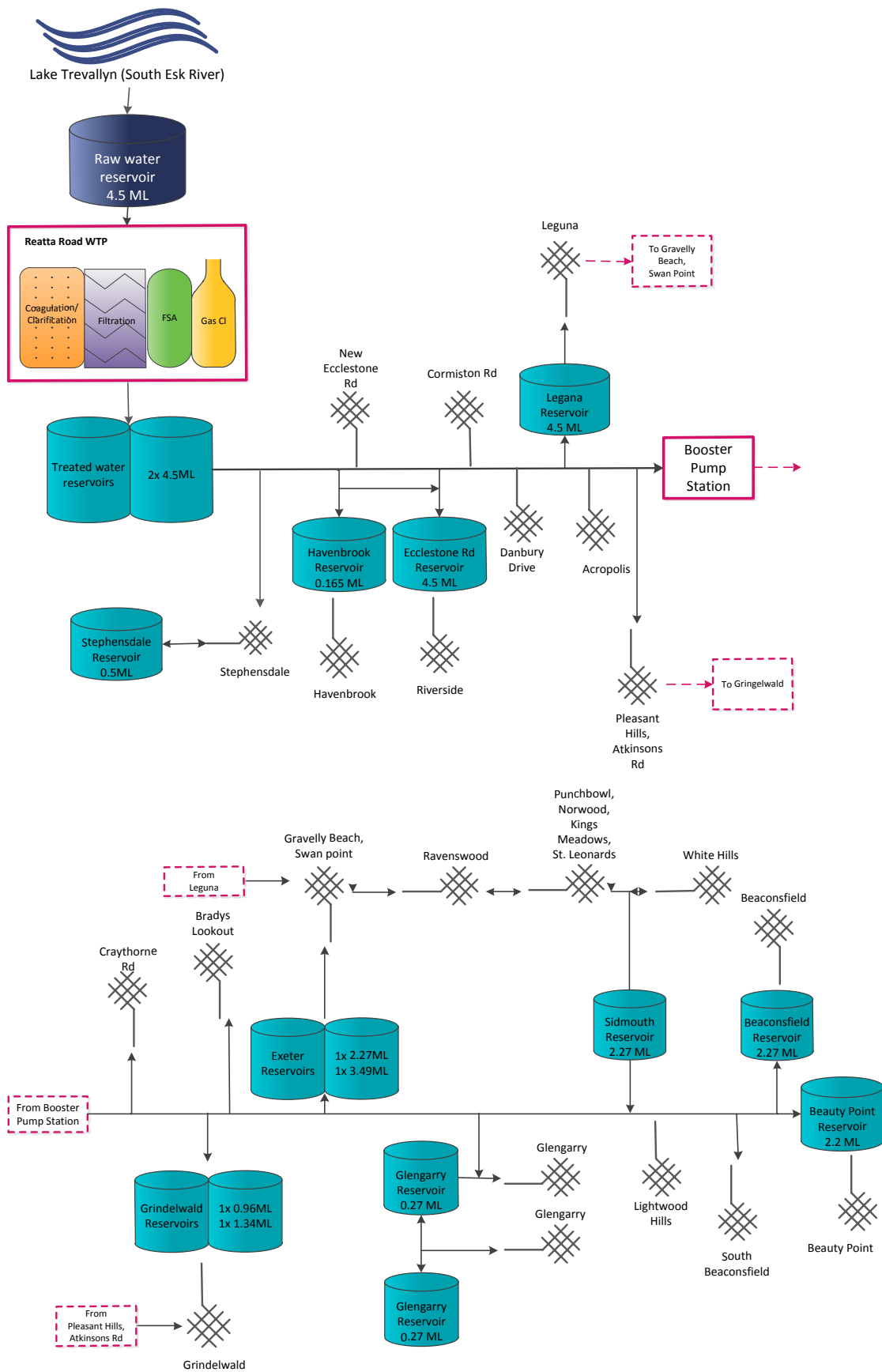


Figure 64.1-a West Tamar system schematic

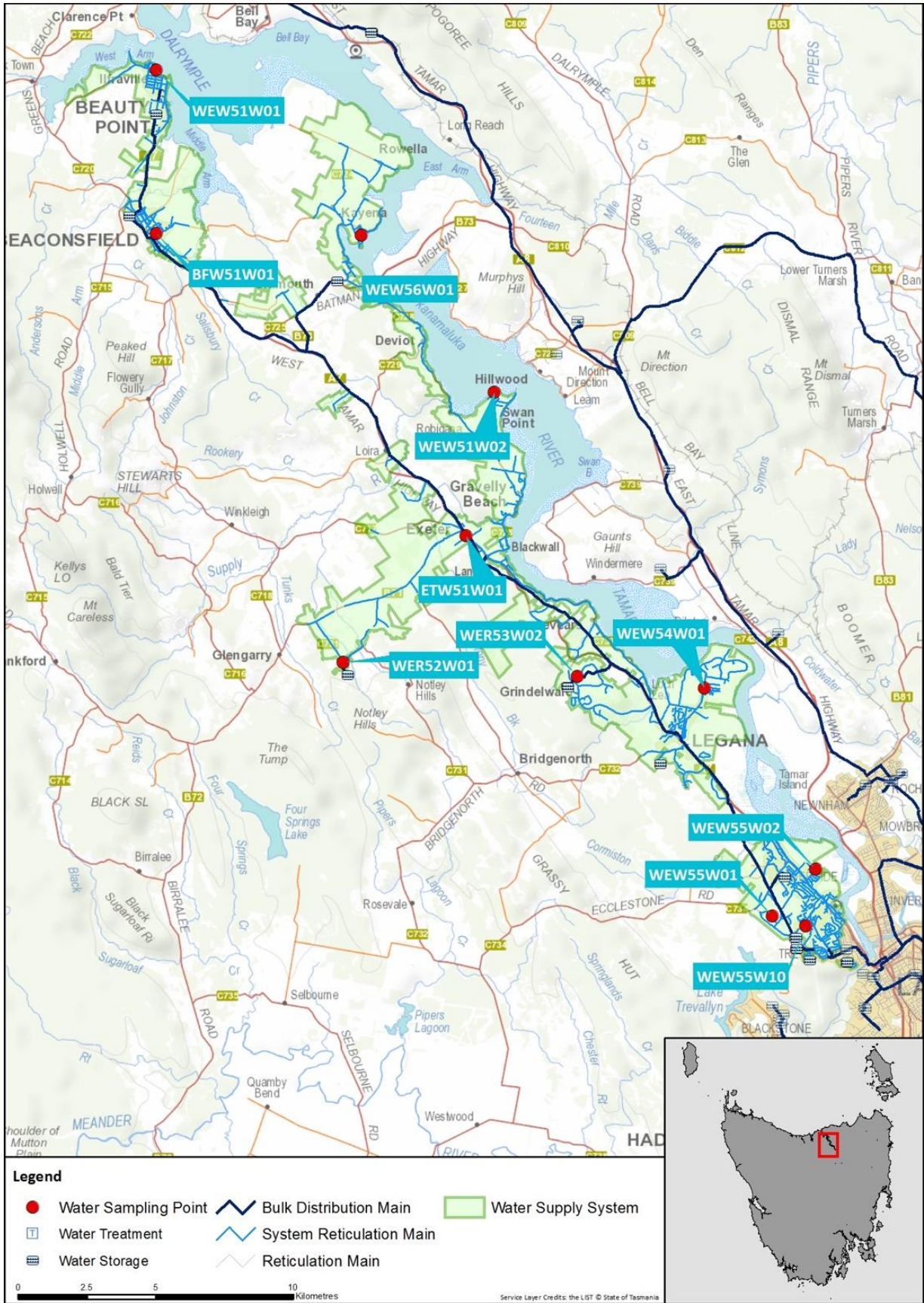


Figure 64.1-b Map of West Tamar monitoring system

64.2. Summary of annual reticulation compliance (2017–18)

Table 64.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Exeter, Biloo St	ETW51W01	W	Q	Q	Q	n/a
Stephensdale, 14 Marlou Crt	WEW55W01	W	n/a	n/a	n/a	n/a
Riverside, 32 Gray St	WEW55W10	W	n/a	n/a	n/a	n/a
Riverside, Cleghorn St	WEW55W02	W	n/a	n/a	n/a	n/a
Legana Freshwater Point Rd	WEW54W01	W	n/a	n/a	n/a	n/a
Grindelwald Retic Outlet	WER53W02	W	n/a	n/a	n/a	n/a
Swan Pt, Park	WEW51W02	W	n/a	n/a	n/a	n/a
Glengarry Res, Reservoir	WER52W01	W	n/a	n/a	n/a	n/a
Kayena, Bonnie Beach	WEW56W01	W	n/a	n/a	n/a	n/a
Beauty Point, Esplanade Toilets	WEW51W01	W	n/a	n/a	n/a	n/a
Beaconsfield, John St Near Fire Station	BFW51W01	W	n/a	n/a	n/a	n/a
Number Planned Samples		572	4	4	4	n/a
Number Samples Tested		572	4	4	4	n/a

64.3. Summary of current and historic performance (2013-18)

Table 64.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	99.0%	99.0%	99.7%	100.0%	100.0%
Fluoride	100.0%	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

64.4. Analysis of current health performance (2017-18)

Table 64.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 64.4-b Fluoride operational performance

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	97.8%
Mean dose (mg/L)	0.95
■ Compliant ■ Non-compliant	

Table 64.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	<0.0003	<0.0003	<0.0003
Barium	2	mg/L	4	0	100	0.009	0.006	0.012
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	0.00131	<0.0001	0.0051
Copper	2	mg/L	4	0	100	0.0014	0.0003	0.0032
Lead	0.01	mg/L	4	0	100	0.00015	<0.0001	0.0003
Manganese	0.5	mg/L	4	0	100	0.0019	0.0015	0.0025
Mercury	0.001	mg/L	4	0	100	0.000101	<0.00003	0.0002
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	0.00013	<0.0001	0.0002
Selenium	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001

Table 64.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	4	0	100	6	5	7
Monochloroacetic acid	150	µg/L	4	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	4	0	100	6.75	3	9
Total trihalomethanes	250	µg/L	4	0	100	22.25	13	27

Table 64.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.53	0.01	1.38
Colour True	HU	15	<1	<1	<1
pH	Units	6.5 – 8.5	7.4	6.07	9.17
Turbidity	NTU	1	0.21	0.06	1.31

64.5. Analysis of overall system performance (2017-18)

Table 64.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

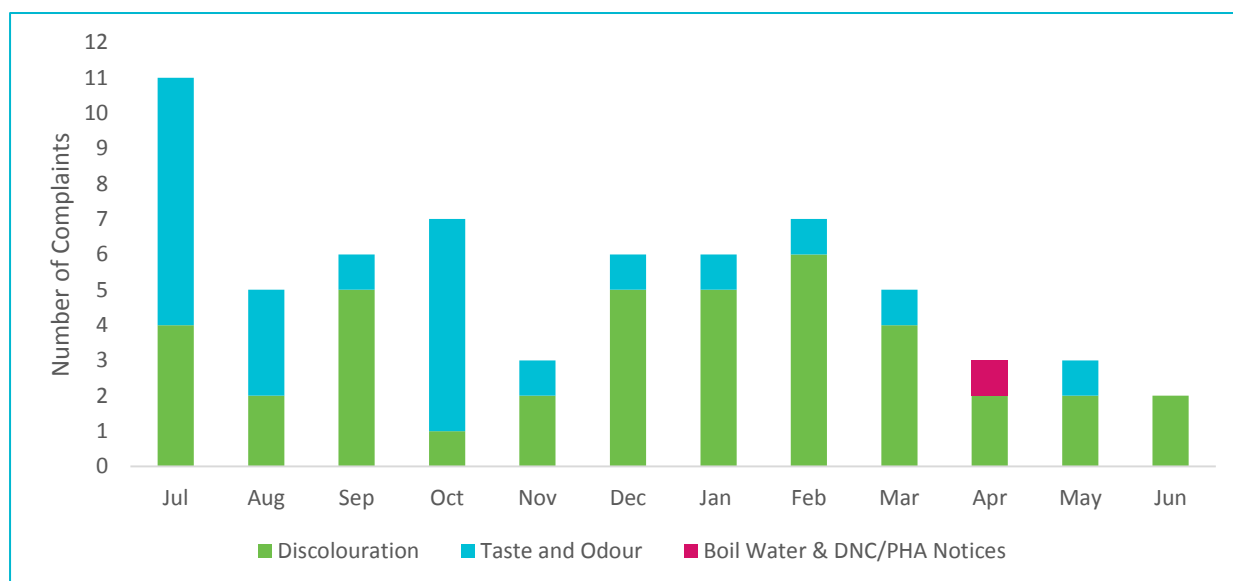


Figure 64.5-b Water quality customer complaints by month and type

65. Westbury drinking water system

65.1. System summary (2017-18)

Westbury drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	1170
Population serviced	2457
Fluoride	Sodium fluoride

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	99.0%	<input checked="" type="checkbox"/>	98.0%	104	1
Fluoride	100.0%	<input checked="" type="checkbox"/>	100.0%	178	0
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0
DBPs	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	1	<i>E. coli</i> exceedance
Public health warnings issued	0	
Notifications made to DoH	1	<i>E. coli</i> exceedance
Customer complaints	13	Discolouration, Taste & Odour

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend (\$'000)
Regional Towns Water Supply Program	UV disinfection system	Not started	TBA	TBA

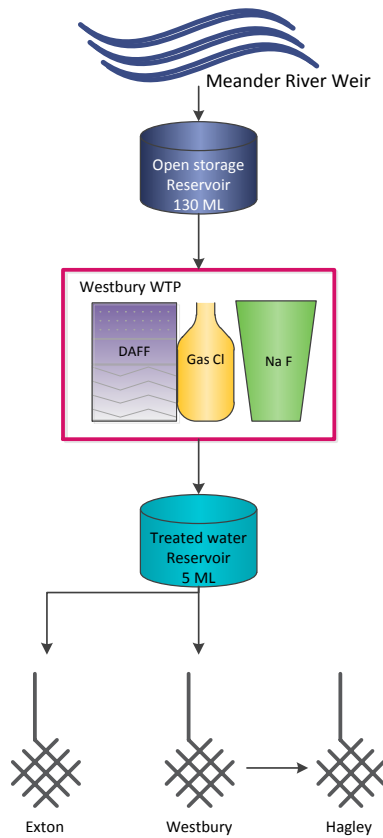


Figure 65.1-a Westbury system schematic

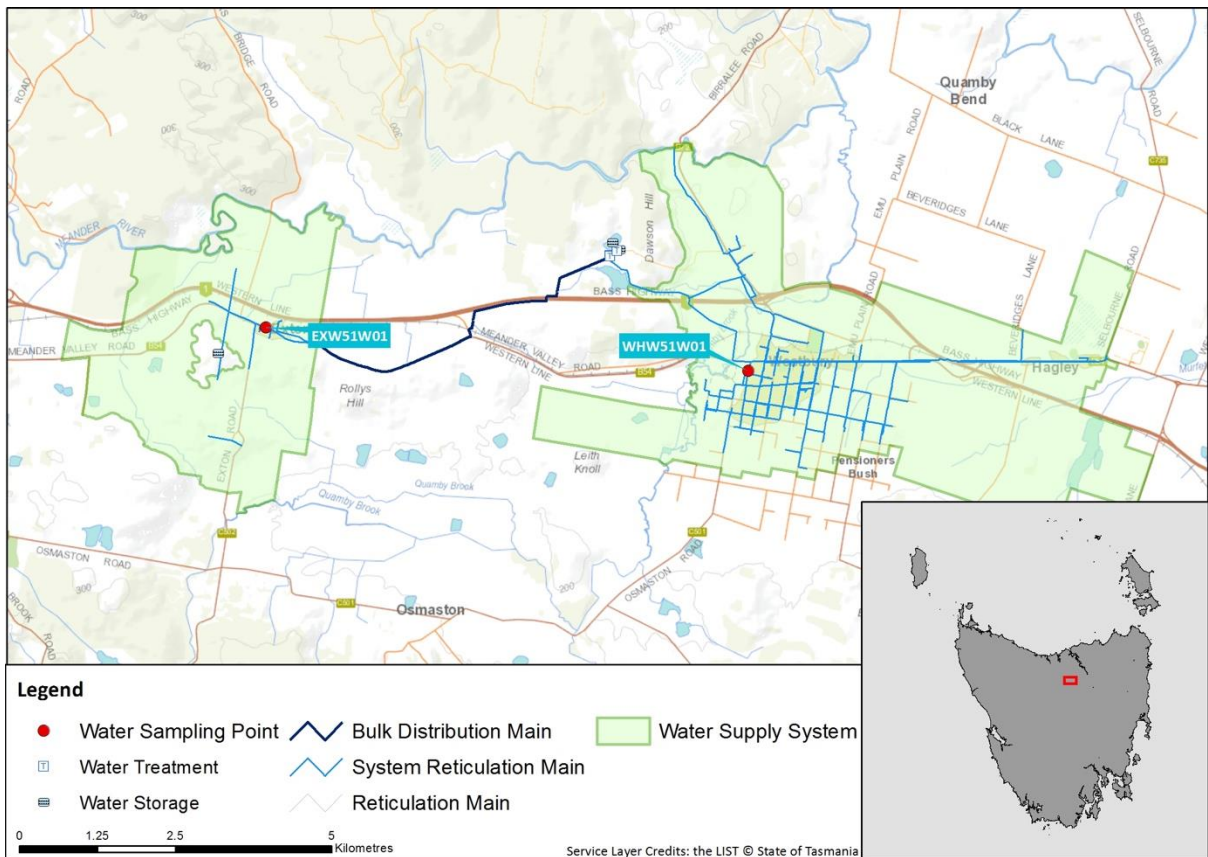


Figure 65.1-b Map of Westbury monitoring system

65.2. Summary of annual reticulation compliance (2017–18)

Table 65.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Westbury/Exton, Main Road	EXW51W01	W	n/a	n/a	n/a	n/a
Westbury/Village Green	WHW51W01	W	Q	Q	Q	n/a
Number Planned Samples		104	4	4	4	n/a
Number Samples Tested		104	4	4	4	n/a

65.3. Summary of current and historic performance (2013-18)

Table 65.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	98.0%	100.0%	100.0%	100.0%	99.0%
Fluoride	100.0%	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

65.4. Analysis of current health performance (2017-18)

Table 65.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
<i>E. coli</i>	28/12/2017	<i>E. coli</i> of 4.1 MPN/100mL in weekly compliance sample	✓

Figure 65.4-b Microbiological non-compliances by month

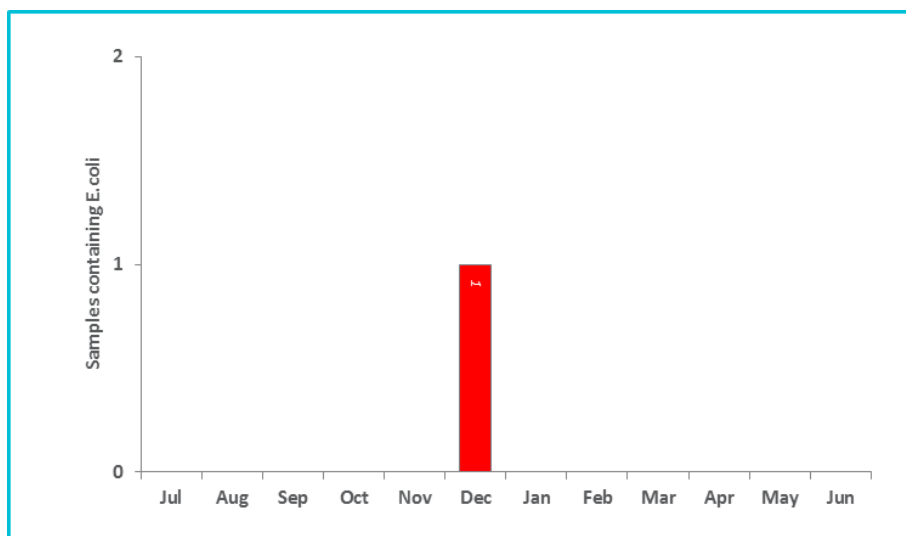


Table 65.4-c Fluoride operational performance

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	94.9%
Mean dose (mg/L)	0.96

■ Compliant ■ Non-compliant

Table 65.4-e Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	<0.0003	<0.0003	<0.0003
Barium	2	mg/L	4	0	100	0.008	0.006	0.009
Cadmium	0.002	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Copper	2	mg/L	4	0	100	0.00258	0.0018	0.0039
Lead	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Manganese	0.5	mg/L	4	0	100	0.0128	0.0008	0.047
Mercury	0.001	mg/L	4	0	100	0.000058	0.00003	0.00012
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	0.00006	<0.0001	0.0001

Selenium	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
----------	------	------	---	---	-----	---------	---------	---------

Table 65.4-f Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	4	0	100	8.25	6	10
Monochloroacetic acid	150	µg/L	4	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	4	0	100	10.75	8	13
Total trihalomethanes	250	µg/L	4	0	100	27.75	26	30

Table 65.4-g General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.8	0.28	1.16
Colour True	HU	15	0.63	<1	1
pH	Units	6.5 – 8.5	7.22	6.35	7.9
Turbidity	NTU	1	0.25	0.09	1

65.5. Analysis of overall system performance (2017-18)

Table 65.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
28/12/2017	Weekly sample detected <i>E. coli</i> of 4.1 MPN/100mL at WHW51W01. An incident was declared and DoH notified. Investigation showed samples taken in the system were free of <i>E. coli</i> . The sample was believed to be compromised as it was contained within the same esky as the MCW51W01 detection. Retest was free of <i>E. coli</i> .	✓	✓

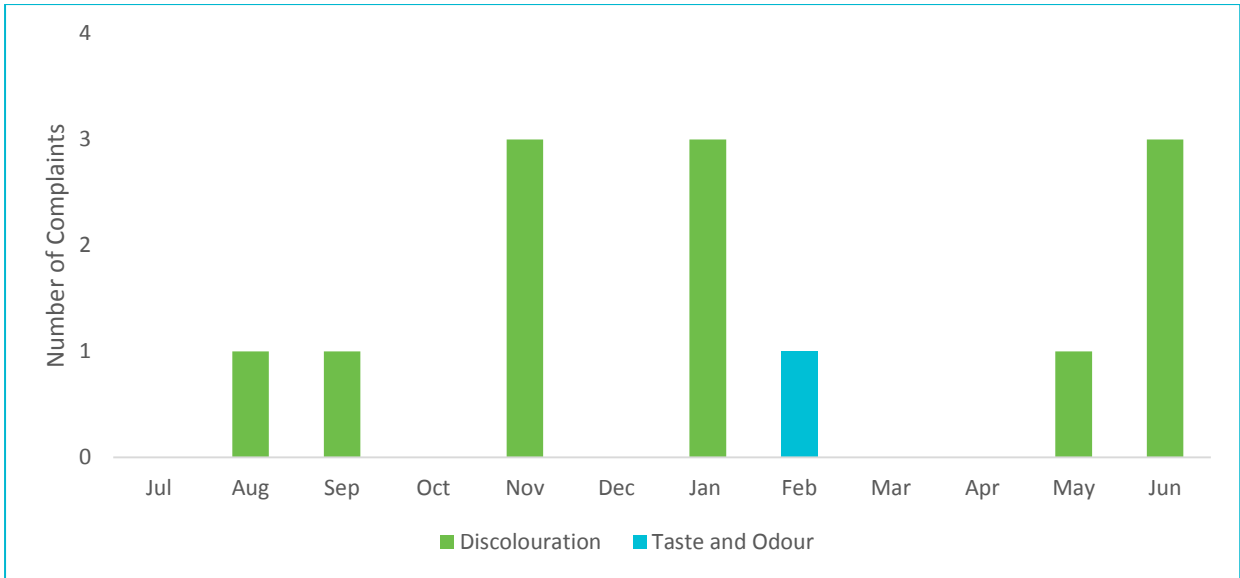


Figure 65.5-b Water quality customer complaints by month and type

66. Whitemark drinking water system

66.1. System summary (2017-18)

Whitemark drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	205
Population serviced	308
Fluoride	n/a

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	<input checked="" type="checkbox"/>	98.0%	104	0
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	<input checked="" type="checkbox"/>	100.0%	12	0
DBPs	100.0%	<input checked="" type="checkbox"/>	100.0%	8	0

■ Compliant ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	0	
Public health warnings issued	0	
Notifications made to DoH	0	
Customer complaints	1	Taste & Odour

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
No projected capital investment				

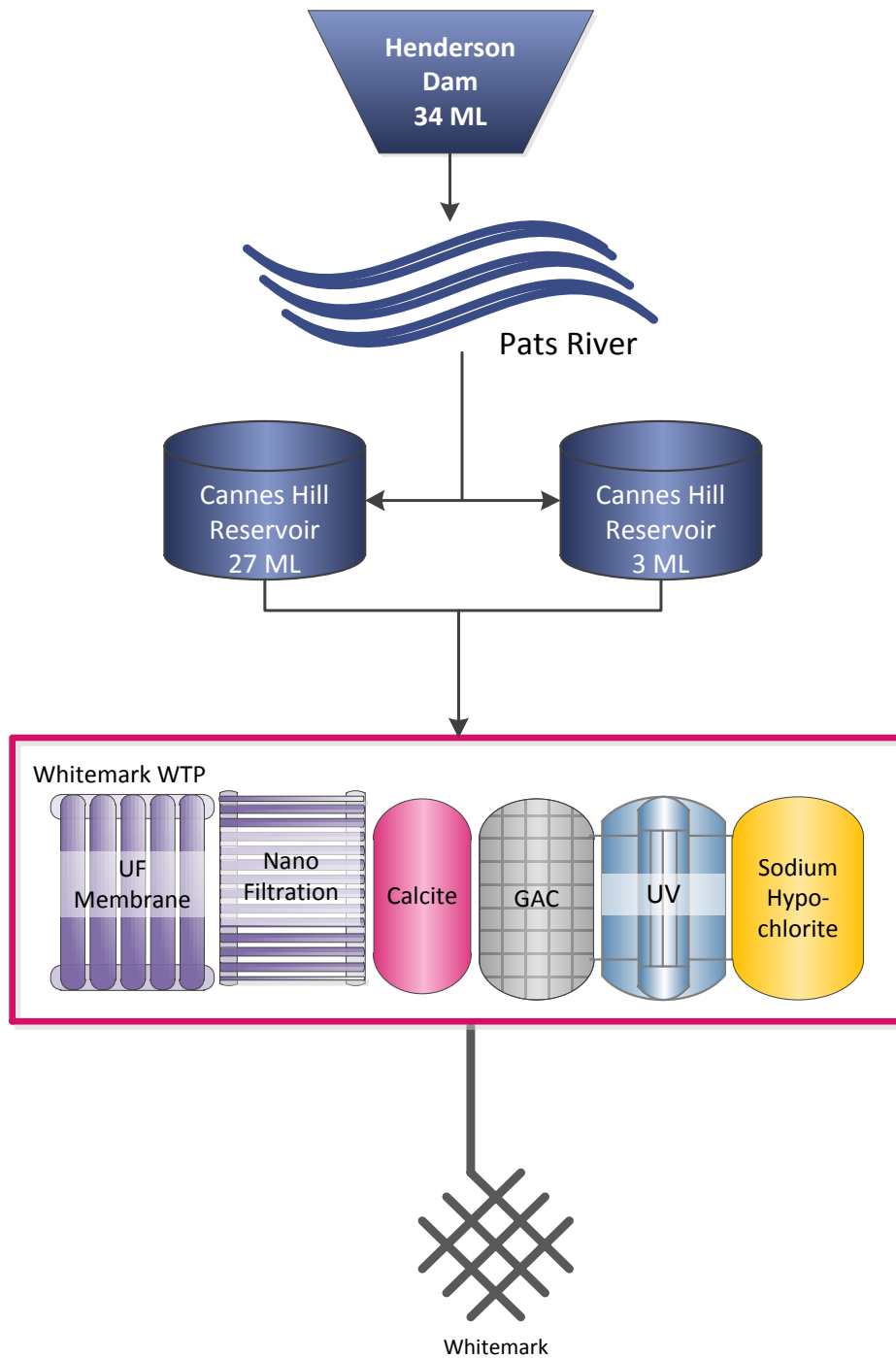


Figure 66.1-a Whitemark system schematic

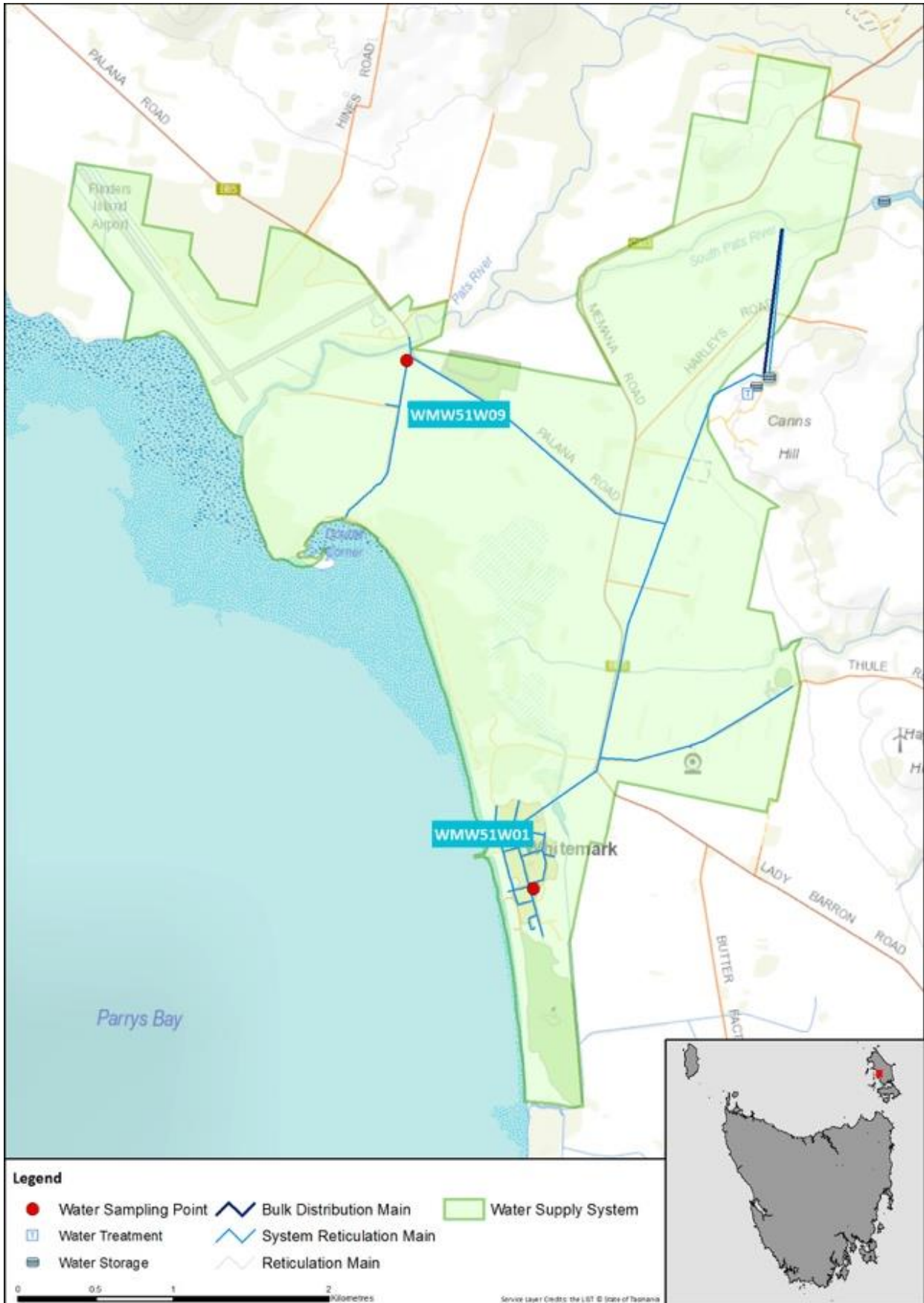


Figure 66.1-b Map of Whitemark monitoring system

66.2. Summary of annual reticulation compliance (2017–18)

Table 66.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Whitemark/Council Depot	WMW51W01	W	M	Q	Q	n/a
Whitemark/crn Palana Rd & Bluff Rd	WMW51W09	W	n/a	Q	Q	n/a
Number Planned Samples		104	12	8	8	n/a
Number Samples Tested		104	12	8	8	n/a

66.3. Summary of current and historic performance (2013-18)

Table 66.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	23.0%	37.8%	50.0%	99.1%	100.0%
Fluoride	n/a	n/a	n/a	n/a	n/a
Metals	100.0%	100.0%	100.0%	100.0%	100.0%
Disinfection by products	n/a	100.0%	n/a	100.0%	100.0%

■ Compliant ■ Non-compliant

66.4. Analysis of current health performance (2017-18)

Table 66.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
No ADWG exceedances			

Table 66.4-b Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	12	0	100	0.00029	<0.0005	0.0008
Arsenic	0.01	mg/L	12	0	100	0.00032	<0.0003	0.0005
Barium	2	mg/L	12	0	100	0.002	0.001	0.003
Cadmium	0.002	mg/L	12	0	100	<0.0001	<0.0001	<0.0001
Chromium	0.05	mg/L	12	0	100	0.00006	<0.0001	0.0001
Copper	2	mg/L	12	0	100	0.00012	0.00005	0.0003
Lead	0.01	mg/L	12	0	100	0.0001	<0.0001	0.0003
Manganese	0.5	mg/L	12	0	100	0.001	0.0005	0.0019
Mercury	0.001	mg/L	12	0	100	0.000083	<0.00003	0.00027
Molybdenum	0.05	mg/L	12	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	12	0	100	<0.0001	<0.0001	<0.0001
Selenium	0.01	mg/L	12	0	100	<0.0001	<0.0001	<0.0001

Table 66.4-c Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	8	0	100	<1	<1	2
Monochloroacetic acid	150	µg/L	8	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	8	0	100	<1	<1	<1
Total trihalomethanes	250	µg/L	8	0	100	12.25	4	28

Table 66.4-d General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.75	0.1	12.23
Colour True	HU	15	0.75	<1	2
pH	Units	6.5 – 8.5	7.92	6.9	9.25
Turbidity	NTU	1	0.4	0.11	4.03

66.5. Analysis of overall system performance (2017-18)

Table 66.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
No system issues or public health warnings issued			

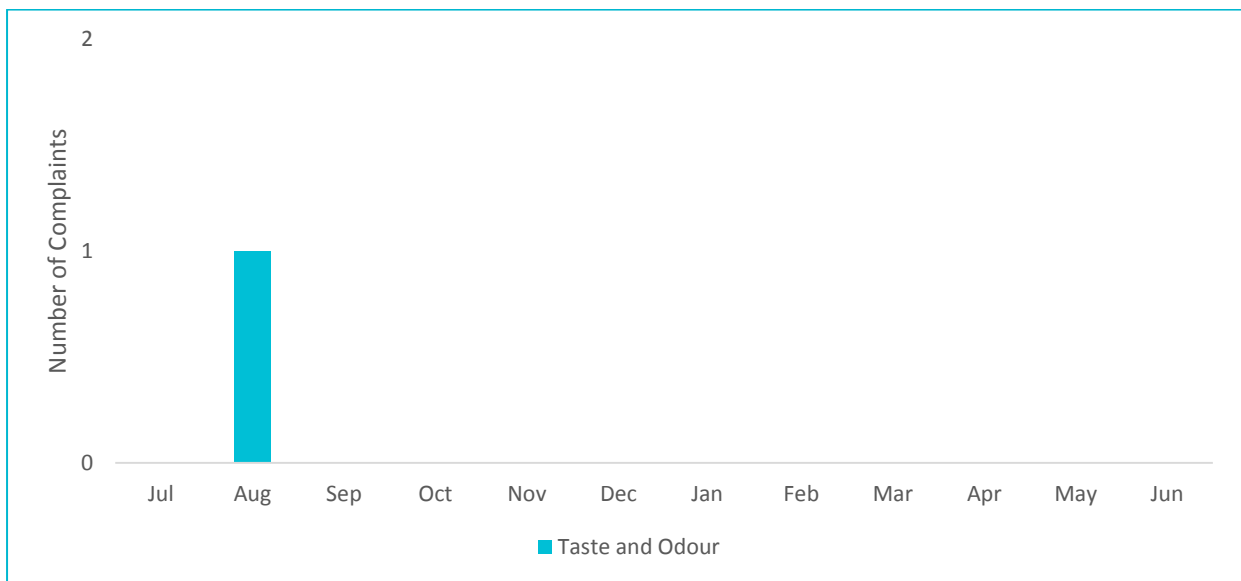


Figure 66.5-b Water quality customer complaints by month and type

67. Zeehan drinking water system

67.1. System summary (2017-18)

Zeehan drinking water system	
System status (as at 30 June 2018)	Potable
Total number of connections	630
Population serviced	1008
Fluoride	Sodium fluoride

Performance overview against health targets (2017-18)					
Indicator	Outcome	Compliance	Target	Sampling Events	Exceedances
Microbiological	100.0%	<input checked="" type="checkbox"/>	98.0%	104	0
Fluoride	100.0%	<input checked="" type="checkbox"/>	100.0%	360	0
Metals	97.9%	<input checked="" type="checkbox"/>	100.0%	4	1
DBPs	100.0%	<input checked="" type="checkbox"/>	100.0%	4	0

■ Compliant
 ■ Non-compliant

Overall system performance (2017-18)		
Indicator	Occurrences	Details
System issues	1	Lead exceedance
Public health warnings issued	0	
Notifications made to DoH	1	Lead exceedance
Customer complaints	1	Discolouration

Current and future planned capital investment				
Project	Overview	Progress	Est. Delivery	Est. Spend
No projected capital investment				

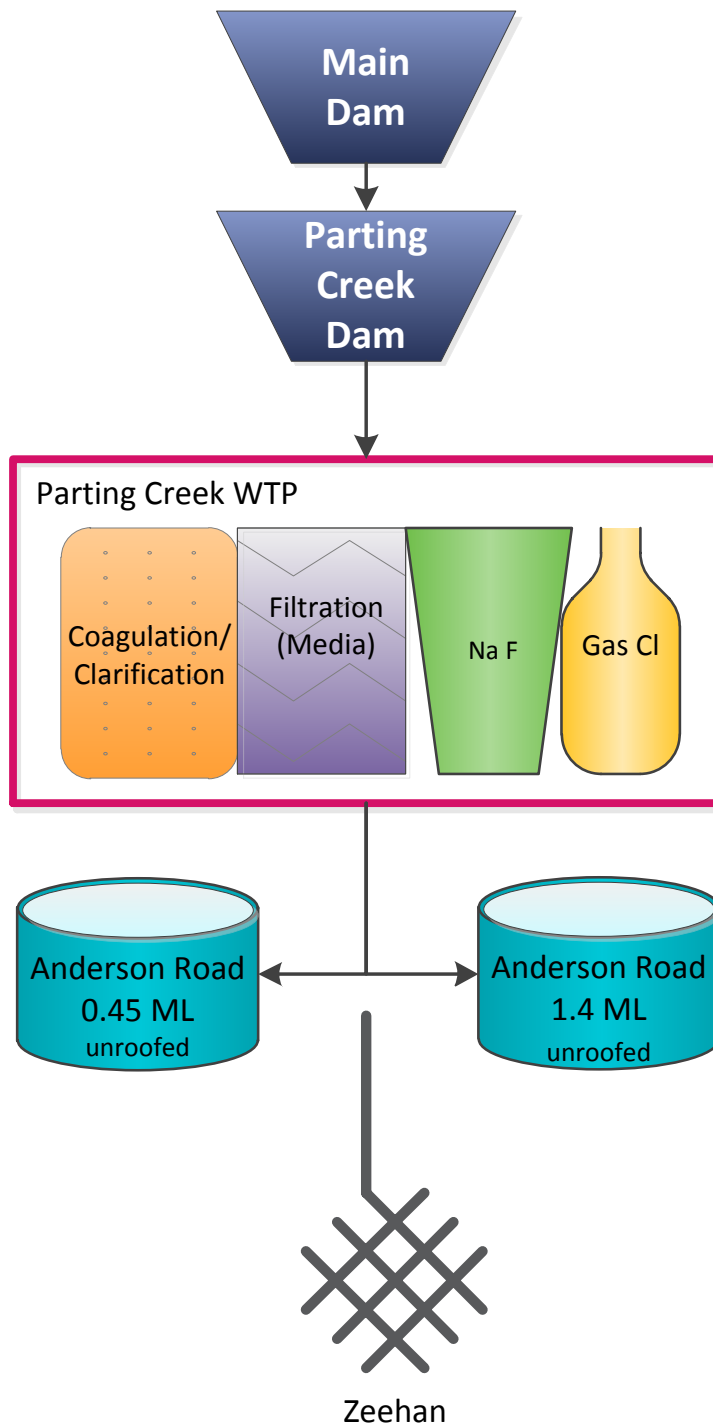


Figure 67.1-a Zeehan system schematic

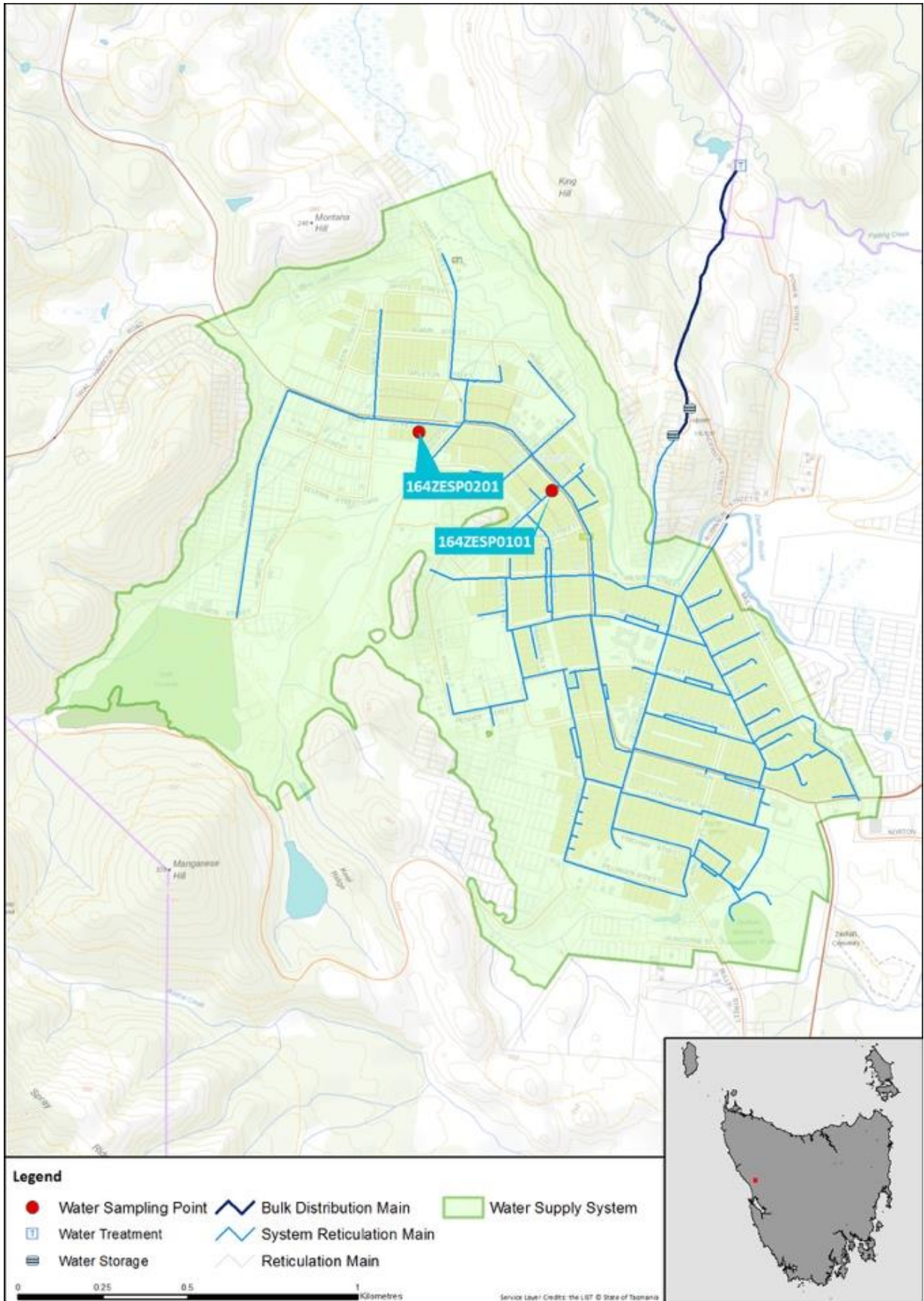


Figure 67.1-b Map of Zeehan monitoring system

67.2. Summary of annual reticulation compliance (2017–18)

Table 67.2-a Sampling program

Planned sampling program (2017-18)						
Site name	Site Code	Micros	Metals	DBP	Chemical Profile	Process Chemicals
Zeehan/Main Street Sample Point	164ZESP0101	W	n/a	n/a	n/a	n/a
Zeehan/CMW Depot Sample Point	164ZESP0201	W	Q	Q	Q	n/a
Number Planned Samples		104	4	4	4	n/a
Number Samples Tested		104	4	4	4	n/a

67.3. Summary of current and historic performance (2013-18)

Table 67.3-a Historical health performance overview (5 year comparison)

Historical health performance overview (5 year comparison)					
Indicator	2013-14	2014-15	2015-16	2016-17	2017-18
Microbiological	100.0%	99.4%	98.7%	100.0%	100.0%
Fluoride	n/a	100.0%	100.0%	100.0%	100.0%
Metals	100.0%	100.0%	100.0%	100.0%	97.9% ⁴⁰
Disinfection by products	100.0%	100.0%	100.0%	100.0%	100.0%

■ Compliant ■ Non-compliant

67.4. Analysis of current health performance (2017-18)

Table 67.4-a Summary of health guideline exceedances

Summary of health guideline exceedances			
Parameter Exceeding	Date	Details	Resampled
Lead	30/01/2018	Exceedance of Lead 0.0108 mg/L in quarterly compliance sample	✓

⁴⁰ Retesting of metals showed no further issues

Table 67.4-b Fluoride operational performance

Operational fluoride performance	
Indicator	2017-18
Exceeding 1.5 mg/L	0
Within target range (%) (0.8-1.2 mg/L)	98.3%
Mean dose (mg/L)	0.94
■ Compliant ■ Non-compliant	

Table 67.4-d Metals performance

Metals – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Antimony	0.003	mg/L	4	0	100	<0.0005	<0.0005	<0.0005
Arsenic	0.01	mg/L	4	0	100	<0.0003	<0.0003	0.0008
Barium	2	mg/L	4	0	100	0.0046	0.0038	0.0056
Cadmium	0.002	mg/L	4	0	100	0.00009	<0.0001	0.0002
Chromium	0.05	mg/L	4	0	100	0.00006	<0.0001	0.0001
Copper	2	mg/L	4	0	100	0.00184	0.0014	0.0024
Lead	0.01	mg/L	4	1	75	0.00285	<0.0001	0.0108
Manganese	0.5	mg/L	4	0	100	0.0313	0.0096	0.0802
Mercury	0.001	mg/L	4	0	100	0.00013	<0.00003	0.00052
Molybdenum	0.05	mg/L	4	0	100	<0.0001	<0.0001	<0.0001
Nickel	0.02	mg/L	4	0	100	0.00144	0.001	0.0024
Selenium	0.01	mg/L	4	0	100	<0.0001	<0.0001	<0.0001

Table 67.4-e Disinfection by product performance

Disinfection by products – health regulated parameters								
Parameter	Limit	Unit	Samples	Exceedances	Performance %	Mean	Min.	Max.
Dichloroacetic acid	100	µg/L	4	0	100	10.25	4	17
Monochloroacetic acid	150	µg/L	4	0	100	<3	<3	<3
Trichloroacetic acid	100	µg/L	4	0	100	32.75	23	39
Total trihalomethanes	250	µg/L	4	0	100	91.25	84	98

Table 67.4-f General physical performance

General physical parameters					
Parameter	Unit	Guideline Value	Mean	Min	Max
Chlorine residual	mg/L	0.1 - <0.8	0.5	0.04	1.5
Colour True	HU	15	1.25	1	2
pH	Units	6.5 – 8.5	7.48	7.08	8.35
Turbidity	NTU	1	0.51	0.18	2.7

67.5. Analysis of overall system performance (2017-18)

Table 67.5-a Summary of system issues/public health warnings

Summary of system issues			
Date	Description	DoH notification required	DoH notification complete
30/01/2018	Routine sampling detected 0.0108 mg/L of Lead at 164ZESP0201 – resampled with results below the ADWG health limit.	✓	✓

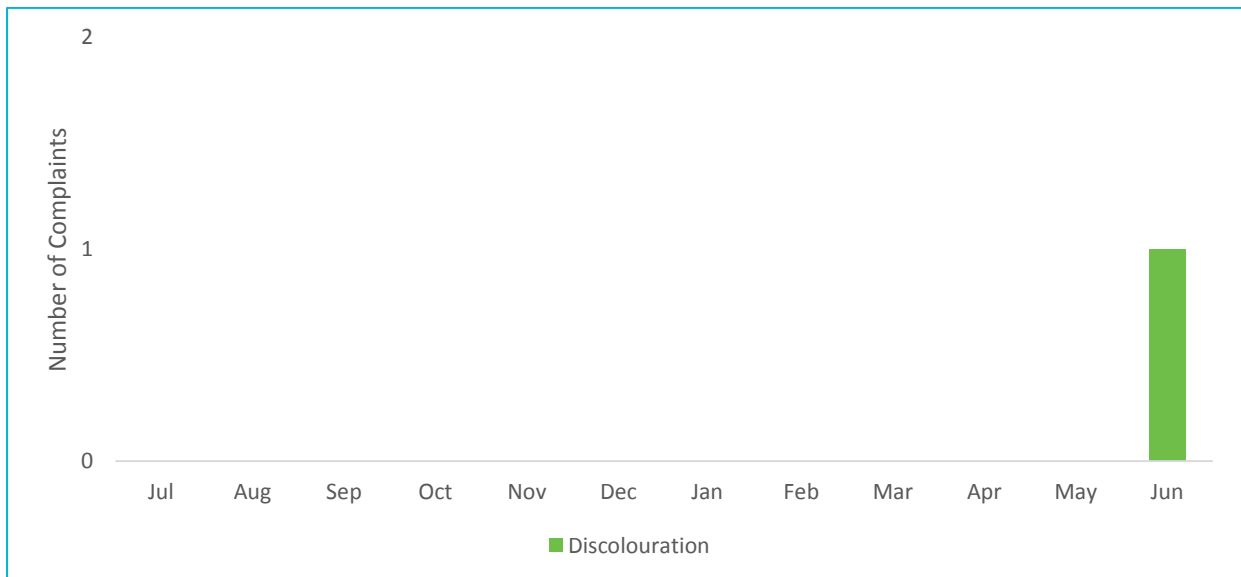


Figure 67.5-b Water quality customer complaints by month and type

