CORPORATE REPORT

Annual Drinking Water Quality Report 2017-18

WESTERNPORT WATER™

Document Status

Name	Westernport Water Annual Drinking Water Quality Report 2017-18
File location	TRIM: INT18-07571
Document version	Final
Date of issue	29/10/2018
Approved by	General Manager Assets & Operations

Document History

Issue	Revision	Prepared by	Reviewed by	Date
First draft for internal review	1	Water Quality & Sustainability Officer	Manager Environment & Product Performance, Treatment Plant Coordinator & General Manager Assets & Operations	19/09/2018
First draft with Department review	2	Water Quality & Sustainability Officer	DHHS Water Sector Liaison Officer	8/10/2018
Final	3	Water Quality & Sustainability Officer	General Manager Assets & Operations	29/10/2018

Authorisation

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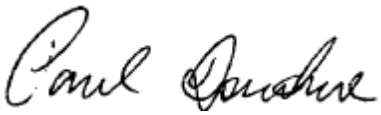

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1. Introduction

1.1 Westernport Water - Overview

Westernport Region Water Corporation (WPW) provides water and wastewater services in an economically, environmentally and socially sound manner to customers within its service area.

WPW services Phillip Island and an area of the mainland from The Gurdies to Archies Creek. Individual towns that are provided with drinking water include Bass, Grantville, Corinella, Kilcunda (including Dalyston), San Remo, Cape Woolamai, Rhyll, Cowes and Ventnor. A map of the service area is included in this report as figure 1-1

1.2 Aims and Objectives of this Report

Under section 26 of the *Safe Drinking Water Act 2003* (SDWA), WPW is required to provide the Department of Health and Human Services (DHHS) with an annual report on the quality of drinking water supplied to its customers.

The aim of this report is to provide all stakeholders, including the community, with water quality information compliant with Section 26 of the SDWA. The report covers the period of 1 July 2017 to June 30 2018 and covers issues relating to the quality and management of drinking water.

1.3 Westernport Water's Commitment to Drinking Water Quality

WPW is committed to a comprehensive risk management approach to the safe provision of drinking water to its customers. This is achieved through the adoption of the framework for the management of drinking water quality outlined in the Australian Drinking Water Guidelines 2011, (ADWG) and implemented through continual review and improvement of WPW's Water Quality Risk Management Plan (WQRMP).

WPW's commitment to drinking water quality is highlighted in the foundation of its drinking water quality policy (endorsed by executive management and board). The policy demonstrates WPW's support and long-term commitment to the development and implementation of an effective system for drinking water quality management.

1.4 2017-18 performance

WPW met all its obligations to provide water compliant with the *Safe Drinking Water Act 2003* and Safe Drinking Water Regulation 2015 throughout 2017-18.

Performance against drinking water quality standards outlined in the Safe Drinking Water Regulations 2015 (SDWR) are presented in section 5.

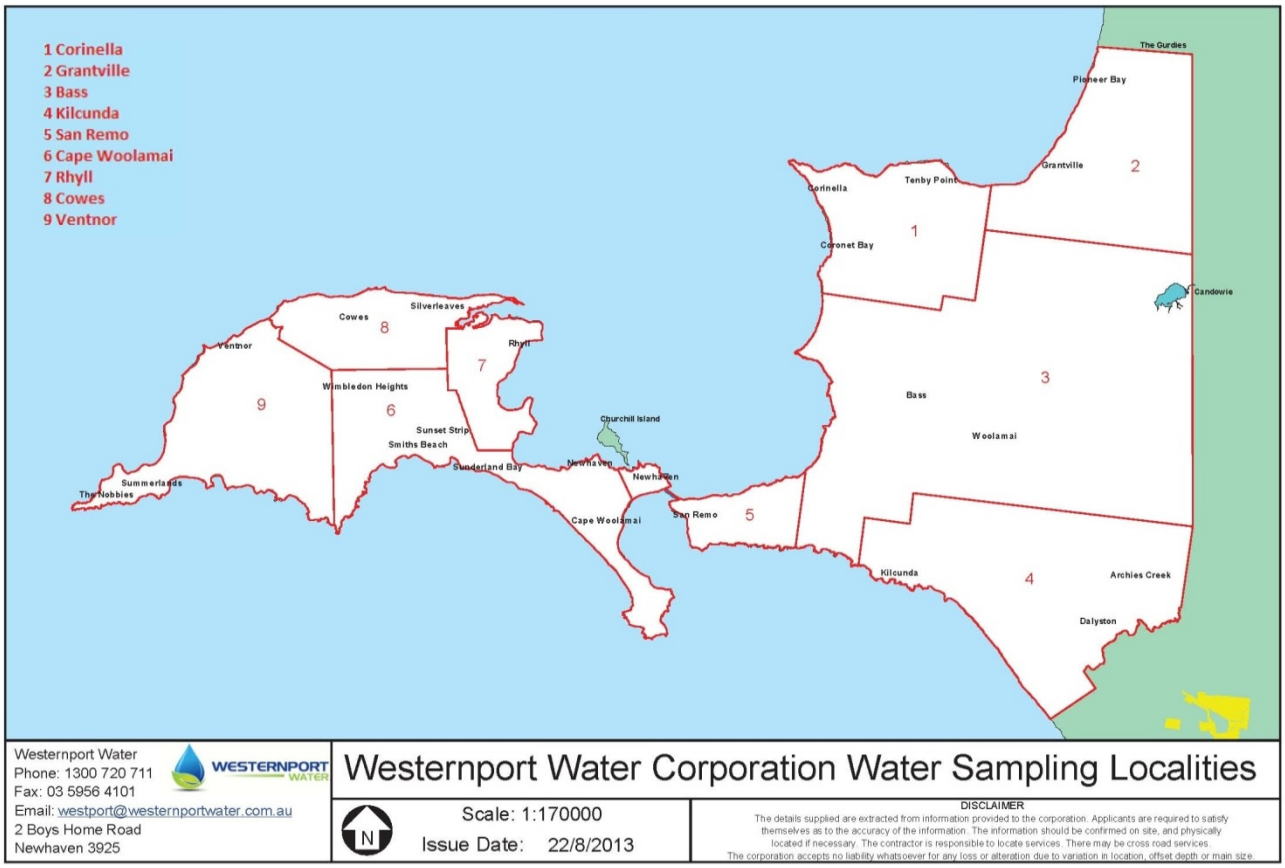


Figure 1-1-1 WPW region including water sampling localities

2. Characterisation of Westernport Water's Supply System

2.1 System Overview

WPW has a single water supply storage (Candowie Reservoir), which is an on-stream storage on Tennent Creek, located in the Bass Hills near Glen Forbes.

Water is treated at the Ian Bartlett Water Purification Plant (IBWPP) and then reticulated to communities through a single main supply line, with a number of smaller off takes servicing each of the residential communities within WPW's area of supply. A plan of the distribution system is included in this report as figure 2-1.

Raw water quality in Candowie Reservoir is generally considered poor for human consumption due to intensive farming activities and runoff from cleared land within the catchment area. Before treatment, the raw water is high in nutrients and organics and quality is typical of water that is sourced from an unprotected catchment. Following treatment, the water complies with the ADWG and standards outlined in regulation 12 of SDWR.

Localities and population supplied in WPW region, water sources and the treatment process are outlined in table 3-1 under section 3.

2.2 Water Sources

Other sources of water are available to supplement Candowie Reservoir during low rainfall periods. These alternative sources are surface water from the Bass River and groundwater from bores constructed in the Corinella Groundwater Management Unit (GMU). Water from these alternative sources is pumped via a pipeline to Candowie Reservoir for centralised storage and treatment at the IBWPP. Table 3-1 lists where raw water is sourced and the treatment processes used to produce potable water to customers

2.2.1 Bass River

Westernport Water's pump station, located along the banks of the Bass River, is used to transfer water into Candowie Reservoir. This is licenced under the Bass River Bulk Entitlement. 272 Mega Litres (ML) of water was extracted from the river during the 2017-18 reporting period.

2.2.2 Groundwater

WPW have four bores licenced to take and use groundwater within the Corinella GMU. WPW has an entitlement of 490 ML/year. No groundwater was extracted during 2017-18 reporting period.

2.3 Source water protection

Section 1.3 details WPW's commitment to drinking water quality. Aligned with the framework for the management of drinking water quality is the catchment to tap approach. To demonstrate this approach for the catchment, WPW builds our understanding of the source water risks by:

I. Undertake sanitary survey's of the catchment. A survey was undertaken in 2014.

II. A comprehensive raw water monitoring program for pathogens, blue green algae, organic chemicals and radiological parameters

III. Continuous performance monitoring at the treatment plant.

IV. Ongoing contractual partnership with Bass Coast Landcare and Melbourne Water on improving catchment health.

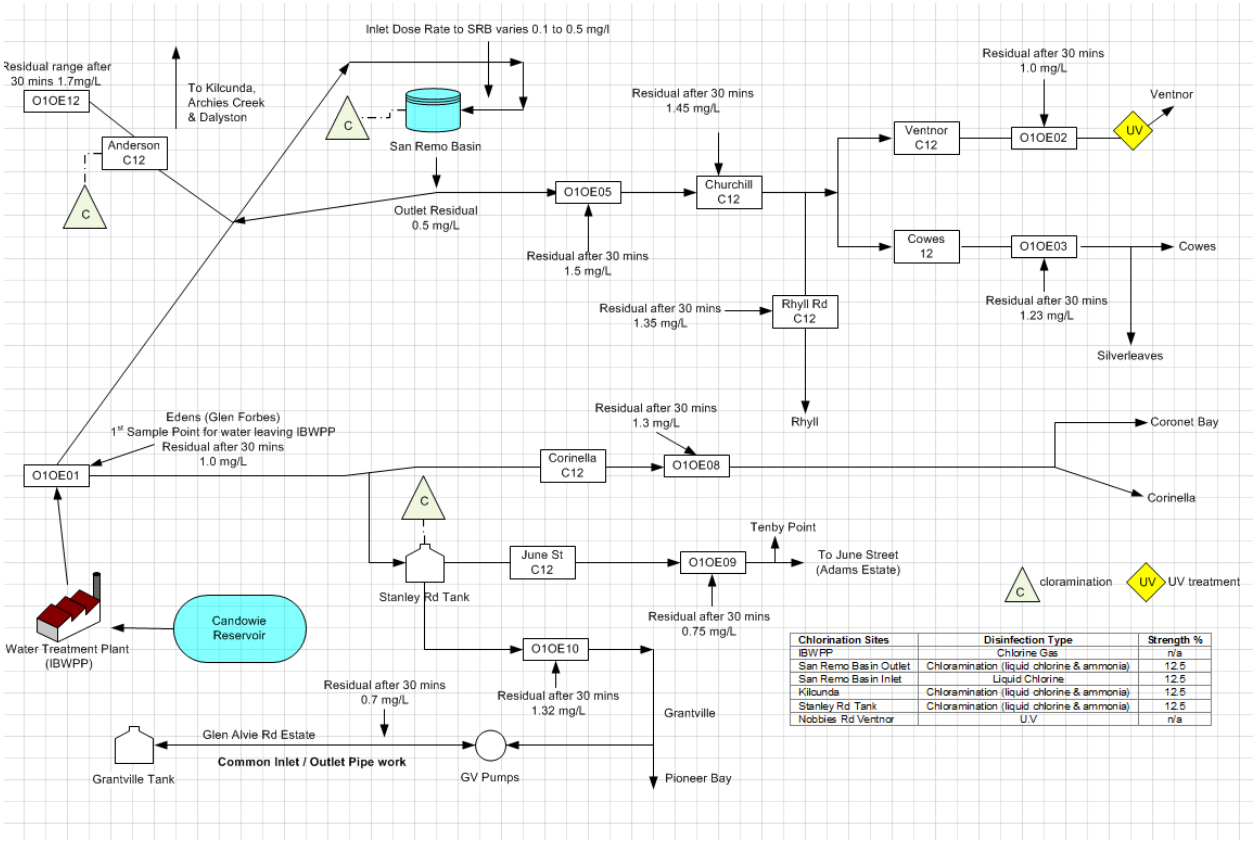


Figure 2-1 WPW's distribution system

3. Water treatment and quality management systems

WPW operates a comprehensive water quality management system that complies with the *SDWA 2003* and SDWR 2015. The system is designed to ensure that customers receive drinking water that is safe and of good quality.

3.1 Water treatment

Raw water from Candowie Reservoir is treated using a combination of oxidation, adsorption, flocculation, coagulation, dissolved air flotation, filtration, pH correction, fluoridation and disinfection at the IBWPP. The source water is predominantly high in nutrients and organics, and quality is typical of water that is sourced from an open, unprotected catchment. The following sections and table 3-1 highlight the treatment process used at IBWPP.

3.1.1 Oxidation

Oxidation is used to remove iron and manganese from the water. Potassium permanganate is added to aid the removal process.

3.1.2 Adsorption

Adsorption is a process where a solid is used to remove a soluble substance from the water. WPW uses Powdered Activated Carbon (PAC) as the solid in water. Water is pumped through PAC and accumulates the soluble substances in the filter. The PAC is then removed from the process, subsequently removing the substance from the water. Adsorption is used to control potential taste and odour issues, and to remove algal toxins from the water.

3.1.3 Coagulation/flocculation

Coagulation is the process to remove fine suspended particles to aid the removal of colour and turbidity. Particles have a negative charge, repelling each other and allowing them to remain suspended in water as they will not clump together and settle out. Coagulation involves the addition of a coagulant (aluminium sulphate) with a positive charge that neutralises the negative charge enabling the fine particles to merge to create larger particles. Flocculation involves gentle mixing of the water which causes the particles to collide increasing their size to visible suspended solids. The visible particles are called a ‘floc’.

3.1.4 Dissolved air floatation and filtration (DAFF)

DAFF is a process of injecting air particles into water causing the floc to float to the surface. The floc is then removed to waste and the clear water is filtered through graded filter media. The purpose of DAFF is to produce water low in turbidity.

Over time filters become blocked with particles from the floc. To overcome the blockage, the filters are backwashed periodically to allow optimum production in the filters to produce consistently low turbidity results.

3.1.5 Fluoridation

Fluoride is added to treated water at a level that helps protect teeth against decay. Fluoride does not alter the taste or smell of water. Fluoridated water is delivered to all localities in WPW distribution system.

3.1.6 pH correction

To ensure treated water is within the ADWG desired range, caustic soda is added to raise pH.

3.1.7 Disinfection

(a) Ultraviolet (UV)

UV light inactivates microorganisms by damaging their nucleic acid, thereby preventing them from replicating and disrupting their ability to infect hosts. UV disinfection can be used for the inactivation of chlorine resistant pathogens (e.g. Cryptosporidium and Giardia).

(b) Chlorine

The final stage of treatment at IBWPP is chlorine disinfection. Disinfection is required to prevent the spread of waterborne pathogens and to retain an appropriate chlorine residual throughout the system.

(c) Chloramination

WPW adopt the method of chloramination to address taste & odour issues and total chlorine residuals to the extremities of the distribution system. Chloramination is the process of adding chlorine to a small amount of ammonia. All localities (except Bass) receive chloraminated water.

Table 3-1 Source water and treatment processes

Water Sampling Locality	Population supplied[1]	Source water[2]	Storage	Treatment plant	Treatment Process													
					Clarification		Filtration	Disinfection			Other		Added substance(s)					
					Coagulation and flocculation	Dissolved air flotation	Granular Media Filter	Chlorine gas	Sodium hypochlorite	Ultraviolet (UV)[4]	Activated carbon (PAC)	Sludge-handling (mechanical with chemical addition	Caustic soda	Aluminium-based coagulants	Potassium permanganate	Chlorine	Ammonia[3]	Fluoride
Bass (including Woolamai)	600	Bass River, Tennent Creek, and Corinella Bores	Candowie Reservoir	IBWPP	■	■	■	■	□	□	■	■	■	■	□	□	□	■
Cape Woolamai (incorporating Smiths Beach, Sunderland Bay, Sunset Strip and Wimbledon Heights)	3200				■	■	■	■	■	□	■	■	■	■	□	■	■	■
Corinella (incorporating Coronet Bay)	1710				■	■	■	■	■	□	■	■	■	■	□	■	■	■
Cowes (incorporating Silverleaves)	4050				■	■	■	■	■	□	■	■	■	■	□	■	■	■
Grantville (incorporating Pioneer Bay)	1070				■	■	■	■	■	□	■	■	■	■	□	■	■	■
Kilcunda (incorporating Dalyston and Archies Creek)	930				■	■	■	■	■	□	■	■	■	■	□	■	■	■
Rhyll	670				■	■	■	■	■	□	■	■	■	■	□	■	■	■
San Remo (incorporating Newhaven)	1470				■	■	■	■	■	□	■	■	■	■	□	■	■	■
Ventnor	830				■	■	■	■	■	■	■	■	■	■	□	■	■	■

■ Treatment/Substance was applied regularly in 2017-18

□ Treatment/Substance was applied intermittently in 2017-18

[1] Population sourced from 2016 census data

[2] Water sources listed are used to augment supply to Candowie and subsequently supply all localities

[3] Ammonia as aqua ammonia used with sodium hypochlorite for chloramination disinfection.

[4] UV disinfection was added to IBWPP in March 2018. A UV unit constructed in 2001 is also used for water supplied to The Penguin Parade and Nobbies area.

3.2 Major changes to the arrangements for water supply

On 30 May 2018 a government gazette No. S 252 Wednesday 30 May 2018 was published that included changes to WPW's water sampling locality. The changes are as follows:

- The water sampling localities named Cape Woolamai, Rhyll, San Remo and Ventnor were merged and substituted as the water sampling locality named San Remo–Phillip Island.
- The water sampling localities named Corinella and Grantville, were merged and substituted to form the water sampling locality named Water Line.

The changes to WPW's sampling localities are displayed in figure 3-1.

Due to the locality change, data in section 5 will be presented in two tables; one which displays data from 1 July 2017 to 29 May 2018 the second will be from 30 May 2018 to 30 June 2018.

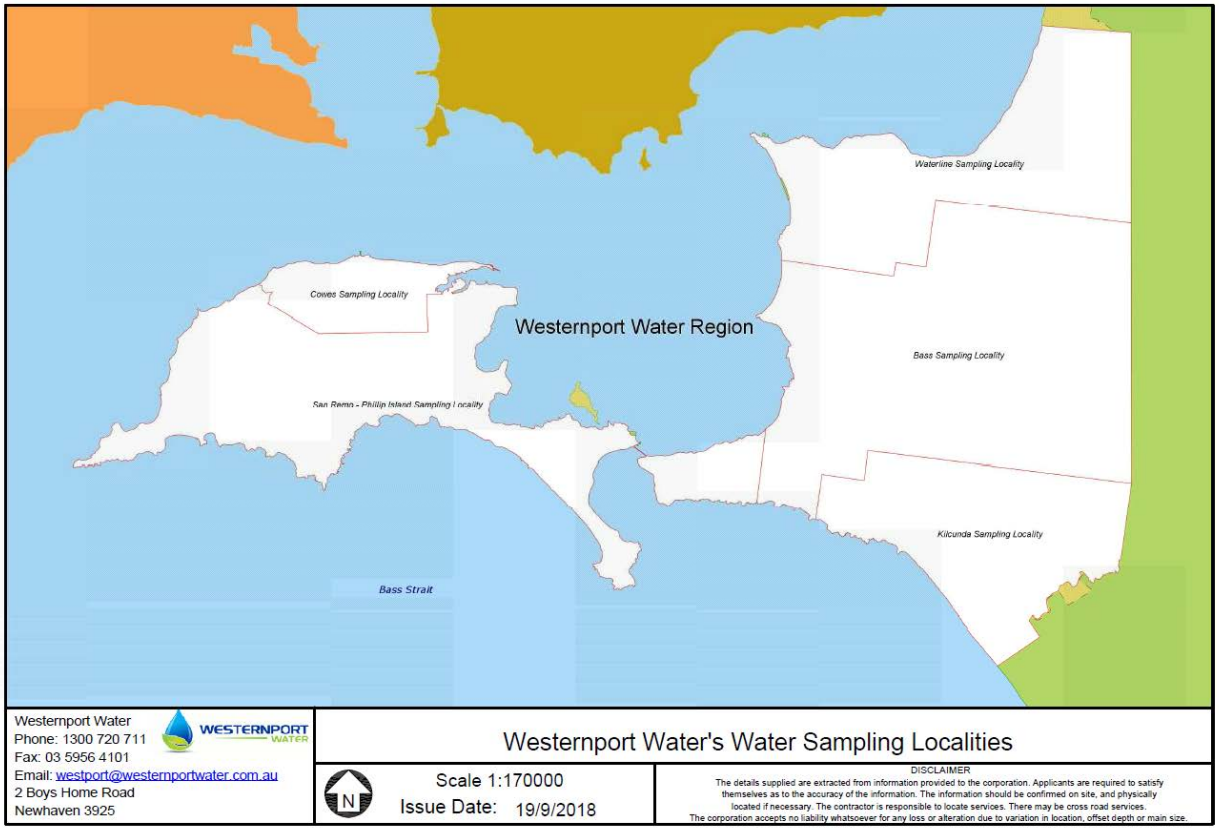


Figure 3-1 Westernport Water's updated sampling localities.

3.3 Issues

There were no issues during the 2017-18 reporting period that affected treatment processes which may of lead to potential or actual exceedances of drinking water quality standards.

4. Emergency, incident and event management

No Section 22 notifications or treatment issues occurred during 2017-18.

5. Quality of drinking water for the period of 1 July 2017 to 30 June 2018

All parameters sampled by WPW throughout 2017-18 were compliant with Regulation 12 and 13 of the SDWR 2015 and health related guideline values in the ADWG. The following tables depict the performance for 1 July, 2017 to 30 June, 2018.

5.1 E.coli

The SDWR 2015 stipulates that all samples of drinking water collected are found to contain no *E. coli* per 100mL of drinking water, with the exception of any false positive sample. Sample frequency in relation to *E.coli* is weekly in each defined locality The water quality with respect to *E. coli* was compliant with this standard as per table 5.1-1 and 5.1-2 below:

Table 5.1-1 *E.coli* 1 July 2017- 29 May 2018

Locality	Frequency	Number of Samples	Maximum detected (orgs/100mL)	Number of detections and investigations conducted (s. 22)	Number of samples where standard was not met (s 18)
Bass	Weekly	100	0	0	0
Cape Woolamai	Weekly	92	0	0	0
Corinella	Weekly	95	0	0	
Cowes	Weekly	97	0	0	0
Grantville	Weekly	240[1]	0	0	0
Kilcunda	Weekly	97	0	0	0
Rhyll	Weekly	96	0	0	0
San Remo	Weekly	144[2]	0	0	0
Ventnor	Weekly	96	0	0	0

[1]locality includes sampling from two treated storage tanks that supply Grantville and Corinella.

[2]locality includes sampling from a treated storage basin that supplies the localities of San Remo, Cape Woolamai, Cowes, Rhyll and Ventnor.

Table 5.1-2 *E.coli* 30 May - 30 June 2018

Locality	Frequency	Number of Samples	Maximum detected (orgs/100mL)	Number of detections and investigations conducted (s. 22)	Number of samples where standard was not met (s 18)
Bass	Weekly	8	0	0	0
Cowes	Weekly	10	0	0	0
Kilcunda	Weekly	8	0	0	0
San Remo-Phillip Island	Weekly	38[1]	0	0	0
Water Line	Weekly	28[2]	0	0	0

[1]locality includes sampling from a treated storage basin that supplies the localities of San Remo, Cape Woolamai, Cowes, Rhyll and Ventnor.

[2]locality includes sampling from two treated storage tanks that supply Grantville and Corinella.

5.2 Trihalomethanes (THM's)

The SDWR 2015 stipulates that all samples of drinking water collected are less than or equal to 0.25 milligrams per litre of drinking water. Sample frequency in relation to THM's is monthly in each defined locality. The water quality with respect to THM's was compliant with this standard as per table 5.2-1 and 5.2-2 below:

Table 5.2-1 THM's 1 July 2017- 29 May 2018

Locality	Frequency	Number of Samples	Drinking water quality standard (mg/L)	Maximum (mg/L)	Average (mg/L)	No of samples where standard was not met (s. 18)
Bass	Monthly	11	0.25	0.14	0.11	0
Cape Woolamai	Monthly	11		0.16	0.13	0
Corinella	Monthly	11		0.12	0.09	0
Cowes	Monthly	11		0.16	0.13	0
Grantville	Monthly	11		0.10	0.08	0
Kilcunda	Monthly	12		0.13	0.10	0
Rhyll	Monthly	11		0.16	0.13	0
San Remo	Monthly	11		0.16	0.13	0
Ventnor	Monthly	11		0.14	0.10	0

Table 5.2-2 THM's 30 May - 30 June 2018

Locality	Frequency	Number of Samples	Drinking water quality standard (mg/L)	Maximum (mg/L)	Average (mg/L)	No of samples where standard was not met (s. 18)
Bass	Monthly	1	0.25	0.10	0.10	0
Cowes	Monthly	1		0.11	0.11	0
Kilcunda	Monthly	1		0.12	0.12	0
San Remo-Phillip Island	Monthly	4		0.14	0.14	0
Water Line	Monthly	2		0.09	0.09	0

5.3 Turbidity

The SDWR stipulate that the 95th percentile of drinking water samples collected in any 12 months period must be ≤ 5.0 NTU. All localities were compliant with the water quality standard as per table 5.3-1 and 5.3-2 below:

Table 5.3-1 Turbidity 1 July 2017- 29 May 2018

Locality	Frequency	Number of Samples	Maximum turbidity in a sample (NTU)	Maximum 95th percentile of turbidity results in any 12 months (NTU)	Number of 95th percentile of results in any 12 months above standard (s 18)
Bass	Weekly	48	0.4	0.2	0
Cape Woolamai	Weekly	48	0.2	0.2	0
Corinella	Weekly	48	0.7	0.4	0
Cowes	Weekly	48	1.6	0.2	0
Grantville	Weekly	48	0.4	0.2	0
Kilcunda	Weekly	49	0.3	0.2	0
Rhyll	Weekly	48	0.3	0.2	0
San Remo	Weekly	48	0.4	0.3	0
Ventnor	Weekly	48	0.6	0.3	0

Table 5.3-2 Turbidity 30 May - 30 June 2018

Locality	Frequency	Number of Samples	Maximum turbidity in a sample (NTU)	Maximum 95th percentile of turbidity results in any 12 months (NTU)	Number of 95th percentile of results in any 12 months above standard (s 18)
Bass	Weekly	4	0.1	0.2	0
Cowes	Weekly	4	<0.1	0.2	0
Kilcunda	Weekly	4	0.1	0.2	0
San Remo-Phillip Island	Weekly	16	0.2	0.2	0
Water Line	Weekly	8	0.3	0.3	0

5.4 Other algae, pathogen, chemical or substance not specified above that may pose a risk to human health

WPW regularly tests for other substances in the drinking water they supply to customers. The following sections detail the results for the 2017/18 reporting period

5.4.1 Fluoride

The heath-based guideline value for fluoride in the ADWG is 1.5mg/L. In conjunction with this value the *Health (Fluoridation) Act 1973* states that the annual average for fluoride in drinking water must not exceed 1 mg/L. Fluoride concentrations at all locations were compliant during the reporting period as presented in table 5.4.1-1 and 5.4.1-2 below:

Table 5.4.1-1 Fluoride 1 July 2017- 29 May 2018

Locality	Frequency	Samples	Drinking water quality standard (mg/L)	Target optimum operating fluoride concentration (mg/L)	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met (s. 18)
Bass	Monthly	23	1.5	0.9	0.87	0.70	0
Cape Woolamai	Monthly	12			0.84	0.73	0
Corinella	Monthly	12			0.88	0.77	0
Cowes	Monthly	12			0.87	0.75	0
Grantville	Monthly	12			0.85	0.72	0
Kilcunda	Monthly	12			0.92	0.77	0
Rhyll	Monthly	12			0.87	0.76	0
San Remo	Monthly	12			0.84	0.73	0
Ventnor	Monthly	12			0.88	0.74	0

Table 5.4.1-2 Fluoride 30 May 2018 – 30 June 2018

Locality	Frequency	Samples	Drinking water quality standard (mg/L)	Target optimum operating fluoride concentration (mg/L)	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met (s. 18)
Bass	Monthly	2	1.5	0.9	0.51	0.50	0
Cowes	Monthly	1			0.59	0.59	0
Kilcunda	Monthly	1			0.59	0.59	0
San Remo/ Phillip Island	Monthly	4			0.57	0.55	0
Water Line	Monthly	2			0.59	0.53	0

5.4.2 Copper

Based on health considerations, the ADWG health-based guideline value is set at 2 mg/L, and at 1 mg/L for the aesthetic-based guideline. The copper concentration complied with both guideline values at all localities during the reporting period as per table 5.4.2-1 and 5.4.2-2 below:

Table 5.4.2-1 Copper 1 July 2017- 29 May 2018

Locality	Frequency	Samples	Drinking water quality standard (mg/L)	Maximum (mg//L)	Average (mg/L)	Number of samples where standard was not met (s. 18)
Bass	Quarterly	4	2	0.01	0.008	0
Cape Woolamai	Quarterly	4		0.01	0.007	0
Corinella	Quarterly	4		0.05	0.037	0
Cowes	Quarterly	4		0.01	0.008	0
Grantville	Quarterly	4		0.02	0.016	0
Kilcunda	Quarterly	4		0.01	0.009	0
Rhyll	Quarterly	4		0.04	0.014	0
San Remo	Quarterly	4		0.04	0.017	0
Ventnor	Quarterly	4		0.14	0.038	0

Table 5.4.2-2 Copper 30 May 2018 – 30 June 2018

Locality	Frequency	Samples	Drinking water quality standard (mg/L)	Maximum (mg//L)	Average (mg/L)	Number of samples where standard was not met (s. 18)
Bass	Quarterly	1	2	0.03	0.03	0
Cowes	Quarterly	1		0.003	0.003	0
Kilcunda	Quarterly	1		0.01	0.01	0
San Remo-Phillip Island	Quarterly	4		0.02	0.009	0
Water Line	Quarterly	4		0.02	0.009	0

5.4.3 Lead

Based on health considerations, the ADWG guideline value is 0.01 mg/L. Lead concentrations complied with this guideline value at all localities during the reporting period as per table 5.4.3-1 and 5.4.3-2 below:

Table 5.4.3-1 Lead 1 July 2017- 29 May 2018

Locality	Frequency	Samples	Drinking water quality standard (mg/L)	Maximum (mg//L)	Average (mg/L)	Number of samples where standard was not met (s. 18)
Bass	Quarterly	4	0.01	<0.001	<0.001	0
Cape Woolamai	Quarterly	4		<0.001	<0.001	0
Corinella	Quarterly	4		0.001	0.001	0
Cowes	Quarterly	4		<0.001	<0.001	0
Grantville	Quarterly	4		0.004	0.002	0
Kilcunda	Quarterly	4		<0.001	<0.001	0
Rhyll	Quarterly	4		<0.001	<0.001	0
San Remo	Quarterly	4		0.002	0.001	0
Ventnor	Quarterly	4		<0.001	<0.001	0

[1] Results with a less than qualifier (<) are below the laboratory detection limit

Table 5.4.3-2 Lead 30 May 2018 – 30 June 2018

Locality	Frequency	Samples	Drinking water quality standard (mg/L)	Maximum (mg//L)	Average (mg/L)	Number of samples where standard was not met (s. 18)
Bass	Quarterly	1	0.01	<0.001	<0.001	0
Cowes	Quarterly	1		<0.001	<0.001	0
Kilcunda	Quarterly	1		<0.001	<0.001	0
San Remo-Phillip Island	Quarterly	4		<0.001	<0.001	0
Water Line	Quarterly	2		<0.001	<0.001	0

5.4.4 Zinc

Based on aesthetic considerations, the ADWG guideline value is set at 3 mg/L. The zinc concentration complied with this guideline value at all localities during the reporting period as per table 5.4.4-1 and 5.4.4-2 below:

Table 5.4.4-1 Zinc 1 July 2017- 29 May 2018

Locality	Frequency	Samples	Drinking water quality standard (mg/L)	Maximum (mg//L)	Average (mg/L)	Number of samples where standard was not met (s. 18)
Bass	Quarterly	4	3	0.008	0.004	0
Cape Woolamai	Quarterly	4		0.01	0.005	0
Corinella	Quarterly	4		0.02	0.008	0
Cowes	Quarterly	4		0.01	0.008	0
Grantville	Quarterly	4		0.04	0.018	0
Kilcunda	Quarterly	4		0.006	0.003	0
Rhyll	Quarterly	4		0.007	0.004	0
San Remo	Quarterly	4		0.05	0.014	0
Ventnor	Quarterly	4		0.09	0.025	0

Table 5.4.4-2 Zinc 30 May 2018 – 30 June 2018

Locality	Frequency	Samples	Drinking water quality standard (mg/L)	Maximum (mg//L)	Average (mg/L)	Number of samples where standard was not met (s. 18)
Bass	Quarterly	1	3	0.01	0.01	0
Cowes	Quarterly	1		0.002	0.002	0
Kilcunda	Quarterly	1		0.005	0.005	0
San Remo-Phillip Island	Quarterly	4		0.01	0.005	0
Water Line	Quarterly	1		0.01	0.01	0

5.4.5 Manganese

The ADWG health-based value is 0.5 mg/L, and 0.1 mg/L for aesthetic-based value. The manganese results met both ADWG values (for aesthetics and health) in all sampling localities during the reporting period as per table 5.4.5-1 and 5.4.5-2 below:

Table 5.4.5-1 Manganese 1 July 2017- 29 May 2018

Locality	Frequency	Samples	Drinking water quality standard (mg/L)	Maximum (mg//L)	Average (mg/L)	Number of samples where standard was not met (s. 18)
Bass	Monthly	33	0.5	0.03	0.005	0
Cape Woolamai	Monthly	33		0.01	0.004	0
Corinella	Monthly	33		0.13	0.007	0
Cowes	Monthly	33		0.01	0.004	0
Grantville	Monthly	44[2]		0.07	0.006	0
Kilcunda	Monthly	33		0.03	0.004	0
Rhyll	Monthly	33		0.008	0.003	0
San Remo	Monthly	33		0.009	0.003	0
Ventnor	Monthly	33		0.02	0.003	0

[2]locality includes sampling from two treated storage tanks that supply Grantville and Corinella

Table 5.4.5-2 Manganese 30 May 2018 – 30 June 2018

Locality	Frequency	Samples	Drinking water quality standard (mg/L)	Maximum (mg//L)	Average (mg/L)	Number of samples where standard was not met (s. 18)
Bass	Monthly	2	0.5	0.002	0.001	0
Cowes	Monthly	3		0.003	0.002	0
Kilcunda	Monthly	3		0.002	0.001	0
San Remo - Phillip Island	Monthly	12		0.003	0.002	0
Water Line	Monthly	7		0.003	0.002	0

5.4.6 All other chemicals or monitored parameters

WPW also sample from water entering points and service basins that deliver water into each locality for health related aspects of drinking water. There are a number of sites that sample different parameters at varying frequencies. These are highlighted, along with compliance with ADWG, in table 5.4.6-1 below:

Table 5.4.6-1 other health related parameters sampled at water entering points and service basins

Parameter	Frequency	Samples	Drinking water quality standard (mg/L)	Number of samples where standard was not met (s. 18)
Chromium (as Cr(VI)	Quarterly	40	<0.05	0
Cyanide	Annually	10	<0.08	0
Nitrate	Fortnightly	216	<50	0
Nitrite	Fortnightly	216	<3	0
Sulphate	Annually	3	<250	0

5.4.7 Raw water monitoring

As described in section 2.1, the raw water quality in Candowie Reservoir is impacted by farming throughout the open catchment. For this reason WPW monitors a number of parameters in the raw water storage to detect changes in water quality, allowing for proactive management of water treatment processes. Parameters, sampling frequency and location are tabulated below.

WPW reviewed its water sampling program in line with regulation 13 of SDWR 2015. Regulation 13 requires samples of drinking water to be collected at a frequency detailed in the WQRMP.

Table 5.4.7-1 raw water monitoring

Location	Frequency	Parameter
Raw water offtake	Daily	Fluoride, turbidity, pH, iron and manganese
	Weekly	*E. coli* and coliforms
	Fortnightly (or increased as required)	Methyl Iso-Borneol (MIB) and geosmin
	Monthly	Alkalinity dissolved organic carbon electrical conductivity @25°C and electrical conductivity
	Quarterly	Herbicides and pesticides, cryptosporidium and giardia
	Annually	Metals (silver iodide, tin, barium, boron, mercury, molybdenum, selenium and beryllium) and radiation
Profile sampling at surface, 1, 3, 7 and 9 meter depths	Fortnightly (or increased as required)	Blue green algae, nitrate, nitrite, ammonia, phosphorus, silica, iron and manganese
Surface and every meter interval (up to 10m)	Fortnightly	Temperature, dissolved oxygen, pH and

5.4.8 Analysis of results

The quality of drinking water supplied to our customers was 100% compliant with requirements detailed in, SDWR 2015 and WPW'S WQRMP in 2017-18.

WPW has also reached 100% compliance with these requirements for the two previous reporting periods, 2015-16 and 2016-17 respectively. For more information on the previous reporting periods please visit our publications page on our website:

http://www.westernportwater.com.au/learning-centre/resources-support/forms-publications/

5.4.9 Water quality improvements in 2017-18

Water quality improvements during 2017-18 were:

- Construction of Ultraviolet Disinfection was completed at IBWPP in March 2018. This provides our treatment process with a multiple barrier approach for pathogen removal.
- Filter to waste was commissioned at IBWPP in May 2018. This addition provides further control to filter operation and greatly reduces the risk of out of specification water being delivered to customers.
- Turbidity filter performance met the Health Based Target guideline of <0.2 NTU 95% of the time and not >0.5 NTU for 15 consecutive minutes throughout 2017-18.
- Mechanical mixers installed in clear water storages to aid in mixing during disinfection and to reduce short circuiting and water age within storages, improving the aesthetics of the water.
- Annual air scouring of water mains continued as an annual routine program.
- Continuous monitoring (CCTV) installed at critical assets improving security and asset protection.
- Filter media was added to two filters. The other filter was topped up in 2016-17.
- Commencement of a backflow prevention project. This project will provide protection of the distribution system against contamination from private supplies.
- Adoption of the 5C's principle to ensure best practice is followed during repairs in the distribution system.

5.5 Aesthetics

The SDWR 2015 refers to aesthetic water quality and states the annual report must include the steps taken by a water supplier to manage aesthetic characteristics of drinking water supplied. Along with verification monitoring of colour and pH, WPW undertake jar testing for optimum coagulant dosing. Other steps taken to manage aesthetics are reactive maintenance programs: annual air scouring of the distribution pipe network and reactive flushing. The ADWG set the aesthetic based guideline values for aluminium, true colour, iron and pH. Those parameters sampled throughout the distribution system, indicating compliance, are presented in tables below.

5.5.1 Aluminium (acid-soluble)

Based on aesthetic considerations, the ADWG guideline value is 0.2 mg/L. The aluminium concentration complied with this guideline value at all localities during the reporting period as per table 5.5.1-1 and 5.5.1-2 below:

Table 5.5.1-1 Aluminium 1 July 2017 – 29 May 2018

Locality	Frequency	Samples	Drinking water quality standard (mg/L)	Maximum (mg/L)	Average (mg/L)
Bass	Quarterly	3	0.2	0.01	0.01
Cape Woolamai	Quarterly	3		0.01	0.01
Corinella	Quarterly	3		0.01	0.01
Cowes	Quarterly	3		0.01	0.01
Grantville	Quarterly	3		0.03	0.02
Kilcunda	Quarterly	3		0.02	0.01
Rhyll	Quarterly	3		0.02	0.01
San Remo	Quarterly	3		0.01	0.01
Ventnor	Quarterly	3		0.01	0.01

Table 5.5.1-2 Aluminium 30 May 2018 – 30 June 2018

Locality	Frequency	Samples	Drinking water quality standard (mg/L)	Maximum (mg/L)	Average (mg/L)
Bass	Quarterly	1	0.2	0.01	0.01
Cowes	Quarterly	1		0.02	0.02
Kilcunda	Quarterly	1		0.02	0.02
San Remo-Phillip Island	Quarterly	4		0.01	0.01
Water Line	Quarterly	2		<0.01	<0.01

5.5.2 True colour

Sampling for true colour was undertaken at water entering points into the distribution system - not at customer taps. The table below presents the data from a locality perspective rather than for individual water sampling points. The ADWG value is set at 15 HU. True colour results met ADWG in all sampling localities during the reporting period as per table 5.5.2-1 and 5.5.2-2 below:

Table 5.5.2-1 True colour 1 July 2017 – 29 May 2018

Locality	Frequency	Samples	Drinking water quality standard (HU)	Maximum (mg/L)	Average (mg/L)
Bass	Quarterly	3	15	2	2
Cape Woolamai	Quarterly	3		2	2
Corinella	Quarterly	3		2	2
Cowes	Quarterly	3		2	2
Grantville	Quarterly	6[1]		2	2
Kilcunda	Quarterly	3		2	2
Rhyll	Quarterly	3		2	2
San Remo	Quarterly	3		2	2
Ventnor	Quarterly	3		2	2

[1]locality includes sampling from two treated storage tanks that supply Grantville and Corinella

Table 5.5.2-2 True colour 30 May 2018 – 30 June 2018

Locality	Frequency	Samples	Drinking water quality standard (HU)	Maximum (mg/L)	Average (mg/L)
Bass	Quarterly	1	15	2	2
Cowes	Quarterly	1		2	2
Kilcunda	Quarterly	1		2	2
San Remo-Phillip Island	Quarterly	4		2	2
Water Line	Quarterly	3[1]		2	2

[1]locality includes sampling from two treated storage tanks that supply Grantville and Corinella

5.5.3 Iron

Based on aesthetic considerations, the ADWG guideline value is 0.3 mg/L. All localities were compliant with the ADWG in the 2017-18 reporting period as highlighted in table 5.5.3-1 and 5.5.3-2 below:

Table 5.5.3-1 Iron 1 July 2017 – 29 May 2018

Locality	Frequency	Samples	Drinking water quality standard (mg/L)	Maximum (mg/L)	Average (mg/L)
Bass	Monthly	11	0.3	0.03	0.01
Cape Woolamai	Monthly	11		0.04	0.02
Corinella	Monthly	11		0.08	0.02
Cowes	Monthly	11		0.07	0.02
Grantville	Monthly	11		0.03	0.02
Kilcunda	Monthly	12		0.02	0.01
Rhyll	Monthly	11		0.03	0.02
San Remo	Monthly	11		0.08	0.03
Ventnor	Monthly	11		0.07	0.03

Table 5.5.3-2 Iron 30 May 2018 – 30 June 2018

Locality	Frequency	Samples	Drinking water quality standard (mg/L)	Maximum (mg/L)	Average (mg/L)
Bass	Monthly	1	0.3	<0.01	<0.01
Cowes	Monthly	1		0.03	0.03
Kilcunda	Monthly	1		0.01	0.01
San Remo-Phillip Island	Monthly	4		0.04	0.02
Water Line	Monthly	2		0.02	0.01

5.5.4 pH

The ADWG aesthetic value for pH is >6.5 and <8.5. All localities were compliant with the ADWG in the 2017-18 reporting period as highlighted in table 5.5.4-1 and 5.5.4-2 below:

Table 5.5.4-1 pH 1 July 2017 – 29 May 2018

Locality	Frequency	Samples	Drinking water quality standard	Minimum	Maximum
Bass	Fortnightly	22	6.5-8.5	7.1	7.5
Cape Woolamai	Fortnightly	22		7.2	7.7
Corinella	Fortnightly	22		7.3	7.5
Cowes	Fortnightly	22		7.4	8.2
Grantville	Fortnightly	22		7.2	7.7
Kilcunda	Fortnightly	22		7.3	7.8
Rhyll	Fortnightly	22		7.4	7.8
San Remo	Fortnightly	22		7.2	7.7
Ventnor	Fortnightly	22		7.4	8.3

Table 5.5.4-2 pH 30 May 2018 – 30 June 2018

Locality	Frequency	Samples	Drinking water quality standard	Minimum	Maximum
Bass	Fortnightly	1	6.5-8.5	7.2	7.2
Cowes	Fortnightly	2		7.6	7.8
Kilcunda	Fortnightly	2		7.3	7.3
San Remo-Phillip Island	Fortnightly	8		7.3	8
Water Line	Fortnightly	4		7.2	7.5

6. Complaints relating to water quality

6.1 Summary of complaints

The number of customer complaints to WPW regarding drinking water totalled 30 for 2017/18. This was an increase of 10 from 2016/17. Table 6.1-1 details the type of customer complaints. Table 6.1-2 details water quality complaints by sampling locality.

Table 6.1-1 Customer^ complaints relating to water quality

Type of complaint	Number of complaints			Comparison with previous reporting periods	Comments
	2017-18	2016-17	2015-16		
Discoloured water	15	10	13	Slight increase from previous year.	Increase from previous year can be attributed to planned air scouring and bursts and leaks repairs.
Taste/odour	8	2	18	Increase from previous year but a reduction from prior years.	Ongoing water quality improvements as discussed in 5.4.9.
Other*	7	8	9	No significant change	Nil
Total	**30**	**20**	**40**	**33% increase from 2016-17**	**Although there was an increase in customer complaints from 2016-17 numbers were similar to previous years.**

Table 6.1-2 Complaints by water sampling locality

Locality	Type of complaint			Total
	Discoloured water	Taste/odour	Other*	
Bass	1	0	0	1
Cape Woolamai	4	2	0	6
Corinella	4	4	2	10
Cowes	2	2	2	6
Grantville	0	0	0	0
Kilcunda	2	0	0	2
Rhyll	1	0	1	2
San Remo	0	0	0	0
Ventnor	1	0	0	1
Unknown[1]	0	0	2	2

^for the purposes of this section, the term 'customer' has the same meaning as that used by the Essential Services Commission, that is, a customer = a connection
*this category includes any contact related to alleged illness
[1]Complaints that were received where an address was not provided, unable to allocate to a sampling locality.

50% of complaints were for discoloured colour, 27% taste/odour and 23% for other.

The majority of complaints were due to reactive maintenance works where there was a burst or leak of the distribution network resulting in discoloured water. Flushing after works corrected any complaint received. There were no media releases or public announcements associated with water quality complaint.

Total customer complaints increased from 20 in 2016-17 to 30 in 2017-18.The 33% increase was due to ongoing preventative maintenance works. The routine air scouring program and reactive maintenance from bursts and leaks can be attributed to the discoloured water complaints.

6.2 Response to complaints

WPW is committed to providing its customers with ongoing quality water and services. Our customer service division manages customer complaints and each complaint is lodged using an entry form in WPW customer request management (CRM) system. Depending on the nature of the complaint, the details are electronically forwarded to the Water Quality and Sustainability Officer for water quality complaints; the Maintenance group for bursts and leaks.

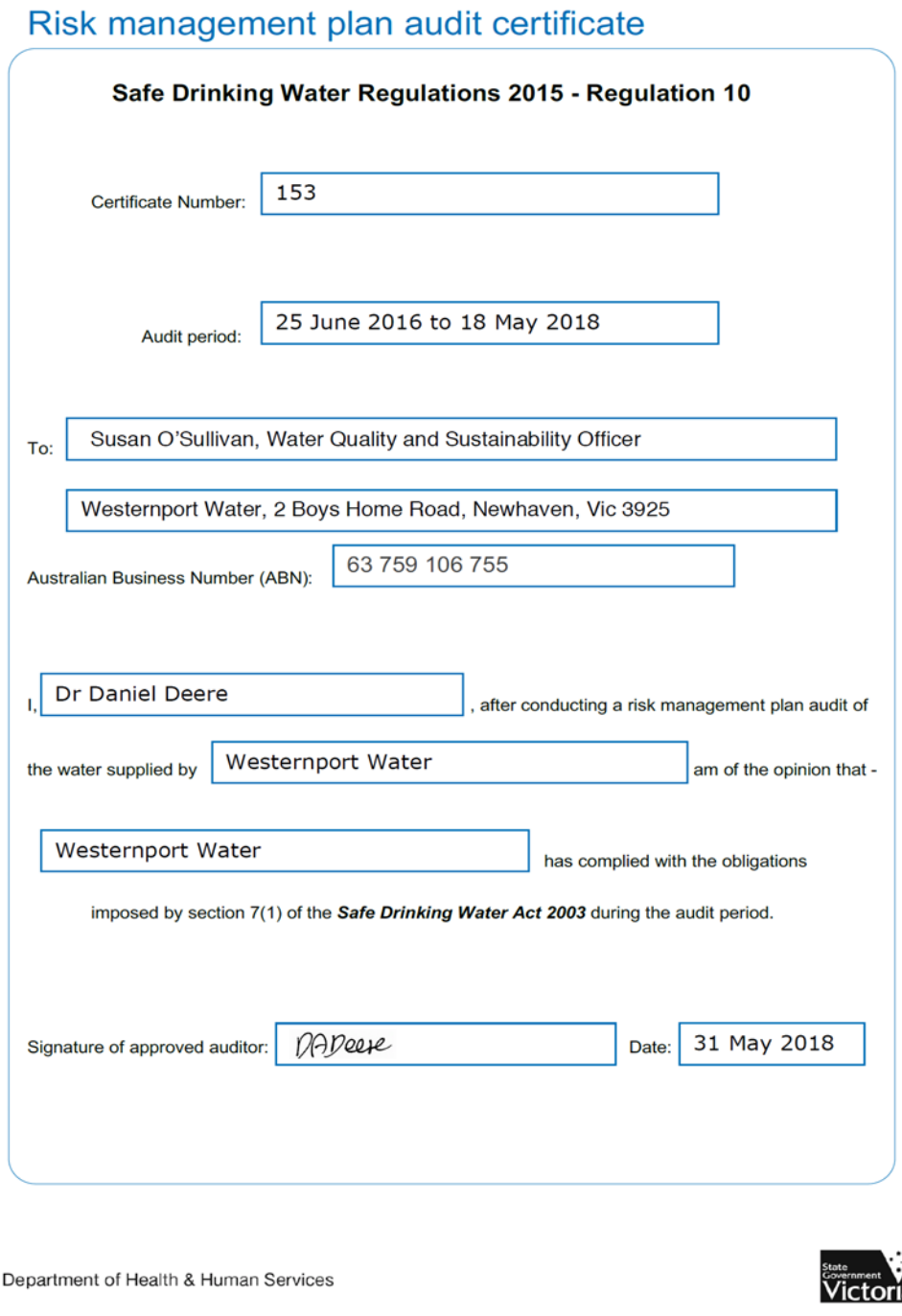
After a complaint is lodged, depending on the nature of the complaint, one or a combination of the following actions may be performed:

- Proceed with remedial action such as water sample testing, mains flushing and sometimes water sampling testing after flushing;
- Contact the customer who lodged the complaint to determine the seriousness of the issue;

- Discuss with the complainant the possible causes of the poor water quality i.e. temporary changes to normal operation or high manganese and/or iron in raw water;
- Explain to the complainant the multiple barriers and rigorous sampling and testing regime employed to provide a safe and aesthetically acceptable water; and
- Give feedback to customer in terms of water quality information and links to further information regarding regulatory obligations.

7. Findings of the most recent risk management plan audit

Written notice was provided by DHHS in October 2017 advising that an audit of Risk Management Plans (RMP) must occur by 31 May 2018. Westernport Waters audit took place on 17-18 May 2018. Westernport Water was found to be compliant with the Section 7(i) of the SDWA.



Risk management plan audit certificate

Safe Drinking Water Regulations 2015 - Regulation 10

Certificate Number: 153

Audit period: 25 June 2016 to 18 May 2018

To: Susan O'Sullivan, Water Quality and Sustainability Officer

Westernport Water, 2 Boys Home Road, Newhaven, Vic 3925

Australian Business Number (ABN): 63 759 106 755

I, Dr Daniel Deere, after conducting a risk management plan audit of the water supplied by Westernport Water am of the opinion that -

Westernport Water has complied with the obligations imposed by section 7(1) of the ***Safe Drinking Water Act 2003*** during the audit period.

Signature of approved auditor: DADeere Date: 31 May 2018

Department of Health & Human Services

State Government Victoria

Figure 7-1 Risk management plan audit certificate

Opportunities for improvement (OFI's) identified during the audit are listed in table 6.2-1 including the status of the OFI and expected completion date.

Table 7-1 OFI's identified during audit

OFI	Status	Completion Date
Over the longer term, consider committing to installing two or more conventional fixed roof water tanks in place of the single San Remo Basin with its floating cover.	To be considered in Year 3 of Pricing Submission	2020-21
Complete the roll-out of monochloramine and free ammonia analysers to cover the remaining Grantville Tank. To provide full coverage for this best practice monitoring program to help inform the challenging task of managing chloramine residuals.	Investigation underway to determine if OFI to be implemented	2018-19
In continuing with its backflow prevention program, WPW is encouraged to consider the ongoing workload that this creates and resource that workload. Any backflow prevention role could be linked to recycled water and trade waste management roles. The role could link to the trend for more proactive involvement by water utilities in oversighting plumbing to help fill a regulatory weakness.	Project underway	2019-20
WPW is encouraged to look at better formalising an obligation on its materials suppliers to only supply pipes, parts, fittings, coatings, etc., that are fit-for-purpose as materials in contact with drinking water, where relevant.	Investigation underway to determine most suitable method.	2018-19
WPW is encouraged to progress with its plans to create a suitably sized and outfitted storage depot that permits chemicals, parts, and fittings to be stored undercover, off the ground, in clean, sanitary conditions, out of sunlight and at suitable temperatures.	Project underway	2020-21

8. Undertakings under section 30 of the Act

WPW currently has no section 30 undertakings.

9. Regulated Water

No regulated water was supplied during the reporting period.

10. Exemption under section 20 of the Act

WPW has no exemptions under section 20.

11. Glossary of Terms

WPW must make this document and all water quality monitoring information available to public disclosure within 7 days of the request. For information pertaining to water quality in WPW's region please contact the Water Quality and Sustainability Officer via:

Email: sosullivan@westernportwater.com.au,

Website http://www.westernportwater.com.au/water-quality/

Phone (03) 5956 4161.

Term	Meaning
ADWG	Australian Drinking Water Guidelines, 2011 prepared by the National Health and Medical Research Council
CRM	Customer Request Management system
DAFF	Dissolved Air Floatation and Filtration
DHHS	Department of Health and Human Services
E.coli	*Escherichia coli*
GMU	Groundwater Management Unit
IBWPP	Ian Bartlett Water Purification Plant
mg/L	Milligram per litre
NTU	Nephelometric Turbidity Units
PAC	Powdered Activated Carbon
SCADA	Supervisory Control and Data Acquisition
SDWA	*Safe Drinking Water Act, 2003 (Victoria)*
SDWR	Safe Drinking Water Regulations, 2015
THM	Trihalomethanes
UCL	Upper Confidence Limit
WPW	Westernport Water
RMP	Risk Management Plan