

Drinking Water Quality Management Plan (DWQMP) report

2016/17

Winton Shire Council

SPID: 131

75 Vindex Street

Winton

Qld 4735

(07) 4657 2666

Richards@winton.qld.gov.au

Glossary of terms

ADWG 2004	Australian Drinking Water Guidelines (2004). Published by the National Health and Medical Research Council of Australia
ADWG 2011	Australian Drinking Water Guidelines (2011). Published by the National Health and Medical Research Council of Australia
<i>E. coli</i>	<i>Escherichia coli</i> , a bacterium which is considered to indicate the presence of faecal contamination and therefore potential health risk
HACCP	Hazard Analysis and Critical Control Points certification for protecting drinking water quality
mg/L	Milligrams per litre
NTU	Nephelometric Turbidity Units
MPN/100mL	Most probable number per 100 millilitres
CFU/100mL	Colony forming units per 100 millilitres
<	Less than
>	Greater than

1. Introduction

This report documents the performance of Winton Shire Council's drinking water service with respect to water quality and performance in implementing the actions detailed in the drinking water quality management plan (DWQMP) as required under the *Water Supply (Safety and Reliability) Act 2008* (the Act).

The report assists the Regulator to determine whether the approved DWQMP and any approval conditions have been complied with and provides a mechanism for providers to report publicly on their performance in managing drinking water quality.

This template has been prepared in accordance with the *Water Industry Regulatory Reform – drinking water quality management plan report factsheet* published by the Department of Energy and Water Supply, Queensland, accessible at www.dews.qld.gov.au.

2. Overview of Operations

WSC is the drinking water service provider (SPID 131) for the water supply scheme. WSC is a Small Drinking Water Service Provider (DWSP) as defined in the *Water Supply (Safety and Reliability) Act 2008* and provides drinking water for an approximate population of 982 with an average demand of approximately 1.8 ML/d.

Winton water supply scheme is comprised of one free flowing artesian bore (Bore No. 4, Table 2.1 below refers) delivering water to heat exchangers to cool water from 86°C to a temperature of 44°C (Alpha Laval Plate Exchangers, model M15-BFG8). Three adjacent bores exist (Bores No. 1, 2 and 3), bore 2 and 3 are considered to be the back up bores. The oldest Town Bore No. 1 is 114 years old, Bore number 1 has been allocated for decommission. Bore number 4 that supplies town flows under its own head, with sufficient pressure (approximately 36m of head) to pass through the heat exchange system, pressurize the town network and fill the elevated town reservoir. In times of greater demand, the reticulation system can utilize pumps to boost flow from the bore through the heat exchangers, increasing throughput in the network and maintain the elevated reservoir level. The heat exchangers work using a "cool water" supply from a pond adjacent to the pump station, passing the cool water through the heat exchange system drops the bore water from approximately 86 degrees down to a target temperature of 44 degrees. The cool water ponds are filled from Town Bore No. 1 for replenishing water lost to evaporation.

The elevated reservoir was built in 1952 and is located on Werna Street. The reservoir has storage capacity of 0.45ML. The elevated reservoir provides storage to buffer peak hour demand and emergency storage for firefighting and allows supply to be maintained in the event the bore water supply shuts down due to power failure at the pump system.

The Winton Drinking Water Quality Management Plan Scheme sources water from the Sub-artesian bore. The treatment comprises heat reduction only. Water is not disinfected before reticulation.

3. Actions taken to implement the DWQMP

The DWQMP for Winton has ensured the consistent delivery of potable standard water for the Town of Winton. As mentioned above, the Town of Winton has relied on water from sub-artesian basins to supply for water since the early 1900's.

The DWQMP for Winton has reviewed each element of the supply chain in the drinking water system and assigned an acceptable outcome for each part of the supply chain;

- Bore Infrastructure including pipeline up to pump station
- Pump station infrastructure including heat exchange, hot water and cold water pump system
- Reticulation network
- Reservoir

Operational Monitoring

The system is checked daily with the Water and Sewer department visually inspecting each of the elements daily.

- The bore infrastructure
- The pump station
- The reticulation network
- The reservoir

Verification of System

The verification of system performance is able to be determined by checking each element;

- The bore infrastructure flow rate is checked
- The pump station performance is checked with water temperature and flow rates monitored
- The reticulation network is monitored with scour valves throughout the network periodically checked/opened
- The reservoir is brought on and off line during the day when balancing flows
- The integrity of the reticulation network to maintain water quality is checked by the routine sampling and testing of water from the network on various nodes of the network

Progress in implementing the risk management improvement program

Refer to the Appendices for a summary of progress in implementing each of the Improvement Program actions.

Risk management factors that are listed in the DWQMP have been adhered to and implemented; intervals for items such as the 10 year clean interval for the reservoir have not yet been reached.

Revisions made to the operational monitoring program to assist in maintaining the compliance with water quality criteria¹ in verification monitoring.

No revisions have been made to the monitoring program.

Amendments made to the DWQMP

The list of personnel in the DWQMP with responsibilities assigned are all up to date as well as the testing regime. The scheduled external audit of the DWQMP is due in the 2017/18 Financial year and was been completed in October 2017 – the outcomes of that audit will be reflected in the 2017/18 Annual Report.

¹ Refer to *Water Quality and Reporting Guideline for a Drinking Water Service* for the water quality criteria for drinking water.

4. Compliance with water quality criteria for drinking water

The water quality criteria mean health guideline values in the most current Australian Drinking Water Guidelines, as well as the standards in the Public Health Regulation 2005.

Testing of the Winton potable water was completed on a monthly basis for the 2015/16 financial year.

A summary of the parameters from each of the 6 locations in town for the following 10 attributes;

- Turbidity
- Fluoride (naturally occurring)
- Nitrates
- Sulphates
- Iron
- Manganese
- Zinc
- Aluminium
- Boron
- Copper

Attribute	Unit of Measurement
Ph	Ph
Turbidity	NTU
Fluoride (naturally occurring)	mg/L
Nitrates	mg/L
Sulphates	mg/L
Iron	mg/L
Manganese	mg/L
Zinc	mg/L
Aluminium	mg/L
Boron	mg/L
Copper	mg/L

The total number of samples collected for the 2016/17 FY is 72;

6 sites per month

Collected 12 out of the 12 months of the year.

There was 1 sample within the 12 months that fell outside of the health guideline levels; there was detection of E Coli in the Winton water network testing in the financial year 2016/17 in September 2016.

The water quality criteria mean health guideline values in the most current Australian Drinking Water Guidelines, as well as the standards in the Public Health Regulation 2005.

Testing of the Winton potable water was completed on a monthly basis for the 2016/17 financial year.

5. Notifications to the Regulator under sections 102 and 102A of the Act

This financial year there was 1 instance where the Regulator was notified under sections 102 or 102A of the Act. This notification involved the detection of *E. coli* – an organism that may not directly represent a hazard to human health, but indicates the presence of recent faecal contamination. This incident did not require Winton Shire Council to issue a boil water or do not drink notice in the communities.

Prescribed incidents or Events reported to the Regulator and corrective and preventive actions undertaken.

Incident Description: The non-compliance was a detection of *E. coli* from a routine sample taken on 27/09/2016 at 104 Elderslie Street. 1 cfu *E. coli* organisms per 100 mL was/were detected when testing was completed on the 28th September, with a disinfection residual of nil (no disinfection used in Winton Shire Council water supply). Notification was given to Winton Shire Council on the 29th September.

Corrective and Preventative Actions: The reservoir was flushed, and shock dosed with chlorine. Further sampling of the reservoir was completed on the 4th October, testing on the 5th October with no trace of E Coli. All follow up samples were free of *E. coli*. Testing procedures were reviewed to detect whether the source of *E. coli* could have been from handling contamination. The same process was used at each of the 6 sites with no other recording of E Coli, handling was unlikely to be the cause. With only one site registering E Coli it is unlikely that it was within the reticulation system. The approach that was taken is to continue testing post chlorine dosing to see if there were any further occurrences. The subsequent testing came back clear, no further action was taken other than to maintain water sampling and testing regime as per the DWQMP.

6. Customer complaints related to water quality

Winton Shire Council is required to report on the number of complaints, general details of complaints, and the responses undertaken.

There were no complaints received regarding the Winton Shire Council water supply.

7. Findings and recommendations of the DWQMP auditor

There was no audit completed in the 2016/17 year, with the next regular audit programmed to occur in October 2017 by external Auditor.

Winton Shire Council had an accredited auditor come to Winton and complete the audit in October 2017, those results will be reported in next years annual report.

8. Outcome of the review of the DWQMP and how issues raised have been addressed

No outcomes to discuss.

Appendix A – Summary of compliance with water quality criteria

The results from the verification monitoring program have been compared against the levels of the water quality criteria specified by the Regulator in the *Water Quality and Reporting Guideline for a Drinking Water Service*.

The reported statistics do not include results derived from repeat samples, or from emergency or investigative samples undertaken in response to an elevated result.

Testing was completed for 12 of the 12 months of the year (additional testing completed in October as a result of the E Coli positive result)

The method of sampling and the testing was carried out to the DWQMP standard.

The verification monitoring shall continue as it fulfils the task of identifying any performance issues with the delivery of potable water.

As per ADWG recommendations, the data could be presented per water quality monitoring zone. Additionally the 95th percentile statistic could be stated, but these aspects are beyond the minimum requirements in the annual report.

Table 1 - Verification monitoring results

Scheme name	Scheme component	Parameter	Units	Frequency of sampling	Total No. samples collected	No. of samples in which parameter was detected	No. of samples exceeding water quality criteria	Average (Mean)	Max	Min	Limit of reporting	Laboratory name
Winton	Reticulation	pH	ph	Monthly	66	66	0	7.73	8.14	7.48	N/A	FSS Lab Coopers Plain
		Turbidity	NTU	Monthly	66	66	0	<1	<1	<1	<1	FSS Lab Coopers Plain
		Fluoride (naturally occurring)	mg/L	Monthly	66	66	0	0.27	0.36	0.20	N/A	FSS Lab Coopers Plain
		Nitrate	mg/L	Monthly	66	66	0	<0.5	<0.5	<0.5	<0.5	FSS Lab Coopers Plain
		Sulphate	mg/L	Monthly	66	66	0	5.23	7.00	5.00	N/A	FSS Lab Coopers Plain
		Iron	mg/L	Monthly	66	66	1	0.08	0.25	0.01	<0.01	FSS Lab Coopers Plain
		Manganese	mg/L	Monthly	66	66	0	0.08	0.09	0.06	N/A	FSS Lab Coopers Plain
		Zinc	mg/L	Monthly	66	66	0	0.11	1.20	0.01	<0.01	FSS Lab Coopers Plain
		Aluminium (acid-soluble)	mg/L	Monthly	66	66	0	<0.05	<0.05	<0.05	<0.05	FSS Lab Coopers Plain
		Boron	mg/L	Monthly	66	66	0	0.06	0.07	0.05	N/A	FSS Lab Coopers Plain
		Copper	mg/L	Monthly	66	66	0	<0.03	0.35	<0.03	<0.03	FSS Lab Coopers Plain

Table 2 - Reticulation *E. coli* verification monitoring

Drinking water scheme: Winton (SPID 131)

Year	2016											
Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
No. of samples collected	0	12	6	6	6	6	6	6	6	6	6	6
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)	0	0	0	0	0	0	0	0	1	0	0	0
No. of samples collected in previous 12 month period	60	62	63	64	65	66	67	68	69	70	71	72
No. of failures for previous 12 month period	1	1	1	1	1	1	1	0	1	1	1	1
% of samples that comply	98.3%	98.4%	98.4%	98.4%	98.5%	98.5%	98.5%	100.0%	98.6%	98.6%	98.6%	98.6%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

Drinking water scheme: Winton (SPID 131)

Year	2017											
Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
No. of samples collected	6	6	6	6	6	6	6	6	6	6	6	6
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	66	62	63	64	65	66	67	68	69	70	71	72
No. of failures for previous 12 month period	1	1	1	1	1	1	1	1	0	0	0	0
% of samples that comply	98.5%	98.4%	98.4%	98.4%	98.5%	98.5%	98.5%	98.5%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

Appendix B – Implementation of the DWQMP Risk Management Improvement Program

Table 3 - Progress against the risk management improvement program in the approved DWQMP

Scheme Component/Sub Component	Hazardous Event	Hazard	Maximum Risk			Existing preventative measures/barriers	Residual Risk			Uncertainty	Comments/proposed further risk reduction actions	Comment on Progress
			Consequence	Likelihood	Risk Level		Consequence	Likelihood	Risk Level			
Bore	Hazard that arises from the natural geological processes in the aquifer	Sodium	Insignificant	Possible	Low (3)	None	Insignificant	Possible	Low (3)	Estimate	Acceptable risk, continue to monitor	Water characteristics such as sodium and pH are characteristics of the bore water, unless these characteristics move outside of aesthetic/health guidelines then the process will be to continue to monitor.
		pH	Insignificant	Possible	Low (3)	None	Insignificant	Possible	Low (3)	Estimate		
	Flood Event	Substances not identified	Catastrophic	Rare	Medium (6)	Capped Bore	Moderate	rare	Low (3)	Uncertain	W4. Identify Effect of flooding on bore water quality considering private bores which exist on the flood plain which may not be capped	Previous town supply bores are maintained in working order with a connection to the town reticulation supply that can be turned on in the event that Bore 4 (town supply) is damaged by floating debris in flood event or similar.
Sourcing Infrastructure	Power Outage	Disruption to supply	Moderate	Unlikely	Medium (6)	Elevated Reservoir (limited backup) Backup generator at pump station	Insignificant	rare	Low (1)	Uncertain	Acceptable risk	There is a generator in place in case of power outage. Winton Shire Council is working towards installing a geothermal plant using the hot bore water to run a turbine. That will supply continuous power, not reliant on commercial power supply. A generator backup will be kept to ensure continuity of power supply should the geothermal system malfunction.
	Flood Event	Loss of Infrastructure	Catastrophic	Rare	Medium (6)	Critical Infrastructure constructed above Flood Event	Moderate	rare	Low (3)	Uncertain		
	Maintenance and repair of water main	Bacteria	Moderate	Rare	Low (3)	None	Moderate	rare	Low (3)	Uncertain	W1. Operational and Maintenance Procedures W5. Provide restricted access to bore sites	Operational and maintenance procedures introduced into the Winton Shire Council include chlorination and testing of all new water mains before bringing new infrastructure online to ensure that contamination does not occur.
	Accidental or intentional contamination	Harmful Substances (not identified)	Catastrophic	Rare	Medium (6)	Fencing and locked gates	Catastrophic	rare	Medium (6)	Uncertain		There is a SCADA system in place that will notify the Water/Sewer Manager as well as the Director of Works if there is water hotter than the target temperature being reticulated through the system.
Cooling/Hot water	Cooling system fails	Potential scalding	Catastrophic	Rare	Medium (6)	Monitoring	Moderate	rare	Low (3)	Uncertain		
Treatment Plant												
Reticulated Water Untreated												
Disinfection process												
Reticulated Water Not Disinfected												
Distribution Service Reservoirs	Contamination due to vermin such as birds, lizards and frogs	Bacteria	Moderate	Almost Certain	High (15)	Roofed Reservoir, vermin mesh on overflow pipe and vents. Gatic raised manhole with locked hatch. Can't inspect due to safety and resource restraints	Catastrophic	Rare	Medium (6)		W1. Operational and Maintenance Procedures W1. Develop procedures for isolation W2. Cleaning of storage tank every 10 years W3. Improve sampling processes	The reservoir is secured in terms of closure of all apertures and manholes as well as animal proof covers over vents. Cleaning of the Reservoir was completed in 2012 as well as December 2017. There is an emphasis on chlorination of new water main installation (capital works) to disinfect and then test to ensure no bacterial contamination is present when bringing online into the system. There are processes in place to contain the risk of bacterial contamination from capital works. Maintenance type repairs have positive pressure on leaks ensuring no infiltration into the system.
	Storage contamination	Salmonella	Catastrophic	Possible	High (15)	Cleaning of reservoir once every 10 years	Catastrophic	Rare	Medium (6)			
	Reticulation, maintenance and repair	Bacteria	Moderate	Rare	Low (3)	None	Moderate	Rare	Low (3)			
Whole of system	Flights carrying samples to lab delayed/cancelled	Logistical	Insignificant	Possible	Low (3)	Nil	Insignificant	Possible	Low (3)		Acceptable Risk	The samples are time tagged, if the samples do not reach the lab in time another round of sampling and testing is completed to account for this.