

Drinking Water Quality Management Plan Report

Livingstone Shire Council

SPID: 556

2018-2019

This report has been prepared in accordance with the Drinking Water Quality Management Plan Report Guidance Note.

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1 Introduction

This is the Drinking Water Quality Management Plan (DWQMP) report for Livingstone Shire Council for the financial year 2018-19 i.e. 1/07/2018 to 30/06/2019

Livingstone Shire Council is a registered service provider with identification (SPID) number 556. Livingstone Shire Council is operating under an approved DWQMP to ensure consistent supply of safe quality drinking water in order to protect public health.

This is done through proactive identification and minimisation of public health related risks associated with drinking water.

This DWQMP report includes:

- the activities undertaken over the financial year in operating our drinking water service
- drinking water quality summary
- summary of our performance in implementing our approved DWQMP

This report is submitted to the Regulator to fulfil our regulatory requirement and is also made available to our customers through our website or for inspection upon request at council office.

2 Summary of scheme/s operated

Livingstone Shire Council was established after de-amalgamation on 1 January 2014 and has a population of more than 37,000 residents. Livingstone Shire Council is in Central Queensland with a service area of approximately 11,776 km². Livingstone Shire Council operates four (4) drinking water schemes:

Table 1 – Summary of schemes

	Water Source	Treatment processes	Treatment capacity	Towns supplied
Capricorn Coast DWSS	<p>The Capricorn Coast Scheme is a multiple entity scheme that has two distinct water supplies. The first supply is Waterpark Creek, which is harvested into the Kelly's Offstream Storage.</p> <p>Water from the Woodbury WTP is supplemented by a second water supply via the Rockhampton to Yeppoon Water Supply Pipeline. The ~40 km pipeline supplies water treated conventionally by Fitzroy River Water (FRW), a business unit of Rockhampton Regional Council, at their Glenmore Water Treatment Plant in Rockhampton.</p>	<p>Water from this storage is conventionally treated (coagulation, flocculation, clarification, filtration & disinfection by chlorination - at the Woodbury Water Treatment Plant (WTP), which is operated by Livingstone Shire Council.</p>	<p>Woodbury WTP - approx. 210 litres per second</p>	<p>Yeppoon, The Causeway, Kinka Beach, Zilzie, Emu Park and Keppel Sands.</p>
Nerimbera DWSS	<p>The entire water supply for "The Nerimbera area" is sourced from and are zones within the Glenmore Water Treatment Plant reticulation network. The local government</p>	<p>Coagulation, flocculation, clarification, filtration, chlorination - operated by Rockhampton Regional Council Fitzroy River Water.</p>	<p>As demand dictates</p>	<p>Nerimbera is a small community located ~8 km East of Rockhampton town Centre, and pressure is maintained by the Lakes Creek Road Water Pump Station. Livingstone Shire Council has no pumps or</p>

	Water Source	Treatment processes	Treatment capacity	Towns supplied
	boundary separates this zone from the Glenmore WTP reticulation network.			reservoirs in the Nerimbera zone. There is an abattoir located at the far end of this reticulation zone, and this is a high-risk customer. There is no further treatment or re-chlorination in this zone
The Caves (Mt Charlton) DWSS	The entire water supply for "The Caves" areas are sourced from and are zones within the Glenmore Water Treatment Plant reticulation network. Livingstone Shire Council has control only of re-chlorination at Mt Charlton reservoir. The local government boundary separates this zone from the Glenmore WTP reticulation network.	Coagulation, flocculation, clarification, filtration, chlorination - operated by Rockhampton Regional Council Fitzroy River Water.	As demand dictates	The Caves area, located to the north of Rockhampton, includes the Mt Charlton, Ramsay Creek, Etna Creek, Glenlee, Glendale, Rockyview and The Caves communities. The Capricorn Correctional Centre is a major customer in this zone. Water is supplied to Livingstone Shire Council at the Ramsay St Pump Station. There is a small reticulation area off Argyle St where drinking water returns to Fitzroy River Water (FRW) control. Both LSC and FRW agree that there is no further increase in public health risks to Fitzroy River Water (FRW) due to this arrangement.
Marlborough DWSS	Bore Water Catchment	Bore water is treated by bag filtration and/or reverse osmosis prior to disinfection	Approx. 1.3 Litres per second Approx. 110 kL per day	This is a bore water catchment to tap scheme that serves the community of Marlborough. It is fully owned and operated by Livingstone Shire Council.

3 DWQMP implementation

The actions undertaken to implement the DWQMP are summarised below.

Livingstone Shire Council Infrastructure Water and Sewer staff met every month to discuss water and sewerage issues.

This provided the opportunity to refer to the approved DWQMP and emphasise the importance of using the plan. The monthly meetings were chaired by the Manager Water and Waste Operations.

Items that relate to the ongoing implementation of the DWQMP were discussed and noted.

An example of this included reviewing set points and alarms in SCADA to ensure they are set in compliance with the approved DWQMP.

These items are also recorded in the ongoing Risk Management Improvement Program (RMIP) See Table 2 below.

As part of council's induction program, any new incoming water and sewer staff are made aware of the approved DWQMP, a summary of which is part of the induction package and made available on the Livingstone Shire Council intranet and external website.

Over the last eighteen (18) months Livingstone Shire Council has partnered with Central Queensland University in a joint collaborative water quality study of the raw water supply (including Kelly's Dam Off stream Storage) to the Capricorn Coast. Aspects of this ongoing study including relevance to the approved DWQMP were jointly presented to the public during the 2018 Water Week activities on 27th October 2018 at Councils Living Water Expo in Yeppoon.

Each month the Water Quality Officer delivers a report on relevant Water Quality matters - including but not limited to aspects of the approved DWQMP - to the Manager Water and Waste Operations. The Manager Water and Waste Operations then includes this information in their reporting to the Executive Leadership.

The actions undertaken to implement the risk management improvement program are discussed in Table 2.

Table 2 – Risk management improvement program implementation status

Item	Relevant Scheme	Unmitigated Risk level	Mitigated Risk level	Actions			Priority	Responsibility	Action
				Immediate actions	Short Term (6 months)	Long Term (18 months)			
Filtration turbidity set point - Woodbury	Capricorn Coast	Extreme 20	High 10	Change setpoint to 0.5 NTU	Investigate ability to drop to 0.3 NTU	Possible requirement to change filter media	1, 2 and 3	Supervisor Treatment / Mgr WW	Completed. Changed to 0.3 NTU in November 2017
Calculate Woodbury WTP disinfection CT	Capricorn Coast	Extreme 25	Medium 6		Calculate CT to ensure adequacy at worst case concentration and minimum CWT level		2	Water Supply and Sewage Engineer	Completed. CT Calculation performed in December 2017.
Roof of header tank	Capricorn Coast	Extreme 25	Medium 6		Replace roof on header tank to prevent recontamination		2	Mgr WW	Completed April 2017.
Review SCADA Limit (SCADA Access)	Capricorn Coast	Extreme 25	High 10	Investigate locking out Critical SCADA limits to remove operator level access			1	Mgr WW	To be included in Cyber Security review
Mains Flushing	All	Medium 8	Medium 8			Develop mains flushing program (all schemes)	3	Mgr WW	Completed. Includes 3 month & 6 month programs
Renegotiate Bulk Water Agreement to include water quality	Capricorn Coast, The Caves, Nerimbera	Medium 9	Medium 9			Bulk water agreement to be renegotiated to include water quality	3	Mgr WW	Completed - Current agreement expires on 31/12/2019. Will commence renegotiation in June 2019
Chlorate	All	Medium 6	Medium 6			One off testing to see if this is a potential issue	3	Water Quality Officer	Completed. Testing to be performed before December 2017
Butterfly Valves	Marlborough	Medium 8	Medium 8			Install valves at Marlborough CWR such that each CWT can be isolated	3	Mgr WW	Completed. The outlet of all three (3) clear water tanks has isolation valves. Tanks 1 & 2 have independent fill valves. Tank 3 has a common

Item	Relevant Scheme	Unmitigated Risk level	Mitigated Risk level	Actions			Priority	Responsibility	Action
				Immediate actions	Short Term (6 months)	Long Term (18 months)			
									inlet/outlet valve.
Mains break procedure	All	Extreme 25	Medium 6	Check for old procedures with FRW, templates from QWD, IPWEA	Finalise procedure	Include in Quality Management System	1, 2 and 3	Coord Water & Sewage Ops/ Mgr WW	Completed July 2019.Procedure No. MSP-052
Filtration procedure	Capricorn Coast	Extreme 25	High 10	Check for old procedures with FRW, templates from QWD, IPWEA	Finalise procedure	Include in Quality Management System	1, 2 and 3	Coord Water & Sewage Ops/ Mgr WW	Completed February 2017.Procedure No. GDE 011.
Disinfection procedure	Capricorn Coast	Extreme 25	Medium 6	Check for old procedures with FRW, templates from QWD, IPWEA	Finalise procedure	Include in Quality Management System	1, 2 and 3	Coord Water & Sewage Ops/ Mgr WW	Completed February 2017.Procedure No. GDE 013.
Redosing procedure (Reservoir re: Chlorination Process)	Capricorn Coast, The Caves	High 10	Medium 8	Check for old procedures with FRW, templates from QWD, IPWEA	Finalise procedure	Include in Quality Management System	1, 2 and 3	Coord Water & Sewage Ops/ Mgr WW	Completed September 2017.Procedure No. GDE 012.
Other WTP procedures Response to SCADA Alarms	Marlborough and Woodbury	Medium 6	Low 4		Develop procedures for items with a SCADA callout	Develop procedures for other routine processes	2 and 3	Coord Water & Sewage Ops/ Mgr WW	Completed. Escalated through one organizational structure within Level 1 Operational Action - under Section 7.2 of the approved DWQMP
Monitoring Boundary Reservoir	Capricorn Coast	Medium 6	Low 3	Rockhampton Regional Council to finalise installation of Water Quality Monitoring equipment at Boundary Reservoir.			1, 2 and 3	Coord Water & Sewage Ops/ Mgr WW	Completed September 2018
Develop Reservoir Inspection Program	All	Medium 9	Low 4		Finalise and enter into Quality Management System	Include in Quality Management System	1, 2 and 3	Coord Water & Sewage Ops/ Mgr WW	Completed February 2016. Worksheet Nos ISF .192 & ISF.193
Compliance with the Plan - Provisions and conditions in the Approval Notice e.g. Establish Compliance	All	Low 2	Low 2	Ensure regulatory requirements including any conditions of approval are identified and processes are in place to ensure compliance e.g.	Finalise and enter into Quality Management System		1	Water Quality Officer/Mgr WW	Completed December 2018`

Item	Relevant Scheme	Unmitigated Risk level	Mitigated Risk level	Actions			Priority	Responsibility	Action
				Immediate actions	Short Term (6 months)	Long Term (18 months)			
Register				establishment of a compliance register					
Compliance with the plan - Implementation of the preventative measures described in the plan - SCADA Alarms & Set Points	All	Medium 6	Low 4	Review set points and alarms in SCADA to ensure they are set in compliance with the DWQMP.	Finalise review of set points and alarms.		1	Water Quality Officer/Mgr WW	Completed September 2019.
Compliance with the plan - Implementation of the preventative measures described in the plan - chlorination of reservoirs	All	Medium 6	Low 4	Prepare documented procedures for important preventative measures e.g adding chlorine tablets into reservoirs.	Finalise and enter into Quality Management System		1	Coord Water & Sewage Ops/ Mgr WW	Completed September 2019 Work Instruction 03-WI.052
Relevance of the plan - Service description and details of infrastructure reflect current circumstances - documented chemical procurement and receipts processes	All	Low 4	Low 2		Prepare documented procedures for important preventative measures e.g. chemical procurement and receipt processes		1	Coord Water & Sewage Ops/ Mgr WW	Completed June 2019.Procedure No. MSP-047
Cyber Security	All	Medium 8	Low 3	Awaiting finalisation of Performance Reporting Framework from Department of Water Supply Regulation	Integrate Performance Reporting Framework into DWQMP.		1	Coord Water & Sewage Ops/ Mgr WW	Incorporate Cyber security into DWQMP in conjunction with DWQMP Review in Q3 Fiscal 2019-2020

4 Verification monitoring - water quality information and summary

This section discusses the compliance with the water quality criteria.

Table 3 – Drinking water quality performance - verification monitoring

Scheme name	Scheme component	Parameter	Units	No. of samples required to be collected (as per the approved DWQMP)	No of samples actually collected and tested	Water quality criteria (i.e. ADWG health guideline value)	No. of samples non-compliant	Comments
Capricorn Coast	Kelly's Offstream Storage (Source Water)	Sulphate	mg/L	12	12	No Value	0	
		Fluoride (naturally occurring)	mg/L	12	12	1.5	0	
		Aluminium (acid-soluble)	mg/L	12	12	No Value	0	
		Copper	mg/L	12	12	2	0	
		Iron	mg/L	12	12	No Value	0	
		Lead	mg/L	12	12	0.01	0	
		Manganese	mg/L	12	12	0.5	0	
		Zinc	mg/L	12	12	No Value	0	
		pH		12	12	No Value	0	
		Turbidity	NTU	12	12	No Value	0	
		Alkalinity (Total as CaCO ₃)	mg/L	12	12	No Value	0	
		Calcium	mg/L	12	12	No Value	0	
		Chloride	mg/L	12	12	No Value	0	
Colour (True)	PCU	12	12	No Value	0			

Scheme name	Scheme component	Parameter	Units	No. of samples required to be collected (as per the approved DWQMP)	No of samples actually collected and tested	Water quality criteria (i.e. ADWG health guideline value)	No. of samples exceeding water quality criteria	Comments
		Conductivity	µS/cm	12	12	No Value	0	
		Magnesium	mg/L	12	12	No Value	0	
		Potassium	mg/L	12	12	No Value	0	
		Sodium	mg/L	12	12	No Value	0	
		Total Dissolved Solids	mg/L	12	12	No Value	0	
		Hardness (Total as CaCO ₃)	mg/L	12	12	No Value	0	
		Total Organic Carbon	mg/L	4	4	No Value	0	
		Arsenic	mg/L	1	2	0.01	0	
		Cadmium	mg/L	1	2	0.002	0	
		Chromium	mg/L	1	2	0.05	0	
		Nickel	mg/L	1	2	0.02	0	
		Selenium	mg/L	1	2	0.01	0	
		Mercury	mg/L	1	1	0.001	0	
		pH		Daily	365	No Value	0	In-house Telemetry
		Turbidity	NTU	Daily	365	No Value	0	In-house Telemetry
		Sulphate	mg/L	12	12	No Value	0	
		Trihalomethanes (Total)	ug/L	4	4	250	0	
		Fluoride (naturally occurring)	mg/L	12	12	1.5	0	
		Aluminium (acid-soluble)	mg/L	12	11	No Value	0	Sample leaked in transit
		Copper	mg/L	12	12	2	0	
		Iron	mg/L	12	12	No Value	0	
		Lead	mg/L	12	12	0.01	0	
		Manganese	mg/L	12	12	0.5	0	
		Zinc	mg/L	12	12	No Value	0	
		pH		12	12	No Value	0	

Scheme name	Scheme component	Parameter	Units	No. of samples required to be collected (as per the approved DWQMP)	No of samples actually collected and tested	Water quality criteria (i.e. ADWG health guideline value)	No. of samples exceeding water quality criteria	Comments
Capricorn Coast	Woodbury Water Treatment Plant	Turbidity	NTU	12	12	No Value	0	
		Alkalinity (Total as CaCO ₃)	mg/L	12	12	No Value	0	
		Calcium	mg/L	12	12	No Value	0	
		Chloride	mg/L	12	12	No Value	0	
		Colour (True)	PCU	12	12	No Value	0	
		Conductivity	µS/cm	12	12	No Value	0	
		Magnesium	mg/L	12	12	No Value	0	
		Potassium	mg/L	12	12	No Value	0	
		Sodium	mg/L	12	12	No Value	0	
		Total Dissolved Solids	mg/L	12	12	No Value	0	
		Hardness (Total as CaCO ₃)	mg/L	12	12	No Value	0	
		Total Organic Carbon	mg/L	4	4	No Value	0	
		Arsenic	mg/L	1	2	0.01	0	
		Cadmium	mg/L	1	2	0.002	0	
		Chromium	mg/L	1	2	0.05	0	
		Nickel	mg/L	1	2	0.02	0	
		Selenium	mg/L	1	2	0.01	0	
		Mercury	mg/L	1	1	0.001	0	
		Chlorine (free)	mg/L	Daily	365	5	0	In-house Telemetry
	pH		Daily	365	No Value	0	In-house Telemetry	
	Reticulation	Chlorine (free)	mg/L	Weekly	144	5	0	In-house
		pH		Weekly	144	No Value	0	In-house
		Turbidity	NTU	Weekly	144	No Value	0	In-house
Trihalomethanes (Total) (Schofield Parade Nth)		µg/L	4	4	250	0		
Trihalomethanes (Total) (Pacific Heights)		µg/L	4	4	250	0		

Scheme name	Scheme component	Parameter	Units	No. of samples required to be collected (as per the approved DWQMP)	No of samples actually collected and tested	Water quality criteria (i.e. ADWG health guideline value)	No. of samples exceeding water quality criteria	Comments
Marlborough	Source Water	Sulphate	mg/L	12	12	No Value	0	
		Fluoride (naturally occurring)	mg/L	12	12	1.5	0	
		Aluminium (acid-soluble)	mg/L	12	12	No Value	0	
		Copper	mg/L	12	12	2	0	
		Iron	mg/L	12	12	No Value	0	
		Lead	mg/L	12	12	0.01	0	
		Manganese	mg/L	12	12	0.5	0	
		Zinc	mg/L	12	12	No Value	0	
		pH		12	12	No Value	0	
		Turbidity	NTU	12	12	No Value	0	
		Alkalinity (Total as CaCO ₃)	mg/L	12	12	No Value	0	
		Calcium	mg/L	12	12	No Value	0	
		Chloride	mg/L	12	12	No Value	0	
		Colour (True)	PCU	12	12	No Value	0	
		Conductivity	µS/cm	12	12	No Value	0	
		Magnesium	mg/L	12	12	No Value	0	
		Potassium	mg/L	12	12	No Value	0	
		Sodium	mg/L	12	12	No Value	0	
		Total Dissolved Solids	mg/L	12	12	No Value	0	
		Hardness (Total as CaCO ₃)	mg/L	12	12	No Value	0	
		Total Organic Carbon	mg/L	4	4	No Value	0	
		Arsenic	mg/L	1	2	0.01	0	
		Cadmium	mg/L	1	2	0.002	0	
		Chromium	mg/L	1	2	0.05	0	
Nickel	mg/L	1	2	0.02	0			
Selenium	mg/L	1	2	0.01	0			
Mercury	mg/L	1	1	0.001	0			

Scheme name	Scheme component	Parameter	Units	No. of samples required to be collected (as per the approved DWQMP)	No of samples actually collected and tested	Water quality criteria (i.e. ADWG health guideline value)	No. of samples exceeding water quality criteria	Comments
Marlborough	Marlborough Water Treatment Plant Potable	Sulphate	mg/L	12	12	No Value	0	
		Trihalomethanes (Total)	µg/L	4	4	250	0	
		Fluoride	mg/L	12	12	1.5	0	
		Aluminium (acid-soluble)	mg/L	12	12	No Value	0	
		Copper	mg/L	12	12	2	0	
		Iron	mg/L	12	12	No Value	0	
		Lead	mg/L	12	12	0.01	0	
		Manganese	mg/L	12	12	0.5	0	
		Zinc	mg/L	12	12	No Value	0	
		pH		12	12	No Value	0	
		Turbidity	NTU	12	12	No Value	0	
		Alkalinity (Total as CaCO ₃)	mg/L	12	12	No Value	0	
		Calcium	mg/L	12	12	No Value	0	
		Chloride	mg/L	12	12	No Value	0	
		Colour (True)	PCU	12	12	No Value	0	
		Conductivity	µS/cm	12	12	No Value	0	
		Magnesium	mg/L	12	12	No Value	0	
		Nitrite	mg/L	12	12	3	0	
		Potassium	mg/L	12	12	No Value	0	
		Sodium	mg/L	12	12	No Value	0	
		Total Dissolved Solids	mg/L	12	12	No Value	0	
		Hardness (Total as CaCO ₃)	mg/L	12	12	No Value	0	
		Total Organic Carbon	mg/L	4	4	No Value	0	
		Arsenic	mg/L	1	2	0.01	0	
		Cadmium	mg/L	1	2	0.002	0	
		Chromium	mg/L	1	2	0.05	0	
		Nickel	mg/L	1	2	0.02	0	
Selenium	mg/L	1	2	0.01	0			

Scheme name	Scheme component	Parameter	Units	No. of samples required to be collected (as per the approved DWQMP)	No of samples actually collected and tested	Water quality criteria (i.e. ADWG health guideline value)	No. of samples exceeding water quality criteria	Comments
Marlborough		Mercury	mg/L	Yearly	1	0.001	0	
		Chlorine (free)	mg/L	Daily	365	5	0	In-house Telemetry
		pH		Daily	365	No Value	0	In-house Telemetry
		Conductivity	µS/cm	Daily	365	No Value	0	In-house Telemetry
	Reticulation	Chlorine (free)	mg/L	Monthly	12	5	0	In-house
		pH		Monthly	12	No Value	0	In-house
		Turbidity	NTU	Monthly	12	No Value	0	In-house
		Trihalomethanes (Total) (Marlborough School)	µg/L	4	4	250	0	
Glenmore (RRC)	Source Water	Nitrate	mg/L	12	12	50	0	
		Sulphate	mg/L	12	12	No Value	0	
		Fluoride	mg/L	12	12	1.5	0	
		Aluminium (acid-soluble)	mg/L	12	12	No Value	0	
		Copper	mg/L	12	12	2	0	
		Iron	mg/L	12	12	No Value	0	
		Lead	mg/L	12	12	0.01	0	
		Manganese	mg/L	12	12	0.5	0	
		Zinc	mg/L	12	12	No Value	0	
		pH		12	12	No Value	0	
		Turbidity	NTU	12	12	No Value	0	
		Alkalinity (Total as CaCO ₃)	mg/L	12	12	No Value	0	
		Calcium	mg/L	12	12	No Value	0	
		Chloride	mg/L	12	12	No Value	0	
		Colour (True)	PCU	12	12	No Value	0	
		Conductivity	µS/cm	12	12	No Value	0	
Magnesium	mg/L	12	12	No Value	0			

Scheme name	Scheme component	Parameter	Units	No. of samples required to be collected (as per the approved DWQMP)	No of samples actually collected and tested	Water quality criteria (i.e. ADWG health guideline value)	No. of samples exceeding water quality criteria	Comments
Glenmore (RRC)	Source Water	Nitrite	mg/L	12	12	3	0	
		Potassium	mg/L	12	12	No Value	0	
		Sodium	mg/L	12	12	No Value	0	
		Total Dissolved Solids	mg/L	12	12	3	0	
		Hardness (Total as CaCO ₃)	mg/L	12	12	No Value	0	
		Total Organic Carbon	mg/L	4	4	No Value	0	
		Arsenic	mg/L	1	1	0.01	0	
		Cadmium	mg/L	1	1	0.002	0	
		Chromium	mg/L	1	1	0.05	0	
		Nickel	mg/L	1	1	0.02	0	
		Selenium	mg/L	1	1	0.01	0	
		Mercury	mg/L	1	1	0.001	0	
	Water Treatment Plant	Nitrate	mg/L	12	12	50	0	
		Sulphate	mg/L	12	12	No Value	0	
		Trihalomethanes (Total)	µg/L	4	4	250	0	
		Fluoride	mg/L	12	12	1.5	0	
		Aluminium (acid-soluble)	mg/L	12	12	No Value	0	
		Copper	mg/L	12	12	2	0	
		Iron	mg/L	12	12	No Value	0	
		Lead	mg/L	12	12	0.01	0	
		Manganese	mg/L	12	12	0.5	0	
		Zinc	mg/L	12	12	No Value	0	
		pH		12	12	No Value	0	
		Turbidity	NTU	12	12	No Value	0	
		Alkalinity (Total as CaCO ₃)	mg/L	12	12	No Value	0	
Calcium	mg/L	12	12	No Value	0			
Chloride	mg/L	12	12	No Value	0			
Colour (True)	PCU	12	12	No Value	0			
Conductivity	µS/cm	12	12	No Value	0			

Scheme name	Scheme component	Parameter	Units	No. of samples required to be collected (as per the approved DWQMP)	No of samples actually collected and tested	Water quality criteria (i.e. ADWG health guideline value)	No. of samples exceeding water quality criteria	Comments
Glenmore (RRC)	Water Treatment Plant	Magnesium	mg/L	12	12	No Value	0	
		Nitrite	mg/L	12	12	3	0	
		Potassium	mg/L	12	12	No Value	0	
		Sodium	mg/L	12	12	No Value	0	
		Total Dissolved Solids	mg/L	12	12	No Value	0	
		Hardness (Total as CaCO ₃)	mg/L	12	12	No Value	0	
		Total Organic Carbon	mg/L	4	4	No Value	0	
		Arsenic	mg/L	1	1	0.01	0	
		Cadmium	mg/L	1	1	0.002	0	
		Chromium	mg/L	1	1	0.05	0	
		Nickel	mg/L	1	1	0.02	0	
		Selenium	mg/L	1	1	0.01	0	
		Mercury	mg/L	1	1	0.001	0	

Table 4 - Reticulation *E. coli* verification monitoring

Drinking Water Scheme:	Saint Faith's System												
	Year Month	2018						2019					
		Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	1	4	1	3	2	1	5	1	1	3	2	4	
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	27	24	27	27	26	27	25	28	28	25	27	26	
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0	
% of samples that comply (monthly samples)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Compliance with 98% annual value (previous 12 months)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	

Drinking Water Scheme:	Taranganba and Lammermoor System												
	Year Month	2018						2019					
		Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	5	1	4	2	2	5	2	4	2	2	4	2	
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	26	30	28	29	30	28	32	33	33	34	32	35	
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0	
% of samples that comply (monthly samples)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Compliance with 98% annual value (previous 12 months)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	

Drinking Water Scheme:

Emu Park and Keppel Sands System

Year Month	2018												2019			
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun				
	No. of samples collected	7	4	4	5	4	5	5	4	3	5	4	4			
No. of samples collected in which E. coli 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	49	52	52	52	51	51	52	53	54	53	54	54				
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0				
% of samples that comply (monthly samples)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%				
Compliance with 98% annual value (previous 12 months)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				

Drinking Water Scheme:

Yeppoon Pipeline

Year Month	2018												2019			
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun				
	No. of samples collected	3	2	2	3	2	3	2	2	1	3	2	2			
No. of samples collected in which E. coli 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	24	25	25	25	25	25	26	27	27	26	26	27				
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0				
% of samples that comply (monthly samples)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%				
Compliance with 98% annual value (previous 12 months)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				

Drinking Water Scheme:

Year Month	Nerimbera											
	2018						2019					
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	1	1	1	1	1	1	1	1	1	1	1	1
No. of samples collected in which E. coli 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	12	12	12	12	12	12	12	12	12	12	12	12
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply (monthly samples)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Compliance with 98% annual value (previous 12 months)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Drinking Water Scheme:

Year Month	Mount Charlton System											
	2018						2019					
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	1	1	1	1	1	1	2	1	1	1	1	1
No. of samples collected in which E. coli 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	12	12	12	12	12	12	12	12	12	12	12	12
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply (monthly samples)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Compliance with 98% annual value (previous 12 months)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Drinking Water Scheme:

Marlborough Reticulation

Year Month	2018												2019			
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
	No. of samples collected	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
No. of samples collected in which E. coli is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply (monthly samples)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Compliance with 98% annual value (previous 12 months)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

5 Incidents reported to the regulator

Notification to the regulator under sections 102 and 102A of the Act.

There were nil incidents reported to the regulator in the 2018 - 2019 year i.e. 01/07/2018-30/06/2019.

Table 5 – Incidents reported to the regulator

Incident date	Scheme / location	Parameter / issue	Preventive actions
Nil	Nil	Nil	Nil

6 Customer complaints

This section discusses details of any complaints received about the drinking water service.

Table 6: Customer complaints about water quality

Scheme	Health concern	Dirty water	Taste and odour	Other
Capricorn Coast DWSS	Nil	33	10	8
The Caves (Mt Charlton) DWSS	Nil	1	Nil	Nil
Nerimbera DWSS	Nil	Nil	1	Nil
Marlborough DWSS	Nil	Nil	1	Nil
Total	Nil	34	12	8

DWSS - Drinking Water Supply Scheme

Health Concern

Livingstone Shire Council investigates each complaint relating to alleged illness from our water quality, typically by testing the customers tap and closest reticulation sampling point for presence of E.coli.

From 01/7/2018 to 30/06/2019 inclusive, there were nil confirmed cases of illness arising from the drinking water supply system.

Dirty Water

A total of thirty four (34) complaints related to dirty water were received from within Livingstone Shire Council from 01/07/2018 to 30/06/2019 inclusive.

From Table 6 of these thirty four (34) complaints – thirty three (33) were in the Capricorn Coast DWSS - and one (1) was in The Caves (Mt Charlton) DWSS. In both schemes, water mains were flushed in the adjacent local area network to rectify the Water Quality.

With reference to the Caves (Mt Charlton) DWSS, Livingstone Shire Council has no direct control over water quality received from Bulk Water Service Provider Rockhampton Regional Council.

Taste and Odour

From Table 6 of the total twelve (12) customer complaints related to taste & odour - ten (10) complaints were from residents in the Capricorn Coast DWSS and one (1) each in the Nerimbera DWSS and Marlborough DWSS.

Complaints were investigated and where necessary appropriate testing was performed.

With reference to both the The Caves (Mt Charlton) DWSS and Nerimbera DWSS, Livingstone Shire Council has no direct control over water quality received from Bulk Water Service Provider Rockhampton Regional Council.

Other

These other enquiries related to water quality data, blended water supply, testing for rain water tanks, water softness information for dishwashers & water quality information for brewing.

7 DWQMP review outcomes

A review of the DWQMP was conducted during the period: 01/07/2018-30/06/2019.

Table 7 – DWQMP review outcomes

Review Date: 15/10/2018

Review component	Findings	Outcomes	Status of actions	Responsible Officer / Position
Service description	N/A			
Details of infrastructure	N/A			
Water quality and catchment characteristics	Need to review water quality data from 2015 to 2018.	The review has not resulted in any major amendments to LSC approved DWQMP	Completed review of water quality data from 2015 to 2018.	Acting Manager Water & Waste Operations
Risk assessment	Need to review hazard identification & risk assessment sections of the DWQMP.	The review has not resulted in any major amendments to LSC approved DWQMP	Completed review of hazard identification & risk assessment sections of the DWQMP	Acting Manager Water & Waste Operations
Operations and maintenance procedures	N/A			
Management of incidents and emergencies	N/A			
Risk management improvement program	Review outstanding items in the RMIP	Item: <i>Filtration turbidity set point - Woodbury</i> : Action - Change Filter set point from 0.5 NTU to 0.3 NTU - <i>Consequence</i> : Mitigated Risk Level reduced from High 10 to Medium 8; Item: <i>Filtration procedure - Woodbury</i> : Action - Finalised procedure and entered in Quality Management System - <i>Consequence</i> : Mitigated	Completed review of outstanding items in the RMIP	Acting Manager Water & Waste Operations

Review component	Findings	Outcomes	Status of actions	Responsible Officer / Position
		<p>Risk Level reduced from High 10 to Medium 8;</p> <p>Item: <i>New Mains / Mains Break Disinfection procedure:</i> Action - Procedure finalised and entered into Quality Management System;</p> <p>Item: <i>Relevance of the plan - Service description and details of infrastructure reflect current circumstances - documented chemical procurement and receipts processes:</i> Action - Procedure finalised and entered into Quality Management System</p> <p>Item: <i>Renegotiate Bulk Water Agreement to include water quality:</i> Action - Negotiation commenced in June 2019.</p>		
Service wide information management	N/A			
Operational monitoring	N/A			
Verification monitoring	N/A			

8 DWQMP audit findings

The audit findings and any recommendations and/or opportunities for improvement (OFI), including how these were actioned is discussed below.

The first regular audit of Livingstone Shire Council DWQMP was undertaken in September 2017 through the engagement of Viridis Consultants Pty Ltd, who are Exemplar Global certified drinking water quality management system auditors.

The auditor submitted the audit report to the regulator on 29 September 2017.

The purpose of the audit was to:

- Verify the accuracy of monitoring and performance data
- Assess Livingstone Shire Council's compliance with its DWQMP
- Assess the relevance of the DWQMP in relation to Livingstone Shire Council's drinking water service.

The recommendations from the audit are as follows:

- Ensure regulatory requirements, including any conditions of approval, are identified and processes are in place to ensure compliance (e.g. establishment of a compliance register).
- Review set points and the alarms in SCADA to ensure that they are set in compliance with the DWQMP.
- Prepare documented procedures for important preventive measures, for example, adding chlorine tablets into reservoirs.
- Implement the RMIP to progress items by the due date.
- Review current alarm limits to ensure that they are adequate to manage the identified risks.
- Identify and document the corrective actions that must be undertaken in response to an alarm.
- Review the risk assessment to ensure that the preventive measures are comprehensively identified and the relevant processes for their implementation are included.

The actions undertaken to address the audit recommendations are outlined in Table 8.

Table 8 – DWQMP audit findings and status

Item	Recommendation or OFI	Action	Status of actions	Responsible Officer / Position
Accuracy of Monitoring and Performance Data - Include all necessary information in the annual report, including the progress in implementing the RMIP.	OFI	Include all necessary information in the Annual Report including progress of RMIP implementation.	Completed December 2018 Refer 2017-2018 Annual Report which includes status of RMIP	Manager Water & Waste Operations
Accuracy of Monitoring and Performance Data - Consider reviewing the complaints handling process for receiving and logging complaints to determine if there can be criteria added to separate enquiries and complaints	OFI	Review the water quality complaints handling process to determine if enquiries can be separated from complaints.	Completed December 2018	Manager Water & Waste Operations
Compliance with the Plan - Ensure regulatory requirements, including any conditions of approval, are identified and processes are in place to ensure compliance (e.g. establishment of a compliance register)	Recommendation	Establish a compliance register.	Completed December 2018 Register has been developed and entered into Quality Management System	Water Quality Officer
Compliance with the Plan - Review set points and the alarms in SCADA to ensure that they are set in compliance with the DWQMP.	Recommendation	Set point and alarms in SCADA to be set in compliance with DWQMP.	Completed September 2019 - Refer RMIP	Manager Water & Waste Operations
Compliance with the Plan - Prepare documented procedures for important preventive measures, for example, for adding chlorine tablets into reservoirs.	Recommendation	Procedure to be developed for adding chlorine tablets into reservoirs - Refer RMIP.	Completed September 2019. Work Instruction 03.WI.052	Manager Water & Waste Operations
Compliance with the Plan - Implement the RMIP to progress	Recommendation			Manager Water & Waste Operations

Item	Recommendation or OFI	Action	Status of actions	Responsible Officer / Position
items by the due date.		RMIP implemented to progress items by the due date - Refer RMIP.	Completed	
Compliance with the Plan - Review performance of Reverse Osmosis (RO) at Marlborough WTP to ensure any issues are identified and investigated.	OFI	Review Reverse Osmosis (RO) performance at Marlborough WTP.	To be to be competed	Coordinator Water & Sewage Operations
Compliance with the Plan - Consider Calculating Ct to ensure adequate primary disinfection is achieved prior to supply to the first customer	OFI	Ct Calculation to be undertaken - Refer RMIP.	Completed December 2017	Coordinator Water & Sewage Operations
Compliance with the Plan - Review access to electronic systems to ensure that officers with responsibilities for water quality and instruments can search for and access relevant records relating to instruments and equipment.	OFI	Undertake training for relevant officers on Quality Management Systems awareness - to facilitate accessing relevant records relating to instruments and equipment.	Completed November 2018	Manager Water & Waste Operations
Compliance with the Plan - Review the reservoir inspection forms to include water quality hazards and integrity breaches, such as damage to vermin proofing, evidence of vermin etc.	OFI	Review Reservoir Inspection Forms.	Completed February 2018 Worksheet Nos ISF.192 & ISF.193	Manager Water & Waste Operations
Compliance with the Plan - Request certificates of analysis from chemical suppliers to confirm the suitability of chemicals for water treatment.	OFI	Request Certificates of Analysis from Chemical Suppliers.	Completed June 2019.Procedure No. MSP-047 Section 4.2 Receipt	Coordinator Water & Sewage Operations
Compliance with the Plan - Review the emergency contact list to ensure all stakeholders are included and contact details are up to date.	OFI	Review emergency Contact List.	Completed October 2019	Water Quality Officer

Item	Recommendation or OFI	Action	Status of actions	Responsible Officer / Position
Compliance with the Plan - Review the flow diagrams to ensure they are correct	OFI	Review Flow Diagrams.	Completed November 2019	Manager Water & Waste Operations
Compliance with the Plan - Consider undertaking scenario testing to confirm the emergency communication protocols between Livingstone Shire Council and Rockhampton Regional Council,	OFI	Undertake scenario testing to confirm emergency communication protocols between Livingstone Shire Council and Rockhampton Regional Council.	Completed	Manager Water & Waste Operations
Compliance with the Plan - Establish a register for the RMIP that is a living document that is continuously reviewed and updated.	OFI	Establish a register for the RMIP that is continuously reviewed and updated.	Completed	Manager Water & Waste Operations
Compliance with the Plan - Review the processes for keeping records and making sure people with responsibilities under the DWQMP can access them.	OFI	Training to be undertaken for relevant officers on Quality Management Systems awareness for keeping and accessing records in relation to the DWQMP.	Completed November 2019	Manager Water & Waste Operations
Compliance with the Plan - Review the process for storing procedures to ensure that are searchable by all staff that need to access them.	OFI	Review the process for storing procedures to ensure procedures are searchable by all staff that need to access them.	Completed November 2019	Manager Water & Waste Operations
Compliance with the Plan - Establish a procedure for conducting review that includes keeping records of reviews.	OFI	Develop procedure for conducting reviews that includes keeping records of reviews.	Completed. Record of Reviews are stored in Council's record system ECM (Enterprise Content Management)	Manager Water & Waste Operations
Relevance of the Plan - Review current alarm limits to ensure that they are adequate to manage the identified risks.	Recommendation	Review current alarm limits to ensure adequacy to managed identified risks.	Completed	Manager Water & Waste Operations
Relevance of the Plan - Identify and document the corrective actions that must be undertaken in response to an alarm.	Recommendation	Identify corrective actions in response to an alarm - Escalated through one organisational structure within - Level 1 Operational Action -	Completed	Manager Water & Waste Operations

Item	Recommendation or OFI	Action	Status of actions	Responsible Officer / Position
		under the approved DWQMP Section 7.2.		
Relevance of the Plan - Review the risk assessment to ensure that the preventive measures are comprehensively identified and the relevant processes for their implementation are included.	Recommendation	Review the risk assessment to ensure preventative measures are identified.	Completed	Manager Water & Waste Operations
Relevance of the Plan - Assess all treatment steps that are relied upon to remove hazards to determine if they are CCPs and establish monitoring processes, critical limits and corrective actions to prevent or reduce a hazard. The assessment process should be documented.	OFI	Assess all treatment steps to remove hazards and determine if they are CCP's and document.	Ongoing Process Mapping scheduled during Q2 Fiscal 2018-2019.	Manager Water & Waste Operations
Relevance of the Plan - Consider undertaking health based targets assessment to confirm that there is adequate pathogen removal for each scheme where LSC is responsible for treatment.	OFI	Undertake health based target assessments to ensure adequate pathogen removal for each scheme where Livingstone Shire Council is responsible for treatment.	On consideration this opportunity has not yet been pursued. Will undertake in DWQMP Review in Q4 Fiscal 2019-2020.	Manager Water & Waste Operations
Relevance of the Plan - Include details of all important preventive measures in the DWQMP such as calibration requirements, maintenance processes and chemical procurement and receipt processes.	OFI	Include preventative measures in the DWQMP such as calibration requirements, maintenance processes and chemical procurement and receipt processes.	Completed June 2019.Procedure No. MSP-047	Acting Manager Water & Waste Operations