

LOGAN WATER

Drinking Water Quality Management Plan Annual Report



DOCUMENT CONTROL

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NOTATIONS AND ABBREVIATIONS

Acronym	Definition
ADWG	Australian Drinking Water Guidelines, 2011. Published by the National Health and Medical Research Council of Australia
AS	Australian Standard
BAU	Business As Usual
CCP	Critical Control Point (as defined by HACCP)
CGC	City of Gold Coast
Council	Loganwater
CRM	Customer Relationship Management (system)
DNRM&E	Department of Natural Resources, Mines and Energy
DSS	Desired Standards of Service
DWQMP	Drinking Water Quality Management Plan
<i>E. coli</i>	Escherichia coliform, a bacterium which is considered to indicate the presence of faecal contamination and therefore potential health risk
EPI	Eastern Pipeline Interconnector
ERP	Emergency Response Plan
FY	Financial Year
Grid	South East Queensland Water Supply Network Grid
HACCP	Hazard Analysis Critical Control Point
HLZ	High Level Zone
IDM	Infrastructure Demand Model
IMP	Incident Management Plan
KPI	Key Performance Indicator
LIMS	Laboratory Information Management System
LLZ	Low Level Zone
LOD	Limit of Detection
LOR	Limit of Reporting
LWIA	Logan Water Infrastructure Alliance
mg/L	Milligrams per litre
MPN/100mL	Most Probable Number per hundred millilitres
NMDP	Network Maintenance Disinfection Program
NATA	National Association of Testing Authorities
RMIP	Risk Management Improvement Plan
SAMMS	Strategic Asset Maintenance Management Systems
SCADA	Supervisory Control and Data Acquisition
SEQ	South East Queensland
SOP	Standard Operating Procedure
SRWP	Southern Regional Water Pipeline
THM	Trihalomethane
WGM	Water Grid Manager
WH&S	Workplace Health and Safety
WSZ	Water Supply Zone
WTP	Water Treatment Plant

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1 INTRODUCTION

This Drinking Water Quality Management Plan (DWQMP) Annual Report has been developed to meet the requirements of section 95 of the *Water Supply (Safety and Reliability) Act 2008 (the Act)*. The purpose of *the Act* is to provide safe and reliable drinking water supply throughout Queensland.

Under *the Act* Loganwater is required to prepare a DWQMP annual report for each financial year. These reports must be submitted to the regulator within 120 business days from the end of the relevant financial year.

This Loganwater (SPID542) DWQMP Annual Report documents the following for the 2019-20 Financial Year (FY)¹:

- Summary of activities undertaken of the financial year in operating our drinking water service
- The water quality performance of the drinking water supply; and
- Actions taken to implement the Drinking Water Quality Management Plan.

This report assists the Queensland Water Supply Regulator (Department of Department of Regional Development and Manufacturing and Water) to determine compliance with the currently approved DWQMP and relevant approval conditions.

This report has been prepared in accordance with the [Drinking Water annual report template](#) and the [Drinking Water Quality Management Plan report guide – September 2018](#).

This report is available to the public via the [Logan City Council website](#), and copies may be provided to members of the public upon request.

¹ 1st July 2019 to 30th June 2020 relates to the 2019–20 FY.

2 SUMMARY OF SCHEMES OPERATED

2.1 Loganwater Drinking Water Supply System

Loganwater is a water service provider which distributes water that is sourced and treated by the bulk water supplier, Seqwater.²

Seqwater is the Queensland Government Authority responsible for ensuring safe, secure and reliable drinking water supply for South East Queensland (SEQ). Key responsibilities of Loganwater and Seqwater are summarised in Table 1.

Table 1 - Key Seqwater and Loganwater responsibilities

<i>Seqwater's Responsibilities</i>	<i>Loganwater's Responsibilities</i>
<ul style="list-style-type: none"> ▪ Catchment management. ▪ Raw water treatment (including fluoridation). ▪ Clear water storage. ▪ Bulk water transport to defined transfer points. ▪ Monitoring of raw and treated water supply, including fluoridation. 	<ul style="list-style-type: none"> ▪ Receipt of bulk treated water from Seqwater at defined transfer points. ▪ Delivery to customers through Loganwater's water distribution network. ▪ Operation and maintenance of the distribution network, reservoirs, pump stations and several secondary disinfection facilities. ▪ Monitoring of drinking water quality performance throughout the distribution network.

2.2 SEQ Water Supply Network Grid

Loganwater is supplied treated drinking water through the SEQ Water Supply Network Grid (the Grid), which is managed and operated by Seqwater, as shown in Appendix B. Water may be sourced from various sources throughout the Grid, dependent on operational supply requirements. For example; treated water may be supplied via the Eastern Pipeline Interconnector (EPI) and may flow West to supply Loganwater or East to supply Redlands City Council (refer Appendix B for a map of the Seqwater supply grid).

Both Seqwater and Loganwater undertake extensive water quality monitoring to confirm that safe drinking water is supplied to the community.

² Further information on Seqwater can be accessed at <http://www.seqwater.com.au/>

2.3 Loganwater’s Drinking Water Supply Network

An overview of Loganwater’s drinking water supply network key features is provided in Table 2, including the number of water supply connections and treated source water.

Table 2 - Overview of the Loganwater drinking water supply

Overview	Description
Activities	Delivery of clean, treated water from bulk supply points (transfer points) to customer meters.
Area	957 square kilometres
Population	325,000
Population connected to water supply network	306,000 ³
Seqwater’s Primary WTPs (& respective catchment)	Mt Crosby (Wivenhoe Dam via Brisbane River), North Stradbroke Island (North Stradbroke Island Bores), Capalaba (Tingalpa Dam), Molendinar (Hinze Dam), Gold Coast desalination plant (seawater off Tugun, Gold Coast)
Loganwater’s Supply Network Schematic	Indicating key water supply zones and supplying reservoirs, with latest updates in Loganwater’s SCADA and GIS systems. Refer to Appendix A Water Supply Servicing Strategy (DM#9553933)
Bulk Supply Points (transfer points)	<ol style="list-style-type: none"> 1. Compton Road meter via Kuraby Reservoir inlet main. 2. Trinder Park pump station via Kuraby Reservoir. 3. Illaweena bulk meters (3) via Kuraby Reservoir. 4. Eastern Pipeline Interconnector (EPI) supply via Kimberley Park Reservoir. 5. Southern Regional Water Pipeline (SRWP) supply via Teviot Road Offtake. 6. SRWP supply via New Beith Offtake (Pub Lane offtake); and 7. Gold Coast Supply via Stanmore Pump Station (contingency supply).

2.4 Summary of Schemes Operated

Loganwater operates six defined Water Supply Zones (WSZ). A WSZ can be defined as an area of the water distribution network with shared bulk water supply sources. The next level of categorisation below WSZ are the Water Quality Zones (WQZ). WQZ share the same disinfectant type (i.e. chloramine or chlorine). These categories are used when undertaking medium to long term water quality trend analysis and regulatory reporting (e.g. in this annual report, a summary of water quality performance by WSZ is included in Appendix C).

A summary of the categorisation of the water supply is included in Table 3. A summary of Loganwater’s suburbs by WSZ is shown in Table 3 under general operating conditions.

³ Population and demand forecast information, based on current Desired Standards of Service (DSS) and adopted Infrastructure Demand Model (IDM), current as of 30/06/2018.

Table 3

Table 3 - Loganwater's water supply zones by associated suburbs

WSZ	Main Suburbs	Partial Suburbs
Greenbank	Browns Plains, Boronia Heights, Forestdale Greenbank, Heritage Park, Hillcrest, Park Ridge Regents Park	Berrinba, Chambers Flat, Crestmead, Logan Reserve, Munruben, Park Ridge South
Kimberley Park	Carbrook, Cornubia, Loganholme, Shailer Park, Tanah Merah	Slacks Creek
Marsden	Crestmead, Logan Reserve, Loganlea, Marsden, Meadowbrook, Waterford West	Berrinba, Heritage Park, Kingston, Park Ridge
Springwood	Springwood High Level Zone Priestdale, Rochedale South, Underwood	N/A
	Springwood Low Level Zone Berrinba, Daisy Hill, Eagleby, Kingston, Logan Central Slacks Creek, Springwood, Woodridge	Loganholme, Marsden, Shailer Park, Tanah Merah, Underwood
Logan East	Bannockburn, Bahrs Scrub, Beenleigh, Belivah, Bethania, Edens Landing, Holmview, Windaroo, Waterford, Wolffdene, Mount Warren Park	Eagleby
Logan South	Cedar Grove, Cedar Vale, Chambers Flat, Jimboomba Logan Village, Mundoolun, Munruben, New Beith North Maclean, Park Ridge South, Maclean, Stockleigh, Veresdale Scrub, Woodhill, Yarrabilba	Greenbank

The SEQ water supply network grid, described in Section 2.2, may supply Loganwater from several Water Treatment Plants (WTPs) operated by Seqwater. In practice, most treated water is supplied from the Mt Crosby WTP.

2.5 Drinking Water Disinfection

The Australian Drinking Water Guidelines (ADWG) emphasise the importance of preventing microbial contamination of the drinking water supply. An effective way to achieve this is by chemical disinfection, such as chlorination. Disinfection may kill or inactivate a wide range of harmful micro-organisms and has been used in the water industry for over 80 years.

Chlorine and chloramine are the disinfectants of choice for Loganwater. One of the major benefits of using these two disinfectants is that after the initial dose to kill potential microbes at the water dosing facilities, both may provide a lasting residual barrier through the network. This 'barrier' continues to protect the health and well-being of our customers throughout the network.

Of course, a balanced approach is required in order to supply safe drinking water which is also aesthetically pleasing to consume. Loganwater manages and controls disinfectant levels within the drinking water network in accordance with our approved Drinking Water Quality Management Plan.

Key features of Loganwater's disinfection program include:

- Operation of water dosing facilities to consistently maintain optimal levels of disinfectant throughout the network;
- Constant management and control of effective disinfectant levels throughout its network, which aims to maintain levels between 0.2 and 2 mg/L (mg/L = parts per million). This is enough to protect customers against most microbial contaminants of concern, and may assist to maintain the cleanliness of the network;
- Constant monitoring and review of operations and customer feedback related to chlorine taste and odour; and
- Extensive monitoring of disinfectant levels within the water supply and monitoring of *Escherichia coli* (*E. coli*) to confirm that disinfection is effective.

E. coli monitoring is used in the water industry as an indicator of recent faecal contamination of the water supply. Of itself, a positive *E. coli* detection does not necessarily indicate that the water supply is unsafe – some strains of *E. coli* are environmental in nature and not of faecal origin, meaning they may not necessarily be harmful to human health. However, as human pathogens are often associated with faecal contamination, it is likely that if pathogens were present that *E. coli* would also be detected.

If Loganwater detects *E. coli* within the water supply network an incident is declared, and immediate corrective action is taken to protect public health.

As discussed in Section 4.1, during the FY2019-20 reporting period Loganwater did not detect the presence of *E. coli* during routine verification monitoring.

3 DWQMP IMPLEMENTATION

3.1 Progress in Implementing the Risk Management Improvement Plan

3.1.1 Risk Management Improvement Plan Process

Loganwater strives for continual improvement in Drinking Water Quality Management, in accordance with Industry *Best Practice* Principles. Loganwater's Risk Management Improvement Plan (RMIP) is the key register used to capture actions aimed at reducing contamination risks associated with the supply of drinking water.

Opportunities for improvements are captured in the RMIP may originate from the following sources:

- Risk Assessments – *high risks*;
- DWQMP Reviews and Audits - *non-conformances, opportunities for improvements and general improvements (if appropriate)*;
- Drinking Water Incidents - *longer term improvement actions*
- Regulator feedback; and
- General improvements

To ensure the RMIP is communicated, implemented and monitored for effectiveness, Loganwater conducts reviews of the RMIP progress.

3.1.2 Implementation of the RMIP

The following section summarises the progress of the key RMIP actions with details found in Appendix D.

This section is categorised according to the 12 element framework of the *National Health and Medical Research Council (NHMRC) Australian Drinking Water Guidelines (2011)*.⁴ Logan water aligns our Drinking Water Quality Management Systems with these 12 elements, in order to strive for best practice Drinking Water Management in a systematic, focussed and measurable manner.

A brief summary of events and activities during the 2019-20 FY which led to changes to the RMIP is also included below.

- A whole of network Drinking Water Quality Risk Assessment was conducted, with the final report returned in May 2020. Relevant findings were incorporated into the RMIP.
- During the reporting period, a review of the Drinking Water Quality Management Plan was performed and submitted to the Queensland Water Supply Regulator during August 2020. This included a review and revision of the RMIP. The DWQMP approval from the regulator was received on 5 November 2019.⁵
- An audit on the implementation of the DWQMP was performed by an independent water quality expert with the final report returned in January 2020. Relevant findings were incorporated into the RMIP.

⁴ To access a copy of the current ADWG 2011 please refer <https://www.nhmrc.gov.au/about-us/publications/australian-drinking-water-guidelines>

⁵ Another DWQMP review has since been performed. Submission of the updated DWQMP occurred in November 2020. This submission included a version of the RMIP.

- A number of notifiable water quality ‘events’ occurred during the period, which required the mobilisation of the Incident Management Team. These are further discussed in Section 5 and relevant long term actions from each investigation were incorporated into the RMIP if required.

Element 1 – Commitment to Drinking Water Quality Management

Action Status:

- The current [Drinking Water Quality Policy Statement](#) was reviewed during the FY2019-20.
- The Seqwater Operating Protocol was reviewed and updated. The protocol demonstrates the shared commitment between Seqwater (the bulk supplier) and Loganwater to manage Drinking Water Quality throughout the entire network.

Element 2 – Assessment of the Drinking Water Supply System

Action Status:

- Online water quality monitoring systems were reviewed and updated to confirm all associated alarming via SCADA. Ongoing reviews occur via the regular Critical Control Point (CCP) review process.
- A whole of network *Drinking Water Risk Assessment* was completed during the reporting period. This included a detailed review and assessment of the drinking water system performance, configuration and key risks. It was noted by the independent workshop facilitator/water quality management expert that there has been an overall significant improvement in risk management at Loganwater since the previous risk assessment was undertaken.
- A project to implement a Water Information Management System (WIMS) was initiated and continued during the 2020/21 FY. This water quality database will improve Loganwater’s ability to store data, review and provide insights into system performance. The database was commissioned in late 2020.
- Continuation of the *Critical Infrastructure Security Upgrade Plan* activities during the period, with implementation to commence during the FY2019-20 and beyond. This project includes assessment and improvement of Loganwater’s reservoir physical security and cyber security management systems. A cyber security review, SCADA review and strategy and the installation of video cameras at key sites were key developments during the reporting period. This project is long-term and ongoing.

Element 3 – Preventative Measures for Drinking Water Quality

Action Status:

- *Dosing Facilities:*
Upgrades and improvements occurred at the following Water Dosing Facilities (WDF): Travis Road, Mundoolun and Woodhill reservoirs. These included site upgrades, SCADA programming and operating improvements. These upgrades were performed to ensure Loganwater continues to provide safe drinking water to the community.
- A current project is underway to upgrade water dosing facilities at the Illaweenaa and Logan River sites. These major WDF upgrades are scheduled for delivery in 2021.
- *Improvement in drinking water monitoring:*
 - Review of the Critical Control Points (CCPs) process continued during the FY2019-20. As part of this process, CCP limits were reviewed and updated, SCADA pages were developed for each dosing site which clearly listed CCPs with the relevant limits. CCP training for on-call employees was also undertaken.

- Operational Control Points (OCPs) have been implemented and early development of 'OCP' SCADA pages has commenced.
- A project was initiated to develop Operations and Maintenance manuals for each water dosing facility. The project first developed the manual for Woodhill dosing facility, and Loganwater will trial its effectiveness over the summer 2020/21 FY before rolling out manuals to the other facilities during 20/21 and beyond.
- A project has been raised for FY20/21 to review all SCADA alarms for the water quality system and fit them to the new alarm standard.
- A project was initiated to install online water quality analysers at the outlet of every operational reservoir in the network. These have been installed at Majella reservoir, Old Bluff Road reservoir and Springwood High ground and elevated reservoirs (reservoir #1 and #3 respectively).
 - New water quality analysers are planned at: Illaweena reservoir #1, Greenbank elevated reservoir and Razorback reservoir. These are to be installed in FY2020-21
- *Reservoir renewals*
 - The reservoir renewals program continued during 2019-20 FY with improvement works performed at the following reservoir complexes: Springwood High Level, Spring Mountain, Old Bluff Road, Mundoolun, Kimberley Park
 - The improvements at each site culminated in a general improvement in network operational capability and water quality performance.
 - In addition reservoir security enhancements continued as part of the *Critical Infrastructure Security Plan* development.

These activities will continue during the FY2019-20 at other reservoir sites across the network.
- *Backflow Prevention Device Management*

The backflow prevention maintenance program was reviewed and updated during the 2019-20 financial year. All Loganwater-owned Backflow Prevention Devices (BFD) were reviewed and maintained as per regulatory requirements, and the cycle of annual maintenance was aligned for ease of maintenance service delivery.
- Critical customer layer – During 2019/20 a critical customer layer was launched on the Corporate GIS platform. This layer may be used to guide planned and reactive works, assist with contamination incident investigations and to facilitate improvements in customer service more broadly.

Element 4 – Operational Procedures & Process Control

Action status:

- *Training and procedure implementation*
 - *Hygienic works practices:* Disinfection of tools is well established, and operational procedures have been updated to incorporate disinfection of parts, and improved hygiene practises. These actions address the risk of contamination and dirty water ingress during main repairs. An extensive training program was delivered to sub-contractors who work on drinking water assets during the 2019-20 FY.
 - In addition, an online module for Safe Drinking Water Awareness was developed during the financial year. This training course was officially launched to the

business in August 2020. All Loganwater personnel are registered and able to complete the course.

- Development of a *Healthy Networks Framework* for Drinking Water Management – work on this project continued throughout the FY2019-20, with workshops and development of the framework on-line monitoring, mains cleaning, planning and design guidelines for healthy networks amongst others. Presentation of the Healthy Network Framework will occur during the 2020-21FY.
- Implementation of the Water Quality database (Aquantify), which will further improve the response time to address ADWG (Health) exceedances, detected during verification monitoring. The notification function of Aquantify is now live – so automated notification occurs if an internal limit or ADWG health or aesthetic breach is recorded during verification monitoring.
- As mentioned in Element 3 above, CCP training occurred for on-call personnel. This is also included in Element 4 because of its relevance to Operational Procedures. Relevant CCP limits are now programmed into SCADA, available 24/7 including a summary of the relevant responsibilities, corrective actions, reporting requirements and other relevant activities. This improves the knowledge and abilities of key personnel and improves the monitoring and response time.
- Work continued a procedure to manage accuracy of online monitoring, including calibration of analysers (WOP222). This procedure will be completed and implemented with relevant personnel during the 2020-21FY; and
- As mentioned in *Element 3* above,
 - Operations and Maintenance manuals (O & M manuals) will be created for all WDF across the network and implemented with key personnel.
 - The Alarm Management Review project was commenced in FY2019-20.

Element 5 – Verification of Drinking Water Quality

Action status:

- Customer complaints monitoring is an important part of drinking water quality verification. Loganwater continued work on the Logan 2025 Strategy and supporting plans, including the Customer Management Model. The model would, amongst other things, improve how we manage and respond to water quality customer enquiries.
- Customer enquiries are an important facet of verification monitoring of the system performance. The project continued in the 2020-21FY.
 - An online dashboard of water quality customer complaints was implemented in order to better track customer complaint clusters in the network. This includes a heat map of complaints, trending and performance information related to customer complaint management
 - Loganwater plans to integrate the numerous customer complaint systems into one Customer Relationship Management (CRM) system, as part of future works. The project timeline is dependent on whole of Loganwater implementation.
- As mentioned in *Element 4*, the Water Quality database (Aquantify) implementation continued in 2020-21FY. This database assists personnel in the interpretation and corrective actions undertaken in response to adverse water quality results. This includes automated notification of ADWG (health and aesthetic) limits breaches, as well as internal operation limits.

Element 6 – Management of Incidents & Emergencies

Action status:

- Loganwater participated in the Seqwater region collaborative Incident Management Team training event called *Operation Hydra*, in October 2019. The team included members from the Loganwater Incident Management Team. The most recent *Operation Hydra* took place in November 2020.

Element 7 – Employee Awareness & Training

Action status:

- The DWQMP and *Water Supply (Safety & Reliability) Act 2008* awareness training continued to be delivered annually to senior staff and management. During the FY2019/20 this was delivered as part of the Drinking Water Risk Assessment workshops and final presentation meeting.
- The 'Hy5' hygienic work practices training, drinking water safety awareness training were implemented across Loganwater's water branches, delivery partners and contractors, during the FY2019-20.
- As described under *Element 1* development of the online drinking water management module was commenced during the reporting period. This was launched to all personnel in FY2020/21.

Element 8 – Community Involvement & Awareness

Action status:

- During the FY2019-20 Loganwater reviewed and updated its public website (www.logan.qld.gov.au). Loganwater continues to provide drinking water fact sheets and useful drinking water information via the public website (www.logan.qld.gov.au). Examples include general information on our drinking water monitoring system, upcoming network maintenance disinfection works, and frequently asked questions related to water quality.
- Development of a critical customer GIS layer commenced in the reporting period. The critical customer GIS layer was launched in late 2020. This tool assists Loganwater personnel to plan works, respond to incidents and reactive works more effectively and most importantly improve levels of service to critical customers throughout the entire network.

Element 9 – Research & Development

Action status:

- To help address long term effective disinfection residual throughout SEQ, a *Disinfection Optimisation Strategy* team was established, including key stakeholders from several water service providers including Seqwater and Loganwater. This specialist team identified two areas within Logan where priority chlorine dosing facilities, which were installed during 2018-19 FY.
- Appropriate maintenance scheduling of drinking water assets may be integrated with the new Strategic Asset Maintenance Management System (SAMMS), currently under development. This will continue into the 2019-20 FY.
- As discussed in Element 4, Loganwater initiated the commencement to develop a 'Healthy Water Networks framework.

Element 10 – Documentation & Record Keeping

Action status:

- All of Council's DWQMP Annual Reports are displayed on Council's public website (www.logan.qld.gov.au).

- A document control system framework is still being investigated, which will continue during the 2019-20 FY, as part of an integrated management system. This will also address one of the external audit recommendations.

Element 11 – Evaluation & Audit

Action status:

- The Process Improvement Team continues to focus on reviewing long term trends and effectiveness of implemented drinking water quality improvement projects.
 - During FY2019-20 FY the Water Quality Team developed an RMIP dashboard for management review. Managers can now track, update and submit for review the progress of RMIP actions on-demand.
- Loganwater will continue to aim for best practice by undertaking annual internal audits of the DWQMP. As described in Section 3.1.2, an internal audit was undertaken during the reporting period.

Element 12 – Review & Continual Improvement

Action status:

- Aspects of the RMIP have now been integrated into the Business Planning process – and are routinely reviewed by Program Leaders via the above-mentioned RMIP dashboard.
- Identification and management of any new high risks from the whole of system risk assessment and recent audit findings will continue during the 2019-20 FY.

4 VERIFICATION MONITORING – WATER QUALITY INFORMATION AND SUMMARY

4.1 Compliance Summary

To determine drinking water compliance, the verification monitoring program results are assessed against:

- Water quality criteria specified by the Regulator in the Water Quality and Reporting Guideline for a Drinking Water Service;
- Health guideline values in the Australian Drinking Water Guidelines (ADWG) 2011; and
- Drinking water quality criteria from the *Public Health Regulation 2018*.

During FY2019 all results collected as part of routine drinking water verification monitoring were compliant with the requirements of the ADWG (Health) criteria and the *Public Health Regulation 2018*.⁶

4.2 Monitoring Program Overview

Monitoring of drinking water quality in Logan City is undertaken to:

- Verify drinking water quality meets regulatory requirements;
- Verify the safety of the drinking water along with the effectiveness of the network operation and system integrity;
- Facilitate review of water quality performance; and
- Identify potential emerging water quality issues.

Monitoring during the 2019– 20 FY was carried out in accordance with Loganwater’s current [Verification Monitoring Plan \(DM#9486600\)](#).

4.3 Lab reporting changes

During the 2019-20 FY, there were no changes in reporting methodology implemented with Loganwater’s NATA laboratory. The data summary in Appendix C contains the current maximum and minimum values.

4.4 Data Analysis Methodology

Table 4 summarises the methodology employed to analyse the data used in the Water Quality Performance Summary for 2019–20 FY. This methodology is consistent with the ADWG (2011) guidance provided on statistical principles (Information sheet 3.3).

⁶ Please note that other reportable events occurred during the reportable period which were not related to verification monitoring. These are further discussed in Section 5.1.1.

Table 4 - Data Analysis Methodology

<i>Data subject</i>	<i>Methodology</i>	<i>Reference</i>
Outliers	All outliers are included in the analysis.	ADWG information sheet 3.3
Less than values (<)	Less than values (<) are substituted with a value equivalent to half the Limit of Reporting (LOR). For example, a result of <1 is considered 0.5 for the purposes of chemical data analysis.	ADWG information sheet 3.3
Data exclusions	Data from repeat samples, project, emergency or investigative sampling are not included in the data analysis.	DEWS Water Quality Reporting Guideline 2010

The summary of water quality data, found in Appendix C, is presented in six separate tables representing each of the six water supply zones (WSZ).

Also included, is a summary of compliance results for *E. coli* undertaken during drinking water verification monitoring. *E. coli* results are included for the whole of Loganwater network in Appendix C.

5 NOTIFICATIONS TO THE REGULATOR UNDER SECTIONS 102 AND 102A OF THE ACT

During the 2019-20 FY, there were five instances where the Queensland Water Supply Regulator was formally notified under sections 102 and/or 102A of *the Act*. Notifiable events may include:

- a detection of *Escherichia coli* (*E. coli*)
- an exceedance of a health guideline value in the Australian drinking water guidelines (ADWG)
- detections of parameters with no guideline valued in the ADWG
- water quality events that a service provider cannot manage within existing processes and/or that may impact on the health of customers (for example, a large dirty water event, or environmental flood event that threatens water quality).

Upon receipt of ADWG health exceedances and for many other reportable events, Loganwater mobilises our *Incident Management Team* and works closely with QLD Health and the Water Supply Regulator to ensure appropriate actions are undertaken protect public health.

The next section details the notifiable events reported by Loganwater during FY2019/20.

5.1 Notification events reported to the Regulator

As discussed in Section 4.1 no reportable events occurred as part of routine verification monitoring.

However, five notifications to the Regulator occurred during the reporting period. Of the five notifications:

- Two were related to short term chlorine dosing exceedances with no known customer impact
- One was related to a security breach of a drinking water reservoir by unauthorised persons. The reservoir was immediately isolated. Testing confirmed that the water quality was normal. Repairs and improvements were undertaken, and the reservoir placed back online.
- One was related to a short term 'discoloured water' event at Logan Hospital.
- One was related to the detection of a substance with no ADWG (Health or Aesthetic) Criteria. Further investigation determined there was no health risk from the detection and that results were within international guideline standards.

A summary of the reported events in included in Section 5.1.1.

5.1.1 Non-compliant Events – Non Verification Monitoring

Table 5 - Summary of non-verification monitoring program reportable events: FY2019-20

#	Incident date	Scheme/Location	Parameter/Issue	Description	Corrective and Preventative Actions
1	15/04/20	Logan South Water Supply Zone – Razorback reservoir	<i>Reservoir security breach</i>	Unauthorised entry/break-in to reservoir compound. Hole cut in fence, stainless steel grate on stairwell levered or cut open, lock on hatch forced open. An empty 600mL water bottle was found floating on the reservoir surface.	<ul style="list-style-type: none"> Incident Management Team was mobilised to manage the incident. Immediate isolation of reservoir from the network. Testing of the reservoir by Logan NATA laboratory All results returned met ADWG (Health) guidelines. Works performed to repair and reinforce holes in gate and stairwell mesh, lock replaced on hatch. Enhanced security upgrades performed (CCTV and SCADA alarms) This reservoir is part of the CISUP security project investigating improvements in security across the board at Loganwater
2	02/02/20	Logan South Water Supply Zone - Woodhill Reservoir	<i>High chlorine event #2</i>	<p>Woodhill water dosing facility dosed above 5mg/L for a period of 6 minutes (6:42am - 6:48am). Root-cause analysis showed that this was due to a downstream reservoir ceasing calling for water and the chlorine dosing station continued to dose for 6 minutes into the main – resulting in a very short-term chlorine exceedance. When the high levels were detected by the analysers the dosing unit disabled. This triggered a page to the on-call officer.</p> <p>No customer complaints were experienced, and it is likely that no customers were affected due to dilution, flows and the time of day.</p> <p>SCADA reprogramming and testing of the new code and operation proved successful in addressing the underlying issue and there have been no more similar events since. This issue occurred in October 2019, however a fault in the programming had meant that the issue was experienced again. Note that this has not occurred again, and all testing and monitoring demonstrates the system now works as designed.</p>	<ul style="list-style-type: none"> Immediate automatic isolation of the chlorine dosing operations – notification to on-call personnel Reprogramming of SCADA code to prevent issue from occurring again. Testing of new code. Included SCADA coding description in Woodhill Operations and Maintenance Manual. Review and update CCP regularly. Train on-call operators as per CCP procedure and on-call responsibilities. Provided general awareness training in WDF operations to all relevant Network Operations personnel (30 minute training conducted via MS Teams).
3	20/11/19	Marsden Water Supply Zone – Logan Hospital	<i>Dirty water event</i>	Lightly-coloured dirty water detected within the hospital internal network. An Incident Management Team was mobilised to manage the incident. Following corrective actions, the hospital supply returned to normal.	<ul style="list-style-type: none"> Incident Management Team was mobilised to manage the incident. Communication with hospital. isolation of the hospital network supply (they have an onsite storage tank) as a precaution. Flushing of network in proximity – network clear on the same day. Water Quality monitoring – all results met ADWG (Health) criteria. Working with hospital to improve onsite water management.
4	18/10/19	Logan South Water Supply Zone - Woodhill Reservoir	<i>High chlorine event #1</i>	Woodhill water dosing facility dosed above 5mg/L for a period of 15 minutes (3:30am - 3:45am). Root-cause analysis showed that this was due to a downstream reservoir ceasing calling for water and the chlorine dosing station continued to dose for 6 minutes into the main. The system worked as designed, and when the high levels were detected by the analysers, the dosing	<ul style="list-style-type: none"> Immediate automatic isolation of the chlorine dosing operations – notification to on-call personnel Reprogramming of SCADA code to prevent issue from occurring again. Included SCADA coding description in Woodhill Operations and Maintenance Manual. Review and update CCP regularly. Train on-call operators as per CCP procedure and on-call responsibilities.

				<p>unit disabled, and this triggered a page to the on-call officer.</p> <p>No customer complaints were experienced, and it is likely that no customers were affected due to dilution, flows and the time of day.</p> <p>SCADA reprogramming was performed to try and prevent a recurrence.</p>	<ul style="list-style-type: none"> • Provided general awareness training in WDF operations to all relevant Network Operations personnel (30 minute training conducted via MS Teams).
5	01/07/20119	Greenbank Water Supply Zone	<p><i>Notification of Drinking Water Event or Detection of Parameter with no water quality criteria - hydrocarbons</i></p>	<p>Following a customer enquiry, Loganwater took samples from a property in Regents Park. Normal hydrocarbon results for Benzene, Ethylbenzene, Toluene, Xylene were within ADWG (Health) limits. However Total Petroleum Hydrocarbon and Total Recoverable Hydrocarbon results of 40µg/L were detected (for both). There are no ADWG Health limits for these.</p> <p>In consultation with QLD Health, the Regulator, Industry WQ experts and other relevant guidelines, including WHO guidelines for Petroleum Products in Drinking Water (2008), it was decided that an appropriate limit was 90µg/L. This meant the results were within acceptable limits and there was no health issue. The issue was reported regardless and led to an improvement in process and customer complaint handling.</p>	<ul style="list-style-type: none"> • Testing • Duplicate samples sent to other laboratories for comparison • Review of customer complaint process • Review of external laboratory sampling process • Creation of laboratory sampling 'menu' to expedite sampling process • Presentation of lessons learned findings to management

6 CUSTOMER COMPLAINTS RELATED TO DRINKING WATER QUALITY

6.1 Community Engagement

Consumer satisfaction is a critical aspect in the verification of drinking water quality. The monitoring and analysis of customer complaints is considered a key part of Loganwater’s drinking water quality verification program. Furthermore, it is simply good business practice to respond to customer feedback and work towards maintaining community customer satisfaction.

General water quality information is available via the Logan City Council website for customers to peruse.⁷ Furthermore communications campaigns are often run with the community during water quality projects, to better manage community expectations.

At all times, Loganwater encourages customers to lodge complaints about their water quality if they feel their drinking water is unsatisfactory or if they believe their health is at risk.

Encouraging customers to lodge complaints establishes a link between the service provider and the customer and may provide a real time indicator of water quality performance.

6.1.1 Key Projects

During the 2019-20 financial year, a Customer Complaint Dashboard was established in with the aim of improving customer complaint management and protecting *Public Health*. Customer calls are logged and transferred to a GIS platform, so that clusters of customer complaints may more easily be identified. This dashboard is available via Loganwater’s internal *Sharepoint* platform.

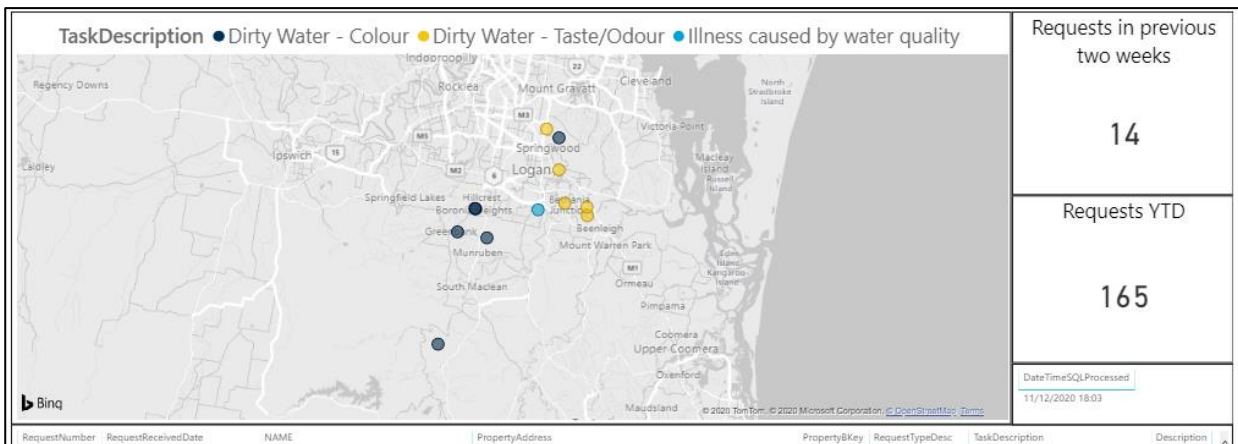


Figure 1 - Customer complaint Dashboard example⁸

6.2 Customer Complaints

Customer complaints are closely linked to the performance of the water supply system.

Loganwater aims to:

- Respond directly to the customer making the complaint;

⁷ Please refer to the Logan City Council website for further information:

<https://www.logan.qld.gov.au/waterquality>

⁸ Please note customer names and addressed have been removed for privacy reasons.

- Investigate the complaint;
- Rectify the condition;
- Address the root cause; and
- Mitigate risks to public health effectively.

During this process, information is collected which assists with future improvement activities. Establishment of this process is crucial in driving Loganwater's process improvement activities.

Loganwater classifies customer complaints according to the following categories:

- Water Quality - Suspected Health
- Water Quality - Appearance
- Water Quality - Taste and Odour
- Water Quality - Other⁹

Loganwater received a total of 253 drinking water complaints during the reporting period. This is a vast improvement from the last FY, during which 434 drinking water complaints during FY2018-19.

In summary:

- This equates to 2.14 complaints per 1000 water connections
- This was composed of 169 *Appearance*, 59 *Taste and Odour*, 18 *Suspected Health* and 7 *Other* complaints. A breakdown of customer complaints categorised by % per category is shown in Figure 2.

The number of customer complaints received by Loganwater per category for each Water Supply Zone (WSZ) is shown in Figure 3 and Table 3, with complaints per connection shown in Table 7.

The calculation of complaints per 1000 connections allows for comparisons to be made between Water Supply Zones (WSZs). The number of connections is based on the number of properties currently connected to Loganwater's drinking water network by WSZ.

⁹ This category refers to those whose description does not readily fit in the other three categories. For example, fish owners who have had fish unwell/die, owners who believe the water makes their clothes more susceptible to mould etc.

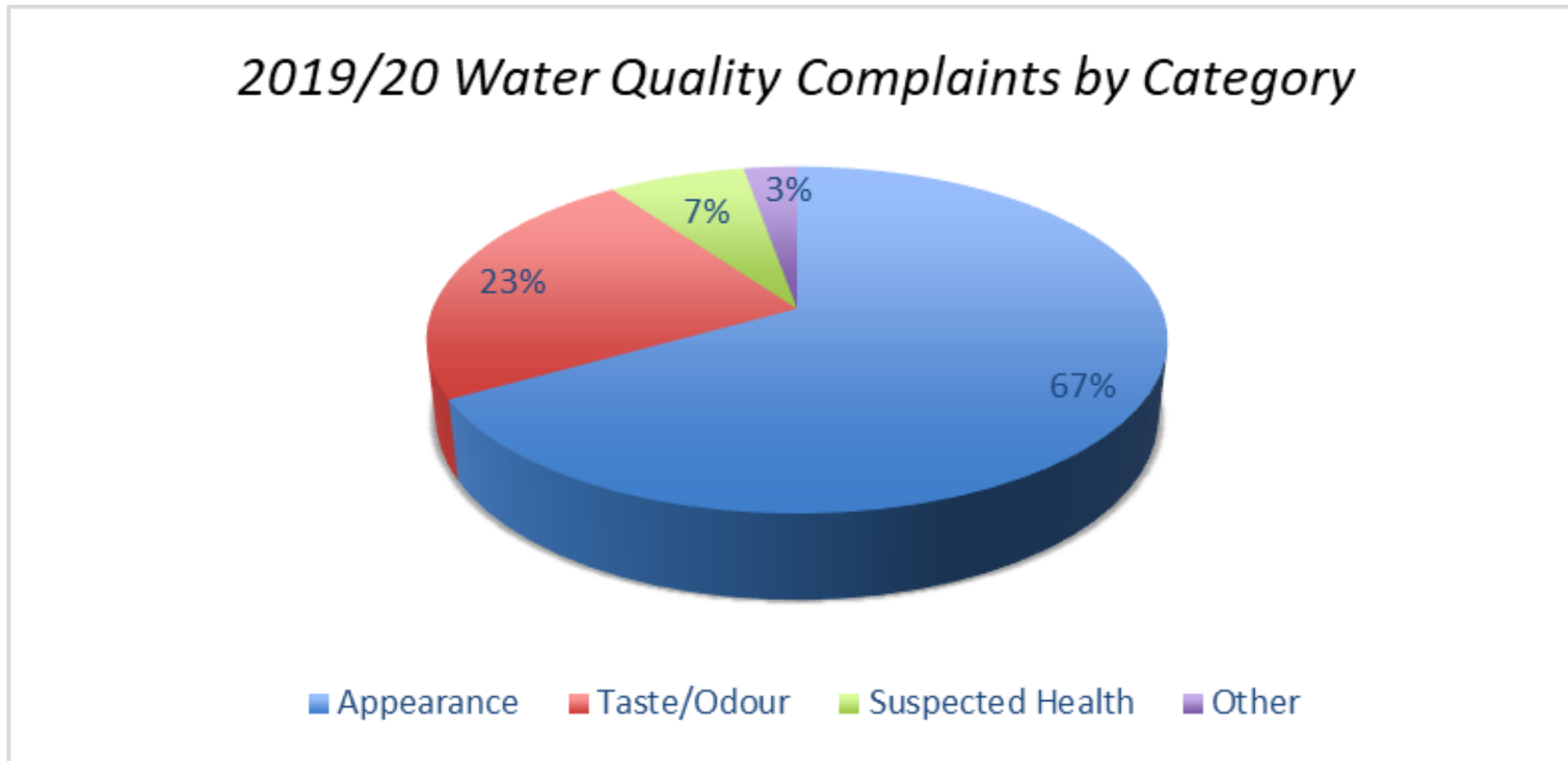


Figure 2 - FY2019-20 Water quality complaints by category

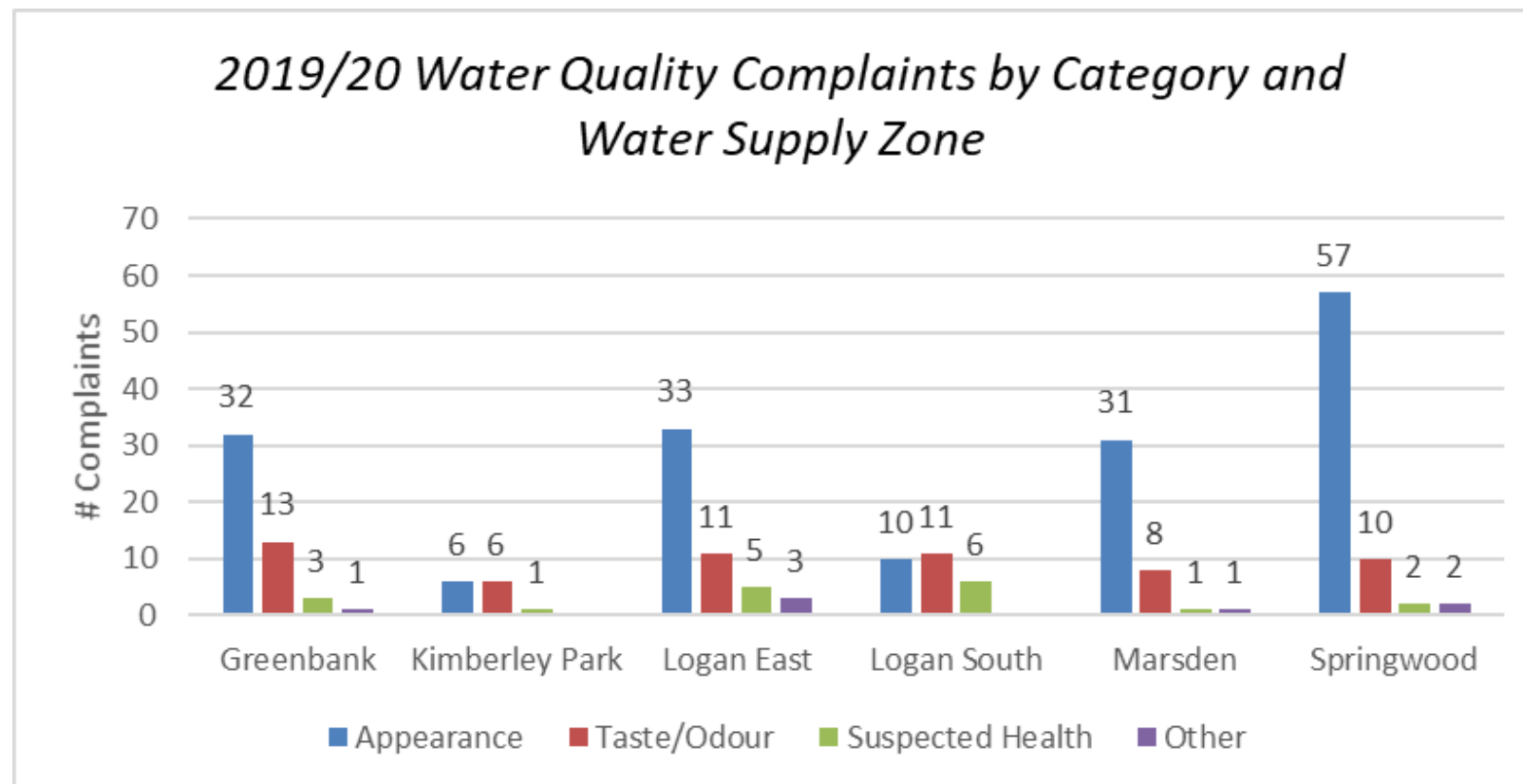


Figure 3 - FY2019-20 Water quality complaints by category and water supply zone

Table 6 - Water quality complaints summary FY2019/20

	FY2019-20 Total Water Quality Complaints				
Water Supply Zone	Appearance	Taste/Odour	Suspected Health	Other	Total
Greenbank	32	13	3	1	49
Kimberley Park	6	6	1	0	13
Logan East	33	11	5	3	52
Logan South	10	11	6	0	27
Marsden	31	8	1	1	41
Springwood	57	10	2	2	71
Total	169	59	18	7	253
% of Total	66.8 %	23.3 %	7.1 %	2.8%	100%

Table 7 - Water quality complaints per 1000 connections

	FY2019-20 Customer complaints/1000 connections					
Water Supply Zone	# Connections¹⁰	Appearance	Taste/Odour	Suspected Health	Other	Total
Greenbank	18,730	1.71	0.69	0.16	0.05	2.62
Kimberley Park	7708	0.78	0.78	0.13	0	1.69
Logan East	17,012	1.94	0.65	0.29	0.18	3.06
Logan South	14,273	0.70	0.77	0.42	0	1.89
Marsden	18,647	1.66	0.43	0.05	0.05	2.20
Springwood	41,677	1.37	0.24	0.05	0.05	1.70
All Zones Total	118,047	1.43	0.50	0.15	0.06	2.14

6.2.1 Suspected Health

Complaints are occasionally received from customers concerned that their drinking water may be causing illness, and these are thus categorised as *Suspected Health* complaints.

During the FY2019-20, Loganwater received a total of 18 suspected health complaints. In all cases, the customer's property and also the surrounding Loganwater network were tested. Test

¹⁰ Number of connections based on water connected property GIS layer extracted 07/12/2020 .

results confirmed in all cases that drinking water in the Loganwater network supplied to the customer's homes all met the ADWG health related guideline limits.

All complaints were actioned and closed out following appropriate consultation with the customer.¹¹

6.2.2 Appearance

Appearance of drinking water (*Appearance*) was the most frequently recorded complaint type for the FY2019-20 reporting period. Of the 253 total complaints received, 169 were related to the appearance of the water (67 % of total complaints received).

Springwood WSZ returned the most *Appearance* complaints (57 complaints, 1.37 complaints per 1,000 connections) representing 34 % of all appearance complaints received. Analysis of complaints per 1000 connections showed that Logan East WSZ had the next highest rate of complaints (33 complaints, 1.94 complaints per 1,000 connections), followed by Greenbank WSZ (32 complaints, 1.71 complaints per 1,000 connections)

All water *Appearance* complaints received were investigated with the most common remedial action being flushing of water mains.

There are three sub-sets to *Appearance*, being the following, with further descriptions below:

- Dirty Water;
- Milky and/or White Water; and
- Other (e.g. customer complained water quality was creating streaks on shower recess)

¹¹ Please note that fuel/chemical tasting complaints (i.e. hydrocarbon related) may be received either as a Suspected Health or Taste & Odour complaint. These are both categorised with Priority 1 status – meaning they are dealt with promptly and efficiently. In this report they have been categorised in the Taste & Odour section (Section 6.2.3.3).

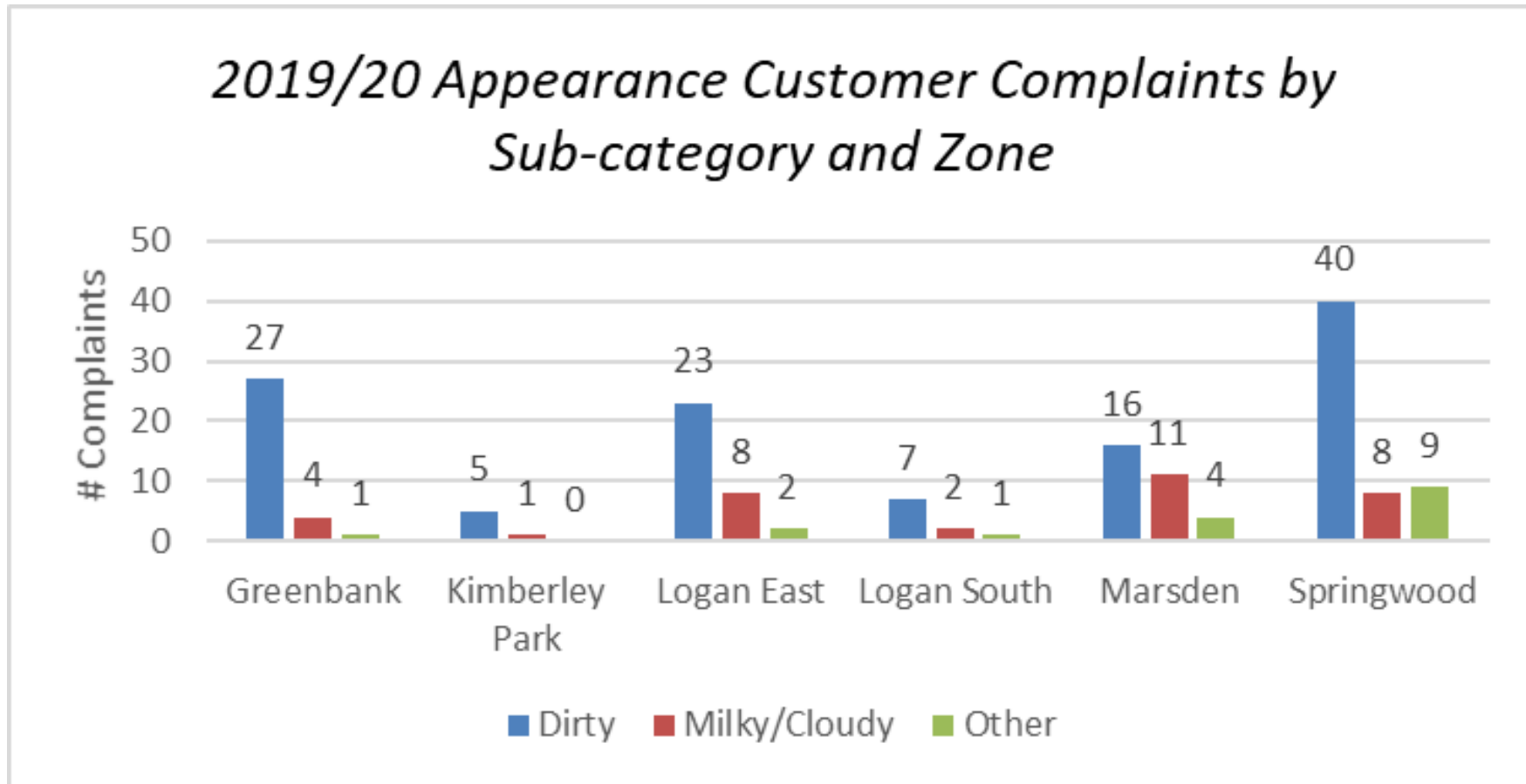


Figure 4 - FY2019-20 Appearance complaints by sub-category and zone

6.2.2.1 Dirty Water

Dirty Water is a sub-category of *Appearance* complaints and is typically associated with brown or turbid water. In total, there were 118 dirty water complaints, contributing to 70% of all *Appearance* complaints.

As can be seen in Figure 4, Springwood WSZ returned the highest number of dirty water complaints (40).

Dirty water complaints may be related to a variety of causes for example network configuration reasons (e.g. customers in cul de sacs), unplanned broken mains, other planned works or flow velocity and directional changes.

Loganwater aims to manage dirty water in the network by:

- A public health risk assessment process associated with major network interventions, such as planned works or network configuration changes.
- Implementation of the Hy5 hygienic work practices program includes training on minimising ingress and adequate flushing techniques when working on the network (refer to Section 3.1.2 – Element 4).
- the Network Maintenance program re-initiated the ongoing flushing program. Key sites throughout the network are flushed and turbidity is tested before and after by trained and experienced personnel. The program is responsive to changing patterns in water quality complaints and incorporates known areas of likely dirty water such as dead-ends and cul de sacs.

These activities, in addition to network mains cleaning projects, aim to improve the overall health of the network.

6.2.2.2 Milky and/or White Water

The majority of *Milky and/or White Water* complaints were suspected to be associated with mains repairs resulting in air in the line.

A total of 34 *Milky and/or White Water* complaints were received during the reporting period, 20 % of the *Appearance* complaints.

Marsden WSZ returned the highest number (11) as shown in Figure 4.

As part of the customer complaint management process, complaints lodged by customers for white or milky water are first investigated to see if air entrainment is the cause. This is done by requesting the customer to perform a settling test and observing if the water clears after a defined time period, which resolved the majority of complaints. All complaints that were not rectified by a settling test, had nearby mains flushed along with additional testing undertaken, of which all testing results met all ADWG health requirements.

In addition, the Hy5 hygienic works practices program which encourages appropriate flushing during works on mains repairs may lead to less aerated water in the network.

6.2.3 Taste and Odour

Taste and Odour complaints are characterised by an objectionable taste or odour noticed by customers. Typical descriptions from customers include earthy, metallic, chlorine or a chemical / petrol taste in the water. Thus *Taste and Odour* complaints are generally placed into one of four sub-categories:

- Chlorine
- Musty / Earthy / Stale; and
- Hydrocarbons / Chemical / Petrol

- Other (e.g. my water tastes ‘fishy’)

The third sub-category, *Hydrocarbons / Chemical*, is included to account for water quality complaints where the water reportedly “smells or tastes like petrol or chemicals”. Occasionally, a taste and odour complaint may accompany a claim of illness. These complaints a high priority and treated in a very similar manner as “*Suspected health*” related complaints.

During the FY2019-20 reporting period, there were 59 *Taste and Odour* complaints received. Figure 5 shows the *Taste and Odour* complaints per WSZ by sub-category, with Greenbank WSZ having the highest number of complaints (13).

All these complaints were attended to and flushed with customers on occasion being supplied bottled water (in the event of a hydrocarbons / chemical / petrol complaint), whilst investigation and remedial activities were undertaken.

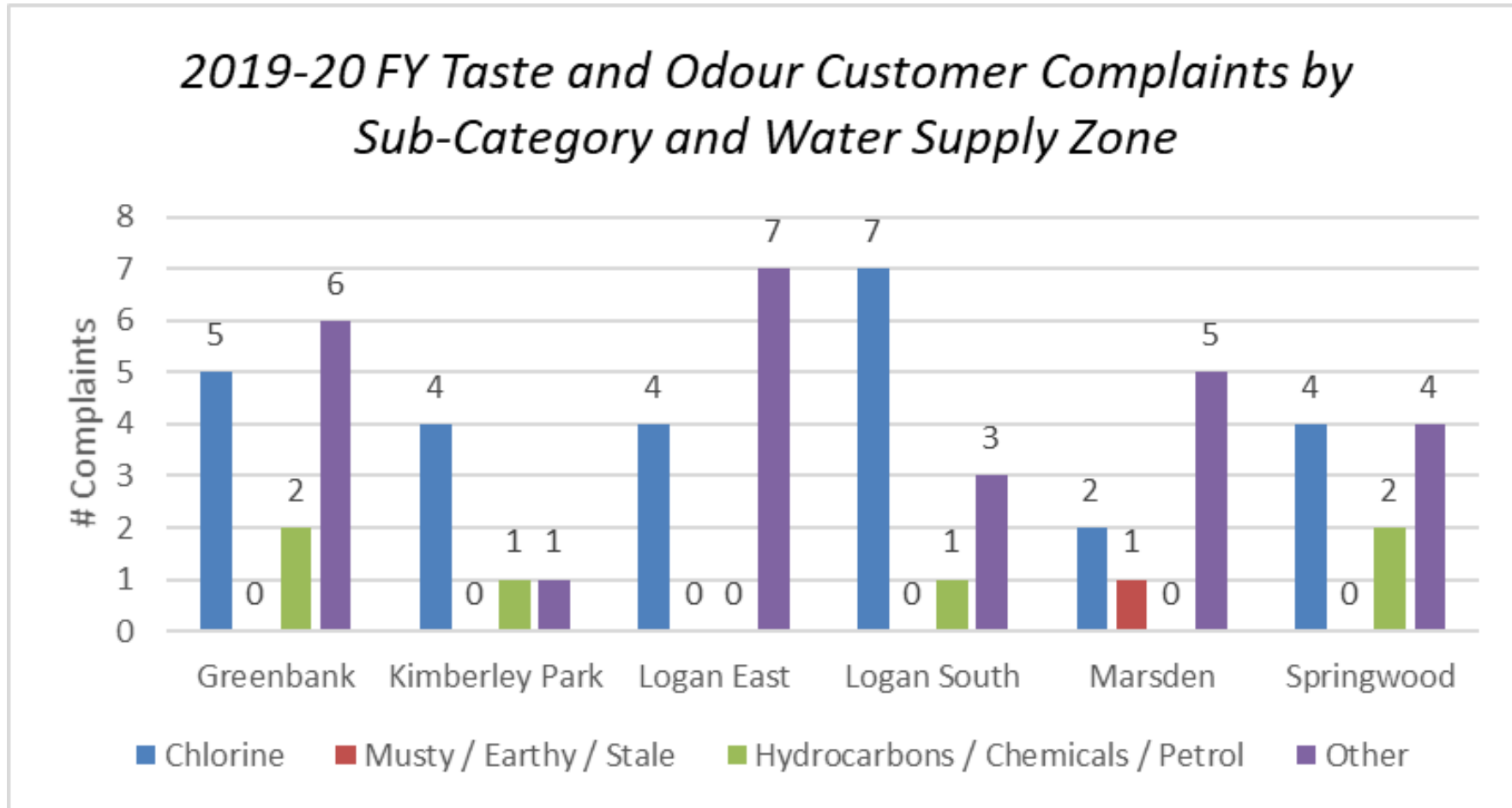


Figure 5 - FY2019-20 Taste and odour customer complaints by category and water supply zone

6.2.3.1 Chlorine

While most of Logan City has chloramine as the residual disinfectant, some WQZs have free chlorine in the water as the residual disinfectant all year round. Furthermore, some WQZs may be seasonally chlorinated or chlorinated as part of routine maintenance works (e.g. network disinfection cleaning projects).

When consuming water, customers typically detect chlorine more easily than chloramine. The ADWG advises that customers may notice the taste of chlorine at levels as low as 0.6 mg/L however this will vary between people. The ADWG health limit for chlorine is 5 mg/L (as total chlorine) however Loganwater operates well below this limit. We aim to manage network chlorine levels which provide customers with safe treated drinking water that is also pleasant to drink.

During the reporting period, 26 of the *Taste and Odour* complaints were associated with a chlorine (44 %).

As can be seen in Figure 5, most *Chlorine* complaints were from the Logan South WSZ (7) followed by Greenbank WSZ (5). These chlorine complaints appear to be related to the:

- Ongoing operation of the Travis Road water dosing facility; and
- Ongoing operation of the Greenbank reservoir water dosing facility discussed in Section 3.1.2 Element 3.
- Furthermore, the operation of the Logan River water dosing facility during summer continues to cause chlorine-related complaints, as some customers detect the change in their water, especially those living in proximity to the dosing site.¹²

Loganwater considers customer complaints as central to their activities and continues to review their processes to ensure a balance to the aesthetic taste of their water and the supply of safe drinking water.

6.2.3.1 Musty / Earthy / Stale

Musty, Earthy or Stale tasting water can be due to several factors including:

- Odours from sink drains being mistaken for odour from taps;
- Stale water in the pipes in areas of low water usage or stale water in residence's pipes when they have been away for a long period; or
- High rainfall in the Seqwater catchment area which can increase the amount of organics and minerals in the raw water which can impact taste even after water treatment.

As shown in Figure 5, only 1 *Musty, Earthy or Stale* complaints were received in the whole of Logan for the 2019-2020 FY (Marsden WSZ) .

All complaints were investigated, where the water quality results analysed, including additional testing met the ADWG health guidelines. In some cases additional flushing was also undertaken.

¹² A current disinfection modelling project is scheduled for 2020-21 in order to better inform network dosing practices and optimise disinfectant levels throughout the network. This will address some of the issues which may cause chlorine-related customer complaints.

6.2.3.2 Hydrocarbons / Chemical / Petrol

Whilst not common, residents do occasionally use pesticides or have leaking petrol/oil on their property which seeps through the soil into their polyethylene service line, contaminating their water supply.

During the FY2019-20, Loganwater investigated 6 hydrocarbon / chemical *Taste & Odour* complaints¹³. Investigations were undertaken, including thorough sampling and testing from both Loganwater's water supply to the property and directly from the affected property (i.e. customer's onsite taps), and in some cases neighbouring properties. The 6 complaints were confirmed by laboratory testing as containing the common hydrocarbon chemicals benzene, toluene, ethylbenzene and xylene (commonly referred to as *BTEX*). In each case the results concluded:

- That Loganwater's water supply network met ADWG health guideline requirements
- That contamination occurred within the owner's property.
 - In these instances, customers are advised not to drink the water, to present to a medical professional if they feel unwell and to engage a licenced plumber to investigate their onsite services.

As a result, Loganwater provides the water quality results together with advice on appropriate corrective and preventative actions that should be undertaken, including a fact sheet (*How to avoid chemical contamination of your water supply*) to all affected customers. This fact sheet can also be found on Council's website. Furthermore customers may maintain awareness of good disposal practices through additional fact sheets and as part of the Don't Rush to Flush campaign - '*Don't be a fool when disposing fuel*'. These are also available via Council's website.

No operational changes have been implemented by Loganwater as a result of these complaints.

¹³ Please note that all hydrocarbon complaints have been classified 'Taste and Odour' for the purposes of this report (i.e. none are classified in the health complaints category).

7 DRINKING WATER QUALITY MANAGEMENT PLAN REVIEW OUTCOMES

No review was conducted during the reporting period 1/7/19 to 30/6/20. In accordance with the requirement of Section 99 (2)(b) and 106 of *the Act*, Loganwater commenced a review of the approved DWQMP during the 2020-21 FY. This review was completed in 2020-21 FY.¹⁴

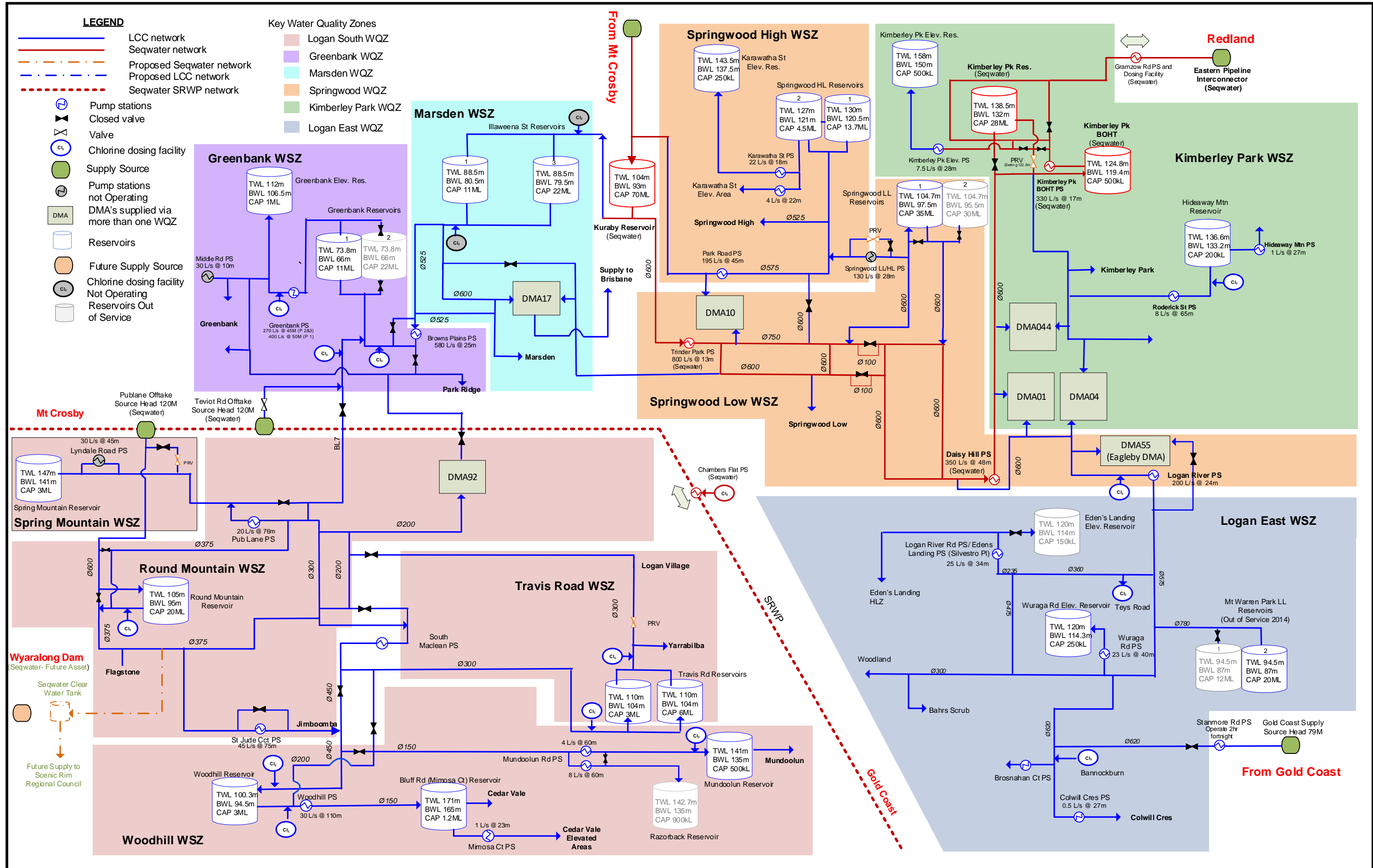
¹⁴ As such, a summary of this review will be included in the next DWQMP Annual Report.

8 DRINKING WATER QUALITY MANAGEMENT PLAN AUDIT FINDINGS

No regulatory audit was conducted during the reporting period. Please note that an internal audit was performed during the reporting period by an independent expert auditor. That internal audit is further discussed in Section 8.

APPENDIX A - LOGANWATER WATER SUPPLY NETWORK SCHEMATIC

Inert latest schematic here: [LCC DOCS-#14338785-Appendx A-v24-Logan Water Supply Network Schematic \(DWQMP figure 6\)](#)



REV. No	DESCRIPTION	DRAWN	CHECKED	APPR.	DATE
V	Improve Logan East network representation & Review CL2 dosing facilities	NA	JT		06/08/19
U	Includes DMA44 as DMA Supplied via more than one WQ zone	NA	JT		01/05/19
T	Recent Operational Changes and Activation of several reservoirs	NA	JT		01/02/19
S	Recent Operational Changes	NA	JT		06/03/18
R	Include several operational changes	NA	JT		28/02/17
Q	Indicate reservoir connectivity details	NA	JT		01/09/16
P	Add details related to Razorback Reservoir and Pump Station	NA	JT		29/06/16

DESIGNED BY		LWA REFERENCES	
Name	Grant Gabriel	PROJECT No.	
UPDATED BY		FILE REFERENCE:	
Name	Nishendra Attygala		
CHECKED BY		SHEET SIZE	
NAME	Jeremy Thomas	A3	
APPROVED BY		DATUM: AHD	
Name	Sandy Veeren	GDA 94 ZONE 56	


LOGAN
 CITY COUNCIL

PROJECT: Logan Water Supply Network Schematic		DATE: 06/08/2019
DRAWING TITLE: Water Supply Servicing Strategy (2019 August)		LWA DRAWING No. FIGURE 6
DESIGN COMPANY: LWA		REV. V
TECH SERVICES DRG No. DM# 9553933		

APPENDIX B - SEQ WATER GRID MAP

Insert latest SEQwater bulk supply diagram here (sourced from Seqwater website)

[LCC DOCS-#14338165-48125 - SEQ Water Grid map - AS AT 30 JUNE 2018 0 \(1\)](#)

SEQ Water Grid



Legend

- Northern Pipeline Interconnector
- Western Corridor Recycled Water Scheme
- Southern Regional Water Pipeline
- Eastern Pipeline Interconnector
- Network Integration Pipeline
- Other bulk water pipelines connecting the SEQ water grid
- Local government boundary
- Reservoirs
- Water Treatment Plants (WTP) – connected to grid
- Water Treatment Plants (WTP) – off grid
- Water Treatment Plants (WTP) – other
- Western Corridor Recycled Water Scheme
- Desalination plant
- Power Station

Water Treatment Plants (WTP)

- 1 Amity Point WTP
- 2 Banksia Beach WTP
- 3 Beaudesert WTP
- 4 Boonah Kalbar WTP
- 5 Canungra WTP
- 6 Capalaba WTP
- 7 Dayboro WTP
- 8 Dunwich WTP
- 9 East Bank (Mount Crosby) WTP
- 10 Enoggera WTP
- 11 Esk WTP
- 12 Ewen Maddock WTP
- 13 Hinze Dam WTP
- 14 Image Flat WTP
- 15 Jimna WTP
- 16 Kenilworth WTP
- 17 Kilcoy WTP
- 18 Kirkleagh WTP
- 19 Kooralbyn WTP
- 20 Landers Shute WTP
- 21 Linville WTP
- 22 Lowood WTP
- 23 Maroon Dam WTP
- 24 Molendinar WTP
- 25 Moogerah Dam WTP
- 26 Mudgeeraba WTP
- 27 Noosa WTP
- 28 North Pine WTP
- 29 North Stradbroke Island WTP
- 30 Point Lookout WTP
- 31 Rathdowney WTP
- 32 Somerset Dam (Township) WTP
- 33 West Bank (Mount Crosby) WTP
- 34 Wivenhoe Dam WTP

Western Corridor Recycled Water Scheme

- 35 Bundamba Advanced Water Treatment Plant AWTP
- 36 Gibson Island AWTP
- 37 Luggage Point AWTP

Desalination Plant

- 38 Gold Coast Desalination Plant

Reservoirs

- 39 Alexandra Hills Reservoirs
- 40 Aspley Reservoir
- 41 Camerons Hill Reservoir
- 42 Ferntree Reservoir
- 43 Green Hill Reservoirs
- 44 Heinemann Road Reservoirs
- 45 Kimberley Park Reservoirs
- 46 Kuraby Reservoir
- 47 Molendinar Reservoir
- 48 Mt Cotton Reservoir
- 49 Narangba Reservoirs
- 50 North Beaudesert Reservoirs
- 51 North Pine Reservoirs
- 52 Robina Reservoir
- 53 Sparkes Hill Reservoirs
- 54 Stapylton Reservoir
- 55 Wellers Hill Reservoirs

Power Stations

- 56 Tarong Power Station
- 57 Swanbank Power Station



APPENDIX C - SUMMARY OF COMPLIANCE WITH WATER QUALITY CRITERIA

The results from the verification monitoring program have been assessed against the water quality criteria specified by the Regulator in the Water Quality and Reporting Guideline for a Drinking Water Service. The reporting period was 1st July 2019 – 30th June 2020 (FY2019 – 20). A summary of performance by Water Quality Zone is included on the proceeding pages.

Please refer to Section 4 for further descriptions of the monitoring program regime and statistical analysis principles adopted for the analysis.

All water supply zones water quality performance summary FY2019-20

PARAMETER <i>E. coli</i>	Unit	TOTAL NO. OF SAMPLES COLLECTED	NO. SAMPLES IN WHICH PARAMETER WAS DETECTED		% SAMPLED COMPLIED	ADWG GUIDELINE (Health)	ADWG Compliance (Health)	
<i>E.coli</i> by Colilert	MPN/100mL	2555	0		100%	98%	✓	
PARAMETER Other tests	Unit	Number of samples	Min	Max	Average	ADWG Guideline (Aesthetic)	ADWG Guideline (Health)	ADWG Compliance (Health)
Alkalinity as CaCO3	mg/L	245	45	105	84	b	b	b
Aluminium, Total	mg/L	674	0.01	0.27	0.06	0.2	b	b
Ammonia-N	mg/L	1464	0.1	0.4	0.1	0.5	b	b
Arsenic, Total	mg/L	674	0.001	0.04	0.003	b	0.01	✓
Barium, Total	mg/L	674	0.005	0.044	0.03	b	2	✓
Beryllium, Total	mg/L	631	0.001	0.001	0.001	b	0.06	✓
Bismuth, Total	mg/L	631	0.001	0.002	0.001	b	b	b
Boron, Total	mg/L	674	0.011	0.556	0.111	b	4	✓
Bromodichloromethane	mg/L	1766	0.005	0.059	0.026	b	b	✓
Bromoform	mg/L	1766	0.005	0.025	0.010	b	b	✓
Cadmium, Total	mg/L	674	0.001	0.001	0.001	b	0.002	✓
Calcium Hardness	mg/L	674	35	86	64	b	b	b
Chloride	mg/L	630	9.9	105.6	51.7	b	b	b
Chlorine, Free	mg/L	2753	0.05	1.96	0.41	b	5	✓
Chlorine, Total	mg/L	2754	0.00	3.70	1.18	0.6	5	✓
Chloroform	mg/L	1766	0.01	0.10	0.03	b	b	✓
Chromium, Total	mg/L	674	0.001	0.020	0.002	b	0.05	✓
Cobalt, Total	mg/L	674	0.001	0.030	0.003	b	b	b
Colour, Apparent	Hazen	630	1	64	2	b	b	b
Colour, True	Hazen	630	1	1	1	15	b	b
Conductivity	µS/cm	2753	167	659	423	b	b	b
Copper, Total	mg/L	674	0.001	0.303	0.008	1	2	✓
Dibromochloromethane	mg/L	1766	0.005	0.0887	0.027	b	b	✓
Fluoride	mg/L	630	0	1.1	0.69	b	1.5	✓
Heterotrophic Plate Count	CFU/mL	1479	10	1215	14	b	b	b
Iron, Total	mg/L	674	0.003	0.673	0.019	0.3	b	b
Lead, Total	mg/L	674	0.001	0.001	0.001	b	0.01	✓
Lithium, Total	mg/L	631	0.001	0.001	0.001	b	b	b
Magnesium, Total	mg/L	674	1	20	12	b	b	b
Manganese, Total	mg/L	674	0.001	0.142	0.004	0.1	0.5	✓
Molybdenum, Total	mg/L	631	0.001	0.001	0.001	b	0.05	✓
Nickel, Total	mg/L	674	0.001	0.001	0.001	b	0.02	✓
Nitrate-N	mg/L	637	0.1	1.0	0.3	b	11.3	✓
Nitrite-N	mg/L	637	0.1	0.6	0.1	b	0.9	✓
pH	pH units	2753	6.3	9.0	7.8	8.5	b	b
Potassium, Total	mg/L	674	1	5	3	b	b	b
Selenium, Total	mg/L	631	0.01	0.01	0.01	b	0.01	✓
Sodium, Total	mg/L	674	12	68	40	180	b	b
Sulphate	mg/L	630	4	88	22	250	b	b
TDS, Calculated	mg/L	1479	102	800	256	500	b	b
Temperature	°C	2749	16.4	48.0	24.0	b	b	b
Thallium, Total	mg/L	631	0.001	0.001	0.001	b	b	b
Total Coliforms	mg/L	2753	1	20	1	b	b	b
Total Hardness (as CaCO3)	mg/L	674	46	161	113	200	b	b
Total THM	mg/L	1766	0.02	0.21	0.10	b	0.25	✓
Turbidity	NTU	2754	0.1	5.9	0.4	5	b	b
Zinc, Total	mg/L	674	0.01	0.03	0.01	3	b	b

ns - no ADWG (2011) aesthetic guideline specified

b - no ADWG (2011) health guideline specified

Please note that ADWG (2011) guidelines only list a health limit for Total THMs (i.e. not the individual THM species listed in the table above).

✓ = Results meet ADWG (Health) criteria compliance limits

Greenbank water supply zone water quality performance summary FY2019-20

PARAMETER <i>E. coli</i>	Unit	# OF SAMPLES	# OF DETECTIONS		% SAMPLED COMPLIED		ADWG GUIDELINE (Health)	ADWG Compliance (Health)
<i>E.coli</i> by Colilert	MPN/100mL	343	0		100%		98.00%	✓
PARAMETER Other tests	Unit	# of samples	Min	Max	Av.	ADWG Guideline (Aesthetic)	ADWG Guideline (Health)	ADWG Compliance (Health)
Alkalinity as CaCO3	mg/L	39	74	105	92	b	b	b
Aluminium, Total	mg/L	92	0.04	0.27	0.07	0.2	b	b
Ammonia-N	mg/L	218	0.1	0.4	0.1	0.5	b	b
Arsenic, Total	mg/L	92	0.001	0.001	0.003	b	0.01	✓
Barium, Total	mg/L	92	0.027	0.042	0.034	b	2	✓
Beryllium, Total	mg/L	87	0.001	0.001	0.001	b	0.06	✓
Bismuth, Total	mg/L	87	0.001	0.001	0.001	b	b	b
Boron, Total	mg/L	92	0.029	0.215	0.072	b	4	✓
Bromodichloromethane	mg/L	352	0.016	0.059	0.04	b	b	✓
Bromoform	mg/L	352	0.005	0.021	0.013	b	b	✓
Cadmium, Total	mg/L	92	0.001	0.001	0.001	b	0.001	✓
Calcium Hardness	mg/L	92	58.2	76.3	66.9	b	b	b
Chloride	mg/L	86	38.1	99.7	62.9	b	b	b
Chlorine, Free	mg/L	369	0.05	1.68	0.58	b	5	✓
Chlorine, Total	mg/L	369	0.08	3.3	1.14	0.6	5	✓
Chloroform	mg/L	352	0.01	0.10	0.04	b	b	✓
Chromium, Total	mg/L	92	0.001	0.020	0.002	b	0.05	✓
Cobalt, Total	mg/L	92	0.001	0.030	0.003	b	b	b
Colour, Apparent	Hazen	86	1	63.6	2.6	b	b	b
Colour, True	Hazen	86	1	1	1	15	b	b
Conductivity	µS/cm	369	281.6	658.9	485.7	b	b	b
Copper, Total	mg/L	92	0.001	0.070	0.006	1	2	✓
Dibromochloromethane	mg/L	352	0.015	0.060	0.039	b	b	✓
Fluoride	mg/L	86	0.39	0.97	0.68	b	1.5	✓
HPC	CFU/mL	221	10	35	10	b	b	b
Iron, Total	mg/L	92	0.00	0.673	0.023	0.3	b	b
Lead, Total	mg/L	92	0.001	0.001	0.001	b	0.01	✓
Lithium, Total	mg/L	87	0.001	0.001	0.001	b	b	b
Magnesium, Total	mg/L	92	10.72	19.05	14.27	b	b	b
Manganese, Total	mg/L	92	0.001	0.142	0.00571	0.1	0.5	✓
Molybdenum, Total	mg/L	87	0.001	0.001	0.001	b	0.05	✓
Nickel, Total	mg/L	92	0.001	0.001	0.001	b	0.02	✓
Nitrate-N	mg/L	86	0.1	0.55	0.16616	b	11.3	✓
Nitrite-N	mg/L	86	0.1	0.1	0.1	b	0.9	✓
pH	pH units	369	7.02	8.84	7.87238	8.5	b	b
Potassium, Total	mg/L	92	2.887	4.633	3.72774	b	b	b
Selenium, Total	mg/L	87	0.01	0.01	0.01	b	0.01	✓
Sodium, Total	mg/L	92	39.68	64.377	47.4149	180	b	b
Sulphate	mg/L	86	13	62.1	25.6698	250	b	b
TDS, Calculated	mg/L	221	197	400	296.317	500	b	b
Temperature	°C	369	16.9	30.2	24.0846	b	b	b
Thallium, Total	mg/L	87	0.001	0.001	0.001	b	b	b
Total Coliforms	mg/L	369	1	1	1	b	b	b
Total Hardness (as CaCO3)	mg/L	92	106.8	154.5	125.682	200	b	b
Total THM	mg/L	352	0.06	0.21	0.13253	b	0.25	✓
Turbidity	NTU	369	0.1	5.89	0.392	5	b	b
Zinc, Total	mg/L	92	0.01	0.03	0.01109	3	b	b

ns - no ADWG (2011) aesthetic guideline specified

b - no ADWG (2011) health guideline specified

Please note that ADWG (2011) guidelines only list a health limit for Total THMs (i.e. not the individual THM species listed in the table above).

✓ = Results meet ADWG (Health) criteria compliance limits

Kimberley Park water supply zone water quality performance summary FY2019-20

PARAMETER <i>E. coli</i>	Unit	# OF SAMPLES	# OF DETECTIONS		% SAMPLED COMPLIED	ADWG GUIDELINE (Health)	ADWG Compliance (Health)	
<i>E.coli</i> by Colilert	MPN/100mL	209	0		100%	98.00%	✓	
PARAMETER Other tests	Unit	# samples	Min	Max	Av.	ADWG Guideline (Aesthetic)	ADWG Guideline (Health)	ADWG Compliance (Health)
Alkalinity as CaCO ₃	mg/L	26	48	102	88	a	b	b
Aluminium, Total	mg/L	56	0.03	0.11	0.07	0.2	b	b
Ammonia-N	mg/L	139	0.1	0.4	0.1	0.5	b	b
Arsenic, Total	mg/L	56	0.001	0.001	0.001	ns	0.01	✓
Barium, Total	mg/L	56	0.009	0.043	0.032	ns	2	✓
Beryllium, Total	mg/L	52	0.001	0.001	0.001	ns	0.06	✓
Bismuth, Total	mg/L	52	0.001	0.001	0.001	ns	b	b
Boron, Total	mg/L	56	0.011	0.097	0.046	ns	4	✓
Bromodichloromethane	mg/L	35	0.005	0.048	0.024	ns	b	✓
Bromoform	mg/L	35	0.005	0.023	0.012	ns	b	✓
Cadmium, Total	mg/L	56	0.001	0.001	0.001	ns	0.002	✓
Calcium Hardness	mg/L	56	42	76	65	ns	b	b
Chloride	mg/L	52	17.9	90.1	59.8	250	b	b
Chlorine, Free	mg/L	225	0.05	1.78	0.36	ns	5	✓
Chlorine, Total	mg/L	225	0.05	2.90	0.90	ns	5	✓
Chloroform	mg/L	35	0.01	0.06	0.02	ns	b	✓
Chromium, Total	mg/L	56	0.001	0.020	0.002	ns	0.05	✓
Cobalt, Total	mg/L	56	0.001	0.030	0.003	ns	b	b
Colour, Apparent	Hazen	52	1	6	2	15	b	b
Colour, True	Hazen	52	1	1	1	15	b	b
Conductivity	µS/cm	225	185	649	461	ns	b	b
Copper, Total	mg/L	56	0.001	0.07	0.008	>1	2	✓
Dibromochloromethane	mg/L	35	0.005	0.06093	0.030	ns	b	✓
Fluoride	mg/L	52	0.39	1.1	0.70	ns	1.5	✓
HPC	CFU/mL	141	10	85	12	ns	b	b
Iron, Total	mg/L	56	0.006	0.038	0.015	0.3	b	b
Lead, Total	mg/L	56	0.001	0.001	0.001	ns	0.01	✓
Lithium, Total	mg/L	52	0.001	0.001	0.001	ns	b	b
Magnesium, Total	mg/L	56	2	17	12	ns	b	b
Manganese, Total	mg/L	56	0.001	0.03	0.005	0.1	0.5	✓
Molybdenum, Total	mg/L	52	0.001	0.001	0.001	ns	0.05	✓
Nickel, Total	mg/L	56	0.001	0.001	0.001	ns	0.02	✓
Nitrate-N	mg/L	52	0.1	1.0	0.3	ns	11.3	✓
Nitrite-N	mg/L	52	0.1	0.3	0.1	ns	0.9	✓
pH	pH units	225	6.7	8.1	7.6	6.5-8.5	b	b
Potassium, Total	mg/L	56	1	5	3	ns	b	b
Selenium, Total	mg/L	52	0.01	0.01	0.01	ns	0.01	✓
Sodium, Total	mg/L	56	12	59	41	180	b	b
Sulphate	mg/L	52	4	68	26	250	b	b
TDS, Calculated	mg/L	141	112	391	279	600	b	b
Temperature	°C	225	17	31.7	24.1	ns	b	b
Thallium, Total	mg/L	52	0.001	0.001	0.001	ns	b	b
Total Coliforms	mg/L	225	1	11	1	ns	b	b
Total Hardness (as CaCO ₃)	mg/L	56	49	144	117	200	b	b
Total THM	mg/L	35	0.02	0.17	0.09	ns	0.25	✓
Turbidity	NTU	225	0.1	5.5	0.4	5	b	b
Zinc, Total	mg/L	56	0.01	0.03	0.01	3	b	b

ns - no ADWG (2011) aesthetic guideline specified

b - no ADWG (2011) health guideline specified

Please note that ADWG (2011) guidelines only list a health limit for Total THMs (i.e. not the individual THM species listed in the table above).

✓ = Results meet ADWG (Health) criteria compliance limits

Logan East water supply zone water quality performance summary FY2019-20

PARAMETER <i>E. coli</i>	Unit	# OF SAMPLES	# OF DETECTIONS		% SAMPLED COMPLIED	ADWG GUIDELINE (Health)	ADWG Compliance (Health)	
<i>E.coli</i> by Colilert	MPN/100mL	569	0		100%	98%	✓	
PARAMETER Other tests	Unit	# samples	Min	Max	Av.	ADWG Guideline (Aesthetic)	ADWG Guideline (Health)	ADWG Compliance (Health)
Alkalinity as CaCO3	mg/L	39	45	102	87	a	b	b
Aluminium, Total	mg/L	151	0.03	0.12	0.06	0.2	b	b
Ammonia-N	mg/L	277	0.1	0.2	0.1	0.5	b	b
Arsenic, Total	mg/L	151	0.001	0.001	0.001	ns	0.01	✓
Barium, Total	mg/L	151	0.005	0.044	0.029	ns	2	✓
Beryllium, Total	mg/L	142	0.001	0.001	0.001	ns	0.06	✓
Bismuth, Total	mg/L	142	0.001	0.001	0.001	ns	b	b
Boron, Total	mg/L	151	0.029	0.528	0.130	ns	4	✓
Bromodichloromethane	mg/L	427	0.014	0.059	0.031	ns	b	✓
Bromoform	mg/L	427	0.005	0.025	0.011	ns	b	✓
Cadmium, Total	mg/L	151	0.001	0.001	0.001	ns	0.002	✓
Calcium Hardness	mg/L	151	35	86	63	ns	b	b
Chloride	mg/L	142	9.9	105.6	51.7	250	b	b
Chlorine, Free	mg/L	617	0.05	1.42	0.29	ns	5	✓
Chlorine, Total	mg/L	617	0.05	2.70	0.77	ns	5	✓
Chloroform	mg/L	427	0.01	0.09	0.04	ns	b	✓
Chromium, Total	mg/L	151	0.001	0.020	0.002	ns	0.05	✓
Cobalt, Total	mg/L	151	0.001	0.030	0.003	ns	b	b
Colour, Apparent	Hazen	142	1	9	2	15	b	b
Colour, True	Hazen	142	1	1	1	15	b	b
Conductivity	µS/cm	617	167	641	426	ns	b	b
Copper, Total	mg/L	151	0.001	0.07	0.008	>1	2	✓
Dibromochloromethane	mg/L	427	0.00605	0.06331	0.032	ns	b	✓
Fluoride	mg/L	142	0.3	0.94	0.69	ns	1.5	✓
HPC	CFU/mL	280	10	300	14	ns	b	b
Iron, Total	mg/L	151	0.003	0.068	0.012	0.3	b	b
Lead, Total	mg/L	151	0.001	0.001	0.001	ns	0.01	✓
Lithium, Total	mg/L	142	0.001	0.001	0.001	ns	b	b
Magnesium, Total	mg/L	151	1	19	12	ns	b	b
Manganese, Total	mg/L	151	0.001	0.03	0.003	0.1	0.5	✓
Molybdenum, Total	mg/L	142	0.001	0.001	0.001	ns	0.05	✓
Nickel, Total	mg/L	151	0.001	0.001	0.001	ns	0.02	✓
Nitrate-N	mg/L	142	0.1	0.6	0.2	ns	11.3	✓
Nitrite-N	mg/L	142	0.1	0.3	0.1	ns	0.9	✓
pH	pH units	617	6.5	8.1	7.7	6.5-8.5	b	b
Potassium, Total	mg/L	151	1	5	3	ns	b	b
Selenium, Total	mg/L	142	0.01	0.01	0.01	ns	0.01	✓
Sodium, Total	mg/L	151	13	57	40	180	b	b
Sulphate	mg/L	142	6	57	22	250	b	b
TDS, Calculated	mg/L	280	102	800	264	600	b	b
Temperature	°C	613	17.2	32.2	24.2	ns	b	b
Thallium, Total	mg/L	142	0.001	0.001	0.001	ns	b	b
Total Coliforms	mg/L	617	1	1	1	ns	b	b
Total Hardness (as CaCO3)	mg/L	151	46	153	113	200	b	b
Total THM	mg/L	427	0.05	0.21	0.11	ns	0.25	✓
Turbidity	NTU	617	0.1	2.1	0.4	5	b	b
Zinc, Total	mg/L	151	0.01	0.03	0.01	3	b	b

ns - no ADWG (2011) aesthetic guideline specified

b - no ADWG (2011) health guideline specified

Please note that ADWG (2011) guidelines only list a health limit for Total THMs (i.e. not the individual THM species listed in the table above).

✓ = Results meet ADWG (Health) criteria compliance limits

Logan South water supply zone water quality performance summary FY2019-20

PARAMETER <i>E. coli</i>	Unit	# OF SAMPLES	# OF DETECTIONS		% SAMPLED COMPLIED		ADWG GUIDELINE (Health)	ADWG Compliance (Health)
<i>E.coli</i> by Colilert	MPN/100mL	762	0		100%		98%	✓
PARAMETER Other tests	Unit	# samples	Min	Max	Av.	ADWG Guideline (Aesthetic)	ADWG Guideline (Health)	ADWG Compliance (Health)
Alkalinity as CaCO3	mg/L	84	45	103	70	a	b	b
Aluminium, Total	mg/L	198	0.01	0.11	0.06	0.2	b	b
Ammonia-N	mg/L	476	0.1	0.3	0.1	0.5	b	b
Arsenic, Total	mg/L	198	0.001	0.001	0.001	ns	0.01	✓
Barium, Total	mg/L	198	0.005	0.04	0.020	ns	2	✓
Beryllium, Total	mg/L	185	0.001	0.001	0.001	ns	0.06	✓
Bismuth, Total	mg/L	185	0.001	0.002	0.001	ns	b	b
Boron, Total	mg/L	198	0.026	0.556	0.181	ns	4	✓
Bromodichloromethane	mg/L	800	0.005	0.051	0.019	ns	b	✓
Bromoform	mg/L	800	0.005	0.021	0.008	ns	b	✓
Cadmium, Total	mg/L	198	0.001	0.001	0.001	ns	0.002	✓
Calcium Hardness	mg/L	198	39	82	58	ns	b	b
Chloride	mg/L	185	10.9	104.2	37.0	250	b	b
Chlorine, Free	mg/L	817	0.05	1.82	0.63	ns	5	✓
Chlorine, Total	mg/L	818	0.00	3.70	1.27	ns	5	✓
Chloroform	mg/L	800	0.01	0.09	0.03	ns	b	✓
Chromium, Total	mg/L	198	0.001	0.020	0.002	ns	0.05	✓
Cobalt, Total	mg/L	198	0.001	0.030	0.003	ns	b	b
Colour, Apparent	Hazen	185	1	6	2	15	b	b
Colour, True	Hazen	185	1	1	1	15	b	b
Conductivity	µS/cm	817	178	543	319	ns	b	b
Copper, Total	mg/L	198	0.001	0.07	0.007	>1	2	✓
Dibromochloromethane	mg/L	800	0.005	0.0887	0.018	ns	b	✓
Fluoride	mg/L	185	0.3	1.01	0.69	ns	1.5	✓
HPC	CFU/mL	478	10	1215	15	ns	b	b
Iron, Total	mg/L	198	0.003	0.266	0.021	0.3	b	b
Lead, Total	mg/L	198	0.001	0.001	0.001	ns	0.01	✓
Lithium, Total	mg/L	185	0.001	0.001	0.001	ns	b	b
Magnesium, Total	mg/L	198	1	20	8	ns	b	b
Manganese, Total	mg/L	198	0.001	0.03	0.004	0.1	0.5	✓
Molybdenum, Total	mg/L	185	0.001	0.001	0.001	ns	0.05	✓
Nickel, Total	mg/L	198	0.001	0.001	0.001	ns	0.02	✓
Nitrate-N	mg/L	192	0.1	0.9	0.3	ns	11.3	✓
Nitrite-N	mg/L	192	0.1	0.6	0.1	ns	0.9	✓
pH	pH units	817	6.3	9.0	8.0	6.5-8.5	b	b
Potassium, Total	mg/L	198	1	5	3	ns	b	b
Selenium, Total	mg/L	185	0.01	0.01	0.01	ns	0.01	✓
Sodium, Total	mg/L	198	16	55	32	180	b	b
Sulphate	mg/L	185	4	34	15	250	b	b
TDS, Calculated	mg/L	478	108	330	195	600	b	b
Temperature	°C	817	16.7	30.1	23.5	ns	b	b
Thallium, Total	mg/L	185	0.001	0.001	0.001	ns	b	b
Total Coliforms	mg/L	817	1	3	1	ns	b	b
Total Hardness (as CaCO3)	mg/L	198	47.1	161	91	200	b	b
Total THM	mg/L	800	0.02	0.18	0.07	ns	0.25	✓
Turbidity	NTU	817	0.1	3.7	0.4	5	b	b
Zinc, Total	mg/L	198	0.01	0.03	0.01	3	b	b

ns - no ADWG (2011) aesthetic guideline specified

b - no ADWG (2011) health guideline specified

Please note that ADWG (2011) guidelines only list a health limit for Total THMs (i.e. not the individual THM species listed in the table above).

✓ = Results meet ADWG (Health) criteria compliance limits

Marsden water supply zone water quality performance summary FY2019-20

PARAMETER <i>E. coli</i>	Unit	# OF SAMPLES	# OF DETECTIONS		% SAMPLED COMPLIED		ADWG GUIDELINE (Health)	ADWG Compliance (Health)
<i>E.coli</i> by Colilert	MPN/100mL	238	0		100%		98%	✓
PARAMETER Other tests	Unit	# samples	Min	Max	Av.	ADWG Guideline (Aesthetic)	ADWG Guideline (Health)	ADWG Compliance (Health)
Alkalinity as CaCO ₃	mg/L	23	75	103	96	a	b	b
Aluminium, Total	mg/L	64	0.05	0.12	0.07	0.2	b	b
Ammonia-N	mg/L	135	0.1	0.4	0.1	0.5	b	b
Arsenic, Total	mg/L	64	0.001	0.001	0.001	ns	0.01	✓
Barium, Total	mg/L	64	0.031	0.044	0.037	ns	2	✓
Beryllium, Total	mg/L	59	0.001	0.001	0.001	ns	0.06	✓
Bismuth, Total	mg/L	59	0.001	0.002	0.001	ns	b	b
Boron, Total	mg/L	64	0.03	0.097	0.051	ns	4	✓
Bromodichloromethane	mg/L	71	0.016	0.039	0.025	ns	b	✓
Bromoform	mg/L	71	0.005	0.018	0.012	ns	b	✓
Cadmium, Total	mg/L	64	0.001	0.001	0.001	ns	0.002	✓
Calcium Hardness	mg/L	64	56	75	68	ns	b	b
Chloride	mg/L	59	42.5	76.8	61.3	250	b	b
Chlorine, Free	mg/L	256	0.05	1.96	0.19	ns	5	✓
Chlorine, Total	mg/L	256	0.05	3.40	1.74	ns	5	✓
Chloroform	mg/L	71	0.01	0.04	0.02	ns	b	✓
Chromium, Total	mg/L	64	0.001	0.020	0.002	ns	0.05	✓
Cobalt, Total	mg/L	64	0.001	0.030	0.003	ns	b	b
Colour, Apparent	Hazen	59	1	20	3	15	b	b
Colour, True	Hazen	59	1	1	1	15	b	b
Conductivity	µS/cm	256	427	659	496	ns	b	b
Copper, Total	mg/L	64	0.001	0.07	0.007	>1	2	✓
Dibromochloromethane	mg/L	71	0.022	0.043	0.032	ns	b	✓
Fluoride	mg/L	59	0.49	0.92	0.70	ns	1.5	✓
HPC	CFU/mL	137	10	300	23	ns	b	b
Iron, Total	mg/L	64	0.005	0.123	0.019	0.3	b	b
Lead, Total	mg/L	64	0.001	0.001	0.001	ns	0.01	✓
Lithium, Total	mg/L	59	0.001	0.001	0.001	ns	b	b
Magnesium, Total	mg/L	64	11	19	15	ns	b	b
Manganese, Total	mg/L	64	0.001	0.039	0.006	0.1	0.5	✓
Molybdenum, Total	mg/L	59	0.001	0.001	0.001	ns	0.05	✓
Nickel, Total	mg/L	64	0.001	0.001	0.001	ns	0.02	✓
Nitrate-N	mg/L	59	0.1	0.7	0.2	ns	11.3	✓
Nitrite-N	mg/L	59	0.1	0.2	0.1	ns	0.9	✓
pH	pH units	256	6.8	8.2	7.8	6.5-8.5	b	b
Potassium, Total	mg/L	64	3	5	4	ns	b	b
Selenium, Total	mg/L	59	0.01	0.01	0.01	ns	0.01	✓
Sodium, Total	mg/L	64	38	61	46	180	b	b
Sulphate	mg/L	59	17	74	28	250	b	b
TDS, Calculated	mg/L	137	199	399	300	600	b	b
Temperature	°C	256	16.4	29.5	23.8	ns	b	b
Thallium, Total	mg/L	59	0.001	0.001	0.001	ns	b	b
Total Coliforms	mg/L	256	1	20	1	ns	b	b
Total Hardness (as CaCO ₃)	mg/L	64	103.7	150	131	200	b	b
Total THM	mg/L	71	0.06	0.13	0.09	ns	0.25	✓
Turbidity	NTU	257	0.1	5.5	0.4	5	b	b
Zinc, Total	mg/L	64	0.01	0.03	0.01	3	b	b

ns - no ADWG (2011) aesthetic guideline specified

b - no ADWG (2011) health guideline specified

Please note that ADWG (2011) guidelines only list a health limit for Total THMs (i.e. not the individual THM species listed in the table above).

✓ = Results meet ADWG (Health) criteria compliance limits

Springwood water supply zone water quality performance summary FY2019-20

PARAMETER <i>E. coli</i>	Unit	# OF SAMPLES	# OF DETECTIONS		% SAMPLED COMPLIED	ADWG GUIDELINE (Health)	ADWG Compliance (Health)	
<i>E.coli</i> by Colilert	MPN/100mL	434	0		100%	98%	✓	
PARAMETER Other tests	Unit	# Samples	Min	Max	Av.	ADWG Guideline (Aesthetic)	ADWG Guideline (Health)	ADWG Compliance (Health)
Alkalinity as CaCO ₃	mg/L	34	72	103	93	a	b	b
Aluminium, Total	mg/L	113	0.03	0.11	0.07	0.2	b	b
Ammonia-N	mg/L	219	0.1	0.4	0.1	0.5	b	b
Arsenic, Total	mg/L	113	0.001	0.001	0.001	ns	0.01	✓
Barium, Total	mg/L	113	0.007	0.044	0.035	ns	2	✓
Beryllium, Total	mg/L	106	0.001	0.001	0.001	ns	0.06	✓
Bismuth, Total	mg/L	106	0.001	0.001	0.001	ns	b	b
Boron, Total	mg/L	113	0.029	0.372	0.059	ns	4	✓
Bromodichloromethane	mg/L	81	0.01246	0.041	0.024	ns	b	✓
Bromoform	mg/L	81	0.005	0.020	0.012	ns	b	✓
Cadmium, Total	mg/L	113	0.001	0.001	0.001	ns	0.002	✓
Calcium Hardness	mg/L	113	41	81	68	ns	b	b
Chloride	mg/L	106	12.9	80.0	58.9	250	b	b
Chlorine, Free	mg/L	469	0.05	1.87	0.19	ns	5	✓
Chlorine, Total	mg/L	469	0.05	3.60	1.40	ns	5	✓
Chloroform	mg/L	81	0.01	0.05	0.02	ns	b	✓
Chromium, Total	mg/L	113	0.001	0.020	0.002	ns	0.05	✓
Cobalt, Total	mg/L	113	0.001	0.030	0.003	ns	b	b
Colour, Apparent	Hazen	106	1	40	3	15	b	b
Colour, True	Hazen	106	1	1	1	15	b	b
Conductivity	µS/cm	469	183	649	493	ns	b	b
Copper, Total	mg/L	113	0.001	0.303	0.012	>1	2	✓
Dibromochloromethane	mg/L	81	0.01005	0.04539	0.031	ns	b	✓
Fluoride	mg/L	106	0	0.93	0.69	ns	1.5	✓
HPC	CFU/mL	222	10	300	13	ns	b	b
Iron, Total	mg/L	113	0.003	0.261	0.023	0.3	b	b
Lead, Total	mg/L	113	0.001	0.05	0.00406	ns	0.01	✓
Lithium, Total	mg/L	106	0.001	0.001	0.001	ns	b	b
Magnesium, Total	mg/L	113	2	19	15	ns	b	b
Manganese, Total	mg/L	113	0.001	0.03	0.005	0.1	0.5	✓
Molybdenum, Total	mg/L	106	0.001	0.001	0.001	ns	0.05	✓
Nickel, Total	mg/L	113	0.001	0.001	0.001	ns	0.02	✓
Nitrate-N	mg/L	106	0.1	0.9	0.2	ns	11.3	✓
Nitrite-N	mg/L	106	0.1	0.4	0.1	ns	0.9	✓
pH	pH units	469	6.7	8.2	7.7	6.5-8.5	b	b
Potassium, Total	mg/L	113	1	5	4	ns	b	b
Selenium, Total	mg/L	106	0.01	0.01	0.01	ns	0.01	✓
Sodium, Total	mg/L	113	16	68	46	180	b	b
Sulphate	mg/L	106	9	88	27	250	b	b
TDS, Calculated	mg/L	222	111	394	299	600	b	b
Temperature	°C	469	16.4	48.0	24.5	ns	b	b
Thallium, Total	mg/L	106	0.001	0.001	0.001	ns	b	b
Total Coliforms	mg/L	469	1	3	1	ns	b	b
Total Hardness (as CaCO ₃)	mg/L	113	50	159	129	200	b	b
Total THM	mg/L	81	0.05	0.13	0.09	ns	0.25	✓
Turbidity	NTU	469	0.1	4.0	0.4	5	b	b
Zinc, Total	mg/L	113	0.01	0.03	0.01	3	b	b

ns - no ADWG (2011) aesthetic guideline specified

b - no ADWG (2011) health guideline specified

Please note that ADWG (2011) guidelines only list a health limit for Total THMs (i.e. not the individual THM species listed in the table above).

✓ = Results meet ADWG (Health) criteria compliance limits

WATER QUALITY SUMMARY: *E. coli*

Loganwater’s verification monitoring performance for key microbial indicator *E. coli* is summarised below.

Table 8 - Whole of Logan region *E. coli* water quality summary

Water Quality Summary: <i>E.coli</i>						
MICROBIAL PARAMETER	UNITS	NUMBER OF SAMPLES COLLECTED	NUMBER OF DETECTIONS	% SAMPLES WHICH MET COMPLIANCE	ADWG GUIDELINE (HEALTH)	ADWG COMPLIANCE (HEALTH)
<i>E. coli</i>	MPN/100mL	2555	NONE	100%	100%	✓ ⁸

E. coli Verification Monitoring

Table 9 - Loganwater E. coli Verification Monitoring FY2019-20

E. coli Verification Monitoring												
WHOLE OF LOGAN CITY - ALL ZONES	2019-20 FY											
Month	Jul'19	Aug'19	Sep'19	Oct'19	Nov'19	Dec'19	Jan'20	Feb'20	Mar'20	Apr'20	May'20	Jun'20
No. of samples collected	220	177	198	211	200	213	232	210	256	201	203	255
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	2304	2319	2373	2378	2372	2402	2485	2490	2558	2489	2494	2555
No. of failures in previous 12 month period	5	5	5	3	3	1	1	1	0	0	0	0
% compliance in previous 12 month period	99.78%	99.78%	99.79%	99.87%	99.87%	99.96%	99.96%	99.96%	100%	100%	100%	100%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
% compliance for month	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

APPENDIX D - IMPLEMENTATION OF THE RISK MANAGEMENT IMPROVEMENT PROGRAM

The Risk Management Improvement Plan (RMIP) summarises the progress of the proposed actions undertaken as part of the current RMIP.

Item No.	Priority	DWQMP Section	Risk Source					Risk Reference	Water Supply Act Guideline Best Practise	ISSUES / RISKS	KEY ACTIONS	CURRENT STATUS	BRANCH	OWNER	LEAD	START DATE	TARGET DATE	REVISED TARGET DATE	% COMPLETE	STATUS
			RA	IA	EA	II	GI													
1.1.	2	E1 : Commitment to Drinking Water Quality Management					GI	2.3 (R)	3.6 3.9.1	LCC not formally notified by Seqwater of high THM experienced in bulk water supply to Gold Coast early 2015. This notification not in current SEQ Operating Protocol hence update required.	Long Term: Incorporate THM Notification alert limits for events which may affect LCC with next Operating Protocol update.	Short Term: Seqwater will notify LCC of increase changes in THMs as per current GC limits in Operating Protocol - completed Long Term: LCC has incorporated new THM alerts into updated Operating Protocol accepted by Seqwater (DM#10300400) - completed ✓	Water Operations	PL - Network Maintenance	PL - Network Maintenance	Jan-15	Jun-17	Jun-17	100%	COMPLETE
1.2.	3	E1 : Commitment to Drinking Water Quality Management					GI	G	3.6 3.9.1	Ensure Policy is reviewed on a regularly basis to remain relevant.	Review and update Drinking Water Policy Statement.	Reviewed & updated to incorporate training (July 2019) (DM#12980466) - completed	All Branches	All Program Leaders	All Managers	Jan-19	Jun-19	Jun-19	100%	COMPLETE
2.1.	1	E2: Assessment of Drinking Water Supply Systems	RA					Res 1.10 Dis 8.1 Dis 9.1 & 9.2 Net 4.1	3.7.2 3.8	Backup online chlorine monitoring system required if Seqwater disinfection systems failed (i.e. dosing and monitoring).	Undertake "Online Water Quality Monitoring Strategy" - online instrumentation with SCADA alarms as backup to Seqwater system.	Online Water Quality Monitoring prioritisation - Preliminary Planning & Design and Installation - completed ✓ SCADA alarming & validation to be completed 2017/18FY- completed ✓	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jul-16	Jun-17	Jun-18	100%	COMPLETE
2.2.	2	E2: Assessment of Drinking Water Supply Systems			EA			Ext Audit (1,8)		#8 Ensure Risk Assessment maintains currency. #1 Reservoir Security Plan to consider exceptions, as each site is different.	Undertake whole of system Risk Assessment during 2019/20FY to include exceptions in Reservoir Security Plan and include new hazards to be managed.	a). Listed key hazards to be incorporated into next whole of system risk assessment, including reservoir security (ref. DWQMP) completed ✓ b). As part of the Reservoir Security Plan, a corporate risk assessment is scheduled for 2019/20FY. completed ✓ c) A whole of system risk assessment will be scheduled as part of HACCP development & implementation. completed ✓	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jun-18	Jun-19	Jun-20	100%	COMPLETE
2.3.	2	E2: Assessment of Drinking Water Supply Systems			EA			NC		There has been evidence of security breaches at a number of reservoir facilities.	a) Investigate the requirements for a Infrastructure Security Plan. b) Develop Infrastructure Security Plan (reservoirs). c) Implement Infrastructure Security Plan (reservoirs).	a) Investigate - Project MGR facilitated two key stakeholder sessions in October 2019. Tenders are now out (which include cyber security also - refer RMIP item 2.4). b) Develop - Once tender has been returned, plan will be developed. c) Implement - update: Loganwater aims to complete and deliver all security and access arrangements for reservoirs will be addressed through 2021 on a priority basis.	Water Business	PL - Water Asset Management	CISUP Project Director (Lee B)	Jun-18	TBC	Dec-21	80%	ON TRACK
2.4.	2	E2: Assessment of Drinking Water Supply Systems					GI	R		Cyber security risks which may affect the Drinking Water Management System	a) Investigate requirements of the cyber security KPIs to be included as part of the DWQMP annual reports Done b) Develop a Cyber security gap analysis is part of the scope of works for the CISUP project and also scope to develop implementation plans for the five Cyber security KPIs required to be included as part of the DWQMP annual reports. Done c) Implement CISUP project across Logan	a) Investigate Addressed as part of CISUP project. Two key stakeholder sessions have been held in October 2019. b) Develop gap analysis has been performed and recommendations have been reviewed and accepted. Implementation discussion is ongoing. c) Implement First recommendation is to Commencement of IS asset register compilation. Works on other recommendations are ongoing.	Water Business	PL - Water Asset Management	CISUP Project Director (Lee B)	Nov-19	Jun-21	Dec-21	40%	ON TRACK
2.5.	3	E2: Assessment of Drinking Water Supply Systems					GI	G		Assessment of Water Quality Data - List and examine water quality data Internal Audit identified that there may be value in considering causes of exceedances - especially recent (past 18-24 months), as this may bring systemic issues to light. For example, repeated incidents with common causes.	1. List and examine exceedances 2. Review exceedances 3. Confirm any strategic interventions required to respond to trends and clusters	1. All exceedances were reviewed as part of the 2020 DW Risk Assessment. Complete 2. Ibid. Complete 3. Health Networks project will review recommended strategic interventions required to respond to clusters and trends.	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Mar-20	Jun-20	Jun-20	100%	COMPLETE
2.6.	2	E2: Assessment of Drinking Water Supply Systems					GI	G		Assessment of Water Quality Data - Assess data using tools such as control charts and trends analysis to identify trends and potential problems Internal Audit identified that there is trending for chlorine, microbial and THM performance, however trends for other parameters should be conducted. Also, there is no trending for trace metals.	a) Investigate trending and reporting options for Aquantify b) Develop dashboard and reporting scripts to enhance performance trending capability c) Implement Aquantify dashboard reporting throughout Loganwater stakeholder group	a) Investigate: trending and reporting project scope developed. Project Manager assigned. b) Develop: Dashboard and reporting scripts requirements are being developed for each group (trade waste, waste water, drinking water) c) Implement: Project to implement due for delivery by June 2021	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Mar-20	Dec-20	Dec-20	30%	ON TRACK
3.1.	3	E3: Preventive Measures for Drinking Water Quality	RA				GI	4.1 (G) Net 1.1 & 1.2	3.9.1 3.9.2	Poor disinfection residual, particularly during Summer periods. Install two chlorine booster stations in Logan East.	Strategy & Planning Investigation outcome to help with implementation of routine network chlorination and chlorine dosing systems as required.	CAPEX approved for two booster stations in Logan East 2015/16FY- completed ✓ Delivery & construction (end 2016) - completed ✓ Commissioned summer 2017/18 - completed ✓	Water Business	PL - Water Product Quality	PL - Water Product Quality	Jun-15	Dec-16	May-18	100%	COMPLETE

Item No.	Priority	DWQMP Section	Risk Source				Risk Reference	Water Supply Act Guideline BP Best Practise	ISSUES / RISKS	KEY ACTIONS	CURRENT STATUS	BRANCH	OWNER	LEAD	START DATE	TARGET DATE	REVISED TARGET DATE	% COMPLETE	STATUS	
			RA	IA	EA	II	GI													
3.2.	3	E3: Preventive Measures for Drinking Water Quality	RA					Net 1.1 & 1.2	3.9.2	Poor disinfection residual, particularly during Summer periods.	<p>Strategy & Planning Investigation outcome to help with implementation of routine network chlorination and chlorine dosing systems as required.</p> <p>Install chlorination system at Round Mt Reservoir. Requires construction of additional outlet main.</p>	<p>CAPEX approved and planning completed for electro-chlorinator system at Round Mt Reservoir 2015/16FY - completed ✓</p> <p>Constructed & commenced commissioning Oct'17. - completed ✓</p>	Water Business	PL - Water Product Quality	PL - Water Product Quality	Jun-15	Dec-17	Mar-18	100%	COMPLETE
3.3.	1	E3: Preventive Measures for Drinking Water Quality	RA					Dis 16.2 Net 1.1 & 1.2	3.9.1 3.9.2	Poor disinfection residual, particularly during Summer periods.	<p>Implement LWA 90-12-98 & LWA 90-12-98 Network Water Quality Maintenance & Operating Strategies to help improve network chlorine residual in the network systems. Develop associated Plans (i.e. valving, monitoring, communication, etc.) & SOPs.</p> <p>Need to ensure business Plans capture associated costs, as now part of BAU.</p>	<p>Kimberley Park WSZ network disinfection clean - completed Aug'15 ✓ (& re-scheduled Aug'17).</p> <p>Greenbank WSZ network disinfection clean - completed Sep'16 ✓</p> <p>Network disinfection cleans scheduled every 2 years alternate for Kimberley Park & Logan North - completed Jun'17 ✓</p>	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jun-15	Jun-17	Jun-17	100%	COMPLETE
3.4.	1	E3: Preventive Measures for Drinking Water Quality	RA					DIS 3.1 DIS 5.5	3.9.2	<p>Internal audit identified that not all CCPs are easily visible on SCADA system to confirm limits. CCP limits are hard coded.</p> <p>Inconsistency of CCP SCADA limits vs CCP chart limits.</p>	<p>Undertake workshop to ensure CCP limits are relevant. SCADA updated to reflect this and ensure visibility of CCP limits on SCADA.</p> <p>Associated WOPs to be updated & training undertaken, to ensure effective implementation.</p>	<p>a). CCP & Operational workshops commenced with Logan River breakpoint dosing systems CCP charts & associated SCADA updated - completed ✓</p> <p>b). Remaining dosing CCPs identified & charts developed - completed ✓</p>	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jun-15	Jun-17	Jun-17	100%	COMPLETE
3.5.	2	E3: Preventive Measures for Drinking Water Quality	RA	IA	EA			NC DIS 3.1 DIS 5.5 Ext Audit (2,3)	3.9.2	<p>Internal audit identified that not all CCPs are easily visible on SCADA system to confirm limits. CCP limits are hard coded.</p> <p>Inconsistency of CCP SCADA limits vs CCP chart limits.</p>	<p>Undertake workshop to ensure CCP limits are relevant. SCADA updated to reflect this and ensure visibility of CCP limits on SCADA.</p>	<p>a). Dosing site procedure gap analysis tool developed with audit review to commence, including importance of record keeping - completed ✓</p> <p>b). Procedures to be updated & associated training implemented, post procedure audit review - Re-allocate to Task Brief project and HACCP development (Ref. Item #3.05-19 & #4.25).</p> <p>c). Undertaken annual audit review of CCP vs SCADA - completed ✓</p>	Water Operations	PL - Network Operations	PL - Network Operations	Jun-15	Jun-18	Jun-19	100%	COMPLETE
3.6.	2	E3: Preventive Measures for Drinking Water Quality	RA	IA	EA			NC DIS 3.1 DIS 5.5 Ext Audit (2,3)	3.9.2	<p>Preventive Measure and Multiple Barriers - Reservoir inspections.</p> <p>Springwood High - The reservoir is externally in good condition, however there is a large tree root under one side of the reservoir, near the largest tree (off site). A number of plugs are missing or coming out. Tree was a wet spot identified near the drain that needs to be monitored to determine if there is a leak. Centre box gutter in good condition. however not certain that there are foam inserts under the ridges.</p>	<p>a) Investigate Reservoir renewal activities to address issues identified. for Springwood High to monitor leak</p> <p>b) Develop items to be added to the renewal works project</p> <p>c) Implement undertake items required to address issues as part of the renewal project. Include items in ongoing reservoir inspections</p>	<p>a) Investigate Reservoir renewal team addressed the leak issues</p> <p>b) Develop Ongoing reservoir inspections will monitor for the leaks</p> <p>c) Implement Leak is being repaired at the moment (June-July 2020).</p>	Water Operations	PL - Network Operations	Mechanical Maintenance Supervisor	Mar-20	Jun-20	Jun-20	100%	COMPLETE
3.7.	2	E3: Preventive Measures for Drinking Water Quality	RA	IA	EA			NC DIS 3.1 DIS 5.5 Ext Audit (2,3)	3.9.2	<p>Internal audit identified that not all CCPs are easily visible on SCADA system to confirm limits. CCP limits are hard coded.</p> <p>Inconsistency of CCP SCADA limits vs CCP chart limits.</p>	<p>a) Investigate HACCP Gap analysis to be performed into the current DWQMS</p> <p>b) Develop HACCP plan and review</p> <p>c) Implement HACCP implementation project including developing CCP WOPs and associated training to ensure effective record keeping & implementation.</p>	<p>a) Investigate: HACCP review gap analysis project scope of works to be generated in 2019/20 financial year (see Item 3.6)</p> <p>b) Develop: Not commenced - to be evaluated and potentially commenced in FY2020/2021</p> <p>c) Implement: Not commenced</p>	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jun-15	Jun-21	Jun-21	20%	ON TRACK
3.10.	1	E3: Preventive Measures for Drinking Water Quality		IA				G		<p>Preventive Measure and Multiple Barriers - Evaluate alternative or additional preventive measures where improvement is required.</p> <p>Critical Infrastructure Security Upgrade Project - Internal Audit identified improvement to cages around stairs. Minor OFI to include the escalation process into the into the Emergency and Response Plan.</p>	<p>a) Investigate Lock and Key management - looking at cyber key (will allow access and permissions)</p> <p>b) Develop Lock and Key management plan</p> <p>c) Implement lock and key management solutions project</p>	<p>a) Addressed as part of CISUP project</p> <p>b) Addressed as part of CISUP project</p> <p>c) Addressed as part of CISUP project</p>	Water Business	PL - Water Asset Management	CISUP Project Director (Lee B)	Mar-20	Dec-21	Dec-21	60%	Complete
3.11.	1	E3: Preventive Measures for Drinking Water Quality		IA				NC		<p>Preventive Measure and Multiple Barriers - Evaluate alternative or additional preventive measures where improvement is required.</p> <p>Backflow Prevention - Internal Audit identified LWIA and operations appear not to be following the Plumbing Act requirements (requirements for maintaining a register). Testable backflow prevention devices were sighted with out of date tags.</p>	<p>1. Plumbing and Operations review and update list of LCC BFDs. completed ✓</p> <p>2. Operations confirm with contractor status of BFDs currently listed as out of date completed ✓</p> <p>3. Development of a new BFD management procedure - ensures testing is undertaken and recorded annually.</p> <p>4. Development of procedure to confirm new BFDs installed by Capital Delivery partners on behalf of LCC meet regulatory plumbing - ensures registration of new pump stations prior to operation.</p>	<p>3. Development of BFD management procedure underway:</p> <ul style="list-style-type: none"> * Mex to be updated with BFD info * RPZs organised in maintenance 'runs' and maintained according to these runs. * All BFDs now up to date with their maintenance requirements <p>4. Procedure referenced above to include section on receipt of BFDs from Capital Delivery partners and migration onto ongoing maintenance list</p>	Water Operations	PL - Network Operations	Mechanical Maintenance Supervisor	Mar-20	Jun-20	Aug-20	90%	ON TRACK

Item No.	Priority	DWQMP Section	Risk Source				Risk Reference	Water Supply Act Guideline BP - Best Practise	ISSUES / RISKS	KEY ACTIONS	CURRENT STATUS	BRANCH	OWNER	LEAD	START DATE	TARGET DATE	REVISED TARGET DATE	% COMPLETE	STATUS
			RA	IA	EA	II													
3.12.	3	E3: Preventive Measures for Drinking Water Quality		IA					<p>Preventive Measure and Multiple Barriers - Evaluate alternative or additional preventive measures where improvement is required.</p> <p>Document preventative measures and Strategies into a plan addressing each significant risk - Internal Audit identified that the RMIP is dated with most items complete from previous risk assessment.</p>	<p>a) Investigate appropriate review process for RMIP b) Develop RMIP management plan (dashboard and review management plan) c) Implement RMIP management plan The risk items should be reassessed to ensure that the effectiveness of the completed actions is captured.</p>	<p>a) Investigate Completed b) Develop Completed c) Implement - Procedure/workflow to review and update RMIP (DWQ) has now been implemented</p>	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Mar-20	Jun-20	Aug-20	100%	COMPLETE
3.13.	2	E3: Preventive Measures for Drinking Water Quality		IA					<p>Preventive Measure and Multiple Barriers - Critical Control Points</p> <p>Establish mechanisms for operational control - Operational philosophy of the CCPs is not currently consistent across sites. Recommend a clearer articulation as to when applicable e.g. offline.</p>	<p>a) Investigate requirements for operation and maintenance manuals for WQS. b) Develop O & M manuals c) Implement O & M manuals</p>	<p>a) Investigate completed b) Develop ongoing - Operations and Maintenance manuals developed and are in draft for Woodhill. Stakeholder review finalised. c) Implement Woodhill almost ready and then implementation phase and test. Needs to run for a while for maintenance tasks and also over summer. Then others can be developed and implemented as per</p>	Water Operations	PL - Network Operations	Team Leader Operations Water Quality	Mar-20	Jan-21	Jan-21	60%	ON TRACK
3.14.	2	E3: Preventive Measures for Drinking Water Quality		IA					<p>Preventive Measure and Multiple Barriers - Reservoir inspections.</p> <p>Is reservoir integrity appropriate for the level of risk?</p>	<p>a) Investigate reservoir integrity review and training requirements including a 3 year period review. b) Develop Reservoir Integrity review and training package c) Implement training package and consider findings of reservoir integrity package - Conduct reservoir integrity training, standardise reservoir inspections and implement consistent reservoir inspection program</p>	<p>Reservoir integrity training delivered Reservoir inspections performed by WOPs personnel are consistent. External providers also trained (Aerial drone solutions) - more evidence of consistent inspections.</p>	Water Operations	PL - Network Operations	Team Leader Operations Water Quality	Mar-20	TBC	Jun-22	30%	ON TRACK
3.15.	1	E3: Preventive Measures for Drinking Water Quality		IA					<p>Preventive Measure and Multiple Barriers - Reservoir inspections.</p> <p>Mt Warren Park - The fence integrity is compromised. Evidence has been provided demonstrated there have been trespassers on site, with some access to the reservoir roof.</p>	<p>a) Investigate a reservoir security management system across all reservoirs b) Develop a reservoir security management system across all reservoirs c) Implement a reservoir security management system across all reservoirs</p>	<p>Further review included "key improvements" to WOPs such as improved valve isolation identification processes, hygiene practises and equipment disinfection, incorporating 5xCs philosophy. Changes communicated via toolbox meetings.</p>	Water Business	PL - Water Asset Management	CISUP Project Director (Lee B)	Mar-20	TBC		100%	COMPLETE
3.16.	2	E3: Preventive Measures for Drinking Water Quality		IA					<p>Preventive Measure and Multiple Barriers - Reservoir inspections.</p> <p>Springwood High - The reservoir is externally in good condition, however there is a large tree root under one side of the reservoir, near the largest tree (off site). A number of plugs are missing or coming out. Tree was a wet spot identified near the drain that needs to be monitored to determine if there is a leak. Centre box gutter in good condition, however not certain that there are foam inserts under the ridges.</p>	<p>a) Investigate Reservoir renewal activities to address issues identified, for Springwood High to monitor leak b) Develop items to be added to the renewal works project c) Implement undertake items required to address issues as part of the renewal project. Include items in ongoing reservoir inspections</p>	<p>a) Investigate Reservoir renewal team addressed the leak issues b) Develop Ongoing reservoir inspections will monitor for the leaks c) Implement Leak is being repaired at the moment (June-July 2020).</p>	Water Operations	PL - Network Operations	Mechanical Maintenance Supervisor	Mar-20	Jun-20	Jun-20	95%	ON TRACK
3.17.	3	E3: Preventive Measures for Drinking Water Quality		IA					<p>Preventive Measure and Multiple Barriers - Reservoir inspections.</p> <p>Illaweena Reservoirs - Clear from design features that vermin proofing is key design criteria. However, there were some gaps under the roof of Illaweena 1 & 2. Also identified that the electrician potentially compromised integrity by running cables internally (in and up through), rather than external to the reservoir. Although cable sealed, it was unnecessary to run cabling this way.</p>	<p>a) Investigate adding item to the 'Reservoir Design Philosophy' b) Develop procedures to implement in Electrical and Telemetry group c) Implement procedures and provide electricians with Hy5 training and additional information (completed)</p>	<p>a) To be added during next review of Reservoir Design philosophy b) Hy5 training completed by LCC Network Operations electricians c) Online Water Quality Awareness module to address</p>	Water Operations	PL - Network Operations	Electrical and Telemetry Coordinator	Mar-20	Sep-20	Sep-20	80%	ON TRACK
3.18.	1	E3: Preventive Measures for Drinking Water Quality	RA						<p>Inadvertent reservoir contamination incident (except for Springwood Low - which has 'controlled' public access to the roof) via authorised access (including Telco's). This can be caused by damage to the roof of reservoirs, allowing ingress.</p>	<p>1. Review lease agreement with third party to ensure it covers any damage occurring from a result of any work undertaken and subsequent actions and communications required. 2. QLD Water Directorate developed standard approach for access protocol. Work towards fully implementing - incorporate into Critical Infrastructure Plan. 3. Ensure no 3rd parties have access to leaks. Taken out of this item and placed in RMIP Item 2.3 4. Investigate separate pole for telecoms equipment. 5. Require induction/contractor training prior to access. 6. Require Aqua card to undertake work on infrastructure.</p>	<p>1. Currently recommendation is before Executive to close public access to Springwood Low reservoir. This is currently closed to the public. Ongoing works to be performed to the Springwood Low reservoir complex. 2. Access protocol work is ongoing. 4. Separate poles are included at some reservoirs now. Individual reservoirs are assessed for ability to remove telecoms equipment 5. Hy5 training has been completed for many contractors (Dec 2019), and online training is available.</p>	Water Business	PL - Water Asset Management	TBA		Dec-21	Dec-21	80%	ON TRACK

Item No.	Priority	DWQMP Section	Risk Source				Risk Reference	Water Supply Act Guideline BP Practise	ISSUES / RISKS	KEY ACTIONS	CURRENT STATUS	BRANCH	OWNER	LEAD	START DATE	TARGET DATE	REVISED TARGET DATE	% COMPLETE	STATUS
			RA	IA	EA	GI													
3.19.	3	E3: Preventive Measures for Drinking Water Quality	RA					Unusual raw water quality in Mt Crosby catchment (Locker catchment) due to high flow or unforeseen circumstances - THMs	1. Critical customer GIS layer, split by criticality. (WAM) 2. Investigate updates to the Operational Protocol to formally proceduralise how THM increases detected in monitoring are communicated to Seqwater. (WOPs)	1. As per item 8.2 (closed in this item) 2. Not started. Once completed, the recommendation to be given to Rally for next Operational protocol review and update	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jun-20	Jun-21	Dec-20	90%	ON TRACK	
3.20.	3	E3: Preventive Measures for Drinking Water Quality	RA					Algal blooms in Seqwater catchments/Taste and Odour complaints	a) Investigate updates to the Operational Protocol to formally proceduralise how increases in reported taste and odour complaints are communicated to Seqwater. b) Develop THM communications triggers to send to Seqwater c) Implement THM comms triggers in next review of the Operations Protocol	Not started. Once completed, the recommendation to be given to Rally for next Operational protocol review and update	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jun-20	Jun-21	Dec-20	10%	ON TRACK	
3.21.	3	E3: Preventive Measures for Drinking Water Quality	RA					Chambers Flat and Gramzow Rd chlorination break-point - taste and odour	a) Investigate updates to the Operational Protocol to formally proceduralise how increases in reported taste and odour complaints are communicated to Seqwater. b) Develop Taste and Odour communications triggers to send to Seqwater c) Implement Taste and Odour comms triggers in next review of the Operations Protocol	Not started. Once completed, the recommendation to be given to Rally for next Operational protocol review and update	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jun-20	Jun-21	Dec-20	10%	ON TRACK	
3.23	1	E3: Preventive Measures for Drinking Water Quality	RA					Protozoan contamination from ingress into the Springwood Low reservoir (currently public access to roof)	a) Investigate options to prevent public access to the roof of Springwood Low reservoir b) Develop plan to prevent public access to the roof c) Implement reservoir renewal works to address sealing issues at Springwood Low reservoir complex and also to prevent public access to the roof	a) and b) Proposal currently before Council executive to close public access to Springwood Low. The proposal for complete prevention of access was denied. Instead, repair works are to be undertaken by Council to maintain the integrity of the reservoir and protect Public Health. c) Sealing works to be scheduled in the as part of the reservoir renewal works. To be completed in 2021	Water Business	PL - Water Asset Management	TBA	Mar-20	Jan-21	Jan-21	50%	ON TRACK	
3.24	2	E3: Preventive Measures for Drinking Water Quality		IA				Protozoan contamination from ingress into the Bluff Road reservoir (currently public access to roof)	1. Develop roof rain testing procedure 2. Test Bluff Road Roof	1. Completed 2. Completed	Water Business	PL - Water Asset Management	TBA	Oct-19	Aug-20	Aug-20	100%	COMPLETE	
3.25.	2	E3: Preventive Measures for Drinking Water Quality		IA				Evaluate alternative or additional preventive measures where improvement is required.	1. Review and update IOP process to incorporate risk assessment for Critical Customers 2. Create and implement a GIS layer of critical customers which is regularly reviewed and updated.	1. Risk Assessment requirements for Water Interruptions memo has been completed. Risk assessment process now implemented into IOP. (completed) DM#13310191 2. Customer GIS layer is available for use via CityMaps web. The new layer should be available as a corporate GIS layer in June 2020 (ongoing - refer action 6.4)	Water Operations	PL - Network Operations	Network Operations Supervisor	Oct-19	Jun-20	Jun-20	100%	COMPLETE	
3.26.	1	E3: Preventive Measures for Drinking Water Quality					GI	Unauthorised access to Razorback reservoir	a) Investigate additional capital works onsite to enhance security (possible CCTV, reinforced security around hatch, gates and stairwell cage). b) Develop plan to install additional security items c) Implement/install items as per plan	CISUP - covers the enhanced security, prevention items have been implemented. Ongoing reservoir security issues are addressed under CISUP plan (RMIP item 2.3)	Water Operations	PL - Network Operations	Mechanical Maintenance Supervisor	Dec-20	Jul-20	Jul-20	100%	COMPLETE	
3.27.	2	E3: Preventive Measures for Drinking Water Quality	RA	IA	EA			Internal audit identified that not all CCPs are easily visible on SCADA system to confirm limits. CCP limits are hard coded. Inconsistency of CCP SCADA limits vs CCP chart limits. Consistent review is required to confirm CCPs are effective	a) Investigate appropriate CCP review workshop process. b) Develop CCP review workshop process c) Implement CCP review workshop process	a) Ongoing b) Ongoing c) Ongoing	Water Operations	PL - Network Operations	Team Leader Operations Water Quality	Jun-20	Dec-20	Dec-20	40%	ON TRACK	
4.1.	1	E4: Operational Procedures and Process Control					GI	Poor residual disinfection in Marsden and Greenbank water supply zones during Summer periods. LWA 90-12-97 Network Water Quality Maintenance Strategy. Once implemented, review effectiveness.	Breakpoint chlorination systems to be instigated at Illaweenah & Greenbank Reservoirs - Marsden/Greenbank Water Supply Zone (WSZ) Disinfection Maintenance Program.	Initial review indicated that routine Network Disinfection Program provided a 50-75% reduction in dirty water customer complaints indicating, generally, greater effectiveness than routine flushing.	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jun-15	Dec-17	Jun-17	100%	COMPLETE	
4.2.	2	E4: Operational Procedures and Process Control	RA					Risk Assessment: No formal potable water hygiene practises WOP exists.	Review & potentially develop formal Potable Water Hygiene Practises WOP and incorporate into future inductions and sign off (Staff & Contractors).	Hygiene practises incorporated into WOP as part of document review process to align with 5xC's philosophy - completed ✓	Water Business	PL - Network Operations	Senior Water Operations Coordinator	Jul-16	Jun-17	Jun-17	100%	COMPLETE	
4.3.	2	E4: Operational Procedures and Process Control	RA					Risk Assessment: No formal potable water hygiene practises WOP exists.	Review & potentially develop formal Potable Water Hygiene Practises WOP and incorporate into future inductions and sign off (Staff & Contractors).	Develop awareness training material and implement hygiene practises training to align with 5xC's philosophy - completed ✓ Implement with the mains break "hands-on" training Ref. 4.03b.	Water Operations	PL - Network Operations	Senior Water Operations Coordinator	Jul-16	Dec-18	Jun-18	100%	COMPLETE	

Item No.	Priority	DWQMP Section	Risk Source				Risk Reference	Water Supply Act Guideline BP - Best Practise	ISSUES / RISKS	KEY ACTIONS	CURRENT STATUS	BRANCH	OWNER	LEAD	START DATE	TARGET DATE	REVISED TARGET DATE	% COMPLETE	STATUS
			RA	IA	EA	GI													
4.4.	1	E4: Operational Procedures and Process Control	RA				NC Net 4.1	3.9.2	Risk Assessment: Need to confirm what flushing system is used when main has been not used for some time and can result in <i>E.coli</i> incident if not effectively implemented.	Undertake further WOP review in light of incident & internal audit findings: a). Flushing & Scouring of mains; b). Mains Repairs; and c). Minor Works (incl. Sampling Taps).	Further review included "key improvements" to WOPs such as improved valve isolation identification processes, hygiene practises and equipment disinfection, incorporating 5xCs philosophy. Changes communicated via toolbox meetings.	Water Operations	PL - Network Operations	Senior Water Operations Coordinator	Jun-15	Mar-17	Mar-17	100%	COMPLETE
4.5.	2	E4: Operational Procedures and Process Control	RA	IA			NC Net 4.1	3.9.2	Risk Assessment & Audit: Need to confirm what flushing system is used when main has been not used for some time, or not effectively disinfected during mains repairs or reporting of significant events, and can result in <i>E.coli</i> incident if not effectively implemented.	Develop and implement "on-the-job" training for the following WOPs to ensure effective implementation: a). Flushing & Scouring of mains; b). Mains Repairs; and c). Minor Works (incl. Sampling Taps). d). Reporting of 'Events' that could impact customers health.	a). WOPs updated & tool box meetings undertaken regarding revised WOPs - completed ✓ b). "On-the-job" training material developed & trailed with supervisors - completed Aug'18 ✓ c). Implementation of "on-the-job" training to be rolled-out during 2018/19FY - completed May'19 ✓	Water Operations	PL - Network Operations	Senior Water Operations Coordinator	Jul-16	Dec-18	May-19	100%	COMPLETE
4.6.	2	E4: Operational Procedures and Process Control	RA	IA			NC Net 4.1	3.9.2	Risk Assessment & Audit: Need to confirm what flushing system is used when main has been not used for some time, or not effectively disinfected during mains repairs or reporting of significant events, and can result in <i>E.coli</i> incident if not effectively implemented.	a) Investigate Aquacard and hygienic works practices requirements b) Develop refresher training for Hy5 - internal staff and contractors - including online training c) Implement all training packages across the business	a) Investigate: Completed Scope of works being developed for an online training module in FY2019/20 b) Develop: Completed Hy5/Aquacard training to be delivered to all relevant personnel and contractors by December 2019 c) Develop: Completed launched refresher training online training module and upload onto the training system during September 2020. Implementing in accordance with implementation plan	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jul-16	Jun-20	Nov-20	100%	COMPLETE
4.7.	1	E4: Operational Procedures and Process Control	RA				NC Net 4.3	3.9.2	Risk Assessment: Need to confirm what flushing system is used when mains has been not used for some time and can result in <i>E.coli</i> incident if not effectively implemented.	Undertake further WOP review in light of incident: a). Recommissioning assets such as mains that have been out of service for a period (> 4 weeks), including both planned and 'hot standby' due to emergency re-instatement. Includes Flushing & Scouring of mains that have been offline for some time. b). Recommissioning reservoirs that have been out of service for a period (> 4 weeks), including both planned and 'hot standby' due to emergency re-instatement.	a). Recommissioning assets such as mains that have been out of service for a period (> 4 weeks) - under final review. b). Recommissioning reservoirs that have been out of service for a period (> 4 weeks) - under final review. c) WOP is due to be reviewed and updated. New testing menu developed by the lab allow easier testing for recommissioned reservoirs (this has been implemented)	Water Operations	PL - Network Operations	Senior Water Operations Coordinator	Jun-15	Jun-17	Dec-19	90%	MONITOR
4.8.	2	E4: Operational Procedures and Process Control	RA	IA			NC Net 4.3	3.9.2	Internal audit identified that routine flushing ceased 2014 post Marsden/Greenbank Disinfection project. This was a preventative measure in the previous Risk Assessment hence needs review. Additionally, with network changes since 2012 a review is warranted to identify changed/new hot spots.	Finalise analysis to help develop an appropriate flushing program for hot spots.	Initial analysis, post network disinfection cleans, identified hot spots which continued to experience dirty water complaints, noting a 50-75% reduction in dirty water complaints post network cleans. Flushing program implemented based on known problem areas. Completed May'19 ✓. <i>Investigate technologies available (refer to 4.05c).</i>	Water Operations	PL - Network Operations	Senior Water Operations Coordinator	Jun-15	Jun-19	Jun-19	100%	COMPLETE
4.9.	2	E4: Operational Procedures and Process Control	RA	IA			NC Net 4.3	3.9.2	Internal audit identified that routine flushing ceased 2014 post Marsden/Greenbank Disinfection project. This was a preventative measure in the previous Risk Assessment hence needs review. Additionally, with network changes since 2012 a review is warranted to identify changed/new hot spots.	a) Investigate framework to ensure drinking water infrastructure (e.g. Investigate other technologies available for maintaining clean networks). b) Develop framework to ensure drinking water infrastructure (e.g. Investigate other technologies available for maintaining clean networks). c) Implement framework	NEW Task brief developed & approved "Healthy Networks Strategy"	Water Business	PL - Water Product Quality	Asset Strategy Lead	Jun-15	Jun-19	Feb-20	70%	ON TRACK
4.10.	1	E4: Operational Procedures and Process Control		IA			NC	3.9.3	There have been a number of non-conformances relating to re-instatement of sampling taps which have either been newly installed or been out of service for some time. Also refer to Items 4.4, 4.5, 4.6, 4.7 & 4.13 which are related.	Review Verification Sampling Tap installation & repair WOP to ensure disinfection of all parts and best practise Tap design, to minimise contamination risks.	Tap installation process including disinfection of parts, incorporated into Minor Works WOP, to ensure no accidental contamination of parts Ref 4.03. completed ✓	Water Operations	PL - Network Operations	Senior Water Operations Coordinator	Jul-16	Jun-17	Jun-17	100%	COMPLETE
4.11.	1	E4: Operational Procedures and Process Control		IA			NC	3.9.3	There have been a number of non-conformances relating to re-instatement of sampling taps which have either been newly installed or been out of service for some time. Also refer to Items 4.4, 4.5, 4.6, 4.7 & 4.13 which are related.	Review Verification Sampling Tap installation & repair WOP to ensure disinfection of all parts and best practise Tap design, to minimise contamination risks.	Investigated best practise Verification Sampling Tap design which is to be incorporated into 2017/18FY CAPEX completed ✓	Water Operations	PL - Network Operations	Senior Water Operations Coordinator	Jul-16	Jun-17	Jun-17	100%	COMPLETE
4.12.	3	E4: Operational Procedures and Process Control		IA			NC	3.9.3	There have been a number of non-conformances relating to re-instatement of sampling taps which have either been newly installed or been out of service for some time. Also refer to Items 4.4, 4.5, 4.6, 4.7 & 4.13 which are related.	Submit CAPEX 2017/18FY Plan for new sampling tap and ensure design to fabricate and install for 2017/18FY.	a). CAPEX submitted - completed ✓ b). Installation commenced 2017/18FY with completion expected 2018/19FY- completed ✓	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jul-16	Jun-18	Jun-19	100%	COMPLETE

Item No.	Priority	DWQMP Section	Risk Source				Risk Reference	Water Supply Act Guideline BP - Best Practise	ISSUES / RISKS	KEY ACTIONS	CURRENT STATUS	BRANCH	OWNER	LEAD	START DATE	TARGET DATE	REVISED TARGET DATE	% COMPLETE	STATUS	
			RA Risk Assessment	IA Internal Audit	EA External Audit	II Incident Investigation														GI General Improvement
4.13.	2	E4: Operational Procedures and Process Control		IA	EA			NC Ext Audit (6)	3.9.3	Internal audit identified slow response to alert Water Operations &/or WPQ of unusually high turbidity &/or metals, delaying prompt response to address unexpected events. External audit found inadequate timely reporting of <i>E.coli</i> health exceedance to key internal stakeholders. Ref Item 4.14 - linked.	a) Review & update procedures to ensure prompt reporting of health exceedance to key internal stakeholders. b) Improve response time from Verification Monitoring to promptly inform Water Operations &/or WPQ of "unusual results" for "lead indicators" such as high turbidity, colour, pH or key metals.	a) Completed Lab systems & procedures updated to ensure prompt reporting of 'health' exceedances and unusual sampling observations (addressed Ext Audit (6)) b) Completed - Internal limits implemented at the lab aligned with DM#12929898 DW Corrective Action procedure. Implementation of Aquantify will automate this 'alert' process in the event of internal limit breaches (This action is closed here and refer RMIP item 2.6 for Aquantify actions) Notification automation to initiated with WQ IMS implementation (Ref. 11.00).	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jul-16	Dec-17	Jun-20	100%	COMPLETE
4.14.	1	E4: Operational Procedures and Process Control		IA				NC	3.9.3	There have been two non-conformances relating to re-instatement of sampling taps which have either been newly installed or been out of service for some time. Also refer to Items 4.4, 4.5, 4.6, 4.7 & 4.13 which are related.	Investigate formalised drinking water sampling NATA accreditation, currently undertaken by NATA accredited laboratory to ensure consistency & key observations reported.	Sampling proposal submitted to NATA approved.	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jul-16	Dec-17	Dec-17	100%	COMPLETE
4.15.	2	E4: Operational Procedures and Process Control	RA					Net 4.4	3.9.2	2012RMIP (G6) Residual project from Alconnex period where existing properties were mainly located in Gold Coast areas. 2012RMIP (G6) To reduce the risk of contamination from properties without backflow prevention devices.	Investigate if project still required. Undertake project to identify the un-metered properties & install a meter with backflow prevention (ongoing project).	All new properties require backflow prevention and there is a regulatory requirement for commercial operations. All new properties are now metered with compliant backflow prevention - completed ✓ Post 2015 amalgamation	Water Operations	PL - Network Operations	Mechanical Maintenance Supervisor	Jan-12	Jun-14	Jun-18	100%	COMPLETE
4.16.	2	E4: Operational Procedures and Process Control				GI		5.2 (G)	3.10.1	No clear operational monitoring program currently in place. Develop and show how to link to corrective actions by operations. Also relate to SCADA. Informal operational monitoring occurs as part of the Lab's routine Verification Monitoring program (i.e. HPC, etc.) and ad hoc SCADA trend reviews.	Establish Process Improvement team to commence review of medium/long term trends & identify opportunities for improvements. Investigate an integrated Water Information Quality Management System with links to other systems (i.e. LIMS, SCADA, field data, etc.) to enable effective long term trends.	a).CCP & OCP reviewed with associated WOP to be developed and implemented. Action moved to refer to Item 3.05 & 4.25. b). Implementation will be assisted with the development of Water Quality Information Management System () which requires development and implementation Action moved to refer to Item 3.05, 4.25 & 11. Pending implementation (Ref. 11.00) and Tech1 (SAMMS project)	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jun-15	Jun-18	Jun-19	100%	COMPLETE
4.17.	3	E4: Operational Procedures and Process Control				GI		5.2 (G)	3.9.3	TBA	Establish effective drinking water Corrective Action system with associated responsibilities and WOP to be developed. Consider implementation process across all 3 Water Branches required.	Drinking water health incidents currently managed via IMP, with reporting to Regulator and long term actions captured via RMIP ✓ Intelex recently implemented for WH&S incidents ✓ Commenced development of Intelex Audit tool however delays due to provider Gabba ceased operations. Investigator new provider. Audit module completed Intelex system investigated as best tool for Corrective Actions , including drinking water near miss incidents, to allow for communication trail & status reporting. Investigate corporate support required Ref #12.00b	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jan-17	Dec-17	TBC	100%	COMPLETE

Item No.	Priority	DWQMP Section	Risk Source				Risk Reference	Water Supply Act Guideline BP Best Practise	ISSUES / RISKS	KEY ACTIONS	CURRENT STATUS	BRANCH	OWNER	LEAD	START DATE	TARGET DATE	REVISED TARGET DATE	% COMPLETE	STATUS
			RA	IA	EA	GI													
4.18.	2	E4: Operational Procedures and Process Control	RA	IA			Res 1.5, 1.6 & 1.7	3.9.2	Internal Audit (2013) - large gaps and dirt close to vent holes found at reservoir. Gaps were repaired.	Long Term: Develop and implement Reservoir Inspection training to operational staff. Investigate on-going refresher training.	Water Quality Distribution training workshop delivered by QLD Water Directorate, including reservoir inspections - Jul'15 ✓ "on-the-job" reservoir inspection training undertaken - Nov'16 ✓ Formalised reservoir inspection training undertaken - Apr'19 ✓. Investigate Reservoir Inspection "refresher" training for 2019/20FY .	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	May-13	Dec-17	Jun-20	100%	COMPLETE
4.19.	1	E4: Operational Procedures and Process Control	RA				NC Res 1.5, 1.6 & 1.7 Res 4.4	3.9.2	<i>E.coli</i> incidents were a result of poor reservoir condition & design with low chlorine residual .	RESERVOIRS Trial chlorine tablets as safer alternative to liquid hypochlorite dosing to maintain chlorine residual for smaller reservoirs (short term). Also investigate other alternatives (see Item 4.24).	Chlorine tablet trial completed with findings indicating effective for smaller reservoirs, though increased monitoring required if no online system exists.	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jul-16	Dec-16	Mar-17	100%	COMPLETE
4.20.	1	E4: Operational Procedures and Process Control	RA	IA			NC Dis 4.1, 4.2 & 4.3	3.9.2	Internal audit review highlighted improvements required in the process to evaluate the quality of chemicals & products supplied (i.e. hypochlorite) to ensure AS4020 compliance, suitable for use in drinking water.	a) Develop new hypochlorite WOP for procurement, which includes quality criteria.	Testing for salt impurities was undertaken as part of Round Mt dosing facility commissioning (salt chlorinator). Draft completed with sign-off required.	Water Operations	PL - Network Operations	Senior Water Operations Coordinator	Jul-16	Jun-18	Dec-19	100%	COMPLETE
4.21.	2	E4: Operational Procedures and Process Control	RA	IA			NC Dis 4.1, 4.2 & 4.3		Internal audit review highlighted improvements required in the process to evaluate the quality of chemicals & products supplied (i.e. hypochlorite) to ensure AS4020 compliance, suitable for use in drinking water.	a) Investigate requirements for hypochlorite procedure b) Develop hypochlorite procedure c) Implement new hypochlorite WOP for procurement, which includes quality criteria.	Procedure developed (WOP- How we order when we order and how we take deliver. Currently under review and adding SWMS to it.	Water Operations	PL - Network Operations	Team Leader Operations Water Quality	Jul-16	Jun-18	Jun-19	95%	COMPLETE
4.22.	2	E4: Operational Procedures and Process Control	RA				NC Res 1.5 & 1.6		<i>E.coli</i> incident was a result of poor reservoir condition & design with low chlorine residual.	a) Investigate Best Practice design requirements b) Develop Reservoir design philosophy c) Implement Reservoir design philosophy via the CAPEX Asset Renewals Program Reservoir renewals program (roof, hatches, ingress prevention).	Capital Works Asset Renewals Program (subject to funding to Yr2022) - Mt Warren Park, Woodhill, Greenbank & Wuraga elevated roof replacement (2017-2019FY) - completed ✓ Kimberley Park elevated, Illaweena, Springwood High & Bluff Rd completed 2019/20FY .	Water Business	PL - Water Asset Management	PL - Water Asset Management	Jul-16	Jun-22	Jun-22	90%	ON TRACK
4.23.	2	E4: Operational Procedures and Process Control	RA				NC Res 1.6 Res 4.4 Dis 12.1 & 12.2	3.9.2	<i>E.coli</i> incident was a result of poor reservoir condition & design with low chlorine residual .	Chlorine tablets were trialled however deemed only effective for small reservoirs. Auto dosing system required.	Designed, built and installed new dosing system at Hideaway Mt reservoir. Completed ✓	Water Operations	PL - Network Operations	Senior Water Operations Coordinator	Jul-16	Jun-17	Jun-17	100%	COMPLETE
4.24.	2	E4: Operational Procedures and Process Control	RA	IA	EA		NC DIS 3.1 DIS 5.5 Ext Audit (2,3)	3.9.2	No clear operational monitoring program currently in place. Develop and show how to link to corrective actions by operations. Also relate to SCADA. Informal operational monitoring occurs as part of the Lab's routine Verification Monitoring program (i.e. HPC, etc.) and ad hoc SCADA trend reviews. Internal audit identified that not all CCPs are easily visible on SCADA system to confirm limits. CCP limits are hard coded. Inconsistency of CCP SCADA limits vs CCP chart limits.	a) Develop formal operational monitoring with training in CCPs and also use of Water Information Management System (WIMS). b) Develop function specifications of all existing dosing systems and develop associated R&M and operational manuals and system to ensure currency. Also develop monitoring procedures within Network Maintenance team c) Implement both O & M manuals and procedures throughout team	a) CCP internal training of on-call personnel has taken place. Aquantify training of some operations personnel has occurred b) O & M manual project due for completion in September 2020 c) To be implemented by December 2020 (Woodhill WDF only - then rolled out to rest following successful summer trial)	Water Operations	PL - Network Operations	Team Leader Operations Water Quality	Jun-19	Dec-20	Dec-20	70%	ON TRACK
4.25.	2	E4: Operational Procedures and Process Control	RA	IA	EA		NC DIS 3.1 DIS 5.5 Ext Audit (2,3)	3.9.2	No clear operational monitoring program currently in place. Develop and show how to link to corrective actions by operations. Also relate to SCADA. Internal audit identified that not all CCPs are easily visible on SCADA system to confirm limits. CCP limits are hard coded. Inconsistency of CCP SCADA limits vs CCP chart limits.	Implement procedures associated with R&M and operational manuals. Update role statements for personnel who monitor network to include monitoring and implementation CCP for water dosing facilities	NEW Implementation to commence once #4.25a completed.	Water Operations	PL - Network Operations	Senior Water Operations Coordinator	Jun-19	Jul-21	Jul-21	0%	NOT STARTED
4.26.	2	E4: Operational Procedures and Process Control				GI	G		Operational Procedures and Process Control - Operational procedures Document all procedures and compile into an operations manual - The intent of this criteria is met with site specific WOPs. However, some of the WOPs are outdated - e.g. customer service requests and completion of WWETT forms appear to be outdated as SAMMS has now replaced WWETT. WOP 216 is a 2015 version and could also be updated to include trigger for recalibration. The need to keep SOPs up to date is the reason for OFI.	a) Investigate document control system which covers Water Operations procedures needs to be defined with responsibilities assigned for document update. b) Develop process to confirm Water Operations documents are reviewed and updated to meet review cycle requirements c) Implement review system	a) Investigate Currently Water Grid and Operations Support Coordinator manages Written Direction for WOPs via spreadsheet: DM#8414293. An interim process on Sharepoint also exists for Loganwater documents, managed by Quality Management System Team in Water Business. b) Develop Water Grid and Operations Support Coordinator to develop procedure to document the Written Direction register management and associated processes (i.e. document how you manage the register). Sharepoint option has been developed and is being implemented. c) Implement procedure	Water Operations	Water Grid and Operations Support Coordinator	Water Grid and Operations Support Coordinator	Mar-20	Dec-20	Dec-20	40%	ON TRACK

Item No.	Priority	DWQMP Section	Risk Source				Risk Reference	Water Supply Act Guideline BP Best Practise	ISSUES / RISKS	KEY ACTIONS	CURRENT STATUS	BRANCH	OWNER	LEAD	START DATE	TARGET DATE	REVISED TARGET DATE	% COMPLETE	STATUS
			RA	IA	EA	GI													
4.27.	3	E4: Operational Procedures and Process Control					GI	G	Operational Procedures and Process Control - Operational procedures Are there sufficient effective SOPs to support work orders? - As above - calibration of instruments is based on the operator to determine the appropriate level for recalibration rather than an explicit statement. It was stated that recalibration is triggered at somewhere between 0.2 and 0.3 mg/L. This is a large variance in comparison to wider industry expectations.	a) Investigate recalibration trigger limits for chlorine meters used within Network Operations WQ team and if they are aligned with best practice requirements. Investigate key training required and ensure appropriately resourced and equipped . b) Develop a process for recalibration process for online chlorine monitoring equipment (LCC procedure) c) Implement procedure amongst the Network Operations team	a) WOP222 started - put on hold b) Started (80%) c) not started	Water Operations	PL - Network Operations	Team Leader Operations Water Quality	Mar-20	TBC	Dec-20	80%	ON TRACK
4.28.	3	E4: Operational Procedures and Process Control					GI	G	Operational Procedures and Process Control - Corrective action Establish and document procedures for corrective action to control excursions in operational parameters - Monthly review of work orders identified outstanding work orders. For key tasks, this frequency of review may be too long.	a) Investigate review process for Corrective Action (TL WQ corrective action emails - are they reviewed and how) 2) Develop review management system 3) Implement review management system	a) Develop a WOP procedure - how to conduct a CCP review parameters (WQ Operations procedure) b) Then update the CCP charts	Water Operations	PL - Network Operations	Team Leader Operations Water Quality	Mar-20	TBC	Jun-20	0%	NOT STARTED
4.29.	2	E4: Operational Procedures and Process Control					GI	G	Operational Procedures and Process Control - Corrective action Establish rapid communication systems to deal with unexpected events - There is a reliance on individuals to report and respond to issues. For example, the reservoir inspection may include recommended and required rectification actions, but the process for prioritisation requires supervisor review of returned paperwork and raising of a new job into MEX. SAMMS was described as having better capability for tracking subsequent jobs.	a) Investigate SAMMS has the capability to raise priority issues and initiate the appropriate response to reservoir inspection 'red flags' b) Develop these 'red flags' as for the inspection checklists c) Implement procedures amongst team who conduct inspections	a) BAU - recognise the criticality of the issue, training. At the moment still awaiting SAMMS (in the absence of release 6). If items are noticed during inspections and it can be fixed immediately, the inspections team will do so. Current system allows for mobility. Will allow it to escalate as a Pr1 job	Water Operations	PL - Network Operations	Mechanical Maintenance Supervisor	Mar-20	TBC	Jul-20	100%	COMPLETE
4.31.	2	E4: Operational Procedures and Process Control					GI	G	Operational Procedures and Process Control - Equipment capability and maintenance. Establish a program for regular inspection and maintenance of all equipment, including monitoring equipment - Network non return valves - Internal audit identified at Greenbank that there are RPZs that are not tested annually. This is further addressed below.	a) Investigate requirements for inspection and maintenance program b) Develop and document inspection and maintenance system c) Implement BFD inspection and maintenance system	This item is also related to the risk item 4.29. and risk item 3.11. This action is to be consolidated within those other two actions.	Water Operations	PL - Network Operations	Mechanical Maintenance Supervisor	Mar-20	TBC		0%	CONSOLIDATED & COMPLETED
4.32.	2	E4: Operational Procedures and Process Control					GI	G	Dirty water complaints and associated issues related to suspended matter or biofilm in pipes	a) Investigate requirements for an effective mains cleaning strategy b) Develop ongoing strategic mains cleaning strategy (including a flushing program). c) Implement ongoing mains cleaning strategy	Ongoing flushing occurs and is reviewed during the WQ fortnightly meeting. This activity will be improved upon by the Healthy Network project.	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Mar-20	TBC	Jun-20	80%	ON TRACK
4.33.	3	E4: Operational Procedures and Process Control	RA						Bacteria - Inadvertent closing/opening of connection to unused supply point	a) Investigate unused connections with other Water Service Providers b) Develop plan to remove unused connections with other WSPs c) Implement plan to remove unused connections with other WSPs	Part of the trunk main isolation and recharging procedure that Senior Operations Coordinator is working on Related to the mains commissioning and recommissioning procedure.	Water Operations	PL - Network Operations	Senior Water Operations Coordinator	TBA	TBC		0%	NOT STARTED
4.34.	2	E4: Operational Procedures and Process Control	RA						Bringing contaminated reservoir online/Bacteria	a) Investigate reservoir commissioning procedure requirements - review literature and other utility procedures b) Develop design, and distribute for review and confirm the procedure dealing with recommissioning of offline reservoirs c) Implement procedure amongst stakeholders	a) Investigate Commenced b) Develop Not commenced c) Implement Not commenced	Water Operations	PL - Network Operations	Senior Water Operations Coordinator	Jun-20	Dec-20	Dec-20	10%	ON TRACK

Item No.	Priority	DWQMP Section	Risk Source RA Risk Assessment IA Internal Audit EA External Audit II Incident Investigation GI General Improvement	Risk Reference Water Supply Act Guideline BP Best Practise	ISSUES / RISKS	KEY ACTIONS	CURRENT STATUS	BRANCH	OWNER	LEAD	START DATE	TARGET DATE	REVISED TARGET DATE	% COMPLETE	STATUS
4.35.	2	E4: Operational Procedures and Process Control	RA		Protozoan risk from backflow into network	<p>a) Investigate backflow prevention management strategy requirements - including monitoring</p> <p>b) Develop brief for development of a brief for online conductivity analyser review project</p> <p>c) Implement project findings as appropriate</p>	This project has been delayed until FY2021/22 budget	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jul-21	Dec-21	Dec-21	0%	NOT STARTED
4.36.	2	E4: Operational Procedures and Process Control	RA		Protozoan risk from backflow into network	<p>a) Investigate review tanker management program</p> <p>b) Develop improvement plan based on findings of review</p> <p>c) Implement improvement plan to improve tanker customer management system.</p> <p>Formerly - Review and implement procedure for auditing water carrier compliance with user permits (include confirmation of backflow prevention device on truck) Compliance monitoring of high-use hydrant controls - standard design of tanker supply sites</p>	<p>a) Investigate - gap analysis underway (reviewing of BF certifications, current training requirements, auditing and compliance program). This will inform future Standpipe/Tanker Customer Management System. In addition, and holistic review of service delivery to tanker standpipe is required.</p> <p>b) Develop - not commenced</p> <p>c) Implement - not commenced</p>	Water Business	PL - Customer Experience & Business Performance	Metering and Customer Connections Lead	Jun-20	TBC	<p>a) Implement - December 2020</p> <p>b) Develop - June 2020</p> <p>c) Implement - December 2020</p>	20%	ON TRACK
4.37.	1	E4: Operational Procedures and Process Control	RA		Fatigue of workforce leading to bacterial contamination (e.g. CDF alarm mismanagement)	<p>a) Investigate requirements for Alarm rationalisation project implementation</p> <p>b) Develop Alarm management review process as part of project</p> <p>c) Implement Alarm MGMT review system</p> <p>Also</p> <p>Investigate establishment of a dedicated Operations Centre (with dedicated telemetry team)</p>	<p>a) Implemented</p> <p>b) Develop Process occurs as part of the project, still be implemented as part of BAU (i.e. when project ceases and review activity becomes BAU).</p> <p>c) Implement transition from project MGMT review to BAU MGMT review will be addressed</p>	Water Operations	PL - Network Operations	Project Manager	Jul-20	Jul-21	Jul-21	100%	COMPLETE
4.38.	1	E4: Operational Procedures and Process Control	RA		Inadvertent reservoir contamination incident (excepting Springwood Low) via authorised access (including Telco's). This can be caused by damage to the roof of reservoirs, allowing ingress.	<p>a) Investigate plan to manage 3rd party reservoir access - Telcos, including induction and training (Aquacard)</p> <p>b) Develop plan</p> <p>c) Implement plan</p> <p>2. Online water quality analysers for all reservoirs. (taken out of this item and covered under RA item 4.43)</p>	<p>a) Investigate ongoing. We may be able to include online WQ training package for these contractors. WQ Coordinator to liaise with PL Asset MGMT Completed</p> <p>b) Develop Telco contractors have been directed to complete Aquacard training.</p> <p>c) Implement Aquacard training has been completed by Telco contractors.</p>	Water Business	PL - Water Asset Management	PL - Water Asset Management	Jun-20	Jul-21	Jul-21	100%	COMPLETE
4.39.	2	E4: Operational Procedures and Process Control	RA		Ingress causing bacterial contamination	<p>a) Investigate project to install online analysers at all reservoirs (CCPs and operational alarms)</p> <p>b) Develop project plan to install online analysers at all reservoirs (CCPs and operational alarms)</p> <p>c) Implement plan to install online analysers at all reservoirs (CCPs and operational alarms)</p>	<p>a) Investigate completed</p> <p>b) Develop Asset MGMT program Already got permission and approval for.</p> <p>c) Implement First two done. Project ongoing</p>	Water Operations	PL - Network Operations	Team Leader Operations Water Quality	Jul-20	Jul-21	Jul-21	30%	ON TRACK

Item No.	Priority	DWQMP Section	Risk Source				Risk Reference	Water Supply Act Guideline	Best Practise	ISSUES / RISKS	KEY ACTIONS	CURRENT STATUS	BRANCH	OWNER	LEAD	START DATE	TARGET DATE	REVISED TARGET DATE	% COMPLETE	STATUS
			RA	IA																
4.40.	2	E4: Operational Procedures and Process Control	RA	IA			Res 1.5, 1.6 & 1.7	3.9.2	Internal Audit (2013) - large gaps and dirt close to vent holes found at reservoir. Gaps were repaired. (THIS IS THE CONTINUATION FROM ITEM 4.18 (NOW COMPLETED))	a) Investigate options to perform 'reservoir inspection refresher training' b) Develop plan to perform refresher training c) Implement plan to perform ongoing refresher training	Investigate Reservoir Inspection "refresher" training for 2020/21FY.	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jun-20	Jun-21	Jun-21	0%	NOT STARTED	
4.41.	2	E4: Operational Procedures and Process Control	RA						Incorrect reading from instrumentation - leading to bacterial contamination	a) Implement removal of ChemScans from dosing equipment, not appropriate for purpose. b) Implement Procedures for calibration of instrumentation-taken out of this action and placed into item 4.27 c) Investigate system to track trends and predict issues (Takado). (Removed from this item and placed in 4.44) d) Investigate key training required and ensure appropriately resourced and equipped taken out of this action and placed into item 4.27	a) Implement this task is the responsibility of Water Operations - removed from this item b) Implement - task taken out of this item c) Investigate	Water Operations	PL - Network Operations	Team Leader Operations Water Quality	Jun-20	TBC	Jun-20	100%	CONSOLIDATED & COMPLETED	
4.42.	2	E4: Operational Procedures and Process Control		IA					Ensure that equipment performs adequately and provides sufficient flexibility and process control. External calibrations are scheduled externally every 6 months; internal checks either weekly or fortnightly. On site operational calibration was stated to be undertaken if the difference between online and handheld instruments is greater than 0.2 to 0.3 mg/L. This is not robust and potentially becomes an issue as the low and high alerts only require a response within 1 week. Analysers should be far more accurate than this otherwise the CCP is compromised. Priority is to visit dosing sites weekly, and analyser sites fortnightly. Analysers are watched, but not reacted to immediately - could be operated as OCPs.	1. Review and update calibration of analysers procedures to confirm they are more robust and address accuracy issues 2. Implement newly reviewed procedures with the WO WQ teams This item is closed and incorporated into item 4.27	TBA	Water Operations	PL - Network Operations	Team Leader Operations Water Quality		TBC		100%	COMPLETE	
4.43.	1	E4: Operational Procedures and Process Control							Inadvertent reservoir contamination incident (excepting Springwood Low) via authorised access (including Telco's). This can be caused by damage to the roof of reservoirs, allowing ingress.	a) Investigate identify and investigate those reservoirs which require online analysers b) Implement raise tasks for installation c) Implement install and incorporate in related systems and processes (e.g. those for maintenance, review and monitoring)	a) Investigate identify and investigate those reservoirs which require online analysers - ongoing b) Implement raise tasks for installation - ongoing c) Implement install and incorporate in related systems and processes (e.g. those for maintenance, review and monitoring) - ongoing	Water Operations	PL - Network Operations	Team Leader Operations Water Quality	Jun-20	TBC	Dec-21	90%	ON TRACK	
4.44.	2	E4: Operational Procedures and Process Control							Incorrect reading from instrumentation - leading to bacterial contamination	a) Investigate system used to calibrate instrumentation b) develop procedures to calibrate instruments c) Implement procedure Removed from item 4.41 and placed here)	a) Investigate system used to calibrate instrumentation b) develop procedures to calibrate instruments c) Implement procedure Removed from item 4.41 and placed here)	Water Operations	PL - Network Operations	Team Leader Operations Water Quality	Jun-20	TBC	Jun-20	100%	COMPLETE	
4.45	3	E4: Operational Procedures and Process Control				GI	5.2 (G)	3.9.3	Identify RMIP "none actions" which could impact the Business by RMIP annual review, which includes high risks, internal audit non-conformances and long term actions to address drinking water health incidents.	Establish effective drinking water Corrective Action system with associated responsibilities and WOP to be developed. Consider implementation process across all 3 Water Branches required.	a) Investigate - effective Corrective Actions Management system to manage actions on the RMIP and also incident actions and WQ improvement actions b) Develop MGMT system c) Implement MGMT system	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jan-17	Dec-21	Dec-21	70%	ON TRACK	

Item No.	Priority	DWQMP Section	Risk Source				Risk Reference	Water Supply Act Guideline BP Best Practise	ISSUES / RISKS	KEY ACTIONS	CURRENT STATUS	BRANCH	OWNER	LEAD	START DATE	TARGET DATE	REVISED TARGET DATE	% COMPLETE	STATUS
			RA	IA	EA	II	GI												
5.1.	3	E5: Verification of Drinking Water Quality					GI	6.2 (G) 6.4 (G)	Various "disjointed" customer complaint systems exist (i.e. pathways, WWETT, various CM database (emails/letters), etc.). Internal audit found incorrect Priority assignment to health related customer complaints in WWETT.	Short term: WWETT system developed to replace UMD. Long term: investigation is taking place to look at "one" Customer Relationship Management System (CRM) integrated with other systems such as SAMMS.	WWETT system implemented - completed ✓ Water Branch CRM system now to be investigated & developed as interim solution, until SAMMS implemented (limited by Corporate initiatives) - SAMMS Ref item 9.02. Delays as Council wide CRM system now being investigated hence Water Branch investigate interim solution such as Power-BI. Proposed development & implementation TBC Current status: active investigations on a customer data MGMT system. Loganwater 2025 project feedback project.	Water Business	PL - Customer Experience & Business Performance	PL - Customer Experience & Business Performance	Jun-15	Dec-17	Jun-25	30%	MONITOR
5.2.	1	E5: Verification of Drinking Water Quality	RA					Res 1.5 Res 1.6	Not all reservoirs are included in the Verification Monitoring Program hence no visibility of chlorine residual nor other parameters.	Incorporate all on-line reservoirs into the Verification Monitoring Program.	Completed	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jun-17	Jun-17	Jun-17	100%	COMPLETE
5.3.	3	E5: Verification of Drinking Water Quality					GI	TBA	Limited sampling parameters and limits of reporting can make diagnosis of incident causes difficult to determine	Investigate potential for a sensitive turbidity test reporting limit and use of field turbidity meters with 0.1 NTU resolution.	a) Laboratory team to investigate potential for a more sensitive turbidity reporting limit. Completed ✓ b) Purchase, train and implement operators on the use of field turbidity meters. Completed ✓	Water Product Quality	PL - Water Product Quality	Laboratory Technical Service and Business Lead	Mar-20	Dec-20		100%	COMPLETE
5.4.	2	E5: Verification of Drinking Water Quality					GI	G	Verification Drinking Water Quality - Consumer satisfaction Establish a consumer complaint and response program, including appropriate training of employees - Complaints process 90% through phone calls (tracking of customer complaints). External BCC out of hours, and internal staff at Smith Rd. WOP 401 identifies the work process it was updated in 2019; it still refers to Pathway. Minor OFI - DWQMP identifies WWETT as still operational.	1. Establish Customer complaint procedure, including assigning actions where appropriate Completed ✓ 2. Establish a customer complaint training program for front of line personnel and those involved with responding to customer complaints 3. Remove reference to WWETT within DWQMP as part of 2020 update Completed ✓	1. Current (interim) process exists, awaiting further input/review if SAMMS project addresses aspects of customer complaint management. 2. To be developed and delivered in July 2021	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Mar-20	TBC	Jul-21	75%	ON TRACK
5.5.	2	E5: Verification of Drinking Water Quality		IA					Delays in reporting ADWG Health exceedances from the lab to stakeholders	1. Review and update Council's Lab reporting and training processes to ensure prompt reporting of drinking water test results that breach ADWG health limits to key internal stakeholders.	Completed review and implemented ADWG Health alert limits and Operational at lab	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Dec-19	Jun-20	Jun-20	100%	COMPLETE
5.6.	2	E5: Verification of Drinking Water Quality		IA					Establish a consumer complaint and response program, including appropriate training of employees.	a) Investigate an overarching Customer Complaint Management System - which covers all teams involved in process b) Develop overarching Customer Complaint Management System c) Implement overarching Customer Management System (includes Complaint MGMT system)	a) Investigate - current overarching process is being captured under WOP 401. WOP 401 captures current (disjointed) systems in the absence of a CRM (refer RMP item 5.1). This procedure is to be referred to in the current customer management system, managed by CEBP team. b) Develop - Not started - to be developed as part of RMP item 5.1 c) Implement - Not started	Water Business	PL - Customer Experience & Business Performance	PL - Customer Experience & Business Performance	Nov-19	Dec-20	Dec-21	30%	MONITOR
6.1.	2	E6: Management of Incidents and Emergencies			EA			NC	3.9.3	Audit highlighted requirement for regular review of IMP & associated training requirements. Ensure IMP review and updates undertaken including training requirements implemented.	Incident response website updated to include additional tools & contact details - completed ✓ IMP review and associated training undertaken completed ✓	Water Business	PL - Customer Experience & Business Performance	Customer Experience and Engagement Officer	Jun-17	Jun-18	Jun-18	100%	COMPLETE

Item No.	Priority	DWQMP Section	Risk Source				Risk Reference	Water Supply Act Guideline	BP	Best Practise	ISSUES / RISKS	KEY ACTIONS	CURRENT STATUS	BRANCH	OWNER	LEAD	START DATE	TARGET DATE	REVISED TARGET DATE	% COMPLETE	STATUS
			RA	IA	EA	II	GI														
6.2.	2	E6: Management of Incidents and Emergencies					GI			Sample taps layers are not accurately displayed on GIS, e.g. which main the sample is connected to. Opportunity to improve and develop GIS layer/s and maps for incident response.	a) Investigate options to represent sample taps as a corporate layer b) Confirm all sample tap layers so that they are accurately displayed on the GIS corporate layer. c) Implement GIS layer for sample taps into the corporate GIS system	More accurate coordinates to be provided to the GIS team to update on the GIS layer. completed ✓ Need to confirm a few remaining sample tap connections to mains that require further meetings and investigations.	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Oct-18	Apr-20	Jun-20	100%	COMPLETE	
6.3.	2	E6: Management of Incidents and Emergencies					GI			Sample taps layers are not accurately displayed on GIS, e.g. which main the sample is connected to. Opportunity to improve and develop GIS layer/s and maps for incident response.	a) Investigate system of location for GIS layer/s and maps downstream of sample taps & supply reservoir to include ID references, flushing plans, and follow-up sample locations. Ensure maps are easily available for incident team. b) Develop plan c) Implement system	a) Determine who will maintain information and updates to GIS layers b) Develop task notice / scope of works to be delivered through LWIA	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Oct-18	Mar-20	Jul-21	40%	MONITOR	
6.4.	2	E6: Management of Incidents and Emergencies					GI	G		Management of Incidents and Emergencies - Communication. Define communication protocols with the involvement of relevant agencies and prepare a contact list of key people, agencies and businesses - There is a list, but key contact numbers are not included. Critical customers should also be recorded as a key layer in GIS.	a) Develop 1 - communication protocol with up to date list of agencies and stakeholders to be contacted (with #numbers) - completed ✓ b) Develop 2 - critical customer register management procedure. This register informs the critical customer layer in GIS (completed & due for upload June 2020)	1. Develop 1 - Register of key agency contacts is kept up to date by Customer Experience team Completed 2. Develop 2 - Interim layer and draft workflow has been developed. This will be implemented in June 2020.	Water Business	PL - Customer Experience & Business Performance	TBA	Mar-20	Aug-20	Aug-20	80%	ON TRACK	
6.5.	2	E6: Management of Incidents and Emergencies					GI	G		Management of Incidents and Emergencies - Communication. Investigate any incidents or emergencies and revise protocols as necessary - Intelix is being developed for tracking incident and audit outcomes, but not yet implemented. This is OFI until this is developed. De-escalation of incidents back to BAU is currently limited in its scope in the incident response plan. During Hospital Incident debrief, it was identified that information exchange between different sites was a concern.	a) Investigate alternatives for Incidents and Emergencies tracking system b) Develop plan for system to track incident management actions (an action tracking system) c) Implement incident management actions tracking system	a) Investigate - not started b) Develop - not started c) Implement - not started	Water Business	PL - Customer Experience & Business Performance	TBA	Mar-20	TBC	Jun-22	0%	NOT STARTED	
6.6.	2	E6: Management of Incidents and Emergencies					GI	G		Management of Incidents and Emergencies - Communication. Investigate any incidents or emergencies and revise protocols as necessary - Intelix is being developed for tracking incident and audit outcomes, but not yet implemented. De-escalation of incidents back to BAU is currently limited in its scope in the incident response plan. During Hospital Incident debrief, it was identified that information exchange between different sites was a concern.	a) Investigate de-escalation strategies and processes that could be included in the IMP. Consider inclusion in next version once revised. b) Investigate alternative communication platforms for IMT use during incidents. To allow for multiple users across different sites.	a) Investigate - PL CE & BP to develop de-escalation process prior to review. IMT documentation to be reviewed internally, and then external consultant to deliver independent review. Updated processes to be used in upcoming planned IMT training. b) Investigate - MS teams identified as likely communications tool to be used. The use of teams is to be included in IMP documentation review and also IMT training.	Water Business	PL - Customer Experience & Business Performance	TBA	Mar-20	TBC	Sep-20	0%	ON TRACK	
6.7.	2	E6: Management of Incidents and Emergencies	RA							Power failure and loss of critical systems	a) Investigate electrical redundancy requirements at critical assets b) Develop gap analysis of critical sites in terms of minimum requirements to manage power failure and loss c) Implement plan - task brief for retrofitting of systems	a) Investigate to be commenced. WQ Coordinator to discuss with WOPs PL in order to commence investigations. b) Develop to be commenced c) Implement to be commenced dependent on a) b)	Water Operations	PL - Network Operations	Electrical and Telemetry Coordinator	Jul-20	TBC	Dec-21	Jan-00	NOT STARTED	

Item No.	Priority	DWQMP Section	Risk Source				Risk Reference	Water Supply Act Guideline	BP	Best Practise	ISSUES / RISKS	KEY ACTIONS	CURRENT STATUS	BRANCH	OWNER	LEAD	START DATE	TARGET DATE	REVISED TARGET DATE	% COMPLETE	STATUS
			RA Risk Assessment	IA Internal Audit	EA External Audit	II Incident Investigation															
6.8.	2	E6: Management of Incidents and Emergencies				II				Boil Water Notice – review process to ensure customer concerns alleviated and initiated & lifted in a timely manner.	a) Investigate protocol for calling boil water notices b) Develop review process for boil water notices b) Develop de-escalation protocols for incidents - include in IMT processes and procedures	a) Checked with QLD Health/Regulator what the protocol for implementing boil water notices (i.e. who has the final say on these events) - it is noted that Council would make this decision, if not otherwise directed. In practice, Council would make this decision in joint with Chief Medical Officer, etc. b) Boil water notice updated. Current version is available on Incident Management intranet page: https://logancity.sharepoint.com/sites/LCCI/ntranet/org-structure/wb/KB/Pages/Templates.aspx . b) De-escalation guidance is noted in the current protocols.	Water Business	PL - Customer Experience & Business Performance	Customer Experience and Engagement Officer	Dec-19	Feb-20	Feb-20	100%	COMPLETE	
6.9.	2	E6: Management of Incidents and Emergencies		IA						Define communication protocols with the involvement of relevant agencies and prepare a contact list of key people, agencies and businesses. There is a list, but contact numbers are not included. These customers should also be recorded as a key layer in GIS.	a) Develop review process for the list of key stakeholder contacts. b) Develop record of Critical Customer key details in a register and have them available via the Critical Customer GIS layer	a) Develop - completed. Regular review and update ongoing - this action is completed. b) Develop - Critical Customer register management procedure development underway. 3. Implementation - Critical register management procedure and workflow amongst relevant CE & BP personnel (to provide a back-up to Business Performance Analyst).	Water Business	PL - Customer Experience & Business Performance	Business Performance Analyst		TBC	Sep-20	80%	ON TRACK	
6.10.	2	E6: Management of Incidents and Emergencies		IA						Communication Develop an active two-way communication program to inform consumers and promote awareness of drinking water quality issues.	a) Develop a method of communication that allows convenient communication between locations during an incident (ongoing) b) Develop SMS notification capabilities for tanker customers to advise in the event of emergencies	a) Develop - MS Teams has been identified as the most likely medium for inter-location communications. To be incorporated into IMT processes during review and update (item removed from this action and placed in RMP item 6.6) - Closed here. b) Develop - SMS notification - available via tanker MGMT team.	Water Business	PL - Customer Experience & Business Performance	PL - Customer Experience & Business Performance	Nov-19	Jun-20	Jun-20	100%	COMPLETE	
7.1.	3	E7: Employee Awareness and Training		IA		GI	8.1 (G)	3.11.1 BP		Internal audit review highlighted that some staff were still unsure of the DWQMP & clarity of Drinking Water Policy.	a) Develop & deliver DWQMP & Policy awareness/toolbox training to all Water Branch staff and possibly include in future Induction Program.	a). Policy endorsed & displayed Completed ✓ b). Annually awareness training delivered to senior management Completed c). Investigate DWQMP & Policy awareness training material to be developed & implemented to all Water Branch staff, eventually via inductions./Online training module Completed Note: Policy updated 2019 with WPQ to develop material.	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jul-16	Jun-20		100%	COMPLETE	
7.2.	3	E7: Employee Awareness and Training		IA			8.1 (G)	3.9.1		Recent audit identified external & OH&S training well documented however internal "on-the-job" training is not, to incorporate employee awareness of drinking water quality management.	Investigate capture of drinking water quality awareness via formalised training, which will be captured via current training systems.	Water Operations certificate training now includes a drinking water quality component.	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jun-15	Mar-17		100%	COMPLETE	
7.3.	3	E7: Employee Awareness and Training		IA			8.1 (G)	3.9.1		Recent audit identified external & OH&S training well documented however internal "on-the-job" training is not.	a) Develop and implement appropriate tool to document "on-the-job" training.	An improved software based solution is being considered corporately. In the interim, Water Operations has advertised for a Water Project Support Coordinator. Part of the role will be the development of a operations training schedule that incorporates all types of required training. The role will manage the coordination of branch training to ensure the qualifications and accreditation of staff meet all regulatory and other requirements. (15.12.20)	All Branches	All Managers	All Managers	Jun-15	Dec'17		5%	CONCERN	
7.4.	2	E7: Employee Awareness and Training				GI	G			Employee Awareness and Training - Employee awareness and involvement. Develop mechanisms and communication procedures to increase employees' awareness of and participation in drinking water quality management - As highlighted during the reservoir inspections, electrical work on reservoirs indicates that understanding of water quality issues is not front of mind in these trades.	a) Develop and implement Water Quality awareness training module	Module completed. Implementation plan developed. Launched to Loganwater in September 2020.	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Mar-20	Jun-20	Aug-20	90%	ON TRACK	

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			RA	IA	EA	II	GI														
7.5.	2	E7: Employee Awareness and Training					GI	G		Employee Awareness and Training - Employee training. Ensure that employees, including contractors, maintain appropriate experience and qualifications - As highlighted during the reservoir inspections, electrical work on reservoirs indicates that understanding of water quality issues is not front of mind in these trades. Ensure that Aquacard training is rolled out for all work units. The intent should be that all internal employees or external contractor understand the importance of reservoir integrity and water quality.	Rollout Hy5/Aquacard training to all relevant employees and contractors	Released to LWIA contractors and Water Operations contractors in December 2019	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Mar-18	Jun-20	Jun-20	100%	COMPLETE	
7.6	2	E7: Employee Awareness and Training	RA							Knowledge retention and knowledge resilience	Operator training to ensure GIS being appropriately updated - require identification of responsible roles Improved handover process and cross training Clearly defined role responsibilities and training matrix. Prepare procedures for all operational activities.	a) Investigate this task is related to training requirements. The task is currently assigned to PL - WPQ until we can determine what actions are required to address and by whom.	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jun-20	TBC		TBA	NEW	
8.1.	2	E8: Community Involvement & Awareness					GI	9.2 (G)	3.11.1	Limited drinking water quality information currently exists on LCC website, like what some of the other water service providers have. On rare occasions, customers have contaminated their own water supply such as tipping old fuel/chemicals onto their lawn.	Develop and upload on LCC's public website helpful information about drinking water quality such as disinfection type, rainwater tanks, water hardness for dishwashers, avoiding contamination of own water supply.	Useful drinking water quality information for customers has been developed and uploaded onto LCC's website, including Fact Sheets and Frequently Asked Question (FAQ).	Water Business	PL - Water product Quality	Drinking Water Quality Coordinator	Nov-15	Feb-17	May-17	100%	COMPLETE	
8.2.	2	E8: Community Involvement & Awareness					GI	G		Community Involvement and Awareness - Communication. Develop an active two-way communication program to inform consumers and promote awareness of drinking water quality issues - Critical customer list exists, but potentially does not capture all key customers. For example, Schools, dialysis, aged care, are included, but not other medical such as doctors and dental surgeries etc., nor all cooling towers. Critical customer list has list of businesses, but not contact details. The process to ensure that this is up to date and immediately useful is potentially not robust.	a) Develop Critical customer register management process Incorporate Critical Customer Register/GIS layer review as part of the Incident Management response process. b) Implement Critical customer register/GIS layer review as part of works planning procedures c) Develop actions to respond/communicate to Critical Customers in the event of works being planned that may have an effect on those customers. - this has been removed from this action and placed in Action 8.3)	a. & b. Are addressed in RMIP action item 5.4 (completed here) Critical customer types are already part of reviews performed during works planning. Once formal GIS layer is implementation is complete, this will be used by personnel planning works. 4. Completed ✓	Water Business	PL - Customer Experience & Business Performance	Business Performance Analyst	Mar-20	TBC		100%	COMPLETE	
8.3	1	E8: Community Involvement & Awareness								Community Involvement and Awareness - Communication. Develop an active two-way communication program to inform consumers and promote awareness of drinking water quality issues - Critical customer list exists, but potentially does not capture all key customers. For example, Schools, dialysis, aged care, are included, but not other medical such as doctors and dental surgeries etc., nor all cooling towers. Critical customer list has list of businesses, but not contact details. The process to ensure that this is up to date and immediately useful is potentially not robust.	a) Develop actions to respond/communicate to Critical Customers in the event of works being planned that may have an effect on those customers. - this has been placed here from Action 8.2) b) Develop comms process and materials to engage with critical customers (in conjunction with WOs) c) Implement Critical Customer comms process	a) Develop Water Critical Customer layer developed and implemented (Corporate layer) b) Develop Communications project specific c) Implement Critical customer comms process is developed under the Critical Customer memo developed by Bhavin	Water Business	PL - Customer Experience & Business Performance	TBA	Jul-20	Dec-20	Dec-20	100%	COMPLETE	
9.1.	3	E9: Research & DevelopmentE9: Research & Development					GI	10.3 (G)	3.11.3 BP	Document the design approaches used to ensure appropriate equipment deployed.	Document the design approaches used to ensure appropriate equipment deployed.	Dosing system design standardisation specification commenced. Workshop identified key requirements. Completed Task brief generated. Completed Work commenced - Adrian Hards project for O & M manuals covers (close to completion) From this, we may be able to define a WDF design spec if required. Completed for Woodhill. One summer of operation required and then will review and rollout to other dosing stations. TO be incorporated as a new item.	Water Business	PL - Water Product Quality	PL - Water Product Quality	Jun-15	Jun-17	Jun-20	100%	COMPLETE	

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			RA	IA	EA	GI																
9.2.	3	E9: Research & Development		IA						5.4 (G)	3.9.2	Recent internal audit found reservoir inspections and cleans were overdue (i.e. 2 yearly cleans up to one year overdue).	1. Reconcile reservoir inspections so they are up to date and aligned with required cycle. (Completed by WOPs) 2. Strategic Maintenance Management System (SAMMS) to have effective schedule systems to ensure associated escalations if due dates not met. (Note that whole of business decision not to implement Tech1 in Network Operations has been made. MEX currently used effectively to schedule and manage reservoir cleaning)	The Water Branch as part of the whole of Council's approach to implement SAMMS hence timeline dependant on Corporate progress. Works order management for reservoir cleaning is up to date. Scheduling performed by MEX for the foreseeable future.	Water Business	PL - Water Asset Management	PL - Water Asset Management	Jun-15	Jun-18	Jun-20	85%	MONITOR
9.3.	2	E9: Research & Development	RA							NC Res 1.12 & 1.13	3.9.2	E.coli incidents were a result of poor reservoir condition & design with low chlorine residual.	RESERVOIRS Development of Reservoir Strategy & Functional Specification by LWIA to address appropriate design, asset condition audits, functional specifications and optimal use.	Reservoir Strategy and Function Specification documents developed and adopted.	Water Business	PL - Water Asset Management	PL - Water Asset Management	Jul-16	Mar-17	Jun-17	100%	COMPLETE
9.4.	2	E9: Research & Development	RA							NC Res 1.7 & 1.8	3.9.2	E.coli incidents were a result of poor reservoir condition & design with low chlorine residual.	RESERVOIRS LWIA to investigate replacement of Brosnahan reservoir.	Investigation to replace Brosnahan reservoir completed. ✓	Water Business	PL - Water Asset Management	Senior Asset Management Engineer	Jul-16	Jun-17	May-17	100%	COMPLETE
9.5.	3	E9: Research & Development	RA							NC Res 1.7 & 1.8	3.9.2	E.coli incidents were a result of poor reservoir condition & design with low chlorine residual.	RESERVOIR Brosnahan reservoir to be decommissioned and replaced with suitable pumps.	Design for reservoir replacement with new pumps completed. ✓ Reservoir demolition planned 2018/19FY.	Water Business	PL - Water Asset Management	Senior Asset Management Engineer	Jul-16	Jun-17	Jun-18	100%	COMPLETE
9.6.	2	E9: Research & Development	RA							BUL 1.2 & 1.3 Res 1.14 Res 4.1, 4.2 & 4.3 Dis 2.1, 2.2 & 2.3	3.9.2	E.coli incidents were a result of poor reservoir condition & design with low chlorine residual .	Develop SEQ Disinfection Strategy to investigate long term solution to improve network residuals for Logan.	SEQ Disinfection Strategy developed to investigate long term solution to improve network residuals for Logan* Breakpoint dosing identified for Greenbank reservoir site. ✓	Water Business	PL - Water Product Quality	PL - Water Product Quality	Jul-16	Dec-16	May-17	100%	COMPLETE
9.7.	3	E9: Research & Development	RA							BUL 1.2 & 1.3 Res 1.14 Res 4.1, 4.2 & 4.3 Dis 2.1, 2.2 & 2.3	3.9.2	E.coli incidents were a result of poor reservoir condition & design with low chlorine residual .	Implement SEQ Disinfection Strategy long term solution to improve network residuals for Logan.	a). Seqwater engaged consultant to develop delivery package to improve Logan's network residuals. Complete ✓ b). Greenbank breakpoint dosing facility designed Complete ✓ c). Constructed and commissioned 2018/19FY Complete ✓	Water Business	PL - Water Product Quality	PL - Water Product Quality	Jul-16	Jun-18	Dec-18	100%	COMPLETE
9.3	2	E9: Research & Development	RA									Contamination when bringing mains back online	a) Investigate innovative technologies related to mains recommissioning (e.g. Sydney Water's mobile Ozonation) b) Develop plans to trial technologies recommended c) Implement trial in Loganwater networks	a) Trial of Grenof mains cleaning asset commencing in February. Possible trial of NO-DES in early 2021 too.	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jun-20	TBC	Jul-21	10%	ON TRACK
9.4	3	E9: Research & Development	RA									Chemical contamination of pipes and mains	a) Investigate potential of other chemicals (e.g. pesticides) contaminating pipes b) Develop memo to PL regarding chemical contamination of pipes c) Implement recommendations of the memo	Not started	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jun-20	TBC	Dec-21	0%	NOT STARTED
10.1.	3	E10: Documentation & Reporting	IA	EA		GI				11.1 (G) NC Ext Audit (4)	3.9.5	Internal audit identified changed or out dated document DM# used. Various doc mgmt approaches exist across the various Water Branches since Allconnex dissolution. DWQMP has documented WOPs known to date.	a) Investigate Document Control Framework Principles. (Currently underway) b) Develop framework c) Implement Document Control framework throughout business	IMS team has recently formed. This team will be responsible for the development of the Integrated Management system plan (IMS). Current Document Control system reviewed with recommendations to be presented to management Document Control to be further investigated for cost effective solution. Part of IMS functions. Current SharePoint option is available as an interim measure (15/12/2020)	Water Business	PL - Water Product Quality	Quality Lead	Jun-15	Dec-17	Jul-21	45%	MONITOR

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			RA	IA	EA	II	GI													
			Risk Assessment	Internal Audit	External Audit	Incident Investigation	General Improvement													
10.2.	1	E10: Documentation & Reporting					GI	11.2 (G)		Public display of DWQMP annual report will be a Regulatory requirement for 2014/15FY onwards.	Upload LCC's DWQMP annual report onto LCC website.	DWQMP Annual Report uploaded to LCC's website.	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jun-15	Feb-17	May-17	100%	COMPLETE
10.4.	2	E10: Documentation & Reporting					GI	G		Documentation and Reporting - Management of documentation and records. Establish a records management system and ensure that employees are trained to fill out records - DM is a document storage system, not a document management system. There are issues finding documents if they are not appropriately saved and referenced.	a) Investigate Document Control Framework Principles. (Currently underway) b) Develop framework c) Implement Document Control framework throughout business	Investigation, review and gap analysis underway. Review and investigation phase is still underway. An interim doc solution is available via Sharepoint.	Water Business	PL - Water Product Quality	Quality Lead	Mar-20	TBC		10%	ON TRACK
10.5.	2	E10: Documentation & Reporting					GI	G		Documentation and Reporting - Management of documentation and records. Periodically review documentation and revise as necessary - There are WOPs that appear to be outdated and should be reviewed. For example, WOP 216 (and WOPs for other reservoir sites) appear outdated as the work orders now being issued include a different table for recording results. That is, working documentation is updated, but not reflected back into the WOP.	Actions as per item RMIP action item 10.1	Project currently underway to review current status of procedure management system	Water Business	PL - Water Product Quality	Quality Lead	Mar-20	TBC		10%	NEW
11.1.	2	E11: Evaluation of Audit					GI	12.1 (G)	3.10.1	Long term data is not fully evaluated or documented.	Investigate an integrated Water Information Quality Management System with links to other systems (i.e. LIMS, SCADA, field data, etc.) to enable effective long term trends.	Establish Process Improvement team to commence review of medium/long term trends & identify opportunities for improvements. a). Process Improvement team established reviewing trends, improvement opportunities & action effectiveness ✓ b). tender awarded. Development and implementation required to broaden trend analysis capability. ✓ c). Software purchased. Server requirements finalised. ✓ d). Stakeholder development commenced with implementation 2019/20FY. Database commissioned, training provided to key stakeholders., operations and maintenance manuals designed, Aquantify Sharepoint page launched - Awaiting final presentation.	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jun-15	Dec-17	Dec-20	95%	ON TRACK
11.2.	3	E11: Evaluation of Audit					GI	12.2 (G)	3.11.4 BP	Internal audit undertaken & presented 2013, however processes for annual audit not yet established.	Establish internal annual audit review process. Investigate use of Intellex system and (No Suggestions) audit tool.	Established annual internal audits over next 4 years using external provider ✓ Investigate capacity & capability to undertake internal audits by LCC staff by 2018. ✓ Decision to continue to engage external provider to undertake annual internal audits. Ad-hoc audits can be undertaken by internal staff. ✓	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jan-13	Jun-18	Jun-18	100%	COMPLETE
11.3.	2	E11: Evaluation of Audit					GI	12.2 (G)	3.10	External audit to be undertaken as per Regulator's "condition" of an approved DWQMP.	Arrange external audit & report findings as per Regulator's conditions.	Regulatory external audit was conducted June 2017.	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jun-15	Jun-17	Jun-17	100%	COMPLETE

Item No.	Priority	DWQMP Section	Risk Source				Risk Reference	Water Supply Act Guideline BP Best Practise	ISSUES / RISKS	KEY ACTIONS	CURRENT STATUS	BRANCH	OWNER	LEAD	START DATE	TARGET DATE	REVISED TARGET DATE	% COMPLETE	STATUS
			RA Risk Assessment	IA Internal Audit	EA External Audit	II Incident Investigation													
11.4.	3	E11: Evaluation of Audit				GI	G		<p>a) Investigate inclusion of longer term trends as part of DWQMP conditions. Determine by consulting SEQ utility partners (Seqwater, UU, Unitywater, GC, Redlands) what level of information they provide with their submissions, and whether that meets DWQMP criteria guidelines released by WSR.</p> <p>b) Develop section to be included in next DWQMP submission (November 2020)</p> <p>c) Implement - include in DWQMP and submit</p>	<p>a) Investigation to include data trending and analysis including. Significant trend analysis performed as part of the whole of system risk assessment. Aquantify is almost implemented, so will use Aquantify to further develop longer term trends and gradually include in future versions of the DWQMP as appropriate.</p>	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Mar-20	Aug-20	Aug-20	50%	ON TRACK	
12.1.	2	E12: Review & Continual Improvement			EA	GI	13.1 (G)	3.11.4 BP	<p>Identify RMIP "none actions" which could impact the Business by RMIP annual review, which includes high risks, internal audit non-conformances and long term actions to address drinking water health incidents.</p>	<p>PLs responsible to ensure RMIP actions implemented such as incorporation into appropriate Water Branch Plans.</p>	Evidence of some RMIP actions incorporated into Water Branch Plans - completed ü DWQMP (ADWG Component) facilitators assigned to help PLs facilitate actions - completed ü Intelex investigated as the most appropriate tool to assist with RMIP action implementation and status reporting - completed ü	All Branches	PL - Water Product Quality	Drinking Water Quality Coordinator	Jun-15	Jun-17	Jun-18	100%	COMPLETE
12.2.	2	E12: Review & Continual Improvement			EA	GI	13.1 (G) Ext Audit (7)	3.11.4 BP	<p>Identify RMIP "none actions" which could impact the Business by RMIP annual review, which includes high risks, internal audit non-conformances and long term actions to address drinking water health incidents.</p>	<p>a) Investigate system to assist with RMIP reporting b) Develop system c) Implement system</p> <p>PLs responsible to ensure RMIP actions implemented such as incorporation into appropriate Water Branch Plans.</p>	<p>Audit & Inspection module development commenced. Corrective Action in telex module required once Audit module implemented. Delays - due to Intelex provider ceased operation, continue with current excel system until further notice. Liaise with Corporate stakeholders. IMS team has commenced investigating an actions management system. Review of current systems is taking place in 2020</p>	Water Business	PL - Water Product Quality	Quality Lead	Jun-15	Dec-18	Jun-21	30%	MONITOR
12.3.	2	E12: Review & Continual Improvement			EA		13.2 (G)	3.11.4 BP	<p>Ensure RMIP is kept up to date by incorporating any new actions to address risks identified via risk assessments, incidents or internal audit findings. Communicate and implement improvements, monitoring effectiveness.</p>	<p>Incorporate any newly identified high risks from whole of system Risk Assessment undertaken 2016 into RMIP. Communicate changes with key stakeholders to ensure effective implementation.</p>	Completed	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	May-17	Jun-17	Jun-17	100%	COMPLETE
12.4.	2	E12: Review & Continual Improvement			EA		13.2 (A)		<p>Ensure RMIP is kept up to date by incorporating any new actions to address risks or non-conformances identified via external Regulatory Audit.</p>	<p>Update RMIP to include actions to address non-conformances from Regulatory Audit and address any outstanding items from Risk Assessment.</p>	RMIP updated.	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jun-17	Jun-18	Jun-18	100%	COMPLETE
12.5.	2	E12: Review & Continual Improvement			EA		13.2 (A)		<p>Ensure RMIP is kept up to date by incorporating any new actions to address risks or non-conformances identified via external Regulatory Audit.</p>	<p>Update RMIP to address recommendations from Bamboo Drive E.coli Incident and Logan Hospital Dirty Water Event.</p>	<p>NEW Meeting with key stakeholders to review recommendations commenced.</p>	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Jun-17	Jun-20	Jun-20	100%	COMPLETE
12.6.	2	E12: Review & Continual Improvement				GI	G		<p>Review and Continual Improvement - Drinking water quality management improvement plan. Ensure that the plan is communicated and</p>	<p>a) Develop RMIP dashboard b) Implement dashboard to WTRG and communicate the update cycle to PL.</p>	<p>RMIP dashboard developed and implemented. Dashboard updating procedure developed and implemented</p>	Water Business	PL - Water Product Quality	Drinking Water Quality Coordinator	Mar-20	Aug-20	Aug-20	100%	COMPLETE