Te Akau Water Supply- Distribution

Water Safety Plan

Organisation and Supply Details: Community Name Te Akau (TEA009). The registration information is below:

Component	Code	Name
Community	TEA009	Te Akau
Zone	TEA009TE	Te Akau

Supply owner/organisation name: Waikato District Council and Watercare Services Limited (Waikato)
Prepared by: Bliss Pappachan, Nigel Connolly, Tatiana Derevianko, Gil Miers, Mathew Telfer

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Table 1: Document Control Record

Version No.	Description	Author	Reviewer	Date	Authorised
1.0	Water Safety Plan	Opus International Consultants, Abby G	Parvati P	April 2015	Martin Mould
2.0	Revision based on small supply template	Bliss P, Gil M, Nigel C	Tatiana D	April 2021	Mathew Telfer
3.0	Revision based on tanker supply	Bliss P, Gil M, Nigel C	Tatiana D	June 2021	Mathew Telfer

Table 2: Document Distribution List

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Waikato DWAU	Waikato District Health Board Pembroke Street	Electronic
Operations Staff	On Plant site	1
Water Quality Analyst	Pukete Road Te Rapa Hamilton office	1
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Executive Summary

This Water Safety Plan (WSP) has been developed to identify the public health risks for Te Akau public water supply registered to the Waikato District Council (WDC).

A Water Safety Plan (WSP) documents a public health risk-based assessment and management process that aims to ensure a safe and secure supply of drinking-water for consumers, protecting the community. Water safety planning strengthens the focus on preventive measures across the whole drinking-water supply system, moving away from a reliance on after-the-event end-point water quality testing. It promotes a multi-barrier approach to managing risks, which safeguards against the failure of any single barrier. Water safety planning supports continuous improvement and guides day-to-day activities now and into the future.

A WSP is an essential tool for providing safe drinking-water. The Health Act 1956 Part 2A Drinking Water (Health Act) requires certain drinking-water suppliers to have and implement a WSP. Te Akau is classified as a 'small' drinking-water supply under the Health Act and is therefore not legally required to prepare a Water Safety Plan. However, Waikato District Council has elected for Te Akau water supply to become a participating small supply under Section 10 of the Drinking-water Standards for New Zealand 2005 (Revised 2018) (DWSNZ) in which having an 'approved and implemented' WSP is a requirement.

Contents

1.0 TE AKAU WATER SUPPLY DESCRIPTION

Background

Te Akau south water supply was first established in October 1994 and consisted of a single bore, small treatment plant, and timber tank storage before supply to the Te Akau South community. Te Akau water supply bore is located at the southern end of Te Akau Wharf community on Te Akau Wharf Road opposite Ryan Road.

Since August 2020, Te Akau Water Treatment Plant (WTP) experienced difficulty maintaining the chemical compliance of Drinking Water New Zealand 2005 (Revised 2018). Further investigation into the events identified the condition of the bore to be poor, increasing the risk of supply failure. In order to continue the safe supply of water to the Te Akau South community, Waikato District Council (WDC) and Watercare Services Ltd (WSL), in communication with Waikato Public Health Unit (WPHU) and Wai-comply, decided to change the source of water supply to the Te Akau South community as an interim measure. An options assessment for the future servicing of the community is underway. The options will be assessed in consultation with the community, Waikato Public Health Unit (WPHU) and Wai-comply engagement to set the direction for the future.

Storage and Distribution

As of April 2021, the source of supply for Te Akau WTP has been changed to the Raglan source via tanker water supply to the reservoir. Water Carriers Allens United Waikato Ltd (registered and approved by MoH) collects treated water from the dedicated hydrant at Raglan and delivers it to the receiving tank (newly installed) at the treatment plant. The water from the receiving tank is pumped to the existing timber storage reservoir and distributed to customers via the gravity network. Tanker supply procedures are in place to deliver safe water to Te Akau. A stock fence is installed around the area within which the reservoir is located. Flow diagram 1.3 outlines details of the current water supply.

1.1 Commitment to Drinking-water Quality Management

WDC is committed to the provision of safe and secure drinking-water for its consumers and to the future improvements that have been identified in this WSP. The organisational commitment to drinking-water quality management is signed by Waikato District Council (WDC)/ Watercare Services Ltd (WSL) and is included as Appendix B with this document.

Relationship of WSP to organisational policy and strategy

The provision of safe and secure drinking-water is visible in the company's organisational policy and strategy. WDC has established a comprehensive strategic and organisational framework in all other organisational policies and strategic planning documents that refer to drinking-water management.

Title	To access listed document
Waikato District Council AMP 2020-21	www.waikatodistrict.govt.nz
Waikato District Council LTP 2018-2028	www.waikatodistrict.govt.nz

Engaging Stakeholders

A list of all stakeholders who could affect or be affected by decisions/activities to do with the Te Akau drinking-water supply, e.g. DWAs, MoH, local territorial and regional authorities, iwi, any politicians, local council, and others are listed in the Appendix C

The Waikato District Council stakeholder/ Communications team maintains relationships with councillors and local board members and responds to queries they receive from their constituents about water quality, providing up to date results and confirmation that compliance is maintained. These

elected officials, along with the public, are given the opportunity to visit treatment plants at various times throughout the year. The long-term stakeholder engagement report along with the stakeholder engagement plan template is included in Appendix D

The delivery of Drinking Water to the community in Te Akau is a joint commitment between Waikato District Council and Watercare, and the WSP has been developed collaboratively. The CEO's of both organisations have endorsed the WSP. Waikato District Council has retained responsibility for Stakeholder liaison and customer/community engagement.

Staff employed in each water supply area receive training specific to their operational area to ensure that they understand the scope of their role, can undertake required tasks safely, and are competent in the delivery of their 'business as usual' responsibilities. Staff work under the supervision of experienced staff until such time as they undertake a competency assessment from their respective supervisor.

In addition to the task specific training, Watercare also focuses on the professional development of staff, for example:

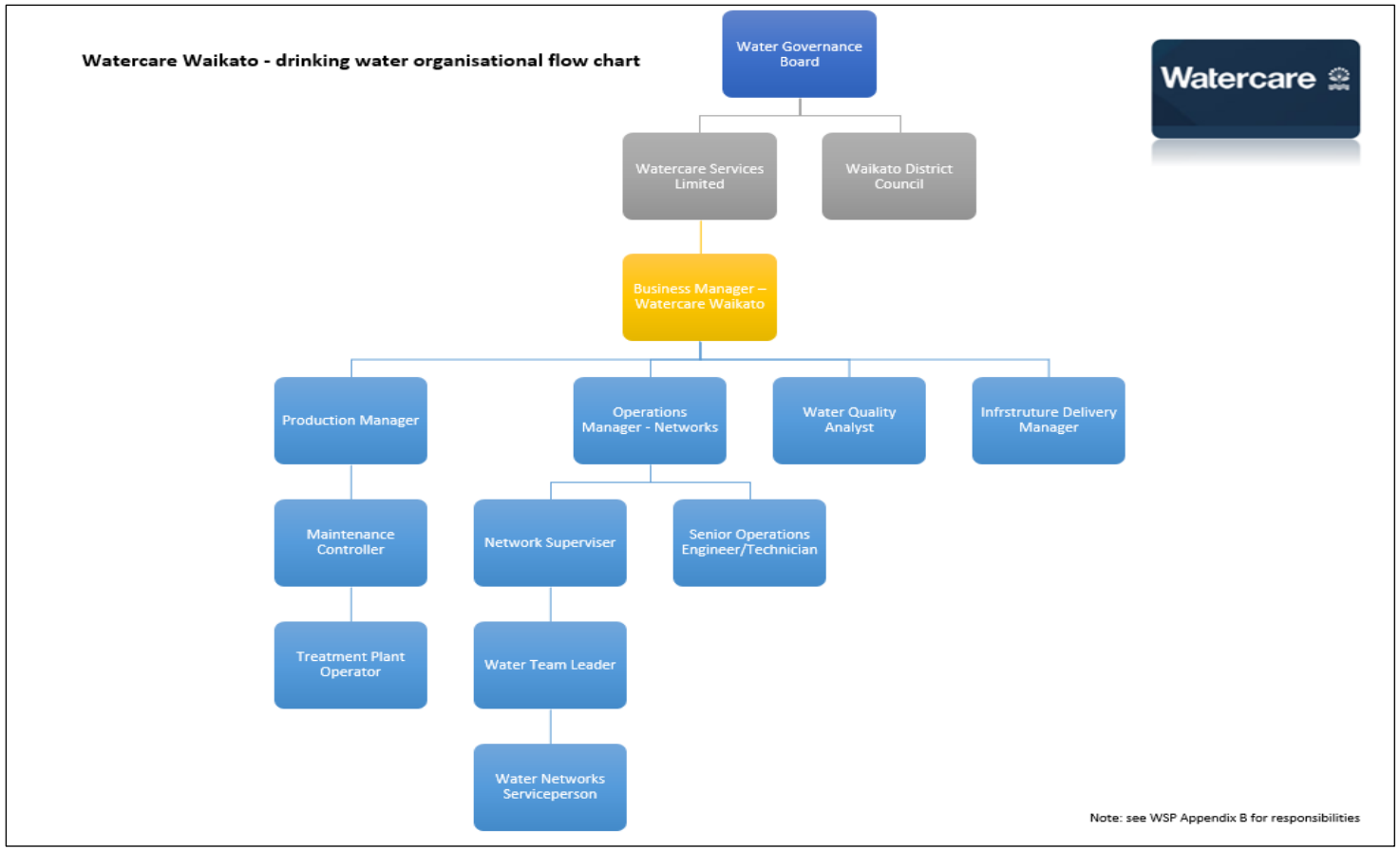
- Following initial water treatment plant-based training, operators, process technicians, and process engineers are enrolled to complete either their National Certificate in Drinking-water Treatment or the National Diploma in Drinking-water Treatment. The training undertaken is dependent on prior qualifications obtained and resource availability.
- Health and Safety training, specific to role requirements.

Watercare has developed significant in-house water supply system technical and engineering capabilities. This capability development has been in recognition of the need for greater technical capability dedicated to the management of water supply risks.

Long-term employee engagement plan on awareness and involvement in safe and secure drinking-water is included in the training matrix programme Appendix E

All training is recorded in Watercare's Draft Training Matrix Programme can be found O:\Ops\Watercare Waikato\Training.

The format of the training has been revised by WSL since the commencement of the operations and maintenance contract and work is continuing to fully population the matrix. The completed matrix is available to review on request.



The core team that lead the WSP development includes senior management, technical specialists, operational team leaders, process engineers, and water quality scientists. The senior staff within this core team hold the authority to make decisions and enact changes. They also have extensive knowledge of the legislative requirements around WSP development.

These team members have a wide range of expertise and years of experience in drinking-water production, distribution, and risk management.

Engaging Community

WDC consumer engagement strategy is led by our Communications and Customer Teams. WDC consumer engagement programmes are listed on our public website and explain how the customers and community are involved in drinking-water initiatives, including water conservation measures.

When there is a change to a community's water supply, WDC uses these channels to inform people in advance and during the change.

As part of this project, the following communications were made:

- There is an active two-way communication program to receive customer complaints/concerns/suggestions.
- Communication with the community during incidents and emergencies are documented in the following Incident Response plans:
- Boil Water Communications Plan can be found here O:\Ops\Watercare Waikato\Training\Response Plans.
- Water Quality Incident Response Plan can be found here O:\Ops\Operations Excellence\Water Quality Science\Resources and References\WSL Procedures\WQ Action Manual\WQ Incident Response

Consumer Satisfaction

Monitoring consumer comments and complaints is a vital part of WDC operations. Customer complaints are recorded on WDC property and rating database as a service request. Information on actions taken to resolve complaints and the outcomes of these actions are also recorded on the database.

Waikato District Council ensures the standard operating procedure is followed per Appendix F

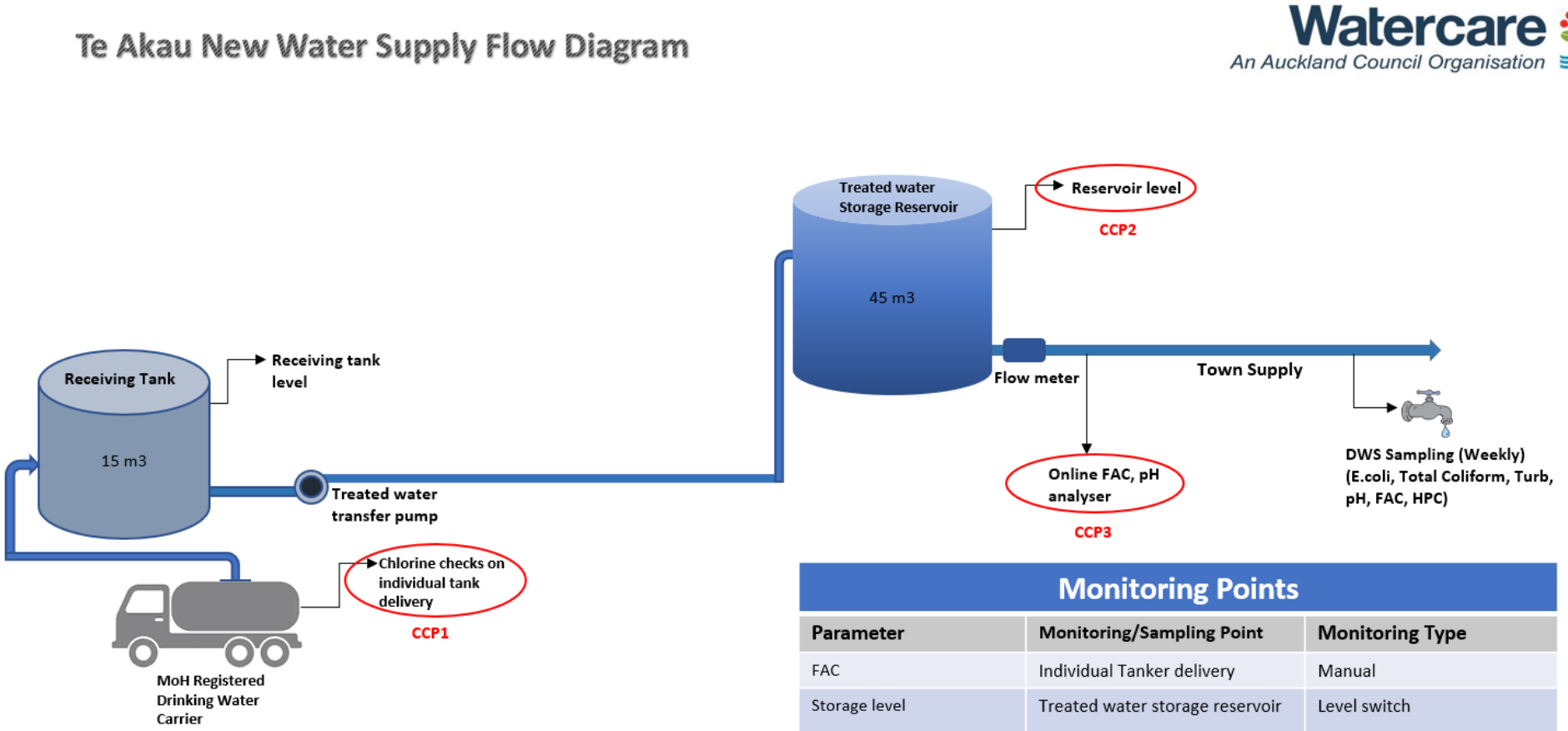
- Information is made available to customers through the website/Facebook; direct mail; newsletters, and by phone
- Regularly reviewing what can be done better or differently to reduce customer problems and complaints

Information on WDC community involvement is detailed on the website on this page: www.waikatodistrict.govt.nz/your-council/public-consultations/current-consultations

1.2 TE AKAU WATER QUALITY CHARACTERISTICS

Appendix A sets out the water quality results for Te Akau since the change in source of supply.

1.3 Flow Diagram



Monitoring Points

Parameter	Monitoring/Sampling Point	Monitoring Type
FAC	Individual Tanker delivery	Manual
Storage level	Treated water storage reservoir	Level switch
FAC	Reservoir Outlet	Continuous
FAC and E.coli	Treated, Post Reservoir, Reticulation	Manual grab samples

1.4 DWSNZ Compliance

As the Te Akau Bore Water Supply is classified as a Small supply within the Health Act 1956, WDC has elected to use Section 10 of the DWSNZ to demonstrate DWSNZ compliance. How each requirement of Section 10.2 of the DWSNZ is seen to be met by this WSP and supporting documents is noted in the table below.

Overview

Section 10.2 Requirement	Water Supplier Comment
1. A drinking-water assessor (DWA) must have approved a water safety plan, and supplier must be implementing the plan.	With the 'approval' and 'implementation' of this WSP, the water supply will meet this requirement (DWA decision pending).
2. Appropriate bacterial, protozoal and chemical treatment, as determined from the catchment assessment in the water safety plan, must be in use (Table 10.1)	Sections 1 and 2.1 of this WSP summarise the hazards believed to be applicable to this water supply system (distribution only*). **protozoal compliance requirements n/a*
3. Water suppliers must monitor water quality and ensure it meets the requirements of section 10.4.	A monitoring plan with testing parameters and frequencies of samples/monitoring is included in Appendix G.
4. Water suppliers must undertake the remedial actions that have been specified in the water safety plan when a MAV is exceeded, or treatment process controls are not met.	Remedial actions in the form of corrective actions and contingency plans have been covered in Appendix I.

Compliance Approach

Compliance Area	Water Supplier Comment
10.4.2 Bacterial Compliance criteria used for the distribution zone	E. coli sampling
10.4.4 – Chemical Monitoring	No P2 monitoring assigned. However ongoing monitoring for bromate and chlorate is in place for the supply.
OTHER: Cyanobacteria	N/A

Note: Refer to Appendix G for confirmation of compliance monitoring (sampling) parameters and frequencies

Documentation and Reporting

Scheduled operational reports on water quality are prepared on a daily, weekly, monthly, quarterly and annual basis depending on the focus of the report and its intended audience. Additionally, customised reports of laboratory analysis data can be created with analytics software at any time. Water quality event reports are prepared in response to transgressions and other incidents for the attention of senior management, Wai Comply and the DWA-unit for Waikato DHB.

Investigations

WDC takes any events related to the quality or quantity of water supplied to its customers and the associated investigations very seriously. During reactive investigations staff follow procedures and protocols to:

- Understand why potentially unsatisfactory performance has occurred and implement corrective measures as appropriate; and
- Ensure that issues are resolved effectively.

These procedures and protocols provide a detailed step-by-step process to follow in response to each type of water quality situation. This includes the criteria to determine when an investigation is needed; who has responsibility for the investigation; steps to take while it proceeds; and actions to be taken at its completion. A report containing investigation findings is completed for every water quality parameter breach incident.

Investigations also inform planning and continuous improvement processes, identifying the need for future proactive investigations, project planning, and provide valuable ideas for suitable future designs and best practice.

A review of previous water quality incidents for causes and the effectiveness of responses is part of the internal event investigation process. An Event Investigation Report is included in Appendix J

2.0 ASSESSMENT OF TE AKAU TANKER WATER SUPPLY

2.1 Hazard Identification

The following sources of hazards are seen to apply to the Te Akau Water Supply based on the water source and storage/distribution type.

Area	Hazard Source	Hazard Type
Water source	Water not complying with DWSNZ	Physical, chemical, microbiological
Tanker supply	Contamination of water through poor hygiene practices	Physical, chemical, microbiological
	Unable to deliver water	Quantity
Storage/Distribution	Contamination within storage reservoirs	Microbiological
	Contamination when repairing reticulation	Microbiological
	Contamination from backflow	Microbiological, Chemical

2.2 Barriers To Contamination

To determine whether there is a major weakness in the supply against contamination, the water supplier must consider what barriers are in place to provide safe drinking water to the community.

Specific 'barrier' information related to the Te Akau Water Supply is outlined in the table below.

Barrier Type	Barrier Detail
Prevent contamination of water source	Raglan water supply fully compliant with the DWSNZ
Prevent contamination during delivery	Tanker filling/delivery procedures are in place for water carriers to deliver safe water to the receiving tank, including good hygiene practice, chlorine checks on individual tank delivery etc.

Barrier Type	Barrier Detail
Maintain the quality of the water during distribution	Chlorine residual and secure storage reservoirs – Chlorine checks are done on individual tank delivery (as recorded in the tanker filling/delivery procedure). Continuous FAC monitoring at the outlet of the reservoir to ensure chlorine residual is available to meets the DWSNZ requirements to protect the water against microbiological contamination throughout the storage and reticulation. The reservoir is made of timber lined with polyethylene plastic liner approved for contact time with drinking water and is sealed to prevent ingress of rainwater or contaminants, and to exclude birds and vermin. Distribution network is serviced and maintained as per approved procedures (please refer to Section 4.0 SOP). Appendix G outlines DWSNZ compliance sampling and monitoring plan-meets Section 10 requirements.

2.3 Prevention Steps

ID	Prevention Step	Effective (Yes/No/Partial)	Applicable Barrier to Contamination			Improvement Required
			Prevent Contamination in Source Water	Prevent Contamination during delivery	Maintain Distribution Quality	
Source-Tanker Supply						
PS01	Use water source (Raglan) that is fully compliant with the DWSNZ)	Yes	✓			Install dedicated filling stations for tanker filling
PS02	Use of an appropriate source water (Tanker supply)	Yes		✓	✓	No
PS03	Receiving Tank and Reservoir secure from access by animals	Yes	✓		✓	No
PS04	Tanker supply procedure in place	Yes	✓	✓	✓	No
PS05	Trained Tanker Operators	Yes	✓	✓		No

ID	Prevention Step	Effective (Yes/No/Partial)	Applicable Barrier to Contamination			Improvement Required
			Prevent Contamination in Source Water	Prevent Contamination during delivery	Maintain Distribution Quality	
Distribution						
PS06	Maintain an adequate disinfectant (chlorine) residual	Yes			✓	Upgrade of SCADA system
PS07	Treated water delivery line condition	Yes	✓	✓	✓	No
PS08	Treated water reservoirs volume (contact time and continuity of supply)	Yes			✓	No
PS09	Fully enclosed distribution system and storages	Yes			✓	No
PS10	Maintaining adequate system pressure	Yes			✓	No
PS11	Regular inspections and monitoring of receiving tank and reservoirs	Yes			✓	No
PS12	System maintenance as per best practice guidelines: • Reservoir maintenance completed hygienically • Reticulation repairs completed hygienically and with the appropriate materials	Yes			✓	No
Other						
PS13	Staff trained in the operation and management of the water supply	Yes	✓	✓	✓	No

ID	Prevention Step	Effective (Yes/No/Partial)	Applicable Barrier to Contamination			Improvement Required
			Prevent Contamination in Source Water	Prevent Contamination during delivery	Maintain Distribution Quality	
PS14	Procedures and programmes available for ensuring the water supply is safe and continues to operate	Yes			✓	No
PS15	Information to consumers: • Shutdown and repairs • Plumbosolvency Notice	Yes			✓	No
PS16	Quarterly full chemical analysis of treated water	Yes			✓	No

2.4 Risk Assessment

The following section sets out the risk methodology utilised for this risk assessment, and the risk activities are separated into 4 risk categories; Catchment and Abstraction, Treatment, Distribution and General Risks.

2.4.1 Risk Methodology

Risk assessment of each event identified requires consideration of the likelihood of an event occurring on a specified timeframe, combined with the severity of the consequences the event may cause. The following table from the 'Handbook for preparing a Water Safety Plan-May 2019' has been used for this water supply's Risk Assessment table.

		Consequence				
		Insignificant	Minor	Moderate	Major	Catastrophic
Likelihood	Almost Certain	Medium	High	High	Extreme	Extreme
	Likely	Medium	Medium	High	High	Extreme
	Possible	Low	Medium	Medium	High	High
	Unlikely	Low	Low	Medium	Medium	High
	Rare	Low	Low	Low	Medium	Medium

Category	Descriptor	Description
Likelihood	Almost certain	Occurs more often than once per week
	Likely	Occurs more often than once per month and up to once per week
	Possible	Occurs more often than once per year and up to once per month
	Unlikely	Occurs more often than once every five years and up to once per year
	Rare	Occurs less than or equal to once every five years

Category	Descriptor	Description
Consequence	Catastrophic	Major impact on most of the population, complete failure of systems, high level of monitoring and incident management required. Acute harm to people, declared outbreak or widespread illness expected.
	Major	Major impact on a sub-population, systems significantly compromised and abnormal operation, high level of monitoring and incident management required. Potential acute harm to people, declared outbreak or widespread illness expected.
	Moderate	Minor impact on most of the population, significant modification to normal operation but manageable, increased monitoring. Potential widespread aesthetic issues or repeated breach of Maximum Acceptable Value (MAV).
	Minor	Minor impact on a sub-population, some manageable operation disruption. Potential local aesthetic issues, isolated exceedance of MAV.
	Insignificant	Insignificant impact, little disruption to normal operation. Isolated exceedance of aesthetic parameter.

2.4.2 Risk Assessment Table

What could happen that may cause drinking-water to become unsafe?	What harmful contaminants could be present?	Maximum Risk – What is the impact if prevention steps ARE NOT in place?	What preventions steps are in place?	Is this Event under control?	Residual Risk – What is the impact if prevention steps ARE in place?	Are any improvements required?
Source water (Tanker supply)						
Contaminated source water (Raglan supply)	Physical Chemical Microbial	Likelihood =Unlikely Consequence = Major **Impact= Medium**	PS01-PS04	Yes-Tankers will collect water from an alternative source (eg. Ngaruawahia) that is in full compliance with DWSNZ	Likelihood =Unlikely Consequence = Major **Impact= Medium**	Install dedicated filling stations for tanker filling
Unable to take water from Raglan	Physical	Likelihood =Unlikely Consequence = Major **Impact= Medium**	PS01-PS04	Yes-Tankers will collect water from an alternative source (eg. Ngaruawahia) that is in full compliance with DWSNZ	Likelihood =Unlikely Consequence = Major **Impact= Medium**	Install dedicated filling stations for tanker filling
Road failure preventing tanker accessing the site	Physical	Likelihood = Unlikely Consequence = Moderate **Impact= Medium**	PS01, PS02, PS13	Yes- Approximately 36 hours storage in reservoir, Bottle water will be provided if >8hrs	Likelihood = Unlikely Consequence = Moderate **Impact= Medium**	No

What could happen that may cause drinking-water to become unsafe?	What harmful contaminants could be present?	Maximum Risk – What is the impact if prevention steps ARE NOT in place?	What preventions steps are in place?	Is this Event under control?	Residual Risk – What is the impact if prevention steps ARE in place?	Are any improvements required?
Contamination of tanker or equipment	Microbial Chemical	Likelihood = Unlikely Consequence = Major **Impact= Medium**	PS02, PS03	Yes-Tanker supply procedure in place. Tankers approved and registered with MoH.	Likelihood = Unlikely Consequence = Minor **Impact= Low**	No
Untrained tanker operators	Microbial Chemical	Likelihood = Unlikely Consequence = Major **Impact= Medium**	PS04, PS05	Yes-Only using qualified and certified tanker operators. Tankers approved and registered with MoH.	Likelihood = Unlikely Consequence = Minor **Impact= Low**	No
Traffic incident/accident	Physical Microbial Chemical	Likelihood = Possible Consequence = Moderate **Impact= Medium**	PS04, PS14, PS15	Yes-Tanker load subject to accident prone to be contaminated, load to be discarded. Alternative tanker load will be arranged.	Likelihood = Unlikely Consequence = Minor **Impact= Low**	No
Storage and Distribution						
Leakage through reservoir or receiving tank roof or other parts of structure or access by birds	Microbial	Likelihood = Likely Consequence = Major **Impact = High**	PS06, PS09, PS11	Yes-Residual chlorine in water. Reservoir/ receiving tank is inspected regularly and condition assessed, E.coli sampled weekly in distribution system	Likelihood = Unlikely Consequence = Moderate **Impact= Medium**	Review asset condition and option for reservoir replacement.
Vandalism to reservoir and/or receiving tank	Physical Chemical Microbial	Likelihood = Possible Consequence = Major **Impact = High**	PS11, PS14	Partial-E.coli sampled weekly in distribution system. Continuous monitoring (FAC, pH,	Likelihood = Unlikely Consequence = Moderate **Impact = Medium**	Review of reservoir/ receiving tank security.

What could happen that may cause drinking-water to become unsafe?	What harmful contaminants could be present?	Maximum Risk – What is the impact if prevention steps ARE NOT in place?	What preventions steps are in place?	Is this Event under control?	Residual Risk – What is the impact if prevention steps ARE in place?	Are any improvements required?
				Turbidity) is available at the outlet of reservoir.		
Sediment accumulation within reservoir or receiving tank	Microbial Chemical	Likelihood = Likely Consequence = Minor **Impact = Medium**	PS11, PS12	Yes-Regular inspection and cleaning of reservoir/receiving tank if required	Likelihood = Unlikely Consequence = Minor **Impact= Low**	No
Loss of water quality (including insufficient FAC for residual disinfection, pH, high NTU, low demand)	Microbial	Likelihood = Unlikely Consequence = Major **Impact = Medium**	PS06, PS08	Yes-Continuous FAC monitoring at the outlet of reservoir, Chlorine checks on individual tanker delivery. Weekly FAC sampling from the distribution system.	Likelihood = Unlikely Consequence = Minor **Impact= Low**	Upgrade of SCADA system and alarm for low FAC
Contamination through insanitary maintenance or sampling procedures	Microbial	Likelihood = Possible Consequence = Moderate **Impact = Medium**	PS12, PS13	Yes-Residual chlorine in treated water. Water is not sampled directly from the reservoir, Access to reservoir is restricted to trained staff only	Likelihood = Unlikely Consequence = Minor **Impact= Low**	No
Reticulation and/or transfer Pipe failure (eg. Breaks or leak)	Physical Chemical Microbial	Likelihood = Possible Consequence = Moderate **Impact = Medium**	PS07, PS10, PS14	Yes-Reticulation is in relatively good condition, Failures, maintenance and renewals are recorded in council asset management system	Likelihood = Unlikely Consequence = Moderate **Impact= Medium**	Review asset condition

What could happen that may cause drinking-water to become unsafe?	What harmful contaminants could be present?	Maximum Risk – What is the impact if prevention steps ARE NOT in place?	What preventions steps are in place?	Is this Event under control?	Residual Risk – What is the impact if prevention steps ARE in place?	Are any improvements required?
Inadequate controls on maintenance and construction work	Physical Microbial	Likelihood = Possible Consequence = Moderate **Impact = Medium**	PS13, PS14	Yes-Contractors are required to have appropriate reticulation qualifications and to undertake maintenance and construction work in a sanitary manner, E.coli sampled Weekly in distribution system	Likelihood = Unlikely Consequence = Moderate **Impact = Medium**	No
Backflow from consumer connections	Microbial Chemical	Likelihood = Unlikely Consequence = Moderate **Impact = Medium**	PS10	Yes-Non-testable devices are installed at all new connections. FAC maintained at suitable levels throughout the reticulation. There are no industrial connections to the supply E.coli sampled Weekly in distribution system	Likelihood = Unlikely Consequence = Moderate **Impact = Medium**	No
Excessive demand in network or inadequate system capacity.	Physical	Likelihood = Possible Consequence = Moderate **Impact = Medium**	PS08, PS14	Yes-Approximately 36 hours storage in reservoir, Community size is stable and demand has not significantly increased for many years	Likelihood = Unlikely Consequence = Moderate **Impact = Medium**	No

What could happen that may cause drinking-water to become unsafe?	What harmful contaminants could be present?	Maximum Risk – What is the impact if prevention steps ARE NOT in place?	What preventions steps are in place?	Is this Event under control?	Residual Risk – What is the impact if prevention steps ARE in place?	Are any improvements required?
Silt build up within reticulation pipes.	Microbial	Likelihood = Likely Consequence = Minor **Impact = Medium**	PS12, PS14, PS16	Yes-Flushing is undertaken in response to consumer complaints and at regular intervals	Likelihood = Unlikely Consequence = Minor **Impact = Low**	No
Poor planning of maintenance and construction work leaves consumers without water supply.	Physical	Likelihood = Possible Consequence = Moderate **Impact = Medium**	PS13, PS14, PS15	Yes-24 hours' notice is given for planned shutdowns of network. Customer service is kept informed. Temporary alternative supply provided if shut down exceeds 8 hours	Likelihood = Unlikely Consequence = Insignificant **Impact = Low**	No
High instantaneous demand (eg. Burst or major fire)	Physical Chemical Microbial	Likelihood = Possible Consequence = Moderate **Impact = Medium**	PS14, PS15	Yes- restricted the fire hydrant use to firefighting purposes only	Likelihood = Unlikely Consequence = Moderate **Impact = Medium**	No
Telemetry/Control system failure -Loss of online monitoring (potential causes include power cut ,natural disaster)	Microbial	Likelihood = Possible Consequence = Moderate **Impact = Medium**	PS14	Yes-Arrange manual sampling until telemetry restored	Likelihood = Unlikely Consequence = Moderate **Impact = Medium**	No
Other						
Inadequate sampling programme or sample collection error	Microbial Chemical	Likelihood = Possible Consequence = Moderate **Impact = Medium**	PS14	Sampling programme prepared and checked against DWSNZ.	Likelihood = Unlikely Consequence = Minor **Impact = Low**	No

What could happen that may cause drinking-water to become unsafe?	What harmful contaminants could be present?	Maximum Risk – What is the impact if prevention steps ARE NOT in place?	What preventions steps are in place?	Is this Event under control?	Residual Risk – What is the impact if prevention steps ARE in place?	Are any improvements required?
inadequate sampling programme, sample collection error or response to transgression.	Microbial Chemical	Likelihood = Possible Consequence = Moderate **Impact = Medium**	PS14	Yes-Sampling programme prepared and checked against standards. Relevant staff well trained and qualified	Likelihood = Unlikely Consequence = Minor **Impact = Low**	No
Failure of staff or lab to follow approved methods/ quality assurance procedures	Microbial Chemical	Likelihood = Possible Consequence = Moderate **Impact = Medium**	PS14	Yes-Only use IANZ accredited lab	Likelihood = Unlikely Consequence = Minor **Impact = Low**	No
Inadequate/incorrect test equipment or incorrectly calibrated test equipment. Inadequate/incorrect reagents	Microbial Chemical	Likelihood = Possible Consequence = Moderate **Impact = Medium**	PS13, PS14	Yes-Use approved SOPs and equipment for calibration	Likelihood = Unlikely Consequence = Minor **Impact = Low**	No
Illegal connections/cross connections	Microbial	Likelihood = Possible Consequence = Moderate **Impact = Medium**	PS14	Yes-Monitor usage-Inspection of the system for cross connections. Weekly water quality sampling in place	Likelihood = Unlikely Consequence = Minor **Impact = Low**	No
Supply equipment fails due to inadequate asset information and inadequate maintenance planning	Physical	Likelihood = Unlikely Consequence = Moderate **Impact = Medium**	PS14	Yes-Maintenance is planned and undertaken by competent staff Specialist maintenance is contracted out as required	Likelihood = Unlikely Consequence = Moderate **Impact = Medium**	No

What could happen that may cause drinking-water to become unsafe?	What harmful contaminants could be present?	Maximum Risk – What is the impact if prevention steps ARE NOT in place?	What preventions steps are in place?	Is this Event under control?	Residual Risk – What is the impact if prevention steps ARE in place?	Are any improvements required?
Inadequate spare parts held or spare parts unavailable.	Physical	Likelihood = Unlikely Consequence = Moderate **Impact = Medium**	PS08, PS13, PS14	Yes-Spare parts are held for some things and replacement spares parts are usually available overnight. Approximately 36 hours storage allows supply to continue while parts are located and repairs made	Likelihood = Unlikely Consequence = Moderate **Impact = Medium**	No
Insufficient, inadequate out of date or incorrect manual of operational procedures	Physical Chemical Microbial	Likelihood = Unlikely Consequence = Moderate **Impact = Medium**	PS13, PS14	Yes-Plant has operations and maintenance manuals Plant operators have a good knowledge of plant operation	Likelihood = Unlikely Consequence = Moderate **Impact = Medium**	No
Poor aesthetic quality of water not identified	Physical	Likelihood = Possible Consequence = Moderate **Impact = Medium**	PS14, PS16	Yes-Complaints investigated Aesthetic quality of water has been assessed and is acceptable	Likelihood = Unlikely Consequence = Moderate **Impact = Medium**	No
Inadequate training, professional development and upskilling of operators	Physical Chemical Microbial	Likelihood = Unlikely Consequence = Minor **Impact = Low**	PS13, PS14	Yes-Operators hold relevant NZ Certificate or Diploma qualifications On-going training and up-skilling is provided for operators	Likelihood = Unlikely Consequence = Minor **Impact = Low**	No

What could happen that may cause drinking-water to become unsafe?	What harmful contaminants could be present?	Maximum Risk – What is the impact if prevention steps ARE NOT in place?	What preventions steps are in place?	Is this Event under control?	Residual Risk – What is the impact if prevention steps ARE in place?	Are any improvements required?
Catastrophic natural disaster or failure including earthquake, flooding	Physical Chemical Microbial	Likelihood = Rare Consequence = Catastrophic **Impact = Medium**	PS14	Yes-Prior warning from Govt agencies incl Met Office, NIWA, Civil Defence, Regional Council or Police Robust secure plant structures and buildings System and people backups Business continuity plan in place and exercised Emergency response plan	Likelihood = Rare Consequence = Catastrophic **Impact = Medium**	No
Failure of supply due to power outage	Physical Chemical Microbial	Likelihood = Possible Consequence = Moderate **Impact = Medium**	PS08, PS14	Yes-Approximately 36 hours storage. A portable generator could be installed within two days. Distribution zone is supplied under gravity	Likelihood = Possible Consequence = Moderate **Impact = Medium**	No
Third party damage	Physical Chemical Microbial	Likelihood = Possible Consequence = Moderate **Impact = Medium**	PS14	Yes-Field crews operates to repair damage within Service Level Agreement (SLA)	Likelihood = Unlikely Consequence = Moderate **Impact = Medium**	No

3.0 Improvement Plan

3.1 Prevention Step Improvements

ID	Task	Priority	Proposed completion date	Cost estimate	Accountability/Owner
PS01	Install dedicated filling stations for tanker filling	Medium	2021/22	TBC	Production Manager
PS03	SCADA upgrade and alarm for low FAC	Low	August 2021	12K	Production Manager

An options assessment for the future servicing of the community is underway. A paper assessing the requirements to achieve the draft water quality standards from Taumata Arowai is being produced. This paper supports one aspect for consideration; the other options include returning the community to private supplies (which would require a referendum), or continuing the tanker option. These options will be assessed in consultation with the community, Waikato Drinking Water Assessment Service and Wai-comply engagement to set the direction for the future.

3.2 Risk Assessment Improvements

Project No.	Project Type	Priority (based on residual risk)	Proposed completion date	Cost estimate	Accountability/Owner
1	Install dedicated filling stations for tanker filling	Medium	2021/22	TBC	Production Manager
2	Review asset condition and option for reservoir replacement.	Medium	2021/22	TBC	Networks Manager

3	Review of reservoir/ receiving tank security.	Medium	2021/22	TBC	Operations/Production Manger
4	SCADA upgrade and alarm for low FAC	Low	August 2021	12K	Production Manager

4.0 Standard Operating Procedures

Operational procedures include a defined set of performance criteria to assess and confirm the performance of the components of the water supply.

Controlled copies of these documents are stored electronically in O:\Ops\Watercare Waikato\Training and are accessible by operations staff. Changes to the procedures must be approved by the person responsible for document control.

Staff records confirm that operations staff have been trained in procedures appropriate to and recorded in the Watercare (Waikato) Training Matrix 2019-21 which is saved electronically. Training records can be sighted at WDC offices during DWAs audits.

Operational and maintenance procedures have been prepared for all components of the water supply. Operational and maintenance procedures at Watercare are grouped as following:

- Standard Operating Procedures (SOPs)
- Functional Descriptions (FDs)
- Process related drawings (P&IDs and PFDs)
- Operational Manuals
- Calibration Manuals
- Maintenance Schedules

Operational Documents include a defined set of performance criteria to assess and confirm the performance of the components of the water supply. Performance criteria are defined across Watercare's water supply system based on the principal to allow enough time for actions to be taken to bring the system back under control before the DWSNZ compliance limits are breached. Due to the number of SOP's available WSL has not attached to this report but available for review if required. As an example, the Carry Out Reservoir Inspection has been attached as Appendix F.

Te Akau water supply site-specific SOPs and Operations Manuals are listed in the table below

Title	To access listed document
Operations	
Tanker Filling Procedure	O:\Ops\Watercare Waikato\Training
Tanker Delivery Procedure	O:\Ops\Watercare Waikato\Training
Perform a Primary Calibration on the pH Analyser	O:\Ops\Watercare Waikato\Training
Perform a Primary Calibration on Treated Water Chlorine Analyser	O:\Ops\Watercare Waikato\Training
Perform a Primary Calibration for Turbidity Analyser	O:\Ops\Watercare Waikato\Training
Perform Verification for the Chlorine Analyser	O:\Ops\Watercare Waikato\Training
Perform Verification for the pH Analyser	O:\Ops\Watercare Waikato\Training
Perform Verification for Turbidity Analyser	O:\Ops\Watercare Waikato\Training
Carry Out Reservoir Inspections	O:\Ops\Watercare Waikato\Training
Customer Water Quality Complaint	O:\Ops\Watercare Waikato\Training
Flush a water main (routine and Reactive)	O:\Ops\Watercare Waikato\Training
Install _ Replace a Faulty Water Meter	O:\Ops\Watercare Waikato\Training
Inspect and Test Hydrants	O:\Ops\Watercare Waikato\Training
Investigate a Water Pressure or Flow Complaint	O:\Ops\Watercare Waikato\Training
Perform a chlorine test to check for potable water	O:\Ops\Watercare Waikato\Training

Title	To access listed document
Repair a Major Water Break	O:\Ops\Watercare Waikato\Training
Repair a Minor Water Break	O:\Ops\Watercare Waikato\Training
Undertake a Water Shutdown (Planned or unplanned)	O:\Ops\Watercare Waikato\Training

Appendices

Appendix A: Water Quality Monitoring from start of supply

Sample Date	Description	Total Coliforms	E.coli	Chlorine Residual	Turbidity	pH	Bromate	Chlorate
4/05/2021	Te Akau Treated	<1.0 MPN/100mL	<1.0 MPN/100mL	0.52 mg/L	0.35 NTU	8.2	<0.005 mg/L	<0.01 mg/L
4/05/2021	Te Akau Post Reservoir	<1.0 MPN/100mL	<1.0 MPN/100mL	0.53 mg/L	0.2 NTU	8.1	<0.005 mg/L	<0.01 mg/L
4/05/2021	TEA009TE 561 Te Akau Wharf Rd	<1.0 MPN/100mL	<1.0 MPN/100mL	0.6 mg/L	0.15 NTU	8.1	<0.005 mg/L	<0.01 mg/L
1/05/2021	Te Akau Treated	<1.0 MPN/100mL	<1.0 MPN/100mL	0.66 mg/L	0.35 NTU	8.1	<0.005 mg/L	0.019 mg/L
1/05/2021	Te Akau Post Reservoir	<1.0 MPN/100mL	<1.0 MPN/100mL	0.6 mg/L	0.2 NTU	8.2	<0.005 mg/L	0.013 mg/L
1/05/2021	TEA009TE 561 Te Akau Wharf Rd	<1.0 MPN/100mL	<1.0 MPN/100mL	0.55 mg/L	1.7 NTU	8.1	<0.005 mg/L	0.018 mg/L
20/04/2021	Te Akau Treated	<1.0 MPN/100mL	<1.0 MPN/100mL	0.63 mg/L	0.25 NTU	8.1	<0.005 mg/L	0.048 mg/L
20/04/2021	Te Akau Post Reservoir	<1.0 MPN/100mL	<1.0 MPN/100mL	0.65 mg/L	0.25 NTU	8.1	<0.005 mg/L	0.049 mg/L
20/04/2021	TEA009TE 561 Te Akau Wharf Rd	<1.0 MPN/100mL	<1.0 MPN/100mL	0.72 mg/L	0.45 NTU	8.1	<0.005 mg/L	0.049 mg/L
19/04/2021	Te Akau Treated	<1.0 MPN/100mL	<1.0 MPN/100mL	0.65 mg/L	0.30 NTU	8.1	<0.005 mg/L	0.049 mg/L
19/04/2021	Te Akau Post Reservoir	<1.0 MPN/100mL	<1.0 MPN/100mL	0.72 mg/L	0.70 NTU	8.1	<0.005 mg/L	0.049 mg/L
19/04/2021	TEA009TE 561 Te Akau Wharf Rd	<1.0 MPN/100mL	<1.0 MPN/100mL	0.61 mg/L	0.80 NTU	8.1	<0.005 mg/L	0.049 mg/L
18/04/2021	Te Akau Treated	<1.0 MPN/100mL	<1.0 MPN/100mL	0.68 mg/L	0.25 NTU	8.1	<0.005 mg/L	0.044 mg/L

Sample Date	Description	Total Coliforms	E.coli	Chlorine Residual	Turbidity	pH	Bromate	Chlorate
18/04/2021	Te Akau Post Reservoir	<1.0 MPN/100mL	<1.0 MPN/100mL	0.67 mg/L	0.30 NTU	8.1	<0.005 mg/L	0.044 mg/L
18/04/2021	TEA009TE 561 Te Akau Wharf Rd	<1.0 MPN/100mL	<1.0 MPN/100mL	0.68 mg/L	0.50 NTU	8	<0.005 mg/L	0.044 mg/L
17/04/2021	Te Akau Treated	<1.0 MPN/100mL	<1.0 MPN/100mL	0.65 mg/L	0.20 NTU	8.1	<0.005 mg/L	0.045 mg/L
17/04/2021	Te Akau Post Reservoir	<1.0 MPN/100mL	<1.0 MPN/100mL	0.63 mg/L	0.35 NTU	8.1	<0.005 mg/L	0.045 mg/L
17/04/2021	TEA009TE 561 Te Akau Wharf Rd	<1.0 MPN/100mL	<1.0 MPN/100mL	0.53 mg/L	0.20 NTU	8.1	<0.005 mg/L	0.084 mg/L
16/04/2021	Te Akau Treated	<1.0 MPN/100mL	<1.0 MPN/100mL	0.80 mg/L	0.65 NTU	8.1	<0.005 mg/L	0.094 mg/L
16/04/2021	TEA009TE 561 Te Akau Wharf Rd	<1.0 MPN/100mL	<1.0 MPN/100mL	0.75 mg/L	0.25 NTU	8.1	<0.005 mg/L	0.093 mg/L
15/04/2021	Te Akau Treated	<1.0 MPN/100mL	<1.0 MPN/100mL	0.76 mg/L	0.30 NTU	8.1	<0.005 mg/L	0.093 mg/L
15/04/2021	TEA009TE 561 Te Akau Wharf Rd	<1.0 MPN/100mL	<1.0 MPN/100mL	0.63 mg/L	0.65 NTU	8.1	<0.005 mg/L	0.094 mg/L
14/04/2021	TEA009TE 561 Te Akau Wharf Rd	<1.0 MPN/100mL	<1.0 MPN/100mL	1.63 mg/L	0.30 NTU	8.1	<0.005 mg/L	0.1 mg/L
14/04/2021	Te Akau Treated	<1.0 MPN/100mL	<1.0 MPN/100mL	0.25 mg/L	0.30 NTU	8.1	<0.005 mg/L	0.095 mg/L
14/04/2021	Te Akau Post Reservoir	<1.0 MPN/100mL	<1.0 MPN/100mL	0.63 mg/L	0.40 NTU	8.1	<0.005 mg/L	0.096 mg/L
13/04/2021	Te Akau Treated	<1.0 MPN/100mL	<1.0 MPN/100mL	0.76 mg/L	0.10 NTU	8.1	<0.005 mg/L	0.11 mg/L
13/04/2021	TEA009TE 561 Te Akau Wharf Rd	<1.0 MPN/100mL	<1.0 MPN/100mL	0.79 mg/L	1.4 NTU	8	<0.005 mg/L	0.17 mg/L
12/04/2021	Te Akau Treated	<1.0 MPN/100mL	<1.0 MPN/100mL	1.35 mg/L	0.60 NTU	7.6	<0.005 mg/L	0.78 mg/L
12/04/2021	TEA009TE 561 Te Akau Wharf Rd	<1.0 MPN/100mL	<1.0 MPN/100mL	1.43 mg/L	0.65 NTU	7.4	<0.005 mg/L	0.78 mg/L

Sample Date	Description	Total Coliforms	E.coli	Chlorine Residual	Turbidity	pH	Bromate	Chlorate
11/04/2021	Te Akau Treated	<1.0 MPN/100mL	<1.0 MPN/100mL	1.29 mg/L	0.50 NTU	7.5	<0.005 mg/L	0.77 mg/L
11/04/2021	TEA009TE 561 Te Akau Wharf Rd	<1.0 MPN/100mL	<1.0 MPN/100mL	1.29 mg/L	1.1 NTU	7.4	<0.005 mg/L	0.77 mg/L
10/04/2021	Te Akau Treated	<1.0 MPN/100mL	<1.0 MPN/100mL	1.29 mg/L	0.55 NTU	7.5	<0.005 mg/L	0.76 mg/L
10/04/2021	TEA009TE 561 Te Akau Wharf Rd	<1.0 MPN/100mL	<1.0 MPN/100mL	1.46 mg/L	0.20 NTU	7.5	<0.005 mg/L	0.76 mg/L
9/04/2021	Te Akau Treated	<1.0 MPN/100mL	<1.0 MPN/100mL	1.45 mg/L	0.85 NTU	7.5	<0.005 mg/L	0.75 mg/L
9/04/2021	Te Akau Post Reservoir	<1.0 MPN/100mL	<1.0 MPN/100mL	1.43 mg/L	0.20 NTU	7.4	<0.005 mg/L	0.75 mg/L
9/04/2021	TEA009TE 561 Te Akau Wharf Rd	<1.0 MPN/100mL	<1.0 MPN/100mL	1.45 mg/L	0.85 NTU	7.4	<0.005 mg/L	0.79 mg/L

Appendix B: Commitment to Drinking Water Quality

Please see attached.

Appendix C: Stakeholder List

Please see attached.

Appendix D: Waikato District Council Community Engagement Strategy

Please see attached.

Appendix E: Training Matrix

Please see attached.

Appendix F: Standard Operating Procedure

Please see attached.

Watercare's commitment to drinking water quality

Watercare Services Limited (Watercare) is committed delivering safe, high-quality drinking water that consistently meets the expectations of the *New Zealand Drinking Water Safety Plan Framework;* the requirements of the Health Act; the *Drinking Water Standards for New Zealand*; and other regulatory and consumer requirements.

To achieve this, Watercare works in partnership with stakeholders and relevant agencies to:

- **Manage water sources effectively**
  - We acknowledge that protecting our water sources is a critical part of our job and helps to keep our customers safe from waterborne illnesses.

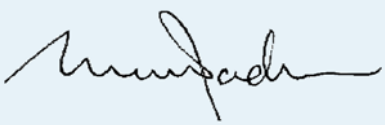
- **Treat water to a high standard and distribute it safely**
  - We take great care when treating water and make sure it is well managed as it travels from its source, through our plants and networks, to our customers.
  - We ensure there are multiple barriers that prevent contamination and protect our customers from harm.

- **Manage risks and respond to change**
  - We use a preventive risk-based approach in which potential threats to water quality and quantity are identified and managed.
  - We carry out contingency planning and focus on developing our incident response capability.
  - We know that contamination is usually preceded by some kind of change (including changes to processes and hazardous events) and therefore we monitor and respond to change.

- **Listen and respond to stakeholder feedback**
  - We listen to stakeholder feedback and integrate their expectations into our planning.
  - We continually improve our practices by assessing performance against corporate commitments, stakeholder expectations, and regulatory requirements.

- **Meet regulatory requirements and contribute to nationwide conversations on water quality**
  - We monitor the quality of our drinking water and provide timely information to stakeholders to promote confidence in the water supply and our management of it.
  - We participate in investigative activities to ensure continued understanding of drinking water quality issues and performance.

All managers and employees involved in the supply of drinking water are responsible for understanding, implementing, maintaining and continually improving the drinking water quality management system.



Raveen Jaduram
Chief Executive Officer, Watercare Services Limited

Date 4 September 2019

Watercare
An Auckland Council Organisation

APPENDIX C –
List Internal Stakeholder – WSL water supplier staff

Activity	***Name***	***Email***	***Phone***
Ops Manager Waikato	Mathew Telfer	Mathew.telfer@water.co.nz	021 495 300
Principal Water Quality Scientist	Tatiana Derevianko,	Tatiana.Derevianko @water.co.nz	021 555 482
Water Quality Analyst	Bliss Pappachan,	Bliss.Pappachan @water.co.nz	021 319 662
Production Manager	Gil Miers	Gil.Miers@water.co.nz	
Process Engineer/Technologist Water	Nigel Connolly	Nigel.Connolly @water.co.nz	027 283 3078
Treatment Plant Operators	Rhiannan Rollitt, Cesar Waksman, Mark Doughty, Tony Gray and Quinn Coyle		Contact Nigel Connolly
Operations Manager	Robert Ball	Robert.Ball@water.co.nz	027 839 0892
Senior Operations Engineer/Technician	Ross Dillon	Ross. Dillon	027 279 4346
Waikato Network Supervisor - Watercare	Joshua Deane	Joshua.Deane@water.co.nz	027 702 6718
Waters Team Leader	Jimmy Foggin	James.Foggin@water.co.nz	027 215 7793
Water networks Servicemen	Roger Smith, Michael Hodgson, Caleb Deane, Tahi Don, Rex Wilbore and Jacob Patterson		Contact Josh Deane
Infrastructure Manager	Richard Pullar	Richard.Pullar@water.co.nz	

List External Stakeholder – Te Akau

	Name	*Contact*	*Responsible*
Government	Waikato Drinking Water Assessment Service Waikato District Health Board	Mark Palmer Ph: 021 982 218 – Mark.Palmer@waikatodhb.health.nz Matt Molloy Ph: Matthew.Molloy@waikatodhb.health.nz Drinking Water Assessor / Technical Manager	WSL Water Quality Analyst
	Wai-Comply	Josh Takao josh.takao@waicomply.co.nz Senior Compliance Advisor/ Drinking Water Assessor	WSL Water Quality Analyst
	Waikato District Council	Gavin Ion; Gavin.Ion@waidc.govt.nz 07 824 8633 Carole Nutt; Carole.Nutt@waidc.govt.nz	CEO Ops Manager Waikato
	Waikato Regional Council	Ed Prince Edward.Prince@waikatoregion.govt.nz General compliance rudcompliancedata@waikatoregion.govt.nz	WSL Water Quality Analyst
Dialysis Patients	REGIONAL RENAL CENTRE Home Haemodialysis Unit Ph (07) 8398741	Sandra Wellington , Clinical Nurse Specialist, Home Haemodialysis Unit, Waikato Hospital p +64 7 839 8741 m +64 21 762973 Sandra.Wellington@waikatodhb.health.nz	WSL Water Quality Analyst
Schools, pre-schools, kindergartens	Te Akau School – 953 Te Akau Rd, Te Akau 3793 Ph: 07 825 4777	office@teakau.school.nz	WSL Water Quality Analyst
Waters Committee and Fire Departments	Te Akau South Water Committee	Anaru Wilson, Chairman Horongarara Community Group teakausouth@gmail.com	WSL Water Quality Analyst

	Fire Emergency New Zealand	Kevin Holmes, Senior Fire Risk Management Officer/Specialist Fire Investigator kevin.holmes@fireandemergency.nz	WSL Water Quality Analyst









Listening to you...

...our community engagement strategy

Waikato
DISTRICT COUNCIL
Te Kaunihera aa Takiwaa o Waikato

Listening to you... our Community Engagement Strategy

Outlines a plan of action that Council are will undertake to enable your views to be heard more clearly when you want to have a say about the things we are doing.

This strategy has been under development since 2012 and is the result of you telling us you wanted more effective and more relevant ways to have input into Council's decision-making.

The Community Engagement Strategy has a life of three years after which we'll review it, with your input and feedback welcome, to see if we are on the right track.

Why have we developed this strategy?

The Local Government Act defines the purpose of local government as being to 'meet the current and future needs of communities for good-quality local infrastructure, local public services, and performance of regulatory functions in a way that is most cost-effective for households and businesses'. It also requires councils to 'give consideration' to the views and preferences of people affected by their decisions.

And while councils have always given consideration to the views of its residents through consultation, we accept this is a very formal process and tends to come at the stage when decisions are already drafted.

Engagement comes at the pre-drafting stage and allows you to be involved at the earliest stage of the decision-making process.

We want to make engagement easier for everyone in the community so we've developed this strategy in order to become more responsive and better at listening to you.

We want to:

- ***be clearer about who to engage with, when and how***
- ***include a diversity of views in our decision-making process***
- ***ensure we invest in engagement to get the best bang for our buck***
- ***improve relationships with all people and groups in the Waikato***
- ***meet all legal obligations***
- ***include our Treaty partners.***

What does the strategy cover?

- ***Our main goal***
- ***Underpinning principles***
- ***The actions we are committed to undertaking***
- ***How we will measure the Community Engagement Strategy's effectiveness.***

At the end of this document is a glossary to help clarify any jargon we use.

Appendix One outlines the process we followed to develop this strategy.

Council has also adopted a Significance and Engagement Policy which identifies the degree of significance attached to particular issues, proposals, assets, decisions and activies. (See our website).

This strategy has been developed, based on your feedback, to:

- ***enable us to make better informed decisions***
- ***make it easier for you to have your say when you want to***
- ***make options for having your say clearer***
- ***be more efficient in our systems and processes.***

Our main goal is to make it easier for you to have your say and for us to hear and understand your views before decisions are finalised.

Principles that underpin our community engagement strategy

The Waikato District Council exists through statute. This statute includes having elected members making cost-effective decisions for the current and future needs of the people who live here. It specifically states that councils should 'give consideration' to the views and preferences of people affected by their decisions.

To do this really well benefits from having input from more minds, more experience and more diversity than we can ever have around the council's decision-making table.

Community engagement enables us to do this.

The principles we consider most important to achieve this are as follows.

1. We will be prepared

We will ensure we are prepared well in advance of formal decision-making processes on issues relevant to you and provide appropriate ways for you to hear and understand what is being proposed or planned at the earliest opportunity.

We will ensure the relevant history and purpose of the proposal are reviewed and then explained clearly.

We will do our best to ensure that different community engagement processes are 'joined-up' where possible - recognising that your time is limited and noting that 'joined-up' communication is more sensible.

2. We will be inclusive

We will make sure we have explored all reasonable avenues for contacting groups or individuals who may have an interest in an activity or proposal that is coming before the council. We will make sure our information is accessible and available across the widest (and most cost-effective) and most 'fit for purpose' means.

We will make additional efforts to engage those whose voices may not normally get heard. This may include going the extra mile to maximise the opportunity for some groups to be heard.

We will develop and build relationships that enhance open dialogue and conversation.

3. We will be flexible, responsive, timely

We will provide different ways you can engage with us, and listen to you about the ways that work best for you.

We will do our best to respond in a timely manner.

4. We will be open, honest and respectful

We will be open to your ideas and constructive in our feedback. This includes being considerate of your views and weighing them as we consider our proposals.

We will do our best to be clear and will always be honest in the sharing of knowledge and process.

We will always respect your privacy.

5. We will be accountable

We will be transparent in our decision-making and you will be able to see how your input has had an effect.

We will communicate the outcome of our decision-making to you either personally or through appropriate, thoughtful means.

Actions we are committed to undertaking

A strategy has actions that state how we are going to achieve the goal. Not all actions can be achieved at once as some take time to implement. The actions described below are staged to ensure we do things in the right order and maximise the opportunity we have to get them right.

While we are implementing the actions outlined below we will do our best to ensure that our principles still underpin any engagement activity we undertake.

Action 1 – Databases enhanced

Enhance the existing databases to include specific interest groups and submitters for any current and anticipated community engagement activity.

This database will use existing information and will be grown over time to include new interest groups. It will be updated on a regular basis.

Action 2 – Processes developed

(a) Specific interest groups will be contacted so they have the opportunity to be made aware of matters that may be of interest to them. This may include regular newsletters, emails, social media or other forms of engagement.

(b) A process will be established for receipt and acknowledgment of all community engagement inputs – this includes informal and formal inputs.

Action 3 – Opportunities provided

A range of opportunities to provide your views will be provided and promoted every time an issue requires engagement with you.

Our Significance and Engagement Policy outlines the type of issues and engagement opportunities that may be considered.

These include such things as web forums, pamphlet drops, advertisements, submission processes, council 'Open Days' in your area, fronting up at your meetings, suggestion boxes in places you frequent and events that are targeted to your needs.

Action 4 – Duplication will be avoided

Where possible we will first check other relevant projects, activities or issues and consult once to ensure that we are making efficient use of your time.

Consideration will be given to timing of engagement activity so, where possible, it can be joined up with other activities.

Action 5 – Communication established

Feedback or engagement with us on projects, activities or issues to any community engagement process will be available online or on request (unless confidentiality is specifically requested).

Action 6 – Feedback

The outcomes/decisions resulting from our community engagement will be provided to participants (assuming they are named) and made publicly available on our website or on request.

Measuring the effectiveness of our strategy

Our goal is to **make it easier** for you to have your say and for us to hear and understand your views before decisions are finalised.

Waikato District Council can only assess how well we are progressing towards this goal if you provide the feedback.

There are three ways we will measure this strategy and whether or not we are achieving our goal.

Annual residents' survey

How well we are doing this will mostly be on be on a case-by-case basis although a more general question will be asked of all residents such as:

- do you think Waikato District Council has provided you with sufficient opportunities for your views to be heard on matters that are important and of interest you?

Follow-up participant surveys

With regard to discrete issues or place-based proposals and activities, the Council will be taking action to ensure that the principles of this community engagement strategy are met.

For example: Waikato District Council has provided online and hard copy feedback forms, online and hard copy surveys, held public meetings for your views to be heard on important issues like Psychoactive Substances, Gambling Policy amd Local Alcohol Plans. Were you interested in these? If you were do you think it was easy to have your views heard? And did your views get acknowledged?

Numbers of views that have been received

The number of participants in a process is a good way to measure engagement noting that 'participants' does not equal 'submitters'. Sometimes an input to a process is by making a comment by phone or to a staff member.
(See action 3 - Opportunities provided)

Glossary

Strategy: a strategy is a plan of action designed to achieve a long-term or overall aim.

Consultation: a formal statutory process asking for feedback on a specific proposal or plan. Consultation may provide options for consideration. It will involve a formal submission process.

Engagement: a two-way process that involves dialogue between citizens and the council to consider an idea and/or create a proposal. It is a conversation and does not necessarily have any formal submission process. Engagement is also the way we describe a whole range of processes that enable us to listen to your views of which consultation is a subset.

Community: any grouping of people with an agreed or potential interest in a particular proposal.

Specific interest groups: any group of persons who have an interest in common which is relevant to a council project, activity or issue. They do not need to be formalised in any way.

Key stakeholder: generally a more formalised version of a 'specific interest group'.

Place-based: specific to a community that has been defined by location.

Information: material that enhances understanding, awareness or clarity and does not invite feedback.

Joined up: characterised by coordination and coherence of thought; integrated.

Fit for purpose: well-equipped or well suited for its designated role or purpose.

Appendix One: Process we followed to develop the strategy

A community engagement project concept was formulated in 2012, based on feedback and analysis received from our 2011 and 2012 Customer Needs Surveys. And preferred consultation methods identified through feedback received from Councillors, Community Boards, Iwi, staff and members of the public through the development of our 2012-2022 draft Long Term Plan. The purpose of the project was to develop a strategy and terms of reference in response to gaps in our consultation process and other engagement experiences.

As part of the project a community engagement working group was established (which included representation from our rural community, Federated Farmers, Community Boards and Committees, Iwi representation, Councillors and staff) who met during 2012 and 2013 to brainstorm the perceived and real issues of community engagement and how to best serve our communities going forward. The feedback we received identified common areas of concern and has informed our approach in developing the Community Engagement Strategy.








Waikato
DISTRICT COUNCIL
Te Kaunihera aa Takiwaa o Waikato

Appendix E: Training Matrix

Training Required	
Mandatory	To review 1 Oct 2020
Acknowledge	Acknowledged holds
Optional	

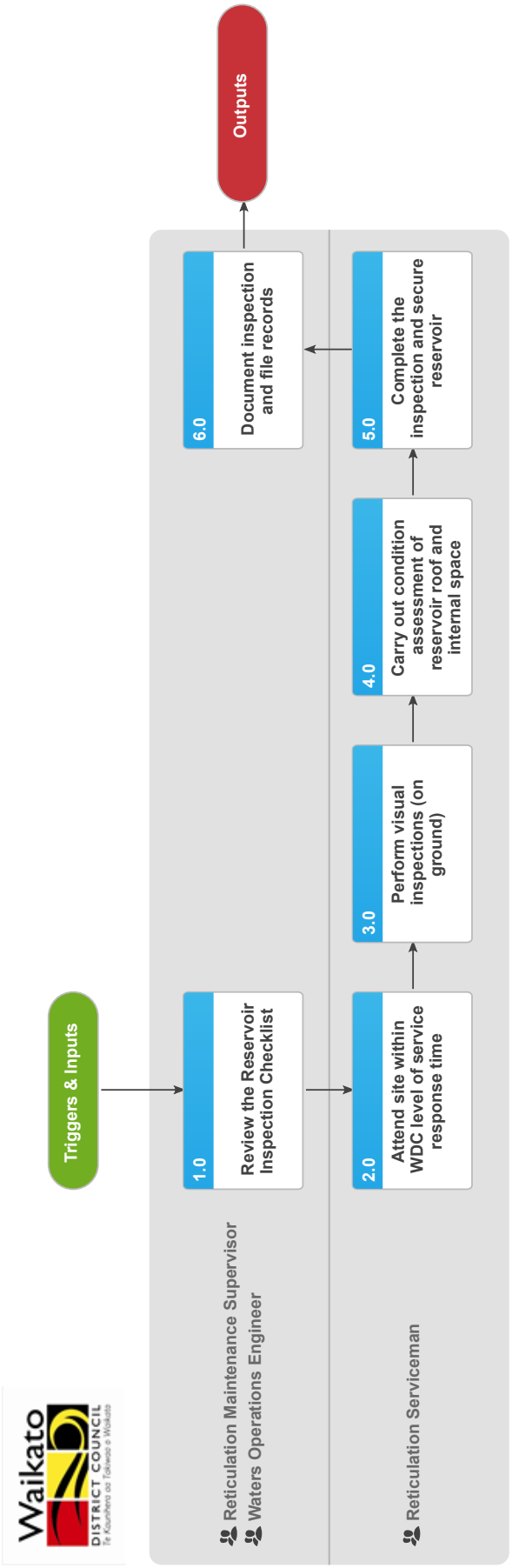
TASKS and/or ACTIVITIES	Review	Production	Gil Miers - Manager	Nigel Connelly - Process Engineer/Technologist	Alicia Blom - Mainatenance Controller	Quinn Coyle - Water Treatment Operator	Cesar Waksman - Water Treatment Operator	Mark Doughty - Water Treatment Operator	David Luke - Water Treatment Operator	Danny Duffull - Water Treatment Operator	Tony Grey - Water Treatment Operator	Operations	Rob Ball - Manager	Ross Dillon - Senior Operations Engineer/Technician	Dan Su - Operations Engineer/Technician	Abbs Safa - Operations Engineer/Technician	Josh Deane - Network Supervisor	Jimmy Foggin - Water Team Leader	Caleb Deane - Network Serviceman	Michael Hodgson - Network Serviceman	Rex Wilbore - Network Serviceman	Tahi Don - Network Serviceman	Jacob Patterson - Network Serviceman	Brain Tahu - Wastewater Team Leader	Major Kahukura - Network Serviceman	Ross Erihe - Network Serviceman	Mark Thomas - Network Serviceman	Roger Smith - Network Serviceman
Drivers Licence (Full)																												
Comprehensive First Aid																												
Advanced Driving Competence																												
Confined space & Gas Detection																												
Height Safety																												
LTSA Basic TC level 1																												
Breathing Apparatus Operational																												
H&S Inductions																												
Inoculations																												
On Call																												
Fire Extinguisher course																												
Wetwell																												
Sewer																												
Water Safety Training (Workplace water safety)																												
Chemical Awareness																												
Chemical Handler																												
Chlorine Gas Handling																												
Chain Saw course																												
Water																												
Rechlorination																												
Wastewater																												
LTSA STMS level 1																												
Elevated work platforms																												
Trailer mounted MEWP																												
Hiab																												
Dogman																												
Gantry Operation																												
Wheeled Tracks and Rollers																												
CLASS 2 (HT)																												
CLASS 4																												
OSH & F Endorsement Course (Forklift)																												
Fire Warden																												
Permit Receiver																												
Isolations Procedure																												
Team Leader (Mentor)																												
Supervisor Water (Mentor) (EMA NZ Certificate in Business and Communication)																												
Supervisor Wastewater (Mentor) (EMA NZ Certificate in Business and Communication)																												
Relevant Industry qualification Level 5																												
Relevant Industry qualification Level 4																												
Relevant Industry qualification Level 2																												
Service / Industry experience 1				16	1	5.00	2.00	3.00	8.00	14.00	15.00																	
Service / Industry experience 5																												
Service / Industry experience 10																												
Service / Industry experience 20																												
Service / Industry experience 30																												
Service / Industry experience 40																												
Mentoring new wsl staff																												
Watercare induction trainings																												
Safe workplace																												
Work Place First Aid Training (Basic 6402/ Level 1 -6401 / Level 2-6400)																												
Personal safety/security at work																												
Fire Warden Training																												
MHF Emergency and Evacuation Plan																												
Emergency Drill																												
Fire Extinguisher																												
Healthy Hearts																												
Stress																												
Safe manual handling (Lifting)																												
Site Safety Audit Inspection Training (Synergi)																												
Site Safe training																												
Water Safety Training																												

AA/JSA/PTW Procedure																												
Height Training																												
Isolation competency - Isolation training																												
Confined Space and Gas Detection																												
Technical Trainings																												
Certified Chemical Handlers Training																												
Cl2 connect & Disconnect training																												
Chlorine Facility Operation Competency																												
Breathing Apparatus Operational Training																												
Chemical site induction? Refresher?																												
Gantry Crane Overhead Training																												
VHF Radio Transmitter Use and Operation Training? 10y refresher?																												
Forkhoist Driver Training																												
Drinking water standards (know where to find regulatory requirements, understand																												
Water Safety Plans																												
Environmental																												
Chemical spill management training (include dechlorination procedure)																												
Chemical delivery management, i.e: bunds valves at WKO)																												
Resource consents limits and Discharge Management Plans understanding																												
Professional developement																												
Health and safety Leadership training																												
Incident response investigation and injury management																												
Contractor management																												
National Certificate in Drinking Water Treatment																												
National Diploma in Drinking Water Treatment																												
Workplace Assessor - Certificate																												
CPEng																												
Management Training - University Level																												
Site Safety Supervisors Training																												
IPENZ Project Management Training																												
KT Project Management																												
KT Problem Solving & Decision Making																												
Quality Auditing - Internal Auditing																												
DeltaV Implentation																												
SAP (to be further detailed?)																												
PI User Training																												
Advanced Report Writing Skills																												
Finance for Non-financial Managers																												
Presentation Skills Training																												
Microsoft Word Skills - Basic																												
Microsoft Word Skills - Advanced																												
Microsoft Excel Skills - Basic																												
Microsoft Excel Skills - Advanced																												
Maintenance Planners School - Maintenance Planning																												
Finance training - WSL by numbers																												

Standard Operating Procedures (SOPs)																													
Production																													
Isolations Procedure	Annually																												
Chlorine Gas Drum Changeover	Annually																												
Physical Entry into Treated water reservoirs/chamber	Annually																												
UV module Cleaning	Annually																												
Manage a Level 1 Minor Local (Contained) Chlorine Gas Leak	Annually																												
Manage a Level 2 Moderate Local (Contained) Chlorine Gas Leak	Annually																												
Manage a Level 3 Major Local (Uncontained) Chlorine Gas Leak	Annually																												
UV Sensor Check - Raglan	Annually																												
Transport and Install Raglan Generator	Annually																												
Spill Free Chlorine Buffer (solution)	Annually																												
Manage spill of Phosphoric acid (solution)	Annually																												
Enter Data into the weekly verification tab	Annually																												
Enter data into water outlook primary calibration	Annually																												
Manage SCADA On-Call and Alarm system – Treatment Plants	Annually																												
Respond to SCADA Alarms for Treatment Plants	Annually																												
Create a Trends Page on Archestra	Annually																												
Perform a Calibration for the real UV254 (realtech)	Annually																												
Perform a Primary Calibration for the Chlorine Analyser (Deplox 3)	Annually																												
Perform a Primary Calibration on the Hach Turbidimeter	Annually																												
Perform a Primary Calibration on the pH Analyser (Crius)	Annually																												
Perform a Primary calibration on the pH analyser (Depolox 3)	Annually																												
Perform a Primary Calibration on Treated Water Chlorine Analyser	Annually																												
Perform a Verification for the Chlorine Analyser (Crius)	Annually																												
Perform a Verification for the Chlorine Analyser (Depolox 3)	Annually																												
Perform a Verification for the Hach Turbidimeter	Annually																												
Perform a Verification for the pH Analyser (Crius)	Annually																												
Perform a Verificiation for the pH Analyser (Depolox 3)	Annually																												
Undertake a Water Shutdown (Planned or unplanned)	Annually																												
Operations																													
Carry Out Reservoir Inspections	Annually																												
Customer Water Quality Complaint	Annually																												
Flush a water main (routine and Reactive)	Annually																												
Install Replace a Faulty Water Meter	Annually																												
Inspect and Test Hydrants	Annually																												
Installing a New Hydrant or Valve	Annually																												
Investigate a Water Pressure or Flow Complaint	Annually																												
Manage SCADA On-Call System - Reticulation	Annually																												
Perform a chorine test to check for potable water	Annually																												
Remove _ Reinstall Flow Restrictors in Rural Metered Water Connections	Annually																												
Repair a Major Water Break	Annually																												
Repair a Minor Water Break	Annually																												
Undertake a Water Shutdown (Planned or unplanned)	Annually																												
Response Plans																													
Manage Water Mains Failure on Bridge	Annually																												
Respond to Cyanobacteria Bloom (002)	Annually																												
Respond to E. coli in the network	Annually																												
Respond to high chlorine in the network	Annually																												
Respond to High Fluoride in the network	Annually																												
Respond to low chlorine in the network	Annually																												

Carry Out Reservoir Inspections v5.0

Appendix F: Standard Operating Procedures



Carry Out Reservoir Inspections v5.0

Summary

Objective
To provide guidance for routine inspections of reservoirs

Background
Waikato District Council has responsibility for the operational functioning, monitoring and maintenance of 26 reservoirs within the district.
Reservoir sites are rostered for at six monthly inspections, generally mid-year and early December ready for the Christmas break. Some sites will demand more frequent visits depending on the level of site vulnerability and maintenance required. Sites that are visited more frequently should be investigated as there may be a business case to support increased site security, increased storage capacity, upgrade of reservoir assets or improved monitoring and control depending on the local issues.

Owner Robert Ball

Expert Nigel Connolly

Procedure

1.0 Review the Reservoir Inspection Checklist
Reticulation Maintenance Supervisor, Waters Operations Engineer

a Print off the reservoir inspection checklist and confirm the servicepersons for carrying out the inspections.

2.0 Attend site within WDC level of service response time
Reticulation Serviceman

NOTE **SAFETY ALERT: this task will require at least two servicepersons due to working at heights**

a Complete Take 5 (hazard identification) form

b Ensure that correct PPE and equipment available for required works

c Ensure to spray all tools, fittings and equipment use with the 1% Sodium Hypochlorite mixture in supplied spray bottles

d Speak with affected customers and advise property owners before entering private property to access reservoirs

e Set up temporary traffic management where required

f Secure the work site(s) and make sure, this includes the user of barriers and cones

3.0 Perform visual inspections (on ground)
Reticulation Serviceman

a Check the site and reservoir for any health and safety issues. If an issue is identified or something that has the potential to become a health and safety issue is identified immediately advise the reticulation maintenance supervisor / water operations engineer

b Check the overall site including access (to the site and reservoir), fence and gate condition (if applicable) and whether any vegetation requires trimming

c Check for leaks within the premises and around the reservoir and advise the reticulation maintenance supervisor / water operations engineer if repairs or any other action is required

d Check fall protection (ladders and rails) for condition. Look especially for any corrosion which compromises functionality

e Check for defects that might allow the ingress of animals and contamination, especially at ventilation and access points

f Check all openings, covers and entry lids for functionality and condition. Check that they are secure and watertight

4.0 Carry out condition assessment of reservoir roof and internal space
Reticulation Serviceman

a Walk around the reservoir and inspect the reservoir walls. Look for cracking and signs of weathering (e.g. rust, moss build up, wire ropes corroding, water seeping through the wall etc.).

NOTE **If ladders or fall protection is visually inspected and deemed to be unsafe or faulty, do not proceed with working at heights and advise the Reticulation Maintenance Supervisor**

b Climb upon reservoir to inspect the reservoir roof. Look for holes'/entry points, cracking, signs of weathering, sagging of the roof, deterioration of the joints in the roof panels, ponding etc.

NOTE **Do not carry out tasks without relevant PPE/ safety equipment such as harness, harness line & carabiner,**

NOTE **Working at Heights training is required before carrying out this step. Notify the Reticulation Maintenance Supervisor or Waters Operational Engineer if training is required and stop work immediately**

c Once secured on top of reservoir with harness and carabiner attached to safety point, open reservoir hatch and inspect the interior of the reservoir, this should be completed from the outside where possible. If entry is required advise the Reticulation Supervisor / water operations engineer.

NOTE **Look for and record any floating objects, corrosion of supporting beams, interior cracking, light entry and level sensors. If light is beaming in to the reservoir this could give an indication that the site is not secure and is a possible entry point for rodents and other wildlife.**

NOTE **If any contamination from wildlife or any urgent work is identified, advise your Reticulation Supervisor/Operations Engineer Immediately**

d Dismount the reservoir safely with the spotter holding the ladder at all times for stability.

NOTE **Take your time and move down the ladder backwards with three points of contact at all time. Alternate carabiner attachment points while dismounting for safety during the whole movement**

5.0 Complete the inspection and secure reservoir
Reticulation Serviceman

- **a** Ensure that reservoir openings, covers and entry lids are securely closed and watertight
- **b** Remove temporary traffic management (where required)
- **c** Secure the site (where necessary)
- **d** Record all observations, findings, communications and actions taken (include photos) on a Waikato District Council reservoir check list form. Also record the date, name of the inspected reservoir and name of the serviceperson who completed the inspection. Make this information available to the reticulation maintenance supervisor / water operations engineer at the next available time.

6.0 Document inspection and file records
Reticulation Maintenance Supervisor, Waters Operations Engineer

- **a** Receive paper work from serviceman and enter all inspection checks and notes into the electronic spreadsheet
- **b** Make a list of any work needed from all reservoir inspection sheets. If advised of work that is deemed urgent or that poses a health and safety threat – escalate this through to the Operations Team Leader

  NOTE **Contamination to our drinking water via reservoirs is serious and poses a serious health threat to the consumers. This is high priority to follow up and set in place urgent works or isolation of reservoirs effected**

- **c** File paperwork hardcopy into planned maintenance folder for future reference
- **d** Take note of date/month these checks were completed on to get an indication of the next round of inspections, six months from the date of inspection.

Triggers & Inputs

TRIGGERS

Starts	Frequency	Volume
notification for a reservoir inspection	adhoc	n/a
Programed reservoir inspection	six monthly	n/a

INPUTS
None Noted

Outputs & Targets

OUTPUTS
None Noted

PERFORMANCE TARGETS
None Noted

Process Dependencies

PROCESS LINKS FROM THIS PROCESS
None Noted

PROCESS LINKS TO THIS PROCESS
None Noted

RACI

RESPONSIBLE
Roles that perform process activities

Reticulation Maintenance Supervisor, Reticulation Serviceman, Waters Operations Engineer

ACCOUNTABLE
For ensuring that process is effective and improving

Process Owner	Robert Ball
Process Expert	Nigel Connolly
Risk Managers	
Approvers	Waters Operations Team Leader
Publishers	Annetta Purdy

CONSULTED
Those whose opinions are sought

STAKEHOLDERS
None Noted

STAKEHOLDERS FROM LINKED PROCESSES

None Noted

INFORMED
Those notified of changes

All of the above. These parties are informed via dashboard notifications.

Process Approval

Date	Approver	Type
09-09-2018 (GMT)	Madelina Baena-Escamilla	Process Group Approver
Approval bypassed	Robert Ball	Process Owner
Approval bypassed	Ross Dillon	Process Expert
09-09-2018 (GMT)	Madelina Baena-Escamilla	Promaster

Published on 09-09-2018 (GMT) by Madelina Baena-Escamilla
via Publish Now (some approvals bypassed)

Timeframes

Activity		Incl.	Active Time	Wait Time
1.0	Review the Reservoir Inspection Checklist *	✔	-	-
2.0	Attend site within WDC level of service response time *	✔	-	-
3.0	Perform visual inspections (on ground) *	✔	-	-
4.0	Carry out condition assessment of reservoir roof and internal space *	✔	-	-
5.0	Complete the inspection and secure reservoir *	✔	-	-
6.0	Document inspection and file records *	✔	-	-
	TOTAL		-	-

Variance Scenarios:

Risk & Compliance

None Noted

Appendix G: Sampling and Monitoring

DWSNZ Compliance Sampling and Monitoring (Section 10)

Frequency	Parameter	Monitoring/Sampling point	Monitoring Type
Weekly*	E.coli, Total coliform	Reticulation- 561 Te Akau Wharf Road	Manual grab sample

*DWA decision pending at the end of the 2020/21 compliance year to determine weekly or monthly sampling required for this zone.

Operational Sampling and Monitoring

Frequency	Parameter	Monitoring/Sampling point	Monitoring Type
Individual tanker load	FAC	Tanker Delivery	Manual Check
Continuous	Turbidity, FAC, pH	Outlet of reservoir	SCADA
Weekly	E.coli, Total Coliform, FAC, pH, Turbidity	Treated Water, Post Reservoir	Manual grab sample
Quarterly	Full Chemical	Reticulation- 561 Te Akau Wharf Road	Manual grab sample

Appendix H: Critical Monitoring Points and Corrective Actions

Frequency	Parameter	Monitoring/Sampling Point	Lower Limit	Upper Limit	Corrective Action
Per tanker load	FAC	Tanker Delivery	<0.4 mg/L	2.0 mg/L	Tanker Operators to notify Watercare Operations Team. WSL Ops team to investigate

Frequency	Parameter	Monitoring/Sampling Point	Lower Limit	Upper Limit	Corrective Action
					the cause and actions as per relevant response plan/ SOP.
Alarm	Level Switch	Treated Water Storage Reservoir	Re-order 24m3	High-level overflow	Organise tanker supply as required (24m3). Automated transfer stop for upper limit.
Continuous	FAC	Reservoir Outlet	<0.2 mg/L	2.0 mg/L	Investigate the cause. Check and calibrate chlorine monitoring systems as required- follow SOP. Continue monitoring online and take appropriate actions as required per applicable Contingency plan B-C.
	pH		7.0	8.5	n/a
Weekly	E.coli	Reticulation- 561 Te Akau Wharf Rd	-	<1 MPN/100mL	Refer to applicable contingency plan (A).
	FAC		0.2 mg/L	2.0 mg/L	Refer to applicable contingency plan (B-C).
	Turbidity		-	<2.5 NTU	Follow WSL Incident Response Plan
	pH		7.0	8.5	n/a – observation only.

Appendix I: Contingency Response Plans(s)

	Type of Event	Required Contingency Action
A	***E. coli* (microbiological) transgression in treated (tanker) water** Indicators: *E. coli* reported following routine monitoring Sickness/illness in the community	Follow transgression response procedure in DWSNZ (refer to Figure 4.2 in the DWSNZ) – continue chlorine disinfection of supply (manual) Advise Drinking Water Assessor (DWA) *Consider* issuing a boil water notice if appropriate (APPENDIX K), Commence sampling *daily* for *E. coli* until 3 consecutive samples are free of *E. coli* Investigate cause by *undertaking a sanitary assessment* of the Receiving tank, Reservoir and network; analyse the tanker supply records- take remedial action to eliminate source of contamination/issue. Record all findings using the 'Daily record sheet'. If *E. coli* is found in repeat samples consult with DWA, intensify remedial action, increase disinfection. Consider alternative water supply provisions (bottled water and/or tankers) if required.
B	**Inadequate disinfection of treated water** Indicators: Failure of Low FAC (<0.2 mg/L) or no FAC reported from treatment plant monitoring.	Follow transgression response procedure in DWSNZ (Figure 4.1 in the DWSNZ) Inspect Reservoir/Receiving Tank (*undertaking a sanitary assessment*) to identify cause of problem and rectify as quickly as possible. Record all findings using the 'Daily record sheet'. Advise Drinking Water Assessor (DWA) Commence sampling daily for *E. coli* until 3 consecutive samples are free of *E. coli* (*enumeration* method required) *Consider* issuing a boil water notice if appropriate, i.e. if cannot reinstate chlorination results in treated water above 0.2 mg/L FAC. Keep customers informed and advise once regular supply is restored

	Type of Event	Required Contingency Action
C	**Chemical contamination of tanker supply** Indicators: FAC >5.0 mg/L, Notification from Tanker operators, online analyser value and alarm on reservoir outlet	Investigate cause of problem and rectify as quickly as possible. Record all findings using the 'Daily record sheet'. Advise Drinking Water Assessor (DWA). Shut off reservoir supply until cause is investigated and remediated Consider alternative water supply provisions (bottled water and/or tankers), Flush contaminated reservoir(s) and distribution network. Keep customers informed and advise once regular supply is restored.
D	**Loss of supply to consumers >= 8 hours or more** Indicators: failure/damage to Reservoir/Receiving tank and water transmission lines, no telemetry, localised failure to main/pipe within distribution network (unplanned activity).	If loss of supply is likely to exceed 8 hours the operator MUST notify the Medical Officer of Health or DWA as required under the Health Act Consider alternative water supply provisions (bottled water and/or tankers) to customers Advise customers to conserve water Keep customers informed and advise once regular supply is restored
E	**Catastrophic natural disaster or failure including earthquake, flooding** Indicators: Warnings from Government agencies including Met Office, NIWA, Civil Defence, Regional Council or Police, OR complete loss of water supply operation	Reinstate water supply depending on feasibility Consider providing alternative water supply (bottled water and/or tankers) Adhere to advice and direction stipulated by Civil Defence and/or national emergency management agencies

Watercare An Auckland Council Organisation	Operations Service Delivery
	Event Investigation Report

Report ID	20200827_EIR_Te Akau WTP _Bromate
Event Date	19 August 2020
Site Name	Te Akau Retic
Physical Location	561 Te Akau Wharf Rd
Parameter(s)	Bromate
Compliance Criteria Compromised	S 8 Chemical compliance criteria
Completed by / Date	Bliss Pappachan 14/12/2020

1. Executive Summary

On 19 August 2020 a compliance monitoring sample was taken at the 561 Te Akau Wharf Rd. On 27/08/2020 Shared Services (**Laboratory**) contacted the Watercare-Waikato (**Operations**) group to advise that Bromate have exceeded the MAV limit of 0.01mg/L.

To ensure ongoing proactive operation and management of WDC/Watercare's water supply systems, the Operations group initiated immediate investigation and follow up water quality sampling 3 consecutive days in the Te Akau Bore, Treatment and Reticulation.

In addition to the additional sampling Watercare team also initiated the following actions:

- Informed DWAs about the elevated levels of Bromate identified in drinking water at Te Akau.
- Assessment of historic Bromate results to identify any exceedances in the past.
- Inpected the site (Te Akau WTP) for any spills, leaks or damage.
- 'Guidelines for Drinking Water Quality Management for New Zealand, 2.1 Datasheet (Page 57-59)' have been reviewed for guidance towards potential source of Bromate contamination in Drinking water. It was identified that the Sodium Hypochlorite solution used at the plant could potentially contribute towards the increased level of Bromate in Drinking water.
- Investigation into the sodium hypochlorite solution and supplier details.
- Communication with DWAs were maintained throughout this period.
- Follow up samples were taken from the [Te Akau Wharf Rd (retic), treatment and bore];

The 3 day sampling results came back below MAV levels (Bromate <0.005 mg/L) for the Te Akau bore and above MAV levels (Bromate >0.01mg/L) in the reticulation.

Based on the above results, source contamination was ruled out in this instance. Watercare undertook the following actions:

- Changed to new supplier for the Sodium Hypochlorite solution
- The Te Akau reservoir was emptied and refilled, mains were flushed
- Organised with lab to take daily samples from 7/09/20-11/09/20 after changing the Sodium Hypochlorite solution to a new supplier.

All samples from the following locations:

- Te Akau Bore
- Te Akau Treatment (Pre and Post Reservoir)
- Te Akau Retic (561 Te Akau Wharf Rd)

returned results <0.01mg/L for Bromate. However, 50% MAV (Bromate <0.005 mg/L) were exceeded in the reticulation on two occations 10/09/20 and 11/09/20 respectively. All results are included in the Appendix 1.
Weekly sampling for Bromate was discussed and agreed with DWAs for the duration of one month to monitor the Bromate levels at Te Akau.

Based on:

- the data confirmed above;
- the high level of disinfection process performance at the [Te Akau WTP]
- the levels of [Bromate] all samples collected during this time;

Watercare assessed this issue and took appropriate actions as required. As per the response received from DWA, there was no immidiate risk to the public health and Watercare has taken appropriate measures to avoid any public health risk.

While a high degree of confidence has been established that the drinking-water supply in the network remain free of contamination with reference to the weekly sampling results completed in October 2020. However, with one result slightly ablove the 50% MAV (<0.005mg/L) limit for Bromate, Watercare further sought advice from the DWA regarding the frequency of sampling at Te Akau WTP for Bromate.

2. Sequence of Events

Please note: all referenced sample results are included in full in Appendix 1.

Date	Event
19/08/20	Te Akau retic Sampling for full chemical analysis
27/08/20	Received notification from Lab of the Bromate MAV limit exceedance
27/08/20	3 day sampling requested from lab and notified DWA of the event
28/08/20	Further investigation into the event by the Watercare Ops team
03/09/20	Forwarded investigation details along with 3 day sampling results to the DWA
03/09/20	Narrowed investigation to the Sodium Hypochlorite solution used at the plant
03/09/20	Watercare production team discarded and removed the old batch of Sodium Hypochlorite solution and replaced with fresh solution from new supplier. Te Akau reservoir was emptied, refilled and lines were flushed.
07/09/20	Resampling commenced (daily) for 1 week (07/09/20-11/09/20) to monitor change and improvement
17/09/20	Forwarded follow up sampling results along with watercare's event mitigation details to DWA
17/09/20	In consultation with DWA weekly sampling for one month has been agreed to monitor the levels of Bromate since the report showed 50% MAV exceedance on two occations 10/09/20 and 11/09/20 respectively
17/09/20	Weekly sampling organised with the lab for October 2020
03/11/2020	Received weekly sampling reports from Watercare Lab- All Bromate results <0.005mg/L except for the Te Akau Wharf Rd Bromate result on 26/10/2020 which was 0.0054mg/L.

3. Event Investigation

As part of the quarterly sampling schedule at the Te Akau WTP, MAV exceedance for Bromate were noted at the Te Akau distribution sampling point (561 Te Akau Wharf Rd) in August 2020.

An investigation into the event has indicated that the Sodium Hypochlorite solution used for disinfection at the Te Akau WTP could be a potential source for Bromate contamination in drinking water. WaterNZ Good Practice Guide for the Supply of Chlorine for use in Drinking-water Treatment (June 2020) was also referred to get thorough understanding of product purity and guidance into quality assurance.

Watercare has taken immediate action by changing the supplier for the Sodium Hypochlorite solution and follow up sampling at the source, plant and reticulation were organised to identify any improvements. The follow up results showed significant change in Bromate results (<0.01mg/L) compliant with the MAV limits for Bromate. However, with 2 out of 5 samples taken above the 50% MAV, Watercare investigated this further and identified the hypochlorite dosing required adjustments to be made to maintain more stable chlorine levels. Weekly sampling was organised to monitor the event. The follow up weekly results competed in October 2020 were consistently <0.005mg/L except on one occasion (26 October 2020) where the Bromate result has slightly exceeded the 50% MAV with a result of 0.0054mg/L.

Watercare continued discussions with the DWA regarding the furture monitoring frequency for bromate in Te Akau water supply to determine compliance requirements and whether bromate is assigned as Priority 2 determinand for this water supply.

4. Effectiveness of Response Review

An analysis into the WDC historic results has showen that a similar incident has occurred in the past where the MAV for Bromate have slightly exceeded the limit.

Watercare has taken immediate actions as soon as the exceedance was noted in August 2020. Watercare Operations maintained communication with the DWAs and followed through the advice received from DWAs for the event. Watercare will continue to monitor any such events, communicate with DWAs and take appropriate actions as required.

5. Conclusion

Based on:

- the data described in this report;
- the high level of disinfection process performance at the [Te Akau WTP]
- the levels of [Bromate] all samples collected during this time;

Watercare assessed this issue and took appropriate actions as required. As per the response received from DWA, there was no immidiate risk to the public health and Watercare has taken appropriate measures to avoid and mitigate any public health risk.

The ongoing monitoring programme for the Te Akau drinking-water supply has been organised to monitor bromate monthly and up until 30 June 2021 from the following sampling locations Te Akau WTP and reticulation (561 Te Akau Wharf Road): This was done in consultation with the the DWA regarding the frequency of sampling at Te Akau WTP for Bromate.

The investigation into the Te Akau Bromate exceedance in August 2020 has now been completed with reference to the email received from the DWA dated 8 December 2020. However, monthly sampling for Bromate will be continued from the locations specified above together with the hypochlorite dosing monitoring at the treatment plant. In agreement with the DWA, the next review will be conducted only if any exceedances identified, otherwise a review whether to formally assign Bromate as a P2 determinand will be done by the DWA at the end of 2020/2021 compliance year.

6. Recommendations

Action	Owner	Date Due
Monthly bromate monitoring at the WTP and reticulation	Bliss P	30/06/2021
Hypochlorite dosing monitoring at the WTP	Nigel C	30/06/2021
Communication with DWA	Bliss P	30/06/2021

7. Attachments

Attachment	Reference
Te Akau Bromate sampling result summary	Appendix 1

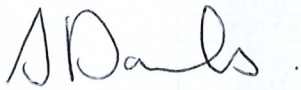
Prepared by:

Bliss Pappachan
Water Quality Scientist

Reviewed by:

Tatiana Derevianko
Principal Water Quality Scientist

Approved by:



Sharon Danks
Waters Business Manager WDC

A 1. Appendix 1

Watercare
An Auckland Council Organisation

Water Quality Report

Te Akau 561 Wharf Rd Bromate MAV exceedance

Sample Location	Sample Date	Bromate (mg/L)
Te Akau Bore	19/08/2020	<0.005
Te Akau Retic (561 Wharf Rd)	19/08/2020	0.011
Te Akau Bore	27/08/2020	<0.005
Te Akau WTP	27/08/2020	0.010
Te Akau Retic (561 Wharf Rd)	27/08/2020	0.011
Te Akau Bore	28/08/2020	<0.005
Te Akau Pre-res	28/08/2020	0.010
Te Akau Post-res	28/08/2020	0.010
Te Akau Retic (561 Wharf Rd)	28/08/2020	0.010
Te Akau Bore	29/08/2020	<0.005
Te Akau Pre-res	29/08/2020	0.009
Te Akau Post-res	29/08/2020	0.011
Te Akau Retic (561 Wharf Rd)	29/08/2020	0.011
Te Akau Bore	7/09/2020	<0.005
Te Akau Pre-res	7/09/2020	<0.005
Te Akau Post-res	7/09/2020	<0.005
Te Akau Retic(561 Wharf Rd)	7/09/2020	0.005
Te Akau Bore	8/09/2020	<0.005
Te Akau Pre-res	8/09/2020	<0.005
Te Akau Post-res	8/09/2020	0.005
Te Akau Retic(561 Wharf Rd)	8/09/2020	0.005
Te Akau Bore	9/09/2020	<0.005
Te Akau Pre-res	9/09/2020	<0.005
Te Akau Post-res	9/09/2020	0.005
Te Akau Retic(561 Wharf Rd)	9/09/2020	<0.005
Te Akau Bore	10/09/2020	<0.005
Te Akau Pre-res	10/09/2020	<0.005
Te Akau Post-res	10/09/2020	0.006
Te Akau Retic(561 Wharf Rd)	10/09/2020	0.006
Te Akau Bore	11/09/2020	<0.005
Te Akau Pre-res	11/09/2020	<0.005
Te Akau Post-res	11/09/2020	<0.005
Te Akau Retic(561 Wharf Rd)	11/09/2020	0.006
Te Akau Retic (561 Wharf Rd)	21/09/2020	<0.005
Te Akai Pre-res	5/10/2020	<0.005
Te Akau Post-res	5/10/2020	<0.005
Te Akai Retic (561 Wharf Rd)	5/10/2020	<0.005
Te Akai Pre-res	16/10/2020	<0.005
Te Akau Post-res	16/10/2020	<0.005
Te Akai Retic (561 Wharf Rd)	16/10/2020	<0.005
Te Akai Pre-res	23/10/2020	<0.005
Te Akau Post-res	23/10/2020	<0.005
Te Akai Retic (561 Wharf Rd)	23/10/2020	<0.005
Te Akai Pre-res	26/10/2020	<0.005
Te Akau Post-res	26/10/2020	<0.005
Te Akai Retic (561 Wharf Rd)	26/10/2020	0.0054

A 2. Appendix 2

Appendix K: Example Boil Water Notice

The following is example wording that can be used to issue a boil water notice

URGENT BOIL WATER NOTICE

Boil all water for; drinking making up formula, juices and ice, washing fruits and vegetables, other cooking needs and brushing teeth. Bring tap water to a full rolling boil, let it boil for TWO MINUTES and let it cool before using. Electric jugs with a cut-off switch can be used as long as they are full – allow the water to come to the boil and automatically switch off. Do not hold the switch down to increase the boiling time. Boiled water should be covered and allowed to cool in the same container. Instant boil water systems do not boil water sufficiently. Take care when bathing and showering so that you don't swallow water.

Boil Water Notice can be released via radio, printed and placed around the community in public areas.

Vulnerable consumers (such as hospital) must be contacted immediately