

	<u>Governance, Legislation and Regulatory Frameworks</u>	Kaiwhakamahi Ratonga Wai-inu Junior Drinking Water Distribution Operator	Kaiwhakamahi Matua Ratonga Wai-inu Senior Drinking Water Distribution Operator	Kaiārahi Wheketere Ratonga Wai-inu Drinking Water Distribution Team leader	Kaiwhakahaere Wheketere Ratonga Wai-inu Drinking Water Distribution Manager	Unit Standard 29994
Needs to be able to	Operate the water distribution network in a manner that follows the Water Safety Plan for the distribution aspects of the supply and meets the Drinking Water Standards for New Zealand .	✓	✓	✓		
	Provide information to the appropriate people regarding the performance of the drinking water distribution network to facilitate asset management planning and Department of Internal Affairs reporting as required under the Local Government Act	✓	✓	✓	✓	
	Operate the water distribution network within the requirements set out in the local bylaws specific to their territorial authority	✓	✓	✓		
	Operate the water distribution network within the conditions set in the Resource Consent(s) for the water take, and any discharges from the distribution network.	✓	✓	✓		
	Safely operate the water distribution network in a manner that addresses health and safety risks, including backflow prevention and firefighting capacity requirements	✓	✓	✓	✓	
Needs to know	About the Health Act, which requires Drinking Water suppliers to meet the Drinking Water Standards, and to have and implement, a Water Safety Plan for each supply	✓	✓	✓	✓	
	About the Resource Management Act which regulates the source of water and requires the taking of water and the discharge of treated water to conform to the requirements of a resource consent.	✓	✓	✓	✓	29995
	About Local Government Act		✓	✓	✓	29995
	About the Building Act		✓	✓	✓	29995
	About the Health and Safety of Work Act which is concerned with the Health and Safety of workers and visitors to the site		✓	✓	✓	29995
	About the Health and Safety at Work (Hazardous Substances) Regulations 2017		✓	✓	✓	29995
	About the Health and Safety in Employment (Pressure Equipment, Cranes and Passenger Ropeways) Regulations 1999.		✓	✓	✓	29995
	<u>The Principles of Safe Drinking Water</u>	Kaiwhakamahi Ratonga Wai-inu Junior Drinking Water Distribution Operator	Kaiwhakamahi Matua Ratonga Wai-inu Senior Drinking Water Distribution Operator	Kaiārahi Wheketere Ratonga Wai-inu Drinking Water Distribution Team leader	Kaiwhakahaere Wheketere Ratonga Wai-inu Drinking Water Distribution Manager	Unit Standard 29995
Needs to be able to	Embrace a high standard of care in the work undertaken	✓	✓	✓	✓	
	Risks to source water: <ul style="list-style-type: none"> ▪ Understand ▪ Manage ▪ Address 	✓	✓	✓ ✓	✓ ✓	
	Understand how the treatment processes provide multiple barriers to contamination and the importance of maintaining these barriers against failure	✓	✓	✓	✓	29994
	Monitor the distribution network for any changes and respond accordingly and inform team leader/supervisor/treatment plant manager	✓	✓			
	Maintain a personal sense of responsibility and dedication to providing consumers with safe drinking water	✓	✓	✓	✓	

	Understand the risks to the water supply and how these risks are managed, and the control measures that are used to ensure that management is occurring properly. This includes the requirement for operators to monitoring the performance of each barrier	✓	✓	✓	✓	
Needs to know	Principle 1: A high standard of care must be embraced	✓	✓	✓	✓	29994
	Principle 2: Protection of source water is of paramount importance	✓	✓	✓	✓	29994
	Principle 3: Maintain multiple barriers against contamination	✓	✓	✓	✓	29994
	Principle 4: Change precedes contamination	✓	✓	✓	✓	29994
	Principle 5: Suppliers must own the safety of drinking water	✓	✓	✓	✓	29994
	Principle 6: Apply a preventive risk management approach	✓	✓	✓	✓	29994
	<u>Development of Water Safety Plans</u>	Kaiwhakamahi Ratonga Wai-inu	Kaiwhakamahi Matua Ratonga Wai-inu	Kaiārahi Wheketere Ratonga Wai-inu	Kaiwhakahaere Wheketere Ratonga Wai-inu	Unit Standard
		Junior Drinking Water Distribution Operator	Senior Drinking Water Distribution Operator	Drinking Water Distribution Team leader	Drinking Water Distribution Manager	
Needs to be able to	Assist with identifying the Critical Control Points within the distribution network for the supply.	✓	✓	✓	✓	29994
	Assist with identifying and documenting the corrective action required when critical limits are reached	✓	✓	✓	✓	29994
	Use operational knowledge to help identify improvement items to include		✓	✓		29994
	Assist with reviewing customer complaints	✓	✓	✓		
	Manage customer complaints			✓	✓	
	Involvement in long term engagement plans on awareness and involvement in safe and secure drinking water	✓	✓	✓	✓	29994
Need to know	What their role is in the development of the water safety plan (WSP) and the requirements of the New Zealand Drinking Water Safety Plan Framework	✓	✓	✓	✓	29994
	The principles of Safe Drinking Water in New Zealand	✓	✓	✓	✓	
	The characteristics of the drinking water supply system, what and how hazards may arise, and create risks, and the processes and practices that affect drinking water quality	✓	✓	✓	✓	
	The available water quality information and be able to analyse and interpret this information which identifies actual and potential water quality issues		✓	✓		
	What the contamination barriers are for the supply, so that the failure of a barrier linked to the distribution network will be compensated for by the effective operation of the remaining barriers. Possible barriers related to the distribution network might include maintaining residual disinfectant levels within the distribution system	✓	✓	✓	✓	29994
	What Critical Control Points are	✓	✓	✓		
	How the New Zealand Drinking Water Standards provide requirements for drinking water safety by specifying maximum amounts of substances, organisms/contaminants/residues that may be present, criteria for demonstrating compliance with the standards and remedial action to be taken in the event of noncompliance	✓ ✓	✓ ✓ ✓	✓		29994
	About the Guidelines for Drinking Water Quality Management in New Zealand	✓	✓	✓		29994
	The commitment to drinking water quality management from their employer and the relationship of the WSP to organisational policy and strategy	✓	✓	✓	✓	29994
	<u>The Role of the Drinking Water Standards for New Zealand</u>	Kaiwhakamahi Ratonga Wai-inu	Kaiwhakamahi Matua Ratonga Wai-inu	Kaiārahi Wheketere Ratonga Wai-inu	Kaiwhakahaere Wheketere Ratonga Wai-inu	Unit Standard
						29994/

		Junior Drinking Water Distribution Operator	Senior Drinking Water Distribution Operator	Drinking Water Distribution Team leader	Drinking Water Distribution Manager	29995	
Need to be able to	Operate the Water Distribution Network in a manner that ensures that each distribution zone within the network complies with the NZ Drinking Water Standards.	✓	✓	✓	✓		
	Monitor, both manually and continuously, the drinking-water within the distribution network for parameters to assess compliance with the DWSNZ in accordance with the supplier's monitoring programme.	✓	✓	✓			
	Verify the overall performance of the Water Treatment Plant by confirming that the following has occurred: Compliance person – Operators – compliance team (Combined)						
	<ul style="list-style-type: none"> ▪ The concentration of a determinant in a sample does not exceed the MAV or GV more often than is permitted ▪ An operational requirement does not move outside its limit for more than it's allowed frequency/duration of the compliance monitoring period ▪ The number of measurements made for each compliance criterion is equal to or greater than that specified ▪ Sampling, standardising, testing and reporting procedures meet DWSNZ standards ▪ The requirements of the compliance criteria have been met throughout the previous 12 months ▪ The remedial actions specified in the DWSNZ and WSP have been carried out when there has been a transgression / excursion beyond an operational requirement 	✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓	✓ ✓		
Need to know	How the New Zealand DWS provide requirements for drinking-water safety by specifying the: <ul style="list-style-type: none"> ▪ Maximum amounts of substances/organisms/contaminants/residues that may be present ▪ Criteria for demonstrating compliance with the standards and remedial action to be taken in the event of non-compliance 		✓ ✓	✓ ✓			
	About the guidelines for DW Quality Management in New Zealand	✓	✓				
	That the drinking water supply requires an approved WSP and implemented by the operator. Considers the potential risks to the water supply and identifies ways to manage those risks. The WSP promotes a multi-barrier approach to managing risks and articulates how the supply addresses The Principles of Safe Drinking Water in New Zealand. Only the parts of the WSP that relate to the distribution network will be implemented by the Drinking Water Distribution Operators.	✓	✓			Overview essential	
	The requirements for verification monitoring within the drinking water compliance monitoring plan referenced in the WSP			✓			
	Actions that need to be taken in event of an exceedance of an operational target value and inform manager	✓	✓	✓	✓		
	Implications and consequences of regulatory water quality sample failures and actions to be taken as detailed in the Incident and Emergency response plan		✓	✓	✓	✓	
	The importance of investigation process in the event of water quality incidents and the regulatory requirements regarding the reporting of these	✓	✓				
	That the water supply they operate should be included on the Register of Drinking-Water Supplies in New Zealand which provides information on who is registered as a drinking-water supplier	✓	✓				
	That the compliance monitoring data about the water supply must be provided to Taumata Arowai via Hinekōrako, the self-service portal for Drinking Water suppliers.		✓	✓	✓		
That the compliance of the water supply they operate will be reported to the public via the Annual Report on Drinking-Water Quality		✓					

	That the Health Act requires that only recognised laboratories may be used to carry out tests and analysis of raw water and drinking water to demonstrate compliance with standards (Water Services Act)	✓	✓			
	What the roles and powers of Taumata Arowai, the Water Services Regulator and Drinking Water Assessors are	✓	✓			
	<u>The Role of the Firefighting Code of Practice</u>	Kaiwhakamahi Ratonga Wai-inu	Kaiwhakamahi Matua Ratonga Wai-inu	Kaiārahi Wheketere Ratonga Wai-inu	Kaiwhakahaere Wheketere Ratonga Wai-inu	Unit Standard
		Junior Drinking Water Distribution Operator	Senior Drinking Water Distribution Operator	Drinking Water Distribution Team leader	Drinking Water Distribution Manager	
Need to be able to	Monitor, water storage levels and pressures within the distribution network to ensure that the minimum pressure and volume of water storage required for firefighting purposes is maintained (Could be managed by combined teams)	✓	✓	✓	✓	29995 1.2
	Ensure that fire hydrants within the distribution network are maintained and kept fully charged (Applicable if managed by the Distribution Network Operators)	✓	✓			29995 1.2
	Ensure that markings and indicators that identify the position of fire hydrants are maintained so that they are always visible (Applicable if managed by the Distribution Network Operators)	✓	✓			29995 1.2
	Manage any discolouration and reduced pressures that may result from flow tests during fire service flow testing (Applicable if managed by the Distribution Network Operators)	✓	✓			
	Remove fire hydrant boxes, lids, marking and marker posts from abandoned water mains (Applicable if managed by the Distribution Network Operators)	✓	✓			29995 1.2
Need to know	That the adequacy of a firefighting water supply involves having sufficient volume and pressure of water available. It also requires knowledge of the location, connections, marking and access to fire hydrants to enable the water supply to be used	✓	✓	✓	✓	29995 1.2
	That the Fire Service should be advised as soon as practicable when new water mains are charged and commissioned, or when existing water mains are decommissioned and when reinstated either temporarily or permanently	✓	✓	✓	✓	
	That fire hydrant boxes, lids, marking and marker posts must be removed from abandoned water mains	✓	✓	✓	✓	
	That the Fire and Emergency Act 2017 allows for the Fire Service to check the adequacy of firefighting water supplies, including the volume and pressure in any water mains and to also take water free of charge for both training and in emergency situations	✓	✓	✓	✓	29995 1.2
	That the New Zealand Fire Service Firefighting Water Supplies Code of Practice covers the inspection and testing requirements of hydrants	✓	✓	✓	✓	29995 1.2
	That the New Zealand Fire Service Firefighting Water Supplies code of Practice covers the markers and indicators required to identify hydrants	✓	✓	✓	✓	29995 1.2
	<u>Te Mana o te Wai</u>	Kaiwhakamahi Ratonga Wai-inu	Kaiwhakamahi Matua Ratonga Wai-inu	Kaiārahi Wheketere Ratonga Wai-inu	Kaiwhakahaere Wheketere Ratonga Wai-inu	Unit Standard
		Junior Drinking Water Distribution Operator	Senior Drinking Water Distribution Operator	Drinking Water Distribution Team leader	Drinking Water Distribution Manager	
Need to be able to	Te Hauora o te Taiao – Drinking Water Distribution Operators help to protect the health of the environment by ensuring that the conditions of any resource consent relating to the discharge of treated water from the distribution network are adhered to	✓	✓	✓	✓	
	Te Hauora o te Wai – Drinking Water Distribution Operators help to protect the health of waterbodies by ensuring that the conditions of any resource consent to discharge chlorinated water are adhered to. This also aligns with the Principle of Safe Drinking Water that identifies that protecting the water source is of paramount importance	✓	✓	✓	✓	

	Te Hauora o te Tangata – Drinking Water Distribution Operators protect the health of the people by operating the drinking water distribution network in a manner that reflects the Water Safety Plan for the supply	✓	✓	✓	✓	
Need to know	What te Mana o te Wai means to their community. Under the Freshwater NPS it is up to the community and each Regional Council to consider and recognise Te Mana o te Wai in their regions	✓	✓	✓	✓	
	The conditions of all resource consents related to the operation of the drinking water distribution network	✓	✓	✓	✓	
	The elements of the Water Safety Plan that relate to the distribution network for the supply	✓	✓	✓	✓	
	That the Ministry of the Environment have produced a factsheet to provide further information about Te Mana o te Wai, the central concept for freshwater management	✓	✓	✓	✓	

Asset Management Decision Making

	<u>Critical Control Points (CCP)</u>	Kaiwhakamahi Ratonga Wai-inu Junior Drinking Water Distribution Operator	Kaiwhakamahi Matua Ratonga Wai-inu Senior Drinking Water Distribution Operator	Kaiārahi Wheketere Ratonga Wai-inu Drinking Water Distribution Team leader	Kaiwhakahaere Wheketere Ratonga Wai-inu Drinking Water Distribution Manager	Unit Standard
Need to be able to	Undertake operational monitoring and inspections of CCP	✓	✓	✓		
	Undertake corrective actions when routine monitoring, and inspections indicate that a CCP is deviating from its expected performance and is reaching it's action limit which may include: <ul style="list-style-type: none"> ▪ Adjustments or process control changes ▪ Communicating and notifying others of the issue ▪ Additional monitoring and inspection to confirm that the corrective action has been effective 	✓ ✓ ✓	✓ ✓ ✓ ✓	✓		
	Activate incident and emergency response procedures when critical limits for a CCP is reached or because the corrective action at the trigger level has not improved the performance of the CCP		✓	✓	✓	
	Have input into a review into the underlying cause of why the corrective action or incident and emergency response procedures were needed. This includes identifying: <ul style="list-style-type: none"> ▪ How effective the monitoring and inspection plan was ▪ How effective the corrective action was ▪ Whether the WSP needs to be updated as a result 		✓ ✓ ✓ ✓	✓ ✓ ✓ ✓		
Need to know	What the Critical Control Points for the distribution element of the water supply are. CCPs are documented within the Water Safety Plan for each drinking water supply. For each of the Critical Control Points this will include: <ul style="list-style-type: none"> • Process control summary • A monitoring procedure for each control point • Defined target, action, and critical limits • Predefined corrective actions 	✓	✓	✓	✓	
	The defined values documented in the CCP for target, action, and critical limits	✓	✓	✓	✓	
	The corrective actions listed in the Water Safety Plan which are considered to be necessary when the control limit is reached. Where the Water Safety Plan only lists the corrective actions, the Drinking Water Distribution Operator needs to know where to find the actual documented procedure, e.g. in the Operations and Maintenance Manual for the distribution network	✓	✓	✓	✓	

	The health-based targets, or maximum acceptable values (MAV), for any parameter being monitored. The CCP trigger and critical limits should always ensure that alarms and corrective actions are undertaken before MAVs are reached to ensure that the supply of non-compliant water is prevented	✓	✓	✓	✓	
	<u>Operational Monitoring and Inspection for Process Control</u>	Kaiwhakamahi Ratonga Wai-inu Junior Drinking Water Distribution Operator	Kaiwhakamahi Matua Ratonga Wai-inu Senior Drinking Water Distribution Operator	Kaiārahi Wheketere Ratonga Wai-inu Drinking Water Distribution Team leader	Kaiwhakahaere Wheketere Ratonga Wai-inu Drinking Water Distribution Manager	Unit Standard
Need to be able to	Obtain, review, and interpret trends on SCADA and telemetry systems	✓	✓		✓	
	Identify target and action limits which identify when intervention may be required	✓	✓		✓	
	Carry out key calibration/instrument checks of equipment using the results to identify issues with performance	✓	✓	✓		
	Assess the condition of the instrument and any supply tubing – Cleaning may be required	✓	✓	✓		
	Identify whether equipment has deteriorated and whether it is no longer operating in accordance with its design	✓	✓	✓		
	Take representative samples of water from key points within the distribution network, safely using appropriate sampling equipment	✓	✓	✓		17890
	Review and analyse the performance of the water distribution network by using laboratory, site, and network quality reports	✓	✓	✓		17890
Need to know	The monitoring and inspection plans identified within the Water Safety Plan that relate specifically to the distribution network element of the drinking water supply system including knowledge of: <ul style="list-style-type: none"> • The parameters to monitor / inspect • The purpose of each parameter • The method of monitoring including instrument used/location/timing/frequency/by whom and what needs to be recorded • What actions to take in response to monitoring / inspection results • Procedures for reporting anomalies • The equipment that provides the process 	✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓		29994
	The instruments used to monitor variables in the water distribution process and the basic scientific principles of these key analytical instruments	✓	✓			29994
	The care and maintenance of monitoring equipment including instrument condition assessments and calibration records	✓	✓			17890
	The need for accurate and precise recording and reporting of process performance, in line with the Water Safety Plan requirements	✓	✓			17890 29994
	Which of the parameters being monitored are Critical Control Points (CCPs).	✓	✓		✓	
	<u>Apply the knowledge of Science to the Distribution Network</u>	Kaiwhakamahi Ratonga Wai-inu Junior Drinking Water Distribution Operator	Kaiwhakamahi Matua Ratonga Wai-inu Senior Drinking Water Distribution Operator	Kaiārahi Wheketere Ratonga Wai-inu Drinking Water Distribution Team leader	Kaiwhakahaere Wheketere Ratonga Wai-inu Drinking Water Distribution Manager	Unit Standard
	Perform mathematical calculations used in the water industry, for example to calculate: <ul style="list-style-type: none"> - volumes, - levels, - flow rates; and - pressure 	✓	✓	✓		19200

Need to be able to	Use their understanding of physics to operate and control the hydraulics through the distribution network	✓	✓	✓		19205 31520
	Use their understanding of microbiology to reduce the risk of contamination	✓	✓	✓		19205
	Select and use appropriate equipment to measure performance of different parameters	✓	✓	✓		
	Take water samples to monitor for the presence of indicator micro-organisms	✓	✓	✓		17890
Need to know	The principles of physics which impact on the water distribution network including understanding hydraulics, pressure and head, backflow, water hammer, surges, and head loss	✓	✓	✓	✓	19200 31520
	The chemistry of drinking water supplies and chemicals of public health significance that may be found in drinking water supplies, including an understanding of chlorine demand, free available chlorine, disinfection by-products, and plumbosolvency	✓	✓	✓	✓	
	The microbiology of drinking water and the relationship between drinking water and public health. Operators need to understand the characteristics of microbiological risks such as bacteria, viruses, protozoa, cyanobacteria and cyanotoxins, how these microbiological risks are detected, and the processes are used to reduce microbiological risks to the drinking water supply	✓	✓	✓	✓	19205

Lifecycle Delivery

	Technical Standards Related to Water Distribution	Kaiwhakamahi Ratonga Wai-inu	Kaiwhakamahi Matua Ratonga Wai-inu	Kaiārahi Wheketere Ratonga Wai-inu	Kaiwhakahaere Wheketere Ratonga Wai-inu	Unit Standard
		Junior Drinking Water Distribution Operator	Senior Drinking Water Distribution Operator	Drinking Water Distribution Team leader	Drinking Water Distribution Manager	
Need to be able to	Follow the appropriate technical standards that relate to the operation and maintenance of the water distribution network. This might include a mix of: <ul style="list-style-type: none"> Internal standards developed by the Water Supplier The Drinking Water standards, guidelines and publications produced by the Ministry of Health relating to drinking water Technical documents, guidelines and publications developed by industry groups like Water New Zealand New Zealand Standards and Guidelines published by NZ Standards, or by government organisations like Worksafe International standards and guidelines e.g. those published by International Organisation for Standardization (ISO), the World Health Organisation, or the American Water Works Association (AWA) 	✓	✓	✓	✓	29994 29995
	Which technical standards relate to the work that they are responsible for. These should be identified on applicable operational and maintenance procedure documentation	✓	✓	✓	✓	
	Where to find the technical standards, e.g. through a subscription to NZ Standards	✓	✓	✓	✓	
	There are many standards that cover the design and installation of drinking water distribution network assets. Some of the more commonly used standards which are applicable to the work undertaken by Drinking Water Distribution Operators include: <ul style="list-style-type: none"> NZS 4404:2010 Land development and subdivision infrastructure which provides criteria for the design and construction of subdivision infrastructure including water distribution assets 	✓	✓	✓	✓	

Need to know	<ul style="list-style-type: none"> • AS/NZS 2566.2:2002 Buried flexible pipelines – installation specifies requirements for the installation, field testing and commissioning of buried flexible pipelines with structural design in accordance with AS/NZS 2566.1 • AS/NZS 4793:2009 Mechanical Tapping Bands for Waterworks Purposes specifies the requirements for connecting property service pipes to reticulation watermains • NZS 4522:2010 Underground Fire Hydrants provides guidance on the installation of fire hydrants • NZS/AS 4020:2018 Testing of Products for Use in Contact with Drinking Water identifies what products that are suitable for use if they are to come into contact with drinking water • The Australasian Society for Trenchless Technology guidelines for horizontal directional drilling, pipe bursting, micro-tunnelling and pipe jacking • AS/NZS 2033:2008 Installation of Polyethylene Pipe Systems specifies methods for handling, storage, installation, testing and commissioning of polyethylene (PE) pipelines • AS/NZS 4129:2020 Fittings for polyethylene (PE) pipes for pressure applications standard specifies requirements for fittings to be used with polyethylene pipe and is applicable to fittings manufactured for the conveyance of water. Also includes the requirements for connecting property service pipes to polyethylene water mains • AS/NZS 2032:2006 Installation of PVC pipe systems includes methods for handling, storage, installation, testing and commissioning of polyvinyl chloride (PVC) pipelines, above or below ground, for pressure and non-pressure applications conveying liquids • AS/NZS 1477:2017 PVC pipes and fittings for pressure applications provides a standard specifies requirements of PVC pipe and fittings for pressure applications • AS/NZS 2280:2020 Ductile iron pipes and fittings provides a standard specification for ductile iron pressure pipes and fittings • AS/NZS 4998:2009 Bolted unrestrained mechanical couplings for waterworks purposes specifies requirements for unrestrained mechanical couplings for joining above or below ground water • AS/NZS 1516:1994 The cement mortar lining of pipelines in situ specifies the requirements for the cement mortar lining of pipelines in situ, by spray application. The lined pipelines are intended for the conveyance of wastewater or water intended for human consumption 					
	<p><u>Safe Isolation of Assets, Plant and Equipment</u></p>	<p>Kaiwhakamahi Ratonga Wai-inu</p> <p>Junior Drinking Water Distribution Operator</p>	<p>Kaiwhakamahi Matua Ratonga Wai-inu</p> <p>Senior Drinking Water Distribution Operator</p>	<p>Kaiārahi Wheketere Ratonga Wai-inu</p> <p>Drinking Water Distribution Team leader</p>	<p>Kaiwhakahaere Wheketere Ratonga Wai-inu</p> <p>Drinking Water Distribution Manager</p>	<p>Unit Standard</p>
Need to be	<p>Identify the asset or equipment that is to be worked on, including the point of isolation. There are occasions where this is not clear, e.g. a switchboard may not isolate all equipment in the vicinity, and some plant, e.g. actuators, may require isolating elsewhere</p> <p>Identify whether the isolation of the asset will interrupt the supply of drinking water to any point of supply. Refer to the element of competence around Water Distribution Network Isolation / Shutdown / Re-commissioning of Assets</p> <p>Identify the hazards that might need to be controlled to isolate the asset. This might include hazards from the likes of:</p> <ul style="list-style-type: none"> • Confined Spaces • Falling from heights • Mechanical equipment with moving parts • Electricity • Pressure • Chemical hazards <p>Identify any other areas that might be affected by the isolation. The Drinking Water Distribution Operator must be able to clearly understand and communicate the effects of the isolation</p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	<p>✓</p>	<p>30005</p>

able to	Be able to select and use the correct equipment to safely isolate the plant to be worked on e.g., valves, isolating locks, and tags, locking pins etc	✓	✓	✓		
	Safely remove substances from the system by draining, venting, purging, or flushing the isolation <i>(The Junior Operator can assist the Senior Operator)</i>		✓	✓		
	Follow approved procedures to confirm that the isolation has been successful to ensure that the isolated equipment is safe to work on	✓	✓	✓		
	Undertake the safe removal of isolation equipment to return the assets into service	✓	✓	✓		30005
Need to know	The permit-to-work system in use	✓	✓	✓		
	The procedures for installing isolations including: <ul style="list-style-type: none"> Electrical isolation and tagging/locking out Proving electrical equipment is dead to ensure the correct piece of equipment has been isolated Immobilisation techniques such as valves, chains, locking pin etc Bleeding off pressure, isolating and bypassing process equipment Cooling requirements, e.g. the time electric motors take to cool Neutralisation of chemicals (e.g. chlorine and caustic soda) 	✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓	
	How to adequately identify, test and confirm that the isolation has made the plant or equipment safe	✓	✓	✓	✓	
	The procedures for draining, venting, purging, and flushing	✓	✓	✓	✓	
	The procedures for removing isolations and returning plant and equipment	✓	✓	✓	✓	
	The risks associated with isolating a piece of plant or equipment and how to minimise the impacts associated with these and as documented within operational procedures	✓	✓	✓	✓	
	Communication, reporting, and record keeping requirements associated with isolating a piece of plant and equipment. This includes ensuring the work meets the requirements of the Health and Safety at Work Act	✓	✓	✓	✓	
	<u>Drinking Water Hygiene Requirements</u>	Kaiwhakamahi Ratonga Wai-inu	Kaiwhakamahi Matua Ratonga Wai-inu	Kaiārahi Wheketere Ratonga Wai-inu	Kaiwhakahaere Wheketere Ratonga Wai-inu	Unit Standard
		Junior Drinking Water Distribution Operator	Senior Drinking Water Distribution Operator	Drinking Water Distribution Team leader	Drinking Water Distribution Manager	
Need to be able to	Prevent the pollution or contamination of drinking water by following hygiene procedures	✓	✓	✓	✓	31449
	Follow the Disinfection Procedures for tools and equipment used in maintenance of the distribution network with chlorine. This also requires the correct disposal of the chlorine solution	✓	✓	✓		31449
	Keep Personal Protective Equipment (PPE) and boots clean	✓	✓	✓	✓	
	Keep all fittings carried in vehicles or stored at site boxed, capped, or sealed with plastic wrapping. These items should not be uncovered until immediately before use	✓	✓	✓		
	Have current inoculations and pass health screening requirements for waterborne illnesses	✓	✓	✓	✓	
	Follow the Incident and Emergency Response Plan associated with the distribution system after any contamination incidents	✓	✓	✓	✓	
	How to identify potential sources of contamination	✓	✓	✓		
	The importance of personal hygiene	✓	✓	✓	✓	
	About the potential for contamination from workers Personal Protective Equipment (PPE) and the need for clean equipment and boots	✓	✓	✓	✓	
	Chlorine/disinfection procedures, both for the water itself and other hygiene purposes i.e. how chlorine is used to wash boots, clean tools and in repairs, and the correct disposal of chlorine solution	✓	✓	✓	✓	31449 31522
	The risks of multi-functional working between water and wastewater assets, including the need to have separate tools and equipment for water and wastewater works. Separate vehicles must be used for water and wastewater maintenance works. Drinking Water Distribution Operators must be mindful of where their vehicle has been e.g. wastewater treatment plants	✓	✓	✓	✓	

Need to know	The potential for, and implications of, contamination of the water supply from items such as fuel and chemical contamination. Drinking Water Distribution Operators need to know what procedures to follow, after a contamination incident	✓	✓	✓		19205
	The potential for, and implications of, contamination of the water supply from waterborne microorganisms	✓	✓	✓	✓	19205
	Sampling and audit processes for the work that they are undertaking	✓	✓	✓	✓	
	That the Water New Zealand Good Practice Guide – Hygiene Practices to Prevent Water Supply Contamination [2] provides best practice guidance	✓	✓	✓	✓	31522
	Disinfection Procedures for Fittings and Materials (Please note that this can be a one team or a combination of team's responsibility. i.e., contractors)	Kaiwhakamahi Ratonga Wai-inu Junior Drinking Water Distribution Operator	Kaiwhakamahi Matua Ratonga Wai-inu Senior Drinking Water Distribution Operator	Kaiārahi Wheketere Ratonga Wai-inu Drinking Water Distribution Team leader	Kaiwhakahaere Wheketere Ratonga Wai-inu Drinking Water Distribution Manager	Unit Standard
Need to be able to	Follow the standard operating procedure for disinfecting fittings and materials. Depending on the circumstances this may include different procedures for: (Contractor/reticulation teams' responsibility) – Other teams may be responsible for these. - connecting new watermains to the distribution system. - planned repairs of watermains where pressure is maintained while carryout the work, - planned or emergency repairs where the pipe has been depressurised and is open - emergency repairs	✓ (Under supervision)	✓	✓		30003 31449
	Swab (clean) all fitting and exterior surfaces of the watermain with the approved disinfectant when carrying out under pressure planned repairs that do not involve cutting pipe open	✓	✓	✓		30003 31449
	The water main will need to be excavated, drained, with the surrounding ground water drained/dewatered to ensure it remains below the invert of the pipe. Any known contaminates should be removed, the pipe cleaned with the approved disinfectant	✓	✓	✓		27501 30003 31449
	Isolations of watermains and affected connections in the event of an emergency repair. All connecting valves used to isolate the reticulated water from a main being disinfected should be tagged and opened once the disinfection procedure has been sign-off as completed	✓	✓	✓		30003 31449
	Flushing watermains following cleaning, until the residual disinfectant is within the required concentration range, using metered standpipes	✓	✓	✓		31449
	Take water samples for bacteriological testing for Verification that the watermain is safe to return to service	✓	✓	✓		17890
	Ensure that the work undertaken has been recorded. This should include ensuring that that the water sampling test results are noted along with the volume of water discharged	✓	✓	✓		
Need to know	The objective of the disinfection process and the potential consequences of failing to disinfect	✓	✓	✓		31522
	That there is a requirement to remove debris, sediments and to clean (swab) the pipe before flushing and disinfecting the main	✓	✓	✓		31449
	That an open pipe, that isn't capped, can allow contamination to enter	✓	✓	✓		
	Isolation requirements to safely dewater and recharge watermains	✓	✓	✓		
	That the pumps used to dewater an excavation are a risk to the contamination of the water distribution system from petroleum products	✓	✓	✓		
	That all tools and materials that will come into contact with treated water need to be disinfected first	✓	✓	✓		
	What chemicals can be used to disinfect water mains e.g.0.1% chlorine solution, and how to calculate the required amount of dilution from commercially available Sodium hypochlorite concentrate	✓	✓	✓		31522

	That fresh disinfectant is required to be used	✓	✓	✓		
	How to safely dispose of old disinfectant	✓	✓	✓		
	The water quality and sampling requirements for the disinfection process	✓	✓	✓		17890
	Ensure that the work undertaken has been recorded. This should include ensuring that that the water sampling test results and water discharge volumes are noted	✓	✓	✓		
	Locating Underground Services (Please note that this can be a one team or a combination of team's responsibility. i.e., contractors)	Kaiwhakamahi Ratonga Wai-inu	Kaiwhakamahi Matua Ratonga Wai-inu	Kaiārahi Wheketere Ratonga Wai-inu	Kaiwhakahaere Wheketere Ratonga Wai-inu	Unit Standard
		Junior Drinking Water Distribution Operator	Senior Drinking Water Distribution Operator	Drinking Water Distribution Team leader	Drinking Water Distribution Manager	
Need to be able to	Use service plans, GPS, and Geographic Information Systems (GIS) to determine the location of both underground drinking water distribution assets and also assets belonging to other utility services	✓	✓	✓		6479 6476
	Request a locate service using a range of internet-based services such as Before U Dig	✓	✓	✓		
	Follow Safe Working in Roads procedures for assets located in the road reserve	✓	✓	✓		
	Visually inspect the work area surface to identify evidence of any drinking water distribution assets along with evidence of other utility assets	✓	✓	✓		6476
	Use electronic locating equipment to determine the location of buried utility assets	✓	✓	✓		6479 6476
	Mark and record the position of services and sub-structures on the work site	✓	✓	✓		
	Communicate to others the details of the position and type of services and sub-structures	✓	✓	✓		
	Report deviations in the expected position of assets to the appropriate people	✓	✓	✓		
	Excavate trial pits to expose the exact location of utility assets	✓ (Under Supervision)	✓	✓		
	Store tools and equipment safely and securely and leave the work area work in a safe condition	✓	✓			
Need to know	The Health and Safety hazards associated with working on or near underground services relating to including hazards related to the following utility types: - Wastewater / Stormwater - Gas - Electricity - Telecommunications / Fibre optic - Oil / Petroleum - Traffic signal cables and detector loops - Working in the roading corridor	✓	✓	✓		
	The requirements of any Traffic Management Plan (TMP) which relate to the site in question	✓	✓	✓		
	How to interpret GIS, utility drawings and line search documents to identify underground utilities assets	✓	✓	✓		6479 6476
	Methods of visually locating and identifying underground services including typical markers and signs	✓	✓	✓		
	The typical locations and depths of underground utilities	✓	✓	✓		6479 6476
	Methods of accurately marking out services	✓	✓	✓		6479 6476
	Methods for undertaking test pit excavations	✓	✓	✓		
That plans may not be accurate and the potential outcomes of incorrect marking out of services and excavations including injury, costs, loss of time, and material wastage	✓	✓	✓		6479 6476	

	How to use, and interpret the results, of electronic locating equipment	✓	✓	✓		
	The possible effects of external influences on electronic locating equipment readings and reduce the effects e.g. metal fencing, reinforced concrete	✓	✓	✓		
	The procedures for reporting and recording work problems including who to inform when assets on site deviate from their position marked out on plans.	✓	✓	✓		
	Safe Working in Roads (Please note that this can be a one team or a combination of team's responsibility. i.e., contractors)	Kaiwhakamahi Ratonga Wai-inu	Kaiwhakamahi Matua Ratonga Wai-inu	Kaiārahi Wheketere Ratonga Wai-inu	Kaiwhakahaere Wheketere Ratonga Wai-inu	Unit Standard
		Junior Drinking Water Distribution Operator	Senior Drinking Water Distribution Operator	Drinking Water Distribution Team leader	Drinking Water Distribution Manager	
Need to be able to	Apply for a Corridor Access Request (CAR) to obtain a Work Access Permit (WAP) from the Corridor Manager	✓	✓			
	Implement the Traffic Management Plan (TMP) for the work	✓	✓			
	Ensure that a copy of the Corridor Access Request (CAR), including global CARs, and Work Access Permits (WAP) are held at all work sites along with a copy of the Traffic Management Plan (TMP)	✓	✓			
Need to know	That the National Code of Practice for Utility Operators' Access to Transport Corridors produced by the New Zealand Utilities Advisory Group [3] is a requirement under the Utilities Access Act 2010 and provides a framework for the access rights to the transport corridor for utility operators like water suppliers	✓	✓	✓		
	That a Corridor Access Request (CAR) must be lodged with the Corridor Manager before any work can be carried out in Transport Corridors. Utilities such as water supplies can operate under a global CAR however each individual site will require an appropriate Traffic Management Plan (TMP)	✓	✓	✓		
	That the New Zealand Transport Agency Code of Practice for Temporary Traffic Management (NZTA COP/TTM) requires that appropriately trained and qualified personnel must carry out and supervise Temporary Traffic Management duties on all roadwork sites	✓	✓	✓		
	That the Site Traffic Management Supervisor (STMS) has specific duties and has ultimate responsibility for overall traffic management at the site	✓	✓	✓		
	Excavation (Please note that this can be a one team or a combination of team's responsibility. i.e., contractors)	Kaiwhakamahi Ratonga Wai-inu	Kaiwhakamahi Matua Ratonga Wai-inu	Kaiārahi Wheketere Ratonga Wai-inu	Kaiwhakahaere Wheketere Ratonga Wai-inu	Unit Standard
		Junior Drinking Water Distribution Operator	Senior Drinking Water Distribution Operator	Drinking Water Distribution Team leader	Drinking Water Distribution Manager	
Need to be able to	Safely use tools and large earthmoving equipment to excavate the ground to provide access to underground services, or to install new assets	✓	✓			
	Load excavated materials onto the trucks, using attachments if necessary	✓ (Under supervision)	✓			
	Backfill, compact, and reinstate the surface of excavated area with suitable materials	✓ (Under supervision)	✓			
	Avoid underground services when excavating, making sure not to undermine nearby structures by digging away from them and by hand digging when close to services	✓	✓	✓		
	Prevent excavation collapse by shoring, benching, or battering back	✓ (Under supervision)	✓	✓		27501
	Provide safe access to get in and out of the trench	✓	✓	✓		
	Prevent people and materials falling into the excavated area. This will require Drinking Water Distribution Operators to install barriers strong enough not to collapse if someone falls against them	✓	✓	✓		27501
Check the excavation each day before starting work and after any event that may affect its stability	✓	✓	✓			

	Where applicable Drinking Water Distribution Operators need to hold a special license e.g. Class 2 licence with a roller, tracks, and wheels (R, T and W) endorsement	✓	✓	✓		
Need to know	That the Good Practice Guide: Excavation Safety [4] produced by Worksafe New Zealand provides practical guidance for how to manage the health and safety risks associated with excavation work	✓	✓	✓		
	That the Guide for Safety with Underground Services [5] sets out the work methods and preferred work practices for the location and excavation of underground service	✓	✓	✓		
	That activities like concrete cutting, which can be used to cut through pavements prior to excavation, produces a wastewater which cannot be discharged to the environment, or the stormwater network	✓	✓	✓		
	That they should not start excavations until they have Locating Underground Services	✓	✓	✓		27501
	Safe Working in Roads procedures	✓	✓	✓		27501
	How to operate different types of digger attachments	✓	✓	✓		
	What different support systems available and the hazards to be aware of when on sites e.g. ground water, soil type, sloping ground, surcharges such as vehicles, structures, or stockpiled materials	✓	✓	✓		27501
	The safe working methods and construction methodologies for different types of excavation support systems including: a) Proprietary support systems b) Steel sheet support systems c) Timber support systems	✓	✓	✓		27501
	The availability and capacity of excavation equipment and temporary works	✓	✓	✓		
	The duties of a banks person and slinger / signaller when working with excavation support systems	✓	✓	✓		27501
	How to interpret a trench support system design	✓	✓	✓		27501
	How to provide support to protect exposed services	✓	✓	✓		27501
	How to recognise situations that could be, or become, a confined space and report in accordance with the Water Suppliers procedures	✓	✓	✓		27501
	How to monitor excavation conditions for stability and atmospheric gasses	✓	✓	✓		27501
	The causes of instability in excavated areas, including soil types, moisture content, presence of surface water and ground water	✓	✓	✓		27501
	How to exclude and remove water from excavations	✓	✓	✓		27501
	The environmental considerations to be taken into account when disposing of trench water and contaminated ground	✓	✓	✓		
The emergency and rescue procedures in the event of a collapse	✓	✓	✓		27501	
The Health and Safety hazards and risks that can occur with the use of incorrect trench support practices	✓	✓	✓		27501	
The organisations notification and reporting processes following the detection of any issue	✓	✓	✓			
How to backfill and reinstate surfaces	✓	✓	✓			
	Install and Repair Water Distribution Pipelines (Please note that this can be a one team or a combination of team's responsibility. i.e., contractors)	Kaiwhakamahi Ratonga Wai-inu Junior Drinking Water Distribution Operator	Kaiwhakamahi Matua Ratonga Wai-inu Senior Drinking Water Distribution Operator	Kaiārahi Wheketere Ratonga Wai-inu Drinking Water Distribution Team leader	Kaiwhakahaere Wheketere Ratonga Wai-inu Drinking Water Distribution Manager	Unit Standard
	Respond to water distribution system maintenance / repair emergencies	✓	✓			
	Perform planned and unplanned maintenance / repairs, or installation, of new assets in accordance with job instructions detailed in operations and maintenance procedures that are referenced in the Water Safety Plan . This will require Drinking Water Distribution Operators to: - Complete the instructions/organisational procedures for the installation or repair task in question e.g., as recorded in maintenance procedures, or contract specifications.	✓	✓			30003

Need to be able to	<ul style="list-style-type: none"> - Identify any environmental, Health and Safety and water quality hazards and how they are to be mitigated. Obtain a permit to work, and where this is required for the procedure. - Follow Safe Working in Roads procedures for assets located in the road reserve. - Identify any distribution network impacts on the work and inform the appropriate people e.g. if there is to be a supply interruption. - Undertake Excavation to allow construction, or repair, to proceed, providing suitable excavation support. - Determine what methods and materials are suitable to repair broken water distribution assets for different types of asset failures e.g. split pipe may require a pipe replacement whereas a repair clamp, or patch may be suitable for a hole. - Ensure the safe Isolation of assets where this is required. - Install a temporary overland supply between fire hydrants to provide continuity of supply. - Ensure materials, pipes and fittings are suitable for use in the water distribution system, are clear of any contaminants and that appropriate Disinfection Procedures for Fittings and Materials are followed - Install, or repair, pipe, and fittings - Check that the completed installation maintenance and repairs meets the specification detailed in the maintenance procedure before returning the equipment to service. - Document what work has been undertaken, including identifying any costs (including time) and inventory items used 					
Need to know	How to identify any environmental, Health and Safety , and water quality hazards, and appropriate mitigation methods	✓	✓	✓		
	About Safe Working in Roads	✓	✓	✓		
	How to safely Safe Isolation of Assets, Plant and Equipment	✓	✓	✓		
	The Isolation procedures for distribution assets	✓	✓	✓		
	The procedures to follow when Locating Underground Services	✓	✓	✓		
	How to safely excavate , support/shore, backfill and reinstate holes and trenches needed for construction	✓	✓	✓		
	How to safely operate tools, machinery, and equipment e.g. excavators and pipe cutters	✓	✓	✓		
	How to install pipe including understanding: <ul style="list-style-type: none"> - position tolerances - appropriate bedding materials, pipe surround and compaction requirements - the need for vertical and horizontal separation from other services - how to install a trace wire 	✓	✓	✓		
The different rehabilitation and repair techniques associated with different material types including, but not limited to: <ul style="list-style-type: none"> - the use of structural liners - the use of non-structural liners - pipe bursting - direction drilling and tunnelling - hydro-excavation - air scoring - pigging - swabbing 	✓	✓	✓			
The procedures associated with the handling, storage, installation, repair, testing and commissioning of different pipe material types including:	✓	✓	✓			

	<ul style="list-style-type: none"> - polyethylene pipe - ductile iron - PVC 					
	<p>How to join pipe materials by:</p> <ul style="list-style-type: none"> - electrofusion processes - butt fusion processes - mechanical joints 	✓	✓	✓		
	How to undertake pressure and leakage testing	✓	✓	✓		
	The Drinking Water Hygiene Requirements and Disinfection Procedures for fittings and materials when commissioning the new pipework. This includes the requirement to ensure that pipes are cleaned, and the ends are covered whilst in storage and being laid	✓	✓	✓		
	How to dewater and recharge distribution mains	✓	✓	✓		
	The requirements for documenting what work has been completed	✓	✓	✓		
	That there are technical standards that cover the installation and repair of water distribution main. Refer to the Technical Standards Related to Water Distribution element of competence for a list of common standards	✓	✓	✓		
	<u>Maintenance and Repair of Water Pumping Systems</u>	Kaiwhakamahi Ratonga Wai-inu	Kaiwhakamahi Matua Ratonga Wai-inu	Kaiārahi Wheketere Ratonga Wai-inu	Kaiwhakahaere Wheketere Ratonga Wai-inu	Unit Standard
		Junior Drinking Water Distribution Operator	Senior Drinking Water Distribution Operator	Drinking Water Distribution Team leader	Drinking Water Distribution Manager	
Need to be able to	Respond to water distribution pumping system repair emergencies.	✓	✓	✓		
	<p>Perform planned and unplanned maintenance on assets in accordance with job instructions detailed in operations and maintenance procedures that are referenced in the Water Safety Plan. This will require Drinking Water Distribution Operators to:</p> <ul style="list-style-type: none"> - Complete the instructions/organisational procedures for the maintenance task in question e.g. as recorded in maintenance procedures. - Identify any environmental, Health and Safety, and water quality hazards and how they are to be mitigated. Obtain a permit to work, where this is required for the procedure. - Identify any distribution network impacts on the work and inform the appropriate people e.g. if there is to be a supply interruption. - Undertake safe Isolation of assets, plant, and equipment. - Make sure materials, pipes and fittings are suitable for use in the water distribution system and are clear of any contaminants before installing. - Disinfection Procedures for Fittings and Materials. - Check that the completed maintenance and repairs meets the specification detailed in the maintenance procedure before returning the equipment to service. - Document what work has been undertaken, including identifying any costs (including time) and spare parts used. 	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓		
	The required planned, scheduled, and reactive maintenance tasks and procedures for the drinking water distribution pumping assets.	✓	✓	✓		

Need to know	How the equipment typically operates. Drinking Water Distribution Operators need to observe the equipment while it is in use so that they can recognize unusual sounds, vibrations or leaks that indicate that reactive maintenance is necessary.	✓	✓	✓		
	What maintenance frequency is required for each task. This will be based on the suggestions of the asset manufacturer but may also be a factor of the reliability and criticality of the asset.	✓	✓	✓		
	How to identify any environmental, Health and Safety and water quality hazards, and appropriate mitigation methods.	✓	✓	✓	✓	
	Safe shut down and Isolation procedures before performing maintenance.	✓	✓	✓		
	The Hygiene Requirements and Disinfection Procedures needed to work on these assets.	✓	✓	✓	✓	
	The requirements for documenting what work has been completed.	✓	✓	✓	✓	
	The maintenance and asset replacement strategies for the water distribution assets that are recorded in the Asset Management Plan, so that Operators are aware of what should be maintained and what should be replaced.	✓	✓	✓		
	That differentiating between planned and unplanned maintenance is important because an increasing incidence of unplanned maintenance might indicate that the distribution system is deteriorating and becoming unreliable.	✓	✓	✓		
	That routine (planned) maintenance comprises the periodic inspections and tests performed on equipment at regular intervals. Included are daily, weekly, monthly, quarterly etc., inspections during which minor routine maintenance tasks are carried out, e.g. cleaning, lubrication, vibration tests, adjustments replacements and calibrations.	✓	✓	✓		
	That scheduled (planned) maintenance is also carried out on a time basis but is based on wear and the expected life cycle of the equipment's individual components. It involves the systematic and periodic removal from service of a piece of equipment for the replacement of parts, reconditioning or overhaul.	✓	✓	✓		
	That reactive (unplanned) maintenance amounts to repairing equipment that has broken down or abandoning it and replacing it with new equipment.	✓	✓	✓		
That communication around water distribution asset maintenance is particularly important for where the maintenance activity might lead to: <ul style="list-style-type: none"> - pressure loss, - interruption to supply, or the possibility of discoloured water (e.g. where changing flow patterns re-suspend sediments).	✓	✓	✓			
Maintenance and Repairs of Water Storage Assets	Kaiwhakamahi Ratonga Wai-inu	Kaiwhakamahi Matua Ratonga Wai-inu	Kaiārahi Wheketere Ratonga Wai-inu	Kaiwhakahaere Wheketere Ratonga Wai-inu	Unit Standard	

	(Please note that this can be a one team or a combination of team's responsibility. i.e., contractors)	Junior Drinking Water Distribution Operator	Senior Drinking Water Distribution Operator	Drinking Water Distribution Team leader	Drinking Water Distribution Manager	
Need to be able to	Perform planned and unplanned maintenance on assets in accordance with Standard Operating Procedures that are referenced in the Water Safety Plan for the water storage tanks / service reservoir including: <ul style="list-style-type: none"> - inspecting the hydraulic controls - confirming the security of the vent screens and access covers - inspecting the cleanliness of the tank, including checking for accumulation of sediment, slime and chemical deposits - safely entering Confined Spaces. - removing accumulated sediments and Disinfection Procedures for Fittings and Materials the tanks. - inspect the condition of the water storage tanks / service reservoir roof, walls and foundations by looking for cracks or leaks. If cracks and leaks are noted the Drinking Water Distribution Operator needs to escalate these condition issues to the appropriate authority to flag that a structural integrity inspection is required. - Safely isolating and draining the reservoir. 	✓	✓			
	Respond to reports of reservoir leakage and escalate these where required.	✓	✓			
	Perform planned and unplanned maintenance on assets in accordance with Standard Operating Procedures that are identified in the Water Safety Plan . This may require Drinking Water Distribution Operators to complete the instructions/organisational procedures to: <ul style="list-style-type: none"> - Safely follow Reservoir Isolation procedures and drain the reservoir - Safely enter Confined Spaces - Inspect the cleanliness and security of the reservoir - Remove accumulated sediments Follow the required Disinfection Procedures for the Reservoir as part of a recommissioning procedure	✓	✓			
	Identify any environmental, Health and Safety and water quality hazards and how they are to be mitigated. Obtain a permit to work, where this is required for the procedure	✓	✓			
	Identify any distribution network impacts on the work and inform the appropriate people e.g. if there is to be a supply interruption	✓	✓			
	Check that the completed maintenance and repairs meets the specification detailed in the maintenance procedure before returning the reservoir to service.	✓	✓			
	Document what work has been undertaken, including identifying any costs (including time)	✓	✓			
Need to know	The operating and maintenance cycles for water storage tank / service reservoir including routine inspections	✓	✓	✓		
	The need to maintain reservoir integrity and how this can be compromised, including inspection requirements following a seismic event	✓	✓	✓		
	The security requirements for treated water storage tank / service reservoir	✓	✓	✓		
	Disinfection Procedures for the reservoir and the requirements for removing sediments, including safe entry procedures.	✓	✓	✓		
	<u>Validation and Calibration of Monitoring Equipment</u>	Kaiwhakamahi Ratonga Wai-inu	Kaiwhakamahi Matua Ratonga Wai-inu	Kaiārahi Wheketere Ratonga Wai-inu	Kaiwhakahaere Wheketere Ratonga Wai-inu	Unit Standard
				Drinking Water Distribution Manager		

		Junior Drinking Water Distribution Operator	Senior Drinking Water Distribution Operator	Drinking Water Distribution Team leader		
Need to be able to	Carry out key calibration or instrument checks of online equipment and identify issues with their performance	✓ (Under supervision)	✓	✓		
	Understand the operation of control systems and how to operate each instrument in various control states	✓	✓	✓		
	Carry out the practice of maintaining online instruments in line with supplier recommendations, standard operating procedures and record keeping as detailed in the Water Safety Plan for the supply	✓ (Under supervision)	✓	✓		
	Review and analyse the performance of the water instruments by reviewing site and telemetry data to ensure the results are correct and accurate	✓ (Under supervision)	✓	✓		
Need to know	The validation and calibration procedures documented within the Water Safety Plan for the supply	✓	✓	✓		
	What the critical control points for the water supply are	✓	✓	✓	✓	
	The correct type and use of various analytical equipment for water quality measurement, including the levels at which the instruments operate, and their limitations are understood e.g. the accuracy and sensitivity of the equipment	✓	✓	✓		
	The requirement and need for online monitoring of water processes, including the key performance criteria for the supply	✓	✓	✓		
	The use and care of online equipment, including record keeping	✓	✓	✓		
	The equipment required to maintain the instrument and its use	✓	✓	✓		
	The calibration of the instruments including understanding the expected results	✓	✓	✓		
	Communications, reporting, and record keeping requirements, associated with maintenance of monitoring equipment. These will be detailed in operations manuals referenced in the Water Safety Plan	✓	✓	✓		
	Monitoring requirements and how to identify and troubleshoot instrument performance problems, such as flat lining	✓	✓	✓		
	The need for accurate and precise analysis and risks associated with incomplete or inaccurate analysis or results	✓	✓	✓		
	Contingency plans associated with the distribution network when monitoring equipment is unavailable or incorrect	✓	✓	✓	✓	
	The requirements for validation and monitoring within the distribution network within the New Zealand Drinking Water Standards	✓	✓	✓	✓	
How the Guidelines for Drinking-water Quality Management for New Zealand relate to distribution networks, particularly with respect to online water quality reporting, and control systems	✓	✓	✓	✓		
	<u>Inventory Management</u>	Kaiwhakamahi Ratonga Wai-inu	Kaiwhakamahi Matua Ratonga Wai-inu	Kaiārahi Wheketere Ratonga Wai-inu	Kaiwhakahaere Wheketere Ratonga Wai-inu	Unit Standard
		Junior Drinking Water Distribution Operator	Senior Drinking Water Distribution Operator	Drinking Water Distribution Team leader	Drinking Water Distribution Manager	
Need to be able to	Proactively identify what spare parts are needed to maintain and repair equipment	✓	✓	✓		
	Monitor the level of parts that are held in stock	✓	✓	✓		
	Identify which parts are to be used first (i.e. the oldest)	✓	✓	✓		
	Proactively order adequate quantities of parts and consumables from the supplier, in accordance with the Procurement policies of the water supplier	✓	✓	✓		
	What spares are held in storage	✓	✓	✓		
	How to store parts correctly	✓	✓	✓		
	That spares should be used on a “first in, first out” basis.	✓	✓	✓		
	What supplier provides spare parts and how to follow the organisations procurement procedures to obtain them	✓	✓	✓		

Need to know	That standardisation of equipment and parts reduces the level of risk of equipment failure, because fewer types of each part need to be stocked which makes stock management easier and because it reduces the number of skills which need to be learnt to correctly install each part by the operators	✓	✓	✓		
	That only materials which are suitable for contact with drinking water are used	✓	✓	✓		
	Cranes and Lifting Equipment	Kaiwhakamahi Ratonga Wai-inu	Kaiwhakamahi Matua Ratonga Wai-inu	Kaiārahi Wheketere Ratonga Wai-inu	Kaiwhakahaere Wheketere Ratonga Wai-inu	Unit Standard
		Junior Drinking Water Distribution Operator	Senior Drinking Water Distribution Operator	Drinking Water Distribution Team leader	Drinking Water Distribution Manager	
Need to be able to	Understand and comply with the written instructions relating to the safe operation of the crane	✓	✓	✓		
	Calculate the load to be lifted and confirm that this is within the safe loading limit of the crane		✓	✓		
	Use, and understand, hand signals for the operation of the crane	✓	✓	✓		
	Exercise the required level of care when operating the crane, including wearing the correct Personal Protective Equipment (PPE)	✓	✓	✓		
	Notify the controller of any unsafe equipment or process as soon as practicable	✓	✓	✓		
	Readily locate all documentation and information related to the crane	✓	✓	✓		
	Engage an Inspector to certify that the crane is safe		✓	✓		
Need to know	That they cannot operate the crane until they have been trained in its safe use	✓	✓	✓		
	That the crane cannot be used unless it has a certification of inspection	✓	✓	✓		
	The design loading limits of the crane.	✓	✓	✓		
	That the Approved Code of Practice for Cranes [6] covers the operation, maintenance and inspection requirements of any crane	✓	✓	✓	✓	
	That a general guide to the health and safety in employment (pressure equipment, cranes and passenger ropeways) Regulations 1999 provides guidance on regulations around the duties of equipment controllers, designers, manufacturers and suppliers, as well as workers	✓	✓	✓	✓	
	Awareness of Specified Building Systems	Kaiwhakamahi Ratonga Wai-inu	Kaiwhakamahi Matua Ratonga Wai-inu	Kaiārahi Wheketere Ratonga Wai-inu	Kaiwhakahaere Wheketere Ratonga Wai-inu	Unit Standard
		Junior Drinking Water Distribution Operator	Senior Drinking Water Distribution Operator	Drinking Water Distribution Team leader	Drinking Water Distribution Manager	
Need to be able to	Ensure that the current version of the BWoF is publicly displayed		✓	✓		
	Inform the appropriate people have been informed if the displayed BWoF is out-of-date					
	Induct the Independent Qualified Person (IQP) engaged to undertake inspections and maintenance of the specified systems onto the site in question		✓	✓		
Need to know	That buildings with specified systems need to have a compliance schedule where one is required under the Building Act [7]	✓	✓	✓	✓	
	That inspections, maintenance and reporting procedures for the specified systems stated in the compliance schedule for the building in question will need to be carried out by an Independent Qualified Person (IQP) to confirm that those systems are performing, and will continue to perform, to the performance standards	✓	✓	✓	✓	
	That reports detailing inspections, maintenance, and repairs from IQP need to be kept with the compliance schedule for at least two years after they have been issued	✓	✓	✓	✓	
	That the Ministry of Building, Innovation and Employment has published a Compliance Schedule Handbook to provide guidance on the requirements of Compliance Schedules and Building Warrants of Fitness	✓	✓	✓	✓	
	Root Cause Analysis	Kaiwhakamahi Ratonga Wai-inu	Kaiwhakamahi Matua Ratonga Wai-inu	Kaiārahi Wheketere Ratonga Wai-inu	Kaiwhakahaere Wheketere Ratonga Wai-inu	Unit Standard

		Junior Drinking Water Distribution Operator	Senior Drinking Water Distribution Operator	Drinking Water Distribution Team leader	Drinking Water Distribution Manager	
Need to be able to	Be involved, with others where appropriate, in the Root Cause Analysis processes. This involves helping to: <ul style="list-style-type: none"> Define the problem: <ul style="list-style-type: none"> what is happening? what are the specific symptoms? Collect data: <ul style="list-style-type: none"> how long has it been happening? what is the impact of the problem? Identify possible causal factors: <ul style="list-style-type: none"> what sequence of events led to the problem? what conditions allows it to occur? Identify the Root Cause: <ul style="list-style-type: none"> Why does the causal factor exist? What is the real reason the problem occurred? Recommend and Implement Solutions <ul style="list-style-type: none"> What can you do to prevent this happening again? How do we implement the solution? Who will be responsible for this? What are the risks of implementing the solution? 	✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓	
	Update the Water Safety Plan			✓	✓	
Need to know	The basic cause of the problem (there can be more than one). Usually either a: <ol style="list-style-type: none"> Physical cause – a physical item failed in some way (for example a dose pump stopped working). Human cause – somebody did something wrong or did not do something that was needed. Human causes typically lead to physical causes (for example nobody filled a dose tank, which led to the pump failing). Organisational cause - a system, process, or policy that people use to make decisions or do their work is faulty (for example, no one person was responsible for maintaining the dose tank, and everyone assumed someone else had done this). 	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	
	<u>Water Demand and Hydraulics</u>	Kaiwhakamahi Ratonga Wai-inu Junior Drinking Water Distribution Operator	Kaiwhakamahi Matua Ratonga Wai-inu Senior Drinking Water Distribution Operator	Kaiārahi Wheketere Ratonga Wai-inu Drinking Water Distribution Team leader	Kaiwhakahaere Wheketere Ratonga Wai-inu Drinking Water Distribution Manager	Unit Standard
Need to be able to	Monitor the flow through the water distribution network and use knowledge of daily and seasonal demand variations to forecast what the future demand for water will be		✓	✓	✓	31520
	Perform calculations involving flow, pressure, velocities, and head loss from first principles		✓	✓		
	Review and analyse the performance of flow instruments.	✓	✓	✓		
	Carry out procedures for maintaining flow instruments in line with supplier recommendations, operational procedures including paperwork and records keeping requirements	✓	✓	✓		

	Follow standard operating procedures to maintain adequate flows through the system, particularly at ends of mains, and during periods of low demand e.g. flushing end of mains					
Need to know	Hydraulic principles and understanding of how flow and hydraulic conditions can influence the water distribution network	✓	✓	✓		31520
	Factors which contribute to water demand including pressure, population, and environmental conditions	✓	✓	✓		
	<ul style="list-style-type: none"> ▪ The different types of water distribution assets, why they are installed and how they impact on network hydraulics including: <ul style="list-style-type: none"> - Service reservoirs - Trunk mains - Distribution mains - Pumping stations / booster pumps - District metered areas and pressure managed areas - Compliance monitoring points - Valves, air valves, hydrants, and washouts 	✓	✓	✓		
	Flow calculations and understand their significance for meeting customer demand	✓	✓	✓		
	The requirements of flow monitoring and reporting requirements to meet Resource Consent conditions	✓	✓	✓	✓	
	The monitoring of hydraulic loading and control limitations	✓	✓	✓		
	The significance of design capacity of the distribution network.	✓	✓	✓		
	That increased water age can lead to sub-optimal water quality including increased concentrations of DBPs, decreased disinfectant concentrations, unacceptable tastes, and odours due to biological growth, and low dissolved oxygen and increased pH in cement or cement-lined pipes	✓	✓	✓		
	Sudden increases in flows or rapid flow reversals, can both dislodge accumulated sediments and biofilms, leading to increased turbidity and colour in drinking-water supplied to consumers	✓	✓	✓		
	Key flow control systems and operation of these in automatic or manual	✓	✓	✓		
The risks associated with incomplete or inaccurate flow measurement	✓	✓	✓			
Contingency plans associated with the network when monitoring equipment is unavailable or incorrect	✓	✓	✓	✓		
	Pressure Management	Kaiwhakamahi Ratonga Wai-inu	Kaiwhakamahi Matua Ratonga Wai-inu	Kaiārahi Wheketere Ratonga Wai-inu	Kaiwhakahaere Wheketere Ratonga Wai-inu	Unit Standard
		Junior Drinking Water Distribution Operator	Senior Drinking Water Distribution Operator	Drinking Water Distribution Team leader	Drinking Water Distribution Manager	
Need to be able to	Undertake operational monitoring of pressures within the drinking water distribution systems using the SCADA system	✓	✓			31520
	Identify areas where the distribution pressure does not meet the required level of service	✓	✓			
	Investigate the loss of positive pressure, especially during system changes and repair work	✓	✓	✓		
Need to know	The principles behind pressure management on the drinking water distribution network and the many causes of sudden pressure reductions	✓	✓	✓		
	Specific Health and Safety requirements relating to pressure management valves	✓	✓	✓		
	Different types of pressure management valves used within the water industry	✓	✓	✓		
	The different types of tools and equipment required when working on pressure management valves	✓	✓	✓		
	Who may be affected by pressure management valve maintenance and how they are informed	✓	✓	✓		
	How to repair, maintain and re-commission pressure management valves	✓	✓	✓		
	Data collection and reporting requirements related to pressures within the drinking water distribution system	✓	✓	✓		
Sufficient pressure needs to be maintained within the drinking water distribution system to meet the Firefighting Code of Practice requirements	✓	✓	✓			
	Flushing Water Mains	Kaiwhakamahi Ratonga Wai-inu	Kaiwhakamahi Matua Ratonga Wai-inu	Kaiārahi Wheketere Ratonga Wai-inu	Kaiwhakahaere Wheketere Ratonga Wai-inu	Unit Standard

	(Please note that this can be a one team or a combination of team's responsibility. i.e., contractors)	Junior Drinking Water Distribution Operator	Senior Drinking Water Distribution Operator	Drinking Water Distribution Team leader	Drinking Water Distribution Manager	
Need to be able to	Follow the standard operating procedure referenced in the Water Safety Plan for mains flushing	✓	✓			31449
	Identify the pipes to be flushed, the associated valves and hydrants required to cause unidirectional flow and determine the discharge location	✓	✓			
	Follow the sequence of operating the required valves and hydrants to flush the pipes for the required period of time, using metered standpipes	✓	✓			
	Safely work in the roading corridor, where applicable	✓	✓			
	Notify the appropriate people before undertaking the work e.g. the communications team so that affected customers are notified. Communicating with customers is an essential part of any mains cleaning programme because the process can: - stir-up sediments; - reduce pressure; increase community concerns about wasting water and the discharge of sediments	✓	✓			
	For new mains that are to be connected to the distribution system, mains flushing represents the first step in the Disinfection Procedures for new watermains	✓	✓			
	Flushing water should be safely discharged, meeting any associated resource consent discharge requirements	✓	✓			
Need to know	Ensure that the work undertaken has been recorded. This should include ensuring that that the volume of water discharged is recorded	✓	✓			
	Reactive and preventative mains flushing and sediment removal procedures and frequencies	✓	✓	✓		
	The required flushing flow rate to suspend and transport sediments along the pipeline and the number of hydrants required to be opened to achieve this flow	✓	✓	✓		
	The time required to flush the main. In calculating flushing times Drinking Water Distribution Operators need to know that it is important to remove at least twice the nominal volume of each main, because the suspended particulate matter moves more slowly than the water	✓	✓	✓		
	That the flow of water should be from one direction at a time. A systematic approach should be used to ensure that water enters from a previously cleaned main and approaches the discharge point from one direction only	✓	✓	✓		
	When flushing of mains is required e.g. following the repair of pipes or as part of a systematic maintenance programme	✓	✓	✓		
	Ensure that the work undertaken has been recorded. This should include ensuring that that the residual disinfectant levels are tested and noted	✓	✓	✓		
	Where flushing operations that place in the roading corridor the Drinking Water Distribution Operator needs to know how to safely work in roads	✓	✓	✓		
How to safely use all tools and equipment required to undertake the work	✓	✓	✓			
	Air Scouring Water Mains (Please note that this can be a one team or a combination of team's responsibility. i.e., contractors)	Kaiwhakamahi Ratonga Wai-inu Junior Drinking Water Distribution Operator	Kaiwhakamahi Matua Ratonga Wai-inu Senior Drinking Water Distribution Operator	Kaiārahi Wheketere Ratonga Wai-inu Drinking Water Distribution Team leader	Kaiwhakahaere Wheketere Ratonga Wai-inu Drinking Water Distribution Manager	Unit Standard
Need to be	Follow the standard operating procedure referenced in the Water Safety Plan for air scouring of mains.	✓	✓			31449
	Prior to starting air scouring operations, Drinking Water Distribution Operators need to check the air scour equipment to check that there is no debris in the air cooler tube or hoses and that the air compressor is not generating large quantities of oil.	✓	✓			
	Fit a tee piece with a ball valve on the hydrant connection to enable the main to be depressurised of air and make it safe for the operator to disconnect the hose connection either from the main, compressor or air scouring unit.	✓	✓			

able to:	Identify the pipes to be scoured, the associated isolation valves, hydrant/air injection point and the discharge location.	✓	✓			
	Safely work in the roading corridor, where applicable for the main in question.	✓	✓			
	Follow the sequence of operating the required valves to isolate the main to be scoured.	✓	✓			
	Ensure that the air compressor pressure is less than the mains pressure to eliminate the risk of backflow.	✓	✓			
	The materials and fixtures used to air scour pipes are potential sources of contamination to the network and therefore Disinfection Procedures need to be followed	✓	✓			
	Take precautions to prevent air contaminated with pathogens and chemicals (such as compressor oil) entering the pipework. As air compressors can release oil into the air stream, Drinking Water Distribution Operators need to ensure that the compressed air is passed through suitable filters to remove oil droplets and vapors.	✓	✓			
	Purge the air and scour water, and on completion, ensuring that the discharge to the environment meets any resource consent requirements.	✓	✓			
	Notify the appropriate people before undertaking the work e.g. the communications team so that affected customers are notified. Communicating with customers is an essential part of any mains cleaning programme because the process can: - stir-up sediments; -reduce pressure; -increase community concerns about wasting water and the discharge of sediments.	✓	✓			
Ensure that the work undertaken has been recorded. This should include ensuring that that the volume of any water discharged is recorded.	✓	✓				
Need to know	The circumstances in which the air scoring technique is best suited for mains cleaning e.g. its suitability for low pressure areas, and its pipe diameter limitations.	✓	✓	✓		
	Reactive and preventative air scouring and sediment removal procedures and frequencies.	✓	✓	✓		
	How to determine what valves to operate to isolate the section of main to be scoured.	✓	✓	✓		
	The required pressure to scour sediments whilst ensuring that there is no resulting backflow from the network.	✓	✓	✓		
	The requirements to keep records about what work they have undertaken has been recorded. This should include ensuring that that the water sampling test results are noted.	✓	✓	✓		
	Where flushing operations take place in the roading corridor the Drinking Water Distribution Operator needs to know about Working in Roads.	✓	✓	✓		
How to safely use all tools and equipment required to undertake the work.	✓	✓	✓			
	Swabbing / Pigging Water Mains (Please note that this can be a one team or a combination of team's responsibility. i.e., contractors)	Kaiwhakamahi Ratonga Wai-inu Junior Drinking Water Distribution Operator	Kaiwhakamahi Matua Ratonga Wai-inu Senior Drinking Water Distribution Operator	Kaiārahi Wheketere Ratonga Wai-inu Drinking Water Distribution Team leader	Kaiwhakahaere Wheketere Ratonga Wai-inu Drinking Water Distribution Manager	Unit Standard
Need to be able to	Follow the standard operating procedure referenced in the Water Safety Plan for swabbing/pigging.	✓	✓			31449
	Identify the pipes to be cleaned, and how the pipe will be accessed. Swabs/pigs are normally launched and exited from existing fixtures, or where there are connections specifically installed for swabbing.	✓	✓			
	Isolate the line to be cleaned.	✓	✓			
	Install and run a "line swab/pig" as a first stage through the pipe to prove flow conditions and the actual pipe diameter.	✓	✓			
	Because the swab/pig is introduced into the distribution network it is a potential source of contamination, therefore is important to follow the Disinfection Procedures before inserting the swab/pig.	✓	✓			
	Launch the swab/pig and, by controlling the rate of flow through upstream fixtures, it can be guided to the exit point. Blockages within the line can usually be rectified by backflushing the swab out the inlet point.	✓	✓			
	Safely work in the roading corridor, where applicable.	✓	✓			

	Notify the appropriate people before undertaking the work e.g. the communications team so that affected customers are notified. Communicating with customers is an essential part of any mains cleaning programme because the process can: - stir-up sediments; -reduce pressure; -increase community concerns about wasting water and the discharge of sediments.	✓	✓			
	Swabbing water should be safely discharged, meeting any associated resource consent discharge requirements.	✓	✓			
	Ensure that the work undertaken has been recorded. This should include ensuring that that the volume of water discharged is recorded.	✓	✓			
Need to know	Reactive and preventative mains swabbing/pigging and sediment removal procedures and frequencies.	✓	✓	✓		
	The required flow rate to guide the swab along the pipeline.	✓	✓	✓		
	Where operations that place in the roading corridor the Drinking Water Distribution Operator needs to know how to safely work in roads.	✓	✓	✓		
	How to safely use all tools and equipment required to undertake the work.	✓	✓	✓		
	Boundary Backflow Prevention (Please note that this can be a one team or a combination of team's responsibility. i.e., contractors)	Kaiwhakamahi Ratonga Wai-inu	Kaiwhakamahi Matua Ratonga Wai-inu	Kaiārahi Wheketere Ratonga Wai-inu	Kaiwhakahaere Wheketere Ratonga Wai-inu	Unit Standard
		Junior Drinking Water Distribution Operator	Senior Drinking Water Distribution Operator	Drinking Water Distribution Team leader	Drinking Water Distribution Manager	
Need to be able to	Maintain positive pressure within the drinking water distribution system to reduce the likelihood of backflow occurring.	✓	✓			
	Install appropriate backflow prevention devices at new connections based on level of risk (low, medium and high). The Water Suppliers backflow policy, referenced in the Water Safety Plan, will identify how to assess the level of risk for the network e.g. water meters with built-in dual check valves may be used for residential customers, whereas testable backflow prevention devices may be required for high-risk industrial customers.	✓	✓			
	Update the Water Suppliers register of backflow prevention devices for each new installation.	✓	✓			
	Undertake the ongoing annual testing programme to evaluate the effectiveness of the testable backflow prevention devices and keep quality assurance records of these – e.g. by recording results in the water supplier's backflow prevention devices register database.	✓	✓			
	Undertake field tests of backflow prevention devices in accordance with Part 3 of AS/NZS 2845.1:2010.	✓	✓			
	Maintain and re-test backflow prevention devices in accordance with Part 3 of AS/NZS 2845.1:2010.	✓	✓			
	Ensure that the equipment used to undertake field testing of backflow prevention devices is calibrated and certified annually.	✓	✓			
	Demonstrate that they have attended and passed approved backflow testing courses.	✓	✓			
Need to know	The loss of pressure during interruptions to supply exacerbates the impact of backflow on the drinking water distribution system. The lower the system pressure and/or the increased instances of leakage in the piping network, the greater the probability of contaminant ingress.	✓	✓	✓		
	That the Health (Drinking Water) Amendment Act: - identifies that back-flow prevention devices can be used to protect the drinking water distribution system from public health risks related to back-flow. - recognises that some back-flow prevention devices are installed and owned by the water supplier and some are installed and owned by the property owner. - requires a water supplier to maintain a register of all boundary backflow devices, including (non-testable) dual check valves. The register should include both water supplier and privately owned boundary devices. - requires, irrespective of ownership, that all boundary backflow devices shall be tested at least annually	✓	✓	✓		
	That each Water Suppliers backflow prevention policy will identify who owns and maintains the boundary backflow devices – e.g. whether it is the water supplier, the property owner, or a combined ownership.	✓	✓	✓		

	That the Water Safety Plan for the supply will: - include a risk assessment of backflow to the water distribution system. - identify how this risk is to be reduced, e.g. via a backflow prevention programme of works.	✓	✓	✓		
	That each Water Supplier will have a backflow prevention programme that: - includes an ongoing annual inspection/testing programme to evaluate the effectiveness of the backflow prevention of all testable boundary devices. - covers installation and replacement programme for non-testable backflow devices. - covers situations where water is extracted from bores or taken from water mains by water carriers.	✓	✓	✓		
	The Incident and Emergency Response Plan for the water supply in the event of: - a backflow event - a failed backflow prevention device	✓	✓	✓		
	That the Water Safety Plan Guide: Distribution System – Backflow Prevention provides details on backflow risks to the drinking water distribution system.	✓	✓	✓		
	That the Water New Zealand guidance document Boundary Backflow Prevention for Drinking Water Supplies [8] provides water suppliers with backflow prevention guidelines.	✓	✓	✓		
	That Part 1 of the Standard AS/NZS 2845.1:2010 Water Supply – Backflow Prevention Devices [9] specifies requirements for the materials, design and performance testing of backflow devices used to prevent contamination of drinking water supplies.	✓	✓	✓		
	That Part 3 of the Standard AS/NZ 2845.3:2020 Water Supply – Backflow Prevention Devices outlines the minimum requirements for the testing and maintenance of testable backflow prevention devices in the field.	✓	✓	✓		
	Maintaining Disinfectant Residuals (Please note that this can be a one team or a combination of team’s responsibility. i.e., contractors)	Kaiwhakamahi Ratonga Wai-inu	Kaiwhakamahi Matua Ratonga Wai-inu	Kaiārahi Wheketere Ratonga Wai-inu	Kaiwhakahaere Wheketere Ratonga Wai-inu	Unit Standard
		Junior Drinking Water Distribution Operator	Senior Drinking Water Distribution Operator	Drinking Water Distribution Team leader	Drinking Water Distribution Manager	
Need to be able to	Follow the standard operating procedures, which will be referenced in the Water Safety Plan, for disinfection residuals. This may include: - operating secondary booster chlorination stations to ensure that the disinfection targets are achieved. - maintaining secondary booster chlorination stations assets. - collecting water samples to test for Free Available Chlorine equivalent (FACe) and disinfection by-products (DBP).	✓	✓			
	Respond to the effects of Mixing Water Sources within the distribution system on the resulting residuals.	✓	✓			
	Escalate issues around DBP’s and FACe to others e.g. the Drinking-water Treatment Operator, who may be responsible for some of the procedures related to maintaining disinfectant residuals, or disinfection by-product reduction.	✓	✓			
Need to know	What the disinfection target criteria are, such as minimum and maximum residuals at: - the head of distribution system - immediately after booster stations - target residuals within the distribution system.	✓	✓	✓		
	How to operate primary and secondary disinfection stations, including operational monitoring requirements.	✓	✓	✓		
	How to respond to sudden drops in disinfectant residuals that could indicate a contamination event, including escalation requirements.	✓	✓	✓		
	That the booster stations should be operated in a manner that reduces the formation of the health-significant disinfection by-products. However, operators need to be mindful that microbiological quality of the water should not be sacrificed just to minimise disinfection by-product formation.	✓	✓	✓		
	That the presence of high levels of DBP should be escalated to the appropriate people e.g. the drinking water treatment operator.	✓	✓	✓		
	That the rate of loss of the disinfection residual is multi-factorial and can be impacted by: - the retention time in the distribution system - the percent of compounds that react slowly with chlorine remaining in water after treatment. - contaminates entering the distribution system - the state of the water mains - water temperature	✓	✓	✓		

	More useful information found in the Water New Zealand Good Practice Guidance Note on the Supply of Chlorine for use in Drinking-water treatment. [10] and within Chapter 15 of the Ministry of Health Guidelines for Drinking-Water Quality Management for New Zealand [11]	✓	✓	✓		
	<p>Mixing Water Sources (Please note that this can be a one team or a combination of team's responsibility. i.e., contractors)</p>	<p>Kaiwhakamahi Ratonga Wai-inu Junior Drinking Water Distribution Operator</p>	<p>Kaiwhakamahi Matua Ratonga Wai-inu Senior Drinking Water Distribution Operator</p>	<p>Kaiārahi Wheketere Ratonga Wai-inu Drinking Water Distribution Team leader</p>	<p>Kaiwhakahaere Wheketere Ratonga Wai-inu Drinking Water Distribution Manager</p>	<p>Unit Standard</p>
Need to be able to	Follow the standard operating procedure, which will be referenced in the Water Safety Plan, for dealing with the mixing of sources, and in particular with changing the usual mix of sources. Depending on the circumstances these procedures may include: - increasing disinfectant doses, - Maintaining Disinfectant within the drinking water distribution system, - changes in operation of the drinking water distribution system, and - water main cleaning. Note that not all these procedures are necessarily the responsibility of the Drinking-water Distribution Operator, who may need to escalate the requirement of some procedures to others e.g. the Drinking-water Treatment Operator.	✓	✓			
	Identify the range of alarms associated with changing water quality in the network.	✓	✓			
	Monitor and check water samples within the distribution system for changes in pH and FACe.	✓	✓			
	Evaluate trend data from SCADA and / or test results to identify: a) Normal trends when the supply is being operated in its standard manner b) Atypical trends when mix of water sources changes from usual	✓	✓			
	Instigate corrective action to ensure residual disinfectant levels are maintained.	✓	✓			
	Instigate water main flushing to remove dislodged sediments or biofilms.	✓	✓			
	Investigate the cause of taste complaints.	✓	✓			
Need to know	The potential sub-optimal consequences of mixing water sources.	✓	✓	✓		
	Water quality and sampling requirements throughout the distribution system.	✓	✓	✓		
	How to interrogate SCADA to: a) Evaluate trend data differentiating normal operational conditions from conditions when there is a change in the usual mix of water sources.	✓	✓	✓		
	The range of instrumentation plant used to monitor water quality within the distribution system and their calibration requirements.	✓	✓	✓		
	Disinfection Procedures for Fittings and Materials standards and requirements for removing sediments.	✓	✓	✓		
	Alarms, action levels, authorisation levels and consequences associated with deteriorating water quality within the distribution system.	✓	✓	✓		
	How to identify the root cause of problems and the sequence of actions required to restore the distribution	✓	✓	✓		
Reactive and preventative mains flushing and sediment removal procedures and frequencies.	✓	✓	✓			
	<p>Operate Treated Water Storage Tanks/Service Reservoirs (Please note that this can be a one team or a combination of team's responsibility. i.e., contractors)</p>	<p>Kaiwhakamahi Ratonga Wai-inu Junior Drinking Water Distribution Operator</p>	<p>Kaiwhakamahi Matua Ratonga Wai-inu Senior Drinking Water Distribution Operator</p>	<p>Kaiārahi Wheketere Ratonga Wai-inu Drinking Water Distribution Team leader</p>	<p>Kaiwhakahaere Wheketere Ratonga Wai-inu Drinking Water Distribution Manager</p>	<p>Unit Standard</p>
	Follow the operational procedures and first line maintenance tasks relating to the water storage asset that are documented in the operational manuals and procedures that are referenced in the Water Safety Plan	✓	✓			
	Identify all mechanical, electrical and instrumentation assets associated with the water storage tank / service reservoir asset on SCADA and on site.	✓	✓			

Need to be able to	Monitor and check reservoir storage volumes, completing associated calculations e.g. to determine disinfection contact times, retention and turnover.	✓	✓			
	Undertake water quality testing at the water storage tanks. (This can be done by a range of roles depending on what is being tested – i.e. treatment plant operators/Lab technician)	✓	✓			
	Identify set-points (e.g. pump start and stop levels) applicable to the operation of the water storage tank / service reservoir.	✓	✓			
	Identify the range of alarms associated with the water storage tank / service reservoir (e.g. low level, high level and hatch alarms).	✓	✓			
	Control the water storage tank / service reservoir to meet energy efficiency targets.	✓	✓			
	Evaluate trend data from SCADA and / or test results to identify: a) Normal trends or cycles for the works, and b) Atypical trends or changes and the underlying or root causes for the change	✓	✓			
	Instigate corrective action to return the water storage tank / service reservoir to normal operation.	✓	✓			
Need to know	The operating and maintenance cycles for water storage tank / service reservoir including routine inspections.	✓	✓	✓		
	The operation and control of associated pumping regimes.	✓	✓	✓		
	Water quality and sampling requirements at the water storage tank / service reservoir.			✓		
	The need to maintain reservoir integrity and how this can be compromised, including inspection requirements following a seismic event.	✓	✓	✓		
	The consequences of sub-optimal treat storage water asset performance on the Distribution network and customers.	✓	✓	✓		
	How to interrogate SCADA to: b) Identify and control items of mechanical, electrical and instrumentation equipment. c) Evaluate trend data differentiating normal operational cycles from developing fault conditions. d) How to confirm the configuration, operation and performance of the actual water storage asset corresponds to the information system.	✓	✓	✓		
	Security requirements for treated water storage tank / service reservoir.	✓	✓	✓		
	The range of instrumentation plant used to monitor and control the water storage tank / service reservoir and their calibration requirements.	✓	✓	✓		
	How levels and flows are controlled to maximize energy efficiency.	✓	✓	✓		
	Disinfection Procedures for Fittings and Materials standards and requirements for removing sediments.	✓	✓	✓		
	Alarms, action levels, authorization levels and consequences associated with the process or processes	✓	✓	✓		
	How to identify the root cause of problems and the sequence of actions required to restore water storage to optimal volumes, taking account of all demand and process lag times.	✓	✓	✓		
	Reactive and preventative maintenance requirements and frequencies for the water storage tank / service reservoir, including safe entry procedures, as detailed further in the Maintenance and Repairs of Water Storage Assets element.	✓	✓	✓		
	Kaiwhakamahi Ratonga Wai-inu	Kaiwhakamahi Matua Ratonga Wai-inu	Kaiārahi Wheketere Ratonga Wai-inu	Kaiwhakahaere Wheketere Ratonga Wai-inu	Unit Standard	
Leakage Detection and Management (Please note that this can be a one team or a combination of team's responsibility. i.e., contractors)	Junior Drinking Water Distribution Operator	Senior Drinking Water Distribution Operator	Drinking Water Distribution Team leader	Drinking Water Distribution Manager		
Need to be able to	Investigate customer complaints about leakage or seepage.	✓	✓			31449
	Sample and test leaks to confirm its source e.g., check for the presence of fluoride or FAC.	✓	✓			
	Repair burst/leaking pipes.	✓	✓			
	Ensure that the location of, and repair of, leaks are recorded. This should include the response time to fix from any complaints, the date of repair, the exact position of the leak, the pipe material and size and whether pipe replacement was necessary.	✓	✓			31449
	Identify District Metered Areas (DMAs) and the location of DMA boundary valves. Drinking water distribution operators need to ensure that the DMA boundary valves are kept closed and routinely check on their status.	✓	✓			

	Retrieve logging data that is used to calculate leakage rates within District Meter Areas.	✓	✓			
	Maintain flow meters and data capture / logging test equipment in line with manufacturers' recommendations e.g. undertake calibrations.	✓	✓			
Need to know	How the drinking water distribution network operates at a strategic level including understanding reservoir zones, district metered areas (DMAs) and key account user monitoring.	✓	✓	✓		
	What the Water Supplier's expected response time to leakage complaints is.	✓	✓	✓		
	The regulatory reporting requirements: the Department of Internal Affairs requires water loss, complaints and their fault response times to be provided as part of Councils non-financial performance measures under the Local Government Act 2002.	✓	✓	✓		
	That the water-take resource consents may have water conservation requirements that suppliers must meet related to reducing water losses from the distribution system.	✓	✓	✓		
	How various water metering and data collection technologies are used in leakage reduction programmes, including data loggers, pressure sensors, flow meters and customer water meters.	✓	✓	✓		
	That the Water NZ Water Loss Guidelines provides information on how to assess water losses, and recommendations around developing a water loss strategy.	✓	✓	✓		
	How to undertake repairs on drinking water assets to stop leaks.	✓	✓	✓		
	Connection of New Customers (Please note that this can be a one team or a combination of team's responsibility. i.e., contractors)	Kaiwhakamahi Ratonga Wai-inu	Kaiwhakamahi Matua Ratonga Wai-inu	Kaiārahi Wheketere Ratonga Wai-inu	Kaiwhakahaere Wheketere Ratonga Wai-inu	Unit Standard
		Junior Drinking Water Distribution Operator	Senior Drinking Water Distribution Operator	Drinking Water Distribution Team leader	Drinking Water Distribution Manager	
Need to be able to	Follow the construction standards, which will be referenced in the Water Safety Plan, for the connection of new customers. Information on new connection requirements will likely be detailed in the District Plan and/or the Land Development and Subdivision Infrastructure Code of Practice. This may include: - Excavating and installing new service connection pipework and fittings. - Install pipe restraint and anchorage. - Install a backflow preventer and test that it is working. - Install a water meter and test that it is working. - Ensuring that Disinfection Procedures for Fittings and Materials and flushing procedures are followed prior to commissioning. - Connecting the new pipework to the distribution network. Depending on the materials used this might require the drinking water distribution operator to connect the pipes use a tapping saddle or by electrofusion fitting. - Keeping records of installation including marking up as-built plans to show the location, materials used, costs and date of installation. - Prevent contamination of the distribution system during the installation of new connection by following the Water Suppliers construction standards and procedures, which will be referenced in the Water Safety Plan.	✓	✓			
Need to know	The extent of their responsibilities for installing new connections as defined in the Water Suppliers standard operational procedures, as referenced in the Water Safety Plan. Including understanding how the Water Supplier defines the point of supply, where private assets are differentiated from assets belonging to the water supplier.	✓	✓	✓		
	Which connections require backflow prevention and how to install it.	✓	✓	✓		
	That NZS4404:2010 Land Development and Subdivision Infrastructure details requirements for the design and construction of water distribution infrastructure.	✓	✓	✓		
	Construction standards and specifications including for material storage, handling, transport, flushing, swabbing, Disinfection Procedures for Fittings and Materials, contact tome and water quality testing	✓	✓	✓		
	That the method of connection (including tapping) will be dependent on both the reticulation main and service connection pipe materials.	✓	✓	✓		
	What to do where existing cathodic protection systems are in place on the pipeline being connected to.	✓	✓	✓		

	The as-building and quality record requirements	✓	✓	✓		
	<p>Flow and Water Meters (Please note that this can be a one team or a combination of team's responsibility. i.e., contractors)</p>	<p>Kaiwhakamahi Ratonga Wai-inu Junior Drinking Water Distribution Operator</p>	<p>Kaiwhakamahi Matua Ratonga Wai-inu Senior Drinking Water Distribution Operator</p>	<p>Kaiārahi Wheketere Ratonga Wai-inu Drinking Water Distribution Team leader</p>	<p>Kaiwhakahaere Wheketere Ratonga Wai-inu Drinking Water Distribution Manager</p>	<p>Unit Standard</p>
Need to be able to	Follow standard operating procedures, which will be referenced in the Water Safety Plan, for:	✓	✓			
	- installing meters					
	- calibrating meters					
	- reading meters					
	Determine what type of meter to install based on expected flows.	✓	✓			
	Document the calibration and certification records	✓	✓			
Need to know	Install data loggers on the water meter e.g. when there is a requirement to understand instantaneous peak flows and pressures.	✓	✓			
	Read a water meter and provide this data to the appropriate people, within identified time frames, to allow the water suppliers to invoice volumetric usage.	✓	✓			
	Implement the water meter renewal programme.	✓	✓			
	The applicable policies or bylaws that cover the approach to water metering for their supply.	✓	✓	✓		
	In what circumstances flow meters are installed within the drinking water distribution system and their types (e.g., magflows to measure bulk water produced) and what type of water meters (e.g., differing mechanical meters) suit different customers.	✓	✓	✓		
	That the Water New Zealand Good Practice Guide Water Metering of Customers on Reticulated Supplies [10] prescribes industry good practice for the supply, use, and operation of water meters.	✓	✓	✓		
Need to be able to	How to install, calibrate and read flow and water meters.	✓	✓	✓		
	The as-building and quality record requirements relating to meters.	✓	✓	✓		
	<p>Valve and Hydrant Operations (Please note that this can be a one team or a combination of team's responsibility. i.e., contractors)</p>	<p>Kaiwhakamahi Ratonga Wai-inu Junior Drinking Water Distribution Operator</p>	<p>Kaiwhakamahi Matua Ratonga Wai-inu Senior Drinking Water Distribution Operator</p>	<p>Kaiārahi Wheketere Ratonga Wai-inu Drinking Water Distribution Team leader</p>	<p>Kaiwhakahaere Wheketere Ratonga Wai-inu Drinking Water Distribution Manager</p>	<p>Unit Standard</p>
	Follow the Water Suppliers standard operating procedures, along with the maintenance programme which referenced in the Water Safety Plan for exercising valves.	✓	✓			
	Locate the position of valves using plans and Geographic Information Systems (GIS).	✓	✓			
	Confirm that valves can still accessible (i.e. that they have not been covered by earthworks or sealed over during road works). Where valves are not visible Drinking Water Distribution Operators need to be able to use locating equipment to detect valve locations and organise for them to be exposed in those instances where they are inaccessible.	✓	✓			
Need to know	Undertake sounding of valves and hydrants to confirm isolation.	✓	✓			
	Following cleaning/flushing or maintenance works, Drinking Water Distribution Operators need to confirm that the valves have been restored to expected operation.	✓	✓			
	Specific Health and Safety requirements relating to valve and hydrant operations. This work may involve working in roads and heavy lifting.	✓	✓	✓		
	The different types of valves used within the drinking water distribution system and their purpose. Including gate valves, sluice valves, globe valves, butterfly valves, fire hydrants, pressure-reducing valves, scour valves and air relief valves.	✓	✓	✓		
	How to identify valve size e.g. from number of turns.	✓	✓	✓		

Need to know	The different types of tools required to access and clean the valve and hydrant chambers e.g. lifting key.	✓	✓	✓		
	The impact of valve and hydrant operations on the distribution network e.g. poor pressure and discolouration.	✓	✓	✓		
	Potential ingress and contamination issues from leaking valves.	✓	✓	✓		
	The notification processes to follow when valves are operated e.g. informing customer service staff and recording current valve position and status on company systems.	✓	✓	✓		
	Different types of monitoring equipment fitted to valves and the procedures to follow upon discovery of monitoring equipment.	✓	✓	✓		
	That when closing valves to isolate section of mains the downstream valve should be closed first to maintain positive pressure along the line and prevent backflow.	✓	✓	✓		
	Data collection, recording, reporting and maintenance requirements.	✓	✓	✓		
	That the New Zealand Fire Service Firefighting Water Supplies Code of Practice covers the inspection and testing requirements of hydrants.	✓	✓	✓		
	<u>Awareness of how the SCADA system is used to control the Distribution Network and collect Data</u>	Kaiwhakamahi Ratonga Wai-inu	Kaiwhakamahi Matua Ratonga Wai-inu	Kaiārahi Wheketere Ratonga Wai-inu	Kaiwhakahaere Wheketere Ratonga Wai-inu	Unit Standard
		Junior Drinking Water Distribution Operator	Senior Drinking Water Distribution Operator	Drinking Water Distribution Team leader	Drinking Water Distribution Manager	
Need to be able to	For the distribution network aspects of the water supply system the Drinking Water Distribution Operators need to be able to use the SCADA system, including: - Logging into and navigating around the SCADA system. - Adjusting control set points and alarm levels for the different types of equipment used to control process operations. - Interpreting alarms. - Accepting, or overriding, alarms. - Viewing and understanding trend data and reporting any unusual trends. - Setting up ad-hoc records. - Interpreting mimic pages. - Undertaking basic maintenance of the SCADA system i.e. shutting down and restarting nodes.	✓	✓	✓ ✓ ✓ ✓ ✓ ✓	✓	
	Interrogate the SCADA system to: - Identify and control items of mechanical, electrical and instrumentation equipment. - Evaluate trend data differentiating normal operational cycles from developing fault conditions or emerging risks.	✓	✓	✓ ✓ ✓		
Need to know	The control philosophy for the water distribution system.	✓	✓	✓		
	How to use the SCADA system to assess the status of the distribution network and escalate issues to the appropriate people when SCADA data highlights fault conditions or emerging risks.	✓	✓	✓		
	<u>Operate Pumping Systems</u>	Kaiwhakamahi Ratonga Wai-inu	Kaiwhakamahi Matua Ratonga Wai-inu	Kaiārahi Wheketere Ratonga Wai-inu	Kaiwhakahaere Wheketere Ratonga Wai-inu	Unit Standard
		Junior Drinking Water Distribution Operator	Senior Drinking Water Distribution Operator	Drinking Water Distribution Team leader	Drinking Water Distribution Manager	
	Follow the operational procedures and first line maintenance tasks for the pumps that are documented in the Water Suppliers operational manuals, which will be referenced in the Water Safety Plan.	✓	✓			
	Identify all mechanical, electrical and instrumentation assets associated with the pumps on SCADA and on site.	✓	✓			
	Monitor and check flows and system pressures.	✓	✓			
	Identify and adjust set-points (e.g. pump start and stop levels) applicable to the pumping operations	✓	✓			
	Identify the range of alarms associated with the pumps	✓	✓			
	Control pumping operations to meet energy efficiency targets	✓	✓			

Need to be able to	Evaluate trend data from SCADA and / or test results to identify: a) Normal trends or cycles for the works, and b) Atypical trends or changes and the underlying or root causes for the change	✓	✓			
	Inspect pump components and identify maintenance needs, as per the manufacturer's recommendations e.g. to repair leaks and replace corroded parts.	✓	✓			
	Schedule preventive maintenance, particularly lubrication and replacement of seals, diaphragms, tubing etc as per manufacturers recommendation.	✓	✓			
	Instigate corrective action to return the pumps to normal operation.	✓	✓	✓		
Need to know	Principle and purpose of the pump operation, the types of pumps and their operational function.	✓	✓	✓		
	Key process parameters and variables associated with the pumps and design limitations of the set-up.	✓	✓	✓		
	Design considerations for pumps including: - Pump delivery head and suction - Impact of friction losses, pipe sizes and materials.			✓		
	The system hydraulics, including network layout and reservoir operation.	✓	✓	✓		
	The operating and maintenance cycles for the pumps including inspection requirements and how to safely isolate the pumps from both mechanical and electrical hazards.	✓	✓	✓		
	How to interrogate SCADA to: e) Identify and control items of mechanical, electrical and instrumentation equipment. f) Evaluate trend data differentiating normal operational cycles from developing fault conditions. g) How to confirm the configuration, operation and performance of the pumping system corresponds to the information system.	✓	✓	✓		
	The range of instrumentation used to monitor and control the pumps and their calibration requirements.	✓	✓	✓		
	How pumps are controlled to maximize energy efficiency.	✓	✓	✓		
	Alarms, action levels, authorization levels and consequences associated with the process or processes	✓	✓	✓		
	How to identify the root cause of problems and the sequence of actions required to restore water storage to optimal volumes, taking account of all demand and process lag times.	✓	✓	✓		
Reactive and preventive maintenance procedures and frequencies.	✓	✓	✓			
	Operate Emergency Power Systems	Kaiwhakamahi Ratonga Wai-inu	Kaiwhakamahi Matua Ratonga Wai-inu	Kaiārahi Wheketere Ratonga Wai-inu	Kaiwhakahaere Wheketere Ratonga Wai-inu	Unit Standard
		Junior Drinking Water Distribution Operator	Senior Drinking Water Distribution Operator	Drinking Water Distribution Team leader	Drinking Water Distribution Manager	
Need to be able to	Follow the operational and first-line maintenance procedures relating to the emergency power system that are documented in operational manuals for the supply. These will also be referenced in the Water Safety Plan.	✓	✓			
	Identify the voltage, load and phase of all electrical assets associated with the distribution system. Typically, these would be located at the pump stations within the distribution system.	✓	✓			
	Ensure that the generator is regularly serviced by a qualified technician as specified by the supplier.		✓			
	Run the generator under full load for extended periods to test for any problems.		✓			
	Ensure that the UPS is regularly tested and serviced by a qualified technician as specified by the supplier.		✓			
	Arrange for fuel in storage tanks to be tested to ensure that it remains viable. Undertake fuel conditioning, or fuel replacement, on a regular basis to maintain the quality of the fuel in the tank.		✓	✓		
	Implement the incident and emergency response plan for loss of power at the site, including informing their lines network provider of the loss of mains electricity supply.		✓	✓		
	For sites which rely on portable emergency generators the drinking water distribution operator needs to be able to select a generator which is suitable for the site and be able to safely transfer the load from the mains to the generator.		✓	✓		
The operating and maintenance cycles for the emergency power system components including inspection requirements.	✓	✓				
How much fuel is needed to operate the site for the period specified in the incident and emergency response plan, the on-site fuel capacity, and the procedures for re-fueling.	✓	✓				

Need to know	If there is not a permanently installed generator the Drinking Water Distribution Operator needs to know what type of generator is needed and where this is to come from. The following variables will need to be known by the Drinking Water Distribution Operator to select an appropriate emergency generator: - Voltage – the generator must have the appropriate voltage to match the motors it will be powering - Load - the Full Load Amps of all motors that are to be run off the generator needs to be known. - Phase (rotation) - Phase (rotation) - Phase is a requirement for a single or multiphase generator based on what the generator will be powering. - The power rating and load factor of the genset. - Where the load transfer switch is located.	✓	✓			
	Reactive and preventive maintenance procedures and frequencies.	✓	✓			
	<u>Water Distribution Network Isolation / Shutdown/ Re-commissions of Assets</u>	Kaiwhakamahi Ratonga Wai-inu Junior Drinking Water Distribution Operator	Kaiwhakamahi Matua Ratonga Wai-inu Senior Drinking Water Distribution Operator	Kaiārahi Wheketere Ratonga Wai-inu Drinking Water Distribution Team leader	Kaiwhakahaere Wheketere Ratonga Wai-inu Drinking Water Distribution Manager	Unit Standard
Need to be able to	Identify early warning signs that assets/equipment need attention.	✓	✓	✓	✓	
	Identify the range of circumstances in which distribution assets will shut down automatically, including the range of failsafe criteria, and any associated critical control points.	✓	✓	✓	✓	
	Carry out the planning and actions required for the following types of shutdowns: a) An automatic shutdown e.g. at a pump station. b) A controlled shutdown on discovery of issues c) A manual isolation e.g. within the pipe network	✓	✓	✓	✓	
	Shutdown pumping stations, reservoirs and valves within the distribution system in line with standard operating procedures, including required communications, to manage shutdowns and re-starts within the distribution network effectively, reducing the impacts as far as practicable.	✓	✓	✓	✓	
	Troubleshoot major components and their problems to identify the cause of an emergency shutdown.	✓	✓	✓	✓	
	Re-start the previously isolated/closed assets within the distribution system in line with standard operating procedures, including: a) Reporting and recording b) Observing, sampling and testing c) Information systems and manual checks	✓	✓	✓	✓	
	Inform the appropriate people of a shutdown.					
Need to know	The range of circumstances in which distribution assets may be shutdown.					
	The correct methods of starting, stopping, operating and controlling each asset including understanding the impact of shutdown on distribution system.	✓	✓	✓	✓	
	The architecture and layout of the distribution system including knowing control philosophies and isolation valves.	✓	✓	✓	✓	
	How to identify the cause of asset shutdown including relevant alarms and actions, and escalations.	✓	✓	✓	✓	
	Shut-down and start-up procedures including standard operating procedures.	✓	✓	✓	✓	
	The range of water quality sampling and testing required in the event of a shutdown and re-start.	✓	✓	✓	✓	
	Communications, reporting and record keeping requirements associated with a shutdown. Including ensuring the response meets the requirements of the Drinking Water Standards of New Zealand.	✓	✓	✓	✓	
	The risks associated with works shutdown and re-start and how to minimise the impacts associated with these.	✓	✓	✓	✓	
	Contingency plans associated with the works shutdown.	✓	✓	✓	✓	
	How to respond in the event of an emergency situation in the workplace environment e.g., following an Incident and Emergency Response Plan.	✓	✓	✓	✓	
That the Health Act mandates that restrictions or interruptions to the supply of drinking water must not exceed 8 hours for planned works. The only exception to this is where prior approval has been given by the	✓	✓	✓	✓		

	Medical Officer of Health and all practical steps have been taken to warn affected people before works started.					
	That the Health Act requires water suppliers to notify the Medical Officer of Health of the reasons of the interruption to the supply as soon as possible and no later than 24hours after the event the event of an emergency any restriction or interruption to the provision of drinking water must not exceed.	✓	✓	✓	✓	
	<u>Awareness of Vulnerable Persons Notification</u> (Please note that this can be a one team or a combination of team's responsibility. i.e., contractors) (Reticulation team)	Kaiwhakamahi Ratonga Wai-inu Junior Drinking Water Distribution Operator	Kaiwhakamahi Matua Ratonga Wai-inu Senior Drinking Water Distribution Operator	Kaiārahi Wheketere Ratonga Wai-inu Drinking Water Distribution Team leader	Kaiwhakahaere Wheketere Ratonga Wai-inu Drinking Water Distribution Manager	Unit Standard
Need to be able to	Identify the location of vulnerable persons and facilities.		✓	✓	✓	
	Instigate the notification process for the vulnerable people of planned works such as shut-downs, or operations that might decrease the level of their service, like mains flushing, in accordance with the communications plans for the supply area.		✓	✓	✓	
Need to know	Where to find current up-to-date information about the location of vulnerable people.	✓	✓	✓	✓	
	What communications protocols are in place to inform vulnerable people.	✓	✓	✓	✓	
	What potential incidents and emergencies related to vulnerable people will require an operational response.	✓	✓	✓	✓	
	The triggers for activating the incident and emergency response plan, for example when the supply of a vulnerable person has been disrupted without prior notification.	✓	✓	✓	✓	
	<u>Incident and Emergency Response Plan</u>	Kaiwhakamahi Ratonga Wai-inu Junior Drinking Water Distribution Operator	Kaiwhakamahi Matua Ratonga Wai-inu Senior Drinking Water Distribution Operator	Kaiārahi Wheketere Ratonga Wai-inu Drinking Water Distribution Team leader	Kaiwhakahaere Wheketere Ratonga Wai-inu Drinking Water Distribution Manager	Unit Standard
Need to be able to	Provide input into the development of the Incident and Emergency Response Plan.	✓	✓			
	Implement the operational corrective actions, which may include process control adjustments or an asset isolation and shutdown to ensure that the supply of noncompliant water is prevented.		✓	✓		
	Demonstrate that they have been trained in emergency situations.	✓	✓	✓		
	Test response plans prior to an emergency arising.	✓	✓	✓		
	Make use of "lessons learned" information by contributing to the implementation and continuous improvement of quality systems in the water industry.	✓	✓	✓		
Need to know	Where to find the documented Incident and Emergency Response Plan.	✓	✓			
	What potential incidents and emergencies will require an operational response.	✓	✓			
	The triggers for activating the incident and emergency response plan, for example when a critical control point level has been reached.	✓	✓			
	Communications, reporting and record keeping requirements associated with emergencies, including ensuring the response meets the requirements of the Drinking Water Standards of New Zealand.	✓	✓			
	What civil defense obligations they have during an emergency.	✓	✓			
	<u>Assist with the Process to Decommission, Dispose or Abandon Assets</u>	Kaiwhakamahi Ratonga Wai-inu Junior Drinking Water Distribution Operator	Kaiwhakamahi Matua Ratonga Wai-inu Senior Drinking Water Distribution Operator	Kaiārahi Wheketere Ratonga Wai-inu Drinking Water Distribution Team leader	Kaiwhakahaere Wheketere Ratonga Wai-inu Drinking Water Distribution Manager	Unit Standard

Need to be able to	Organise a risk assessment, prior to starting the decommissioning process, that is reflective of the scope and complexity of the decommissioning process. The risk assessment may need to include the following items to provide assurance that all hazards are identified, understood, and eliminated: - An engineering assessment of the structural integrity of any associated building and structure carried out by a Chartered Structural Engineer. - A Health and Safety electrical assessment that identifies and marks out the power supply to, and the Distribution of power in the work area, to identify the isolation requirements or protection of the supply to other areas of plant or equipment carried out by an Electrical Engineer or Electrician. - A Health and Safety Fire Assessment if changes to fire protection systems might be required carried out by a Fire Engineer. - A Health and Safety Asbestos Assessment to establish if any asbestos is present and if so, how to deal with it. - Undertake the decommissioning process and dispose of water distribution assets at the end of their life once the risks above have been eliminated.		✓ ✓ ✓ ✓ ✓	✓	✓	30005
Need to know	The Decontamination and Demolition of Plant and Assets Procedure outlined in the Guidelines for Occupational Health & Safety in the New Zealand Water Industry. [11]	✓	✓	✓		

Asset Information

	<u>Provide Data to assist in Asset Management Decision Making</u>	Kaiwhakamahi Ratonga Wai-inu Junior Drinking Water Distribution Operator	Kaiwhakamahi Matua Ratonga Wai-inu Senior Drinking Water Distribution Operator	Kaiārahi Wheketere Ratonga Wai-inu Drinking Water Distribution Team leader	Kaiwhakahaere Wheketere Ratonga Wai-inu Drinking Water Distribution Manager	Unit Standard 30005
Need to be able to	Undertake a systematic approach to collecting, recording, and reporting data		✓	✓		
	Follow the reporting requirements and procedures that are either referenced or documented within the Water Safety Plan		✓	✓		
	Follow reporting requirements and procedures for the performance measures and targets that are either referenced or documented within the Asset Management Plan		✓	✓		
	What mechanisms are in place for recording and reporting data to others within the organisation. This includes what reporting responsibilities and accountabilities the Drinking Water Distribution Operator will have		✓	✓		
Need to know	What higher level oversight, performance assessment against organisational goals and objectives is expected. This includes needing to know about: <ul style="list-style-type: none"> ▪ The required level of service for the drinking water supply ▪ The performance measures and targets that are to be used to assess compliance with the required level of service. ▪ How performance is to be assessed and reported 	✓	✓	✓		

Risk and Review

	<u>Implementing the distribution aspects of the Water Safety Plan</u>	Kaiwhakamahi Ratonga Wai-inu Junior Drinking Water Distribution Operator	Kaiwhakamahi Matua Ratonga Wai-inu Senior Drinking Water Distribution Operator	Kaiārahi Wheketere Ratonga Wai-inu Drinking Water Distribution Team leader	Kaiwhakahaere Wheketere Ratonga Wai-inu Drinking Water Distribution Manager	Unit Standard
Need to be able to	Operate the drinking water distribution network in a manner that aligns with the operational procedures that are identified in the Water Safety Plan	✓	✓	✓	✓	
	Undertake Operational Monitoring and Inspection for Process Control of the distribution assets, as documented in the Water Safety Plan. This includes undertaking corrective actions when monitoring and inspections indicate that a measure is deviating from expected performance and communicating this to the appropriate people	✓	✓			
	Monitor the Critical Control Points and undertake the corrective actions for the CCPs when the defined action and critical limits are reached	✓	✓			
	Verify the performance of the distribution network performance in accordance with the Drinking-water Quality Compliance Monitoring Plan referenced in the Water Safety Plan	✓	✓			
	Implement the procedures that are documented in the Water Safety Plan that detail how to respond to transgressions and non-compliances with the Drinking-water Standards for New Zealand where these relate to the distribution network	✓	✓			
	Assist with reviewing customer complaints to help identify whether operational changes within the distribution network can be made to improve consumer satisfaction	✓	✓			
	Communicate with the appropriate people when updates to the Water Safety Plan are identified			✓		
Need to know	Undertake any improvement items identified in the Water Safety Plan for which the drinking water distribution operator has been given responsibility for	✓	✓			
	The Principles of Safe Drinking Water in New Zealand	✓	✓			
	The characteristics of the drinking-water supply system, what hazards might arise, how these hazards arise and create risks, and the processes and practices that affect drinking-water quality	✓	✓			
	The available water quality information and be able to analyse and interpret this information which identifies actual and potential water quality issues	✓	✓			
	What the barriers to contamination are, so that the failure of one barrier will be compensated for by the effective operation of the remaining barriers. Possible barriers might include: <ul style="list-style-type: none"> - killing, or inactivating pathogens by disinfection - maintaining the quality of the distribution system 	✓	✓			
What the Critical Control Points are for the supply	✓	✓				

	How the The New Zealand Drinking-Water Standards provide requirements for drinking-water safety by specifying the: <ul style="list-style-type: none"> - maximum amounts of substances or organisms or contaminants or residues that may be present in drinking-water - criteria for demonstrating compliance with the Standards remedial action to be taken in the event of non-compliance with the different aspects of the Standards	✓	✓			
	About the Guidelines for Drinking-Water Quality Management in New Zealand which complement the Drinking-Water Standards for New Zealand and provides advice for achieving high level of drinking-water quality management. The Guidelines will assist water suppliers to achieve the Standards and are updated on an ongoing basis with new information	✓	✓			
	The commitment to drinking-water quality management from their employer and the relationship of the WSP to organisational policy and strategy	✓	✓			
	Health and Safety	Kaiwhakamahi Ratonga Wai-inu	Kaiwhakamahi Matua Ratonga Wai-inu	Kaiārahi Wheketere Ratonga Wai-inu	Kaiwhakahaere Wheketere Ratonga Wai-inu	Unit Standard
		Junior Drinking Water Distribution Operator	Senior Drinking Water Distribution Operator	Drinking Water Distribution Team leader	Drinking Water Distribution Manager	
Need to be able to	Identify hazards, risk assessment and control measures	✓	✓			
	Safely undertake their work and look after the health and safety of any other workers that they direct. To do this Water Distribution Operators need to be able to: <ul style="list-style-type: none"> - Work in the transport corridor - Conduct a health and safety induction for visitors to site - Safely enter confined spaces - Work alone, and in isolated areas - Work with hazardous substances - Work at heights - Work in, and above, water 	✓	✓			
	Control plant and equipment hazards by: <ul style="list-style-type: none"> - Following temporary traffic management plans - Safely operating machinery - Safely operating vehicles - Safely operating mobile plant 	✓	✓			
	Implement the Incident and Emergency Response Plan for the site	✓	✓			
Need to know	That the Health and Safety at Work Act 2015 (HSWA) [12] is New Zealand’s workplace health and safety legislation. Water Suppliers must look after the health and safety of their Drinking Water Distribution Operators and any other workers that they influence or direct	✓	✓			
	That the Water New Zealand Good Practice Guide for Occupational Health and Safety in the New Zealand Water Industry [11] provides guidance and model procedures for how to comply with the Health and Safety at Work Act	✓	✓			
	What “permits to work” and operational procedures are in place within the distribution network that control the identified hazards	✓	✓			

	What Personal Protective Equipment (PPE) is required when operating and maintaining the Water Distribution System	✓	✓			
	<u>Confined Spaces</u>	Kaiwhakamahi Ratonga Wai-inu Junior Drinking Water Distribution Operator	Kaiwhakamahi Matua Ratonga Wai-inu Senior Drinking Water Distribution Operator	Kaiārahi Wheketere Ratonga Wai-inu Drinking Water Distribution Team leader	Kaiwhakahaere Wheketere Ratonga Wai-inu Drinking Water Distribution Manager	Unit Standard
Need to be able to	Identify confined space hazards, undertake risk assessments, and identify the control measures for confined space entry work	✓	✓	✓		
	Select and safely use the correct PPE for a confined space entry. This may include the use of safety harnesses and lifelines, and respiratory protection	✓	✓	✓		
	Ensure that communication between the person within the confined space and the confined space standby person is always maintained during any confined space entry	✓	✓	✓		
	Secure confined space entry and exit points to allow for safe access, ensuring that appropriate danger signs are used	✓	✓	✓		
	Isolate the confined space to prevent the inflow of hazardous substances	✓	✓	✓		
	Ensure that the space is ventilated, either through forced, extraction, or natural ventilation	✓	✓	✓		
	Undertake atmospheric testing prior to, and during a confined space entry	✓	✓	✓		
	Clear atmospheric conditions in a confined space by purging	✓	✓	✓		
	Implement the Incident and Emergency Response Plan for confined space entries and rescues	✓	✓	✓		
Need to know	That the Worksafe Quick Guide to Confined spaces: planning entry and working safely in a confined space gives a brief overview of the requirements and procedures required to plan an entry to and also to work safely within a confined space	✓	✓	✓		
	That Worksafe New Zealand accepts the Standard AS/NZS 2865:2001 Safe working in a confined space as having the current state of knowledge on confined space entry work. It follows the approach of the Health and Safety at Work Act 2015 (HSWA) [5] in requiring that the hazards associated with working in confined spaces be identified and controlled either by elimination or minimisation	✓	✓	✓		
	That the Water New Zealand Good Practice Guide for Occupational Health and Safety in the New Zealand Water Industry [4] provides guidance and model procedures for planning an entry into a confined space	✓	✓	✓		
	What “permits to work” and operational procedures are in place for the distribution system that control identified hazards like confined space	✓	✓	✓		
	What Personal Protective Equipment (PPE) is required when entering, or working within, a confined space	✓	✓	✓		
	What the atmospheric conditions within the confined space are	✓	✓	✓		
	That the concentration of potential atmospheric contaminants will determine whether it is safe to be within the confined. The Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOHSC:3008(1995)] identify what the safe level of atmospheric contaminants that Drinking Water Distribution Operators can be exposed to	✓	✓	✓		
	That the Standard AS/NZS 1891 Industrial fall-arrest systems and devices covers the selection, use and maintenance of harnesses and ancillary equipment commonly used in confined space entry work	✓	✓	✓		
	<u>Hazardous Substances</u>	Kaiwhakamahi Ratonga Wai-inu Junior Drinking Water Distribution Operator	Kaiwhakamahi Matua Ratonga Wai-inu Senior Drinking Water Distribution Operator	Kaiārahi Wheketere Ratonga Wai-inu Drinking Water Distribution Team leader	Kaiwhakahaere Wheketere Ratonga Wai-inu Drinking Water Distribution Manager	Unit Standard
	Manage an inventory of all hazardous substances used within the network, including booster chlorination stations and fuel for emergency generators. The inventory needs to be kept up-to-date, accurate and easily accessible to emergency workers	✓	✓			

Need to be able to	Ensure that Safety Data Sheets are available for all hazardous substances used in the water distribution network	✓	✓			
	Safely work with chemicals and hazardous substances (both in terms of handling and storage requirements) including for: <ul style="list-style-type: none"> - Asbestos containing materials - Fuel - Chemicals 	✓	✓			30596
	Use the correct Personal Protective Equipment (PPE) and other appropriate controls (e.g. ventilation) as indicated on the Safety Data Sheet when handling chemicals and hazardous substances	✓	✓			30596
	Label containers containing hazardous substances correctly, including when they are decanted or transferred into smaller containers	✓	✓			30596
	Store hazardous substances safely	✓	✓			30596
	Ensure that correct signage is in place for hazardous substances	✓	✓			
	Follow the procedures detailed in the Incident and Emergency Response Plan in the event of a spill	✓	✓			
Need to know	What hazardous substances (i.e. any product or chemical that has explosive, flammable, oxidising, toxic, corrosive or ecotoxic properties) are stored or used within the water distribution network and the dangers that these substances pose	✓	✓			
	That they cannot work with or around hazardous substances until they have the knowledge and practical experience to do so safely	✓	✓			
	That the Incident and Emergency Response Plan for the supply details the procedures to follow in the event of a spill or work on asbestos containing materials	✓	✓			
	That the Health and Safety at Work (Hazardous Substances) Regulations [13] identifies how the chemicals and hazardous substances such as those used in Water Treatment and distribution processes need to be managed	✓	✓			
	That the Water New Zealand Good Practice Guide for Occupational Health and Safety in the New Zealand Water Industry [11] provides guidance and model procedures for how to manage chemical and hazardous substances	✓	✓			
	That health and safety information is available for all chemicals on Safety Data Sheets (SDS) that must be provided at the time of supply	✓	✓			
	That the Water New Zealand National Asbestos Cement Pressure Pipe Manual [14] details the health and safety requirements when working with asbestos material containing pipes, i.e. for work involving cutting into, removal, storage or replacement of AC pipes Refer to the Water New Zealand Good Practice Guide for Occupational Health and Safety in the New Zealand Water Industry [11] for procedures for asbestos material not associated with pipes i.e. asbestos material present in switchboards or building materials	✓	✓			
	<u>Working with Asbestos</u> (Reticulation team)	Kaiwhakamahi Ratonga Wai-inu Junior Drinking Water Distribution Operator	Kaiwhakamahi Matua Ratonga Wai-inu Senior Drinking Water Distribution Operator	Kaiārahi Wheketere Ratonga Wai-inu Drinking Water Distribution Team leader	Kaiwhakahaere Wheketere Ratonga Wai-inu Drinking Water Distribution Manager	Unit Standard
Need to be	Identify asbestos containing material	✓	✓			30596
	<ul style="list-style-type: none"> Following Standard Operating Procedures for working with asbestos containing material. This should include being able to: <ul style="list-style-type: none"> - Correctly use P3 Asbestos PPE. - Set up a decontamination area. - Set site up for work, including securely barricaded it and putting temporary traffic management measures in place. 	✓	✓			30596

able to	<ul style="list-style-type: none"> - Correctly use controlled equipment for working with AC pipes - Control the contamination of the asbestos work area and equipment. - Carry out personal decontamination in designated areas - Clear the site and correctly dispose of contaminated material and PPE 					
	Implement Incident and Emergency response plans for incidents on asbestos containing assets	✓	✓			30596
Need to know	That they must have had appropriate training before working with asbestos containing materials	✓	✓	✓		30596
	What “permits to work” and operational procedures are in for working with asbestos containing material	✓	✓	✓		30596
	What Personal Protective Equipment (PPE) is required when working with asbestos containing material	✓	✓	✓		30596
	That the Health and Safety at Work Act 2015 (HSWA) [12] is New Zealand’s workplace health and safety legislation. Water Suppliers must look after the health and safety of their Drinking Water Distribution Operators and any other workers that they influence or direct	✓	✓	✓		
	That the Health and Safety at Work (Asbestos) Regulations 2016 [15] made under the Health and Safety at Work Act require asset owners to provide, and adhere to, an Asbestos Management Plan	✓	✓	✓		
	That the Worksafe Approved Code of Practice for the Management and Removal of Asbestos [16] sets out expectations about how to comply with asbestos health and safety law, including the Health and Safety at Work (Asbestos) Regulations 2016	✓	✓	✓		
	That the Water New Zealand Good Practice Guide: National Asbestos cement pressure pipe manual [17] provides examples of safe working practices when working with AC pipes	✓	✓	✓		
The Water New Zealand Good Practice Guide for Occupational Health and Safety in the New Zealand Water Industry [11] provides guidance and model procedures for how mitigate common health and safety risks in the water industry in New Zealand, including how to deal with non-pipe related asbestos	✓	✓	✓			
	Asset Security and Protection	Kaiwhakamahi Ratonga Wai-inu	Kaiwhakamahi Matua Ratonga Wai-inu	Kaiārahi Wheketere Ratonga Wai-inu	Kaiwhakahaere Wheketere Ratonga Wai-inu	Unit Standard
		Junior Drinking Water Distribution Operator	Senior Drinking Water Distribution Operator	Drinking Water Distribution Team leader	Drinking Water Distribution Manager	
Need to be able to	Induct and supervise visitors to distribution asset locations (e.g. reservoir sites)		✓			
	Lock and alarm all points of entry, including hatches, vents, and gates	✓	✓			
	Maintain a key register of who holds keys for each site			✓		
	Routinely perform visual examinations of the exterior of the drinking water distribution assets and remove objects that could be used to aid an intruder	✓	✓			
Need to know	Respond to security breaches at drinking water distribution assets in accordance with the requirements of the incident and emergency response plan for the site		✓	✓		
	Who has access to drinking water distribution assets, and where the keys are kept	✓	✓			
	How to induct and supervise visitors to site	✓	✓			
	How to implement the incident and emergency response measures for security breaches	✓	✓			
	Verification Monitoring	Kaiwhakamahi Ratonga Wai-inu	Kaiwhakamahi Matua Ratonga Wai-inu	Kaiārahi Wheketere Ratonga Wai-inu	Kaiwhakahaere Wheketere Ratonga Wai-inu	Unit Standard
		Junior Drinking Water Distribution Operator	Senior Drinking Water Distribution Operator	Drinking Water Distribution Team leader	Drinking Water Distribution Manager	

Need to be able to	Follow the drinking-water compliance monitoring plan, which will be referenced in the Water Safety Plan , for the distribution aspects of the supply. This plan will detail the supply-specific requirements for compliance monitoring to meet the Drinking-water Standards for New Zealand. This might include being able to: <ul style="list-style-type: none"> Take representative samples of water from key points within the distribution network, safely using appropriate sampling equipment. Review and analyse the performance of the distribution system by using laboratory, site, and network quality reports 	✓	✓			17890
	Follow the procedures referenced in the Water Safety Plan for responding to transgressions and non-compliances with the Drinking-water Standards for New Zealand	✓	✓			
	Review customer complaints and use them to make improvements to the distribution system		✓	✓		
	Review the results of both the drinking-water quality monitoring and the Operational Monitoring and Inspection for Process Control and communicate to identify target and action limits when intervention may be required and communicate this to the appropriate people		✓	✓		
Need to know	That the Drinking-water compliance monitoring plan, which will be referenced in Water Safety Plan , details how the supply meets the compliance monitoring requirements for the Drinking-water Standards for New Zealand	✓	✓			
	The procedures for responding to transgressions and non-compliance with the Drinking-water Standards for New Zealand	✓	✓			
	The customer complaint process and how complaints are to be reviewed and used with helping to make improvements	✓	✓			
	What operational monitoring and inspection requirements are required, including knowing how to instigate the updating of the Water Safety Plan where necessary	✓	✓			
	Resource Consent Compliance Monitoring and Reporting	Kaiwhakamahi Ratonga Wai-inu	Kaiwhakamahi Matua Ratonga Wai-inu	Kaiārahi Wheketere Ratonga Wai-inu	Kaiwhakahaere Wheketere Ratonga Wai-inu	Unit Standard
		Junior Drinking Water Distribution Operator	Senior Drinking Water Distribution Operator	Drinking Water Distribution Team leader	Drinking Water Distribution Manager	
Need to be able to	Fulfil the resource consent conditions related to the operation and maintenance of the drinking water distribution network. For flushing operations this will likely require the drinking water distribution operator to dechlorinate water prior to discharge, or to collect flushed water within a tanker for later disposal into the wastewater network		✓	✓		
	Assist staff from the consent authority when they undertake site inspections, e.g. induct them onto the site		✓	✓		
	Provide operational data to the consent authority in accordance with the conditions of consent		✓	✓		
	Monitor the discharge, including trending data, and communicate with the appropriate people when conditions of consent are close to being breached so that action can be taken to prevent this before it occurs		✓	✓		
	Notify the appropriate people when the operation of the discharge fails to comply with the resource consent conditions and implement the operational response in accordance with the Incident and Emergency Response Plan		✓	✓		
Need to know	What resource consent conditions are in place for the operation of the distribution system and the limitations these apply to the operation of network (e.g. maximum discharge flow rates)	✓	✓			
	What data needs to be collected and monitored to meet the conditions of the consent	✓	✓			
	What to do if the operation of the distribution network fails to comply with the resource consent conditions, as detailed in the Incident and Emergency Response Plan	✓	✓			
	Engage with Stakeholders and the Community	Kaiwhakamahi Ratonga Wai-inu	Kaiwhakamahi Matua Ratonga Wai-inu	Kaiārahi Wheketere Ratonga Wai-inu	Kaiwhakahaere Wheketere Ratonga Wai-inu	Unit Standard

		Junior Drinking Water Distribution Operator	Senior Drinking Water Distribution Operator	Drinking Water Distribution Team leader	Drinking Water Distribution Manager	
Need to be able to	Identify the stakeholders that they are required to engage with. This will include, but not be limited to, those identified in the Water Safety Plan		✓	✓	✓	
	Identify the connections that will be impacted by maintenance operations or shutdowns					
	Engage with stakeholders by following the mechanisms and documentation within the Water Safety Plan for stakeholder engagement. Drinking Water Distribution Operators will need to follow the Water Suppliers Standard Operating Procedures for providing advance notice to those who will be impacted by planned maintenance works		✓	✓	✓	
	Provide input into the long-term employee engagement plan (management and operational) on awareness and involvement in safe and secure drinking water		✓	✓	✓	
	Identify the contact list and communication plan for incidents and emergencies			✓	✓	
Need to know	That the stakeholders who could affect, or be affected by, decisions or activities to do with drinking water will have been identified either in the Water Safety Plan , or in other communications plans referenced by the WSP	✓	✓			
	That the Water Safety Plan and associated Standard Operating Procedures will also have documented the appropriate mechanisms that they should use to obtain input and involvement from the stakeholders	✓	✓			
	The long-term consumer engagement plan on awareness and involvement in safe drinking water	✓	✓			
	The Water Suppliers two-way communication programme to receive consumers' suggestions, complaints, and concerns	✓	✓			

Acknowledgements: Adrian Webb, Ian Couling, Noel Roberts, Peter Edwards

Please note the following:

- This at a glance should be used in conjunction with the competency framework document for this particular role.
- Some sections and or responsibilities are completed by certain individuals as well as a combination of teams. This does vary depending on the treatment plant.

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