CENTRAL HAWKE'S BAY DISTRICT COUNCIL

3 Waters Asset Management Plan

July 2021

1. Introduction

1.1. Background

The purpose of this Three Water Supply Asset Management Plan is to support the goal of the 3 water activities by ensuring that assets are operated and maintained to provide the required level of service and to meet community outcomes for present and future customers in a sustainable and cost-effective manner.

The specific objectives for this AMP are:

- To outline the three waters service targets set by Council and the measures of tracking and monitoring performance
- To translate Council's strategic goals into activity responses and forward works project and programmes
- To ensure the community health, well-being and safety in each of these communities by providing for the collection, transmission, and disposal of wastewater.
- To manage public funds to ensure the delivery of cost-effective services provided to stakeholders and customers.
- To document existing CHBDC asset management practice as a part of optimising the life cycle management and to identify improvement actions to enhance the future life of assets.
- To comply with the requirements of relevant legislation.

This AMP covers a period of 30 years commencing 1 July 2021. Operational, maintenance and renewal programmes for the first 3 years are generally well defined with reasonable certainty of being implemented to budget as planned. Beyond this period, work programmes are based on projected trends and demands and there is less certainty with respect to scope and timing of the projects. All expenditure forecasts are based on unit costs as of 1 July 2021.

1.2. Relationship with other plans

This Three Waters Asset Management Plan is one of many documents compiled by Council to ensure an efficient and structure management of Council assets and ensure correct delivery of water, wastewater and stormwater services to our Customers. The following diagram shows the relationships between this document and other Plan's and Policy's produced by the Council.

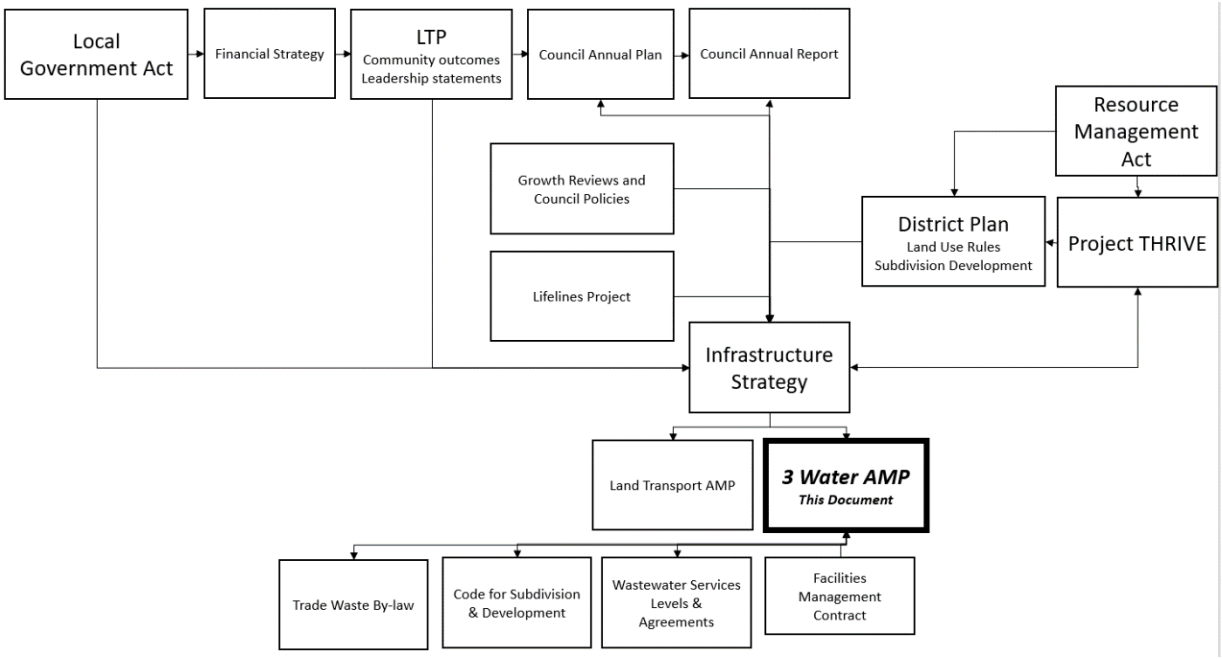


Table 1 – AMP relationship to other policies

Policy, Plan or Strategy	Relationship to the AMP
Asset Management Policy	Communicated within the organisation and used by asset managers during planning and operational delivery aspects of asset management.
Infrastructure Strategy	Subordinate to the Policy and other documents and contains the 30yr strategy for managing key asset classes at a higher level of detail than individual asset management plans
Council Risk Framework	The Risk Framework prescribes in detail the risk approach used by Council. This approach will be used in asset management decision making – as outlined in this Policy.
Finance Strategy	Together with the Policy, and other documents area key feed into Councils Long Term Plan
Long Term Plan (LTP)	A consultation document that sets out community identified outcomes, long terms plans for each Council activity, and long-term financial requirements to undertake activities and meet identified outcomes
Strategic Asset Management Plan	To be developed. Will be subordinate to the Policy and will contain Asset Management

Policy, Plan or Strategy	Relationship to the AMP
	Objectives and strategic approach to managing assets
Asset Management Plans (this Document)	Subordinate to the Policy and will highlight work to be performed on the assets, with suitable justification in line with the Policy intent, principles and policy statements.
Annual Plan	Council's annual plan sets out the works to be actioned in the current financial year, the means of funding these and the performance measures to be met within each activity.
Bylaws	The main bylaw for this activity is the Central Hawke's Bay District Council No: 7 Water Bylaw 2018
Development Contributions	This policy set the dollar amount that new consumers must pay to connect to the network, based on a percentage total capital work program for water is constructed to meet future demands

1.3. Delivering on Council's Strategic Framework

1.3.1. Alignment of Outcomes and Activity Objectives

Project Thrive is the backbone of Council and provides the strategic direction behind the significant investment in people and infrastructure to support the growth and aspirations of the Central Hawkes Bay District. Parallel to this activity plan meeting national and regional strategic objectives and strategies, it has also been designed to deliver on Council's vision for Central Hawkes Bay, E ora ngātahi ana! Together we thrive! An outline of the framework is below which has been integrated throughout this plan including forming part of the assessment criteria for the final programme of work.

Figure 1 - Council's Mission, Purpose and Objectives

The table below shows how Central Hawkes Bay District Council's 3 waters network contributes to the community vision:

The contribution of water services to the Community Outcomes and Asset Management objectives will be seen through:

- Meaningful stakeholder consultation to establish service standards.
- Implementing a programme of inspections and monitoring of the network to assess asset condition and performance.
- Undertaking a risk-based approach to identify operational, maintenance, renewal and capital development needs, and applying multi-criteria analysis techniques to select the most cost effective and sustainable work programme.
- Ensuring services are delivered at the right price and quality.
- Achieving the appropriate level and quality of asset management practice.
- Continuing programme of capital works.
- Futureproofing and resilience

Table 2 - Community Strategic Outcomes

Our Communities Strategic Outcomes	
Outcome	How Water activity supports this outcome
Connected Citizens He Kirirarau whau hononga	By delivering 3 water services outcomes in a in a way that protects and enhances the uniqueness of the Central Hawke's Bays identity.

	Our citizens can connect easily with each other and with those outside of our District. We all have access to everything Central Hawke's Bay has to offer and enjoy these great things together.	
	**Durable Infrastructure** He hanganga mauroa We aim to provide sound and innovative facilities and services that meet the needs of our communities today. Our infrastructure is fit for purpose and future proofs our thriving district for tomorrow.	The provision of a 3 waters system in the most cost effective and stainable way by using the latest technologies and looking for outside the square opportunities and of a quality and quantity that meets the consumers' demands, while ensuring any risk to Public health is eliminated.
	**Environmentally Responsible** He Whaaro nui ki te taiao Central Hawke's Bay is home to a unique and beautiful landscape. We celebrate and work together to enhance our local natural wonders and resources.	The management of the 3 waters systems meets growth needs to best serve the community while ensuring the effective us of the limited water resource and protecting the natural environment.
	**Prosperous District** He rohe tonui Our is a thriving District that is attractive to businesses. Central Hawke's Bay is enriched by the households and whanau that are actively engaged in and contribute to our thriving District.	The provision of 3 waters to the consumer will help promote and ensure a thriving community.
	**Proud District** He rohe poho kererū Central Hawke's Bay is proud of its identity and place in our region and nation. We hold our head high on the national and international stage, celebrating our unique	By delivering 3 water services outcomes in a in a way that protects and enhances the uniqueness of the Central Hawke's Bays identity.

	landscape from the sea to the mountains.	

These outcomes will be delivered through delivering on Central Hawke's Bay District Council's core principles of:

Figure 2 - Council's Core Principles

Activities delivered through the 3 water services meet our community outcomes as well as the key customer outcomes as required through the Council "Thrive" philosophy adopted by Council as described below:

1.3.2. Why we provide three water systems

The provision of systems for the collection, transmission and disposal of drinking water, Stormwater and wastewater is a function of the Central Hawke's Bay District Council permitted by Section 11A of the Local Government Act 2002 states that Council is required to provide core services as outlined below:

11A Core services to be considered in performing role

In performing its role, a local authority must have particular regard to the contribution that the following core services make to its communities:

- *(a) Network infrastructure:*
- *(b) Public transport services:*
- *(c) Solid waste collection and disposal:*
- *(d) The avoidance or mitigation of natural hazards:*
- *(e) Libraries, museums, reserves, and other recreational facilities and community amenities.*

Section 11A: inserted, on 27 November 2010, by section 4 of the Local Government Act 2002 Amendment Act 2010 No 124).

Section 11A(e): replaced, on 8 August 2014, by section 7 of the Local Government Act 2002 Amendment Act (2014 No 55)

This requirement implies the need for the Council to have 3 Water Asset Management Plans for core or major infrastructure activities, to define agreed levels of service, the expenditure required to maintain the agreed service levels for the period of the plan and the expenditure required to install new infrastructure. These are essential requirements of the LTP and Council has chosen to exercise this function to provide:

- Water systems in Otane, Waipawa, Waipukurau, Takapau, Porangahau, Te Paerahi, Pourerere and Kairakau
- Wastewater systems in Otane, Waipawa, Waipukurau, Takapau, Porangahau and Te Paerahi
- Stormwater systems in Otane, Waipawa, Waipukurau, Takapau, Porangahau, Te Paerahi, Blackhead and Kairakau,

Council owns these systems on behalf of each of the communities serviced.

Council has strived to meet the vision of Thrive and the Big Water and Wastewater Stories by ensuring the supply, collection and treatment of three waters to the connected community.

1.3.3. Activity Responses to Strategic Goals

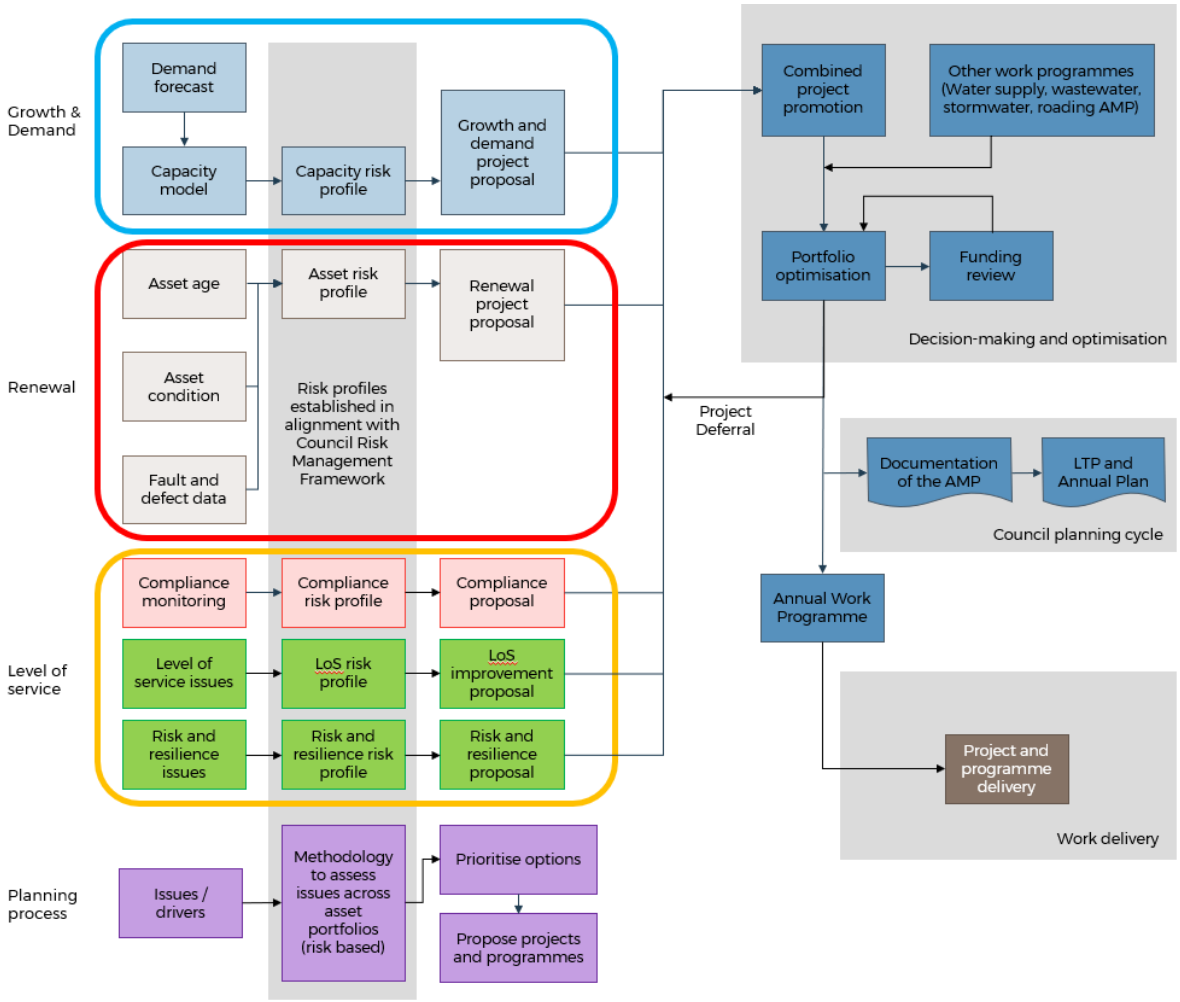
Strategic Goals	Activity Response
Reliable distribution and efficient management of three waters services to customers.	– The supply and collection of 3 waters network will receive enough funding to continue to allow the efficient distribution, collection and control of 3 waters throughout the serviced areas in the district at all times. – Infrastructure renewal and replacement programme using more modern and resilient methods and materials – The 3 waters network is planned for, designed, managed, and maintained to meet the service levels

	agreed with the community and operated within relevant national standards and guidelines. – Minimal interruptions during maintenance and extension works. – Council developed strategies and environmental goals are supported. – Water efficiency and conservation (e.g. leak detection and management – Pipe pressure is adequate everywhere along the network – Ensure that the adequate capacity for firefighting is available within designated fire districts
Safe distribution and efficient management of three waters services to customers.	– To manage the 3 waters system to operate within relevant national standards and guidelines within the financial constraints set by Council. – The water network is planned for, designed, managed, and maintained to meet the service levels agreed with the community and is operated so as to prevent any undue nuisance, disturbance or damage to property *Water* – Water safety plan improvements to demonstrate public health and safety – To manage the water system to operate within public drinking water supplies meet safety and health risk standards. *Wastewater* – Ensuring the incidence of any surcharging are dealt with in a prompt and efficient manage. That appropriate action is taken to prevent future incidences of surcharging. *Stormwater*

	– Maintaining open drains at a level that maximises safety and ensures their appearance is acceptable. – Ensuring the incidence of any flooding is not shifted from one area to another.
Cost Effective distribution and efficient management of three waters services to customers.	– Ensuring the provision of a cost-effective water system that protects public health and the environment, and that is affordable to the community. – Maintaining piped reticulation at a level that optimises the economic life and performance of the asset while considering asset lifecycle costs
Sustainable distribution and efficient management of three waters services to customers	– Ensure the systems are operated in a manner that meets or exceeds our obligation set out in our Resource Consents. – Supporting Council's Development Strategies and Council's environmental Goals.

1.4. Asset Management Planning Process

The following diagram sets out the asset management planning process used for 3Waters.



The left-hand side of the diagram sets out how projects and programmes are identified.

The right hand side of the diagram sets out how projects and programmes are selected and form part of the optimised portfolio programme that is documented in Council's planning cycle and delivered in the annual work programme.

2. Levels of Service

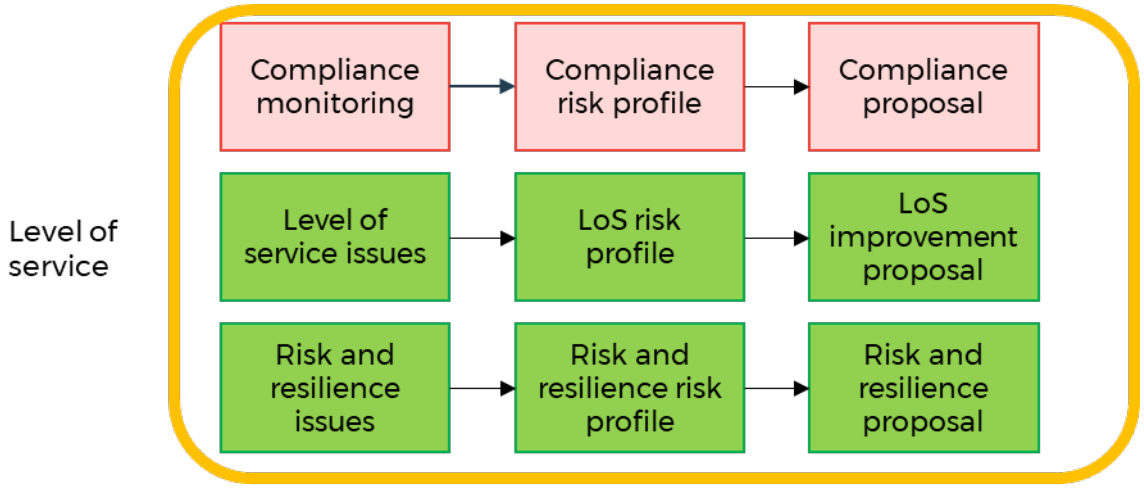
Levels of Service (LOS) are used to define the expectations of customers and stakeholders, and to measure the effectiveness of the delivery of three water activities. Levels of service fall into three broad categories:

- Compliance with legalisation, statutes and resource consent requirements
- Levels of service regarding the standard of service provided to customers
- Risk and resilience (risk and resilience issues are covered under Section 4)

This section covers the processes shown in the figure below, which include:

- Establishment of levels of service targets, i.e. how the LOS are derived and what they include

- Monitoring of levels of service, i.e. how levels of service are measured, and how the managers of the system report to Council whether the LOS are being achieved
- Comparison of the current state against targets (covered under section on Monitoring)
- Proposals for improvement projects



2.1. Establishment of Levels of Service

LOS are developed around the community outcomes of connected citizens, durable infrastructure, environmental responsibility, and a prosperous, proud district.

It is the Council's duty to report on the way it manages the three water systems in Central Hawkes Bay.

LOS are not intended as a formal customer contract, rather, it is the Council's responsibility to aim to achieve these levels and then progressively improve on the cost effectiveness and to meet current budgets.

The levels of service are set as described in the NAMS manual. They are derived using an iterative process which involves the Council setting LoS, then consulting with the community and amending those LoS. The Council then provides the resources to achieve the LoS as agreed with the community. This process is repeated for on a three-year LTP cycle. However, due to funding limitations, the LoS is also driven by the level of funding. The level of funding is decided by how much Council decides the rating income will be set. Only under exceptional circumstances such as legislative directives that would require work to be completed that exceeds the Council's budget, the plan of works is to match level of funding.

The following sections discuss drivers that influence how levels of service have been derived and the targets set.

2.1.1. Customers and Stakeholders

2.1.2. Relationships with Stakeholders

Who are our customers? CHBDC has identified a range of customers and are generally categorised into the two groups "Internal" and "External" Customers. The expectations of these customers regarding three-waters activities, are summarised in the table below:

Table 3 - CHB Internal and External Customers

Who are our Customers ?	
External	**Expectations/need**
Private Property Owners	The supply and collection of 3 waters at a suitable pressure, quantity and quality
Commercial Properties	The supply and collection of 3 waters at a suitable pressure, quantity and quality. Reasonable notice of interruptions to supply
Industrial Properties	The supply and collection of 3 waters at a suitable pressure, quantity and quality. Reasonable notice of interruptions to supply.
Critical Facilities	The supply and collection of 3 waters at a suitable pressure, quantity and quality. Urgent notice of any interruptions to supply.
Internal	**Expectations/need**
Land Transport Department	Ensure all works within the road corridor is managed in an appropriate manner. An expectation that major works within the road corridor are coordinate with the Land Transport work program
Facilities Management Contractor	Ensure all works conducted on the 3 waters network are carried out in a timely manner with the least disruption to customers as possible. Upgrade and renewal works are to be planned and carried out in a cost-effective way causing minimal disruption to customer supplies. These must also align with long-term goals of the organisation.
Council Properties	The supply of water at appropriate pressure and quality and quality.

The key stakeholder organisations and groups with interest in the Three Water Activities are:

Table 4 - CHB External and Internal Stakeholders

Stakeholders	***Expectations/needs***
Key External Stakeholders	
Ratepayers and local business	Support for quality employment opportunities to live, work and play in the District. The Council supports innovation to address local issues in a responsible way that protects the wellbeing of the District

Industrial and commercial users	Public health and safety, service reliability, environment, cost
Recreational Users (Fish & Game)	Working with recreational users to protect and support the waterways.
Consultants, Contractors and Developers	Working with consultant to ensure there development are constructed in a sustainable manner to protect existing and new water infrastructure.
New Zealand Transport Agency/ Land Transport Section	Working with the Land Transport section and thru them the NZTA to manage our construction program especial in the roading corridor to align with their forward works programs.
Government agencies (MoH, DIA, MfE, Audit NZ, DoC, HBRC)	Public health and safety, service reliability, environment, cost. As well as working with some of these agencies to set environmental standards that affect water management.
Local Iwi	Working with the local Iwi to establish cultural
New Zealand Fire Service	Urban and Rural fire fighting
Key Internal Stakeholders	
Councillors	To set the strategic direction for the management of water within the district and provide appropriate funding to support and implement this activity to protects the wellbeing of the District.
Chief executive and Senior Management	To support the Asset management process and provide direction, guidance, appropriate resources and resolving conflict between conflicting priorities.
Asset Management staff	Provide data on new asset installed within the networks under this plan, support and ideas on the development of capital works, and renewals programs etc.
Financial Support staff	Providing financial information that supports funding for this asset
Information Technology staff	Giving technical support in the field of IT to allow the functioning of asset management programs and control systems (SCADA).
Council FM Contractor	To manage the asset in a prudent manager within the boundaries set by Council and advise back to council condition ratings and other asset data so well found and logical decisions can be make be council with all relevant information

Regulatory staff	To support 3 waters operational team with RMA, advise and help with management of resource consents etc.

2.1.3. Legislation/Regulation

The three water activities are required to comply with all applicable legislation and regulations. These form the minimum standards of service that the water activity must meet. Some of the acts and strategic documents with relevance to the water activity are:

Table 5 - CHB Legislation/Regulation to Council Responsibilities

Legislation or Regulation	Council Responsibilities
The Local Government Act 2002	• Erect, construct, and maintain any public work, which in the opinion of the Council may be necessary or beneficial the District. • May make bylaws with regard to water services within the District. • Comply with certain financial management practices. • Consult with communities. • Complete assessments of water services within the District.
The Resource Management Act 1991	• Sustain the potential of natural and physical resources to meet the reasonable needs of current and future generations. • Comply with the District and Regional Plans. • Avoid, remedy, or mitigate any adverse effect on the environment and structures.
Hazardous Substances and New Organisms (HSNO) Act 1996	• To protect human health and the environment from persistent organic pollutants. • Requiring that decisions are made on the basis of the environmental, health and safety effects of hazardous substances and new organisms.
The Building Act 2004 and amendments.	• Ensure all buildings and facilities constructed for the safe disposal of water that complies with the Act. • Produce Project Information Memoranda (PIM's) and Building Consents, with all available information relating to an individual property requiring a connection to the water network either directly or via the roadside drainage system. For water services the relevant

	information may include details of access, restrictions to reticulation, approvals etc.
The Health and Safety in Employment Act 1999	• Ensure that its employees, contractors, and general public are protected from injury as a result of its activities. • Notify the Occupational Safety and Health Department of serious harm or fatal accidents as a result of its activities within seven days. • Maintain a hazard register.
The Health Act 1956	• MOH can require local authority to provide water works for the benefit of its district where the lack of water control would adversely impact of public health. • Government grants and subsidies may be made available from time to time for water works. • Local Authorities may make bylaws for improving, promoting, or protecting public health, and preventing or abating nuisances, regulating drainage and the control, collection and disposal of wastewater.
The Public Works Act 1981	• Set requirements for the acquisition of land by local authorities for water works as required.
The Local Government (Rating) Act	• Rate for provision of water services.
The Climate Change Response Act 2002	• provide for the implementation, operation, and administration of a greenhouse gas emissions trading scheme in New Zealand that supports and encourages global efforts to reduce the emission of greenhouse gases
The New Zealand Coastal Policy Statement	• To protect the character and qualities of the coastal environment
Employment Relations Act 2000	• The control of water relating to the public systems within the District is an essential service and strike action and lockouts are not permitted in regard to this service provision except in accordance with special conditions of the Act.

The Civil Defence Emergency Act 2002	• Establish and be a member of a Civil Defence Emergency Management Group. • Coordinate, through regional groups, planning, programmes, and activities related to civil defence emergency management across the areas of reduction, readiness, response and recovery, and encourage cooperation and joint action within those regional groups. • Improve and promote the sustainable management of hazards in a way that contributes to the public's well-being and safety and to property protection. • Ensure that it is able to function to the fullest possible extent, even though this may be at a reduced level, during and after an emergency (Lifeline Plans).

2.1.4. Other Bylaws and policies

2.1.5. Bylaws

The main bylaws for this activity are the Central Hawke's Bay District Council Water, Wastewater, Stormwater and Trade Waste Bylaws (2018).

2.1.6. Policies

CHBDC has a number of policies for the management of their assets and activities. These policies are maintained and managed in the CHBDC Policy Manual. Policy documents relating to water, wastewater and stormwater activities include:

- Acquisition of Esplanade Reserves – scope and standards of service provided
- Development Contribution Policy - *Rating issue and clarification of responsibility*
- Remission of water meter rates attributable to water leaks policy - *Rating issue only*
- School Sewerage Charges Remission Policy. – *Rating issue only*
- Stormwater Laterals and Sewer Repairs Policy – *clarification of responsibility*
- Levels of Asset Management Plan Preparation Policy. - *clarification of level of AMP*
- Stormwater Drainage Policy – scope and standards of service provided
- Te Aute Drainage Area Policy – scope and standards of service provided

2.1.7. Strategic Framework

Levels of Services are formally adopted by Council as part of the consultation process with the LTP. Once set, it is the responsibility of the 3 Waters operations Manager to implement the set out levels of service and ensure the Community Facilities and Infrastructure Maintenance (CFIM) contract provides the required service. This is done by setting Key Performance Indicators (KPI's) which the contractor must meet. KPI's are reported on

monthly and consolidated into and quarterly report for the Council, as shown in the flow

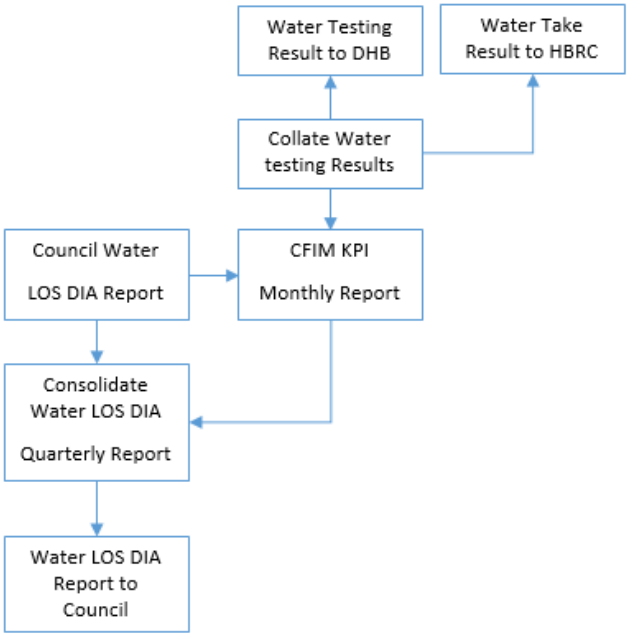
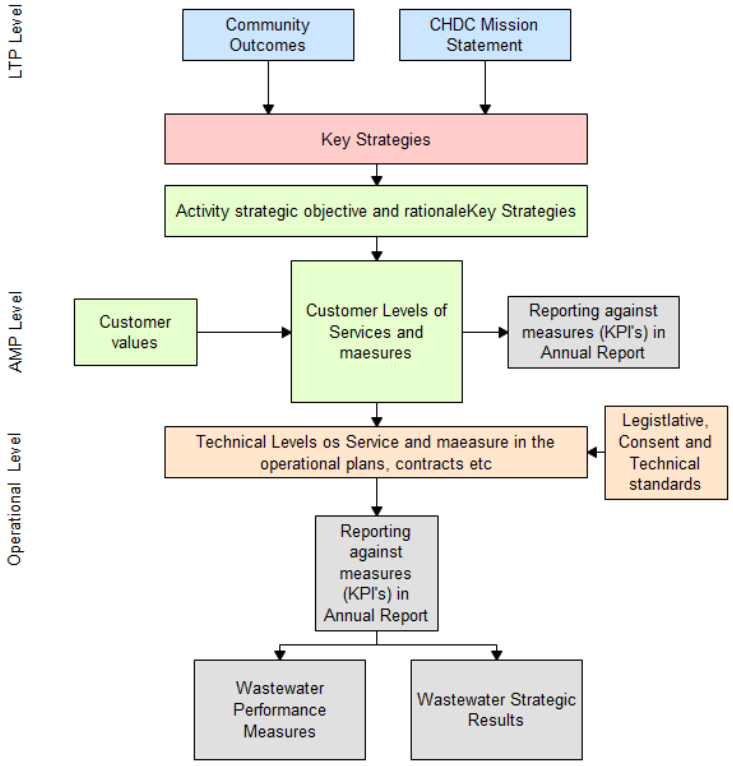


chart below.

2.1.8. Framework for Establishing Levels of Service

The framework for establishing levels of service is illustrated in the figure below.



2.2. Monitoring our Levels of Service – Potable Water

The levels of service for water supply are divided into the following categories:

2.2.1. Potable supplies complying with the drinking water standards

- 100% of all potable supplies comply with Part 4 of the drinking water standards (bacteria compliance criteria)
- 100% of all potable supplies comply with Part 5 of the drinking water standards (protozoal compliance criteria)

In the recent years, due to the Havelock North water incident, the regional council and district health board have had a strong focus on the management of potable water supplies. The bacteria and protozoal compliance are high priorities of focus. The Council has concentrated on improving the quality of water at all potable supplies. Furthermore, the council has included Water Treatment Plant improvements and water source protection as part of the capital works programme to further advance the water quality to residents.

Regular quality checks carried out for each water supply in the Central Hawkes Bay area are outlined in the respective Water Safety Plans. Control limits for compliance criterion and maintenance schedules for the Waipawa, Waipukurau, Takapau, Porangahau and Kairakau water supplies are also outlined in these reports and in the table below. Quality testing results are regularly entered into a Drinking Water Online database for record.

The Water Safety Plans identified the need to improve backflow prevention to reduce the risk of cross contamination of the potable water supply. Since 2019 Council have developed a backflow prevention policy and have undertaken investigations into high risk properties that require replacement of valves in Waipawa, Waipukurau including Redwood Area, Takapau and Otane. Valve replacement and other improvement works are planned to take place over the next 3 years.

To further improve the water quality, the following capital works are included: installation of backflow preventors, minor water treatment plant upgrades, water source protection, installation of valves for flushing purposes and improving standpipe protection.

<u>Reducing water loss across the network;</u>

Currently, the real water loss cannot be measured accurately. Work is underway to install Pressure and flow monitors to enable night-flow analysis and accurately measure water losses. This has been included in the capital work programme as bulk water meter and customer meter improvements. These works will be part of the wider sustainable water management plan.

2.2.2. Firefighting Compliance

Firefighting compliance for Waipukurau and Waipawa, the two main townships, have been the focus for compliance. A firefighting flow model was updated for Waipukurau in early 2019 and a staged work programme has been produced to resolve the areas of fire flow compliance; specifically, the Low Pressure Zone and high fire hazard. Waipawa firefighting model is currently being updated as a result, and a staged work programme will also be formed. These

programmes have been included in the capital works under Waipukurau and Waipawa firefighting improvements and the works have been spread out over a course of several years.

2.2.3. Water Supply Consent

The Council has renewed the consented takes for the existing bores and wells. However, the requirements from the Regional Council for the future resource consent for water takes may result in restriction on the flow when river levels are low. This is further discussed in Section 6 – Growth and Demand.

The Council holds the resource consents listed in the sections below.

Table 6 - Water supply consents

Water Supply	System Source	Permit Number	Consented Take	Expiry Date
Kairakau	Bore (Kapitit Pl)	WP090153T	1 litre per second 605 m3 over any 7 day period	31/05/2029
	Well (Brodie Pl)	WP090166T	0.7 litres per second 420 m3 over any 7 day period	31/05/2029
Pourerere	Spring (Ouepoto Farm)	WP010510T	0.25 litres per second	31/05/2022
Te Paerahi	Bore (Beach Rd)	WP090150T	10.2 litres per second 6,619 m3 over any 7 day period	31/05/2034
Takapau	Bore (Meta Street)	WP140534T	19 litres per second 31,600 m³ over a 28 day period	31/05/2035
Waipawa	Bore (Johnson St)	WP030817T	35 litres per second 21,168 m3 over any 7 day period	31/05/2028
	Bore (Tikokino Rd)	WP030818T	55 litres per second 33,264 m3 over any 7 day period	31/05/2028
Waipukurau	Bore (SH2)	AUTH-113708-03	100 litres per second 60,480 m3 over any 7 day period	31/05/2028

Measuring service delivery

- Attendance for urgent callouts; 2 hours from the time that the local authority received notification to the time that service personnel reach the site
- Resolution of urgent call outs; 12 hours from the time that the local authority receives notification to the time the service personnel confirm resolution of the fault or interruption
- Attendance for non-urgent call outs: 6 hours from the time that the Local Authority receives notification to the time the service personnel reach the site

- Resolution of non-urgent call outs: 72 hours from the time that the Local Authority receives notification to the time the service personnel confirm resolution of the fault or interruption
- ≤ 5 complaints relating to drinking water received (per annum per 1000 connections to the local authority's networked reticulation system) Drinking water clarity, drinking water taste, drinking water odour, Drinking water pressure or flow, continuity of supply, the local authority's response to any of these issues

On average for the past three years, the Council has been able to meet the targets of attendance and resolution of call outs. The complaint targets have also been reached. During this period the council also included the installation of new valves to improve the flushing process which could reduce the time to resolve call outs and reduce the complaints relating to drinking water.

Demand Management

- ≤1.80m3 average consumption of drinking water per day per water connection

Over the past three years the Council has been aiming to reduce the average consumption of water as part of the wider sustainable water management plan. A new Water demand and conservation strategy is being developed, which will change the current levels of service, especially in the area of water management. New levels of service will also be developed to monitor the demand management. New levels of services may relate to the following:

- The requirement for the installation of water storage tanks on new properties
- The installation of bulk water meters to manage water flows across the larger networks

The capital works programme has included the following projects to enhance the management of water demands; bulk water meter upgrades, customer meter improvements, developers led projects and multiple reservoir upgrades and replacements.

Customer Satisfaction

- 90% of users satisfied with the water supply service provided

Council works to provide potable water to satisfy the customer's needs. Although the level of service for customers' satisfaction has not been met, the trend from the past 3 years shows progressive improvement. The Council aims to continue improving customer satisfaction for residents and businesses, through actions such as investing in the following projects, securing a second water supply in Waipukurau and investigations and upgrades to the Waipukurau Industrial Area.

The performance measure for the levels of service for water supply are shown in the table below:

Table 7 - Water Supply Performance Measures for Level of Service

LOS number	L/N	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Primary Community Outcome
					Year 1 2021/22	Year 2 2022/23	Year 3 2023/24	Year 10 2030/31		
1	L	100% of all potable supplies comply with Part 4 of the drinking water standards (bacteria compliance criteria)	2019/20:66.7 % 2018/19: 66% 2017/18: 58%	Ministry of Health Annual Report on Drinking-water Quality	100%	100%	100%	100%	Report to DHB on compliance with the Drinking-water Standards for NZ	Durable Infrastructure
2	L	100% of all potable supplies comply with Part 5 of the drinking water standards (protozoal compliance criteria)	2019/20: 20 % 2018/19: 17% 2017/18: 0%	Ministry of Health Annual Report on Drinking-water Quality	100%	100%	100%	100%	Report to DHB on compliance with the Drinking-water Standards for NZ	Durable Infrastructure
3	L	30% of real water loss from the local authority's networked	2019/20: NA 2018/19: NA 2017/18: NA	Water NZ National Performance Review	≤ 30 %	≤ 30 %	≤ 30 %	≤ 30 %	Calculated from night-time flow measurement and total	Durable Infrastructure

		reticulation system							water abstraction.	
4	L	Attendance for urgent callouts; 2 hours from the time that the local authority received notification to the time that service personnel reach the site	2019/20: 28 mins 2018/19: 31mins 2017/18: 15mins	Water NZ National Performance Review	≤ 2 hours	≤ 2 hours	≤ 2 hours	≤ 2 hours	The median response time measured from the time that the Council receives notification of the issue to the time that service personnel reach the site on CHB's request for service system	Connected Citizens
5	L	Resolution of urgent call outs; 12 hours from the time that the local authority receives notification to the time the service personnel confirm resolution of the fault or interruption	2019/20: 1 hr 48 mins 2018/19: 1 hr 52 mins 2017/18: 3 hrs 53 mins	Water NZ National Performance Review	≤ 12 hours	≤ 12 hours	≤ 12 hours	≤ 12 hours	The median resolution time measured from the time that the Council receives notification of the issue to the time that service personnel reach the site on CHB's request for	Connected Citizens

									service system	
6	L	Attendance for non-urgent call outs: 6 hours from the time that the Local Authority receives notification to the time the service personnel reach the site	2019/20: 38 mins 2018/19: 4hrs 43 mins 2017/18: 5hrs 20mins	Water NZ National Performance Review	≤ 6 hours	≤ 6 hours	≤ 6 hours	≤ 6 hours	The median response time measured from the time that the Council receives notification of the issue to the time that service personnel reach the site on CHB's request for service system	Connected Citizens
7	L	Resolution of non-urgent call outs: 72 hours from the time that the Local Authority receives notification to the time the service personnel confirm resolution of the fault or interruption	2019/20: 27hrs 18 mins 2018/19: 25 hrs 24mins 2017/18: 21 hrs 39mins	Water NZ National Performance Review	≤ 72 hours	≤ 72 hours	≤ 72 hours	≤ 72 hours	The median resolution time measured from the time that the Council receives notification of the issue to the time that service personnel reach the site on CHB's request for	Connected Citizens

									service system		
		≤ 5 complaints relating to drinking water received (per annum per 1000 connections to the local authority's networked reticulation system) Drinking water clarity, drinking water taste, drinking water odour, Drinking water pressure or flow, Continuity of supply, The local authority's response to any of these issues	2019/20: 3.68 complaints/1000 connections 2019/20: 14 complaints/1000 connections 2019/20: 0 complaints/1000 connections	Ministry of Health Annual Report on Drinking-water Quality ≤ 5 complaints relating to drinking water received (per annum per 1000 connections to the local authority's networked reticulation system							
8	L				≤ 5 complaints	≤ 5 complaints	≤ 5 complaints	≤ 5 complaints	Report to DHB on compliance with the Drinking-water Standards for NZ	Connected Citizens	
9	L	≤1.80m3 average	2019/20:1.65 m3	Water NZ National	≤ 1.80 m3	≤ 1.80 m3	≤ 1.80 m3	≤ 1.80 m3	Total volume of water	Environmentally Responsible	

		consumption of drinking water per day per water connection	2018/19: 1.56 m3 2017/18: 1.68 m3	Performance Review					abstracted minus the leakage from the public network divided by the number of water connections served by Council's water supply networks		
10	L	90% of users satisfied with the water supply service provided	2019/20: 83 % 2018/19:82 % 2017/18: 81%	Water NZ National Performance Review	≤90 %	≤ 90%	≤ 90%	<90%	Resident Opinions surveys	Connected Citizens	

2.3. Monitoring our Levels of Service – Wastewater

The levels of service for wastewater are divided into the following categories:

Reduction of sewage overflows

- ≤10 of dry weather sewerage overflows (per 1000 connections to the total sewerage system)
- ≤30 of total sewerage overflows (per 1000 connections to the total sewerage system)

Although Council is currently meeting the target of sewage overflow, Council continues with preventative works to meet the demand and aging infrastructure such as upgrades and new pipeline in Great North Rd linking from Tamumu Rd to Abbotsford Rd and relocation of wastewater mains beneath the town of Waipukurau.

Compliance with resource consent discharge

- Compliance with the territorial authority's resource consents for discharge from its sewerage system measured by the number of abatement notices, infringement orders, enforcement orders and convictions, received by the territorial authority

The wastewater discharges from the treatment plants are regularly tested in accordance with the testing regime set by the resource consent conditions issued from the Hawke's Bay Regional Council. The wastewater discharges from the treatment plants are regularly tested in accordance with the testing regime set by the resource consent conditions issued from the Hawke's Bay Regional Council. The list of routine tests is shown in the table below.

Table 8 - Routine wastewater tests

Network	Otane				Waipukur		Waipawa		Takapau		Porangahau		Te Paerahi	
Sample Site	STP Discharge	203 & 269 Drumpeel Road	Farm Drain	Papanui Stream (US & DS)	STP Discharge	Tuki Tuki River (US & DS)	STP Discharge	Waipawa River (US & DS)	STP Discharge	Makaretu River (US & 2x DS)	Porangahau Town STP Discharge	Porangahau Town River STP Discharge (US & DS & Kate's Quarry)	Te Paraehi Beach STP Discharge	Piezometers
Faecal Coliforms	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
E.Coli	☑	☑	☑	☑	☑	☑	☑	☑			☑	☑		
Enteroccoci											☑	☑		
Total Organic Carbon									☑	☑				
Dissolved Inorganic Nitrogen	☑	☑	☑	☑	☑	☑	☑	☑						
Nitrite	☑	☑	☑	☑	☑	☑	☑	☑						
Volatile Solids					☑	☑	☑	☑						
Clarity		☑	☑	☑		☑		☑				☑		
pH	☑	☑	☑	☑	☑		☑		☑	☑	☑	☑	☑	
Suspended Solids	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	
cBOD5	☑				☑		☑		☑		☑	☑	☑	
Soluble cBOD5						☑		☑						
Total Ammoniacal Nitrogen	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
Soluble Reactive Phosphorus	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑		☑
Total Nitrogen	☑	☑	☑	☑	☑		☑				☑	☑		☑
Total Phosphorus	☑	☑	☑	☑	☑	☑	☑	☑			☑	☑		☑
Dissolved Oxygen	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	
Temperature	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	
COD									☑					
Condition of River						☑		☑		☑		☑		
Nitrates	☑	☑	☑	☑		☑		☑	☑	☑	☑	☑	☑	☑
TKN											☑	☑		
Turbidity												☑		
Conductivity									☑	☑		☑		
Frequency	F	M	M	M	F	M	F	M	M	M	F	M	F	M
F = Fortnightly, M = Monthly														

In addition to these:

- Flow at all ponds is monitored thru the Telemetry system and reported as required by the Resource Consent conditions.
- The Otane, Waipukurau and Waipawa Oxidation Ponds will also be tested every two years for Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Zinc, Arsenic and Iron.
- at Takapau all (STP and River) monthly samples are also tested for Conductivity, Nitrite-Nitrogen, Dissolved Reactive Phosphorus and Total Organic Carbon.

Over the last three years, no notices or infringements have been issued for the resource consent for discharge. However, Council will continue to invest and improve their wastewater treatment plants. Further works and improvements are required for Waipawa and Waipukurau Treatments Plants are required to achieve compliance with environmental regulations.

The resource consent for Otane, Waipawa and Waipukurau will expire at least 9 years from now however based on two independent reviews, the current Waipawa and Waipukurau plants will never be able to achieve compliance and have significant performance issues. To meet regulations, major upgrades will need to take place. Otane's current Wastewater treatment plant would also require upgrades to meet consent by 2021. An analysis took place in 2018-2019, resulting in the decision that Otane's wastewater should be conveyed toward Waipawa for treatment and discharge.

The council has been working closely with community members to develop options, which include; upgrades to the existing water treatment plants at Waipawa and Waipukurau, construction of up to two new treatment plants, new wastewater pipelines from Otane and Waipukurau to Waipawa, and the introduction of up to two new discharges. These options, and potential costs, are outlined in the Big Wastewater Story.

Other projects included in the Big Wastewater initiative include; re-consenting, then upgrades to the Porangahau and Te Paerahi wastewater systems, and re-consenting, then upgrades to the Takapau wastewater system. These projects will address consents expiring in 2021.

Furthermore, council is maintaining the effluent discharge quality by pond desludging at Waipukurau, Waipawa, Otane, Takapau, Porangahau and Te Paerahi. These works are shown in the capital works programme.

Table 9 - Wastewater System consents

Wastewater System	Permit No.	Purpose	Expiry Date
Otane	DP030230Wb DP030858Ab	To discharge municipal sewage after treatment in the Otane oxidation pond to water, and to land where it may enter water, being an intermittently flowing un-named tributary of the Papanui Stream. To discharge contaminants (odour) associated with the operations of the Otane wastewater treatment system to air.	30 September 2042
Waipawa	DP030232Wa DP030860Aa	To discharge treated municipal sewage to water and to land where it may enter water. To discharge contaminants (odour) associated with a sewage treatment plant to air.	30 September 2030
Waipukurau	DP030231Wa DP030859Aa	To discharge treated municipal sewage to water, and to discharge contaminants (odour) associated with a sewage treatment plant to air.	30 September 2030
Takapau	DP980271Wa	To discharge treated sewage effluent from the Takapau oxidation pond into or onto	31 May 2021

		land (wetland) in circumstances which will result in that contaminant entering water.	
Porangahau	DP030233W DP030861A DP080621L (This consent has lapsed 31 May 2014)	To discharge treated domestic effluent into the Porangahau River via a constructed wetland. To discharge contaminants (odour) to air associated with the operation of the Porangahau Township Oxidation Pond	31 May 2021
Te Paerahi	DP030234L DP030862A	To discharge treated domestic effluent into or onto land (via soakage) from the existing Te Paerahi (Porangahau Beach) oxidation pond where that contaminant may enter water. To discharge contaminants (odour) to air associated with the operation of the Te Paerahi (Porangahau Beach) Oxidation Pond	31 May 2021

Measuring service delivery

- ≤1hr median response time for attending sewerage overflows resulting from blockages or other faults (measured from the time that notification is received to the time that the service personnel reach the site)
- ≤ 4 hrs median resolution time for attending sewerage overflows resulting from blockages or other faults (measured from the time that notification is received to the time that service personnel confirm resolution of the blockage or other fault)

The past three years, the Council has met their measuring targets of response and resolution the time to resolve overflows.

Customer Satisfaction

- ≤ 10 number of complaints received per annum per 1000 sewerage connections about any of the following: Sewage odour, Sewerage system faults, Sewerage system blockages or Council's response to issues with its sewerage systems.
- 90% of users satisfied with the wastewater service provided

Council works to improve the collection and treatment of wastewater to satisfy the customer's needs. Though both customer satisfaction targets have been met, the council will continue to invest in improving the customers experience for residents and businesses by; collaborating with developer led projects, investigating district wide sewer reticulation shortfalls and investigating planned upgrades for Waipukurau industrial area.

The performance measure for the levels of service for wastewater are shown in the table below:

Table 10 - Wastewater Performance Measures for Level of Service

LOS number	L/N	Achieved/Not Achieved	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Community Outcome
						Year 1 2021/22	Year 2 2022/23	Year 3 2023/24	Year 10 2030/31		
1	L	Achieved XXX dry weather sewerage overflows (per 1000 connections to the total sewage system)	≤10 of dry weather sewerage overflows (per 1000 connections to the total sewerage system)	2019/20: 3.5 2018/19: 0.58 2017/18: 3.17	Average of 1.56 in Water NZ National Performance Review 2015/16	≤ 10	≤ 10	≤ 10	≤ 10	Number of dry weather overflows per 1,000 properties connected to the wastewater network. Reported in resource consent compliance reports to CHBDC Department of Internal Affairs, wastewater non-financial performance measure	Durable Infrastructure
2	L	Achieved XXX sewage overflows (per 1000 connections to the total sewage system)	≤30 of total sewerage overflows (per 1000 connections to the total sewerage system)	2019/20: 3.5 2018/19: 1.16 2017/18: 4.33		≤ 30	≤ 30	≤ 30	≤ 30	Number of total overflows per 1,000 properties connected to the wastewater network. Reported in resource consent compliance reports to CHBDC	Durable Infrastructure

										Department of Internal Affairs, wastewater non-financial performance measure	
3	L	Achieved Abatement notices: 0 Infringement Orders: 0 Enforcement Orders: 0 Convictions: 0	Compliance with the territorial authority's resource consents for discharge from its sewerage system measured by the number of 0 abatement notices 0 infringement orders 0 enforcement orders and 0 convictions, received by the territorial authority	2019/20: 0 2018/19: 0 2017/18: 0	No. of Abatement: Average of 0.15 in Water NZ National Performance Review 2015/16 No. of Infringement: Average of 0.04 in Water NZ National Performance Review 2015/16 No. of enforcement orders: Average of 0 in Water NZ National Performanc	0	0	0	0	Reported in resource consent compliance reports to CHBDC Department of Internal Affairs, wastewater non-financial performance measure	Environmentally Responsible

					e Review 2015/16 No. of convictions: Average of 0 in Water NZ National Performanc e Review 2015/16						
4	L	Achieved The median response time year to date is xxx minutes	≤1hr median response time for attending sewerage overflows resulting from blockages or other faults (measured from the time that notification is received to the time that the service personnel reach the site)	2020/ 47 mins 2019/20: hrs 2018/19: 22mins 2017/18: 55mins	Average of 55 minutes for all types of wastewater networks in Water NZ National Performanc e Review 2015/16	≤ 1 hr	≤ 1 hr	≤ 1 hr	≤ 1 hr	The median response time measured from the time that the Council receives notification of the overflow to the time that service personnel reach the site. Reported in monthly contract reports from the Contractor. Department of Internal Affairs, wastewater non-financial performance measure	Connected Citizens

5	L	Achieved The median resolution time year to date is Xhrs XX minutes	≤ 4 hrs median resolution time for attending sewerage overflows resulting from blockages or other faults (measured from the time that notification is received to the time that service personnel confirm resolution of the blockage or other fault)	2019/20: 2 hrs 20 mins 2018/19: 1 hr 54 mins 2017/18: 2 hr 16 mins	Average of 3 hours in Water NZ National Performance Review 2015/16	≤ 4 hrs	≤ 4 hrs	≤ 4 hrs	≤ 4 hrs	The median resolution time measured from the time that the Council receives notification of the overflow to the time that service personnel confirm resolution of the overflow. Reported in monthly contract reports from the Contractor. Department of Internal Affairs, wastewater non-financial performance measure	Connected Citizens

6	L	Achieved XX complaints received per 1000 sewerage connections year to date	≤ 10 number of complaints received per annum per 1000 sewerage connections about any of the following: Sewage odour, Sewerage system faults, Sewerage system blockages or Council's response to issues with its sewerage systems.	2019/20: 14.4 complaints/1000 connections 2018/19: 0 complaints/1000 connections 2017/18: 80.56 complaints/1000 connections	Average of 9.53 for all wastewater complaint types in Water NZ National Performance Review 2015/16	≤ 10 complaints	≤ 10 complaints	≤ 10 complaints	≤ 10 complaints	The number of complaints about Council's wastewater system blockages received through the call centre, expressed per 1,000 properties connected to the Council's wastewater system Department of Internal Affairs, wastewater non-financial performance measure	Connected Citizens
7	L	Achieved During June 2020, resident opinion survey, 91% of those surveyed were satisfied with the	90% of users satisfied with the wastewater service provided	2019/20:91% 2018/19: 93% 2017/18: 87%		90 % ≥	90 % ≥	90 % ≥	90 % ≥	Resident Opinions surveys	Connected Citizens

		wastewater service provided.									

2.4. Monitoring our Levels of Service – Stormwater

The levels of service for stormwater are divided into the following categories:

Reduction of habitable floors during flooding event

- For each flooding event, 0 habitable floors affected. (Expressed per 1000 properties connected to the territorial authority's stormwater system.)

In the past three years, there has been no record of habitable floors affected. However, there has been known issues for stormwater flooding in the towns, hence further investigation has been planned and included in the capital works programme.

Compliance with resource consent discharge

- Compliance with the territorial authority's resource consents for discharge from its stormwater system measured by the number of abatement notices, infringement orders, enforcement orders; and, successful prosecutions, received by the territorial authority in relation to those resource consents

Over the last three years, there has been no notice and infringements for the resource consent for discharge. However, there have been high levels of zinc in a few discharge areas. This would be further addressed in the Stormwater Catchment Management Plan (CMP) that needs to be prepared by CHB as part of the resource consent requirements. Following submission of the CMP, identified improvement works will be implemented.

Table 11 - Stormwater System consents

Stormwater System	Permit No.	Purpose	Expiry Date
Waipukurau	HKB790212	Divert stormwater from Pah Flat Stream to Mangatarata Stream catchment.	In perpetuity
Waipukurau	HKB790213	Increase the discharge capacity into the Mangatarata Stream.	In perpetuity
Waipukurau	WP921583D	Divert water from the College Drain to the new drain thence to the Pah Flat Drain	31 May 2027
Waipukurau	DP921584W expired	Discharge of water via new drain to Pah Flat Drain	Permitted Activity
Waipukurau	WP040049M	Divert water from Chambers Street area to Pah Flat Stream	In perpetuity
Te Aute	WP921502M	To dam the Te Aute main drain to retain water during summer and to prevent flooding from the Papanui Stream	31-May-2025
Rural	HKB760352	Divert un-named stream on Blackhead Road for road culvert	In perpetuity
Rural	HKB780104	Divert Mangaorapa Stream around a slip	In perpetuity

The stormwater discharge's various locations across the districts are regularly tested in accordance with the testing regime set by the resource consent conditions issued from the Hawke's Bay Regional Council. The list of routine tests is shown in the figure above.

Furthermore, resource consent was granted in 2017 with various conditions to be completed and implemented by 2022 through a Stormwater Catchment Management Plan. The Stormwater implantation budget is currently being completed and outlines a staged approach from year 4 to 7.

The early works involve sampling and investigations into the individual catchments. It also includes educating and involving community engagement such as liaising with CHBDC staff, schools, developers and builders in collaboration with the CHBDC Comms team, Resource Consent team and CID team. Then this information and data from the investigation and sampling will be analysed and used to formulate flood and spill strategies and plans for the catchment management plans.

The late stages of capital works could include open channel replacement to control contaminants, installation of stormwater treatment to treat high zinc levels and wetland and detention pond infrastructure to slow down and treat the discharge into the rivers.

The Catchment Management Plan has been included in the capital works programme to reflect the several years of capital work that will be required to comply with resource consent conditions. It has also included an estimated of the potential capital works due to tightening of consenting conditions after 2025.

Measuring service delivery

- ≤2hr median response time to attend a flooding event, measured from the time that the territorial authority receives notification to the time that service personnel reach the site.

Over the past three years, the Council has met their measuring targets of response time to resolve overflows. The Council continues to maintain this service delivery level by maintenance for channel and drain upgrades at Pah Flat and other districts.

Customer Satisfaction

- ≤ 5 complaints received about the performance of the stormwater system (expressed per 1000 properties connected to the stormwater system)
- 90% of users satisfied with the stormwater service provided

Council works to improve the catchment of stormwater to satisfy the customer's needs. Though both customer satisfaction targets have been met, the council will continue to invest in improving customer experience for residents and businesses by investing in the following; collaborating with developer led projects, investigating district wide sewer reticulation shortfalls, Pah Flat Drain Channel Upgrade and CBD flooding upgrades.

The performance measure for the levels of service for stormwater are shown in the table below:

Table 12 - Stormwater Performance Measures for Level of Service

#	L/N	Achieved/ Not Achieved	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Community Outcome
						Year 1	Year 2	Year 3	Year 10		
1		Achieved X habitable floors affected in flooding events	For each flooding event, 0 of habitable floors affected. (Expressed per 1000 properties connected to the territorial authority's stormwater system.)	2019/20: 2018/19: 0 2017/18: 0	Average of 1.56 in Water NZ National Performance Review 2015/16	0	0	0	0	Number of habitable floors affected in flooding event per 1,000 properties connected Reported in resource consent compliance reports to CHBDC. Department of Internal Affairs, wastewater non-financial performance measure	Durable Infrastructure

1		Achieved Abatement notices: 0 Infringement Orders: 0 Enforcement Orders: 0 Convictions: 0	Compliance with the territorial authority's resource consents for discharge from its stormwater system measured by the number of: abatement notices 0, infringement orders 0, enforcement orders 0; and, successful prosecutions, received by the territorial authority in relation to those resource consents 0	2019/20: 2018/19: 0 2017/18: 0	No. of Abatement: Average of 0.15 in Water NZ National Performance Review 2015/16 No. of Infringement: Average of 0.04 in Water NZ National Performance Review 2015/16 No. of enforcement orders: Average of 0 in Water NZ National Performance Review 2015/16 No. of convictions: Average of 0 in Water NZ	0	0	0	0	Reported in resource consent compliance reports to CHBDC. Department of Internal Affairs, wastewater non-financial performance measure	Environmentally Responsible

					National Performance Review 2015/16						
1		Achieved The median response time year to date is XX minutes	≤2hr median response time to attend a flooding event, measured from the time that the territorial authority receives notification to the time that service personnel reach the site.	2019/20: 2018/19: 20 mins 2017/18: 107mins	Average of 55 minutes for all types of wastewater networks in Water NZ National Performan	≤ 2hrs	≤ 2hrs	≤	≤	The median response time measured from the time that the Council receives notification of the flooding event to the time that service personnel reach the site. Reported in resource consent compliance reports to CHBDC. Department of Internal Affairs, wastewater non-financial performance measure	Connected Citizens

					ce Review 2015/16					
1		Achieved X complaints received per 1000 stormwater connections	≤ 5 complaints received about the performance of the stormwater system (expressed per 1000 properties connected to the stormwater system)	2019/20: 2018/19: 0 2017/18: 0	Average of 9.53 for all wastewater complaint types in Water NZ National Performance Review 2015/16	≤ 5	≤ 5	≤ 5	≤ 5	The number of complaints about Council's stormwater system received through the call centre, expressed per 1,000 properties connected to the Council's stormwater system Reported in resource consent compliance reports to CHBDC. Department of Internal Affairs, wastewater non-financial performance measure	Connected Citizens

1		Achieved During June 2020, resident opinion survey, 91% of those surveyed were satisfied with the stormwater service provided.	90% of users satisfied with the stormwater service provided	2019/20:92 % 2018/19: 85% 2017/18: 87%		90 % ≥	90 % ≥	90 % ≥	90 % ≥	Resident Opinions surveys	Connected Citizens

2.5. Level of Service – Compliance and Improvements Projects and Programmes

Programme	Project Name	Project Description	Project Driver	Other Benefits	Duration of Project (Yrs)	Project Cost (PV 2021) over 30 years
Water Supply	Waipawa firefighting improvements	Upgrading to address shortfalls of existing reticulation system firefighting capacity	Compliance	Growth/Demand	6	$ 3,750,655
Water Supply	Waipukurau firefighting improvements	Upgrading to address shortfalls of existing reticulation system firefighting capacity	Compliance	Growth/Demand	8	$ 4,810,140
Water Supply	Installation of testable boundary backflow preventers	Installing back flow preventers starting with highest risk customer connections	Compliance	Risk and Resilience	6	$ 306,000
Water Supply	Water treatment plant improvements	Minor improvements and upgrades identified through the district wide Water Safety Plans	Compliance	Improvements	3	$ 200,000
Water Supply	Water source protection	Water Source protection and security improvements identified through the district wide Water Safety Plans	Compliance	Risk and Resilience	2	$ 100,000
Water Supply	Standpipe improvements	Improvement to standpipe security	Compliance	Risk and Resilience	2	$ 20,000
Water Supply	Installation of new valves for flushing purposes	Improve water safety risk mitigation and operational efficiency by installing new valves for network flushing	Compliance	Improvements	3	$ 100,000

Wastewater	WPK WPA OTN wastewater treatment and discharge upgrade	Upgrades to Waipawa, Waipukurau and Otane treatment plants and discharges to achieve resource consent compliance.	Compliance	Improvements	10	$ 51,016,236
Wastewater	WPK WPA OTN pond desludging	Desludging at Waipawa, Waipukurau and Otane treatment plant sites	Compliance	Renewal	10	$ 5,000,000
Wastewater	TEP / PHU wastewater treatment and discharge upgrade	Improvements to Te Paerahi and Porangahau treatment plants and discharges to comply with resource consent. Convey Te Paerahi's and Porangahau's wastewater to common land site for disposal. Construct a new land discharge site. Build storage to allow all wastewater to a land-based site. Minor improvements at both sites	Compliance	Improvements	4	$ 17,000,000
Wastewater	TKP, TEP & PHU Pond desludging	Desludging at Takapau, Te Paerahi and Porangahau treatment plant sites	Compliance	Renewal	10	$ 2,000,000
Wastewater	TKP wastewater treatment and discharge upgrade	Takapau plant requires upgrades and improvements as the resource consent is expiring. Requires minor upgrades to the treatment works	Compliance	Improvements	3	$ 3,000,000
Stormwater	Stormwater Catchment Management Plan (CMP)	As part of the resource consent requirement a stormwater Catchment Management Plan (CMP) has to be prepared by Nov 2022. Following submission of the CMP, identified improvement works will be implemented	Compliance	Improvements	30	$ 6,500,000

3. Risk and Resilience

Council manages risk in the organisation at a corporate level as set out by Councils Risk Management Framework (the Framework). The Framework prescribes risk management approaches at strategic and operational levels from identification and analysis through to mitigation/treatment.

Importantly, the Framework sets out how risks should be managed within the business in a consistent and rigorous manner. For 3 waters assets, asset managers are able to use the Framework to rank risks for treatment or reporting.

3.1.1. Resilience Challenges

The table below summarises the most significant potential impacts of disruptors on 3 waters assets and

	Disruptors	**Potential Impacts on our Assets and Services**
Chronic Stressors	Climate Change	Increased drought risk –less water available plus increased water demand for irrigation Increased peak and total demand with more hot days (25°C+). Possible biological response to low flow/higher temperature- e.g. increased bacterial action, legionella, cyanobacteria. Forest fire risk to 3 waters infrastructure and source water catchments Increased high intensity rainfall – increased flood risk (see Acute Shock: Flooding)- surface assets vulnerable to flooding. May also lead to more frequent contamination events. Increased landslides and erosion due to devegetation by drought or fire, followed by more intense rainfall events and stronger winds. Increasing sediment runoff with drought, devegatation and increased erosion. Sea level rise, coastal erosion and coastal inundation - reduced viability to service some properties and possibility of stranded assets. Damage to surface assets in coastal areas, including by saline water and sediment. Groundwater rise – reduced asset life and performance of buried assets, reduced viability to service some properties. Shallowing of groundwater increases liquefaction risk in coastal areas. Climate change mitigation – carbon accounting required for capital and operational projects requiring different cost, time and methodologies.
	Covid-19 and economic impact	Early forecasting signals significant economic impacts locally, nationally and internationally. There is great uncertainty. This advice is being updated regularly and is likely to change over time.

		What might this mean for the water supply activity? Initial focus on critical projects, government stimulus projects and completing committed projects. Short-term possible delays in scheduled capital programme works, potential issues with workforce availability/contractor viability, uncertainty about materials supplies, changing priorities, and increased financial pressure. Opportunities for bringing forward 'shovel ready' work. Medium term consideration of capital works programme in light of the emerging Financial Strategy and Infrastructure Strategy response. Longer term horizon is very uncertain. Potentially dealing with the effect of any deferred expenditure due to the above factors.
	Population Health	Declining source water quality (e.g. nitrates in groundwater) – potential health risks or higher treatment standards required. Fluoridation – potential change in fluoridation requirements and sentiment
	Housing and Social Inequity	Fairly charging users of the service – expectations that users only pay for their own use and do not subsidise high users through universal rating. Equity between urban and rural 3 waters service users Intergenerational equity and debt – expectations that the cost of assets and services are equitably applied to the generations that do (and will) receive the benefits
	Regulation	Government Three Waters Review – expected changes in regulation, funding, organisational arrangements Shared service delivery – potential sharing of service delivery between multiple councils and organisations Centralisation - potential amalgamation or national delivery organisations National Environmental Standards – changing targets and controls for environment outcomes
Acute Shocks	Flood	Flooding causing inundation in serviced areas - damage to assets and lost or impaired service. Further risk profiling needed to determine impacts.
	Earthquake	Large earthquake causing ground shaking, liquefaction, landslides and permanent ground deformation, uplift, subsidence or tilting – damage to assets and lost or impaired service. Specific pipe materials, jointing systems and above ground facilities have higher seismic vulnerability (brittle pipes, concrete tanks) Further risk profiling needed to determine impacts.
	Tsunami	Further risk profiling needed to determine impacts.

3.2. Resilience responses in this AMP

Asset replacement and upgrade programmes have works listed specifically to address identified risk and resilience concerns in the asset base. Often risk and resilience is closely linked with renewal drivers as it is often the case that asset condition or age are heightening the most significant risks. Further, the investment in renewals is prioritised highly in this asset management plan recognising the additional benefits from renewal towards improving resilience.

3.3. Council's approach to risk

Central Hawke's Bay District Council (CHBDC) is committed to the effective management of risk and recognises that risk is present in everything we do. CHBDC has adopted a Risk Management process, this process is outlined in council's "Risk Management Framework" document.

In terms of this activity risk management is: -

Risk management involves looking at all the activities carried out in providing the 3 Water Services and assessing what might go wrong and how often this might occur. The information gained from this can be used to eliminate the risk, reduce its effect, or allow a contingency plan to be prepared to deal with the risk if it occurs. It also involves looking more widely for events that would not normally be expected to happen but have the possibility of happening and affecting this activity.

This section outlines Council's approach to managing risk and investing in resilience. It includes responses by the activity to build resilience across a number of identified 'disruptors'. A risk register and schedule of proposed risk mitigation actions are also included.

Risk Management Framework

3.4. Likelihood and Consequence Scale

The likelihood scale is based on frequency or return period rather than an absolute probability.

Score	Likelihood	Descriptor
5	Almost Certain	Known issue, is expected to occur more than 50% of the time
4	Likely	Has occurred locally, chances more than 10% but less than 50% per year
3	Possible	Has occurred in the industry, local chances more than 1% but less than 10% per year
2	Unlikely	May occur in the industry, local chances more than 0.1% but less than 1% per year
1	Highly Unlikely	May occur only in exceptional circumstances, chances less than 0.1% per year

3.4.1. Consequence Scale

The scale of consequences for the categories of Asset and Project Management and Health and Safety are described below.

Consequence (C)	**1**	**2**	**3**	**4**	**5**
Risk Area	**Insignificant**	**Minor**	**Significant**	**Major**	**Catastrophic**
Asset & Project Management	Some damage where repairs are required however facility or infrastructure is still operational. Loss of utilities/systems resulting in minor IT disruption to a service for up to 12 hours.	Short term loss or damage where repairs required to allow the infrastructure to remain operational using existing internal resources. Loss of utilities/systems resulting in minor IT disruption to a service (>12 hours - 24 hours).	Short to medium term loss of key assets and infrastructure where repairs required to allow the infrastructure to remain operational. Cost outside of project budget allocation by 10% or $10,000 to $100,000. Loss of utilities/systems resulting in IT disruption to a department for up to 12 hours.	Widespread, short term to medium term loss of key assets and infrastructure. Where repairs required to allow the infrastructure to remain operational. Cost significant outside of project budget allocation by great than $100,000. Loss of utilities/systems resulting in serious IT disruption to several services or more than 1 department for up to 12 hours.	Widespread, long term loss of substantial key assets and infrastructure. Where infrastructure requires total rebuild or replacement. Failure of utilities/systems resulting in the loss of function for several departments (> 12 hours).
Health & Safety (for staff, contractors or members of the public)	Discomfort or first aid treatment only	Medical treatment required	Restricted work duties or lost time injury	Debilitating injury resulting in loss of quality of life	Fatality or multiple fatalities

3.4.2. Risk Matrix

The results of this consideration of the likelihood and consequences of a risk is entered on the Risk Rating Matrix to determine its Risk Rating Category.

The process is fully discussed in Council Risk Framework document and only the final risk assessment traffic light system table below is included in this document for reference.

CONSEQUENCE SEVERITY	LIKELIHOOD: Highly Unlikely	Unlikely	Possible	Likely	Almost Certain
Major	H	H	E	E	E
Significant	M	H	H	E	E
Moderate	L	M	M	H	E
Minor	L	L	M	M	H
Insignificant	L	L	L	M	M

3.4.3. Risk Rating Categories

High and Extreme levels of Residual Risk will require management actions or solutions that should be programmed into Annual Business Plans to ensure the level of risk is reduced where deemed appropriate.

Risk evaluation

This means making a judgement about whether the level of risk is OK or not OK, why, and what must happen next. The risk analysis helps us to make this judgement, and also to prioritise risks for action.

LEVEL OF RISK	WHAT IT MEANS
E (Extreme risk)	Stop activity or process immediately, and don't continue until the risk has been reduced.
H (High risk)	Manage risk immediately.
M (Medium risk)	Action required but not immediate.
L (Low risk)	Manage through continuous improvement.

3.5. Critical assets

A formal method is used to assign consequence of failure scores to pipe in the 3 waters network.

For other assets, a more general assessment is made based on experience, considering risk of failure and lifelines evaluation to identify critical assets. Generally, critical assets are considered to be those assets for which the consequence of failure is unacceptable given the

difficulty of repair and/or the strategic role they play and would result in a major disruption or failure in meeting one or more levels of service.

Assets that are considered critical within the Council's water supply system are:

- Bores and springs including bore pumps etc.
- Trunk mains
- Water treatment plants
- Reservoirs and tanks

Assets that are considered critical within the Council's wastewater system are:

- Wastewater treatment plants and disposal assets
- Trunk mains
- Major pumping stations

Assets that are considered critical within the Council's stormwater system are:

- Open drains or piped mains without suitable secondary flow paths
- Stop banks
- Floodgates

By contrast non-critical assets are relatively quickly and easily repaired or replaced and their failure does not disrupt a significant number of customers.

Council is in the early process of formally applying different asset lifecycle management strategies for critical and non- critical assets. This includes:

- Proactive or scheduled approaches to maintenance
- Priorities for collecting asset data and undertaking condition assessment
- Adjusting economic lives with respect to renewal profiles
- Prioritising/deferring renewals
- Prioritising expenditure
- Prioritising levels of service reviews

3.6. Risk Assessment Context

Risk management is applied and developed in both the strategic and organisational contexts.

Risk should be considered relative to Strategic Objectives, Organisational Performance and Event Management.

3.6.1. Strategic Context

This Asset Management Plan describes Council's Strategic Objectives relative to the 3 Waters Activities and details the relationship between Strategic and Community Outcomes and 3 Waters Asset Goals. The plan also sets out the various relationships between other plans, legal requirements, financial strategies, regulatory consents and policy documents for the water activity.

3.6.2. Organisational Context

The organisational context for risk management relates to assessment of Council's ability to manage the 3 waters activity to achieve the required outcomes.

In particular, the focus for this context is risk associated with organisation issues such as staffing (resources, skills and training etc), work areas, location, IT and financial systems, database and data recording, analysis and tracking systems, policies and procedures, relationships with elected representatives etc.

3.6.3. Event Management Context

The Event Management context relates to both the management and operation of the activity. It includes assessment of risk relating to particular events that may occur. The range of types of events assessed includes contract management activities, operational activities, asset failure events as well as general, accidental, environmental and deliberate harm events.

3.6.4. Assessment Process

The assessment process is set out in further detail in the following paragraphs that describe the risk Management Procedure and various risk criteria.

3.7. Risk Management Procedure

The risk procedure is based on the Guidelines in AS/NZS 4360:2004 - Risk Management. The definition of risk management, as presented in Standards New Zealand Handbook – 'Risk Management for Local Government' (SNZ HB 4360:2000) is:

"The systematic applications of management policies, procedures and practices to the task of identifying, analysing, evaluating, treating and monitoring those risks that could prevent a Local Authority from achieving its strategic or operational objectives or plans or from complying with its legal obligations".

The risk management process is illustrated below.

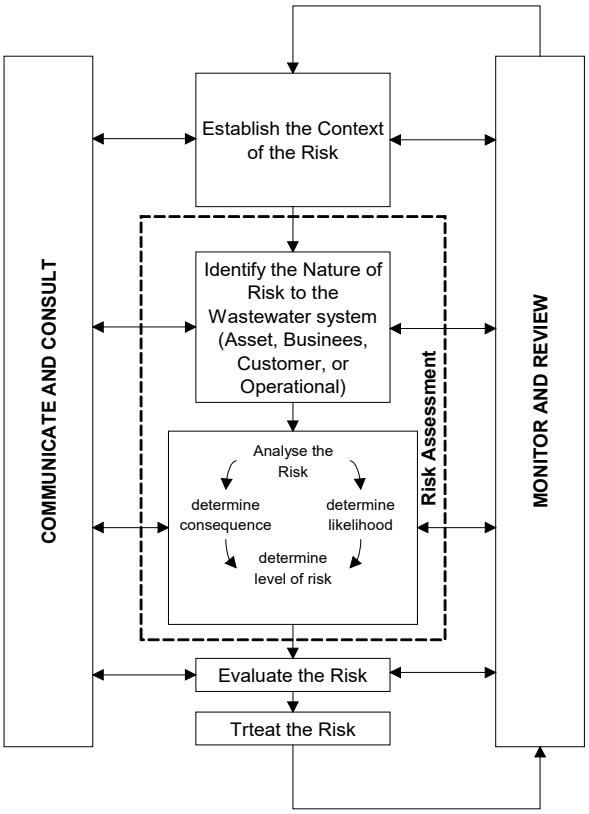


Figure 3

3.8. Strategic Risks

The strategic risks list below represent the most significant risks for the 3Waters activities:

- Major/critical infrastructure fails
- Drinking water supply is contaminated
- We are unable to supply sufficient water
- Wastewater (and stormwater) discharge harms the environment
- Wastewater schemes fail to comply with consents
- Stormwater infrastructure condition or performance exacerbates flooding
- Identified improvement works cannot be funded and therefore will not be built
- Identified improvement processes cannot be funded and therefore will not be implemented
- Poor data, planning processes or risk management results in low decision-making confidence
- Procurement obstacles and resource constraints result in failure to deliver the capital programme
- The changing legislative environment results in unforeseen costs, service level changes, or lower water availability

- Shortage of suitably trained operational, asset management, technical and project management staff
- Institutional knowledge is lost through staff retirement or turnover
- Customers are dissatisfied with service levels
- Service delivery reform leads to poor cost, service level or customer relationship outcomes
- 3 waters service operation harms staff or public

3.9. Risk Management Activities

Activities associated with 3 waters services are categorised into four areas below. The processes for each area that may introduce risks are listed in the table below.

ACTIVITY CATEGORIES FOR RISK REGISTER				
Activity Area	**Asset Management Risks**	**Business Risks**	**Customer Services Risks**	**Operational Risks**
Processes	Forward Planning	Funding Provision	Public Request Management	Routine Operation & Maintenance
	Asset Renewals Programme	Governance	Managing Response Times	Planned Maintenance
	Information Systems & Management	Legislative Compliance	Managing Customer Expectations	Routine Inspections (Contractor/Council)
	Standards and Guidelines	Policy Development	Level of Service changes	Facilities Management
	Demand Change	Procurement	Customer Expectation change	Data capture, analysis and forward forecasts
	Data Storage	Employment	Customer not understanding service levels	Contract Administration (reporting, programmes, quality management, service delivery)
	Data Analysis	Financial Management & Reporting	Recording Data	Capital and Renewal Physical Works Projects (QA, Management, Timeliness)
	Resources	Political	Analysing Data	Budget Constraints
	Contract Administration	Staff (Council)	Customer Consultation	
	Performance Tracking (Contracts and Consents)		Customer expectations research	

Figure 4

3.9.1. Risk Register

Each separate 3 waters network is analysed as an individual system with a series of components.

A summary of the identified network risks is presented below.

Summary of Risk across the Networks

	COMPONENT/ SEGMENT	Waipukurau	Waipawa	Otane	Takapau	Porangahau	Te Paerahi
Tangible	Private Retic	Low	Low	Low	Low	Low	Low
	Connection/laterals	Low	Low	Low	Low	Low	Low
	Manholes	Medium	Medium	Medium	Medium	Medium	Medium
	Mains	Medium	Medium	Medium	Medium	Medium	Medium
	Sub Mains	Low	Low	Low	Low	Low	Low
	Rail crossings	Medium	Medium	Medium	Medium	N/A	N/A
	Open Drainage network	Medium	Medium	Medium	Medium	Medium	Medium
	Outfalls	Medium	Medium	Medium	Medium	Medium	Medium
	Location/Access	Low	Low	Low	Low	Medium	Medium
	Item						
Non - Tangible	Known Age/Condition of system	Medium	Medium	Medium	Medium	Medium	Medium
	Lack of Information	Low	Low	Low	Low	Low	Low
	Unknown Assets	Low	Low	Low	Low	Low	Low
	Capacity	Medium	Medium	Medium	Medium	Medium	Medium
	Personnel Skill - Council	High	High	High	High	High	High
	Personnel Skill - Contractor	Medium	Medium	Medium	Medium	Medium	Medium
	Legislation changes	Low	Low	Low	Low	Low	Low
	Lack of Forward Planning	Medium	Medium	Medium	Medium	Medium	Medium
	Discharge Consents	Low	Low	Low	Low	Low	Low
	Poor Maintenance	Low	Low	Low	Low	Low	Low
	Stall/Resouces	Low	Low	Low	Low	Low	Low

3.10. Risk Mitigation Responses

3.10.1. Water Safety Plan

Water Safety Plans (WSP) are designed to manage risk to the supply of drinking water from source end user. Council has compiling WSP for Waipukurau and Waipawa-Otane. Draft plants based on the recently completed treatment plants at Takapau and Porangahau. At this stage there is not water WSP for Kairakau supply, but once upgraded have been completed council work develop a WSP for this supply. Pourerere is deemed a non-potable supply so does not require a WSP.

The Drinking Water Assessor has requested further work is required on analysis of the protection zone for the Waipukurau and Waipawa supplies, this work is planned for the coming 3 years LTP term.

3.10.2. Water Quality

Risks posed to water quality range from low to extreme and can be divided in to two areas.

Source Catchment: Part of the WSP has conducted an initial assessment of the source catchment analysis for all water takes. This mean council will be notified by the HBRC if any activity requiring a resource consent we will be come and effected party and have the right to request condition on any consent issued by the HBRC. As most of our water takes are shallow bores adjacent to the rivers the is an increasing concern by the Drinking Water Assessor these catchments could be compromised. Therefore, Council will be undertaking a more detailed catchment assessment in the next LTP period.

Operational: This is a risk contamination from external source during work on the network either thru operating the plant, repairs to the networks or new construction project. In terms of our CFIM contract, the council has minimized the risk by employ a contract with qualified staff and robust management practises. For project all tenders to work on the water networks must provide suit documentation to show they are qualified to work on the network and have a suitable disinfection process before any new pipework becomes live.

3.10.3. Liquefaction

Hawke's Bay Civil Defence group has identified areas within CHB that are subject to liquefaction. The risk to the water network in these areas arises from flotation of chambers, damage to water plant and tanks as well as damage to the mains from extension, shortening and translation arising from ground movement.

The main water bore, treatment and pumping station for the Porangahau Water supply is located in a liquefaction zone. This has been taken into account when designing the new upgrade to the treatment plant, but the reticulation for Te Paerahi was constructed prior to the liquefaction zone being identified. Most of the network is uPVC or MDPE the risk of damage is moderate. Of more concern is the AC rising main to Porangahau network.

3.10.4. Water Treatment Plant

Council has been minimising the risk of the treatment by adding duty standby for key equipment such as UV units, pumps etc. as part of the plant upgrade. Coupled with the addition of standby generator set to protect the plants from the loss of power.

3.10.5. Trunk Mains

Main trunk lines are particularly susceptible to earthquake damage in Waipukurau where the key service corridors like Porangahau Road runs parallel a major fault line. This is especially noticeable on ridged pipe materials like asbestos cement. Experience has shown water leaks are noticeable approximately 2-3 weeks after a reasonable shake.

To minimise the impact of earthquakes, new mains are constructed from material that is more ductile.

Mutual aid would be required from other water supply authorities to reinstate trunk mains in the event of multiple major breaks or breaks on key mains such as the rising mains to the reservoirs.

3.10.6. Reservoirs

Our major concrete reservoirs are at risk to water loss from breaks in the falling mains without the protection automatic seismic shut off valves. These can be retrofitted to all large reservoirs. These shut the outflow from the reservoir when excess flow from the reservoir is detected (such as from a broken outlet trunk main) the outlet valve is automatically shut and an alarm sent to the Duty Officer via the SCADA system.

3.10.7. Backflow Prevention

The protection of the quality of the water supplied to customers is a vital responsibility of any water supply authority. While the quality of the water entering the system is known, chemical or microbiological contamination can occur in some circumstances from water re-entering the system from consumer's premises should fittings be wrongly connected, or a temporary vacuum develops in the line. The risk from activities such as undertakers, doctors and dentist surgeries lifestyle blocks dairy farms etc. are readily understood, however similar issues can also arise in commercial kitchens where food is prepared and cleaning chemicals are used.

The Ministry of Health has placed an increasing emphasis on the Water Safety Plan since the Havelock North incident. This included understanding the risks from backflow for serviced properties. Currently all new connection to standard users have double check valve backflow protection device. Any user with a high risk as defined in the Building Act is required to install a fully testable device. Council is planning a review of all types for backflow protection in the coming plan period.

3.10.8. Open drains

By providing stormwater pipes and open drains with sufficient capacity to convey stormwater resulting from rainfall events. By ensuring that overland flow paths are protected and maintained.

3.10.9. Insurance

Council has insurance cover for the Wastewater, Water & Stormwater services. The insurance is broken down into two areas of cover

- Infrastructure Damage: This damage due to natural events such as earthquake of flood.
- Material Damage: This provides cover for events like fire, localised floods, vehicle damage.

Council has joined a Local Authority Shared Services group to obtain insurance cover which use ANON to broker the most effect insurance cover.

3.11. Emergency Management

Civil Defence and Emergency Response Plans

CHBDC belong to the wider HB Emergency Management Group and under this group, the council manages events through a local controller.

Lifelines Responsibility

As part of the HB Emergency Management Group, CHBDC belongs to the lifeline subgroup involves all utility service providers for Hawke's Bay, as well as many other agencies. The group identifies some of the risks to maintaining services and addresses what needs to be done to reduce the risk. As well, as advise the emergency controller the state of the infrastructure during and event. Full details can be found within the HB Emergency Management group HQ.

Succession Planning

Succession planning within any business is considered necessary to reduce the risk associated with staff leaving the organisation. Succession planning allows institutional knowledge to be passed on and assists in ensuring continuity of organisational culture. More details on this process can be found in the "Risk Management Framework".

Key Assumptions and Uncertainties affecting Risk

Significant assumptions and uncertainties in the preparation of this Water Asset Management Plan are:

- There will be an ongoing requirement for the provision of this activity.
- Possible changes in the method of service delivery through the national 3 waters review will not affect the next 3 years of this plan.
- The demand for this activity will increase, and not reduce.
- The knowledge of the practitioners directly providing this activity, both on a day-to-day basis and historically, has been relied upon. These practitioners include Council's CID group, and Corporate Services Department staff, and staff of the CIM Contractor.
- The operational and maintenance requirements for this activity will remain similar for the next ten years.
- Funding will be available to provide the operational and maintenance requirements of this activity.
- Funding for renewal works will be limited by the amount of depreciation raised through rates each year, and any surplus depreciation funding raised will be retained to be used in the future for renewal works.
- Funding for capital improvements will be limited by political decisions as to the level of funding available.
- The dollar values shown in this Plan are June 2021 dollars, adjusted where appropriate by "BERL" estimated rates of inflation.
- Some capital and renewal costs are rough order of cost estimates that will need to be further researched and refined.
- Incomplete management and supervision of this Activity due to limited staff resources

3.12. Risk and Resilience Projects and Programmes

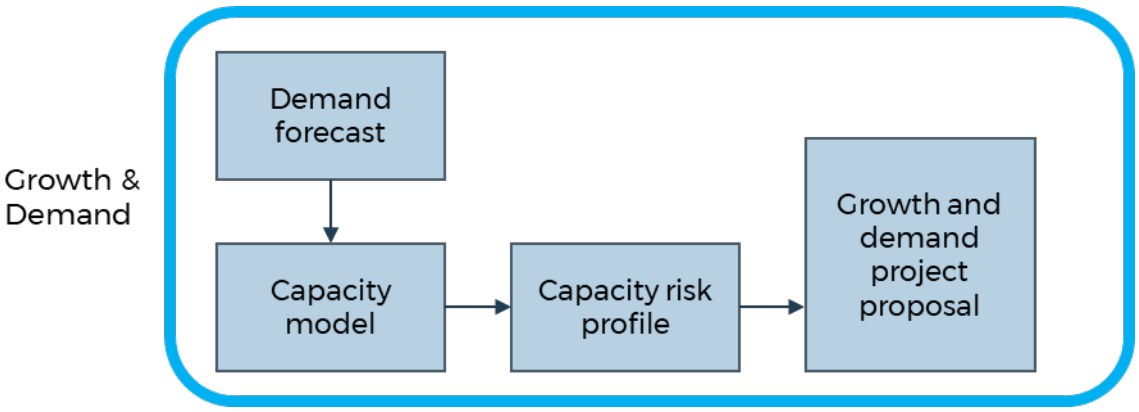
Programme	Project	Short Description	Primary Drivers	Other Benefits	Indicative Cost ($) over 10 years
Wastewater	Waipukurau Review main under buildings in town, relocation of 160 m main	Relocation of existing WW mains beneath Waipukurau town buildings.	Risk and resilience	Renewal	$700,000
Water Supply	Seismic shut off valve programme - all storage sites	Identify needs, test existing and install new seismic valves at storage sites for earthquake resilience	Risk and Resilience		$100,000
Water Supply	SCADA data security upgrade	Upgrade of SCADA data security to prevent misuse and losing operational functionality. This will include establishing VPN routing.	Risk and Resilience		$50,000

4. Growth and Demand

This Section provides a summary of growth and demand forecasts which affect the management and utilisation of three waters services and assets.

This section covers the processes shown in the figure below, which include:

- Forecasting demand, including identification of demand drivers
- Modelling the capacity of the system to meet forecasted demand
- Identifying issues
- Proposals for improvement projects



4.1. Demand Drivers

This section identified demand drivers below will influence the demand for services for the three waters network. It would impact the design capacity of future assets and the design of asset standards such as quality and environmental conditions.

4.1.1. Population/household growth

Population/household growth has a direct effect in increasing water and wastewater service demand. Household growth projections, included in this AMP predict an increase of 1750 households (30%) in the main towns of Otane, Waipawa and Waipukurau, over the next 30 years.

4.1.2. Change in customer expectations

Historical trends in customer expectations for water services have changed little over the years. But since the Havelock North water supply problems there has been significant changes driven by national bodies to improve the quality of water delivered to our customers. These changes have been implemented over the last three years and can be seen in the levels of service. The levels of service have shown a significant improvement to the percentage of potable water supplies that comply with the drinking water standards.

4.1.3. Changes in technology

Changes in technology over the next 30 years help to meet water, wastewater and stormwater supply, collection and treatment. For example:

- Increasing options available for treatment of water
- Improved methods of directional drilling
- Increased confidence in predictive modelling for asset failures, changes in demand and impacts on infrastructure and financial forecasting and the timing of these impacts
- Water efficient devices
- Water zone pressure management
- Improvements in water metering including remote metering
- Firefighting techniques
- Electronic leak survey and location equipment

4.1.4. Ageing infrastructure

Pipes at or near the end of their useful (theoretical) asset lives will continue to worsen and have increased leakage and bursts. This water loss adds to the overall water demand. Groundwater entering water and wastewater networks through various pipe defects, also leads to an overall increase in flow. The renewal or rehabilitation (i.e. pipe lining) of pipes with existing infiltration issues will reduce peak water and wastewater demand.

4.1.5. Demographics of communities

Squillions' report found New Zealand's workforce is becoming increasingly multicultural. International immigrants are often entrepreneurial and bring services to their

communities,such as ethnic restaurants and specialty retail offerings. This could result in higher localised water demand due to new connections in urban areas.

New Zealand has an ageing population. Squillions' report estimates by 2036, 1 in 4.5 New Zealanders will be aged 65 plus – a 77% increase from 2016. Water use is not expected to vary as a direct relationship with customer age, however any resulting change in people per dwelling as a by-product of the ageing population could impact water demand patterns.

4.1.6. Economic growth

Squillions' report found that more than 800 jobs were added in Central Hawke's Bay in the past three years to 2019. The largest creators of jobs were agriculture and service industries. An increased demand is placed on Council's water supply where industries decide to transition from private groundwater supplies to Council water supply. A major industrial growth area is east of the Waipukurau station. Council has included in the capital works programme, investigations into the upgrade of water and wastewater services this area.

4.1.7. Subdivision development/Land use changes

Up to 161 lots in the main towns of Waipukurau, Waipawa and Otānē, were identified in Squillion' report where resource consents have been submitted. This shows that there are enough sections in the subdivision pipeline to accommodate the next two years of household growth. However, due to the impact of COVID-19 there is much uncertainty and delays in building activity are expected in the short term.

4.1.8. Recreational/Tourism development

Recreational/tourism development can impact demand for water services when there are new, or changes to existing facilities which are connected to Council networks. It is expected that over the next 10 years, demand for higher quality facilities and improved levels of service will result in the needs to construct new or upgrade recreational facilities (COUNCILDC Long-term Plan 2018-2028).

4.1.9. Standards/Resource consent changes

Resource consent conditions have tightened resulting in conflicting increase in demand while restraining resource. As mentioned previously, the future of water intake could be restricted by resourcing consent condition such as reduction in water intake during low flows in the river. Furthermore, the future quality of drinking water will also be scrutinised. The future of wastewater and stormwater resource conditions are also constricting with possible reduction and improving the quality of effluent discharge into existing rivers.

More stringent resource consent conditions will require improved management of wet weather flows in particular the existing InI flows as well as wastewater treatment upgrades in order to limit the frequency and volume of overflow incidents.

4.1.10. Temperature rainfall and climate change

The expected climate change for Central Hawkes Bay are facing drier climate conditions and more frequent and intense rainstorms. Hence resulting in exacerbating the current inflow and infiltration related wastewater capacity issues and could result in increased overflows.

4.1.11. Furthermore, rising sea water levels have been predicted to increase the surface water levels resulting in increased overflows for stormwater and wastewater network. Firefighting requirements

The increasing future water demand is straining the firefighting requirements. If the firefighting requirements or legislation changes in the next 30 years, there would be a direct impact on the assets to meet these legislations. Waipukurau and Waipawa water network models have been and are being updated. The models show the affected areas that are lacking fire compliance. Hence, capital works for Waipukurau and Waipawa have been staged over several years to upgrade and improve the existing infrastructure for fire compliance.

4.1.12. Demand for Service

The likely changes in demand from the listed demand drivers are summarised below.

Demand Driver	Present Position	Projection
	Upward demand pressure	
Population/household growth	Medium	High
Changes in customer expectations	Medium	High
Ageing infrastructure	Medium	High
Economic growth	Low	Medium
Subdivision development/land use changes	Medium	Medium
Cultural/recreational/tourism development	Low	Low
Design standards	High	High
Debris build-up and other system inefficiencies	Medium	High
	Downward demand pressure	
Changes in technology	Low	High
Climate change	Medium	High

4.2. Demand Forecasts

4.2.1. Historic Demand

Information showing historic demand on water supplies from 2018-2020 is shown below.

Consumption Data 2018-2020						
		M3 Total	**Average M3/Day**	**L/Day/Household**	**L/Per Person/Day**	**Estimated Accuracy**
Waipawa + Otane	2018-2019	587,107.0	1,608.5	1,231.6	473.7	Within 10%
	2019-2020	738,080.0	2,022.1	1,548.3	595.5	Within 15%
Waipukurau	2018-2019	1,584,817.0	4,342.0	1,987.2	764.3	Within 5%
	2019-2020	1,701,595.0	4,661.9	2,133.6	820.6	Within 5%
Takapau	2018-2019	127,075.0	348.2	1,164.4	447.8	Within 5%
	2019-2020	136,671.0	374.4	1,252.3	481.7	Within 15%
Porangahau	2018-2019	62,326.0	170.8	481.0	185.0	Within 5%
	2019-2020	75,129.0	205.8	579.8	223.0	Within 15%
District Wide (Where SCADA is recording)	2018-2019	2,361,325.0	6,469.4	1,560.8	600.3	Within 10%
	2019-2020	2,651,475.0	7,264.3	1,752.5	674.1	Within 15%

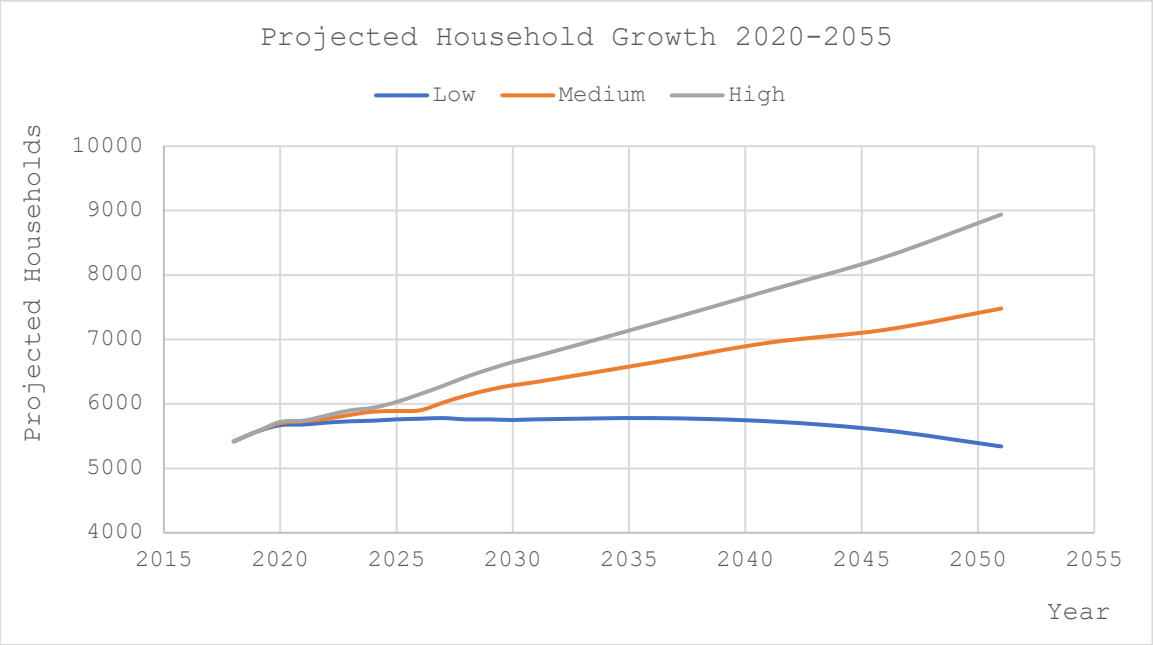
4.2.2. Future Demand

Household growth

Understanding the characteristics of our current households and how these are likely to change over the next 30 years is critical for the effective management of our infrastructure. Different demographic groups have different needs and preferences for services. Our people live in dispersed settlements across the district and each of these settlements is likely to change in different ways over the life of this strategy and this may influence how, when and where we provide infrastructure across our district in the future.

To estimate current trends and predict future growth Council has embarked on a spatial plan project with Veros Ltd., and Squillions Ltd., to determine what COUNCIL will look like in the next 30 years, with emphasis on the towns of Otane, Waipawa and Waipukurau. The project will plan what these towns will look like spatially and determine growth areas for future expansion of the built environment of these towns. This will set the direction for expansion of the 3 waters networks.

Based on the Squillions growth report, the Central Hawkes Bay District has a current population of around 15,110, with an estimated 5,700 households. Significant growth is expected in private dwellings over the next 30 years, as seen in the graph below.



The medium and high trends translate to a marked increase in private dwellings in the main towns of Otane, Waipawa and Waipukurau over the next 30 years, as well as other areas of Council, as shown in the table below.

Area	Census 2018	Senerio	2031	2051	Change 2018-31	Change 2018-51	Average hh size 2018	2031	2051
Otane		Low	280	270	34	24		2.8	2.6
	246	Medium	340	430	94	184	2.7	2.8	2.7
		High	400	630	154	384		2.8	2.8
Waipawa		Low	880	880	37	37		2.5	2.4
	843	Medium	920	1,020	77	177	2.5	2.6	2.5
		High	950	1,120	107	277		2.6	2.5
Waipukurau		Low	1,860	1,740	105	(15)		2.6	2.4
	1,755	Medium	2,060	2,420	305	665	2.5	2.6	2.5
		High	2,200	2,940	445	1,185		2.6	2.5
Central Hawke's Bay		Low	5,760	5,340	342	(78)		2.7	2.5
	5,418	Medium	6,340	7,480	922	2,062	2.6	2.7	2.6
		High	6,740	8,940	1,322	3,522		2.7	2.6

Impact of uncertainty

The Council is facing the most uncertain times in its history, with the prospects of significant population growth and the amalgamation of water service be a regional operated water unit. Ageing infrastructure costs, increased environmental demands on water extraction and the possible economic impact of the COVID-19 pandemic, add to the difficulty of long-term planning. At this stage, the Council is working under the medium growth projection in the Squillions report (copy on file).

The information to date on what the future holds in the Squillions' report is based on Census Area units. These are a geographical region used by Statistic New Zealand to divide up the country in large zones. They are formed by an aggregation of meshblocks. Because of the size of these Census Unit, it makes detail infrastructure plan difficult e.g. the Elsthorpe CA unit cover the area from the coast to the out skirts of Waipawa and Waipukurau. To help in more detailed analysis of the growth data from the Squillions report and the spatial planning work by Veros staff have indicated funding an infrastructure planning project to determine best option for developing reticulation to meet the future demands.

4.2.3. Impact on Assets

The impact of increased demand on assets and service provision is considered below.

Water Shortage

Increased demand may put existing pipes and fittings under higher pressures more frequently which could lead to a higher number of bursts and leaks.

In peak periods where demand exceeds supply, customers may face water restrictions and firefighting capacity could be impacted.

Reservoir storage provides for emergencies and assists in meeting peak demand. The effectiveness of existing storage is reduced as water demand increases. Hence, Council have included the replacement or upgrade of reservoirs such as Hunter Park, Pukeora and Waipawa to improve the future demand on the levels of service.

An increase in water demand will impact existing groundwater sources. Due to the current increase in water demand Council has proactively investigated and constructed a second

water supply to Waipukurau. Furthermore, this may alleviate some of the risk and also provide more resilience from Pukeora to Waipukurau. Capital works programme has included both these projects that would provide beneficial growth capacity to the town.

Overflows

Increased peak demand will put increased pressure on assets that are already operating at or near capacity. Overflows will occur more frequently where pipe capacity is exceeded. To reduce overflow risk, new or replacement assets will be needed i.e. larger diameter pipes, additional pumps, upsized or more pump stations and additional treatment processes. The capital work programme has included projects such as shortfalls in the wastewater and stormwater network for Waipukurau and Waipawa. In particular, there has been a significant focus in improving the overflows of stormwater such as Pah Flats in Waipawa and Eastern Interceptor in Waipukurau. These projects would counter the current under capacity within the stormwater network and also upgrades for the future capacity.

I&I

The district inflow and infiltration (I&I) is a planned response to reduce the I&I impact on the network. This will involve investigation and capital remediation works. The investigation findings will also inform the case for installing stormwater reticulation in parts of the district for the first time where a material difference in I&I is expected. Targeted I&I reduction will offset the cost of having to design and maintain pumping and treatment infrastructure capacity for extremely high wet weather flows, as is currently the case for treatments plants upgrades in the planning and design phase.

New assets required.

New development will have a toll on the demand of all three waters. New infrastructure would be required to provide services to these developments. Existing infrastructure such as pipes, pump stations and treatment would require upgrade to sustain the new demand. For Council to oversee the master planning of the towns, Council has set aside budget in the capital works programme to address rising demands from developer led projects. This is used to upgrade existing assets to cater for development and to unify different development into the master plan and cater for future asset strategy planning.

Increased pumping and treatment costs

Total costs of pumping and treatment will increase to cater for the greater flows in the network. Power costs for pumping will go up in order to deliver the same levels of service due to higher hydraulic losses in the network.

Increased operational costs (reactive maintenance, pressure monitoring)

Increased reactive maintenance costs are likely as maintenance staff respond to more breaks and leaks. Mechanical and electrical equipment now operating with increased run hours will need more frequent maintenance and repair.

With higher peak demand Council faces a greater need to monitor pressure and flow conditions. This means more instruments installed within the network to measure the operational performance including the installation of bulk and customer water meters.

4.2.4. Demand versus capacity

To cater for the continual demand on assets, Council is investing in hydraulic models to proactively predict future demand versus capacity for all 3waters district wide. This is called

Structure Plan for Growth within the capital works programme. Provision has been made in the capital programme to construct the upgrades identified in the hydraulic modelling. The capital works programme also provides a placeholder for model updates in the future after year 7.

Currently identified improvements are required in Waipukurau and Waipawa where assets have insufficient capacity to cater for growth and demand. In Waipawa, Council has included water and wastewater upgrades on Great North Road in the future capital works programme. Furthermore, capital works have been planned for stormwater upgrades in the CBD.

Firefighting upgrades for Waipukurau and Waipawa are required for compliance mentioned in Section 3 – Levels of Services. These upgrades will also improve the capacity of the water supply network to meet growth and demand in the identified areas.

4.2.5. Demand Management: Sustainable Water Management Plan

Council is targeting to reduce the average consumption of water as part of the wider sustainable water management plan that is being developed. This will bring change to typical water demand and will have some influence on setting levels of service in future.

The sustainable water management plan is currently a work in progress but has identified the following key areas and activities:

Key Area	Key Activity
Engaging with our customers	Residential education and awareness campaigns
	Non-residential customer education and awareness campaigns
	School education programme
	Universal metering and volumetric charging
	Use of rainwater tanks to substitute water demand during peak demand
Improving our Assets	Identify 'champions' for Sustainable Water Management within Council and define their role of promoting SWM within the community and within the Region.
	Implement a bulk meter management system to ensure accuracy of measurement and reporting (Telemetry System)
	Develop a Non-Revenue Water Strategy to reduce leakage levels
	Targeted renewals / rehabilitation programme to reduce leakage and burst frequency

	Develop Standard Operating Procedures (SoPs) to capture fault data (breaks, complaints), flushing / repairs, etc..
Working with our stakeholders	Develop a policy to ensure sustainable water use within the Council Council owned facilities and operations adopt a sustainable water use i.e. flushing, repairs, treatment plants, and irrigation use within Parks
	Working in partnership with relevant organisations (Water NZ, Regional Council) either with joint campaigns and/ or on-line promotions Finding innovative ways to engage with our customers in water efficiency.
	Use of water efficient fixtures across all Council assets and key stakeholders such as Housing NZ

These following projects are already accounted for and included in the capital works programme:

- The requirement for the installation of water storage tanks on new properties
- The installation of bulk water meters to manage water flows across the larger networks
- The installation or replacement of customer meter to manage water flow in each network.

Growth and Demand Projects and Programmes

Projects driven all or in part by growth are included in the table below.

Activity	Name	Total Project Costs (30yrs)
Drinking Water	Developer led projects	$ 2,255,336
Drinking Water	Structure Planning for growths	$ 470,658
Drinking Water	Upgrades for growth (District wide)	$ 7,418,734
Drinking Water	Great North Rd - High St Main Replacement	$ 200,000
Drinking Water	Waipawa Reservoir Replacement	$ 2,813,772
Drinking Water	Waipukurau Second Supply	$ 7,388,240
Drinking Water	Hunter Park Reservoir Replacement	$ 1,663,677
Drinking Water	New water main Pukeora to town	$ 8,181,312
Drinking Water	Pukeora Reservoir Replacement	$ 4,774,050
Drinking Water	SH2 Replacement AC Main (Risk)	$ 1,568,175
Storm Water	Developer led projects	$ 4,510,672

Activity	Name	Total Project Costs (30yrs)
Storm Water	Structure Planning for growth	$ 188,264
Storm Water	Upgrades for growth (District wide)	$ 20,974,103
Storm Water	Waipawa Shortfalls in existing assets Loan Funded	$ 209,181
Storm Water	Waipawa Shortfalls in existing assets Rate Funded	$ 2,046,155
Storm Water	Bush Drain Restoration and Opportunities	$ 107,729
Storm Water	Pah Flat Drain Channel Upgrade and treatment	$ 309,090
Storm Water	Improve performance of open drain racecourse road	$ 92,700
Storm Water	Eastern Interceptor to fit in with sewer works	$ 624,180
Waste Water	Reticulation renewal including pipes and other retic	$ 21,403,079
Waste Water	Developer led projects	$ 2,255,336
Waste Water	Great North Rd link Abbotsford to Tamumu (approx. 300mtrs)	$ 350,000
Waste Water	Structure plan for growth	$ 271,936
Waste Water	Reticulation renewal - Racecourse Road	$ 1,231,000

Activity	Name	Total Project Costs (30yrs)
Waste Water	Reticulation renewal-Winlove to Svenson Hosp Site enablement	$ 1,572,430
Waste Water	Reticulation renewal - Mt Herbert	$ 1,465,103
Waste Water	Growth - WPK Old Saleyards / Industrial area	$ 1,509,056

5. Service Delivery

5.1. Historical Context

Pre-1970

Hawke's Bay was administrated by Provincial Government until 1876 when it was replaced by the county system based on the English model. The Counties Act emerged from Parliament providing for 63 counties of which Waipawa was one. The Waipawa County of 1876 covered over 200 square miles and extended from the Manawatu Gorge to Pukehou and from the Ruahine Mountains to the sea. Within the County area were a number of Roads Boards responsible to the County.

During 1885 Patangata broke away from the County and in 1908 the County of Waipawa was divided into the Counties of Waipawa, Waipukurau, Patangata, Woodville and Dannevirke. Meanwhile in 1907 a proposal had been put through to Parliament empowering the Town Board to extend its boundaries so that a Borough Council could be formed. The Borough Bill was passed in early 1908 and in May that year the new Waipawa Borough Council was sworn in. in 1912 The Waipukurau Town Board was replaced also by a Borough Council.

1970 – 1989

In 1974 The Patangata County Council amalgamated with the Waipukurau County Council and in 1977 the Waipukurau County Council and the Waipukurau Borough Council amalgamated as the Waipukurau District Council. The Waipawa Councils followed suit in 1978. In 1987 the Government empowered the Local Government Commission to force amalgamation of Local Government units throughout the country. In 1989 the Waipukurau District Council and the Waipawa District Council merged to form the Central Hawke's Bay District Council.

1990-2000

Two of the existing reservoirs in Waipawa were resealed between 1993-1996. The Hunter park reservoir in Waipukurau was also re-roofed and sealed during this time.

In 1994 new 100mm reticulation mains, and fire hydrants were installed throughout the Otane township. A new 150mm diameter supply line from the Waipawa reservoir to the existing 100mm reticulation was added in 1998. A booster pump station was also installed.

2001-2010

In 2006 in Otane, several of the old concrete reservoirs were replaced with timber reservoirs, and a section of the supply main from the Waipawa supply was replaced.

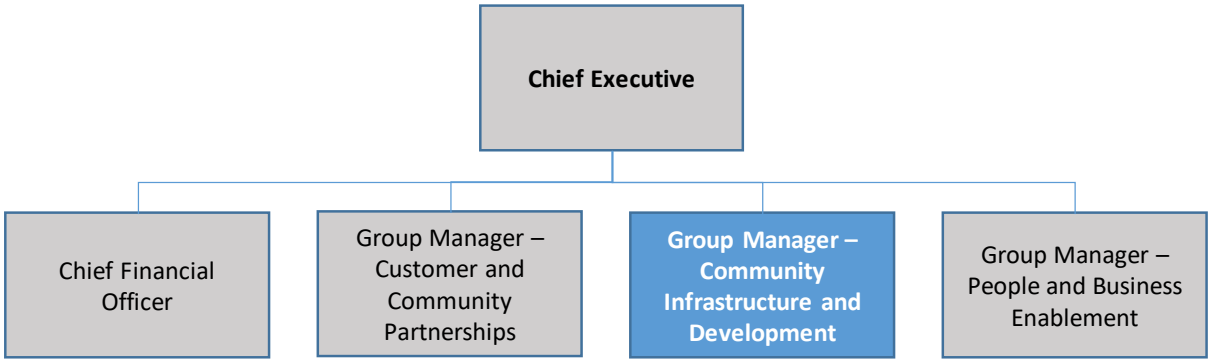
2011- 2020

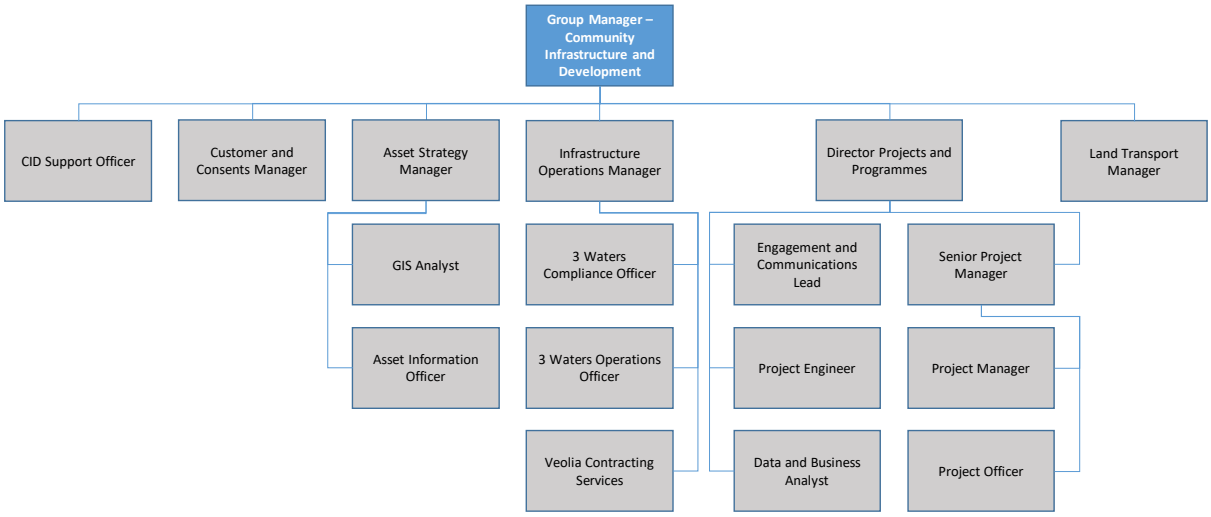
The Tikokino Road bore site in Waipawa had upgrades in 2011, including the addition of a second bore and above-ground pump.

In 2011 a significant number of the mains in the Otane area had been replaced and increased in size to improve performance and allow for future development.

5.2. Internal Business Structure

A snapshot of Councils internal organisation structure is provided below showing relevant detail to those parts of the business involved with the management of 3 waters assets.





5.3. External Contracts and Partners

Contract	**Term / Type**	**Contract Management Approach**
3Waters network management, maintenance and operations contract, Partnership between Recreational Services and Veolia, Contract No. 551	External contractor Partnership contract 5 years plus extensions	Partnership approach – shared location and fully integrated staff

Water supply network leakage reduction, Partnership between Recreational Services and Veolia, Contract No. 551	External contractor Partnership contract 5 years plus extensions	Partnership approach – shared location and fully integrated staff
Drinking water laboratory testing, Water Testing Hawke's Bay ltd	External contractor Utilised as required	Transactional relationship
Water meter reading, Partnership between Recreational Services and Veolia, Contract No. 551	External contractor Partnership contract 5 years plus extensions	Partnership approach – shared location and fully integrated staff
CCTV Inspection Services	External contractor Utilised as required	Transactional relationship
Overflow monitoring and manhole sewer level monitoring, Partnership between Recreational Services and Veolia, Contract No. 551	External contractor Partnership contract 5 years plus extensions	Partnership approach – shared location and fully integrated staff

5.4. Other Service Delivery Partners

Service Delivery Partner	**Role**
Council (internal) - Councillors	To set the strategic direction for the management of water within the district and provide appropriate funding to support and implement this activity to protects the wellbeing of the District.
Council (internal) - Chief executive and Senior Management	To support the Asset management process and provide direction, guidance, appropriate resources and resolving conflict between conflicting priorities.
Council (internal) - Asset Management staff	Provide data on new asset installed within the networks under this plan, support and ideas on the development of capital works, and renewals programs etc.
Council (internal) - Financial Support staff	Providing financial information that supports funding for this asset

Council (internal) - Information Technology staff	Giving technical support in the field of IT to allow the functioning of asset management programs and control systems (SCADA).
Council (internal) - Council FM Contractor	To manage the asset in a prudent manager within the boundaries set by Council and advise back to council condition ratings and other asset data so well found and logical decisions can be make be council with all relevant information
Council (internal) - Regulatory staff	To support 3 waters operational team with RMA advise and help with management of resource consents etc.
Veolia	Contractor providing routine management, maintenance and operations for the water activity through Community Facilities and Infrastructure Maintenance (CFIM) contract
Consultants	Professional service consultants providing ongoing design and construction management for water supply capital works
Land developers	Build water supply infrastructure to service newly developed land. Infrastructure is handed over to Council.
Hawke's Bay Regional Council	Working with the HBRC to manage our consents to extract water from the environment.
Tangata Whenua including whanau, iwi and hapu	Participate in decision-making processes. Sharing tāngata whenua knowledge to enhance the Council's outcomes for the district.
Ministry of Health/Government Regulator	Assess water safety plans and sign off compliance to New Zealand Drinking Water Standards
New Zealand Fire Service	Urban and Rural fire fighting

5.5. Significant changes planned for the activity

Over the last three years central and local government have been considering solutions to challenges facing delivery of three waters services to communities. These discussions are still ongoing and together central and local government are developing the Three Waters Reform Programme to transform the delivery of three water services.

This has seen the development of new legislation and the creation of Taumata Arowai, the new Water Services Regulator, to oversee and enforce a new drinking water regulatory framework, with an additional oversight role for wastewater and stormwater networks.

Options to reform current water service delivery into larger scale providers, to realise significant economic, public health, environmental, and other benefits over the medium- to long-term are being considered. The Hawke's Bay Councils have taken a lead role. Central Hawke's Bay District Council, Hastings District Council, Hawke's Bay Regional Council, Napier City Council and Wairoa District Council, have been working together to review the current and potential three waters service delivery options for Hawke's Bay, Te Matau-a-Māui.

The five councils have shared strategic priorities for 2019 to 2022 – water safety, security and planning. With all councils sharing the same responsibility for ensuring communities can enjoy safe, reliable, resilient, efficient and affordable three waters services.

The five councils commissioned an independent review of current water services and potential future service delivery options. The recommended preferred option is a regional asset owning CCO (council-controlled organisation), that best meets the Review's investment objectives and principles.

The timing of the Hawke's Bay three waters review report coincides with the four Hawke's Bay district councils opting in to the first phase of discussions with Government on their proposed three waters service delivery reforms.

Because the councils have worked together to commission an independent in-depth assessment of the issues and options for the future of three waters service delivery across the region, Hawke's Bay is in a very strong position to represent the interests of the community in our engagement with Central Government through the reform process to solve the challenges that come from regionalisation of three waters services.

6. 3 Waters Asset Lifecycle Management Plan

This section details how Council manages the 3waters network assets over their lifecycle. Common asset lifecycle information across all 3waters is presented in this section, with more specific detail for the individual water supply, wastewater, and stormwater portfolios provided in the following sections.

6.1. 3 Waters Asset Lifecycle Approach

The asset lifecycle stages, taken from the International Infrastructure Management Manual, are shown in the figure below.

Figure 5

Detail of Council's processes relating to each stage on the perimeter are discussed in the asset lifecycle sections of this AMP.

6.2. Requirement's definition

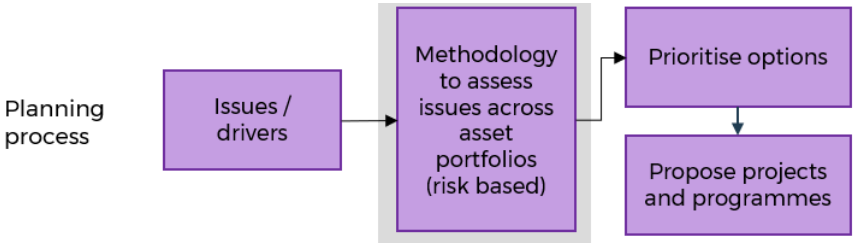
This is a combination of Council's objectives, Council's Asset Management Policy, the defined Levels of Service, and the financial strategy provided in earlier sections of this AMP.

6.3. Asset Planning

This is a combination of the processes used to determine asset needs and the options to meet those needs. Council approaches this task according to the three streams below depending on which category is the main driver for the planning of new or altered assets:

1. Growth and demand
2. Renewal
3. Level of service

In each case the planning process follows the sequence of steps:



1. Identify issues and drivers
2. Apply methodology to assess issues (risk based)
3. Prioritise options

4. Propose projects and programmes

Historically these processes have been generally followed in Council's asset lifecycle planning to some degree, however this process is now formalised for the first time as part of this 2021 3Waters AMP.

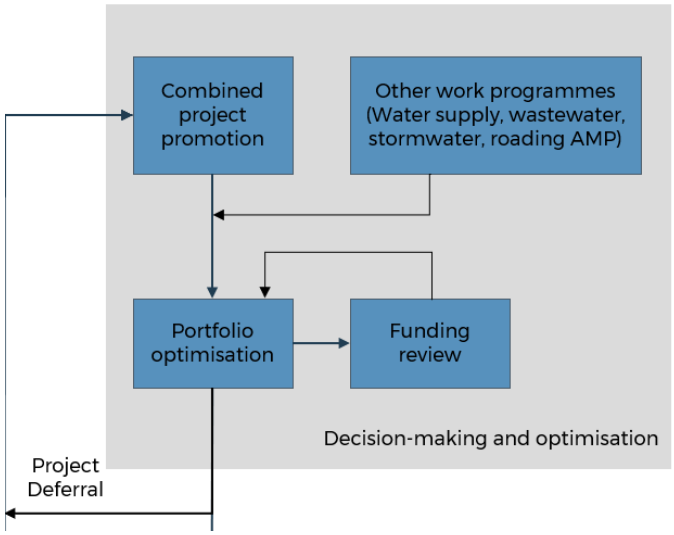
Further detail of asset planning for **growth and demand** is provided in the Growth and Demand Section 5.

Further detail of asset planning for **renewal** is provided in this section and the following portfolio lifecycle management - renewal sections.

Further detail of asset planning for **level of service** is provided in the Level of Service Section 3 and the Risk and Resilience Section 4.

Decision-making and optimisation follows the planning process to choose the best combination of projects and programmes to support Council's objectives given the available funding.

This part of the process is shown in the figure below.



For the 2021 3Waters AMP the following optimisation process is used:

- Spatially represent the proposed growth and demand, renewal, and level of service projects showing level of risk
- Overlay roading reseal areas
- Determine via workshop with asset planners, asset managers and operational managers the priority areas that will realise greatest benefit
- Define projects and year 1 – 3 programmes based on the priority areas
- Set appropriate budgets to deliver the following priority areas in year 4 and beyond

6.4. Asset Creation

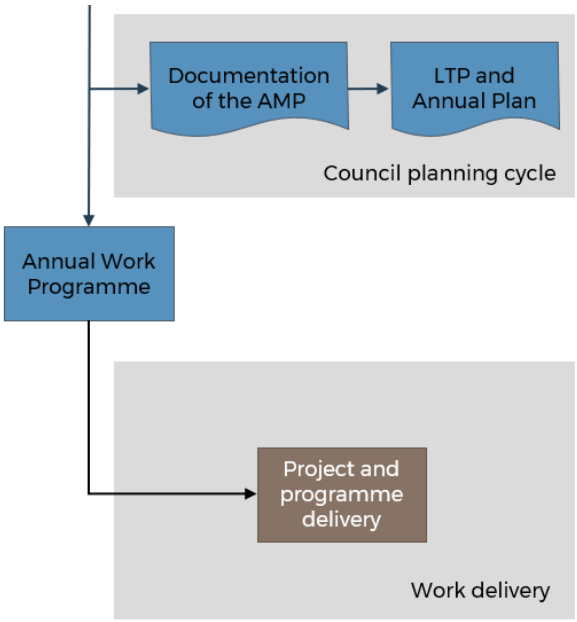
Assets are created under one of the three categories below:

- Capital programme
- Operations and Maintenance

- Acquisition (private development)

6.4.1. Capital programme

The capital programme is formalised through the LTP process and the subsequent Annual Plan process. Asset planning is completed ahead of these processes to promote projects for adoption into the capital programme. Project prioritisation, promotion and selection criteria is applied as part of the Asset Planning stage. The process for formalising the capital programme is shown in the figure below.



The capital programme requires design and construction activities.

Design

During the design phase the following mechanisms are used:

Updating costs estimates

Project costs are prepared during the initial project brief, then updated during preliminary design and detailed design. This allows the budget expectations to be adjusted throughout design to ensure the maximum value from the project can be delivered.

Risk assessment and workshops

Risk registers are kept for each project. These are monitored and updated throughout the project lifecycle. Risk workshops are held with designers and relevant stakeholder.

Safety in design

In some cases, safety in design workshops also occur during the design phase to identify any design changes that can be made to maximise safe constructability and the long term safe operation, maintenance and monitoring of the asset.

Options reports

If value-add opportunities are identified, the design phase can pause while options reports are prepared to consider the benefits of potential changes in project scope.

Design standards and guidelines

Council uses Hastings District Council engineering standards as a base while work is underway to develop a CHBDC specific engineering code of practice and standards.

Where design requirements introduce additional steps, such as sustainability workshops and climate change impact assessments, these introduce new costs to the design phase of capital projects that need to be taken into account when forecasting activity costs.

Construction

During the construction phase the following mechanisms are used:

Risk assessment

The existing risk registers for each project are updated to account for construction specific risks.

Construction standards

Construction standards and specifications are used to ensure compliance with the design requirements and overall quality assurance.

As-builts

As-built records are required in a format that can be entered into Council's electronic asset management systems to support future lifecycle decision making.

6.4.2. Operations and Maintenance

Assets can be created through the operations and maintenance activity. This includes reactive asset replacement or minor upgrades.

6.4.3. Acquisition (private development)

Assets built as part of private developments are vested with Council if they meet the requirements.

Once assets are accepted by Council, the asset information is entered into the asset management systems.

6.1. Operations and Maintenance

The operations and maintenance arrangements for the 3waters networks is described earlier in earlier sections of this AMP.

6.1.1. 3 Waters O&M Strategies

Further work has been identified to formalise a maintenance strategy, including the basic maintenance requirements, categorisation of maintenance costs and the desired split between proactive and reactive works.

Currently the 3 Waters strategy is based on executing the conditions of the maintenance contract within the allocated budget.

6.2. Asset Monitoring

Asset monitoring is conducting using information in Council's asset management system, information from the operations and maintenance activities and from Council staff knowledge.

6.2.1. Asset Overview

An overview of the 3 waters asset portfolio is provided in the following tables for water supply, wastewater respectively:

Waipukurau	Quantity	Capacity/ Performance	Condition
Service Connections	2249 no.	Good	Newer connections - Excellent. Copper line being replaced as required.
Piped reticulation	80 km	Moderate. Shortfalls when considering 30-year growth. Some performance issues when considering COP for Firefighting.	Range from excellent to poor. Issues surfaced with AC, GI and Copper materials replacement program is planned in this LTP period.
Pump Stations	1 no.	Poor	Poor. Full upgrade of site required.
Reservoirs	3,600 m3	Moderate	Condition being assessed - initial reports indicate they are nearing end of life.
Treatment Plants	1	Excellent	Excellent
Waipawa	**Quantity**	**Capacity/ Performance**	**Condition**
Service Connections	966	Good	Ranging from 1 to 3
Piped reticulation	51,694	Good	Ranges from Excellent to poor. Recent work has indicated that the AC pipes are in a poorer condition so will be replace in this LTP period.
Pump Stations	2	Good, excellent	Range from good - Excellent
Reservoirs	1,148	Good	Assessed to be in good condition, but nearing end of expected life. To be replaced in this LTP period.
Treatment Plants	2 (combined with pump stations)	Range from good - Excellent	Range from good - Excellent
Otane	**Quantity**	**Capacity/ Performance**	**Condition**
Service Connections	326	Good	Ranging from excellent for new connection to average for older parts of the network
Piped reticulation	23,788	Good	ranges from excellent for the new connection to poor for the older parts of the network.
Pump Stations	1 (decommissioned)	-	-
Reservoirs	300	Very Good	Excellent

Treatment Plants	0	-	-
Takapau	**Quantity**	**Capacity/ Performance**	**Condition**
Service Connections	278	Good	Good. Estimated remaining economic life of 30-40 years
Piped reticulation	16,349	Good	Good or better
Pump Stations	1	Excellent	Good
Reservoirs	470	Good	Ranges from fair - excellent
Treatment Plants	1 (combined with pump station)	Excellent	Good

WATER SUPPLY

Porangahau	**Quantity**	**Capacity/ Performance**	**Condition**
Service Connections	110	Very good	excellent
Piped reticulation	9,778	Very good	New pipelines, excellent. Older pipelines, fair.
Pump Stations	0	-	-
Reservoirs	120	Good	Ranges from good to poor. Remaining life of 30-47 years
Treatment Plants	0	-	-
Te Paerahi	**Quantity**	**Capacity/ Performance**	**Condition**
Service Connections	133	Very good	excellent
Piped reticulation	6,405	very good	New pipelines, excellent. Older pipelines, fair.
Pump Stations	1	Good	Good
Reservoirs	360	Good	Excellent
Treatment Plants	1 (combined with pump station)	Good	Good
Kairakau	**Quantity**	**Capacity/ Performance**	**Condition**
Service Connections	84	Good	Good
Piped reticulation	3,206	Good	Generally good, with some of the galvanised iron being fair to poor
Pump Stations	Not specified	Average	Average
Reservoirs	192	Very good, except for 1 at the treatment site and one on the hill which have decommissioned	Good to excellent

Treatment Plants	0	-	-
Pourerere	**Quantity**	**Capacity/ Performance**	**Condition**
Service Connections	5	Good	Poor
Piped reticulation	4,440	Good	Good
Pump Stations	0	-	-
Reservoirs	96	Good	Fair to good
Treatment Plants	0	-	-

WASTEWATER

Waipukurau	Quantity	Capacity/ Performance	Condition
Connections	1920	Good. Can become overloaded in some areas	Range from excellent to poor, average condition of good
Piped reticulation	41km	Good. Can become overloaded in some areas.	Range from excellent to poor, average condition of good.
Pump Stations	5	Good	Good
Treatment/Disposal Areas	1	Varies from very good to poor with the changes in weather conditions and rain events	Excellent
Waipawa	**Quantity**	**Capacity/ Performance**	**Condition**
Connections	845	Good. Infiltration problems causing system surcharges in wet weather.	Range from excellent to poor, average condition of good.
Piped reticulation	23.2km	Good. Infiltration problems causing system surcharges in wet weather.	Range from excellent to poor, average condition of good.
Pump Stations	2	Pourerere Rd, Moderate, McGreevy St, very good	Pourerere Rd, fair, McGreevy St, excellent
Treatment/Disposal Areas	1	Varies from very good to poor.	Varies from excellent to very poor, with the majority of the components being rated as good.
Otane	**Quantity**	**Capacity/ Performance**	**Condition**
Connections	248	Good	Average
Piped reticulation	7.2km	Good	Average
Pump Stations	0	-	-
Treatment/Disposal Areas	1	Varies from very good to moderate.	Good
Takapau	**Quantity**	**Capacity/ Performance**	**Condition**
Connections	193	Good	Excellent
Piped reticulation	6.3km	Good	Excellent
Pump Stations	1	Moderate to good	Good
Treatment/Disposal Areas	1	Moderate to very good	Good
Porangahau	**Quantity**	**Capacity/ Performance**	**Condition**
Connections	105	Good	Excellent

Piped reticulation	3.7km	Good	Excellent
Pump Stations	1	Good	Good
Treatment/Disposal Areas	1	Moderate to very good	Good
Te Paerahi	**Quantity**	**Capacity/ Performance**	**Condition**
Connections	124	Good	Excellent
Piped reticulation	3.9km	Good	Excellent
Pump Stations	2	Good	Good
Treatment/Disposal Areas	1	Moderate to very good	Good

STORMWATER

Waipukurau	Quantity	Capacity/ Performance	Condition
Inlet/Outlet Structures	129	Majority average or better. Some areas that suffer poor performance if regular maintenance is not undertaken	Good or better
Gravity Mains	26km	Majority average or better. Some areas that suffer poor performance if regular maintenance is not undertaken	Good or better
Manholes	406	Majority average or better	Good or better
Open Drains	10.4km	Average or better	Good
Waipawa	**Quantity**	**Capacity/ Performance**	**Condition**
Inlet/Outlet Structures	120	Newer parts of network, good to excellent. Some minor parts poor to very poor	Newer parts of network, good to excellent. Some minor parts poor to very poor
Gravity Mains	10.7km	Newer parts of network, good to excellent. Some minor parts poor to very poor	Newer parts of network, good to excellent. Some minor parts poor to very poor
Manholes	142	Newer parts of network, good to excellent. Some minor parts poor to very poor	Newer parts of network, good to excellent. Some minor parts poor to very poor
Open Drains	4.4km	Good or better	Good
Otane	**Quantity**	**Capacity/ Performance**	**Condition**
Inlet/Outlet Structures	3	Good	Good
Gravity Mains	0.185km	Moderate	Good or better
Manholes	0	-	-
Open Drains	0.136km	Moderate	Moderate
Takapau	**Quantity**	**Capacity/ Performance**	**Condition**
Inlet/Outlet Structures	2	Very good	Very good
Gravity Mains	0.06km	Very good	Very good
Manholes	1	Good	Good
Open Drains	0.8km	Good	Good
Porangahau	**Quantity**	**Capacity/ Performance**	**Condition**
Inlet/Outlet Structures	8	Very good	Excellent
Gravity Mains	2.2km	Very good	Excellent
Manholes	69	Very good	Excellent
Open Drains	0.39km	Very good	Good

Te Paerahi	Quantity	Capacity/ Performance	Condition
Inlet/Outlet Structures	1	Good	Good
Gravity Mains	0.33km	Good	Good
Manholes	1	Good	Good
Open Drains	0	-	-
Kairakau	**Quantity**	**Capacity/ Performance**	**Condition**
Inlet/Outlet Structures	4	Good	Good
Gravity Mains	0.38km	Average	Fair
Manholes	5	Good	Good
Open Drains	0	-	-
Blackhead	**Quantity**	**Capacity/ Performance**	**Condition**
Inlet/Outlet Structures	1	Excellent	Excellent
Gravity Mains	140	Excellent	Excellent
Manholes	0	-	-
Open Drains	0	-	-

6.3. Data Accuracy

As part of the asset valuation process data confidence and accuracy levels have been established.

Grading of the data is based on the following grading system as provided by the IIAMM. The table below has been tailored from the IIAMM system for use with the AssetFinda program.

Grade	Label	Definition	Accuracy	Description
1	Excellent Accurate	Site inspected or GPS located or detailed as built has been provided.	± 5%	Spatial location of the asset has been collected along with detailed information on the asset such as material, pipe size, depth of manhole, construction, age, condition, quantity, type of item, plant item duty (including manufacture details or schematic), etc. and where possible photos of the asset are provided. If practical the asset has been physical inspected/installed within 2 years.
2	Good Minor inaccuracies	Discussed with supervisor/based on some supporting documentation	± 15%	Spatial location is known from visual inspection or asset records etc. but some information is missing such as depth and size, type, etc. known but aged and condition. In terms of pumps the exact duty may not be known.
3	Average Significant data estimated	Based on local knowledge and reference to adjacent assets.	± 30%	Data based on verbal reports and/or cursory inspection and analysis or information is derived from plant records or reports. Location, depth and size, type, aged and condition etc. assumed from historical records of hearsay information, exact location has yet to be GPS located. e.g. asset may have been sealed over or covered.
4	Poor All data estimated	Data based on best guess of experienced person	± 40%	Data based on unconfirmed verbal reports and/or cursory inspection and analysis. Exact details of location, depth and size aged and condition etc. unknown but Council records show there is an asset in the approximately area. E.g. buried service connections

Grade	Label	Definition	Accuracy	Description
5	Very Poor Educated guess.	Council knows there are asset here but location etc. completely unknown	± 70%	Data based on unconfirmed verbal reports and/or cursory inspection and analysis. No details (location, depth and size aged and condition etc.) have been found but general system knowledge indicates there is an asset in this location. i.e. the property must be connected to the services. Flagged for site inspection and investigation.
Default setting				3

6.4. Renewals

6.4.1. 3 Waters Renewal Strategies

A new renewal framework is being used for the first time for this 2021 AMP to providing greater decision-making transparency.

The renewal strategy is based on mitigating risk. Risk scores for assets are determined by assigning likelihood of failure and consequence of failures scores to individual assets.

6.4.2. Likelihood of failure

Reticulation assets

Council currently uses asset age as the proxy for determining the likelihood of failure of reticulation assets. This is determined by estimating the remaining expected useful life of assets.

Expected useful life

This is the theoretical expected useful life (EUL) of an asset at the time of installation. For example, a DN 100 cast iron water supply pipeline EUL is 60 years. EULs are based on the tables referenced in the 2017 valuation report.

Condition age score

The condition age score (CA) is expressed as a percentage and is calculated as follows:

$$CA=(Age/EUL)$$

For example, if a pipe was installed 50 years ago and has an expected useful life of 60 years, then the value of its Age / Expected Useful Life ≈ 83%.

The word “useful” in expected useful life refers to a point when the benefits of keeping the pipe in service no longer outweigh the costs of renewal including the cost of ongoing repair and maintenance versus the cost of renewal.

This also includes the intangible costs, risks and benefits such as service disruption or reputation risk. It is difficult to accurately account for all the costs and benefits so the EUL should be considered in a general sense.

Additionally, this is a theoretical expected useful life and it is normal for some pipes to reach the end of their "usefulness" before or after this point in time.

The table below shows how 1 - 5 likelihood of failure scores are assigned using pipe age.

Likelihood of failure score	Simple description	When could failure happen?	Age / Expected useful life
5	Very likely	Failure could happen at any time	Age > 100% of EUL
4	Likely	Failure could happen often	90% > Age > 100% of EUL
3	Possible	Failure could happen sometime	70% < Age < 90% EUL
2	Unlikely	Failure could happen but very rarely	40% < Age < 70% EUL
1	Very unlikely	Failure could happen but probably never will	Age > 40% EUL

Pumping, storage and treatment assets

Council currently uses the 2018 Veolia condition assessment report as the basis for determining condition of pumping, storage and treatment assets.

6.4.3. Consequence of failure

Reticulation assets

Council currently uses the criticality framework presented in the figure below to assign 1 – 5 consequence of failure scores to reticulation assets.

Reticulation Element Assets	Sub Element	Criticality Level				
		Very Low 1	Low 2	Medium 3	High 4	Very High 5
No. Connections		1 to 2	3 tot 10	11 to 50	51 to 200	plus 200
Service importance		Domestic Dwellings	Halls	Businesses	Schools, Rest Homes, Hairdressers	Medical, High volume users
Location/Access						
	In Rail Corridor					Yes
	State Highway					Yes
	Back of Properties			Yes		
	Under Buildings				Yes	
	Lifeline Routes					Yes
	Near waterways					Yes
	Medium Level Rds		Yes			
	Low Level Rds	Yes				
Service Type						
	Main Supply Lines/plant etc.					Yes
	Major PS etc.				Yes	
	Minor PS etc.			Yes		

Pumping, storage and treatment assets

Council currently uses the 2018 Veolia condition assessment report as the basis for determining consequence of failure for pumping, storage and treatment assets.

6.4.4. Failure risk

Council has a corporate risk management framework; *CHBDC Risk Management Framework 2018*.

The risk scores used to prioritise renewal decision-making broadly align with Council's overall Risk Management Framework.

The risk score for individual 3waters assets is calculated by multiplying the likelihood of failure score and the consequence of failure score.

Risk score=LoF score x CoF score

Multiplying the 1-5 scores produces a risk score on a 1-25 scale.

These risk scores are categorised as:

5: Very high risk = 20-25

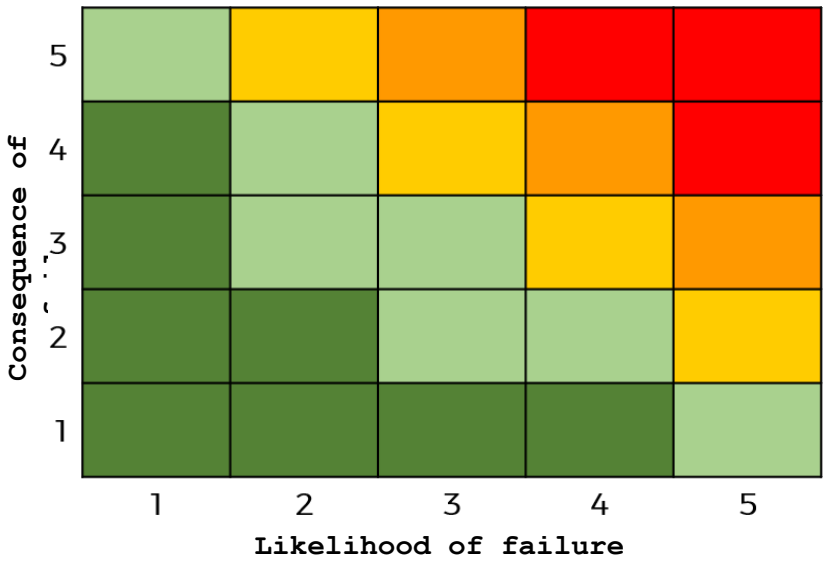
4: High risk = 15-19

3: Medium risk = 10-14

2: Low risk = 5-9

1: Very low risk = 1-4

The scoring is show visibly in the 5 x 5 matrix below.



6.4.5. Renewal budgets

Renewal budgets are determined to ensure sufficient funding for both proactive and reactive renewals. Proactive renewal is used when the identified failure risk is high to mitigate the impacts of large scale or repeated failure. Reactive renewal is used when the consequence of failure is low. Assets are reactively renewed when the benefits of keeping assets in service no longer outweighs the costs of renewal including the cost of ongoing repair and maintenance versus the cost of renewal.

The long-term reticulation renewal budget forecasts are provided in following sections. These are based on pipes being replaced at the end of their theoretical useful lives. The budget forecast includes an adjustment for risk; renewal is brought forward for pipes with a high consequence of failure and pushed back for low consequence of failure according to the table below.

Consequence of failure	Life adjustment
5	20% early
4	10% early
3	No adjustment
2	10% beyond
1	20% beyond

The budget is set so that an appropriate number of individual renewal projects are carried out each year to address long term condition and performance risks. Individual renewal projects are identified by confirming the risk scores and priorities with the operational manager and

looking for cross benefit where renewal will also support growth and demand and level of service outcomes.

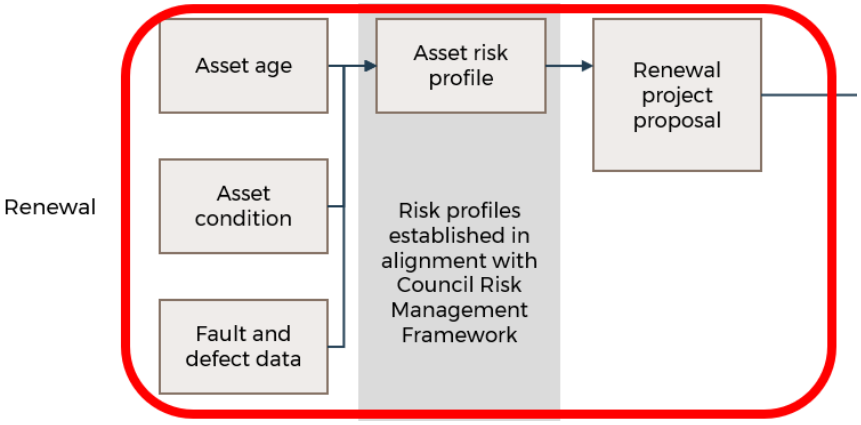
7. Water Supply Lifecycle Management - Renewal

This section details the renewal specific lifecycle management considerations for water supply, covered under the two asset class categories of:

- Reticulation
  - Pipes: Mains, submains, service connections
  - Other reticulation: valves, hydrants

- Pumping, storage and treatment
  - Pumping stations and wells
  - Reservoirs and suction tanks
  - Water treatment sites and intake sources

This relates to the process below:



The overall objective of the water supply lifecycle management – renewal plan is.

To manage the water activity to ensure that current.

Strategies provide the required level of service in an efficient and cost-effective manner that does not consume the water assets.

7.1. Reticulation Lifecycle Management – Renewal Plan

7.1.1. Reticulation Issues and Priorities

Key Issue	Priority for this Plan
Large proportion of pipes at the end of their estimated useful life (particularly AC pipes)	*Addressing the renewal of pipes at the end of their useful lives, focussing on high failure risk*
Ensuring water supply works are coordinated with other works (stormwater, wastewater and roading)	*Overlay areas of priority water renewal with areas showing other works to identify where combined projects will deliver better outcomes*
Reducing water consumption	*Implementing pressure management and increased focus on leak detection. Installing water meters to track water use*
Reducing reactive maintenance	*Prioritising pipe renewal based on risk and begin collecting maintenance data in a form that supports renewal decisions*
Increase maturity and transparency of investment decision-making	*Use the risk based outputs of the renewal criteria and integrate with growth and improvement criteria*
Additional Water meters	*Replacing standard meters with smart meters when submains are renewed*

Water supply reticulation includes water mains, submains, hydrants, valves, fittings and connections. Asset management effort focusses on mains and submains as these make up the majority of the value of the reticulation network. Valves, hydrants, fittings and other auxiliary assets connected to the mains and submains generally last as long as the main or submain and are renewed as part of a main or submain renewal.

A new renewal framework is being used for the first time for this 2021 AMP to providing greater decision-making transparency. The following criteria is assessed for each pipe in the database:

- Likelihood of Failure
- Consequences of Failure
- Failure Risk
- Replacement cost

The output of the renewal framework is used for two separate purposes.

1. To set an appropriate long-term reticulation renewal budget
2. To provide a prioritised list of renewal candidates on a pipe by pipe basis

7.1.2. Reticulation Overview

Water supply schemes

There are eight public water supply systems in the district; Otane, Waipawa, Waipukurau, Takapau, Porangahau, Te Paerahi, Pourerere and Kairakau. Water is also supplied to the Pourerere Camping Ground, Pourerere toilet block and two private dwellings. Otane and Waipawa are sometimes referred as one supply as both towns are fed from the same reservoirs. This is the same for Porangahau and Te Paerahi as they are feed from the same treatment plant.

Overview of the reticulation asset systems

The figure below shows the length of pipe installed in the district by diameter. The total length of pipe is 215 km.

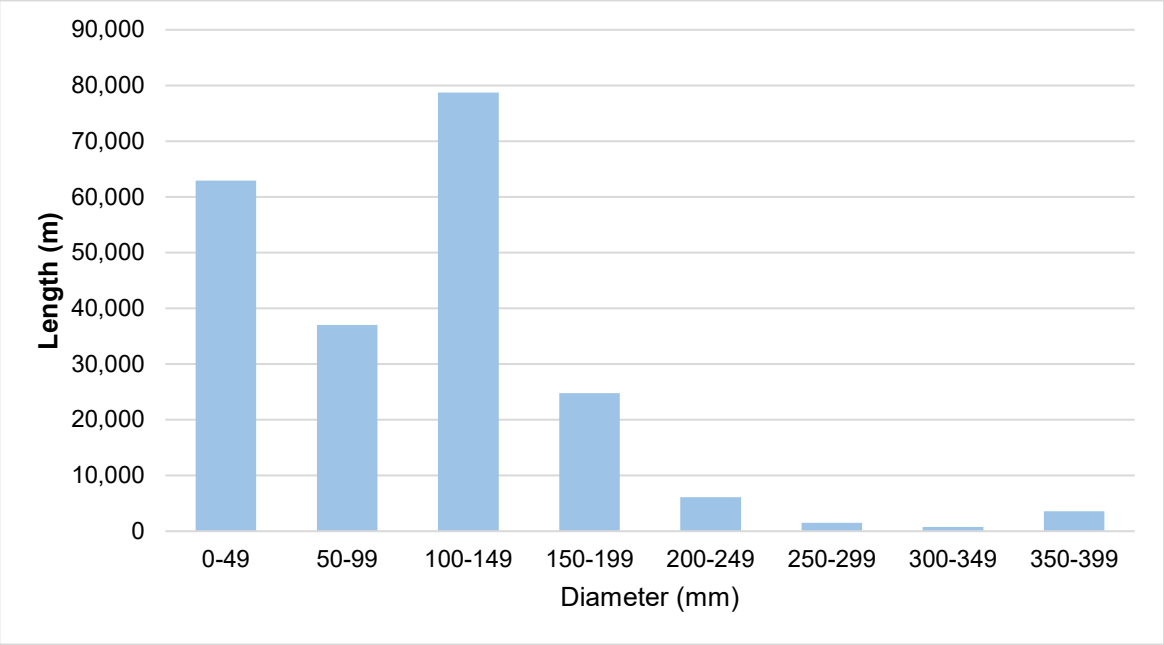


Figure 6

The largest cohort of pipe is 100 mm diameter. There are also significant lengths of pipes smaller than 100 mm diameter pipe that are used for service connections. This is typical for smaller schemes each individually servicing a community.

The figure below shows the length of pipe installed in the district by material.

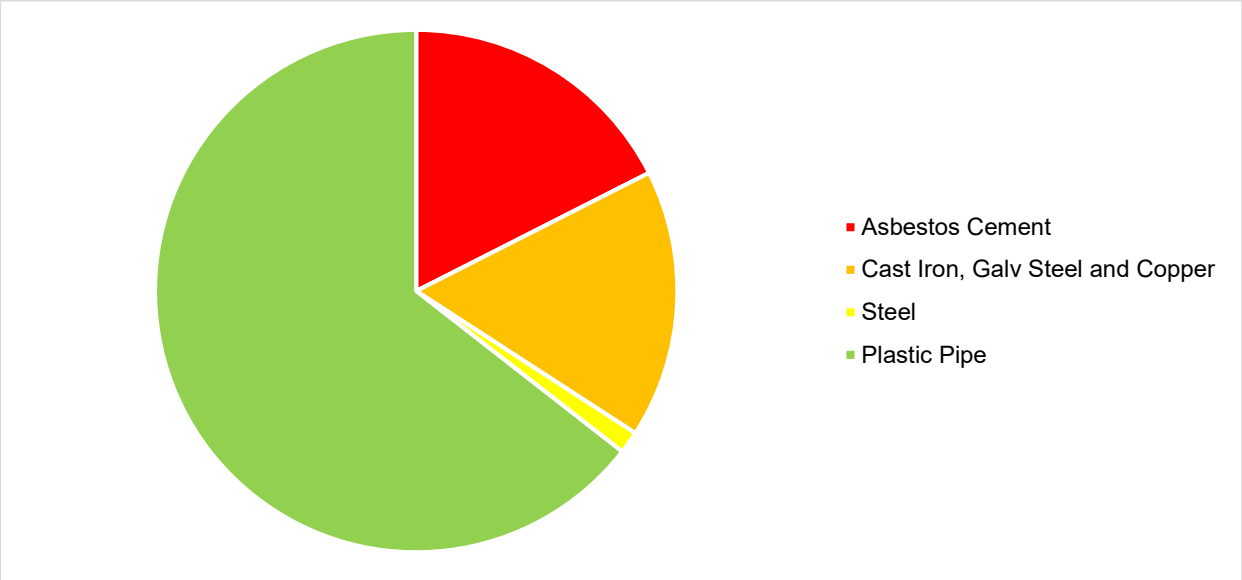


Figure 7

Over half of the pipe network is UPVC or MDPE. The proportions of the network likely to have condition-related performance issues are cast iron (CAST I), asbestos cement (AC, AC-E and AC-F), and galvanised steel (GI).

The figure below shows the distribution of pipes between each community scheme.

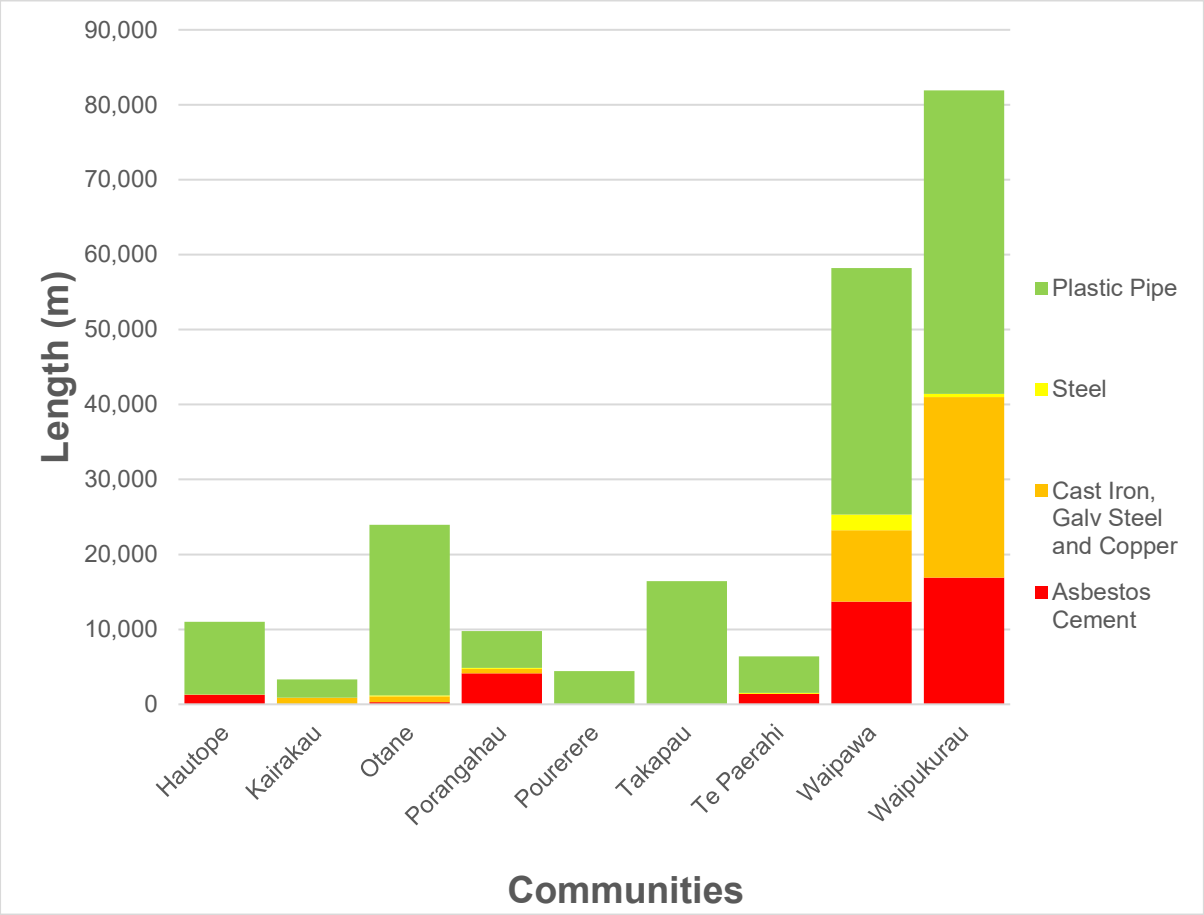


Figure 8

7.1.3. Asset Age

The figure below shows the length of pipe installed during different decades and is coloured according to the pipe material.

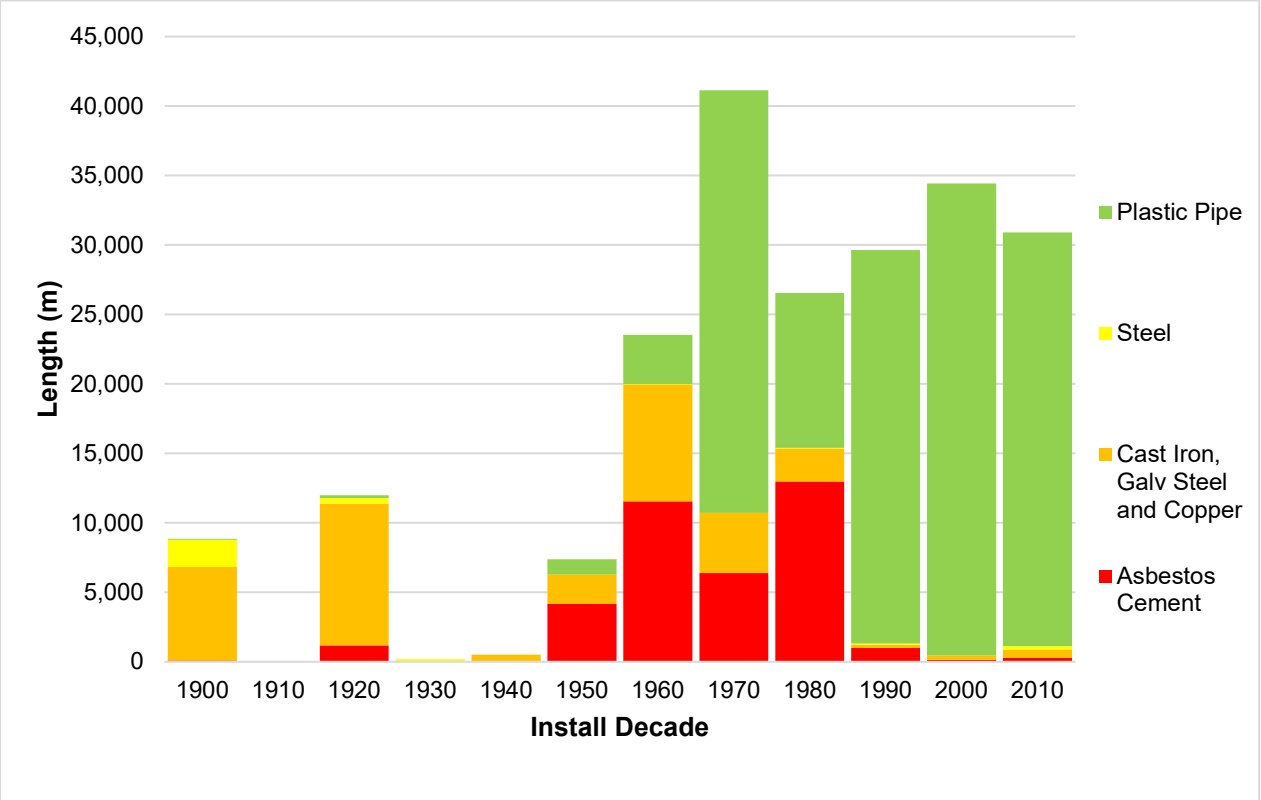


Figure 9

This shows the cast iron pipe installed in 1900 - 1930, the period of asbestos cement pipe installation in 1950 – 1980 and the increased use of plastic pipes from 1960 onwards.

Council currently uses asset age as the proxy for determining the likelihood of failure of reticulation assets.

7.1.4. Fault and defect data

Fault and defect data is collected as part of the Operations and Maintenance contract. Historically, failure data has not been collected in a manner where it is associated to individual assets. Therefore, failure data trends are monitored in a general sense rather than to specifically inform renewal strategies. Council has identified failure data improvements as a continuous improvement action within this plan.

7.1.5. Likelihood of failure

The figure below shows the likelihood of failure distribution for water supply pipes.

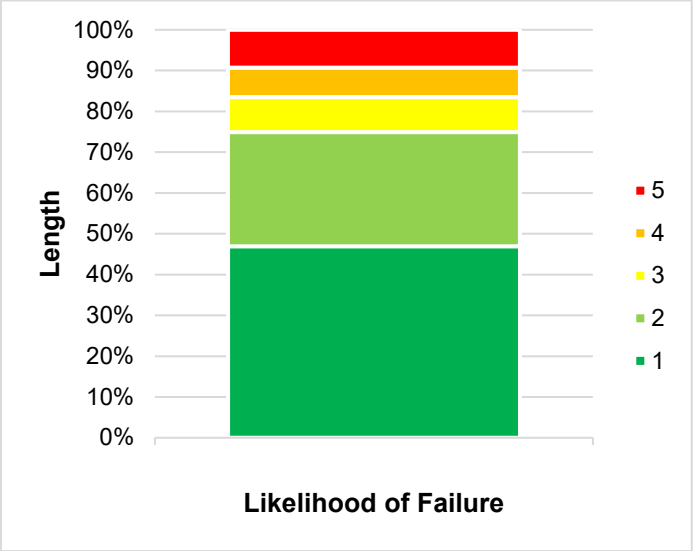
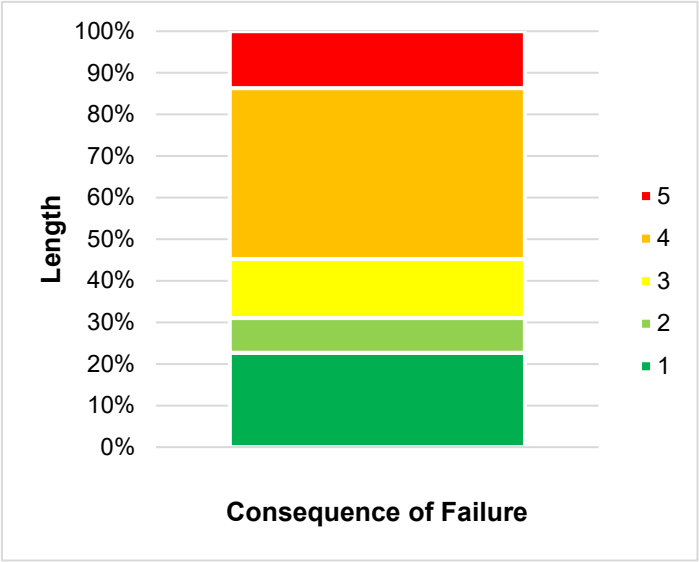


Figure 10

7.1.6. Consequence of failure

Council's criticality framework described earlier has been applied to determine the CoF for each asset.

The figure below shows the consequence of failure distribution for water supply pipes.



7.1.7. Failure risk

The risk score is calculated by multiplying the LoF score and the CoF for each asset.

The figure below shows the failure risk profile for water supply pipes.

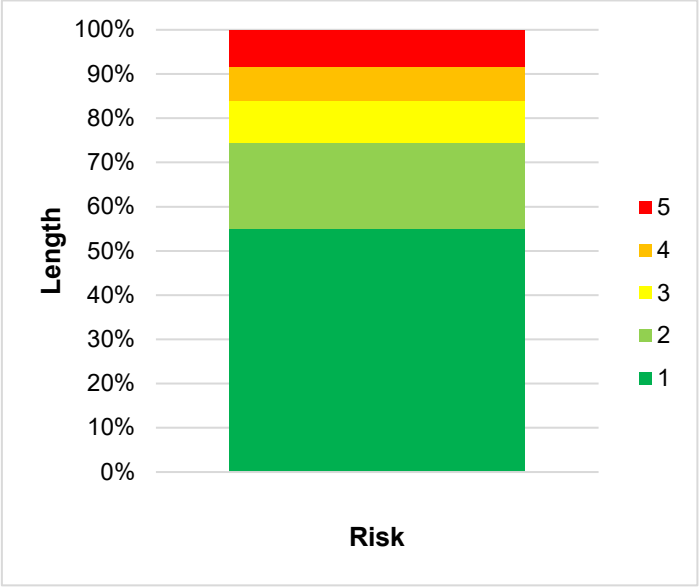


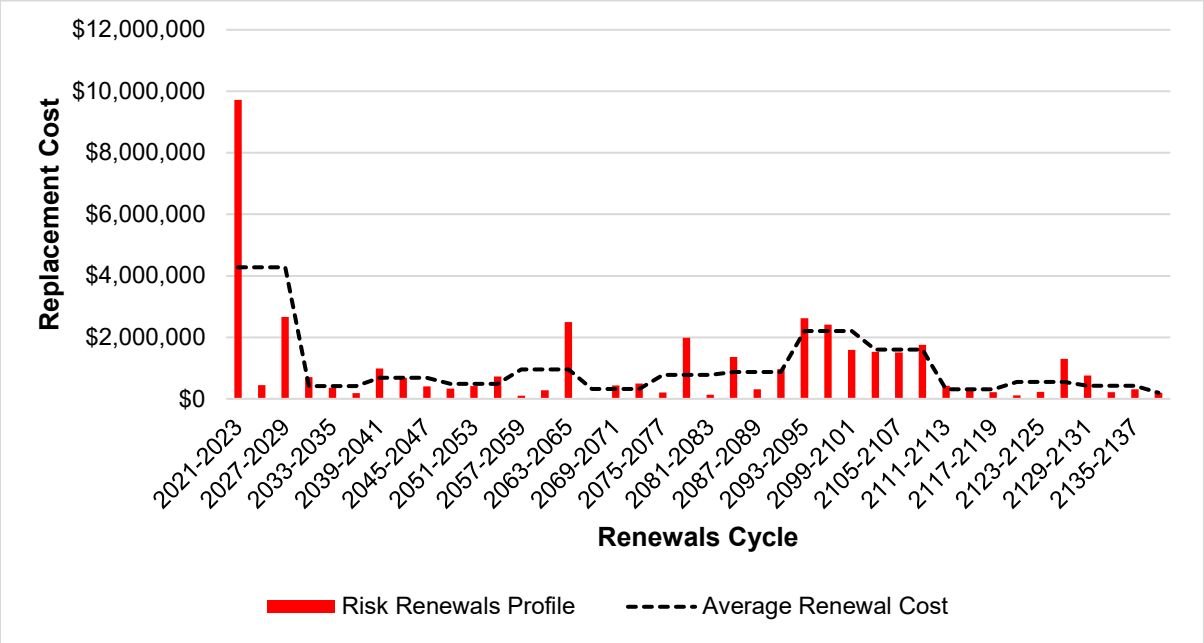
Figure 11

The replacement value of risk category 4 and 5 pipes is:

Risk category	Replacement value
5	$4,200,000
4	$4,900,000

7.1.8. Reticulation renewal budget

There is a significant portion of assets that have already exceeded their theoretical useful lives and this is represented in the large spike in costs for the first period. Budgets are presented in three year periods. The dotted line provides the renewal budget average of three of these periods (i.e. nine years).



Investing in renewal at the level indicated by the dotted average renewal cost line works out at $4.3M per 3-year period until 2033. This investment levels are sufficient to address the very high risk pipes (risk = 5) through renewal over a period of 3 – 4 years. At that investment level, the pipes currently assessed as high risk (risk = 4) will be addressed through renewal in the following 3 – 4 year period.

7.1.9. Reticulation renewal candidates

The adopted renewal budget determines the rate that pipes are renewed and therefore the time period for addressing pipes with a very high failure risk.

Pipes that are candidates for renewal are selected as part of the following process:

- Assign a renewal priority to each pipe in the database using the risk scores
- Map the location of high and very high risk pipes across the district
- Determine discrete projects to cost effectively address the high risk pipes in each location, taking into account:
- Opportunistic renewal of pipes in the vicinity
- Interaction with Council's road surfacing programme
- Interaction with growth and demand or level of service drivers

The replacement value in each of the renewal priority categories is provided below:

Renewal Intervention	Replacement value
Priority 1	$1,235,281

Priority 2	$2,920,450
Priority 3	$2,425,973
Opportunistic 1	$2,916,951
Opportunistic 2	$388,791
Do Nothing	$32,038,530
Grand Total	$41,925,977

7.1.10. Reticulation renewal capital programme (in $M)

Financial Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Proactive pipe renewal	$1.4	$1.4	$1.4	$1.4	$1.4	$1.4	$1.4	$1.4	$1.4	$1.4
Other retic renewal (est 20% of pipe cost)	$0.3	$0.3	$0.3	$0.3	$0.3	$0.3	$0.3	$0.3	$0.3	$0.3
Reactive pipe renewal	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05

A portion of the pipe renewal budget will be used to conduct physical sample condition assessment to validate the estimated condition grading. It is expected that this will allow the renewal of some pipes to be deferred. Condition assessment is targeted in years 1 – 3 on the Priority 1 and Priority 2 pipes identified and mapped as part of the analysis. The greater focus on condition assessment is needed in years 1 – 3 to validate the age-based criteria that has been used. The risk assessment will be refined in future using condition assessment and failure records.

The reactive pipe renewal budget is a provision for mains and laterals with repeat bursts where it is more effective to replace the pipe than further spot repair.

7.1.11. Reticulation Operations and Maintenance Plan

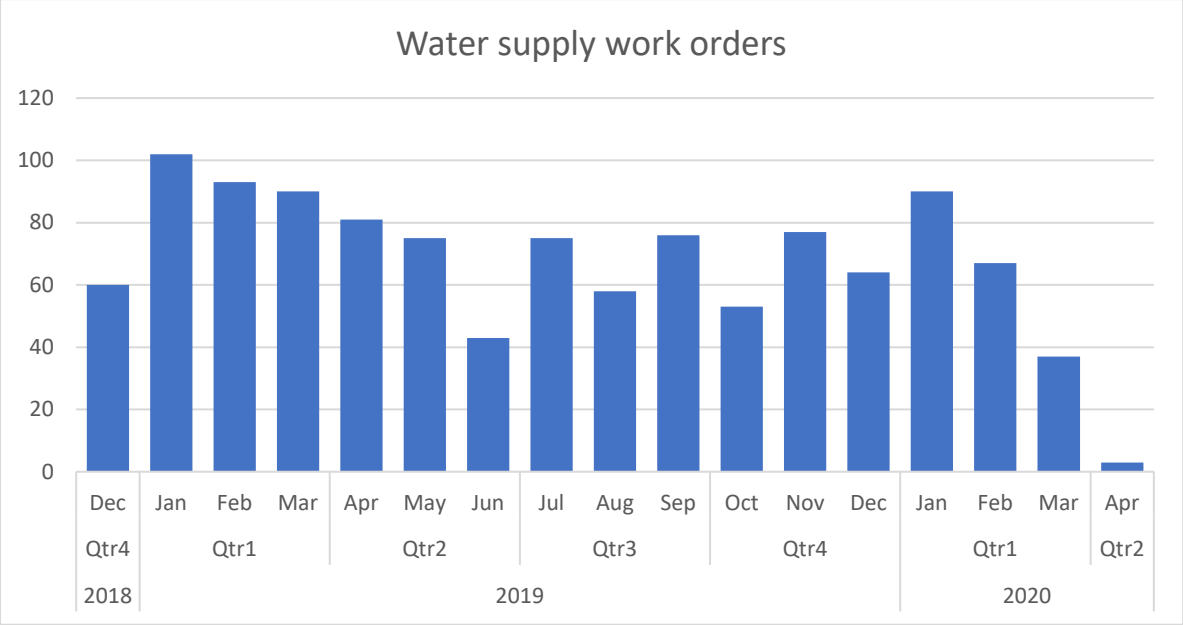
O&M Historic Trends

Operations and maintenance performed by Veolia includes the following functions for reticulation assets:

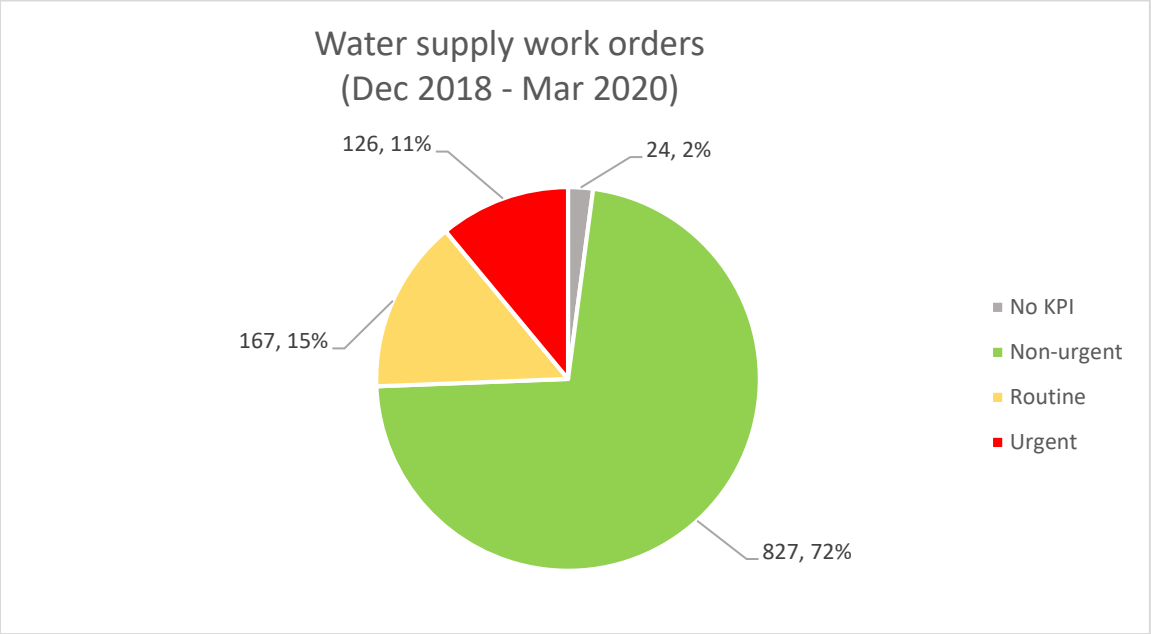
- Investigating faults;
- Resolving problems;
- Water pipe repairs;
- Valve and hydrant repairs;
- Meter repairs and replacements;
- Service valve repairs and replacements;
- Resolving dirty water problems;
- Inspection and repair of water restrictors;
- Preventing contamination of the water supply;
- Reporting and providing information to Council; and
- Implementing quality assurance measures to ensure quality levels are achieved.

Maintenance or reactive renewal requirements are identified following inspections carried out as part of the maintenance contract or following customer service requests or complaints.

Work orders are generated where there is a customer complaint or staff/contractor observed issue. A summary of work orders for the water supply network is presented in the figures below.



There can be up to 100 work orders per month. The majority of these are non-urgent and relate to slow leaks.



The key issues for reticulation assets under the O&M contract include:

Key Issue	***Priority for this Plan***
High number of work orders relating to leaks or bursts	*Providing budget for proactive and reactive renewal. Targeting leak detection through the sustainable water management plan.*
O&M data not integrated with core Council data systems	*Ensure fault data is recorded in a data format that allows for analysis and proactive decision-making*

7.2. Pumping, Storage and Treatment Lifecycle Management – Renewal Plan

7.2.1. Pumping, Storage and Treatment Issues and Priorities

Key Issue	***Priority for this Plan***
Several reservoirs and suction tanks are in very poor condition and pose water safety and seismic vulnerability concerns.	*Assessment, refurbishment and replacement of these assets where required. Several priority repairs are already identified as well as full replacement of the Waipukurau and Waipawa reservoir sites*
Pump failures	*Prioritise replacement of the older more critical pumps. Prioritise renewal budget spending to accumulate a set of critical spare parts.*
Asset data for stations is poor. Current O&M data is not easily useful for long term decision-making	*Resourcing to a) collect and update inventory data that supports asset management planning, b) refine and update valuation process and how costs are applied, c) collect O&M data that can be analysed network-wide to determine strategy for proactive/reactive split*

Instrumentation renewal needs to account for increased regulatory monitoring requirements	*Replacement and upgrade of instrumentation to latest regulatory standards*
Several pumping and treatment assets require replacement or upgrade due to non-renewal drivers. Works on these sites needs to be optimised with respect to the future upgrades and capital works	*Identify crossover issues where renewal needs to either be brought forward or delayed due to interaction with other planned upgrades or capital works*
Security of Council SCADA system	*Dedicated programme for upgrading SCADA data security*

7.2.2. Pumping, Storage and Treatment Overview

The pumping, storage and treatment assets are grouped by the following operational sites:

- Johnson Street WSTP
- Kairakau Water Supply Reservoirs
- Kairakau WSTP
- Otane Water Supply Reservoirs
- Porangahau Water Supply Reservoirs
- Porangahau WSTP
- Pourerere Water Supply Reservoirs
- Pourerere Water Supply Spring
- Takapau Water Supply Reservoirs
- Takapau WSTP
- Tikokino Road WSTP
- Waipawa Water Supply Reservoirs
- Waipukurau Water Pumping Stations
- Waipukurau Water Supply Reservoirs
- Waipukurau WSTP

7.2.1. Asset Age

The installation date records for pumping, storage and treatment assets held in Council's core asset database are unreliable or have large data gaps. Asset age, as derived from the core asset database, is not currently used as a core indicator of asset condition.

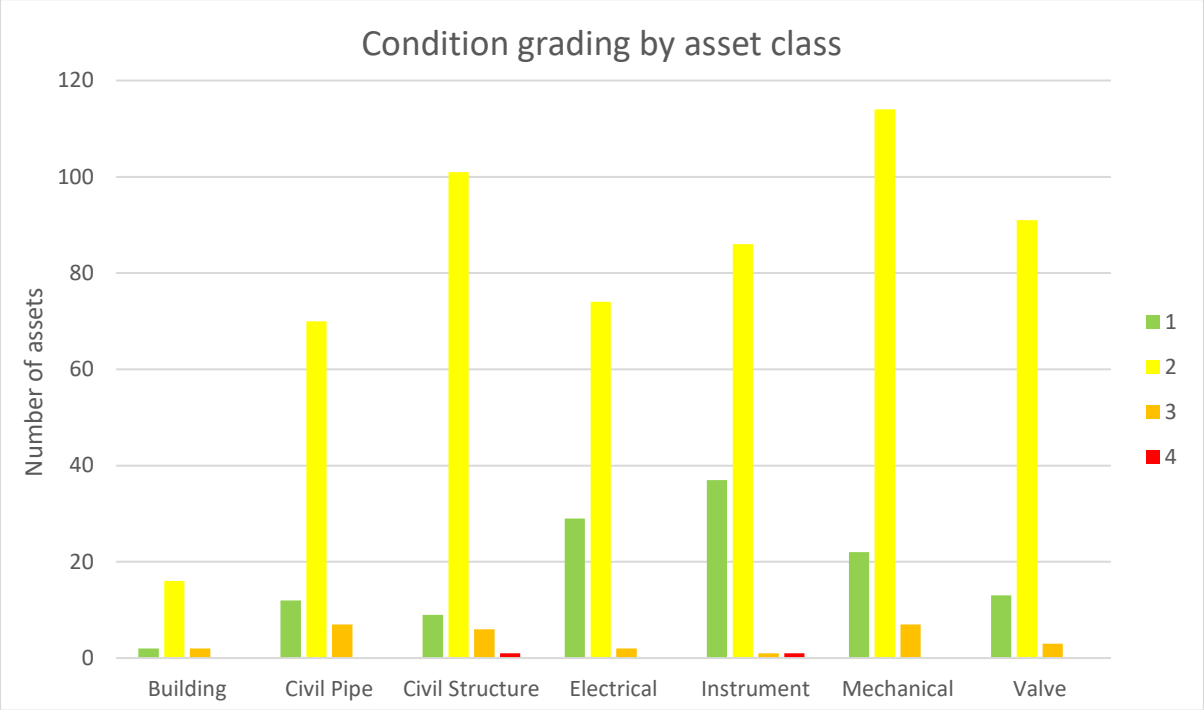
7.2.2. Fault and defect data

Work orders for the Operations and Maintenance contract provide a record of fault and defect data. Most work orders relate to the reticulation system. Historically, failure data has not been

collected for pumping, storage and treatment assets in a manner to specifically inform renewal strategies. Council has identified failure data improvements as a continuous improvement action within this plan.

7.2.3. Likelihood of Failure

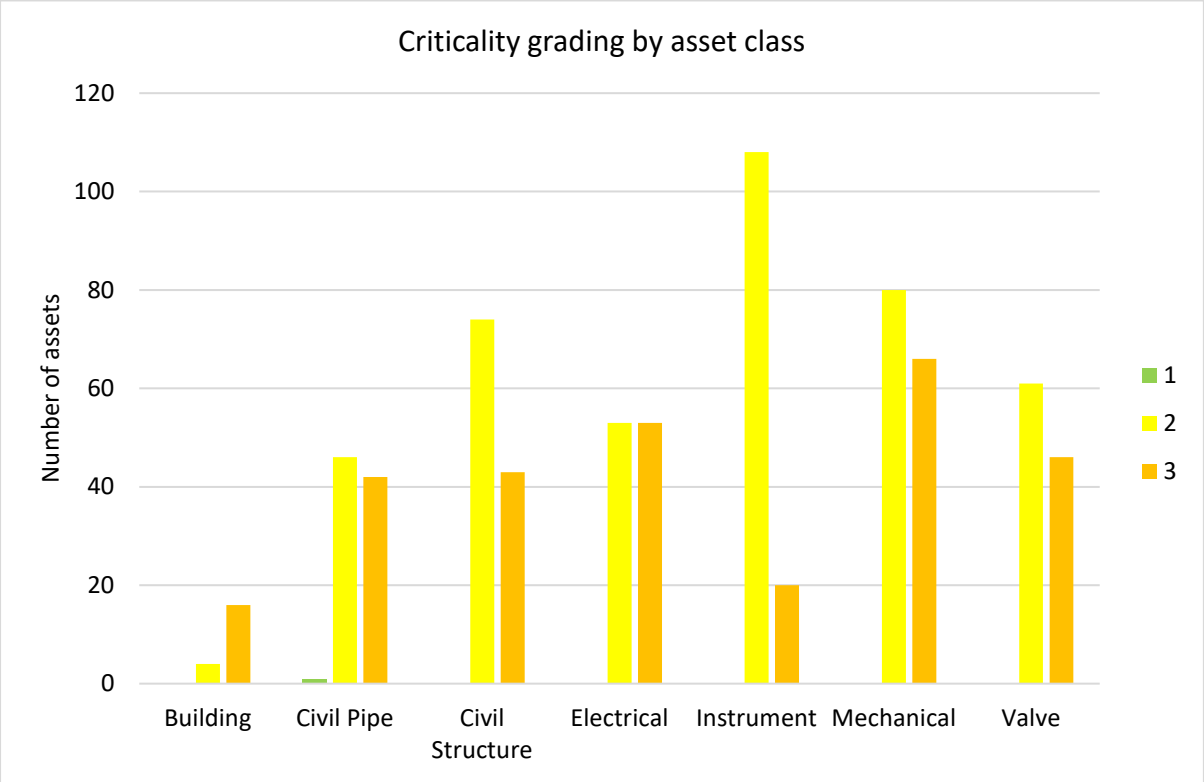
A condition assessment was conducted by Veolia in 2018 at the beginning of the new maintenance contract. This condition grading data uses a 1 to 4 scale (1 is good and 4 is very poor) and is the most up to date reference for estimating asset likelihood of failure. A summary of the data is presented below.



A number of civil structure and instrument assets are in very poor condition (condition grade 4) and have a high likelihood of failure. The majority of assets have been assessed as condition grade 1 and 2 and are in good or average condition.

7.2.4. Consequence of Failure

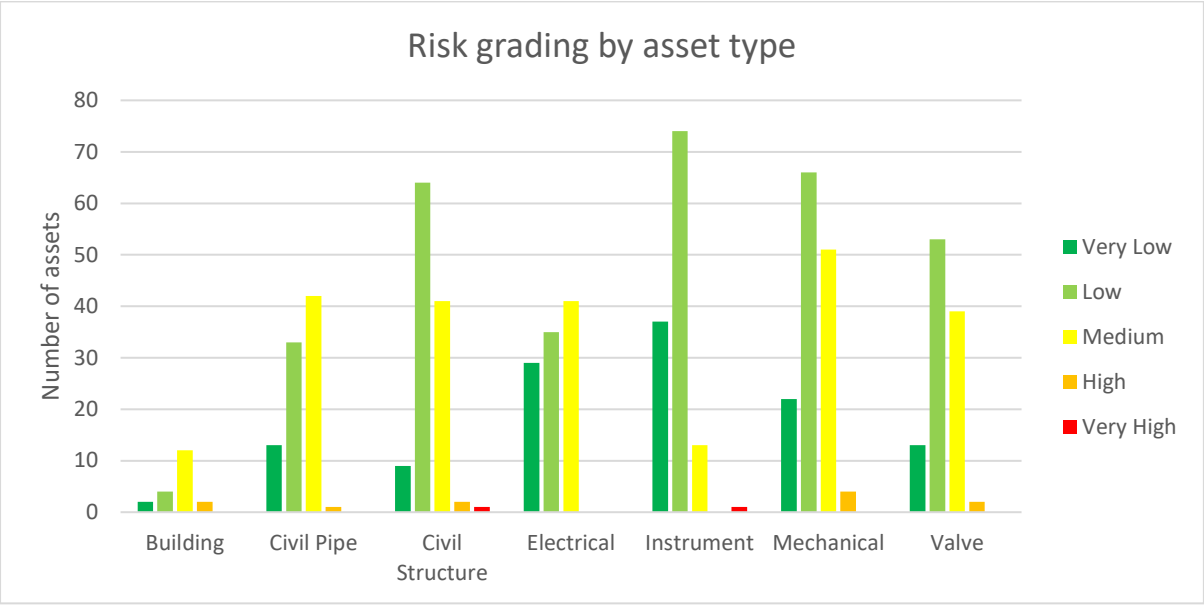
A criticality assessment was conducted by Veolia in 2018 at the beginning of the new maintenance contract. This criticality grading data uses a 1 to 3 scale (1 is low criticality and 3 is high) and is the most up to date reference for estimating asset consequence of failure. A summary of the data is presented below.



Most assets have a high or medium criticality due to the nature of these asset sites where large numbers of customers rely on their function.

7.2.5. Failure risk

A rudimentary risk assessment has been conducted by multiplying the 1 – 4 condition grade scores (representative of the likelihood of failure,), with the 1 – 3 criticality scores (representative of the consequence of failure). The resulting risk is presented below. This method does not fully align with the typical 5 x 5 risk matrix used by Council but is useful as a basic estimate of risk.



A number of civil structures and instrumentation assets represent the highest risk. These are the priority focus for future condition assessment work to identify proactive renewal projects.

7.2.6. Pumping, Storage and Treatment renewal budget estimate and capital programme (in $M)

Financial Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Proactive pumping, storage and treatment asset renewal	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05
Reactive pumping, storage and treatment asset renewal	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05

The budgets prepared above are based on historic renewal costs for these asset classes. The reactive budgets are based on the equivalent cost of having to replace a large pumpset including auxiliary assets.

7.2.7. Pumping, Storage and Treatment renewal candidates

The first budget priority for proactive renewal is to conduct condition assessment for the high risk assets to better determine a proactive renewal programme using the data. This is focussed on reservoirs and civil structures.

The first budget priority for the reactive renewal budget is to accumulate a set of critical spare parts to mitigate risks of prolonged water supply outage due to failed assets.

7.2.8. Pumping, Storage and Treatment Operations and Maintenance Plan

O&M Historic Trends

Operations and maintenance performed by Veolia includes the following functions for pumping, storage and treatment assets:

- Operating treatment plants
- Operating pumping sites
- Investigating faults;
- Resolving problems;
- Service pumps, repairs and replacement;
- Service valve repairs and replacements;

- Preventing contamination of the water supply;
- Reporting and providing information to Council; and
- Implementing quality assurance measures to ensure quality levels are achieved.

Maintenance or reactive renewal requirements are identified following inspections carried out as part of the maintenance contract.

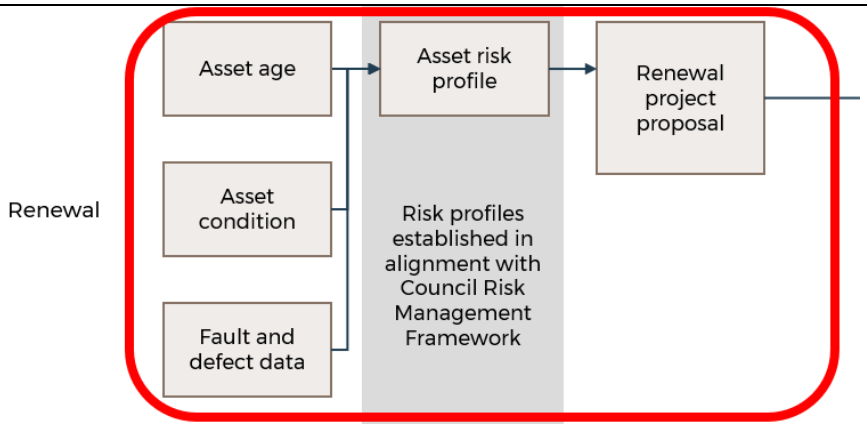
Key Issue	***Priority for this Plan***
Risk data not currently used in formal O&M strategy	*Formalise collection of asset data, condition assessment and criticality in alignment with Council risk policy*
O&M data not integrated with core Council data systems	*Ensure fault data and maintenance records are recorded in a data format that allows for analysis and proactive decision-making*

8. Wastewater Lifecycle Management - Renewal

This section details the renewal specific lifecycle management considerations for wastewater, covered under the two asset class categories of:

- Reticulation
  - Pipes: Mains and laterals
  - Other reticulation: manholes, valves
- Pumping, storage and treatment
  - Pumping stations
  - Wastewater treatment sites

This relates to the process below:



The overall objective of the wastewater lifecycle management – renewal plan is.

To manage the wastewater activity to ensure that current strategies provide the required level of service in an efficient and cost effective manner that does not consume the wastewater assets.

8.1. Reticulation Lifecycle Management – Renewal Plan

8.1.1. Reticulation Issues and Priorities

Key Issue	*Priority for this Plan*
Pipes at the end of their estimated useful life (particularly earthenware pipes)	*Addressing the renewal of pipes at the end of their useful lives, focussing on high failure risk. Pipe renewal will be optimised by using CCTV assessment to confirm condition and apply trenchless lining for pipe renewal (already used successfully in parts of the network to refurbish earthenware pipes).*
Reducing inflow and infiltration due to network condition	*Targeting asset renewal at locations where pipe replacement will reduce or eliminate the downstream impacts of inflow and infiltration*
Low seismic resilience	*Target asset renewal at locations to replace older brittle materials with new flexible materials and jointing systems*
Reducing reactive maintenance	*Prioritising pipe renewal based on risk and begin collecting maintenance data in a form that supports renewal decisions*
Increase maturity and transparency of investment decision-making	*Use the risk based outputs of the renewal criteria and integrate with growth and improvement criteria*
Relying on age-based condition assessment criteria for decision-making	*Targeting CCTV inspection to increase the evidence base for specific renewal project decisions*

Wastewater reticulation includes mains, lateral, manholes and valves. Asset management effort focusses on mains as these make up the majority of the value of the reticulation

network. Laterals, manholes, valves and other auxiliary assets connected to the mains generally last as long as the main and are renewed as part of a main renewal.

A new renewal framework is being used for the first time for this 2021 AMP to providing greater decision-making transparency. The following criteria is assessed for each pipe in the database:

- Likelihood of Failure
- Consequences of Failure
- Failure Risk
- Replacement cost

The output of the renewal framework is used for two separate purposes.

1. To set an appropriate long-term reticulation renewal budget
2. To provide a prioritised list of renewal candidates on a pipe by pipe basis

8.1.2. Reticulation Overview

Wastewater schemes

There are six wastewater schemes in the district: Otane, Waipawa, Waipukurau, Takapau, Porangahau, Te Paerahi and Pourerere.

Overview of the reticulation asset systems

The figure below shows the length of pipe installed in the district by diameter. The total length of pipe is 131 km.

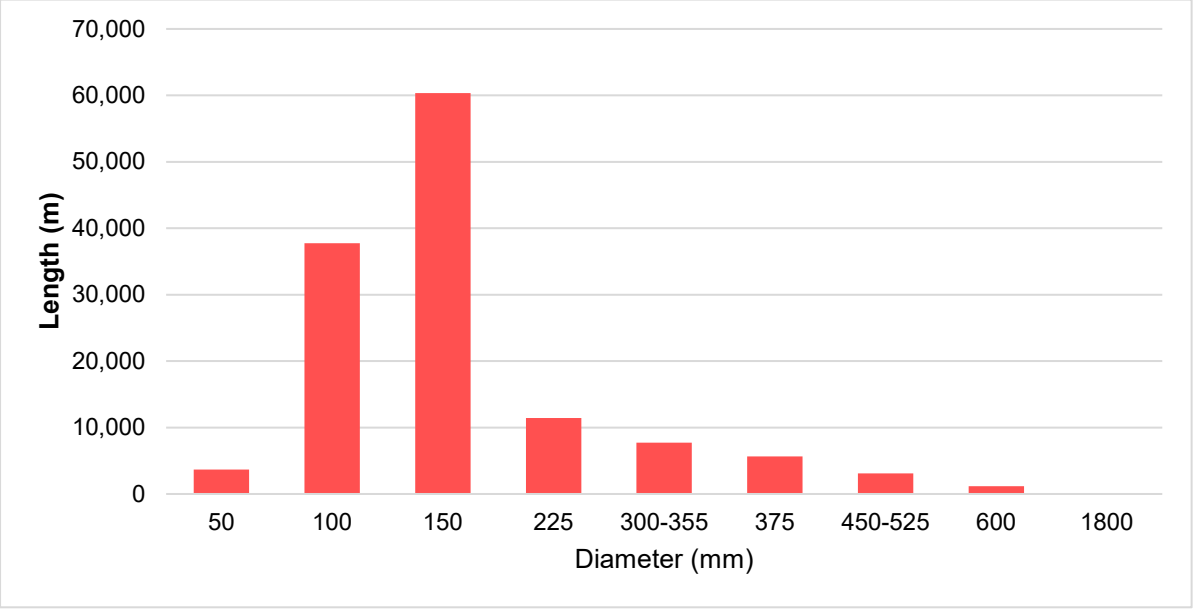


Figure 12

The largest cohort of pipes are 100 or 150 mm diameter. This is typical for smaller schemes each individually servicing a community.

The figure below shows the length of pipe installed in the district by material.

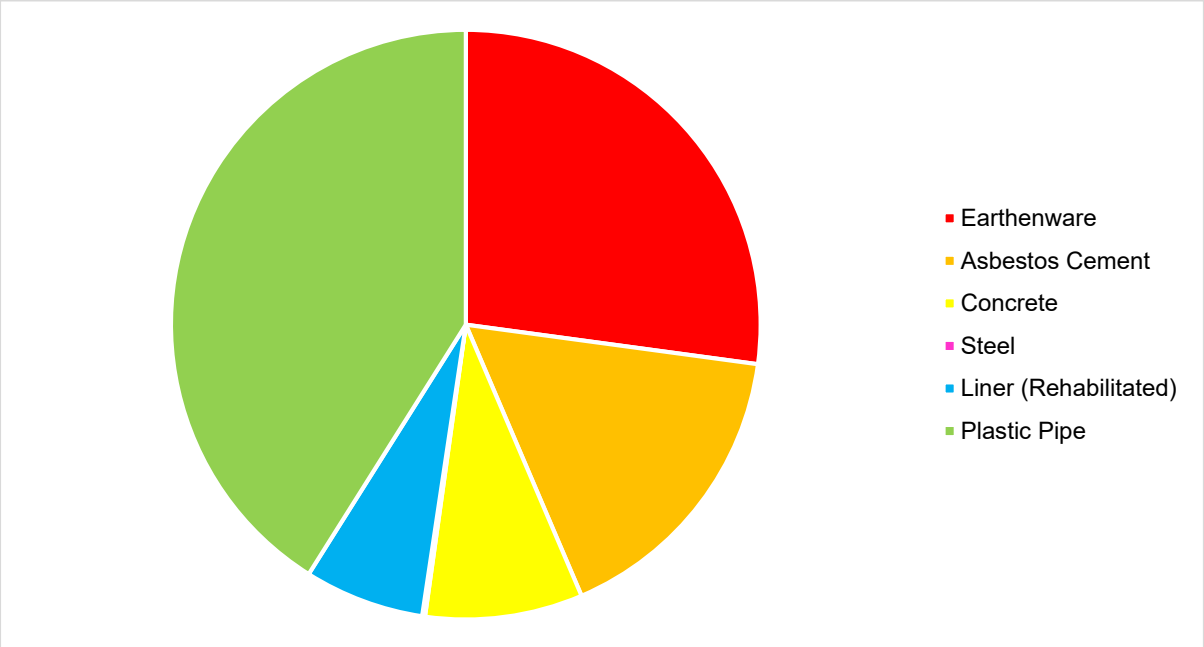


Figure 13

The network is split approximately 50/50 between flexible materials (plastic pipe and liner) and brittle materials. The proportions of the network likely to have condition-related performance issues are earthenware (GEW and EW), asbestos cement (AC, AC-E and AC-F), and some concrete (CONC).

The figure shows the distribution of pipes between each community scheme.

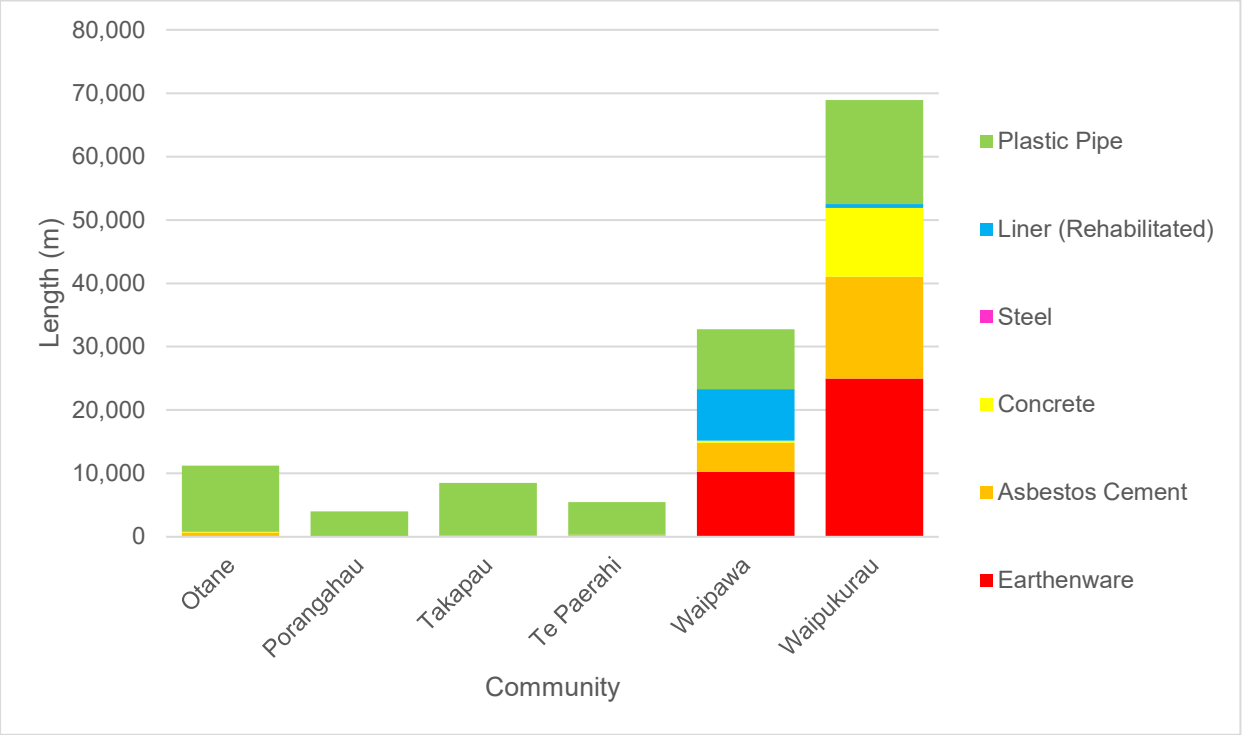


Figure 14

8.1.1. Asset Age

The figure below shows the length of pipe installed during different decades and is coloured according to the pipe material.

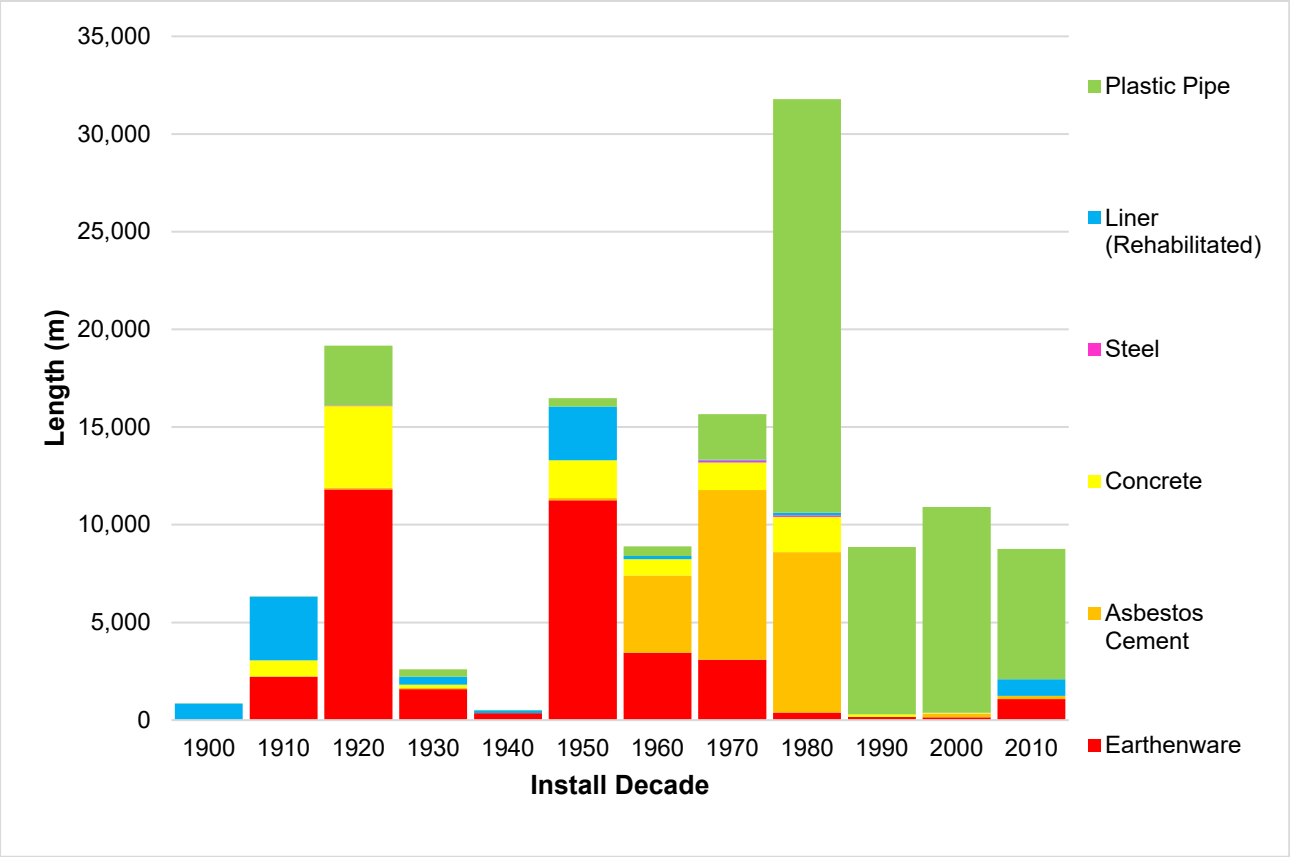


Figure 15

This shows significant lengths of earthenware pipe installed in the 1920s and 1950s. Some of this pipe has now been lined (labelled as CIPP/GEW and AM_Liner/GEW). Steel was used heavily during between 1960 and 1980. UPVC pipe has been used as the predominant material from 1980 onwards. Some further pipe material data validation is required to remove the anomaly of plastic pipe shown above for the 1920 decade.

Council currently uses asset age as the proxy for determining the likelihood of failure of reticulation assets.

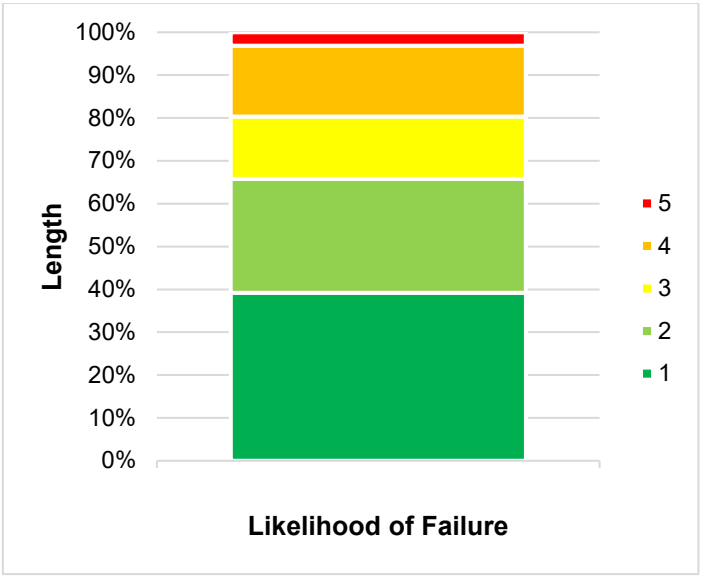
8.1.1. Fault and defect data

Fault and defect data is collected as part of the Operations and Maintenance contract. Historically, failure data has not been collected in a manner where it is associated to individual assets. Therefore, failure data trends are monitored in a general sense rather than to

specifically inform renewal strategies. Council has identified failure data improvements as a continuous improvement action within this plan.

8.1.2. Likelihood of failure

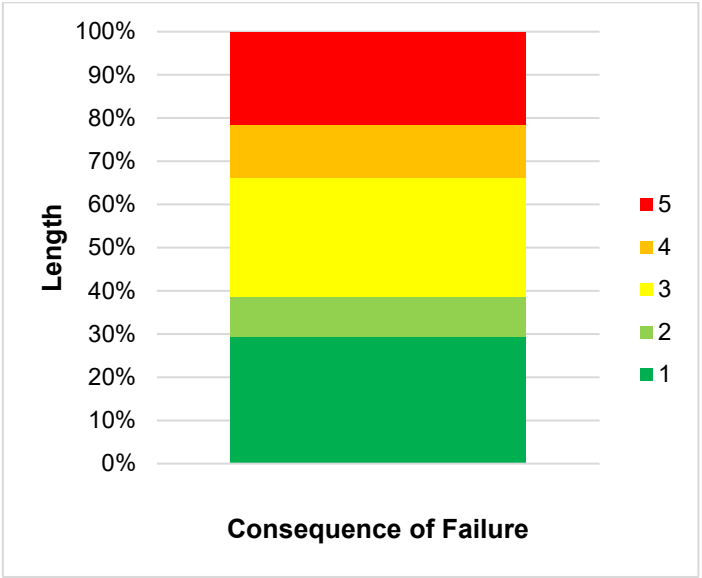
The figure below shows the likelihood of failure distribution for wastewater pipes.



8.1.3. Consequence of failure

Councils risk criticality framework has been used to determine the CoF for each asset.

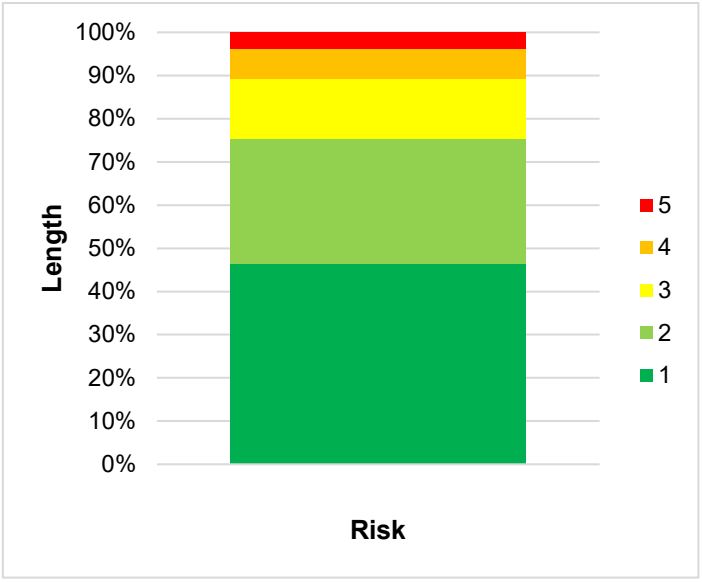
The figure below shows the consequence of failure distribution for wastewater pipes.



8.1.4. Failure risk

The risk score is calculated by multiplying the LoF score and the CoF for each asset.

The figure below shows the failure risk profile for wastewater pipes.

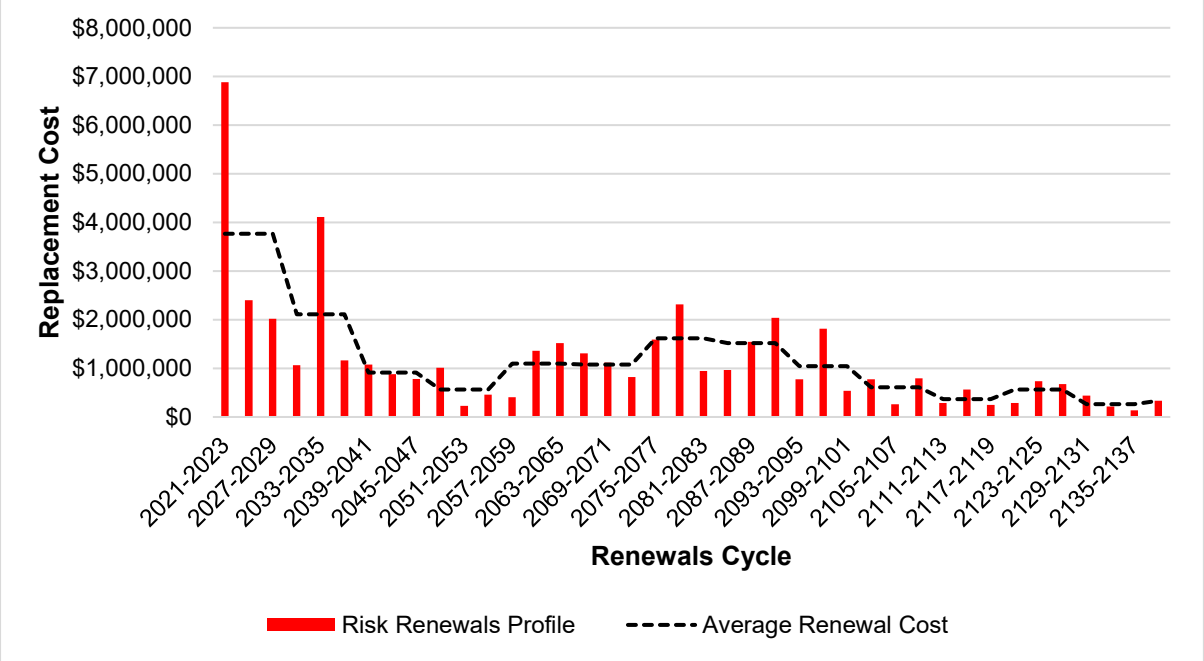


The replacement value of risk category 4 and 5 pipes is:

Risk category	Replacement value
5	$2,300,000
4	$3,900,000

8.1.5. Reticulation renewal budget

There is a significant portion of assets that have already exceeded their theoretical useful lives and this is represented in the large spike in costs for the first period. Budgets are presented in three year periods. The dotted line provides the renewal budget average of three of these periods (i.e. nine years).



Investing in renewal at the level indicated by the dotted average renewal cost line works out at $3.8M per 3-year period until 2033. This investment levels are sufficient to address the very high risk pipes (risk = 5) through renewal over a period of 3 years. At that investment level, the pipes currently assessed as high risk (risk = 4) will be addressed through renewal in the following 3-year period. This budget covers wastewater mains and laterals.

8.1.6. Reticulation renewal candidates

The adopted renewal budget determines the rate that pipes are renewed and therefore the time period for addressing pipes with a very high failure risk.

Pipes that are candidates for renewal are selected as part of the following process:

- Assign a renewal priority to each pipe in the database using the risk scores
- Map the location of high and very high risk pipes across the district
- Determine discrete projects to cost effectively address the high risk pipes in each location, taking into account:
  - Opportunistic renewal of pipes in the vicinity
  - Interaction with Council's road surfacing programme
  - Interaction with growth and demand or level of service drivers

The replacement value in each of the renewal priority categories is provided below:

Renewal Intervention	Replacement value
Priority 1	$115,133
Priority 2	$2,220,526
Priority 3	$2,077,222
Opportunistic 1	$2,212,538
Opportunistic 2	$4,297,199
Do Nothing	$35,970,337
Grand Total	$46,892,956

8.1.7. Reticulation renewal capital programme (in $M)

Financial Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Pipe renewal	$1.3	$1.3	$1.3	$1.3	$1.3	$1.3	$1.3	$1.3	$1.3	$0.7
Other retic renewal (est 10% of pipe cost)	$0.1	$0.1	$0.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Reactive pipe renewal	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05

A portion of the pipe renewal budget will be used to conduct CCTV condition assessment to validate the estimated condition grading. It is expected that this will allow the renewal of some pipes to be deferred. CCTV condition assessment is targeted in years 1 – 3 on the Priority 1 and Priority 2 pipes identified and mapped as part of the analysis. The greater focus on condition assessment is needed in years 1 – 3 to validate the age-based criteria that has been used. The risk assessment will be refined in future using condition assessment and failure records.

The reactive pipe renewal budget is a provision for mains and laterals with repeat failures where it is more effective to replace the pipe than further remediation.

8.1.8. Reticulation Operations and Maintenance Plan

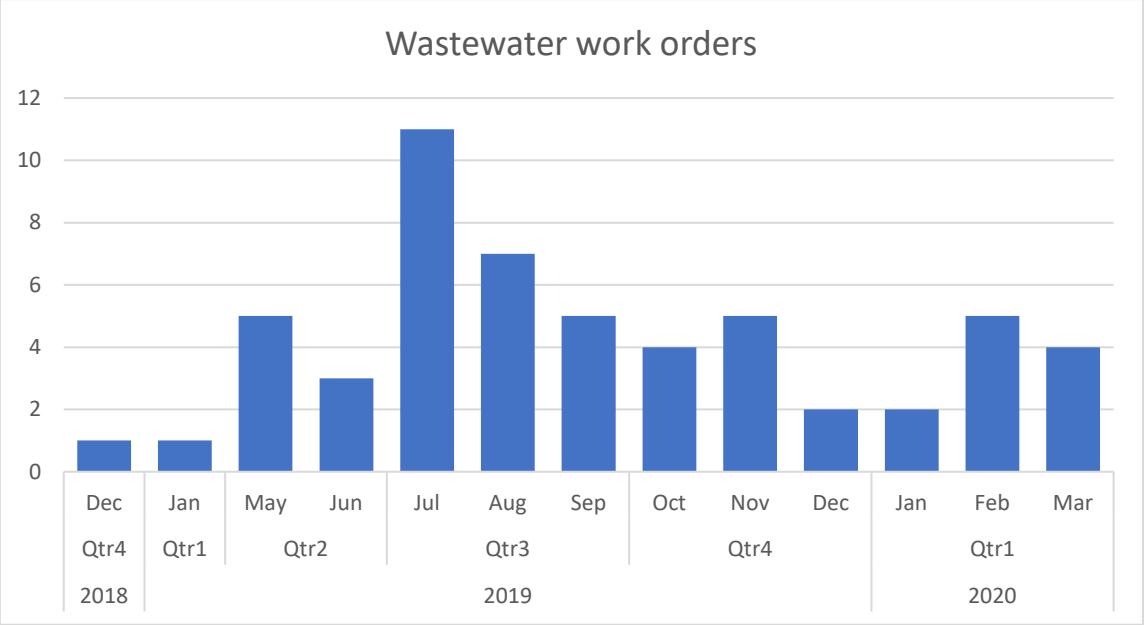
O&M Historic Trends

Operations and maintenance performed by Veolia includes the following functions for reticulation assets:

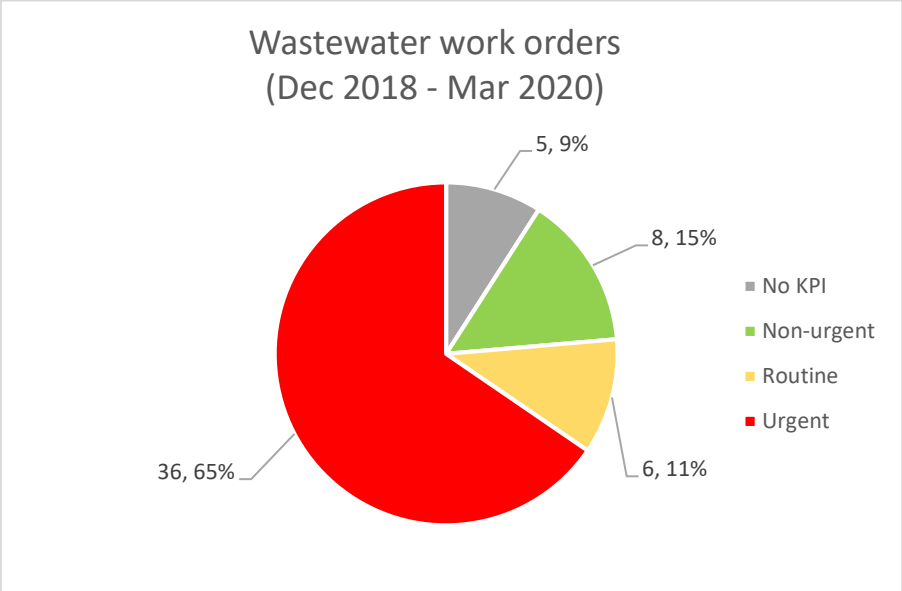
- Investigating faults;
- Resolving problems;
- Wastewater pipe repairs;
- Cleaning, jetting and root cutting
- Manhole repairs
- Reporting and providing information to Council; and
- Implementing quality assurance measures to ensure quality levels are achieved.

Maintenance or reactive renewal requirements are identified following inspections carried out as part of the maintenance contract or following customer service requests or complaints.

Work orders are generated where there is a customer complaint or staff/contractor observed issue. A summary of work orders for the wastewater network is presented in the figures below.



There are typically less than 10 work orders per month with more in winter than in summer. The majority of these are urgent as wastewater service issues and blockages can quickly escalate into uncontrolled overflows to stormwater, property or waterways.



The key issues for reticulation assets under the O&M contract include:

Key Issue	***Priority for this Plan***
Inflow and infiltration	*Performance targeted I&I investigations to plan responses to reduce the I&I impact on the network. The findings will also inform the case for installing stormwater reticulation in parts of the district for the first time where a material difference in I&I is expected.*
Blockages	*Improving data capture process so that blockage failure data can be used systematically in project planning and O&M strategy*
Overflows	*Improving data capture process so that overflow failure data can be used systematically in project planning and O&M strategy*

8.2. Pumping, Storage and Treatment Lifecycle Management – Renewal Plan

8.2.1. Pumping, Storage and Treatment Issues and Priorities

Key Issue	*Priority for this Plan*
Pump failures	*Prioritise replacement of the older more critical pumps. Prioritise renewal budget*

	spending to accumulate a set of critical spare parts.
High pumping and treatment flows during wet weather	*Target I&I reduction to offset the cost of having to design and maintain pumping and treatment infrastructure capacity for extremely high wet weather flows*
Asset data for stations is poor. Current O&M data is not easily useful for long term decision-making	*Resourcing to a) collect and update inventory data that supports asset management planning, b) refine and update valuation process and how costs are applied, c) collect O&M data that can be analysed network-wide to determine strategy for proactive/reactive split*
Some high value assets such as civil structures pose risk of failure and require more detailed assessment	*Condition assessment of civil structures*
Instrumentation renewal needs to account for increased regulatory monitoring requirements	*Replacement and upgrade of instrumentation to latest regulatory standards*
Several pumping and treatment assets require replacement or upgrade due to non-renewal drivers. Works on these sites needs to be optimised with respect to the future upgrades and capital works	*Identify crossover issues where renewal needs to either be brought forward or delayed due to interaction with other planned upgrades or capital works*
Security of Council SCADA system	*Dedicated programme for upgrading SCADA data security*

8.2.2. Pumping, Storage and Treatment Overview

The pumping, storage and treatment assets are grouped by the following operational sites:

- Otane WWTP
- Porangahau Wastewater Pumping Stations
- Porangahau WWTP
- Takapau Wastewater Pumping Stations
- Takapau WWTP
- Te Paerahi Beach Wastewater Pumping Stations
- Te Paerahi WWTP
- Waipawa Wastewater Pumping Stations
- Waipawa WWTP
- Waipukurau Wastewater Pumping Stations
- Waipukurau WWTP

8.2.3. Asset Age

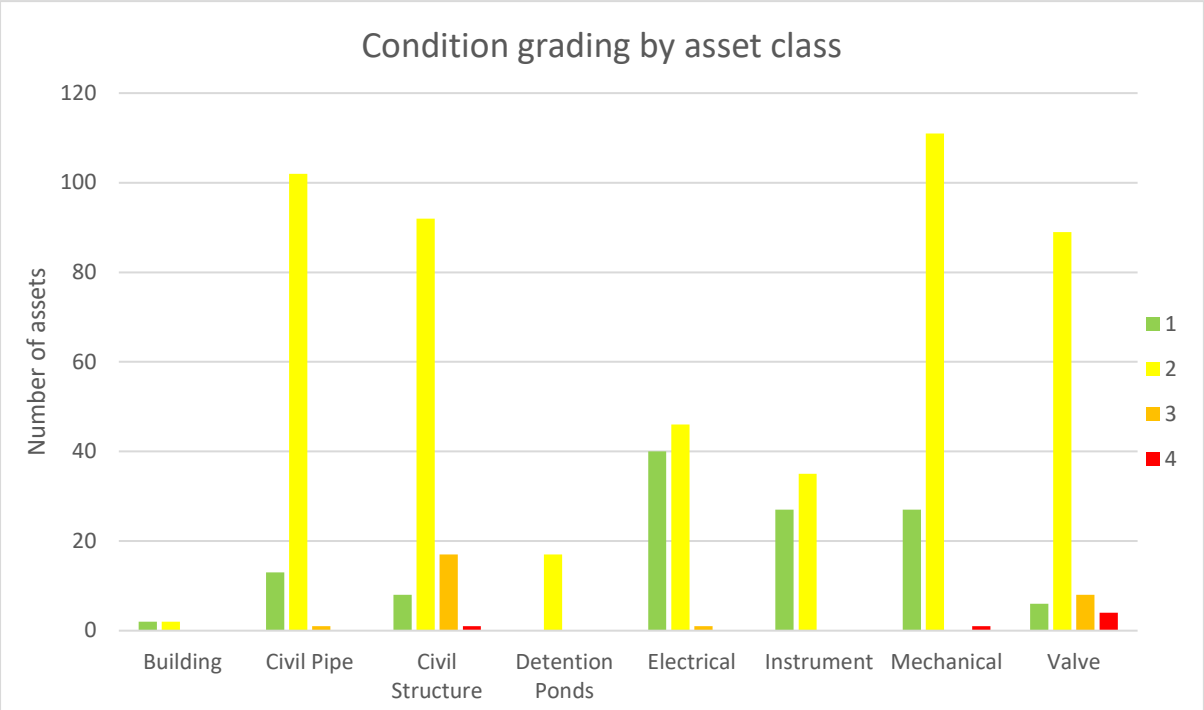
The installation date records for pumping, storage and treatment assets held in Council's core asset database are unreliable or have large data gaps. Asset age, as derived from the core asset database, is not currently used as a core indicator of asset condition.

8.2.4. Fault and defect data

Work orders for the Operations and Maintenance contract provide a record of fault and defect data. Historically, failure data has not been collected for pumping, storage and treatment assets in a manner to specifically inform renewal strategies. Council has identified failure data improvements as a continuous improvement action within this plan.

8.2.5. Likelihood of Failure

A condition assessment was conducted by Veolia in 2018 at the beginning of the new maintenance contract. This condition grading data uses a 1 to 4 scale (1 is good and 4 is very poor) and is the most up to date reference for estimating asset likelihood of failure. A summary of the data is presented below.

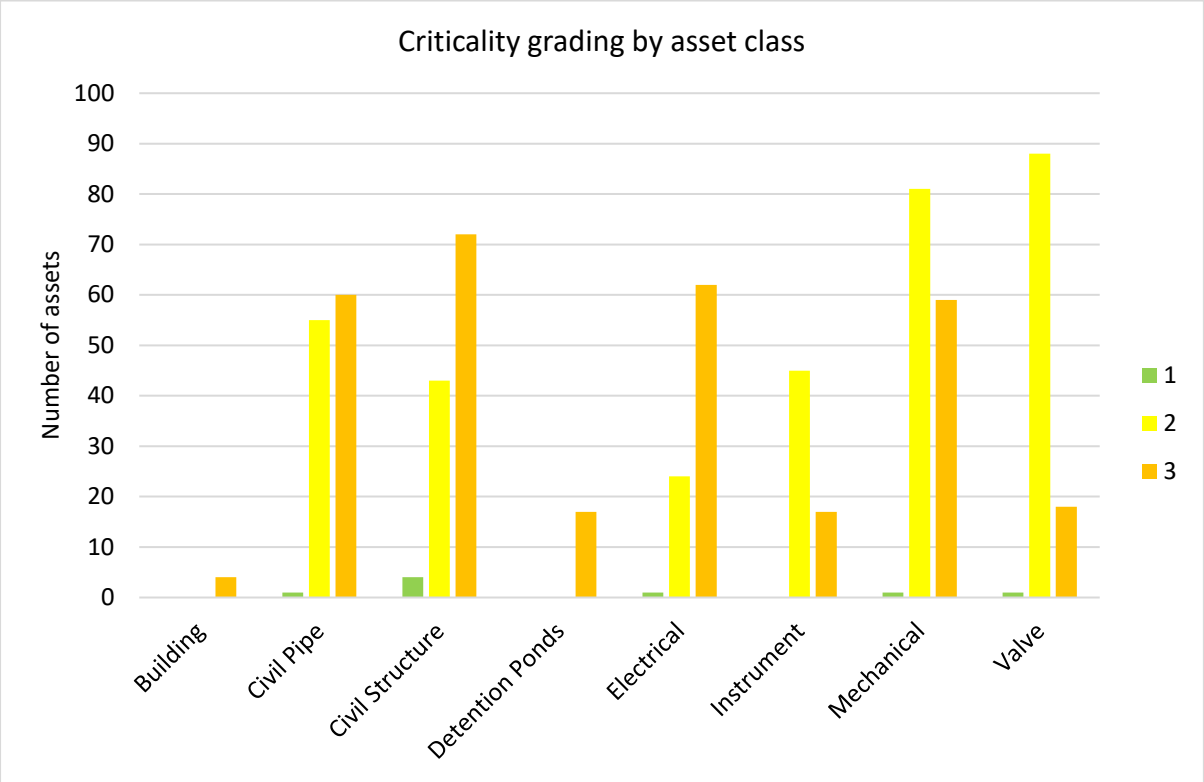


A number of civil structures, mechanical and valve assets are in very poor condition (condition grade 4) and have a high likelihood of failure. The majority of assets have been assessed as condition 2 and are in average condition.

8.2.6. Consequence of Failure

A criticality assessment was conducted by Veolia in 2018 at the beginning of the new maintenance contract. This criticality grading data uses a 1 to 3 scale (1 is low criticality and

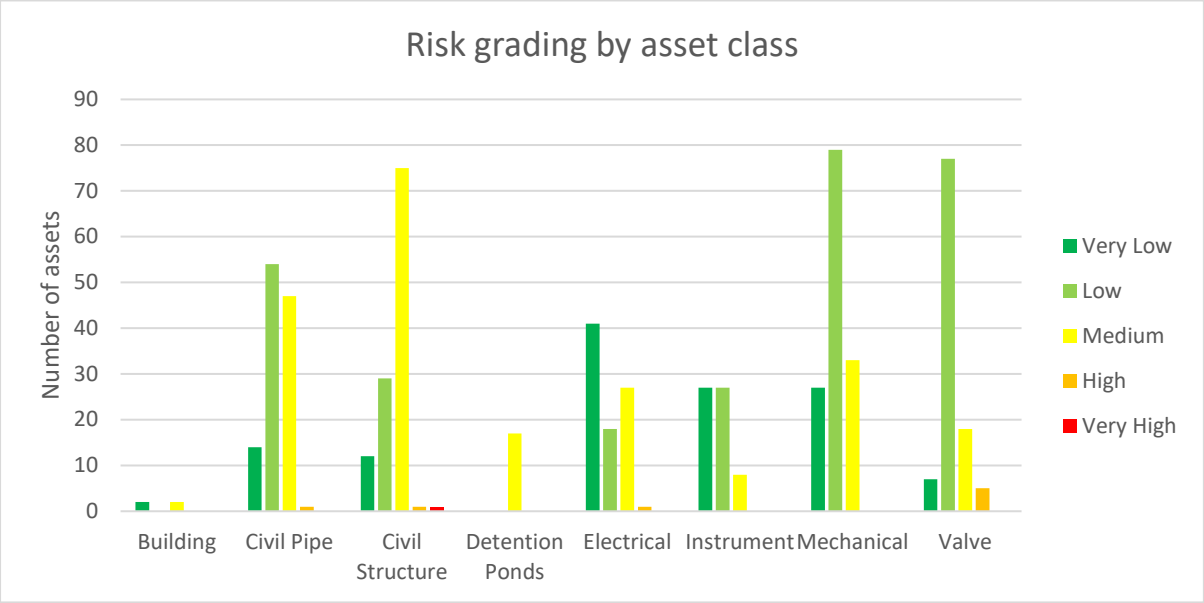
3 is high) and is the most up to date reference for estimating asset consequence of failure. A summary of the data is presented below.



Most assets have a high or medium criticality due to the nature of these asset sites where large numbers of customers rely on their function.

8.2.7. Failure risk

A rudimentary risk assessment has been conducted by multiplying the 1 – 4 condition grade scores (representative of the likelihood of failure,), with the 1 – 3 criticality scores (representative of the consequence of failure). The resulting risk is presented below. This method does not fully align with the typical 5 x 5 risk matrix used by Council but is useful as a basic estimate of risk.



A number of civil structures represent the highest risk. These are the priority focus for future condition assessment work to identify proactive renewal projects.

8.2.8. Pumping, Storage and Treatment renewal budget estimate and capital programme (in $M)

Financial Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Proactive pumping, storage and treatment asset renewal	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05
Reactive pumping, storage and treatment asset renewal	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05

The budgets prepared above are based on historic renewal costs for these asset classes. The reactive budgets are based on the equivalent cost of having to replace a large pumpset including auxiliary assets.

8.2.9. Pumping, Storage and Treatment renewal candidates

The first budget priority for proactive renewal is to conduct condition assessment for the high risk assets to better determine a proactive renewal programme using the data. This is focussed on civil structures.

The first budget priority for the reactive renewal budget is to accumulate a set of critical spare parts to mitigate risks of prolonged wastewater conveyance or treatment outage due to failed assets.

8.2.10. Pumping and Storage Operations and Maintenance Plan

O&M Historic Trends

Operations and maintenance performed by Veolia includes the following functions for pumping, storage and treatment assets:

- Operating treatment plants
- Operating pumping sites
- Investigating faults;
- Resolving problems;
- Service pumps, repairs and replacement;
- Service valve repairs and replacements;
- Responding to and preventing wastewater overflows;
- Reporting and providing information to Council; and
- Implementing quality assurance measures to ensure quality levels are achieved.

Maintenance or reactive renewal requirements are identified following inspections carried out as part of the maintenance contract.

Key Issue	***Priority for this Plan***
Risk data not currently used in formal O&M strategy	*Formalise collection of asset data, condition assessment and criticality in alignment with Council risk policy*
O&M data not integrated with core Council data systems	*Ensure fault data and maintenance records are recorded in a data format that allows for analysis and proactive decision-making*

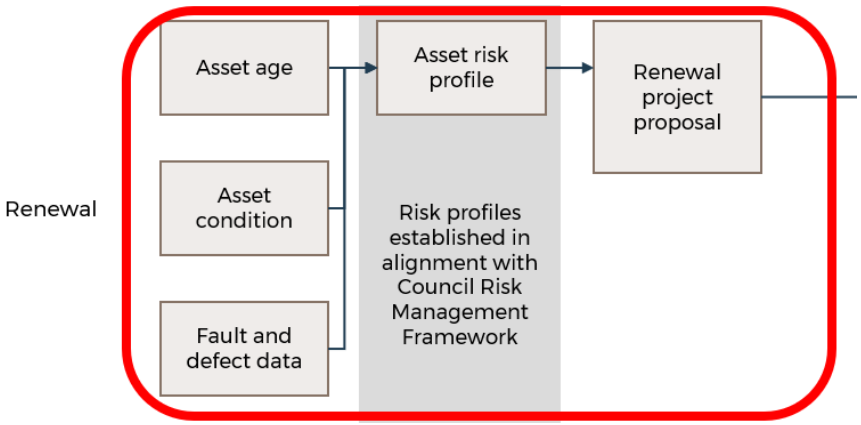
9. Stormwater Lifecycle Management - Renewal

This section details the renewal specific lifecycle management considerations for stormwater. This covers reticulation assets only as there are no assets categorised as “pumping, storage and treatment”.

- Reticulation
  - Pipes: Mains, collector, service connections,
  - Other reticulation: sumps, manholes
  - Open drains and drainage reserves

- Pumping, storage and treatment
  - N/A

This relates to the process below:



The overall objective of the stormwater lifecycle management – renewal plan is:

To manage and maintain the disposal of stormwater in the urban of built up areas of Central Hawke's Bay District.

9.1. Reticulation Lifecycle Management – Renewal Plan

9.1.1. Reticulation Issues and Priorities

Key Issue	*Priority for this Plan*
Helicore pipe failure risk	*Helicore pipe has been collapsing, causing sink holes and poses significant risk. Council is targeting the replacement of all Helicore pipe, however there is uncertainty around which pipes are Helicore. Council has set aside budget for dealing with reactive replacement of Helicore pipe if new failures occur or if Helicore pipe is identified during regular day to day activity. There is also a proactive stormwater condition assessment programme which will help identify the location of Helicore pipe.*
Open drains – maintenance requirements and condition assessment	*Council has an extensive network of open drains and is increasing effort to maintain the condition of the drains. Targeted ongoing maintenance is required to ensure that open drain capacity is maintained, and flood risk is reduced.*

Asset management effort focusses on the assets within the database. This generally comprises piped assets and manholes. The detailed renewal plan focusses on piped assets. The adjacent manholes and sumps can be renewed at the same time as pipe assets and therefor managed as a component of the adjoining pipe.

Further data collection and condition assessment work is needed to proactively manage open drains and drainage reserve assets.

A new renewal framework is being used for the first time for this 2021 AMP to providing greater decision-making transparency. The following criteria is assessed for each pipe in the database:

- Likelihood of Failure
- Consequences of Failure
- Failure Risk
- Replacement cost

The output of the renewal framework is used for two separate purposes.

1. to set an appropriate long-term reticulation renewal budget
2. to provide a prioritised list of renewal candidates on a pipe by pipe basis

9.1.2. Reticulation Overview

Built stormwater schemes

There are two main stormwater networks servicing the towns of Waipawa and Waipukurau. There are also six smaller networks providing varying levels of coverage for the townships of Otane, Takapau, Porangahau, Te Paerahi, Kairakau, and Blackhead Beach. The management or control of stormwater flows elsewhere in Central Hawke's Bay falls under the control of Council's Land Transport section, The Hawke's Bay Regional Council or the private land owner.

The figure below shows the length of pipe installed in the district by diameter. The total length of pipe is 48 km.

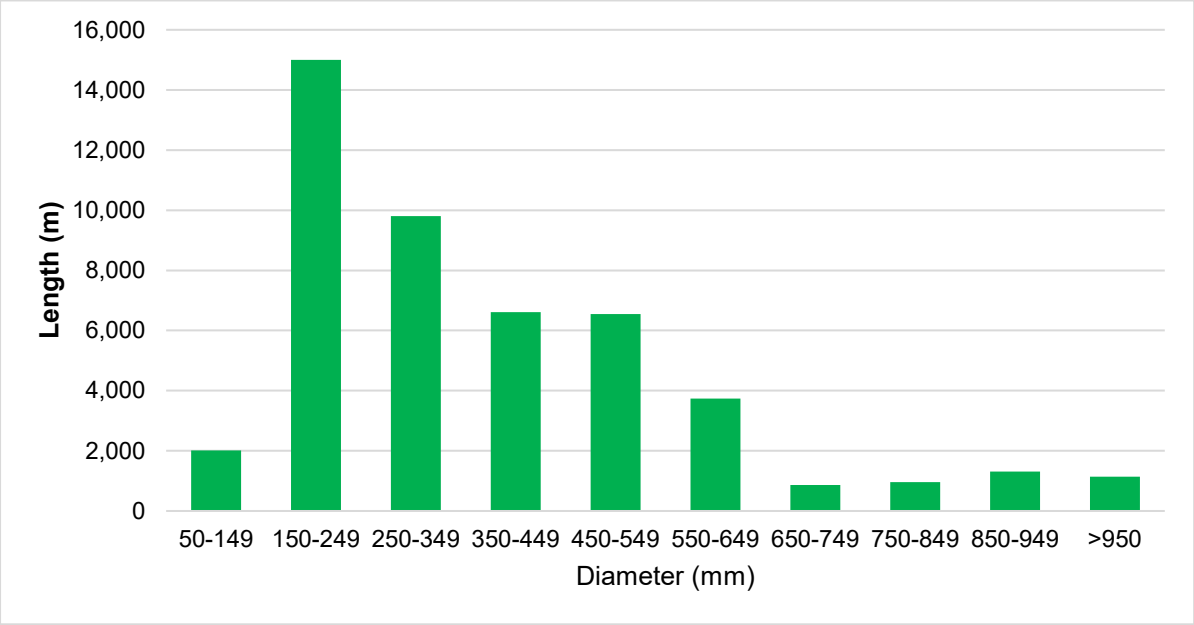


Figure 16

The largest cohort of pipe is 225 mm diameter. There are also significant lengths between 300 and 600 mm diameter.

The figure below shows the length of pipe installed in the district by material.

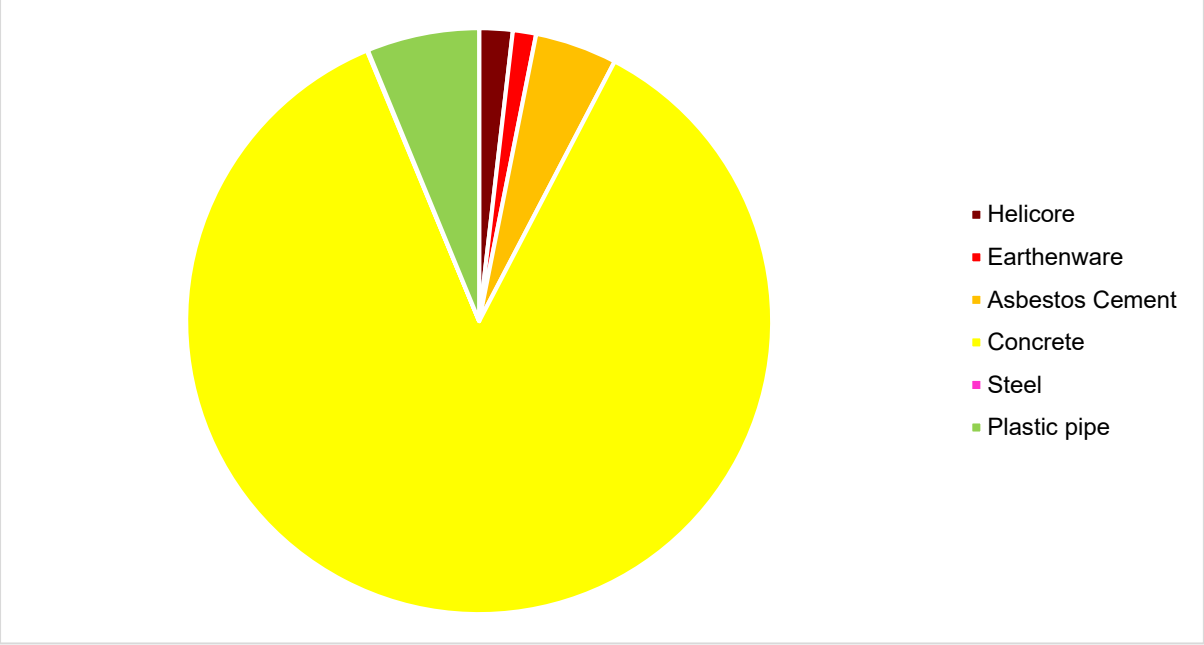


Figure 17

Over three quarters of the pipe network is concrete. The proportions of the network likely to have condition-related performance issues are Helicore, earthenware, and asbestos cement.

The figure shows the distribution of pipes between each community scheme.

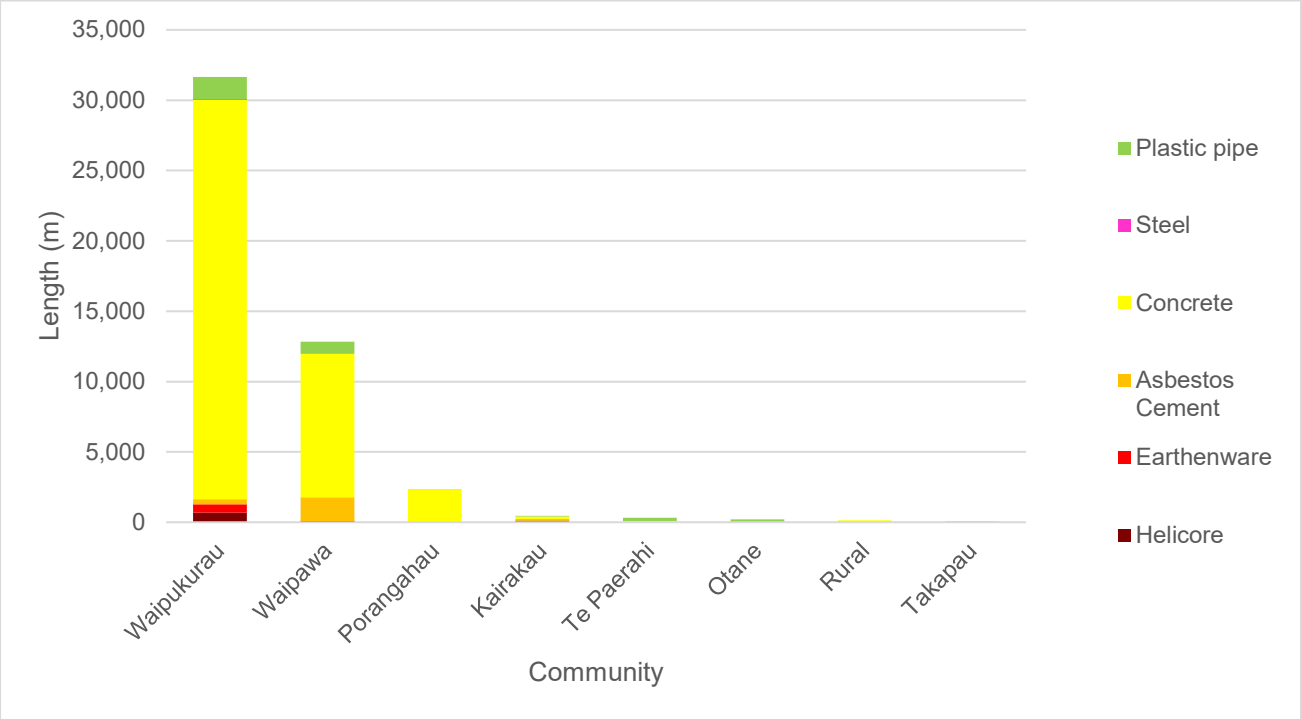


Figure 18

This shows the majority of the network is in Waipukurau and to a lesser extent Waipawa.

9.1.3. Asset Age

The figure below shows the length of pipe installed during different decades and is coloured according to the pipe material.

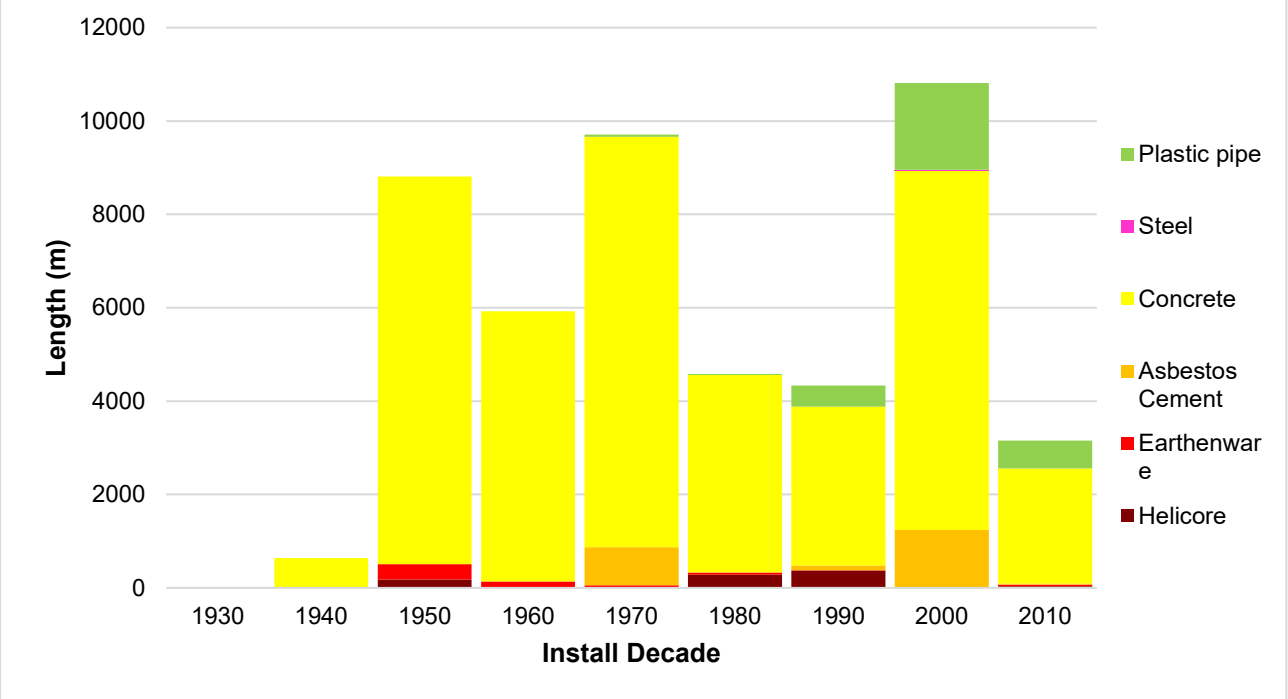


Figure 19

This shows large portions of the network installed in the 1950s, 1970s and 2000s. Concrete pipe has been the predominant material throughout.

Council currently uses asset age as the proxy for determining the likelihood of failure of reticulation assets.

9.1.4. Fault and defect data

Fault and defect data is collected as part of the Operations and Maintenance contract. Historically, failure data has not been collected in a manner where it is associated to individual assets. Therefore, failure data trends are monitored in a general sense rather than to specifically inform renewal strategies. Council has identified failure data improvements as a continuous improvement action within this plan.

9.1.5. Likelihood of failure

The figure below shows the likelihood of failure distribution for stormwater pipes.

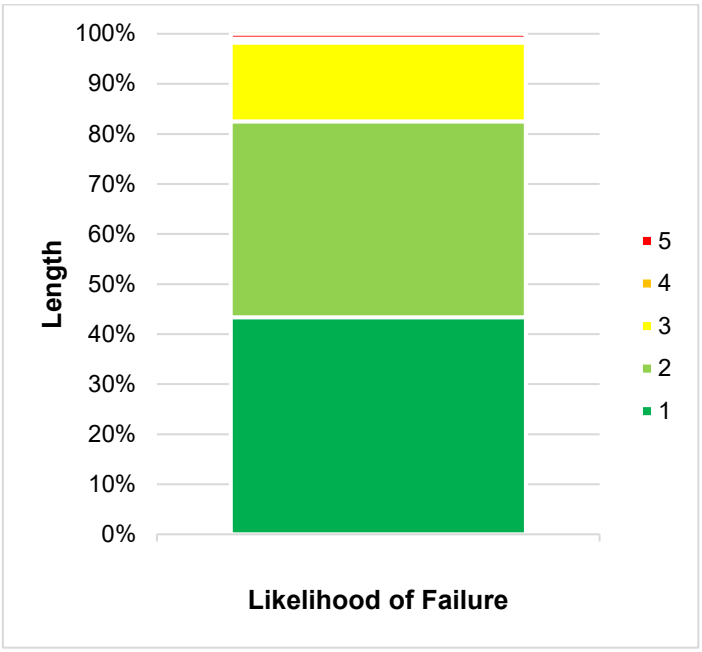
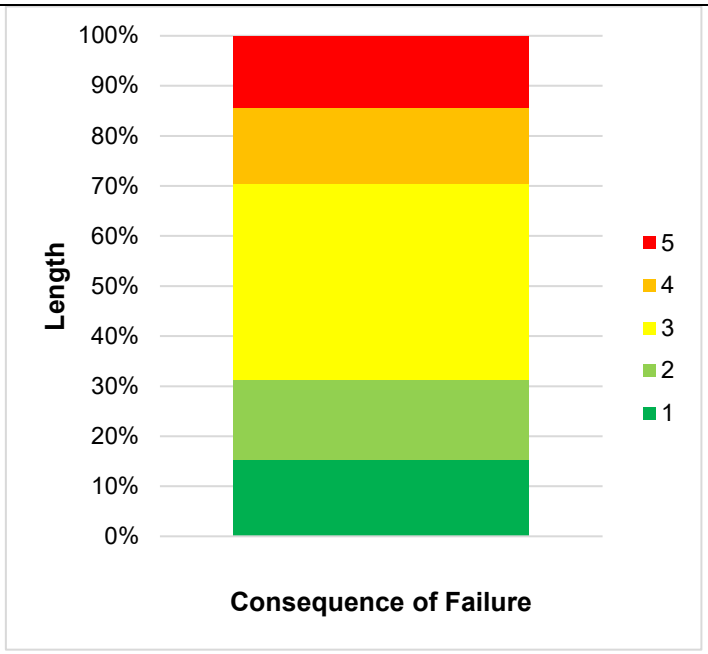


Figure 20

9.1.6. Consequence of failure

Councils criticality framework has been used to determine the CoF for each asset.

The figure below shows the consequence of failure distribution for stormwater pipes.



9.1.7. Failure risk

The risk score is calculated by multiplying the LoF score and the CoF for each asset.

The figure below shows the failure risk profile for stormwater pipes.

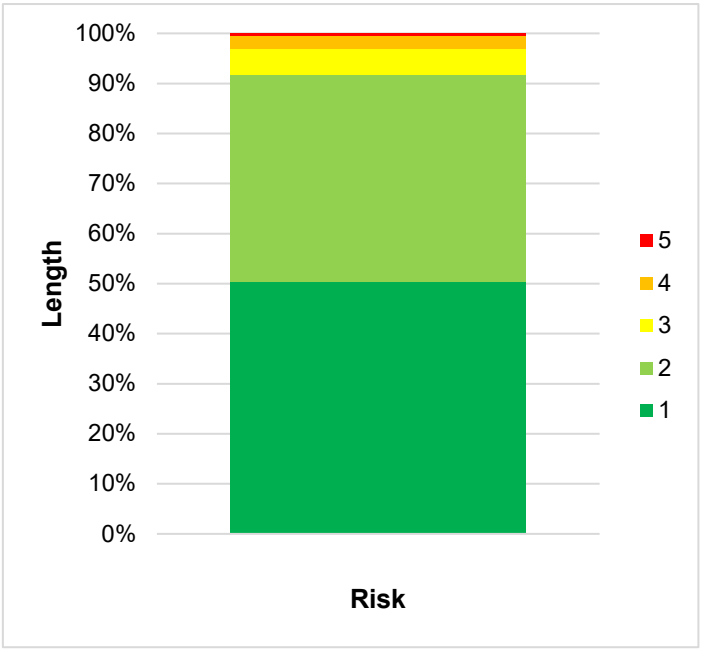


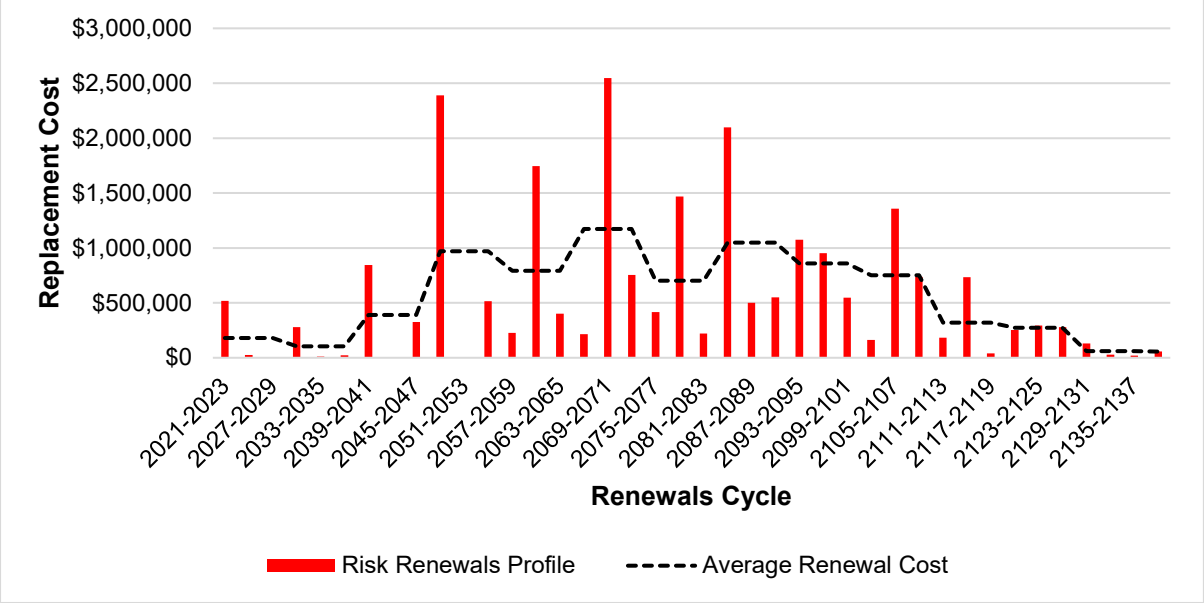
Figure 21

The replacement value of risk category 4 and 5 pipes is:

Risk category	Replacement value
5	$160,000
4	$590,000

9.1.8. Reticulation renewal budget

Few assets have already exceeded their theoretical useful lives. Increased renewal budget is expected beyond 2050 when the older concrete pipes begin to approach the end of their estimated useful lives. Budgets are presented in three year periods. The dotted line provides the renewal budget average of three of these periods (i.e. nine years).



Investing in renewal at the level indicated by the dotted average renewal cost line works out at $180K for the first 3-year period. This investment levels are sufficient to address the very high risk pipes (risk = 5) through renewal over a period of 3 years. At that investment level, the pipes currently assessed as high risk (risk = 4) will be addressed through renewal in the following 9-year period.

9.1.9. Reticulation renewal candidates

The adopted renewal budget determines the rate that pipes are renewed and therefore the time period for addressing pipes with a very high failure risk.

Pipes that are candidates for renewal are selected as part of the following process:

- Assign a renewal priority to each pipe in the database using the risk scores
- Map the location of high and very high risk pipes across the district
- Determine discrete projects to cost effectively address the high risk pipes in each location, taking into account:

- Opportunistic renewal of pipes in the vicinity
- Interaction with Council's road surfacing programme
- Interaction with growth and demand or level of service drivers

The replacement value in each of the renewal priority categories is provided below:

Renewal Intervention	Replacement value
Priority 1	$34,780
Priority 2	$122,449
Priority 3	$280,131
Opportunistic 1	$305,142
Opportunistic 2	$80,432
Do Nothing	$22,100,946
Grand Total	$22,923,879

9.1.10. Reticulation renewal capital programme (in $K)

Financial Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Pipe renewal	$60	$60	$60	$35	$35	$35	$130	$130	$130	$325
Other retic renewal (est 50% of pipe cost)	$30	$30	$30	$18	$18	$18	$65	$65	$65	$162
Reactive pipe renewal (primarily Helicoil)	$150	$150	$150	$150	$150	$150	$150	$150	$150	$150
Condition/materials assessment	$50	$50	$50	$50	$50	$50	$50	$50	$50	$50
Open drain renewal/ maintenance	$200	$200	$200	$200	$200	$200	$200	$200	$200	$200

The reactive pipe renewal will be focussed on responding to replace any known or newly located Helicoil pipe in the network. The condition and materials assessment budget will be used to proactively conduct CCTV condition assessment to validate material and condition grading as well as locate Helicoil pipe. Material and condition validation will be with the Priority 1 and Priority 2 pipes identified above.

Open drain renewal and maintenance is a targeted programme to address the poor state and compromised capacity of the existing open drain network.

9.1.11. Reticulation Operations and Maintenance Plan

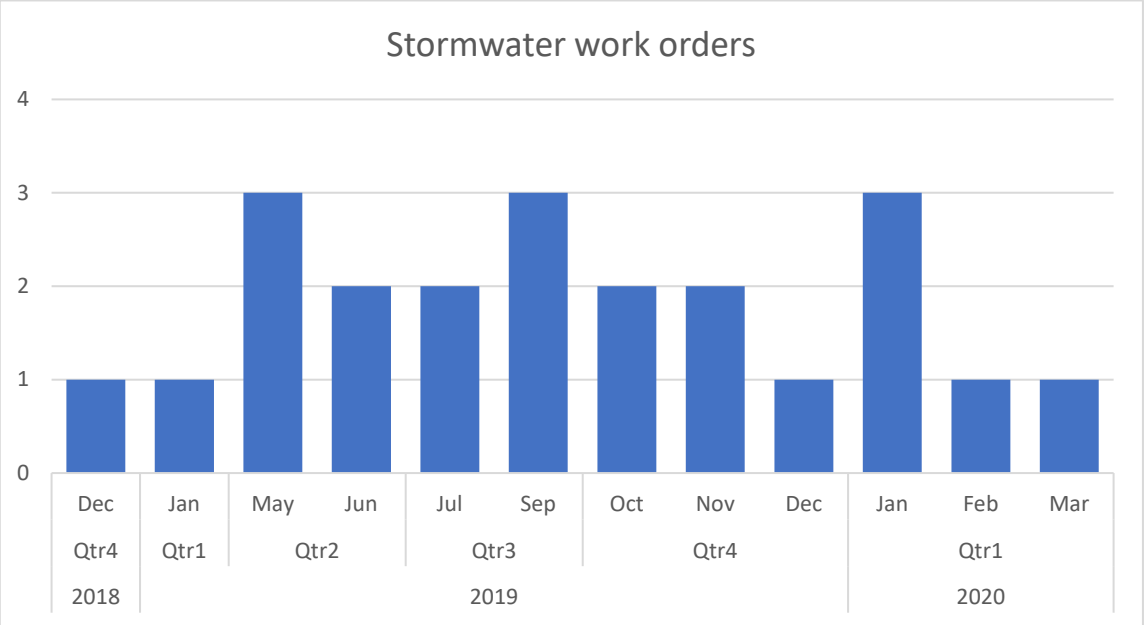
O&M Historic Trends

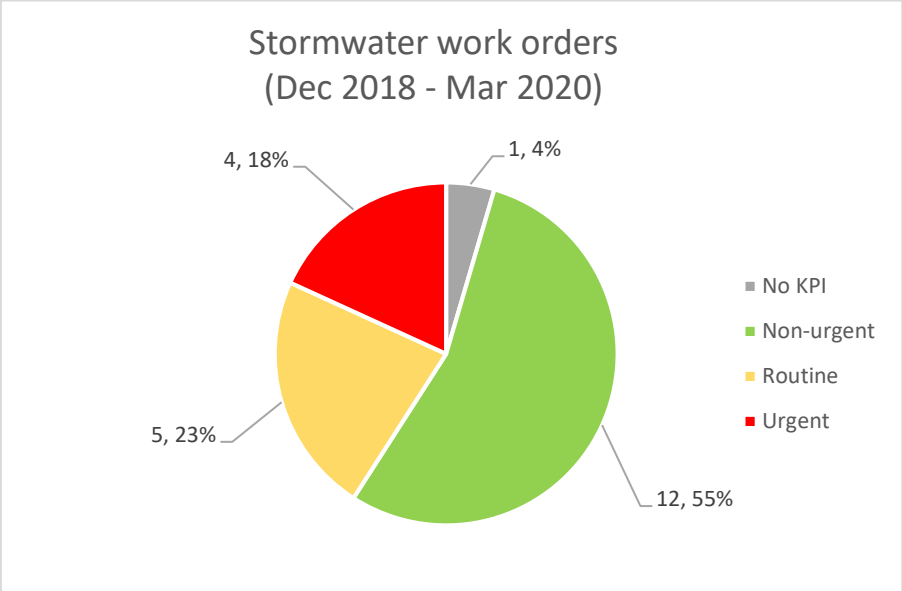
Operations and maintenance performed by Veolia includes the following functions for reticulation assets:

- Investigating faults;
- Resolving problems;
- Stormwater pipe repairs;
- Cleaning, jetting and root cutting
- Manhole repairs
- Reporting and providing information to Council; and
- Implementing quality assurance measures to ensure quality levels are achieved.

Maintenance or reactive renewal requirements are identified following inspections carried out as part of the maintenance contract or following customer service requests or complaints.

The key issues for reticulation assets under the O&M contract include:





Key Issue	***Priority for this Plan***
Helicoil pipes	*Record instances during day to day operation where the location of Helicoil pipe is found*
Open drain maintenance	*Increased renewal and maintenance of open channel drains. This is identified separate from the current O&M contract with Veolia and is part of the renewal capital programme above.*

9.2. Pumping, Storage and Treatment Lifecycle Management – Renewal Plan

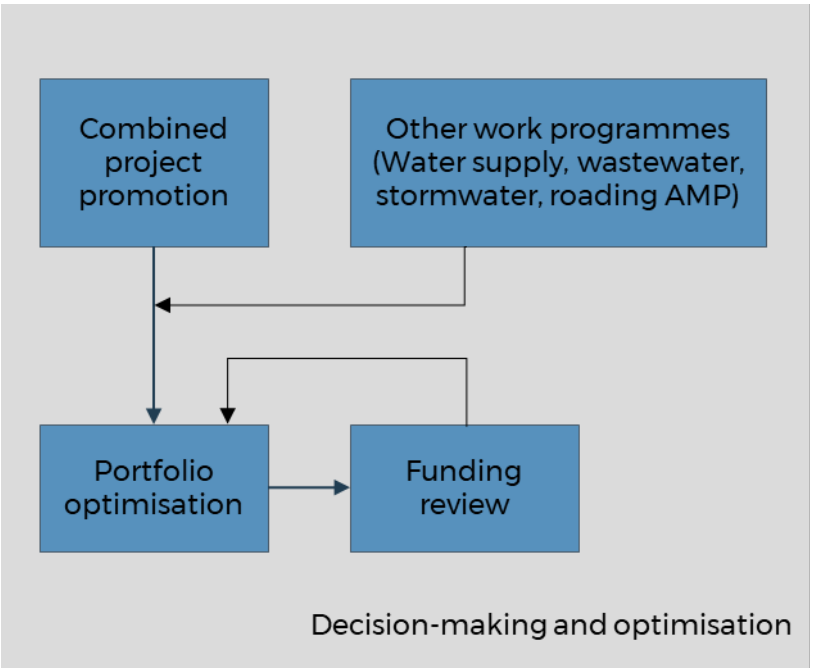
Not applicable. There are no pumping storage and treatment stormwater assets.

10. Financial Requirements

This section outlines the long-term financial requirements for 3Waters activities. Councils Revenue & Financial Policy, Financial Strategy and Development Contributions are outlined. The valuation of the 3Waters assets is summarised

The process adopted in preparing this section is outlined in the figure below. Projects identified in the earlier sections have been combined and the financial requirements summarised. In the earlier sections where the projects were identified consideration was given to other works programmes and portfolio optimised.

A funding review has not yet been completed. This may result in further portfolio optimisation being required which could impact on project selection and the timing of projects and ultimately require refinement of the financial requirements.



10.1. Historic and Projected Financial Statements

The financial statements are in 2020 dollars excluding inflation.

Impacts of Covid-19 – short and longer term

This plan has been prepared without financial prediction of any long-lasting impacts of Covid-19.

10.1.1. Historical Expenditure

The historic water supply activity expenditure is shown in the figures below.

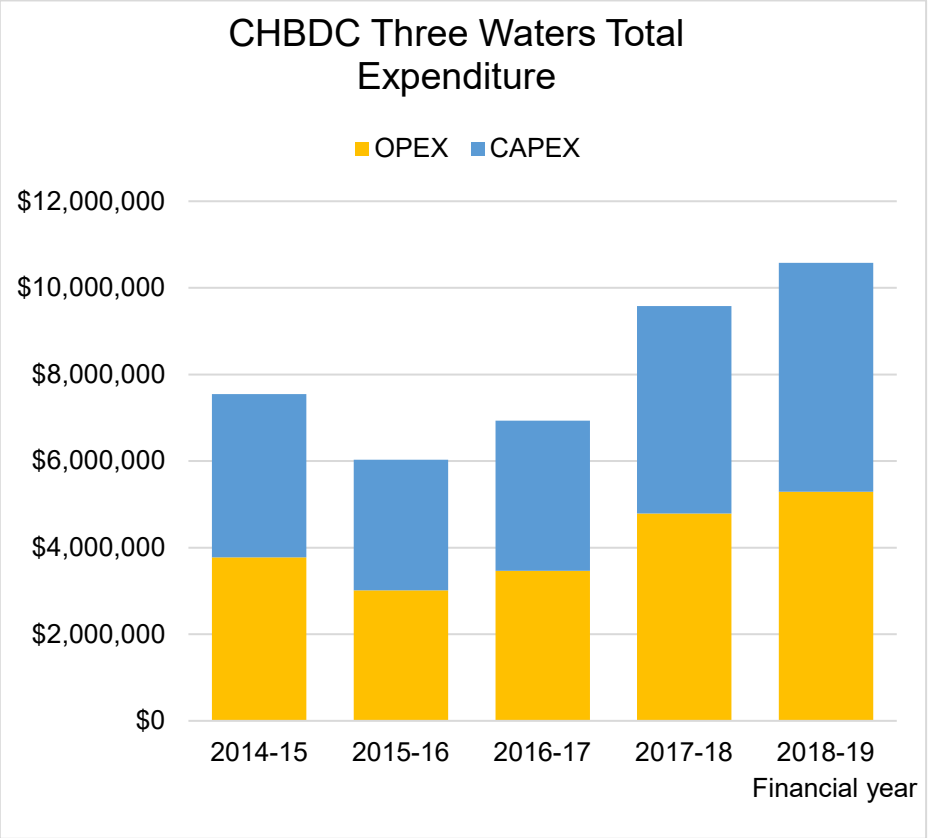


Figure xyz: Historic total expenditure

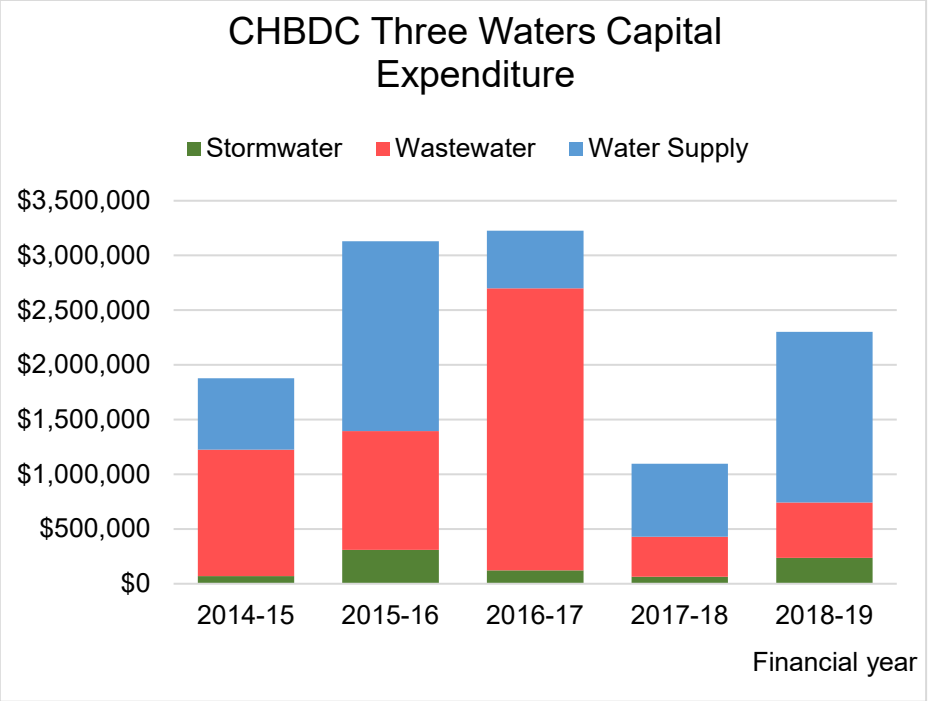


Figure xyz: Historic CAPEX

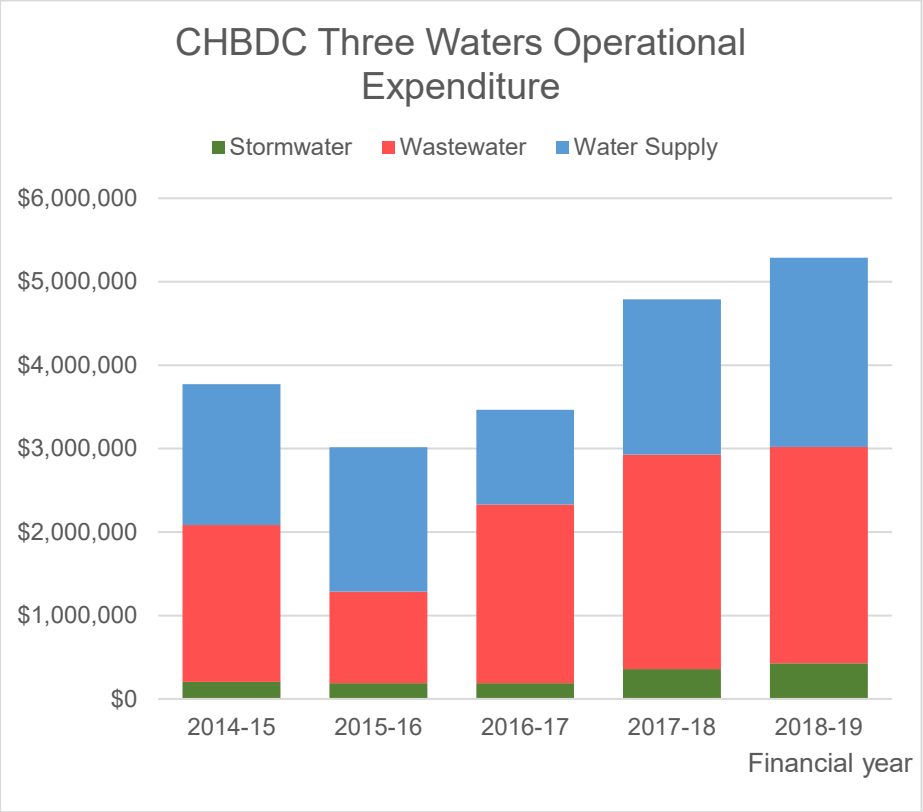
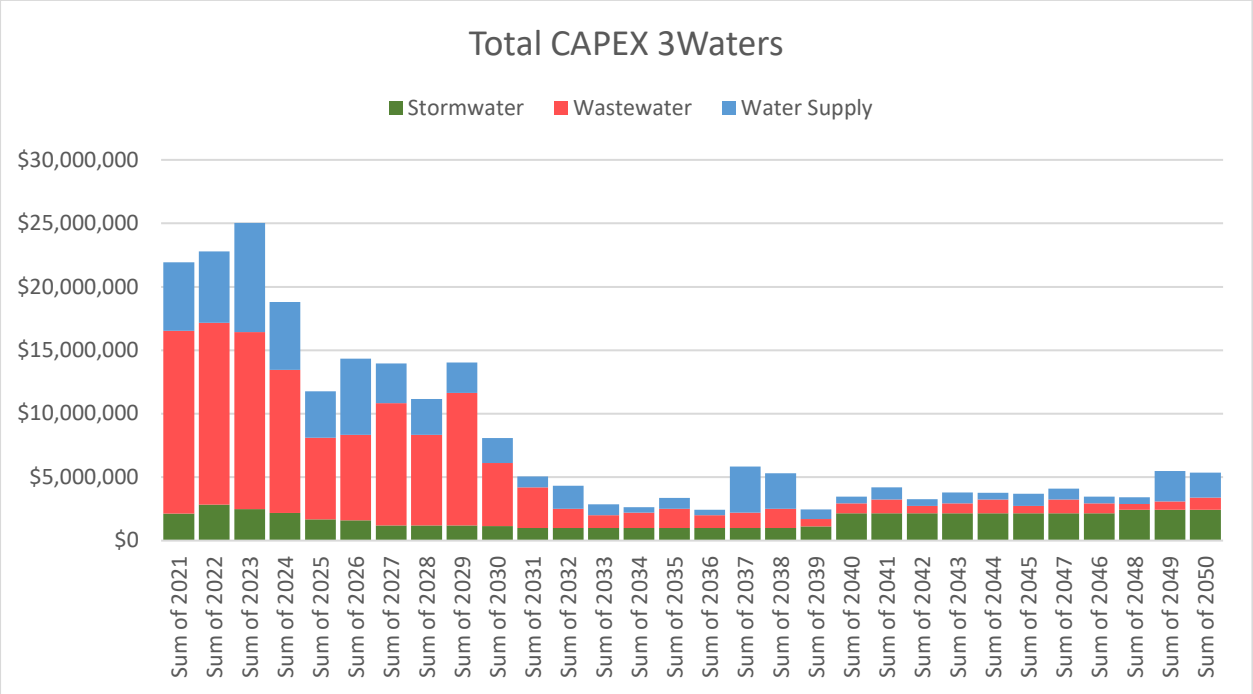


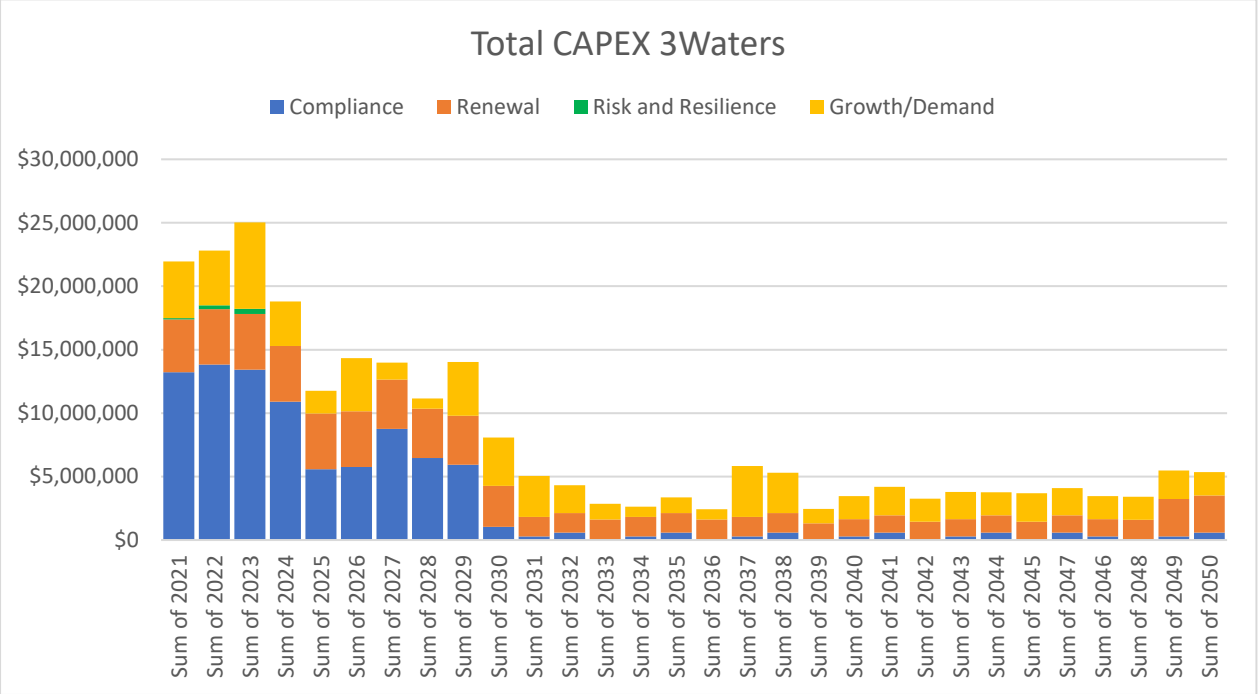
Figure xyz: Historic OPEX

10.1.2. Forecast Capital Expenditure

Future capital expenditure for all 3waters is forecast in the figure below. This provides a breakdown of expenditure based on the different networks.



The figure below provides the same forecast broken down based on the primary drivers for expenditure across all 3waters.

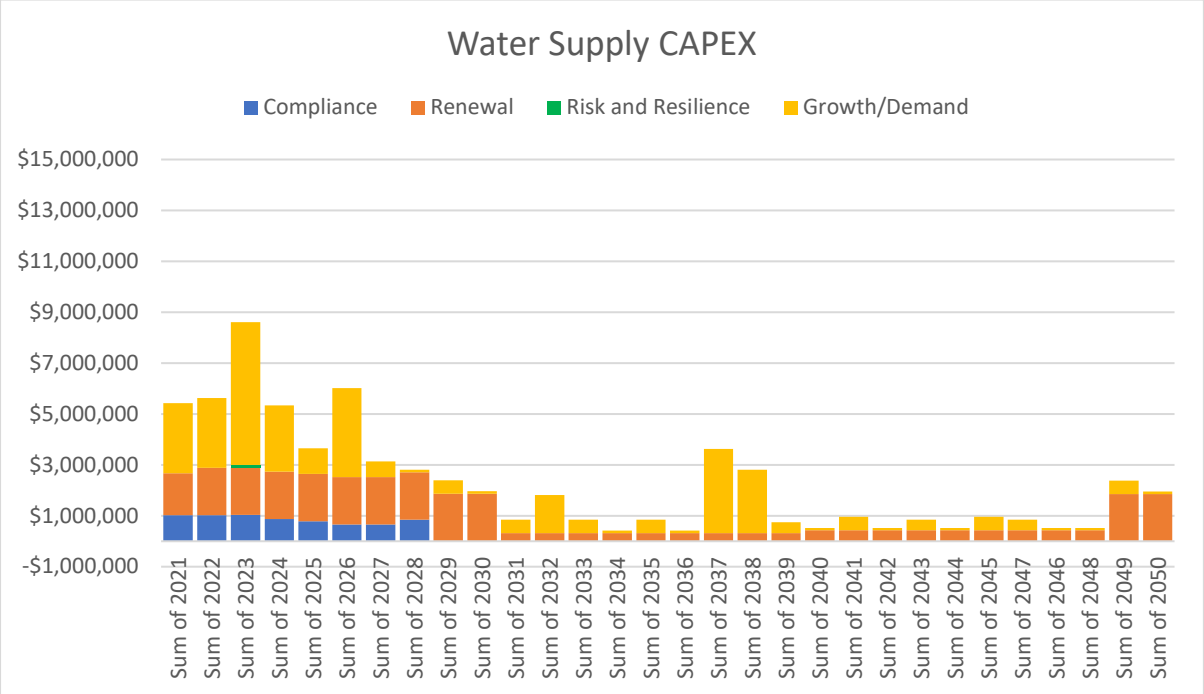


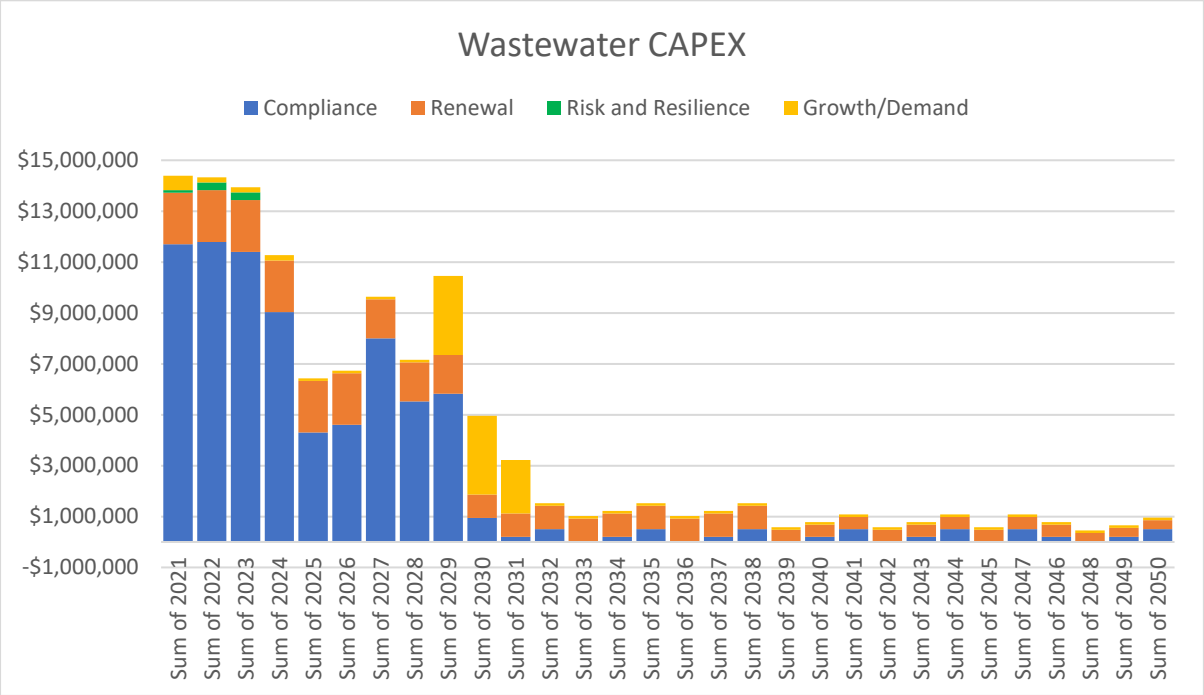
Significant compliance funding is required in the first ten-year period. This is in response to wastewater treatment and discharge upgrades required to meet consents, stormwater catchment management plan development and subsequent programmes, water supply firefighting upgrades and some water supply improvements identified in the Water Safety Plans.

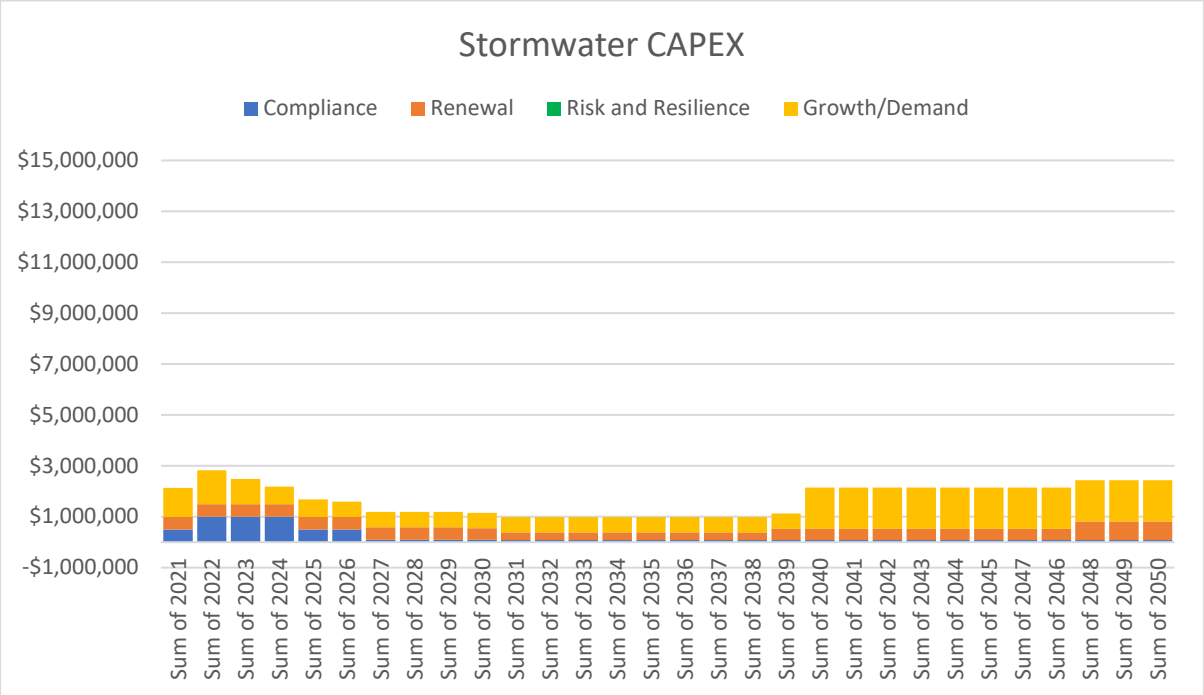
Renewal funding over the first ten-year period is in response to poor condition and high risk AC, galvanised steel and cast iron water supply reticulation, and earthenware wastewater reticulation.

Growth and demand funding over the first ten-year period is primarily in response to sustainable water management; targeting water loss and sustainable customer use.

These trends are presented in the figures below showing the breakdown of forecast capital expenditure in each of the 3 networks. Each figure has the same vertical scale so that relative costs can be compared.

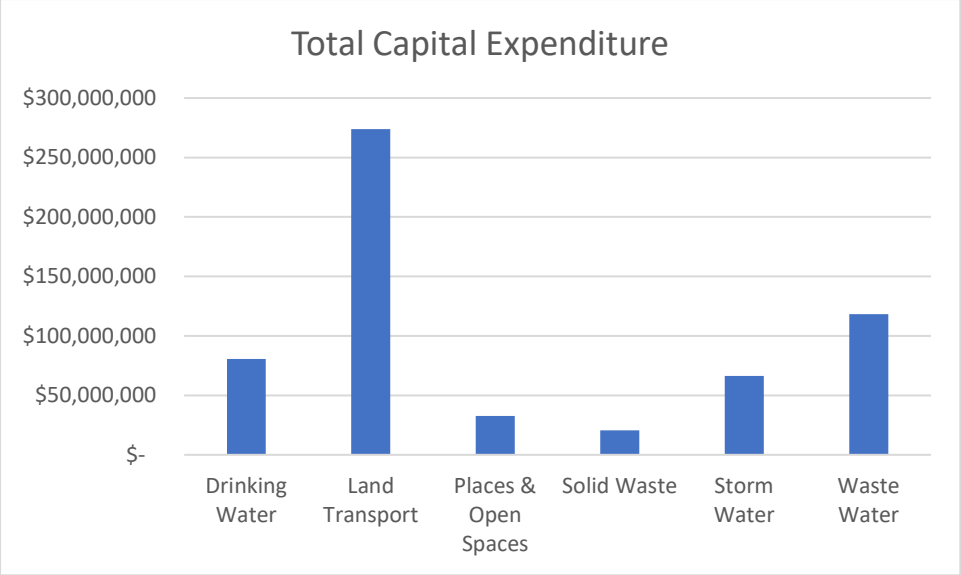






10.2. Summary of Changes following Funding Review

Following an iterative process with Council and alignment with the Financial Strategy, the total expenditure committed to in the draft LTP for public consultation is shown below:



10.3. Revenue and Financing Policy

The Revenue and Financing policy is required under Section 103 of the Local Government Act 2002. Council uses the following mechanisms when funding operating and capital expenditure:

- General rates
- Targeted rates
- Grants and Subsidies

- Interest and Dividend from Investments
- Fees and Charges
- Borrowing
- Proceeds from Assets Sales
- Development or Financial Contributions
- Any other source

The Revenue and Financing policy considers the following elements when setting appropriate funding mechanisms for each activity:

- *Community Outcomes* – the community outcomes an activity will primarily contribute to.
- *Distributions of benefits* – the distribution of benefits between the community as a whole, any identifiable parts of the community and individuals.
- *Timeframes of benefits* – the period in and over which those benefits are expected to occur. For example, the benefits may occur on an ongoing basis, but may also benefit future generations.
- *Contributors to need for activity* – the extent to which actions or inactions of particular individuals or groups contribute to the need to undertake the activity.
- *Costs and Benefits of distinct funding* – the cost and benefits, including for transparency and accountability, of funding the activity distinctly from other activities.

10.4. Financial Strategy

Council has a Financial Strategy that accompanies the Asset Management Plans, Infrastructure Strategy and forms part of the Long Term Plan. The strategy ensures funds are available to maintain each network and ensure an appropriate level of renewals, to provide for growth and demand, to ensure legislative compliance, to improve risk and resilience and to otherwise support the Levels of Services set out in this plan. This funding level is capped due to the limits on rates as highlighted in the Strategy when considering the following factors:

- growth in public debt – principally to fund waste water upgrades,
- limitations on future rate rises,
- and the need to contain costs by maintaining the existing levels of service and existing core services and infrastructure, rather than providing for improvements or additional growth

10.5. Development Contributions

Council requires development contributions from developers under the Local Government Act 2002. Council's policy sets out how the levies are calculated and charged for each required connection.

10.6. Asset Valuation

10.6.1. Asset Valuation Summary

Valuations were conducted by Council staff in June 2017. Opus International Consultants Ltd reviewed and verified the valuation. A summary of the valuation is shown in the following tables.

Water Supply

Community	Asset Class	Total Replacement Cost	Depreciated Replacement Cost	Total Annual Depreciation
Kairakau	Water Mains	$505,950	$351,122	$5,522
	Water Valves, FH etc.	$79,970	$28,616	$1,562
	Water Plant Items	$352,383	$223,579	$6,911
	Connections	$58,775	$34,620	$646
	Reticulation Total	$644,696	$414,358	$7,730
	Plant Total	$352,383	$223,579	$6,911
	Total	**$997,079**	**$637,937**	**$14,641**
Otane	Water Mains	$3,767,608	$3,045,376	$35,932
	Water Valves, FH etc.	$507,325	$335,173	$15,346
	Water Plant Items	$128,756	$104,017	$2,668
	Connections	$16,457	$12,964	$197
	Reticulation Total	$4,291,389	$3,393,513	$51,475
	Plant Total	$128,756	$104,017	$2,668
	Total	**$4,420,145**	**$3,497,530**	**$54,143**
Porangahau	Water Mains	$1,905,501	$1,171,461	$22,951
	Water Valves, FH etc.	$220,254	$146,949	$6,385
	Water Plant Items	$2,299,897	$2,243,869	$29,232
	Connections	$7,053	$11,294	$173
	Reticulation Total	$2,132,808	$3,426,625	$52,355
	Plant Total	$2,299,897	$146,949	$6,385
	Total	**$4,432,704**	**$3,573,574**	**$58,740**
Pourerere	Water Mains	$911,756	$565,277	$9,118
	Water Plant Items	$67,653	$54,534	$912
	Connections	$11,755	$7,195	$116
	Reticulation Total	$923,511	$572,472	$9,234
	Plant Total	$67,653	$54,534	$912
	Total	**$991,164**	**$627,006**	**$10,146**
Takapau	Water Mains	$3,271,204	$2,056,532	$29,386
	Water Valves, FH etc.	$425,313	$188,793	$12,396
	Water Plant Items	$1,426,219	$756,221	$29,457
	Connections	$77,583	$46,156	$859
	Reticulation Total	$3,774,101	$2,291,482	$42,642
	Plant Total	$1,426,219	$756,221	$29,457
	Total	**$5,200,320**	**$3,047,703**	**$72,099**
Te Paerahi	Water Mains	$1,228,885	$973,397	$12,998
	Water Valves, FH etc.	$252,918	$167,727	$7,302

	Water Plant Items	$824,242	$568,939	$21,566
	Connections	$25,861	$19,574	$348
	Reticulation Total	$1,507,664	$1,160,698	$20,649
	Plant Total	$824,242	$568,939	$21,566
	Total	**$2,331,906**	**$1,729,637**	**$42,215**
Waipawa	Water Mains	$12,514,564	$5,431,109	$114,317
	Water Valves, FH etc.	$1,544,393	$707,306	$37,610
	Water Plant Items	$2,442,313	$1,311,203	$43,853
	Connections	$199,835	$86,029	$2,129
	Reticulation Total	$14,258,792	$6,224,444	$154,057
	Plant Total	$2,442,313	$1,311,203	$43,853
	Total	**$16,701,105**	**$7,535,647**	**$197,909**
Waipukurau	Water Mains	$15,508,535	$7,166,323	$171,480
	Water Valves, FH etc.	$3,411,269	$1,358,919	$65,964
	Water Plant Items	$3,702,415	$1,024,891	$45,857
	Connections	$345,835	$153,036	$4,262
	Reticulation Total	$19,265,639	$8,678,277	$241,707
	Plant Total	$3,702,415	$1,024,891	$45,857
	Total	**$22,968,055**	**$9,703,168**	**$287,564**
Quantities	Water Mains	155,027	m	
	Water Valves, FH etc.	6,040	ea	
	Water Plant Items			
	Connections	31,401	m	
District Totals	Reticulation Total	$49,098,496	$26,308,818	$586,232
	Plant Total	$8,943,981	$4,043,383	$151,225
	Total	**$58,042,478**	**$30,352,201**	**$737,457**

Wastewater

Community	Asset Class	Total Replacement Cost	Depreciated Replacement Cost	Total Annual Depreciation
Otane	Wastewater Mains	$3,302,010	$2,506,142	$28,255
	Wastewater Manholes etc	$622,500	$443,975	$6,225
	Wastewater Plant	$1,489,957	$693,556	$28,859
	Connections	$683,726	$487,642	$6,837
	Reticulation Total	$4,608,237	$3,437,760	$41,317
	Plant Total	$1,489,957	$693,556	$28,859
	Total	**$6,098,194**	**$4,131,316**	**$70,176**
Porangahau	Wastewater Mains	$1,007,761	$722,380	$9,807
	Wastewater Manholes etc	$247,500	$175,588	$2,475
	Wastewater Plant	$1,046,340	$423,127	$59,148
	Connections	$284,886	$202,111	$2,849
	Reticulation Total	$1,540,147	$1,100,078	$15,131
	Plant Total	$1,046,340	$423,127	$59,148
	Total	**$2,586,488**	**$1,523,205**	**$74,279**
Takapau	Wastewater Mains	$2,710,630	$1,932,987	$21,927
	Wastewater Manholes etc	$415,035	$275,207	$4,125
	Wastewater Plant	$1,254,257	$443,026	$39,704
	Connections	$539,927	$190,712	$17,091
	Reticulation Total	$3,665,592	$2,398,906	$43,144
	Plant Total	$1,254,257	$443,026	$39,704
	Total	**$4,919,849**	**$2,841,932**	**$82,847**
Te Paerahi	Wastewater Mains	$1,055,216	$832,956	$8,786
	Wastewater Manholes etc	$1,250,555	$757,299	$37,657
	Wastewater Plant	$195,000	$141,375	$1,950
	Connections	$341,863	$247,851	$3,419
	Reticulation Total	$2,647,634	$1,838,106	$49,861
	Plant Total	$195,000	$141,375	$1,950
	Total	**$2,842,634**	**$1,979,481**	**$51,811**
Waipawa	Wastewater Mains	$11,375,232	$5,698,305	$80,119
	Wastewater Manholes etc	$2,140,616	$1,172,221	$18,502
	Wastewater Plant	$6,318,017	$4,312,810	$200,691
	Connections	$2,327,926	$1,589,090	$73,946
	Reticulation Total	$15,843,774	$8,459,617	$172,568
	Plant Total	$6,318,017	$4,312,810	$200,691
	Total	**$22,161,791**	**$12,772,426**	**$373,259**
Waipukurau	Wastewater Mains	$20,958,295	$8,633,954	$209,759
	Wastewater Manholes etc	$4,383,630	$1,881,610	$44,367
	Wastewater Plant	$10,692,394	$8,008,681	$316,915
	Connections	$5,285,314	$2,268,645	$53,493
	Reticulation Total	$30,627,238	$12,784,209	$307,618
	Plant Total	$10,692,394	$8,008,681	$316,915

	Total	**$41,319,632**	**$20,792,890**	**$624,533**
Quantities	Wastewater Mains	84,530	m	
	Wastewater Manholes etc	2,457	ea	
	Wastewater Plant			
	Connections	17,697	m	
District Totals	Reticulation Total	$58,932,622	$30,018,676	$629,638
	Plant Total	$20,995,966	$14,022,575	$647,267
	District Total	**$79,928,588**	**$44,041,251**	**$1,276,905**

Stormwater

Community	Asset Type	Total Replacement Cost	Depreciated Replacement Cost	Total Annual Depreciation
Kairakau	Stormwater Mains and Open Drains	$229,331	$159,071	$3,946
	Stormwater Manholes	$45,519	$40,710	$455
	Total	**$274,850**	**$199,780**	**$4,401**
Otane	Stormwater Mains and Open Drains	$82,892	$64,347	$889
	Stormwater Manholes	$14,334	$12,315	$143
	Total	**$97,226**	**$76,662**	**$1,032**
Porangahau	Stormwater Mains and Open Drains	$1,072,242	$949,146	$10,850
	Stormwater Manholes	$473,507	$418,364	$4,735
	Total	**$1,545,749**	**$1,367,510**	**$15,586**
Blackhead	Stormwater Mains and Open Drains	$67,153	$58,368	$703
	Stormwater Manholes	$11,015	$9,781	$110
	Total	**$78,168**	**$68,149**	**$813**
Takapau	Stormwater Mains and Open Drains	$90,175	$50,916	$1,601
	Stormwater Manholes	$15,793	$12,858	$158
	Total	**$105,968**	**$63,775**	**$1,759**
Te Paerahi	Stormwater Mains and Open Drains	$142,373	$103,976	$1,424
	Stormwater Manholes	$4,778	$3,699	$48
	Total	**$147,151**	**$107,675**	**$1,472**
Waipawa	Stormwater Mains and Open Drains	$6,581,915	$4,498,668	$69,272
	Stormwater Manholes	$1,581,332	$1,000,412	$15,813
	Total	**$8,163,247**	**$5,499,080**	**$85,085**
Waipukurau	Stormwater Mains and Open Drains	$13,815,975	$7,680,216	$141,600
	Stormwater Manholes	$3,178,273	$1,858,834	$31,809
	Total	**$16,994,248**	**$9,539,051**	**$173,409**
Quantities	Stormwater Mains	39,577	m	
	Service Lines	918	m	
	Stormwater Open Drains	17,311	m	
	Catchpit Leads	199	m	
	Stormwater Manholes	1,404	ea	
District Totals	**Total**	**$27,406,608**	**$16,921,681**	**$283,556**

10.6.2. Asset Valuation Data Confidence

In 2020 Council was part of an exercise across all four Councils in the Hawke's Bay region to compare valuation methods and financial models. The intent of this process was to identify differences between Councils to ensure any future regional organisation structure provided fair and equitable regionalisation of costs and debts. As part of this process, Council's 2017 valuation data and practice was assessed. A summary of this assessment is provided in the table below. Council's data and processes were found to be reliable and appropriate to the size of their networks.

Council	Overall valuation confidence	Valuation date	Valuation and data management practices
CHBDC	Reliable	30 June 2017	• Underlying data capture and management processes appear to be appropriate for the size of the network. • Valuation process completed in-house in accordance with national accounting and valuation requirements. • Unit rates component peer reviewed by external consultant.

10.7. Accounting Financial Systems

Financial management processes are carried out through Council's Financial Management system. Costs are recorded against specific general ledger funding categories as they are incurred. The accounting system is an accrual accounting system, which backdates the expenditure to the financial year in which it is occurs. For asset management purposes, and accounting purposes, expenditure is divided into four categories:

Category	Description
Operational	Activities which have a no effect on asset condition but are necessary to keep the asset utilised appropriately (e.g. power costs, overhead cost, etc).
Maintenance	The on-going day-to-day work required to keep assets operating at required service levels, i.e. repairs and minor maintenance.
Renewal	Significant work that restores an existing asset to its original size, condition or capacity.
Capital Work. (also called development, new works)	Works to create a new asset, or to upgrade or improve an existing asset beyond its original capacity or performance, in response to changes in usage, customer expectation, or anticipated future need.
Disposal	Any cost associated with the disposal of a decommissioned asset. (Most times the asset is

	destroyed or abandoned as part of the renewal work and therefore included in the renewal costs).

11. Continuous Improvement

11.1. Asset Management Maturity

11.1.1. Historic asset management maturity

In 2010 Council adopted a "Core-plus" as the desired level of asset management maturity.

The 'Core' approach for Asset Management Plans can be typified as 'top down' with decisions made using simple analysis processes using data relating to a low level of asset component breakdown.

The core approach covers all elements of asset management planning but at a relatively simple level such as:

- Risk management includes identification of critical assets.
- Asset registers have low level of component breakdown.
- Decision-making based on simple benefit-cost processes for major decisions rather than more detailed multi-criteria analysis.
- Levels of service generally defined on historical performance.
- Financial forecasts based on broad assumptions.

11.1.2. Asset management planning capability review

In 2019 Council engaged external consultants Gatland Consulting Ltd to review the asset management planning capabilities of Central Hawke's Bay District Council to identify opportunities for improvement, support the development of the 2021 asset management plans, and build asset management capability in the organisation.

The key findings from this review that relate to 3Waters are reproduced below:

Making progress with #bigwaterstory (2018-2020) and new contracted maintenance provider

Management of the three-waters asset portfolio is undergoing significant change with the introduction of Veolia as the contracted maintenance provider. CHBDC and Veolia are making progress in getting on top of operational risks, including managing compliance with drinking water standards, and establishing a preventive maintenance baseline. There is also a pipeline of major capital work underway or being planning as part of the #bigwaterstory programme.

Need to better understand asset risk profile in a systemic and documented way

There is minimal guidance for asset planning for the three-waters portfolio at this time, and much of the work currently underway has been raised to address compliance risk. Planning practices that have been applied in the past have not been documented and therefore personnel changes have resulted in decision-making rationale being lost. A stocktake is required to identify information that is available to start to build up an understanding of the asset risk profile, and this information needs to be used in a systematic way to begin to identify

forward work requirements. The approach taken must be documented to support continual improvement.

Asset information strategy needed

As a basic planning system is established, a strategy to ensure asset information requirements of the system are supported will be needed. This will need to consider what information is needed, as well as quality requirements, and how these requirements can be met on a sustained basis (i.e. processes and systems for the lifecycle management of the information asset). Without this work any improvements to the planning system will be limited in their effectiveness.

11.2. 2018 AMP Improvement Plan

In the previous 2018 AMPs Council identified the following improvement areas:

1. Data collection and refinement of existing data.
2. Data storage, manipulation, accessibility and display.
3. Analysis of known information.
4. Forward planning for operations, maintenance renewal and improvements.
5. Defining and meeting levels of service.

Improvements 1 and 2 above relate to the 2019 Gatland Consulting Ltd findings above, and the recommended improvement in the section below relating to **Three-waters asset information strategy**

Improvements 3 and 4 above relate to the 2019 Gatland Consulting Ltd findings and recommendation for a **Three-waters planning system.**

More detail on the 2018 AMP improvement plan areas is provided below.

11.2.1. Data collection and refinement of existing data

While all of the known assets are recorded in the AssetFinda database, work needs to continue on the capture of asset attributes and on the verification of the accuracy of information.

Continuing to undertake conduct condition assessment using CCTV to support condition grading and risk assessment.

11.2.2. Data storage, manipulation, accessibility and display

Ensure financial projection data for the renewal programme is not duplicated under other categories of the capital programme.

Update valuation data.

11.2.3. Analysis of known information

Existing hydraulic models need to be updated to provide effective analysis for decision making.

11.2.4. Forward planning for operations, maintenance renewal and improvements

Planning of renewal works is currently reactive based on observed failure. Work is needed to transition to proactive renewal planning and prioritisation.

Identification of assets that have high condition-related failure risk that are not flagged using an age-based process.

Provide a strong justification for renewal expenditure to ensure that funding is prioritised.

Relate risk assessment in 3Waters to the corporate risk framework.

Improve forward prediction of operation and maintenance costs to account for impacts due to the capital programme.

11.2.5. Defining and meeting levels of service

The Development Contributions Policy needs review to ensure that the policy reflects the financial constraints in accommodating new infrastructure for new developments.

Levels of service require update with community consultation to ensure that key measurements and drivers reflect Council and the community's expectations.

11.3. Progress to date on historic improvement plan

Progress has been made on the following 2018 AMP improvement items

11.3.1. Data collection and refinement of existing data

Veolia conducted a condition assessment on pumping, storage and treatment assets at the beginning of their contract period in 2018. This also included a criticality assessment and inventory check. This assessment provides the most up to date asset data for pumping, storage and treatment assets.

11.3.2. Forward planning for operations, maintenance renewal and improvements

A new renewal framework is being used for the first time for this 2021 AMP to provide greater decision-making transparency. The framework provides a documented assessment of condition related failure risk. The output of the renewal framework is used to set reticulation renewal budgets and to provide a prioritised list of renewal candidates based on individual pipe risk.

The renewal process (reference diagram from intro section) has been developed and followed in the 2021 AMP as a basic building block to approach asset management planning in a systematic way.

11.4. 2019 Gatland Consulting Ltd Recommendations

The 2019 asset management planning capability review recommended to focus on two improvement areas:

1. **Asset management planning - Three-waters planning system**
2. **Asset management system support and enablement -Three-waters asset information strategy**

These are described in detail in the asset planning review report and are included in the 2021 AMP improvement plan below.

11.5. Consolidated 2021 Improvement Plan

The seven themes below are a consolidation of previous and new recommendations.

1. 3Waters planning system - embed the documented approach

2. 3Waters asset information strategy - inventory, condition, failure, financial data improvement programme
3. 3Waters business case template - standard approach for project proposal and selection
4. Climate change and natural hazard risk response - improvement programme
5. Level of service and customer engagement - improvement programme
6. Risk register and risk ownership – improvement programme

The improvement requirements under these themes are described below.

1. 3Waters planning system - embed the documented approach

A new 3Waters planning system has been used in the development of this 2021 AMP. This approach requires ongoing improvement and commitment to become embedded as a core Council process. This task is about developing, applying, and then re-documenting this approach so that it can be improved in the future. It will provide a clear statement of the asset information requirements for asset planning (which will evolve as the sophistication of the planning system evolves). This will also inform the priority of data improvements required under the next theme.

2. 3Waters asset information strategy - inventory, condition, failure, financial data improvement programme

An improvement to the quality and usability of asset data is needed to support Council's asset management decision-making confidence. Several specific asset data or information sets require improvement; however, an overarching asset data strategy is first needed. The asset information strategy will define the purpose of asset data and the specific parts of the asset management planning system supported by each dataset. The strategy will detail how information requirements will be met on a sustainable basis through the implementation of appropriate processes and information systems, provision of resources and competent people.

The following information is the initial focus of the strategy:

- Inventory and physical properties
- Condition
- Failure events
- Financial data

Asset information will support decisions on individual assets as well as portfolio-wide management decisions. This requires data to be attributable to individual assets within Council's core asset data management system. Operation and maintenance staff will record fault data in a manner where it can be easily used to inform renewal decision making and performance monitoring.

3. 3Waters business case template - standard approach for project proposal and selection

A consistent documented approach is required during the project promotion, optimisation and selection process of the asset management planning system. This approach will use the language of the planning system with reference to issues and drivers, risk, costs (CAPEX and

OPEX), and benefits. A standard format of identifying and assessing benefits with respect to the organisational and 3Waters activity objectives is required.

4. **Climate change and natural hazard risk response - improvement programme**

Additional investigation is required prior to Council providing a comprehensive programme of works to meet the challenges of climate change adaption and mitigation. Commitment to a climate change response improvement programme allows Council to further progressed leading into the 2024 LTP planning cycle to identify a preferred strategy and supporting budget for responding to climate change impacts to the 3Waters activities.

5. **Level of service and customer engagement - improvement programme**

Setting levels of service requires conversation with Council and community to ensure that expectations are clear, and trade-offs are understood. Refreshing Council's levels of services objectives for 3Waters requires a programme of community consultation which will form the basis of this improvement programme.

6. **Risk register and risk ownership – improvement programme**

The current risk registers and risk ownership process are not well integrated into the asset management planning process. Commitment to a risk improvement programme allows alignment of asset planning risk assessment, with day to day risk management and also Council's corporate risk management framework. This will bring consistency to risk based decision-making and will allow for significant activity risks to be addressed through the asset management planning system.

11.6. Resourcing and programme

Improvement theme	Priority	Timeframe	Resourcing strategy	Cost
3Waters planning system - embed the documented approach	Very High	2020 Begin Review annually 2023 Increase sophistication	90% Internal 10% External audit and support	$25 k annually, or 0.25 FTE
3Waters asset information strategy - inventory, condition, failure, financial data improvement programme	Very High	2020 immediate changes to fault data recording 2021 Strategy complete 2022 Using improved inventory, condition, failure and financial data sets for decision-making	50% Internal 50% External	$150 k+ annually for Internal data stewards, external support, software and systems upgrade
3Waters business case template - standard approach for project proposal and selection	High	2021 Template developed and used for annual plan 2023 Template used in AMP development	20% Internal 80% External	$50k initially, negligible ongoing cost

Climate change and natural hazard risk response - improvement programme	High	2021 High level risk and impact assessment 2022 Scenario options developed 2023 Decision on any large-scale responses	20% Internal 80% External	$100k annually to cover internal and external costs
Level of service and customer engagement - improvement programme	Medium	2022 Plan community engagement for level of service reset 2023 Conduction community engagement and reset levels of service	50% Internal 50% External	$50k 2022 $250k 2023
Risk register and risk ownership – improvement programme	Medium	2021 Begin Review annually	90% Internal 10% External audit and support	$25 k annually, or 0.25 FTE

11.7. Monitoring and review

The improvement programme will be reviewed 6 monthly in July and January each year by the Group Manager - Community Infrastructure and Development. The review will assess progress, adjust priorities, and manage resources, costs and programme.