



THREE WATERS

2021-2031

- Asset Management Plan -

Quality Assurance

Waikato



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Part I: Introduction

The Three Waters Asset Management Plan is a 10-year Strategic Plan which shows our vision and steps we will take to get there.

The audience for this plan includes our Three Waters customers, stakeholders, Council representatives, Council staff, contractors, consultants, ratepayers and residents who will take an interest in current and future levels of service we will be providing in respect of Three Waters assets.



I Background

I.1 Our Vision and Values

The Waikato District Council’s **Vision Statement** is ‘Liveable, Thriving and Connected Communities’, this is essentially about creating ‘liveable communities’ that provide for a wide range of residential options, which gives everyone a sense of belonging in the district. ‘Thriving communities’ strongly supports community-led projects and participation in Council decision-making. ‘Connected communities’ have fit-for-purpose infrastructure through roads, cycle ways, walkways and digital capabilities that enable liveable and thriving communities.

The Waikato District Council’s **Values** are:



Figure 1: Waikato District Council Values

1.2 Our District

The Waikato district borders Hamilton City from the north, east and west and covers more than 400,000 hectares of land, despite this significant size, it resides a relatively small population of 63,678. The key towns within the district are Raglan, Huntly, Ngaruawahia, Tuakau and Te Kauwhata. Smaller settlements include Gordonton, Matangi, Tamahere, Meremere, Port Waikato and Pokeno.

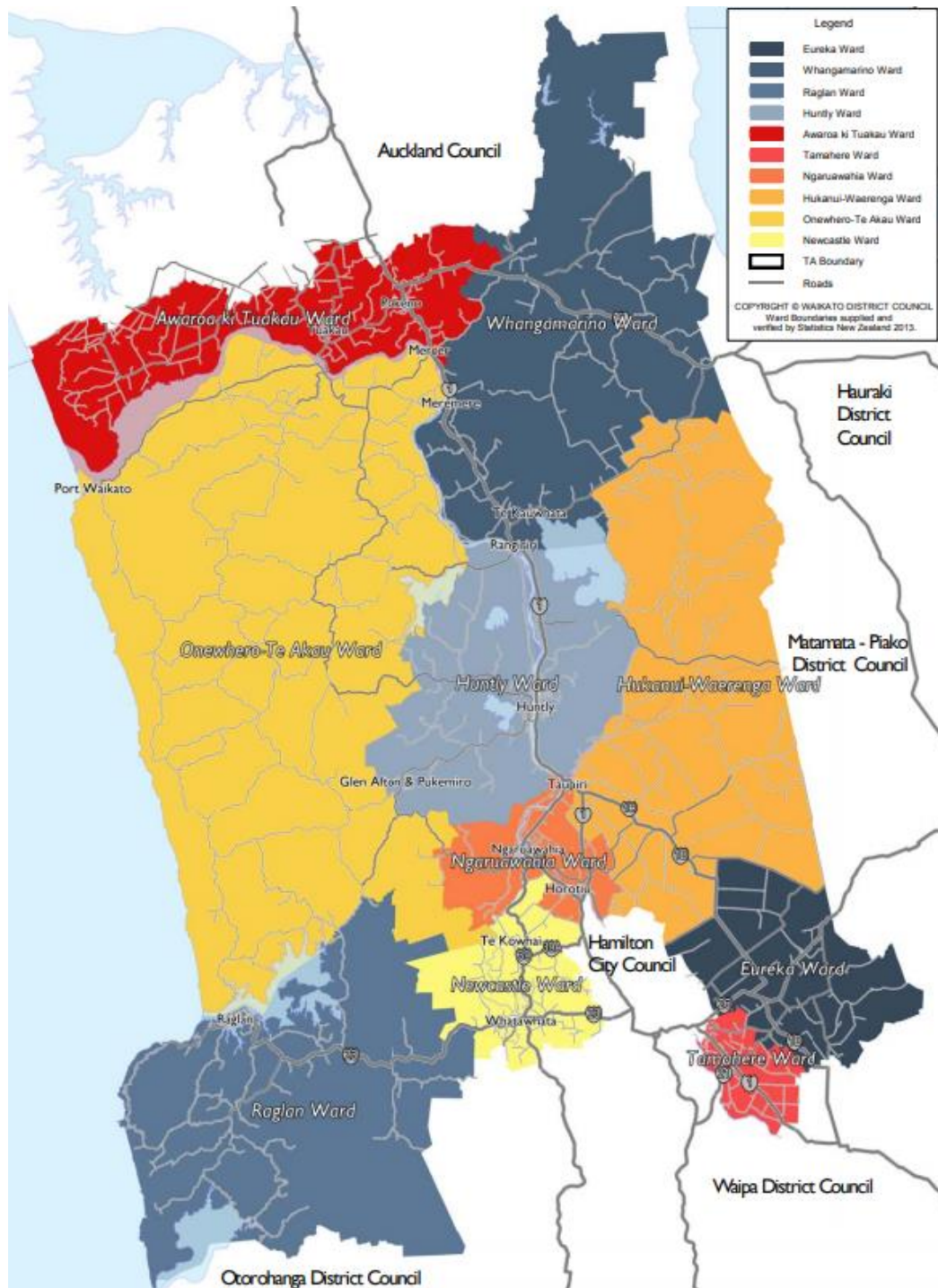


Figure 2: The Waikato District 2019

I.3 How does this plan interact with other Plans and Documents?

Waikato District has a number of key internal and external strategic documents in place that govern many of its activities. These relate to, and will assist, in working towards the achievement of the community outcomes.

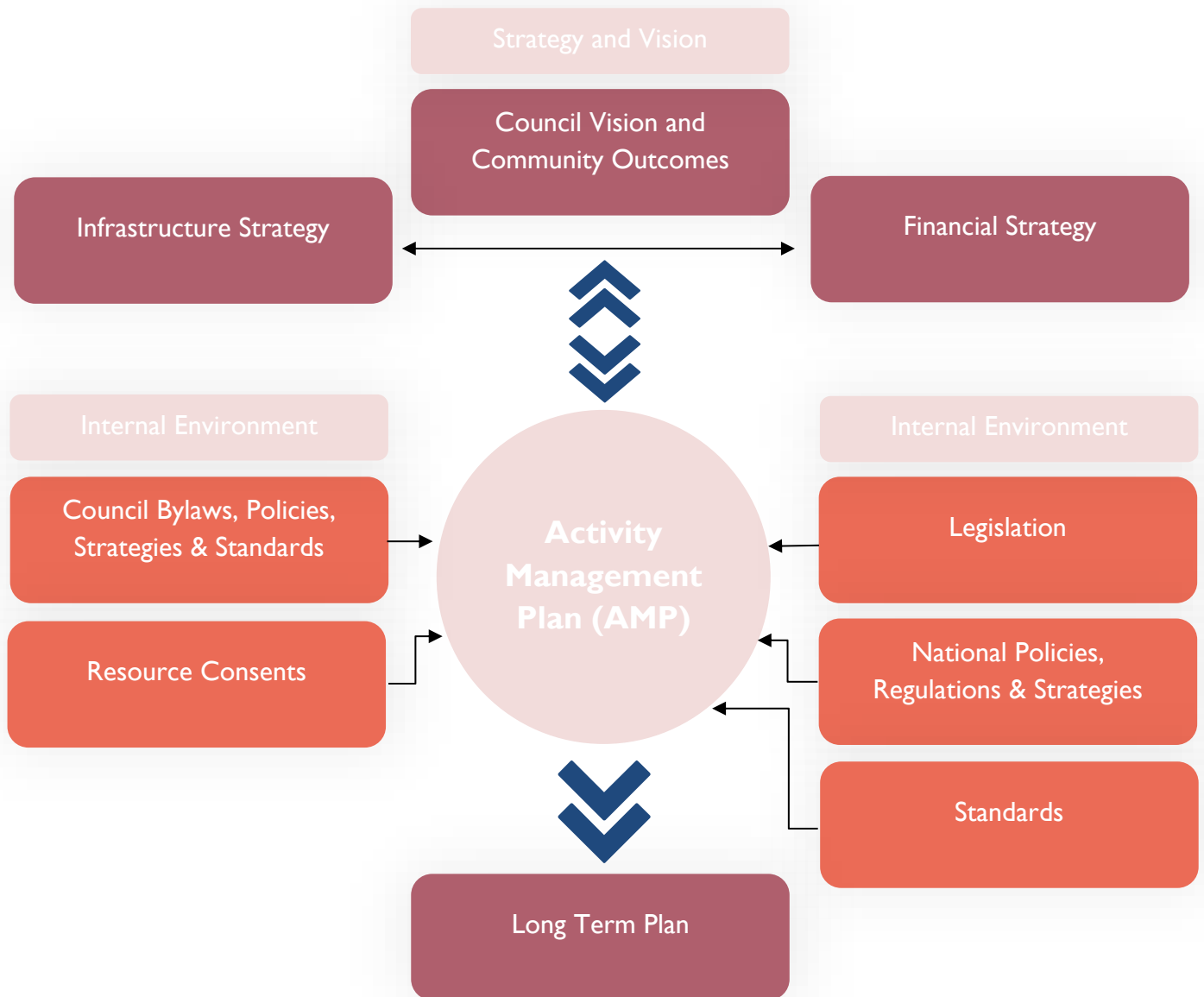


Figure 3: Relationship between the AMP and other documents

Asset Management Plan (AMP)

This Asset Management Plan (AMP) formally documents a 10-year programme for the management of the Three Waters assets. This approach ensures that acceptable levels of service are provided in the most cost-effective manner and contribute to the achievement of the Long-Term Plan 2021-2031 (LTP). It is essential to ensure that the Asset Management Plans for the Three Waters assets as well

as all asset classes remain relevant with the growth and change in circumstances within the district, as such; these are reviewed as part of the Long Term Plan every three years.

Long Term Plan (LTP)

The LTP sets out an agreed vision and community outcomes for Waikato District. The framework of this plan is in line with the requirements of the Local Government Act 2001 (LGA 2002). This plan will assist the Council in promoting sustainable practices as well as assisting the community to determine over time what 'outcomes' could and should be.

Infrastructure Strategy

The Infrastructure Strategy formally documents the management philosophy that is applied to Waikato District Council's infrastructure assets as required under section 101b of the Local Government Act 2002 and to identify the significant infrastructure issues over the next 30 consecutive financial years, the principal options for managing those assets and the implication of those options. The AMP is an integral document in informing the Infrastructure Strategy.

1.4 What Assets are included in this plan?

Three waters activity applies to all drinking water supplies, all wastewater systems, urban stormwater schemes, open drains and associated assets owned and managed by Council. This includes all treatment plants, pump stations, reservoirs and the reticulation network. It does not include roading drainage, which is covered in the Transportation AMP, or rural drainage schemes operated by the Waikato Regional Council.

Under the Land Drainage Act 1908, both the Regional and District Councils are responsible for drainage issues on land that are not part of a drainage district. The division of this responsibility has not been formalised between the councils, and it is currently Council's practice to accept responsibility for those calls it receives about land drainage.

1.5 Who are our Partners, Customers and Key Stakeholders?

In order to provide an efficient level of service, Council needs to identify their partners, customers and stakeholders. For the Three Waters Activity, they include:

Table 1: Understanding Customers' Needs and Expectations

Category	Customer Groups	Specific Needs/Expectations
The Wider Community	Residents and Ratepayers	<ul style="list-style-type: none"> • Able to be 'proud' of where they live • Value for rates spent
	Regional Community	
Associated Service Providers	<p>Bulk Treated Water Supply to Southern Districts</p> <p>Council purchases bulk water from Hamilton City Council to serve the communities of Tamahere, Eureka, Gordonton, Puketaha, Matangi and Tauwhare Pa. This supply is known as the Southern Districts. Council also serves a small area known as Western Districts from Hamilton City, which supplies a section</p>	<ul style="list-style-type: none"> • Able to be 'proud' of where they live • Responsibilities that reflect good practice.

Category	Customer Groups	Specific Needs/Expectations
	<p>of Te Kowhai Road on Hamilton City Council's boundary. An extension of this agreement is under discussion.</p> <p>Bulk Raw Water Supply to Te Kauwhata and surrounds</p> <p>Council has a supply agreement with the Te Kauwhata Irrigation Association which covers the supply of raw water to the Mid Waikato Water Treatment Plant. An extension to this agreement is being negotiated.</p> <p>Council also has an operations agreement with Te Kauwhata Irrigation Association to provide operations and maintenance services for the TKIA assets (which includes their treatment system and network).</p> <p>Bulk Water and Wastewater services from Watercare Services Ltd</p> <p>Council has a current agreement with Watercare Services Ltd, provide supply bulk water and treat wastewater from Pokeno and Tuakau.</p> <p>Currently Council is charged for wastewater discharged from Pokeno and wet industries to Watercare Services Ltd volumetrically, while the wastewater charges for Tuakau is based upon number of connections to the network until the volumetric flow can be measured. The capacity at the Pukekohe wastewater treatment is limited until an upgrade is completed in 2021. Until that time, Council's discharge volume will be capped at 1,700m³. Following the current upgrade additional wet industrial discharges will continue to be limited until further upgrades are completed.</p> <p>Shared Services</p> <p>Council has partnered with Hamilton City and Waipa District Councils to provide joint services in the areas of Trade Waste, Water Sampling and Analysis and Smart Water (Water Conservation Programme Management and Education). This contract will end in October 2020 and the provision of these services will transition to Watercare Services as part of the Operations and Maintenance Contract.</p> <p>Various Consultancies and External Contractors</p> <p>Council uses a range of consultancy services and external contractors for operations and construction projects for the three waters activity.</p> <p>On the 1st of October 2019 Council entered into a long term operations and maintenance contract with Watercare Services Limited to provide operations, maintenance, planning and customer services for the 3-waters infrastructure within Waikato District. The contract is currently in a transition phase with a</p>	

Category	Customer Groups	Specific Needs/Expectations
	<p>view to the becoming fully operational for a term of up to 29 years.</p> <p>Council currently has additional one long term maintenance contract which covers Electrical and Telemetry services for the three waters. The current maintenance contact is held by McKay Electrical. This contract will be retendered in 2021.</p>	
Key Partnerships & Stakeholders		
Key Partnerships	<ul style="list-style-type: none"> • Neighbouring Councils • Shared Services (with Hamilton City Council and Waipa District Council) • Waikato Regional Council • Community Groups and Boards • Iwi and Tangata Whenua • Joint Management Agreements with Waikato – Tainui and Ngati Maniapoto • MOUs with Nga Uri A Maahanga Trust Board and Ahu Whenua Trust • Watercare Services Ltd 	
External Stakeholders	<ul style="list-style-type: none"> • The Community – citizens and ratepayers • Other Government agencies (Fire Services, Department of Building & Housing, Ministry of Health, District Health Boards, Department of Conservation, Department of Corrections)* • Utility Companies • Developers • Contractors • Professional service providers • Regulatory and monitoring bodies • Schools, Ministry of Education 	
Internal Stakeholders	<ul style="list-style-type: none"> • Elected Representatives • Asset Managers and AM Staff • Operational Staff • Development Engineers • Resource Consent Planners • Economic Development Advisor • Financial Managers • Strategic Planners • Information Technology and GIS staff • Council Staff (in general) • Site Managers 	

* As the district is vast, with some organisations, Council is required to liaise with more than one branch, e.g. Waikato Fire Area and Counties Manukau Fire Area, Waikato District Health Board and Auckland District Health Board


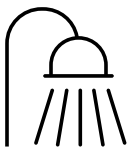

1.6 What, How and Why do we do it?

In 2019 agreement for operation and maintenance of water, wastewater and storm water services signed between Waikato District Council and Watercare Services Limited.

Watercare under the terms of the contract, is responsible for the efficient management of district wide Council’s three waters. Management includes network development, maintenance, and disposal of network components such as pipes, valves, hydrants, pumps and treatment plant equipment. Unlike the Wastewater and Water Supply activities, the treatment and services team normally have limited involvement in delivery of the stormwater service as there are no treatment plants and reticulation repair work is usually contracted out. However, the reticulation team are utilised for operational support during extreme weather events.

Three Waters Schemes

Table 2: District wide schemes

WATER SUPPLY	WASTEWATER	STORMWATER
		
<p>Raglan Ngaruawahia Horotiu Hopuhopu/Taupiri Huntly Whangamarino/Te Kauwhata Meremere Pokeno Tuakau Northern West (Te Kowhai) Rangiriri Southern (Tamahere, Matangi, Tauwhare, Gordonton) Te Ohaaki Te Akau Western (Whatawhata) Port Waikato</p>	<p>Raglan Ngaruawahia Horotiu Hopuhopu/Taupiri Huntly Whangamarino/Te Kauwhata Meremere Pokeno Tuakau Te Kowhai Rangiriri Matangi Te Ohaaki Tauwhare Pa Maramarua Whanga Coast</p>	<p>Raglan Ngaruawahia Horotiu Hopuhopu/Taupiri Huntly Whangamarino/Te Kauwhata Meremere Pokeno Tuakau Te Kowhai Tamahere Port Waikato</p>

The three waters schemes are of varying size, quality and age across the district. Many of the schemes that Council now operates and maintains were inherited from businesses/groups within the local community that they served. Only five of the water supply schemes were created by the local government body of the time. Council does not have any information on the history of Port Waikato and Onewhero as these were originally part of the Raglan County Council.

While some of the oldest urban stormwater reticulation dates back to the 1920s, the development of Council's reticulation schemes began in earnest in the 1950s and 1960s with work to replace the urban network of open drains with piped reticulation.

Historically, the local community boards and committees had relative autonomy to programme capital works for the stormwater activity in their communities, with reference to this arrangement occurring as recently as Council's 2003-13 urban drainage asset management plan. This has now transitioned to council providing the strategic leadership for the stormwater activity.

The works undertaken in this time relied largely on piped solutions and were focused on reducing surface flooding and the number of urban open drains.

In 2008, Council applied for and was granted a comprehensive consent for its stormwater discharges. This covered Huntly, Ngaruawahia, Raglan, Te Kauwhata, and 12 villages.

Until 2012, Council also managed 45 rural drainage districts. Responsibility for these schemes has been handed over to the Waikato Regional Council. The Tamahere and Travers Road schemes were retained by WDC as these overlapped with growth areas that no longer operate as rural drainage.

More recently Low Impact Design (LID) has become a prevalent consideration for Council because of increased intensity of development and urbanisation growth in the district. The uptake of LID within WDC has been influenced through incorporation of instruments into statutory and non-statutory plans, strategies, and codes of practice administered by both Regional and the District Councils. It is considered that LIDs will continue and increase as a key part of storm water management in the future.

Approximately 45% of rateable properties are connected to a council water scheme. Only six of the wastewater schemes were created by the local government body of the time. Tauwhare Pa and Pokeno are Council's newest scheme. Approximately 35% are connected to wastewater scheme.

I.7 Council Organisational Structure

The organisation structure for WDC is displayed in Figure 2 and Watercare service delivery structure displayed in Figure 4.

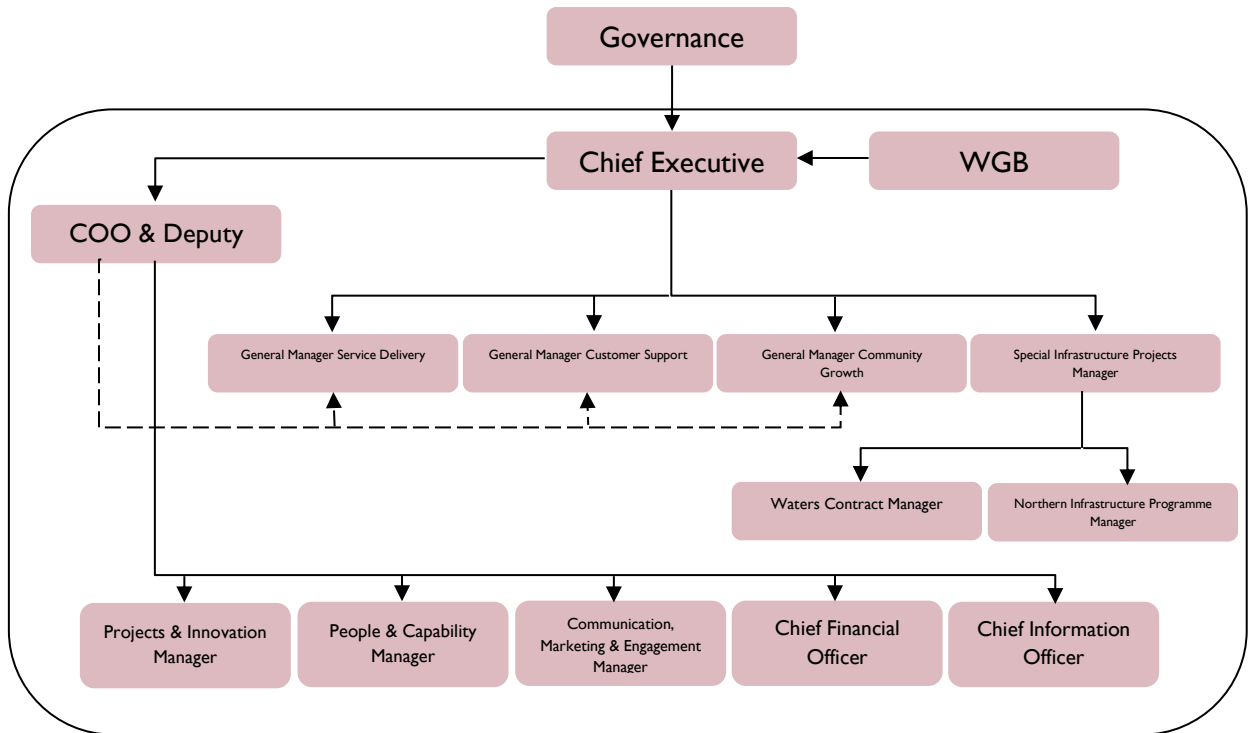
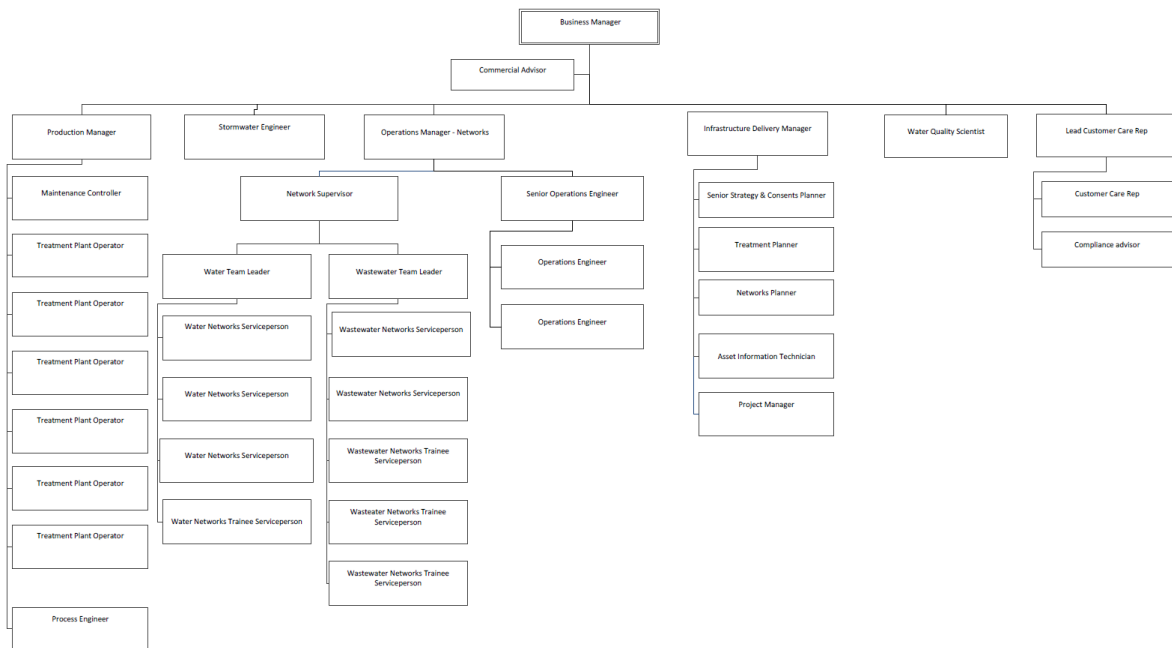


Figure 4: Waikato District Council Executive Leadership Team including Waters Contract Manager and Northern Infrastructure Programme Manager

I.8 Three Waters Activity Management Structure

The Watercare Waikato management structure for the three waters is shown in Figure 5. This includes asset management planning, capital and operational project management, operation and maintenance of the treatment plants and reticulation networks.



2 What are the goals and objectives of Asset Management?

2.1 Why are we Important?

Figure 5: Watercare Waikato Three Waters Delivery Structure

The Council’s 3 waters portfolio is retained, managed and operated as a strategic leadership role that the Council takes in supporting economic excellence and sustainable communities in the district.

Economic excellence in the district is retained through having a reliable water source. Water dependent processes are more easily controlled, the acute effects of droughts on supply markets are tempered, and business overheads are lowered through economies of scale. Also ensuring that wastewater is collected and delivered to centralised facilities for treatment in a safe and reliable manner. Discharged water quality is more easily controlled, business overheads are lowered through economies of scale of not having to provide localised solutions. The existing stormwater system has been developed and built up over many years as a public system to serve the needs of the community for the protection from flooding and for the collection and drainage of stormwater. The Council’s stormwater portfolio is retained, managed and operated in a strategic leadership role that the Council takes in supporting economic growth and sustainable communities in the District.

Similarly, communities are more sustainable through centrally managing our water supply resources, wastewater collection and treatment. Direct benefits of providing three water services to entire communities include reduced costs and safer, more reliable water services than areas without a scheme. These benefits are of strategic importance as the council seeks to lead the district in supporting sustainable communities.

The legislative justification for asset ownership is covered under the following Acts and Sections:



- Section 130 (Local Government Act 2002) states the obligation of local government to continue to maintain existing water services to communities within the district or region.




- Sections 23, 25, 28 and 29 of the Health Act 1956 imply an underlying obligation to provide wastewater services because of its essential nature to public health. The Act provides guidance to the Local authority to provide sanitary works which covers a range of areas from water supply to cemeteries and includes sewerage works.
- Under the Health (Drinking Water) Amendment Act 2007, the requires suppliers of drinking water to take all practicable steps to ensure that an adequate supply of drinking water is provided to each point of supply that the supplier provides for (Section 69S).

2.2 How do our community outcomes link to the three waters activity?

Under the Local Government Act 2002, we are required to have community outcomes, they are statements of the measures of success that we are working to achieve for the community. The community outcomes are set out in the 2021-2031 Long-Term Plan and outlined in Table 3 below.

Table 3: Council Community Outcomes

Community Outcomes		Three Waters Outcomes	
 <p>Supporting our communities <i>We consider the well-being of all our people</i></p>		We aim to have water supply networks that require minimal intervention and provide quality drinking water that is safe to consume.	Water Supply
		Our wastewater system is operated to minimise health risks.	Wastewater
		Our stormwater systems are reliable, efficient, and effective and protect properties from flooding in urban areas.	Stormwater
 <p>Working together with you <i>Collectively focussed on the right things</i></p>		Water supply is delivered to a standard that allows people to participate in social and economic opportunities.	Water Supply
		Our wastewater system meets the needs of the urban and commercial communities and is reliable, efficient and effective.	Wastewater
		Our stormwater network meets the needs of the community and customer requests are dealt with promptly and appropriately.	Stormwater

Community Outcomes		Three Waters Outcomes	
 <p>Sustaining our environment <i>We are a community that believes in environmental sustainability</i></p>	<p>Our water system is managed in a way that ensures the natural environment is healthy and protected.</p>	Water Supply	
		<p>Our wastewater system is managed in a way that ensures the natural environment is healthy and protected.</p>	Wastewater
		<p>Our stormwater systems support environmental sustainability and does not adversely affect or degrade the receiving environment.</p>	Stormwater
 <p>Building our economy <i>We attract diverse business, creating jobs and opportunities</i></p>	<p>Water supply is delivered in a way that supports growing communities and is maintained and developed in a way that provides value for money.</p>	Water Supply	
	<p>Our wastewater infrastructure is efficient, cost effective and is maintained and developed in a way that provides value for money.</p>	Wastewater	
	<p>Our stormwater infrastructure is efficient, cost effective and supports growing communities.</p>	Stormwater	
 <p>Providing value for money <i>Residents and ratepayers get value for money</i></p>	<p>Water supply is delivered in a way that is efficient and ensures that our infrastructure meets current and future needs.</p>	Water Supply	
	<p>Our wastewater activity provides value for money for ratepayers and ensures current and future needs are met.</p>	Wastewater	
	<p>Our stormwater systems are managed efficiently to ensure that our infrastructure meets current and future needs.</p>	Stormwater	

3 What are the Success, Issues, Opportunities and Risks?

3.1 What are the Key Success Factors?

In 2019 a contractual was signed with Watercare Services Limited to leverage off the technical expertise, systems, procurement advantages offered by Watercare. The contract will offer financial efficiencies and cost savings by utilising the technical capability and size of Watercare.

3.2 What are the Key Strategic Issues?

The key strategic issues for the sub region and subsequently for Council are as follows:

- Ensuring the protection and improvement of public health and safety and providing appropriate water sanitary services and hazard management practices.
- Meeting future anticipated and planned for growth demands.
- Planning for and adapting to climate change.
- Ensuring that decisions relating to the Three Waters are underpinned by best practice, research and knowledge.
- Ensuring quality, efficient and sustainable infrastructure.
- The need for integration of:
 - Relevant Council functions.
 - The Three Waters.
 - Land use and water planning and management.
- The availability and allocation of water.
- Ensuring that iwi and hapu are involved in the management of Three Waters and Taangata Whenua values, aspirations and interests are identified and reflected.
- Ensuring protection and where possible the enhancement of the natural environment.

3.3 How do we improve in the future?

Improve asset data

One area of future improvement is improving asset data to allow for better asset management in comprehensive asset management system (Infor). Work is currently proposed in 2021 LTP to improve gaps in the installation data for assets and a project to develop a condition assessment programme.

Hydraulic modelling

Detailed modelling of every schemes would allow for a better understanding of the system capacity. This would assist with forecasting population growth, the impact of climate change on networks and confirming their existing performance.

Green Infrastructure

Green infrastructure is considered a subset of Sustainable and Resilient Infrastructure. It means planting trees and restoring wetlands, rather than building a costly new treatment plant (low-carbon infrastructure).

Low impact design

A third opportunity exists because of the emphasis Council has placed on low impact stormwater designs in the district plan and engineering standards. A significant capital works programme is planned

for Raglan, following the adoption of a new catchment management plan, and this will be a strategic opportunity for Council to walk the talk for urban stormwater design, both reducing stormwater impacts in Raglan and raising the bar for developers in the district.

3.4 What are the key Strategic Risks to Provision of our Services?

3.4.1 Risk Management

The objective of risk management is to identify and manage any uncertain event or condition (risk) that has the potential to have a negative impact on Council. The Waikato District Council has a risk management policy, risk management framework and risk management processes which outline the philosophy and methodologies for systematically identifying, assessing, managing and monitoring risks at various levels within the organisation. The three levels at which risk management is applied are, Strategic level, Operational level and Project level. The three waters related strategic risks are managed by Waters Governance Board whilst the operational and project level risks have to be delegated to Watercare Services Limited to manage as part of the operations and maintenance contract.

Risks associated with the management of the three waters assets are classified as operational risks as they are specific to and managed by Watercare. Once identified and listed in a risk register, there can be the specific business risks, together with any possible risks to the health and safety of employees, other contractors and the travelling and general public, and the management of the three waters assets. This can be used to determine the direct and indirect costs associated with these risks and form a priority-based action plan to address them. This action plan is submitted by Watercare to Waikato District Council on an annual basis for review and approval.

3.4.2 Key Risks

Council policy and operation cannot influence all the factors contributing to these events. However, Waikato District Council has a responsibility to assess the risks in order to best manage the network within the resources available to avoid and mitigate the effects of any event. The Waikato District Council also has a responsibility to ensure that plans are in place to ensure business continuity in the case of an event.

In addition, Council has highlighted a number of key risk areas across the activity including:

- External Economic Influence (Cost Escalations).
- Inadequate Maintenance /Operations Management.
- Loss of Organisational knowledge.
- Non-compliance with Legislation and Legal Requirements.
- Moderate Natural Hazard Damage.
- Loss of services due to system failure.
- Lack of Internal Skilled Resources.

Many of the risks identified by Waikato District Council and listed above are in the process of being mitigated by the Watercare Services Limited operations and maintenance contract.

4 Community Involvement

Council interacts with its customers and formally agrees community expectations via consultation on the following plans.

Long Term Plan

Every three years, Council prepares a Long Term Plan (LTP) which outlines the levels of service and planned works to improve or maintain its services to the community. The LTP is updated annually and undergoes a public consultation process. During the consultation period, the community is invited to provide submissions on the LTP, including the water supply activity.

Structure Plans

The Council uses structure plans as a framework to guide the development or redevelopment of a particular area. The purpose of a structure plan is to define a community vision for future development and define a spatial layout and pattern of different land uses as well as the location and distribution of key infrastructure and services. The structure plan programme is set by Council and is reviewed in response to growth demands. In some cases District Plan changes follow a structure plan adopted or the structure plan outcomes can be incorporated into the next District Plan review.

Recent Structure Plans have included:

- Pokeno Structure Plan (Plan Change 24: 2011)
- Te Kauwhata Structure Plan 2008 (Variation 13: 2009)
- Ngaruawahia and surrounding Villages Structure Plan 2015 (Plan Change 17: 2016)
- Tuakau Structure Plan 2014 (Plan Change 16: 2016) Note plan change withdrawn, and will be addressed with the District Plan Review 2020)

District Plan

The District Plan covers issues such as:

- Effects of land use;
- Impacts of land use on natural hazards and the management of hazardous substances;
- Noise;
- Activities on the surfaces of rivers and lakes;
- Impacts of land use on indigenous biological diversity.

The District Plan is required to be reviewed every 10 years. A district plan review is currently underway and notification is planned for 2020. One of the key changes proposed is to bring in a deferred zoning regime for future growth cells. This will give more certainty about which land is suitable for development (i.e. can be serviced).

The District Plan relates to the three waters activity in a number of ways, with rules requiring water supply and receiving wastewater to be provided for urban developments and compliance with relevant engineering standards for vested three waters assets.

5 What is the Strategic Direction of the Water Supply Activity?

In 2009 Waikato Regional Council, Hamilton City Council, Waipa and Waikato District Councils and Taangata Whenua developed the sub regional growth strategy known as “Future Proof” which covered a 50 year horizon looking at all aspects of growth from planning to infrastructure. This strategy identified that the Three Waters needed to be considered holistically and that the issues facing the Three Waters in the region went beyond growth and demand.

In 2012, Council adopted the Sub Regional Three Waters Strategy. This document sets the strategic focus and direction on critical Three Waters issues across the sub-region. The Action Plan sets out how the strategy will be implemented. The strategy establishes a framework for collaboratively addressing the issues facing the three waters in the sub-region. These include growth issues identified in the Future Proof Growth Strategy and Implementation Plan (“the Future Proof Strategy”) and the Regional Policy Statement and operational issues arising from the City and District Councils’ statutory obligations in relation to the management of the three waters.

In recent years there have been a number of developments in how stormwater activities are managed, including the development of detailed hydraulic analysis of stormwater schemes, an understanding of the environmental impact of stormwater discharges, and a planning requirement for much larger storm events to be considered. These factors now shape the strategic direction of Council’s stormwater activity, which includes:

- An increased focus on environmental impact in addition to flood hazard management
- Flood hazard modelling to support catchment management plans

6 Our Investment Drivers

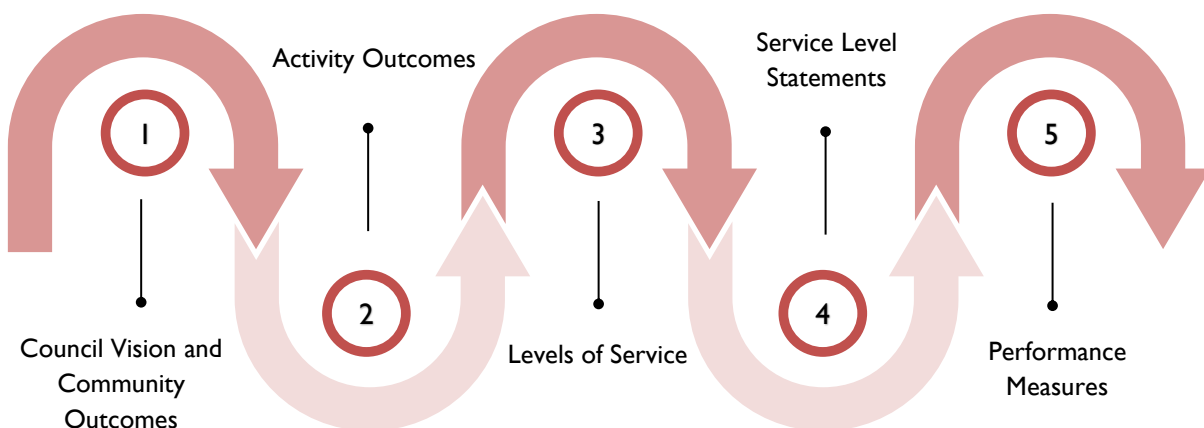


Figure 6: Investment Drivers

6.1 How is the asset programme developed?

Part 7: Lifecycle Management provides details of the programme development for maintenance, operation, renewal and new project work for the three waters activity. Lifecycle Management enables Waikato District Council and Watercare to:

- Identify issues
- Determine appropriate response options; and

- Identify strategies and programmes for response to identified issues/opportunities

In order to deliver Levels of Service and achieve both asset and organisational goals and objectives.

Prioritisation of works is carried out to:

- Meet the short- and long-term needs of our community, as driven by Council's vision and community outcomes
- Offer value for money; and
- Deliver levels of service in a sustainable manner to the least whole-of-life costs.

The Prioritisation of planned maintenance, renewal/replacement and capital projects is based on:

- Level of Service requirements
- Criticality and risk assessment associated with investment levels that potentially change the level of service
- Age and condition of the infrastructure
- Budgetary constraints
- Opportunities to introduce cost savings through innovation and improvement to drive efficiency
- Growth – required by and supporting population and economic growth

Part 3: Levels of Service provides a framework which shows the line of sight from national, regional and local strategy through to the levels of service to be achieved through the proposed level of investment and risk management.

7 How is the Plan laid out?

Table 4: Asset Management Plan Format

SECTION	DESCRIPTION
<i>Part 1 – Introduction</i>	This section provides an overview of all the elements of the assets within the AMP. It also provides sound justification for owning and operating the assets covered, and the reasons for preparing the AMP.
<i>Part 2 – Activity Summary</i>	This section explains how Council manages the activity and detail of the assets required to deliver the activity.
<i>Part 3 – Levels of Service</i>	This section defines the levels of service provided by the activity and the basis for these levels of service and how service performance will be measured, using both customer and technical measures. New works are based on the information outlined in this section.
<i>Part 4 – Risk Management Planning</i>	This section describes how risks are identified and managed, and lists the specific risks identified for the Three Waters activity.
<i>Part 5 – Managing Growth</i>	This section provides details of growth and demand forecasts that affect the management, provision and utilisation of Three Waters services and assets. New works will be based on information outlined in this section.
<i>Part 6 – Sustainability</i>	This section focuses on social, cultural, and environmental sustainability, including climate change. It provides detail of initiatives underway and planned.
<i>Part 7 – Lifecycle Management</i>	This section outlines what is planned to manage and operate the assets at the agreed levels of service while optimising lifecycle costs. It includes an asset renewal and replacement plan.
<i>Part 8 – Financial Summary</i>	This section provides a summary of the total value of the activity and the investment that Council has planned to make over the next 10 years. This section captures all the new works and operating needs, providing a prioritisation based on their strategic outcomes.
<i>Part 9 – Continuous Improvement</i>	This section provides details on planning for improvement to activity management practices, which will improve confidence in the activity management plan.

Part 2: Activity Overview

This section explains how Council manages the activity. The focus is on the day-to-day delivery of the service, what we are doing now to ensure we can provide the service in the future, and the impact on our natural, community and financial resources.

It provides an overview of the major assets which enable the 3 waters activity, including their condition, capacity, and performance.



I Activity Management Structure

I.1 Water Services Staff

From the 1st of October 2019, Waikato District Council has contracted the provision of 3 waters to Watercare Services Limited. All previous Waikato District Council 3 – waters Staff have transferred to Watercare. The Water Services Business unit at Waikato District Council now consists of the Waters contract relationship manager – who is responsible for residual 3-water issues remaining at WDC

Watercare Waikato is responsible for the delivery of all water, Wastewater and stormwater services within Waikato District Council. WDC retains ownership of all assets.

The Watercare Waikato structure consist of 5 key teams within the Waikato District.

The Infrastructure Delivery team is responsible for long term planning and management of the waters assets, the delivery of capital works projects and the management and maintenance of Asset management systems.

The Networks Operations team is responsible for day to day management of the three waters networks. The team deals with any operational issues that arise, optimising the system and ensuring that the customer receives a reliable and well managed service.

The Production team is responsible for operating and maintaining the treatment plants and the network. The team is the works division of the Waters unit and are responsible for ensuring repairs and faults are addressed in a timely manner.

The Water Quality team is responsible for regulatory compliance for the both the Drinking Water Standard and Resource consents issued by the Waikato Regional Council.

The Customer team is responsible for meter reading, billing and new connections.

Form the 1st of October 2020 the Watercare Operations and Maintenance contract will be extended to deliver laboratory and Trade Waste Services to WDC.

1.2 Contracts and Agreements Associated with Delivering this Activity

Watercare and Waikato District Council Agreement

The contract between Watercare Services Limited and Waikato District Council has allowed Watercare to have control over the operation and delivery of the Three Waters services. The outsourcing of water services to Watercare was consulted by Waikato District Council as part of the 2018-2028 LTP process. This agreement between the two parties has been arranged to encourage the production of better environmental outcomes and more affordable water services for the community.

All assets are still owned by Waikato District Council, as well as the billing and any fault enquiries. Watercare have a role in the management and operation of water, wastewater and stormwater infrastructures in the Waikato district within the two-year transitional period.

Watercare is responsible for:

- Collecting, treating and distributing water for use by households, commerce, industry and firefighting, ensuring that drinking water is delivered to a safe, reliable and cost-effective standard.
- Collecting, treating and disposing of wastewater. Reticulated wastewater should eventually be disposed in a way that does not cause harm to the public health and the environment.
- Management of stormwater systems to provide protection from flooding and for collection and drainage of stormwater.

Mighty River Power

Council has an agreement with Mighty River Power (MRP) relating to the Waikato Hydro System. When resources consents were granted to MRP, Council agreed to withdraw their objection based on entering into an agreement with MRP to work together to address the matters raised in the submission.

One of the matters raised was development of blue green algae blooms in the Waikato River, studies have shown one of the factors contributing to the development is the operation of the hydro system.

The agreement allows for MRP to contribute 50% of the capital costs (up to maximum \$150,000) to cover the upgrading of the Council's water treatment to address water quality issues relating to the blue green algae blooms and 50% of annual operating costs for the equipment up to \$30,000 per year for 5 years. No issues related to blue green algae blooms have been experienced to date.

Electrical and Telemetry Maintenance of Water and Wastewater Assets

In 2017, the electrical maintenance and telemetry maintenance contracts for the 3-waters reticulation were re-let. The decision was made to combine the two contracts and to include the services for treatment plants. This contract has been extended to 2021. The Electrical/Telemetry contract has been transferred to Watercare Waikato.

Table 5: Contracts Associated with the Activity

Contract Number and Name	Contractor	Services Provided	Expiry/Renewal Date
Electrical and Telemetry Maintenance of Water and Wastewater Assets	McKay Electrical	Electrical and Telemetry maintenance and repair services	2021

1.3 Delivery of Service Review under Local Government Act 2002

Section 17A of the Local Government Act 2002 came into effect in August 2014. This section requires Council to review the cost-effectiveness of current arrangements for meeting the needs of its communities for good-quality local infrastructure, local public services, and performance of regulatory functions.

This review should be carried out:

- In conjunction with consideration of any significant change to relevant service levels;
- Within 2 years before the expiry of any contract or other binding agreement relating to the delivery of that infrastructure, service, or regulatory function;
- At such other times as the local authority considers desirable, but not later than 6 years following the last review.

1.4 Community Groups Associated with Delivering this Activity

Through current resource consents, Council has committed to forming and reporting to a number of groups. Through the resource consent application process, key stakeholders and affected parties are given the opportunity to submit on the application. Generally, the groups identified in the consent have made submissions against the consent, so have an interest in the ongoing compliance of the site.

The current groups are as follows:

- Port Waikato
 - Peter & Merrial Lucking
 - Kerron & Jocelyn Barry
- Huntly & Ngaruawahia & Taupiri/Hopuhopu
 - Genesis Energy
 - Waikato Raupatu Lands Trust (via Waikato-Tainui Water Steering Group)

The establishment of the Waikato-Tainui Steering Group is a consent requirement of 3 of the Council's water takes. The group is required to be active for the duration of the consents and shall comprise an equal number of Waikato Raupatu Lands Trust and Council representatives. They are mandated to oversee the consent conditions relating to the water consents. The meeting is required to operate in accordance with the principles of the Treaty of Waitangi.

As there are a number of groups, in particular iwi, interested in the management and operation of this activity, Council staff are working to ensure that all groups are identified and appropriately being communicated with in a timely manner.

1.5 Capital and Other Contracts

Procurement Policy

Procurement is an activity that is critical to the effectiveness and efficiency of Council as the Waikato District Council spends a considerable amount of money procuring goods and services. This policy covers activities associated with the purchasing of all goods and services by the Council.

Procurement Manual

Waikato District Council staff are required to comply with the Procurement Manual with respect to making, or planning to make, a financial commitment on behalf of Council. It contains advice and procedures required to comply with Council's Procurement and Staff Delegation Policies and the relevant Acts and Manuals. The Manual also includes guidance on contract law considerations, contract ethics, the use of standard templates, and the carrying out of procurement procedures.

1.6 What is the reporting structure?

1.6.1 Business Plans

Watercare provides a Business Plan for Three waters management to Waikato District council annually.

Business plans can:

- Clarify what to focus on (set direction),
- Provide the link between day-to-day business and the strategic direction,
- Identify projects and action,
- Identify resourcing and skill requirement, and
- Identify key performance indicators (KPIs).

1.6.2 Reporting to Council, Community Boards and Committees

Watercare reports month to the Water Governance Board on all matters relating to 3 waters operation and maintenance contract.

The Waters Governance Board (WGB) is a semi-independent board consisting of the CE of Waikato District Council and three independent directors. The WGB reports directly to the council. The WGB has delegated authority to approved expenditure that is in line with the Councils LTP.

The elected representatives meet regularly to discuss and make policies regarding the Waikato District through full Council meetings and they also endorse recommendations made through Council Committees.

There are four Council Committees that are set up to deal with localised issues:

- Infrastructure.
- Policy & Regulatory.
- Strategy & Finance.
- Discretionary & Funding.

The Infrastructure Committee monitors and develops the operations of Council's infrastructure and facilities. When required the Committee will make recommendations to Council for amendments to levels of service and financial expenditure as outlined in the Delegations Manual. Most reports relating to the water supply are presented at the Infrastructure Committee, occasionally items are presented in the Policy & Regulatory Committee or Strategy & Finance as appropriate. The Committee generally meets monthly.

Any actions identified by the Council or relevant Committees are conveyed back to staff as "Action Sheets" with recommendations for staff to follow up.

The Audit & Risk Committee is a subcommittee of the Strategy & Finance Committee. The committee provides independent assurance and assistance to Council on risks, control and compliance framework, and its external accountability responsibilities.

There are a number of Community Boards and Community Committees which look after local interests and are the link between the community and the Council. Infrastructure projects and issues of local interest are included in these meetings from time to time.

Watercare does not report to any Council Committees however the Watercare Contract Relationship Manager may report to council committees on matters relating to 3 - Waters management.

1.6.3 Who are the External Parties we report to?

Ministry of Health

The Council as a water supply authority has a number of obligations under the Health (Drinking Water) Amendment Act 2007 as follows:

- Be registered as a drinking water supplier on the Ministry of Health's register;
- Prepare and implement Water Safety Plans (previously public health risk management plans);
- To adhere to the Drinking Water Standards and if requested by the DWA (Drinking Water Assessor), provide appropriate records showing compliance with the standards; and
- And complete the Annual Survey for the registered water supplies.

Currently the Watercare provides reports to both the Auckland and Waikato District Health Boards, (the water supplies in Port Waikato, Onewhero, Pokeno and Tuakau fall under the jurisdiction of the Auckland District Health Board) on Waikato District Councils behalf.

Watercare uses the Water Online database to record and manage its compliance with the drinking water standards. Through agreement with the District Health Boards, compliance data is exported and sent to the District Health Boards on a quarterly basis.

Waikato Regional Council

Resource consents are issued by the Waikato Regional Council to enable water to be taken and treated for potable water purposes. Discharge consents are also issued to enable discharge of process water.

The resource consents issued require a number of conditions to be met. Generally, the consents require annual reports detailing overall compliance against the consent. The resource consent conditions imposed tend to be site specific and as such generally have different reporting requirements.

The following sections provides an overview of the major assets for the water supply, wastewater and stormwater activities including their condition, capacity, and performance.

2 Water Supply Schemes Overview

Waikato District Council provides a reticulated water supply to the community for domestic and dairy and agricultural use. The urban areas receive an on-demand supply with surrounding rural areas receiving a restricted supply. Rural areas beyond the Council reticulated systems are reliant on bores or the collection of roof water for their water source. Council currently manages ten public water supply schemes, which provide potable water to the community and firefighting capability for urban areas. The water supply schemes are:

- Huntly
- Central District (Ngaruawahia (includes Horotiu, Hopuhopu/Taupiri)
- Mid Waikato (Te Kauwhata urban and rural, Meremere, Whangamarino, Rangiriri)
- Onewhero
- Pokeno/Tuakau
- Raglan
- Southern Districts
- Western Districts
- Te Akau
- Port Waikato

The location of these water schemes are shown below:

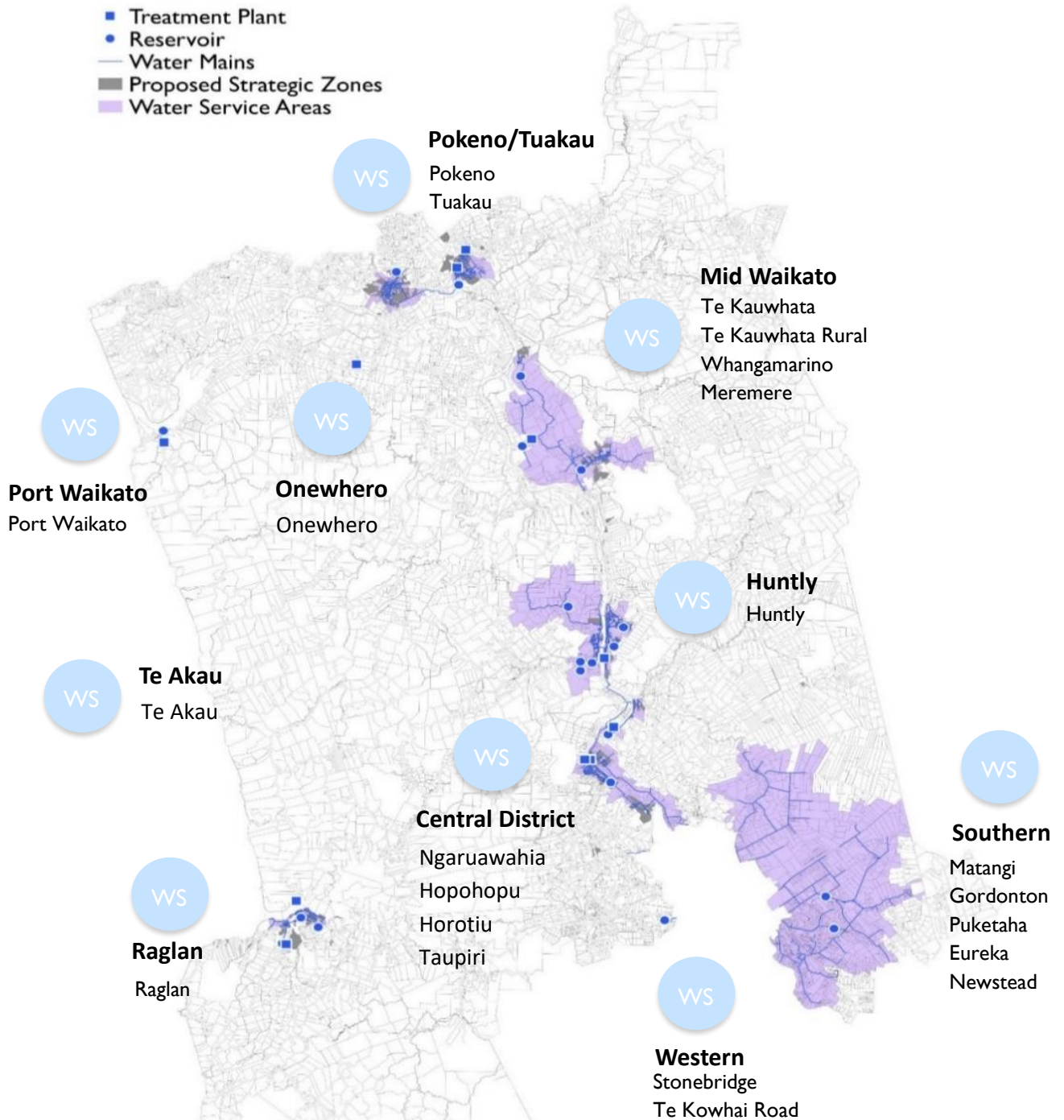


Figure 7: Location of Water Supply schemes in the Waikato District

The District’s water schemes serve approximately a third of the rated properties in the Waikato District. There are multiple water sources for the water schemes, from river to ground water. Some of our schemes are reliant on bulk water supply arrangements from third parties.

The quality of water sources vary across the district, influenced by the security and adequacy of the supply. Water is mainly sourced from the Waikato River and various groundwater sources. The Southern and Western Districts scheme receives treated water from Hamilton City Council for distribution. Northern Districts schemes receive treated water from Watercare.

3 Our Water Supply Assets

Where are the sources of our water supply?

The main water source for the District is the Waikato River. This accounts for approximately two thirds of the annual water production for the Waikato District.

The isolated communities of Raglan and Onewhero draw water from springs, Te Akau draw water from bores and Port Waikato draws from a stream. The communities surrounding Hamilton (Southern and Western Districts) receive water from Hamilton City Council (Waikato River water) with the Waikato District Council providing the distribution network only to these communities. Watercare provides water to Tuakau & Pokeno.

The figure below gives a pictorial representation of the proportion of water production across the various water sources

Water Source Percentage

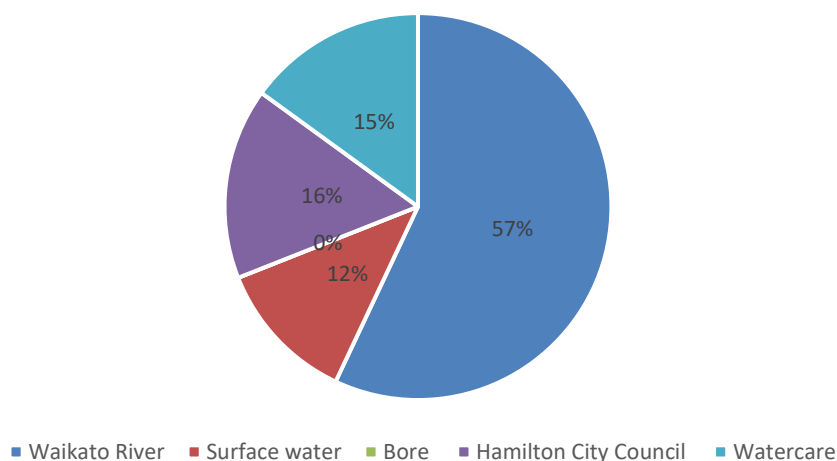


Figure 8: Water Balance 2017 (Thomas Consultants)

Most of the schemes have in excess of 24 hours of available storage capacity. The exceptions are North Waikato with 21 hours storage capacity and Southern Districts which has 7 hours plus 24 hours at individual properties. The schemes do not have supplementary supplies. Reliable supply is an issue in some areas e.g. Raglan with further water sources required.

Treatment Plants

The purpose of treatment facilities is to reliably produce water that meets drinking water standards in sufficient quantities to meet projected peak demands. There are 7 treatment plants within the district.

Table 6: Overview of Water Treatment Plants

Treatment Plant	Raw Water Source	Scheme	Treatment Capacity m ³ /day
Port Waikato	Stream	Port Waikato	143
Onewhero	Spring	Onewhero	65
Te Kauwhata	River	Whangamarino	3,080
Raglan	Spring	Raglan	3,300
Te Akau	Bore	Te Akau South	68
Huntly	River	Huntly	8,000
Hopuhopu	River	Hopuhopu-Taupiri	n.a.
Ngaruawahia	River	Ngaruawahia-Horotiu	3,800

Source: Resource Consents 2017, * Consent owned by Te Kauwhata Irrigation Association

Pump Stations

The purpose of pump stations is to reliably pump water into the reservoirs and distribution network to ensure service levels relating to pressure and supply availability are met. There are 11 pump stations installed within the District networks which are listed in the table below with their corresponding function in the network. Performance monitoring of the pump stations is implemented through SCADA/telemetry and also with visual inspections.

Table 7: Overview of Water Supply Pump Stations

Pump Station	Scheme	Function
Hetherington Rd	Huntly	Pumps water up to the reservoir
Hillside Heights	Huntly	Pumps water up to water tank
Upland Road	Huntly	Boosts water to elevated properties
Hills Rd	Raglan	Pumps water out of the reservoir
SH 26 (Eureka)	Southern Districts	Pumps water out of the reservoir
Matangi Rd	Southern Districts	Pumps water out of the reservoir
Newell Rd	Southern Districts	Boosts pressure in pipe
Sainsbury Rd	Southern Districts	Boosts pressure to Gordonton
Stonebridge	Western Districts	Pumps water out of water tank
Railway Booster	Tuakau	Boosts water to Harrisville
Wayside Road	Te Kauwhata	Boosts water to Te Kauwhata township

Source: Operations Team 2017

Reservoirs

The purpose of reservoirs is to provide sufficient reserves of treated water to ensure supply levels of service are maintained, to provide a head source to ensure pressure levels of service are maintained. There are 28 reservoirs across the network. Most of the reservoirs have telemetry to monitor level including high/low level alarms. Council aims to have 48 hours storage for each scheme.

Table 8: Overview of Water Supply Reservoirs

Supply Scheme	Reservoir	Details	Capacity (m3)
Pokeno	Hitchens Road	Steel	2,400
Tuakau/Onewhero	Harrisville Road (Large)	Steel	2,145
Tuakau/Onewhero	Harrisville Road (Small)	Timber	670
Mid Waikato	Te Kauwhata Water Treatment Works 1	Timber	360
	Te Kauwhata Water Treatment Works 2	Timber	360
	Te Kauwhata Water Treatment Works 3	Timber	1,500
	Springhill Road	Timber	250
	Wayside Road	Timber	500
	Western B	Timber	360
	Central Districts (Ngaruawahia/Horotiu)	Brownlee Avenue A	Concrete
Brownlee Avenue B		Concrete	2,273
Hopuhopu		Steel	1,150
Jackson Street		Steel	3,000
Huntly	Hetherington Road	Concrete	446
	Hillside Height A	Concrete	23
	Hillside Height B	Concrete	23
	Huntly West	Concrete	1,948
	Jackson Road	Concrete	1,500
	Kimihia Road	Concrete	1,128
	Upland Road	Concrete	1,155
	Huntly WTP	Steel	3,200
Raglan	Springs	Concrete	1,000
	Bow Street	Concrete	1,136
	Hills Road	Timber	1,250
Southern/Western Districts	Eureka (Hoeka)	Timber	500
	Matangi Road	Timber	250
	Stonebridge	Concrete	22
Te Akau	Te Akau	Timber	45

Source: AECOM Reservoir Condition Assessment Report 2015 & Operation Inputs 2017

Pipes

Water supply pipes function to distribute water from the treatment plants and bulk supply points (reservoirs, bores etc.) to the supply connection for each customer, reliably, in sufficient quantity to meet peak demands and firefighting needs, and in a manner that protects water from contamination.

Figure below shows the material types that are prevalent in the network.

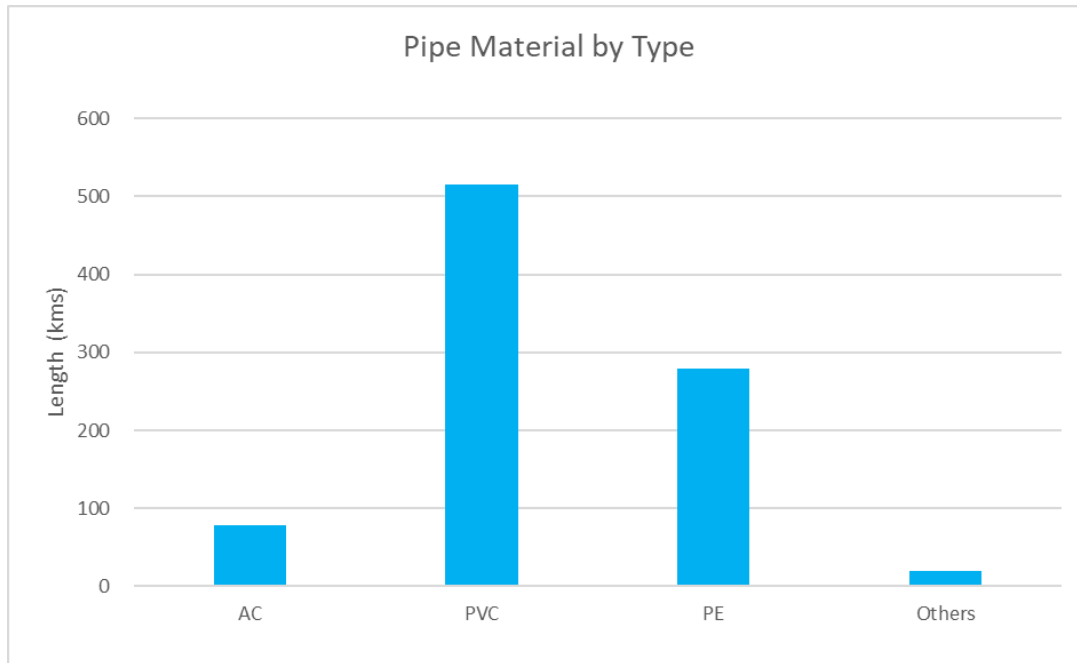


Figure 9: Pipe Length by Material

Source: AssetFinda, 2019.

The most commonly used pipe materials within the network are PVC (including uPVC, MPVC and oPVC), PE (including MDPE and HDPE) and AC (Asbestos Cement). A wide range of other materials have been also used across the District.

Over the next few years the focus will be replacing AC Everite, AC Ribbed and Alkathene pipe, as these materials represented the majority of pipe failures. This will continue to replace the last remaining pockets.

The remaining AC is reaching the end of its useful life based on base life predictions, but it is known that some AC is in very good condition. To avoid premature replacement, a programme of sampling to assess condition has been completed as part of the condition assessment strategy. It is known that depending on the ground and operating conditions some AC pipes last longer than others, it is anticipated that the sampling and analysis programme would identify those areas where replacement of AC is a priority.

uPVC installed in the 1980's is another known problem material, this early uPVC becomes brittle and failures are becoming more common. Due to issues with data reliability of the early assets, it would be assumed that any PVC installed in this period is this brittle uPVC which represent 10% of the network. PE was not used in the network until the late 90's.

Criticality assessments of the entire pipe network have been undertaken using a framework developed by Opus Consultants (Condition Assessment Strategy, Opus Consultants, 2013). Along with OPUS Condition Assessment Strategy Council had developed a guide to capture critical assets. The most

critical pipes identified (rating 5) represents 4.4% of the network. These pipes are single supply pipes which service large parts of the network (bigger size pipes service large area) and are located across bridges or under railways and state highways.

Points Assets

Table 9: Point Asset Quantity and Replacement Costs

Concise Asset Type	Quantity	Gross Replacement Cost
Backflow Prevention Devices	3,999	\$ 2,844,219.07
Bulk Meters	34	\$ 70,120.62
Hydrants	1,585	\$ 3,749,542.95
Manifolds	13,281	\$ 3,264,573.58
Meters	15,765	\$ 3,973,639.36
Other	2,180	\$ 496,778.88
Valves	4,625	\$ 7,191,422.61
Total	41,469	\$ 21,590,297.07

Source: AssetFinda 2019

Fire hydrants are installed, owned and maintained by Council and are typically positioned within the road reserve and identified by a yellow cast iron lid. Roadside marking also allows for easy identification.

The fire hydrants are generally replaced as part of the mains replacement programme, hydrants are not reconditioned. The Operations team have found that the AVK brand of hydrants are not as resilient as other brands used in the network.

The following types of valves used in the network; non-return, sluice/gate and flushing valves. They all provide different functionality to maintain and operate the water supply networks.

- Non-return valves enable water flow to be restricted to one direction, in spite of any changes to flow and pressure. The valves are not able to be exercised, when they do fail, it is usually identified through customer complaints due to lack of pressure of flow.
- Sluice/gate valves serve to enable the direction of water flow to be manipulated or the flow to be stopped entirely, thus valves positioned in the correct place in the network allows parts of the network to be isolated/redirected for maintenance and repair without affecting the entire water supply. In the future, the operations team plan to develop a valve exercising programme for critical valves to ensure their operation when needed.
- Flushing valves are generally located at the end of the network to enable water to be flushed out. Good design practice is to avoid dead ends, mains are commonly now looped to avoid water becoming stagnant.

Service Connections

There are approximately 16,464 service connections across all the water supplies in the district.

The urban connections comprise of a meter, manifold, gate valve and meter box. The rural connections comprise of a meter, manifold, meter box, backflow preventer and gate valve. Rural connections also have restrictors of various sizes to ensure that they only receive trickle supply.

The data reliability in this area is grade C (uncertain) there are inconsistencies between the water billing database and the asset management system (AssetFinda) and the rates database, this discrepancy needs addressing in the asset register and the way the assets are attributed to connections in the register also needs reconciling. In the last 12 months, work has been done to address the inconsistencies, but this is a continuing programme. A methodology has been developed for recording of service connections and associated assets, but this has not been applied to historical assets. Since AssetFinda is a database that works in discrete tables, the service connections methodology is as follows:

- Manifolds (Points table)
- Meters, backflows (Plants table)
- Service lines (Lines table)

Telemetry and SCADA Systems

Telemetry is the technology which allows remote measurement and reporting of operational information. SCADA (Supervisory Control and Data Acquisition) is the software package that is positioned on top of a real time control system to control a process.

In simplified terms the strategy document (Waikato District Council SCADA Development Strategy, Streamline Ltd 2011) recommended that the Council move to a single communications platform, QTech RTU (radio telemetry units) and single SCADA system, Wonderware Archestra software.

In 2013, following a major wastewater overflow event which was partially attributed to the failings of the telemetry/SCADA system, NEO was engaged to review the strategy and to provide direction in terms of a detailed design and implementation plan. The review highlighted a few changes in direction in light of the event and taking on board staffs needs in terms of operational and legislative requirements.

As of end of 2019, NEO has delivered the upgrade from detailed design to trial implementation. A capex approval is in place to be deliver the remainder of the upgrade in 2020/21.

Resource Consents

Council has a number of resource consents issued by the Waikato Regional Council to extract and discharge water in order to provide potable water to the community. Consent conditions within the consents outline how Council should manage the extraction and discharging of water to the environment, the conditions outline how much water can be taken, the quality of discharge and requirement for regular reporting.

Management of Consents

Council has used CS Vue to manage its resource consents. CS Vue is a web-based compliance management system where resource consents and associated conditions are entered into a database, compliance requirements are identified, and responsibilities assigned to individual staff members. Over recent years, use of CS Vue has reduced and is currently being underutilised. As staff have moved on, the system has lacked overall ownership and responsibility, hence consents have not been maintained

in the system. It is proposed to transition consent compliance to Watercare corporate systems in 2020/21.

In late 2019, an overall review of consent compliance was undertaken across the three waters activities by Watercare. The review highlighted that the required reporting was not being consistently carried out, operational requirements were not being implemented and where volume and quality parameters were not being met, some of initiatives have been implemented to address non-compliance with varying levels of success. Watercare will look to review all consent management processes and reporting with a view to improving compliance.

From a financial perspective, it is now common practice to capitalise and value significant resource consents as intangible assets. All consents are now capitalised. Below is the complete list of all current consents to abstract water for potable use held by the Council. Onewhero does not require consent, as the amount abstracted is deemed a permitted activity under the Waikato Regional Plan rules.

Table 10: Volume limits for Water Supply Resource Consents

Water Source	Consent Number	Consent limit (m ³ /day)	Status	Expiry Date
Omahina Spring (Raglan Water Supply)	118341	3,100	In use	15 January 2034 (Issued 2009)
Groundwater Bore (Raglan Water Supply)	118342	500	In use	15 January 2034 (Issued 2008)
Peters Spring Bore (Tuakau Water Supply)	104459	1850	Not required	1 March 2016 (Issued 2001)
Munro Road Bore (Pokeno Water Supply)	120989 120990	997.5	Not required	1 July 2030
Razorback Road Spring (Pokeno Water Supply)	112494	137	Not required	31 October 2022
Razorback Road Bore (Pokeno Water Supply)	112495	250	Not required	31 October 2022
Maraetai Stream (Port Waikato Water Supply)	136297	80	In use	30 April 2051 (Issued 2016)
Waikato River (Huntly, Ngaruawahia Water Supply)	136806	Present – 30 June 2021 11,800 1 July 2021 – 30 June 2027 11,950 1 July 2027 – 30 June 2033 12,150 1 July 2033 – 30 June 2039 12,500 1 July 2039 – expiry 12,800	In use	12 January 2046 (Issued 2016)

Water Source	Consent Number	Consent limit (m ³ /day)	Status	Expiry Date
Groundwater Te Akau Wharf (Te Akau South Water Supply)	110226	68	In use	22 January 2024 (Issued 2004)

As at 30 June 2017

In order to treat the abstracted water to the standards required, some operational consents have been granted to Council, below is the complete list of all current consents to discharge process water or to alter the water source to enable abstraction.

Table 11: Resource Consents to operate the treatment process

Water Supply	Consent Number	Consent limit (m ³ /day)	Status	Expiry Date
Huntly Water Supply (Backwash Water)	105035	500	In use	17 January 2046 (Issued 2011)
Ngaruawahia Water Supply (Backwash Water)	108157	350	In use	17 January 2018 (Issued 2011)
Hopuhopu Water Supply (Backwash Water)	105037	60	In use	17 January 2046 (Issued 2011)
Port Waikato Water Supply (Dam the Maraetai Stream)	136297		In use	30 April 2051 (Issued 2016)
Port Waikato Water Supply (Backwash Water)	136297		In use	30 April 2051 (Issued 2016)
Onewhero Water Supply (Backwash Water)	103540	0.5 per week	Not required	26 September 2036 (Issued 2001)

As at 30 June 2017

3.1.1 Water Billing

Council uses the billing module within Technology One, which is the corporate finance and property and rating management system. The Billing system captures a lot of information that is used for consent compliance and for asset management such as:

- Properties on full and restricted flows
- Average usage per connection
- Number of connections per property
- Backflow information

Following a public consultation process in late 2020 it is proposed to transition billing to Watercare Infor IPs system by 1 July 2021.

3.1.2 Condition Overview

Council's asset renewal planning is currently based on pipe age and material. Similarly, asset valuation and depreciation are currently based on the age of the pipes, with limited consideration given to actual condition.

The Council has limited information on the actual condition of the pipe networks. The need for more comprehensive condition assessment has been recognised. This will:

- Identify pipes in imminent risk of failure, enabling proactive replacement before service is lost and/or the development of contingency measures.
- Result in more accurate prediction of renewal requirements.
- Provide more accurate asset valuations and rates of depreciation, which will enable revenue and debt requirements to be set in line with future renewal requirements.
- Focus limited funding to replacement of those assets that most need replacement, considering cost, risk and level of service issues.

All new pipes constructed or vested in Council are assigned a condition rating of 1.

Knowledge of the performance of the system currently is retained with the operational staff, when repeated issues arise the staff raise the request for the asset to be replaced.

A comprehensive above ground asset condition assessment was undertaken by Watercare as part of the due diligence process for the commencement of the operations and maintenance contract. This work will inform an asset remediation programme at Treatment plants and Pump Stations.

4 Water Supply Schemes Descriptions

4.1 Huntly Scheme

Overview

The Huntly scheme supplies the Huntly township, including the Genesis Huntly Power Station and the Solid Energy Mine, plus surrounding rural areas.

All of the water for the Huntly scheme is drawn from the Waikato River located towards the southern end of the town. Water is pumped to the treatment plant in Jackson Road from a pump station that was constructed in 2012. After treatment (including chlorination and fluoridation) the water is pumped to the town reticulation system and five reservoirs. Parts of Huntly are directly fed from the treatment plant, parts of the scheme are reliant on the reservoirs. In 2019 the Huntly network was connected to Ngaruawahia via a link pipeline to ensure resilience and to allow summer peak demands to be met.

The Huntly treatment plant has been upgraded in order to increase capacity to 8,000 m³/day. Huntly's current average daily demand is well below the current consent limit.

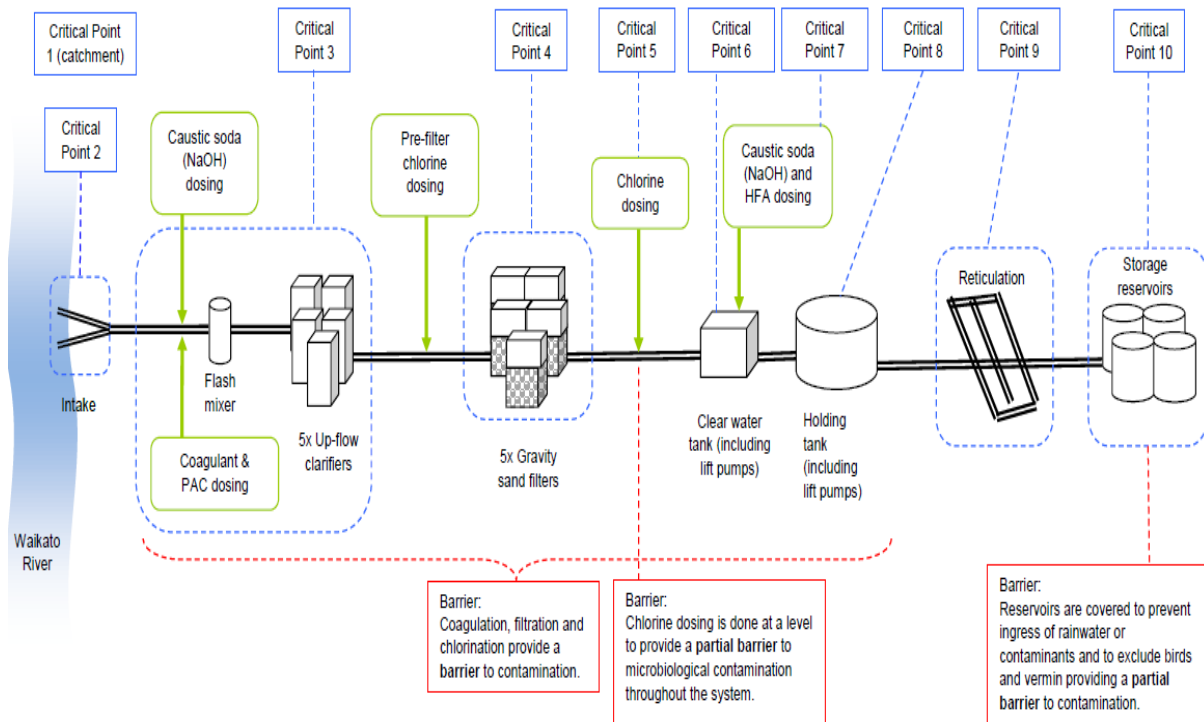


Figure 10: Huntly scheme schematic

Source: Water safety plan, 2016

Water Source

Water for the Huntly scheme is drawn via a 500mm diameter intake pipe from the Waikato River South of the town. The upgrade of the intake to comply with the latest resource consent was completed in 2012.

Raw Water Treatment

Water is pumped from the Waikato River to the treatment plant via two submersible intake pumps (one duty, one standby) contained in a wet well. The treatment plant consists of a flocculation tank, five sedimentation tanks and five filter beds. The treated water is chlorinated and fluoridated.

Four turbidity monitors, a pH monitor and controller, and a chlorine monitor and controller have been installed at the plant to enable continuous monitoring, the data capture has yet to be implemented. A UV reactor has been installed to meet NZDWS compliance.

Post Treatment Storage and Distribution

The total current storage capacity for the Huntly scheme is 6,222 m³. The raw water is pumped through the treatment plant and four transfer pumps pump the treated water to the town reticulation and the reservoirs. These reservoirs act as a combination of operational and storage reservoirs; consumers draw water directly from the pumping main.

The combined capacity of the reservoirs provides 24 hours of storage for peak production at the treatment plant. In 2019 the Huntly network was connected to Ngaruawahia via a link pipeline to ensure resilience and to allow summer peak demands to be met.

Asset Description

The following table summarises the assets at component level, indicating the expected life, age, condition and financial information for each item.

Table 12: Huntly Scheme Asset Information

Concise Group	Quantity	Unit	Average Age	Gross Replacement Cost
Pipes	110,790	m	31	\$ 17,053,630.93
Point Assets	4,120	Each	16	\$ 3,117,579.37
Pump Station Assets	82	Each	9	\$ 239,018.00
Reservoir Assets	94	Each	48	\$ 2,702,535.76
Treatment Plant Assets	372	Each	19	\$ 6,436,892.56
<i>Total</i>				\$ 29,549,656.63

Source: AssetFinda, 2019

The above data only represents a portion of the treatment plant assets, the data is being migrated into a new hierarchy and only the data in the new hierarchy is shown. There is an improvement project to collect the information on all the assets at each site, align with the data already in the AMS and move into the new hierarchy structure and enter in any missing data into the system. All the data currently in the AMS has been valued where it could be ascertained what the asset represents.

Asset Condition

In 2020 a comprehensive condition assessment was undertaken of all above ground assets by Jacobs as Part of the due diligence for the Operations and Maintenance contract. Many electrical and control system assets were found to be in poor condition.

Condition and Performance Issues

The last few years of pipe replacement has focussed on replacement of ribbed AC and GI pipes and known problem parts of the network. While the system has a substantial amount of AC in the network, anecdotal information from the operations team suggest that the AC seems to be lasting longer than expected. The plan is to undertake condition assessment on the most critical assets to re-evaluate the base lives if necessary.

The Huntly West network is vulnerable due to the fact that it is reliant on a single feed across the Tainui Bridge.

There are some areas of low pressure in Huntly, the water supply hydraulic model provides recommendations to address the low pressure.

4.1.1 Central District Scheme

Overview

The Central District scheme supplies water to the Ngaruawahia and surrounding rural areas, approximately 6,879 people in the towns of Ngaruawahia, Horotiu, Hopuhopu and Taupiri. The largest commercial customers include Holcim Ready Mix Concrete, Astra Poultry Lodge and the Christian Youth Camp. Turangawaewae marae is the largest consumer in the central district scheme.

The water for the scheme is sourced via one 300mm diameter intake pipe from the Waikato River at the northern edge of the township known as The Point to the treatment plant on Brownlee Avenue, located to the west of the Waipa River. The water is pumped by submersible pump from the intake through to the treatment plant. The two reservoirs (2,273 m³) at the treatment plant act as storage and provide a head source for gravity feed into the town reticulation. In 2019, the Huntly network was connected to Ngaruawahia via a link pipeline to ensure resilience and to allow summer peak demands to be met.

The consent that is currently held to allow filter backwash and sedimentation tank discharge from the treatment plant will expire in January 2018. The sedimentation tank to process the backwash is programmed for 21/22 year, the consent will not be required when this is implemented as the residual waste will be discharged to the wastewater network.

The current capacity of the Ngaruawahia treatment plant is 3,800 m³/day.

Recent upgrades to address issues include:

- A powdered activated carbon dosing system has been installed at the treatment plant for dosing (when necessary) to remove toxins released by algal blooms in the Waikato River.
- Dead-ends flushing programme has been implemented to address issues of taste and odour

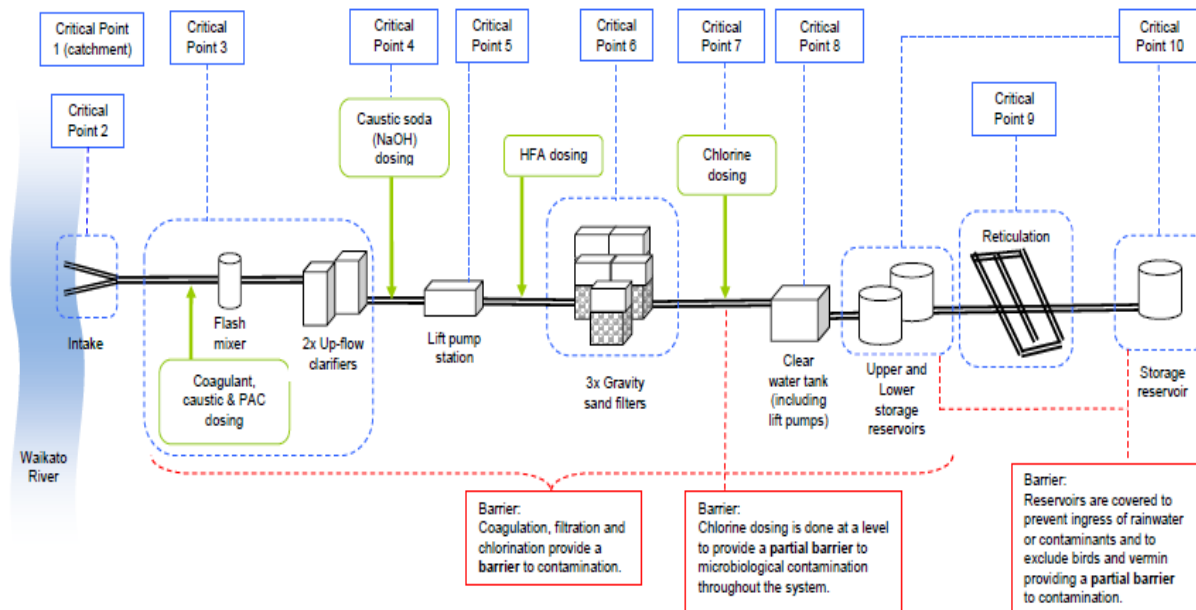


Figure 11: Ngaruawahia scheme schematic

Source: Water safety plan, 2016

Water Source

The water intake structure was upgraded in 2009, a new intake and pump station was constructed to meet the requirements of the new consent which was granted in 2011. PAC dosing was also included as part of the intake upgrade.

Raw Water Treatment

Water is pumped from the Waikato River to the treatment plant via two (one duty, one standby) submersible intake pumps of 0.044m³/s capacity at 21m head. The treatment plant consists of a flocculation tank, two sludge blanket clarifiers and three filter beds. The treated water is chlorinated and fluoridated.

Three turbidity monitors and a pH and chlorine monitor have been installed at the plant to enable continuous monitoring.

Post Treatment Storage and Distribution

Treated chlorinated and fluoridated water is pumped to two concrete reservoirs each with storage capacity of 2,273 m³. The water is gravity fed from the reservoirs to the reticulated areas of Ngaruawahia and Horotiu.

The reserve storage for the scheme is less than 24 hours at maximum production.

Asset Description

The following table summarises the assets at component level, indicating the expected life, age, condition and financial information for each item.

Table 13: Central District Asset Information

Concise Group	Quantity	Unit	Average Age	Gross Replacement Cost
Pipes	128,785	m	25	\$ 20,032,508.00
Point Assets	4,316	Each	13	\$ 3,240,515.93
Pump Station Assets	10	Each	2	\$ 226,100.87
Reservoir Assets	80	Each	12	\$ 4,426,647.31
Treatment Plant Assets	482	Each	25	\$ 4,254,931.50
<i>Total</i>				\$ 32,180,703.61

Source: AssetFinda, 2019

The above data only represents a portion of the treatment plant assets, the data is being migrated into a new hierarchy and only the data in the new hierarchy is shown. There is an improvement project to collect the information on all the assets at each site, align with the data already in the AMS and move into the new hierarchy structure and enter in any missing data into the system. All the data currently in the AMS has been valued where it could be ascertained what the asset represents.

Asset Condition

In 2020, a comprehensive condition assessment was undertaken of all above ground assets by Jacobs as Part of the due diligence for the Operations and Maintenance contract. Many electrical and control system assets were found to be in poor condition.

Condition and Performance Issues

The main issue at the treatment plant are the capacity restrictions (incapable of producing designed flow rate) through the treatment plant process. General redundancy of assets and resilience is an area of concern. A UV upgrade will be completed in 2020/21.

The main issues with the reticulation are:

- Lack of storage in network, less than 24-hour peak demand and the entire system is reliant on storage at the treatment plant. This has been addressed with connection to the Huntly network.
- Low pressure areas at the extremities of the network (highlighted through the hydraulic model)
- Inability to meet firefighting requirements in parts of the network

4.2 Mid Waikato Scheme

Overview

The Mid Waikato scheme supplies water to Te Kauwhata, Te Kauwhata Rural, Rangiriri, Whangamarino and Meremere.

The Mid Waikato scheme receives raw water from a storage reservoir owned by the Te Kauwhata Water Association (TKWA). The TKWA draws water from the Waikato River and Council treats

the water at a treatment plant in Hall Road. TKWA own the intake and pipeline to the treatment plant however Council staff operate and maintain the system under contract with TKWA.

The water treatment plant was upgraded in 2006, this was undertaken to increase the capacity to 3080 m³/day to enable growth and to provide capacity for the Springhill Prison facility and to be able to meet Drinking Water Standards. As part of the upgrade, an additional clarifier was constructed, the filters were upgraded and the media replaced. From the treatment plant the water is gravity fed or booster-pumped to reservoirs that supply discrete areas of the scheme. These reservoirs have a combined capacity of 3,330 m³.

A plant upgrade is currently underway to increase the plant capacity to 4.5MLD. This work is expected to be completed by mid-2021 and is being driven by growth in Te Kauwhata.

The majority of the reticulation pipework is Class B uPVC and these assets are of variable condition and generally starting to fail.

Future developments of the scheme include the contribution from Housing Infrastructure Funding (HIF). Waikato District Council has identified through independent economic analysis, population growth statistics, and affordability that Te Kauwhata can provide a significant percentage of sub regional growth for North Waikato / South Auckland sub regional growth cell.

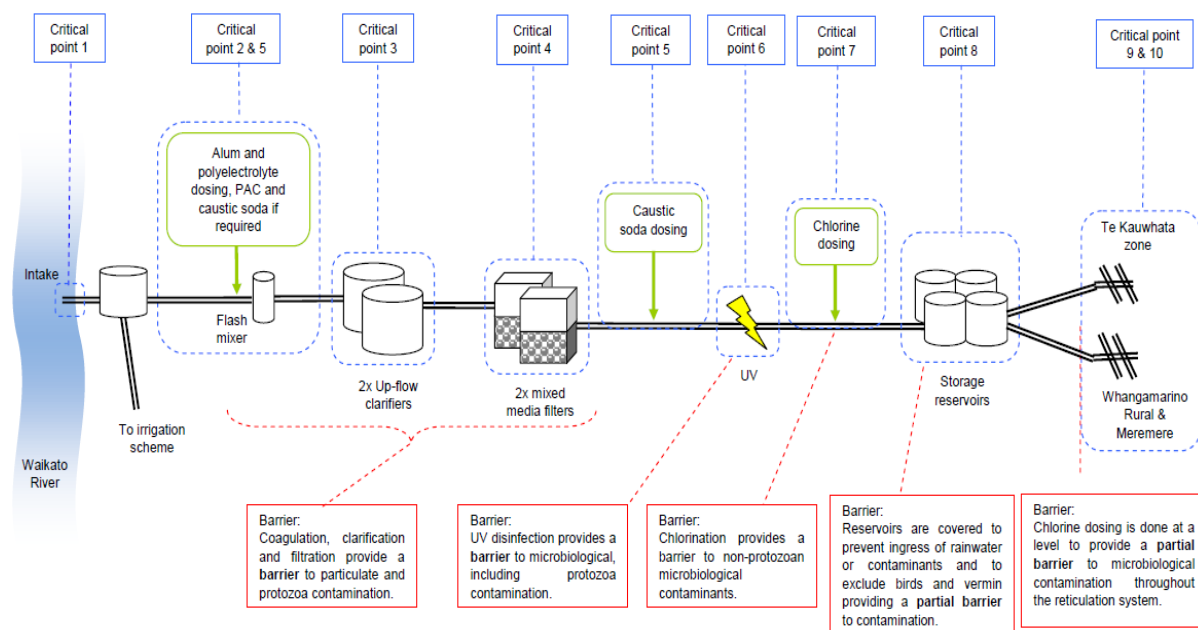


Figure 12: Mid Waikato scheme schematic

Source: Water safety plan, 2016

Water Source

Water for the scheme is purchased from the TKWA. The TKWA draw water from the Waikato River and pump to their storage reservoir at a maximum rate of 1,150 m³/hour. Council has an agreement with TKWA to supply water; this agreement expired in June 2016 and is the process of being renegotiated by Waikato District Council. This process is ongoing as of June 2020.

Raw Water Treatment

The treatment plant is located in Hall Road and includes:

- Sedimentation tank
- Sand Filter
- Chemical dosing equipment
- Chlorinator (installed 2000)
- Instrumentation for turbidity, pH and chlorination monitoring
- The plant was upgraded in 2006 to increase capacity of treatment from 1,870 m³ to 3,080 m³ per day to cater for the new corrections facility. The upgrade consisted of:
 - Additional clarifier
 - Two new granulated activated carbon filters
 - New pump building and pumps
 - UV disinfection plant
 - Plant control system

Post Treatment Storage and Distribution

The treated water is gravity fed and/or booster-pumped to the reservoirs from where it supplies the surrounding areas. All water supply connections in this scheme are metered which allows the ability to measure water loss.

Asset Description

Table 14: Mid Waikato Asset Information

Concise Group	Quantity	Unit	Average Age	Gross Replacement Cost
Pipes	93,918	m	20	\$ 13,888,366.52
Point Assets	1,879	Each	12	\$ 1,390,615.03
Pump Station Assets	31	Each	10	\$ 92,050.00
Reservoir Assets	102	Each	20	\$ 2,179,610.00
Treatment Plant Assets	184	Each	13	\$ 2,838,391.02
<i>Total</i>				\$ 20,389,032.57

Source: AssetFinda, 2019

The above data only represents a portion of the treatment plant assets, the data is being migrated into a new hierarchy and only the data in the new hierarchy is shown. There is an improvement project to collect the information on all the assets at each site, align with the data already in the AMS and move into the new hierarchy structure and enter in any missing data into the system. All the data currently in the AMS has been valued where it could be ascertained what the asset represents.

Asset Condition

In 2020, a comprehensive condition assessment was undertaken of all above ground assets by Jacobs as Part of the due diligence for the Operations and Maintenance contract. Many electrical and control system assets were found to be in poor condition.

Condition and Performance Issues

The main issues at the treatment plant are the inability to meet the Drinking Water Standards due to lack of instrumentation and ability to generate reports. Sludge management needs improvement.

The main issues with the reticulation are:

- Low pressure in parts of the network, and the inability to provide minimum flow rates to restricted flow properties.
- No centralised database of all water allocation and properties on restricted flow.
- Pipe failures due to the historical use of glue joints and Class B PVC.

4.3 Raglan Scheme

Overview

The supply for the Raglan scheme is from a spring located to the east of Te Hutewai Road, there is a consented bore but this has not been used due to the quality of the bore water. Eventually Council will look to decommission this bore, as the cost to treat is not considered cost effective.

The water drawn from the spring and bore is chlorinated then pumped to a high level 1000 m³ reservoir. This reservoir acts as a head source allowing the water to be gravity fed to the town reticulation and to two further storage reservoirs.

The source water from the spring is of good quality and treatment consists of chlorination only. A catchment assessment was undertaken, this demonstrated that the catchment had a moderate risk of protozoa, hence 3 log removal was assigned to the Raglan plant.

The reticulation network consists of 43 km of pipes of predominantly AC, uPVC, mPVC or MDPE material. Below is an overview map of the Raglan scheme area.

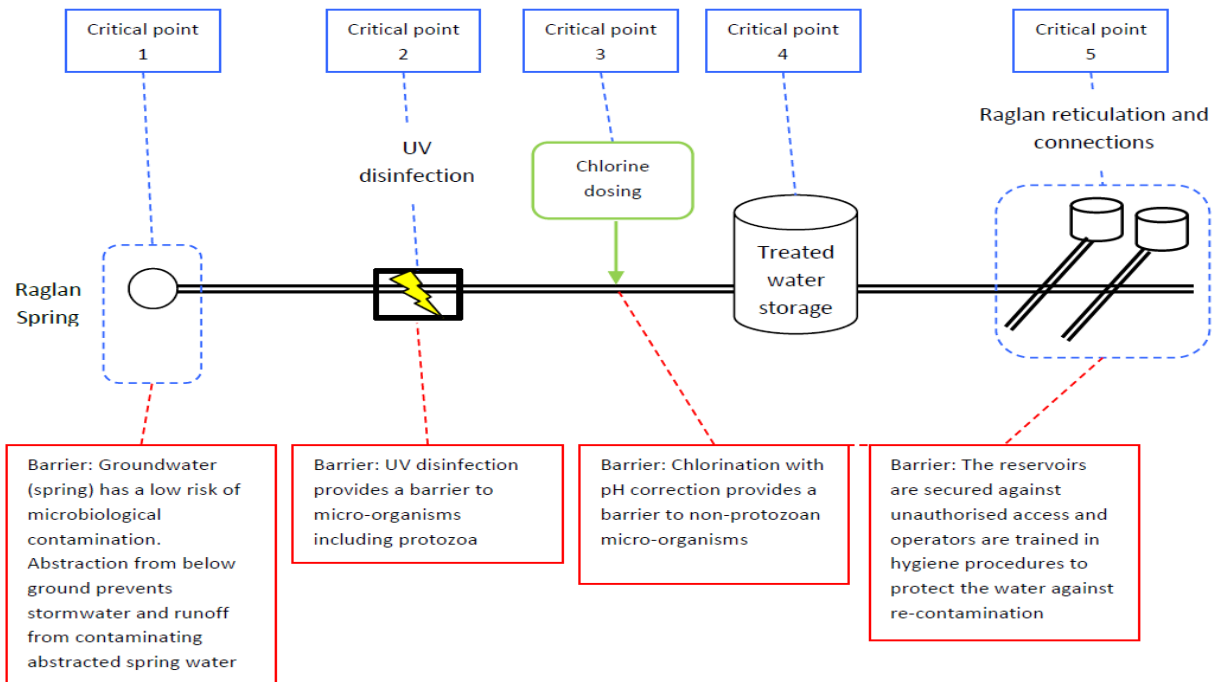


Figure 13: Raglan scheme schematic

Source: Water safety plan, 2016

Water Source

Water for the Raglan scheme is drawn from a spring via a 250 mm diameter intake pipe in the upper reaches of the Omahina Creek at Te Hutewai Road. There is a concrete weir built across the spring.

In 2001, an additional water source (bore) was installed approximately 40 m away from the springs to supplement the spring supply and cater for increased demand over summer, but due the quality issues, use of the bore has discontinued. The bore is 150 mm in diameter and 123 m in depth. The bore pump is located at 59 m depth.

The spring has a maximum output capacity of 4,800 m³/day (ref. Raglan Water Supply AEE, Opus Consultants, 2008).

Raw Water Treatment

Water drawn from the spring undergoes UV treatment followed by chlorination before being pumped to the storage reservoir. The treatment plant includes a flow meter, 2x UV reactors (duty standby) and chlorine monitoring equipment.

Post Treatment Storage and Distribution

After chlorination, the water is pumped via two high lift pumps to a 1,000 m³ capacity high level concrete reservoir. From here, it is gravity fed to the distribution network and to two further storage reservoirs:

- 1,136 m³ concrete reservoir located in Bow Street

- 1,250 m³ timber tank reservoir at Hills Road. This reservoir supplies the eastern end of Raglan. The current consented take of the spring is 3,100m³/day. New 2000 m³ will be installed as part of future stages of the Ranjith development.

Asset Description

Table 15: Raglan Scheme Asset Information

Concise Group	Quantity	Unit	Average Age	Gross Replacement Cost
Pipes	52,463	m	33	\$ 7,446,831.46
Point Assets	2,604	Each	15	\$ 1,604,064.66
Pump Station Assets	30	Each	19	\$ 59,900.00
Reservoir Assets	66	Each	21	\$ 2,037,526.52
Treatment Plant Assets	113	Each	8	\$ 1,023,280.00
<i>Total</i>				\$ 12,171,602.64

Source: AssetFinda, 2019

The above data only represents a portion of the treatment plant assets, the data is being migrated into a new hierarchy and only the data in the new hierarchy is shown. There is an improvement project to collect the information on all the assets at each site, align with the data already in the AMS and move into the new hierarchy structure and enter in any missing data into the system. All the data currently in the AMS has been valued where it could be ascertained what the asset represents.

Asset Condition

In 2020, a comprehensive condition assessment was undertaken of all above ground assets by Jacobs as Part of the due diligence for the Operations and Maintenance contract. Many electrical and control system assets were found to be in poor condition.

Condition and Performance Issues

There are no significant issues at the treatment plant relating to meeting the requirements of the Drinking Water Standards and resource consent compliance. The pumps and plant have been recently upgraded to provide for future growth, Raglan is predicted to experience a steady medium growth over the next 50 years.

- There are some areas of known low pressure in Raglan
- Pump capacity issue (being addressed as part of upgrade)
- Existing bore of poor quality and has been decommissioned. The supply is now solely from the spring.
- Inability to meet firefighting requirements in parts of the network
- Historically the Raglan network has grown in an ad hoc manner with little effect to best practice, this makes network improvement challenging.

4.3.1 Te Akau Scheme

Overview

The Te Akau scheme, established in 1994, pumps water from an unconfined aquifer to the Te Akau township. The water is not treated or fluoridated, however it is chlorinated.

The scheme consists of the bore, the pump station (including submersible pump and switchboard), a 45 m³ PVC lined timber tank storage reservoir and reticulation pipes. It is a relatively small scheme for a small population with an estimated 39 connections.

The installation of a chlorine dosing system was completed in 2011.

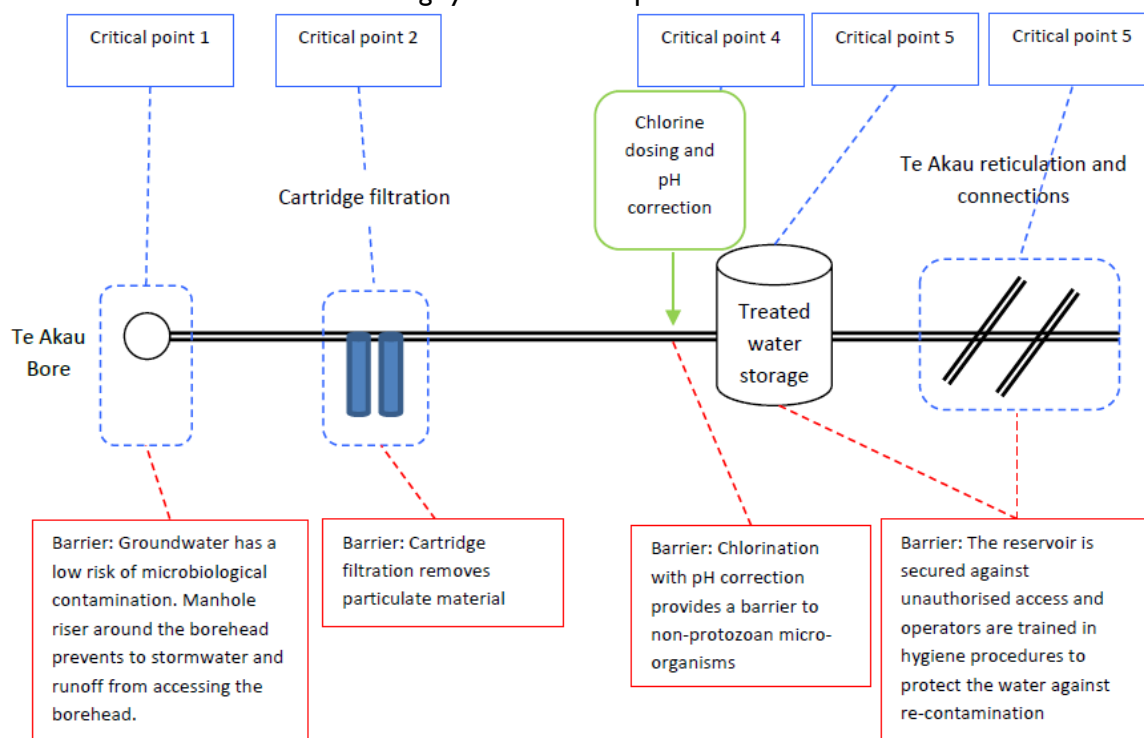


Figure 14: Te Akau scheme schematic

Source: Water safety plan, 2016

Water Source, Storage and Distribution

Te Akau draws water from a 125m deep bore located at the southern end of the township by a submersible pump suspended at a depth of 65 m. The water is pumped to a 45 m³ timber tank from where it is gravity fed into the reticulation.

Asset Description

The following tables summarise the assets at component level, indicating the expected life, age, condition and financial information for each asset type in the Te Akau South networks.

Table 16: Te Akau Scheme Asset Information

Concise Group	Quantity	Unit	Average Age	Gross Replacement Cost
Pipes	942	m	27	\$ 90,789.50
Point Assets	22	Each	16	\$ 10,161.58
Reservoir Assets	14	Each	20	\$ 54,180.00
Treatment Plant Assets	25	Each	18	\$ 83,260.00
Total				\$ 238,391.08

Source: AssetFinda, 2019

The above data only represents a portion of the treatment plant assets, the data is being migrated into a new hierarchy and only the data in the new hierarchy is shown. There is an improvement project to collect the information on all the assets at each site, align with the data already in the AMS and move into the new hierarchy structure and enter in any missing data into the system. All the data currently in the AMS has been valued where it could be ascertained what the asset represents.

Asset Condition

A detailed condition asset study was completed by Jacobs in 2020. The plant has minor condition related issues with mechanical, electrical and control assets.

Condition and Performance Issues

Currently this scheme meets Drinking Water Standards under section 10. Council are exploring options as to the best way forward for this community as part of the water supply strategy.

Other areas of concern are:

- Equipment on site not linked to any data collection and no telemetry
- Lack of turnover in the reservoir due to the size of the community and variable usage
- Meters located within properties

Currently Watercare are assessing the viability of this plant into the future.

4.4 Southern and Western Districts Scheme

Overview

The Southern Districts scheme commenced in 1989 with a supply to Matangi. Since then the scheme has extended to include supply to Eureka, Gordonton, Puketaha, Newstead and Matangi.

The Western Districts scheme supplies water to two areas – Stonebridge and Te Kowhai Road

All of the customer connections are metered with a restricted trickle supply and customers are invoiced six-monthly by Council for measured consumption. The communities of Matangi, Gordonton and Tauwhare Pa have historically been on full flow and continue to receive this service.

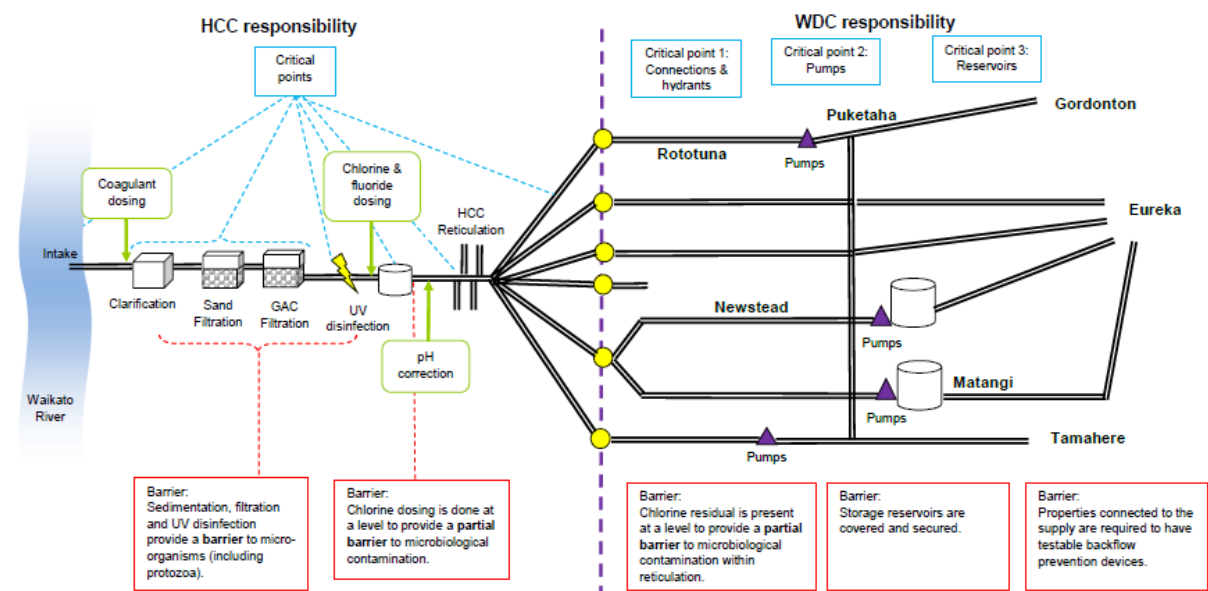
The full extent of the Southern Districts water supply scheme has been adopted via Council resolution in 2010. The Western Districts is limited to the existing connections only and no expansions are planned.

In the current Long Term Plan, Council has allowed for extending the Southern Districts scheme, at a cost of \$6 million, to provide supply to areas of proposed intensive lifestyle development. This will ensure future developments can join the Council network, the current District Plan requires properties less than 6ha to connect the water supply.

Hamilton City Council (HCC) supplies the scheme with treated water via eight bulk water meters that are invoiced on a monthly basis to Waikato District Council. Council has three reservoirs and three booster pumps within the scheme area in order to ensure adequate supply and pressure. The Council entered into an agreement with HCC outlining terms of supply in 2007, this was updated in 2010 to reflect that fact Council had obtained a resource consent for 12,000m³/day (which was transferred to HCC). This agreement recently had been updated.

In 2010, the boundary with Hamilton City was extended to align with the future expressways to the west and the east, this resulted in parts of the Southern and Western Districts being vested with Hamilton City Council.

The reticulation pipework is predominantly PVC or MDPE and because this is a relatively new scheme the pipework is in good condition and in the early stages of its lifecycle.



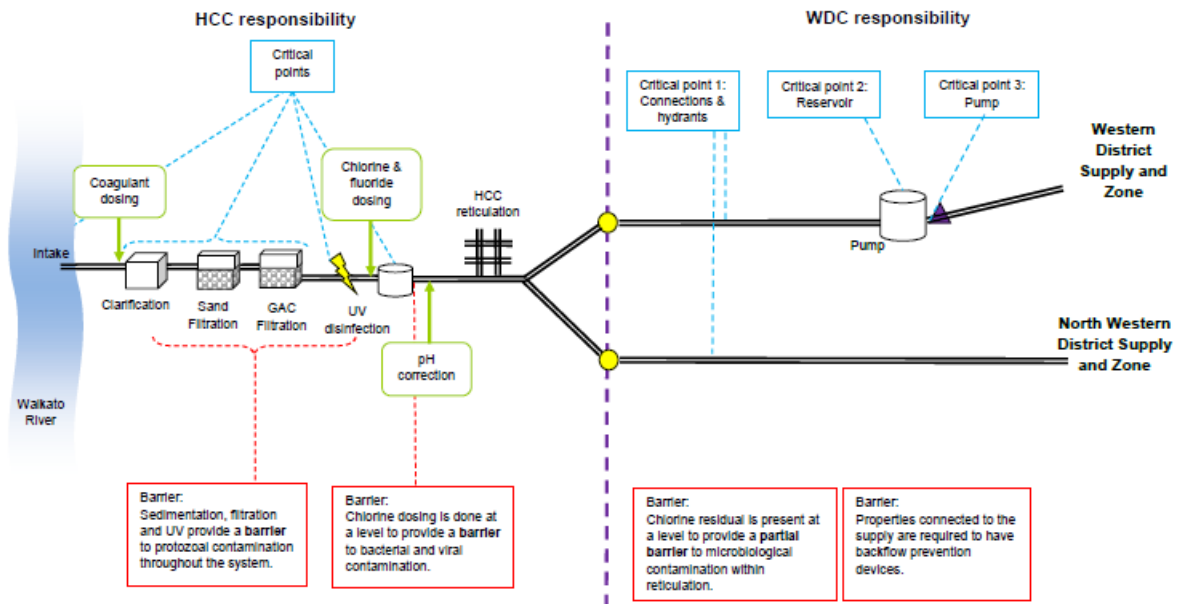


Figure 15: Southern and Western Districts schematic

Source: Water safety plan, 2016

Water Source & Treatment

The Southern Districts water supply is from HCC under a written supply and acceptance agreement. HCC draws water from the Waikato River, treats the water at its treatment plant and supplies it to Council via eight bulk water meters.

There have been issues with lack of chlorine residual coming from the Hamilton supply, in 2010 Council installed chlorine booster pumps at Morrinsville Road, Newell Road and Sainsbury Road.

Storage and Distribution

Water received from HCC through the bulk meters is distributed to the reticulated area and storage reservoirs by gravity feed or booster pumps. Table 16 shows which bulk meters serve which areas:

Table 17: Hamilton City Council Supply Bulk Meters

Bulk Meter Location	Area Served
Greenhill	Puketaha Gordonton
Morrinsville Road	Newstead
Davison Road	Eureka
Ruakura Road (SH26)	Tauwhare
Matangi Road	Matangi
Cambridge Road (SH1)	Tamahere
Te Kowhai Road	Te Kowhai Road
Whatawhata Road	Stonebridge

Three reservoirs have been built in order to provide storage for the scheme. The total capacity of the reservoirs is 772m³.

Table 18: Southern and Western Districts Reservoirs

Reservoir	Type	Capacity (m ³)	Area Served
Matangi	Timber tank	250	Matangi
Eureka	Timber tank	500	Eureka
Stonebridge	Concrete	22	Stonebridge
Total		772	

Consumers on trickle feed supplies are expected to have their own on-site storage of at least 48 hours capacity.

There are pump stations at both reservoirs and a further two pump stations at Newell Road, Sainsbury Road and Stonebridge.

Asset Description

Table 19: Southern and Western Districts Scheme Asset Information

Concise Group	Quantity	Unit	Average Age	Gross Replacement Cost
Pipes	298,203	m	20	\$ 37,434,037.34
Point Assets	3,641	Each	13	\$ 1,442,505.01
Pump Station Assets	131	Each	20	\$ 378,000.00
Reservoir Assets	43	Each	18	\$ 506,741.91
Total				\$ 39,761,284.26

Source: AssetFinda, 2019

The above data only represents a portion of the treatment plant assets, the data is being migrated into a new hierarchy and only the data in the new hierarchy is shown. There is an improvement project to collect the information on all the assets at each site, align with the data already in the AMS and move into the new hierarchy structure and enter in any missing data into the system. All the data currently in the AMS has been valued where it could be ascertained what the asset represents.

Asset Condition

Condition and Performance Issues

A hydraulic model was undertaken in 2013 for Southern Districts. The report highlighted a number of issues with the existing network and constraints in terms of future growth.

The issues identified:

- Insufficient pressure in parts of the network, in particular Matangi and the outer extremities.
- Insufficient emergency and operational storage
- Maintenance requirements for timber tanks are high

The main issue with the Western District is the size of the system. Since most of this network was vested with Hamilton City in 2010, there is only a small network left to maintain. A possible solution would be to approach HCC to take over ownership and management of this network.

4.5 Onewhero Scheme

Overview

Onewhero is a small community located 5km SW of the Tuakau bridge, it is unknown when the scheme was constructed. The scheme services the community of Onewhero with a population of approximately 36, total of 15 connections. The water supply is ungraded as the population is less than 500. In 2010, Council inherited this scheme from the now disestablished Franklin District Council.

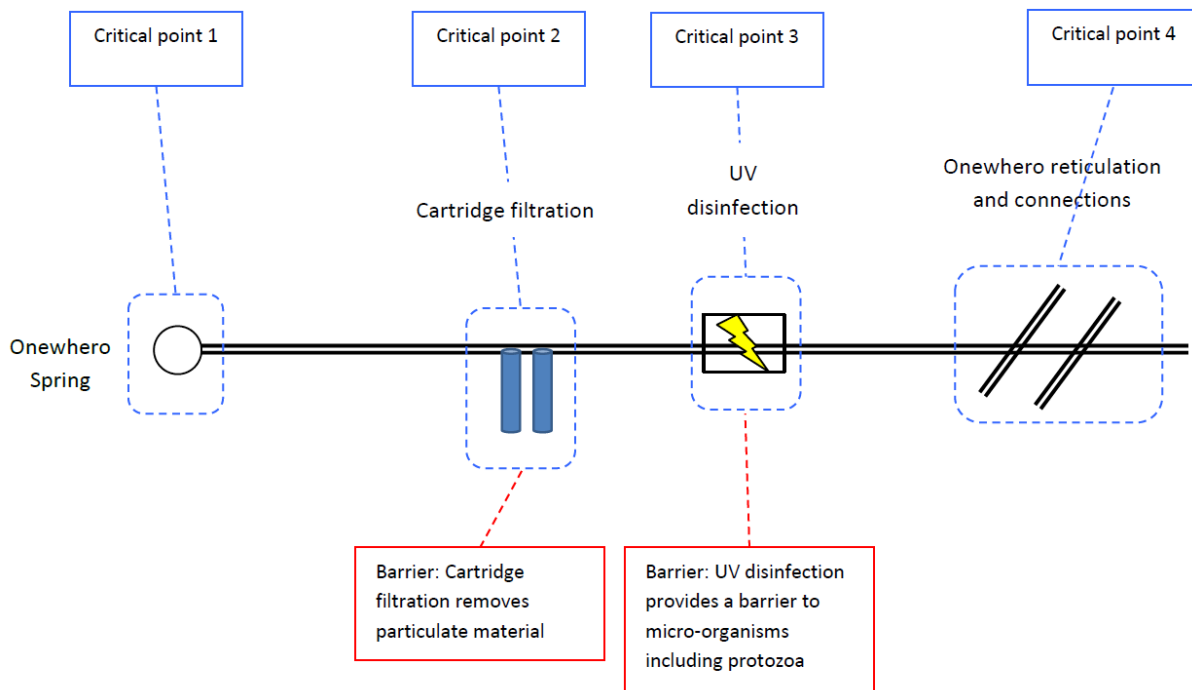


Figure 16: Onewhero scheme schematic

Source: Water safety plan, 2016

Water Source

The water for Onewhero comes from a spring and is currently unconsented. The low volumes taken mean this is a permitted activity under Regional Plan rules.

Raw Water Treatment

There is minimal treatment at this facility. There are Akdolit and cartridge filters, UV disinfection and chlorine dosing. The backwash water is discharged to an unnamed tributary of the Waikato River, this is a consented activity. The consent has been granted until 26 September 2036.

Post Treatment Storage and Distribution

There is a basic distribution system as the system only services 12 properties and is fully metered. There is no emergency storage; the 10m³ concrete tank was disconnected following a positive e.Coli test in 2011.

Asset Description

The following tables summarise the assets at component level, indicating the expected life, age, condition and financial information for each asset type in the Onewhero network.

Table 20: Onewhero Asset Information

Concise Group	Quantity	Unit	Average Age	Gross Replacement Cost
Pipes	629	m	35	\$ 54,151.79
Point Assets	5	Each	7	\$ 2,236.08
Treatment Plant Assets	29	Each	31	\$ 45,380.00
Total				\$ 101,767.87

Source: AssetFinda, 2019

Asset Condition

A comprehensive condition assessment study was completed by Jacobs in 2020. Generally, assets are in reasonable condition however electrical and control assets needs replacement.

Condition and Performance Issues

The scheme does not require much maintenance, the main issues with this system is the unreliability of the local power grid. Along with the fact the scheme has no storage, when the power does go out, residents are without water supply.

The scheme does currently comply with drinking water standards for a scheme of this size.

4.6 Pokeno/Tuakau Scheme

Overview

Both Pokeno and Tuakau drinking water supplies were passed from the now disestablished Franklin District Council to Waikato District Council as part of the local authority reform and setting up of the Auckland Council. The operation of the supplies used to be run using in-house staff but these have been contracted to CityCare since 2016.

Water is supplied to Tuakau and Pokeno supplies from the Watercare water treatment plant off Trig Road at Tuakau. A written agreement between Watercare and Waikato District Council is in place for the supply and acceptance of potable water. This agreement does not place limits on volume or duration of the agreement.

Future developments of the scheme will be influenced by population growth, WDC's Growth 2070 has proposed significant new growth zones in both townships.

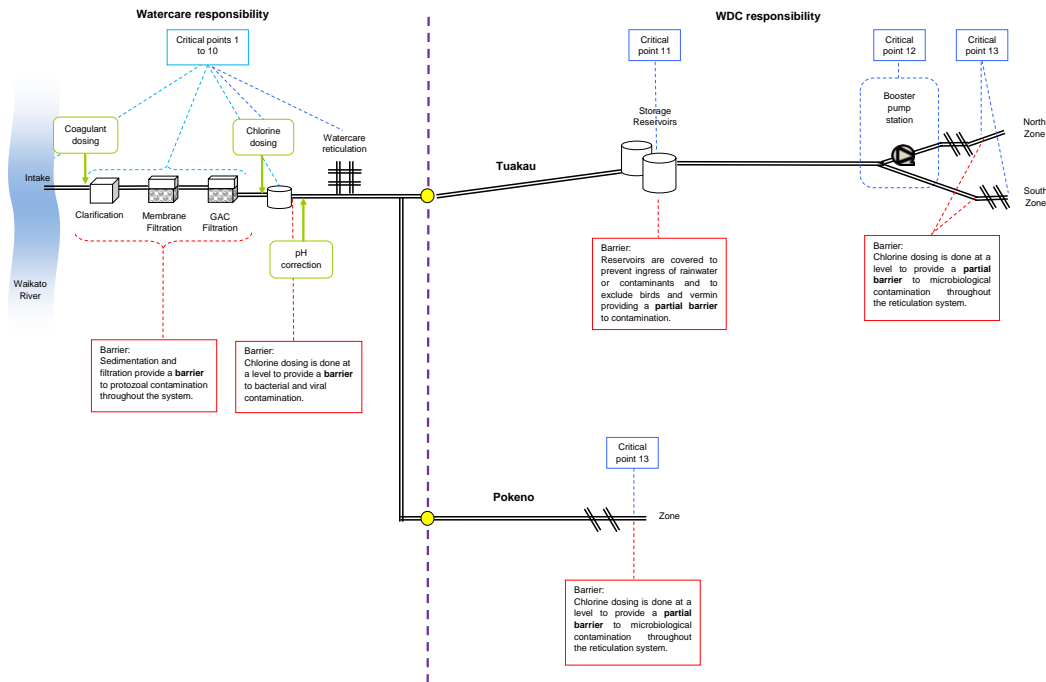


Figure 17: Pokeno/Tuakau scheme schematic

Source: Water safety plan, 2016

Water Source & Raw Water Treatment

The water for the scheme is supplied from Watercare Services Ltd (Watercare) Waikato water treatment plant. The plant sources water from the Waikato River before treating it prior to distribution. The Tuakau and Pokeno reticulation systems are managed by Waikato District Council and operated by CityCare.

Post Treatment Storage and Distribution

Water is supplied from the Watercare trunk main via two separate metered bulk mains, one at 296a Whangarata Road for the Pokeno supply, and one at 118F Barnaby Road for the Tuakau supply. The Pokeno supply point consists of a primary Pressure Regulating Valve (PRV), a secondary PRV for primary PRV bypass, and a manually operated bypass for both PRVs. The Tuakau supply point details are undefined but likely to be of similar configuration to the Pokeno supply point.

Tuakau supply has two distribution zones, the South Zone and the North Zone. Water from the Watercare supply point is fed direct to the Harrisville Road reservoirs from where it gravitates to the South zone. The Railway Road booster pump station, supplied from the Harrisville Road reservoirs, boosts pressure to the North Zone. Continuation of supply in the event of Watercare treatment plant failure is reliant upon Watercare’s Redoubt Road reservoirs, and the Drury Pump Station.

Pokeno supply has one distribution zone and is supported by a recent constructed reservoir.

Asset Description

The following tables summarise the assets at component level, indicating the expected life, age, condition and financial information for each asset type in the Pokeno network.

Table 21: Pokeno Asset Information

Concise Group	Quantity	Unit	Average Age	Gross Replacement Cost
Pipes	112,605	m	21	\$ 18,220,306.35
Point Assets	4,528	Each	9	\$ 3,905,542.74
Pump Station Assets	22	Each	20	\$ 68,900.00
Reservoir Assets	67	Each	7	\$ 2,521,276.55
Total				\$ 24,716,025.64

Source: AssetFinda, 2019

The above data only represents a portion of the treatment plant assets, the data is being migrated into a new hierarchy and only the data in the new hierarchy is shown. There is an improvement project to collect the information on all the assets at each site, align with the data already in the AMS and move into the new hierarchy structure and enter in any missing data into the system. All the data currently in the AMS has been valued where it could be ascertained what the asset represents.

Asset Condition

A comprehensive condition assessment study was completed by Jacobs in 2020. Generally, assets are in reasonable condition.

Condition and Performance Issues

The treatment and reticulation systems are under a lot of pressure due to the expansion of Pokeno, planned infrastructure upgrades need to occur in a timely manner to avoid issues with pressure and provide resilience.

4.7 Port Waikato Scheme

Overview

Port Waikato is a beach and riverside community located adjacent to the south bank of the Waikato River, just upstream of the river mouth. The reticulated water supply serving Port Waikato is drawn from Maraeti Stream, constructed in 2003/4. This scheme replaced the former groundwater-based system which had to be shut-down due to saline intrusion problems. Prior to that, the supply was taken directly from Maraetai Stream. Connections to the system are presently limited mostly to public facilities such as public toilets, motor and school camps, marae, surf club, yacht club, etc. Apart from a few that receive supply from the public system, for the most part dwellings rely on roof-fed rainwater tanks.

In 2010, Council inherited this scheme from the now disestablished Franklin District Council.

The water supply is ungraded as the population is less than 500. For a small scheme, the treatment process is quite complex and includes chemical dosing, clarification, filtration and UV disinfection.

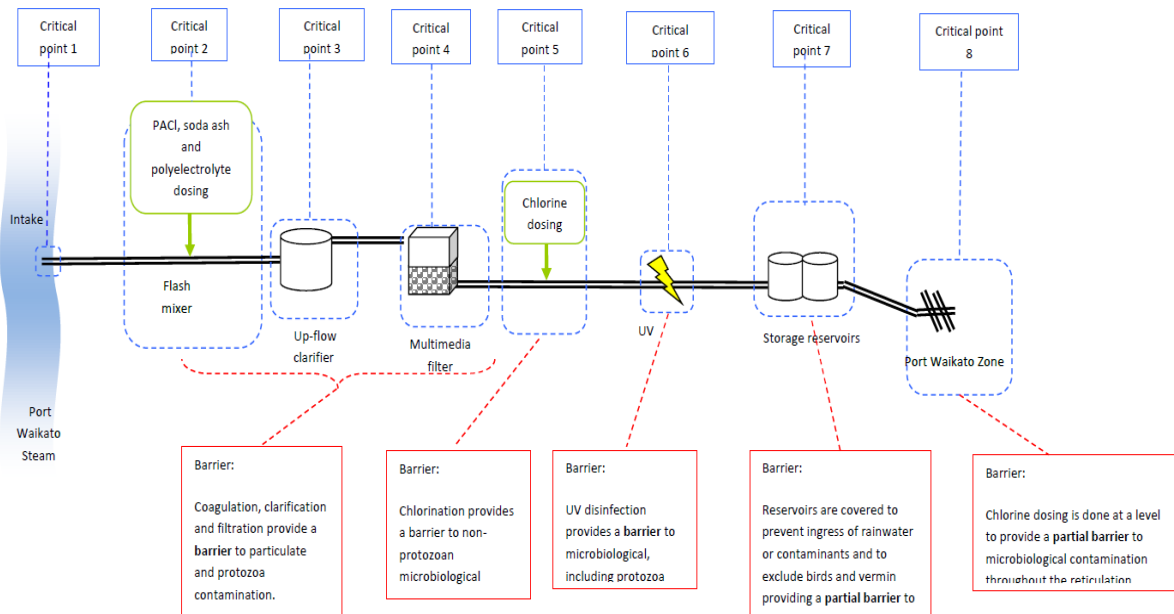


Figure 18: Port Waikato scheme schematic

Source: Water safety plan, 2016

Asset Description

The following tables summarise the assets at component level, indicating the expected life, age, condition and financial information for each asset type in the Port Waikato network.

Table 22: Port Waikato Asset Information

Concise Group	Quantity	Unit	Average Age	Gross Replacement Cost
Pipes	5,516	m	26	\$ 555,435.86
Point Assets	22	Each	7	\$ 11,633.33
Reservoir Assets	9	Each	9	\$ 30,750.00
Treatment Plant Assets	44	Each	70	\$ 339,150.00
Total				\$ 936,969.19

Source: AssetFinda, 2019

The above data only represents a portion of the treatment plant assets, the data is being migrated into a new hierarchy and only the data in the new hierarchy is shown. There is an improvement project to collect the information on all the assets at each site, align with the data already in the AMS and move into the new hierarchy structure and enter in any missing data into the system. All the data currently in the AMS has been valued where it could be ascertained what the asset represents.

Asset Condition

A comprehensive condition assessment study was completed by Jacobs in 2020. Generally, assets are in reasonable condition however electrical and control assets needs replacement.

Condition and Performance Issues

The main issue with this system is the poor quality of the source water which requires a complex process and operator time to treat, relative to the scale of the system. Treatment includes the addition of soda ash, poly aluminium and a poly electrolyte along with circumferential settling clarifier and multimedia filter. Lack of telemetry is another issue which adds to the required operator attendance.

The plant is situated very close to a blind corner and operators are required to be extra vigilant at all times.

The scheme complies with the Drinking water standards for a scheme of this size. However, the scheme is not compliant with its discharge consent due to elevated aluminium in the backwash to the local stream.

5 Wastewater Schemes Overview

Waikato District Council provides a wastewater network to the community for domestic and industrial use. Council currently has wastewater treatment plants at Huntly, Meremere, Central District, Raglan and Mid Waikato with smaller treatment facilities at Maramarua, Matangi, Tauwhare Pa and Te Kowhai.

The Council rating system indicates a total number of 10,044 wastewater connections throughout the District.

Council's reticulated wastewater collection, treatment and disposal systems serve the following areas within the District:

Table 23: Wastewater Scheme Locations

Scheme	Town/Village	Treatment Plant Location	No of Connections
Central District	Hopuhopu	Ngaruawahia	01
	Horotiu	Ngaruawahia	124
	Taupiri	Ngaruawahia	180
	Ngaruawahia	Ngaruawahia	1976
Huntly	Huntly	Huntly	2787
Mid Waikato	Rangiriri	Te Kauwhata	25
	Te Kauwhata	Te Kauwhata	538
Raglan	Raglan	Raglan	1688
	Whaanga Coast	Raglan	53
Meremere	Meremere	Meremere	182
Maramarua	Maramarua	Maramarua	08
Matangi	Matangi	Matangi	53
Tauwhare Pa	Tauwhare Pa	Tauwhare	43
Te Kowhai	Te Kowhai	Te Kowhai	19
North Waikato	Tuakau	Pukekohe*	1669
	Pokeno	Pukekohe*	695

Property and Rating database 2017

Council’s reticulated wastewater collection, treatment and disposal systems serve the following areas

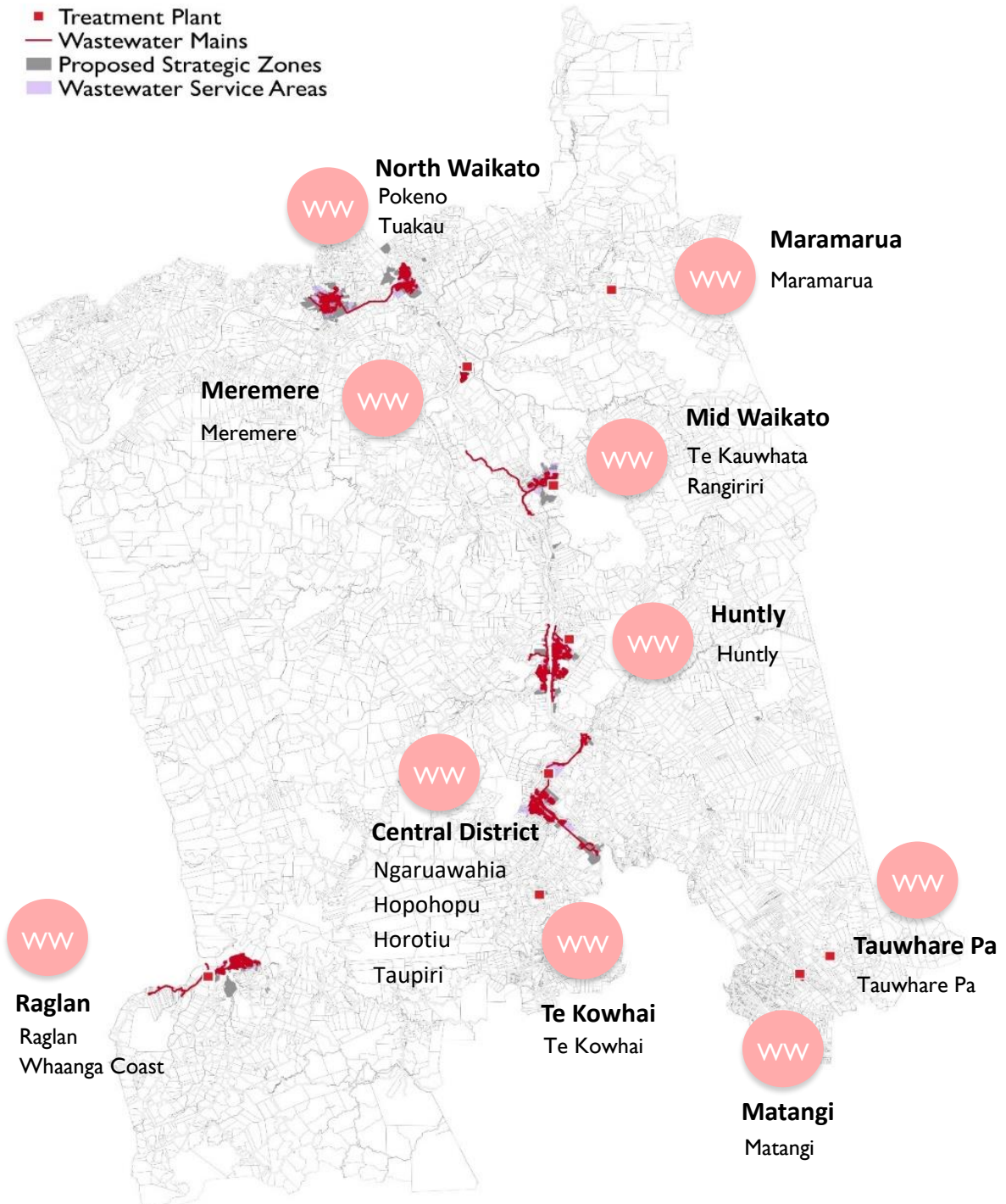


Figure 19: Location of Wastewater Schemes in Waikato District

Non-Reticulated Systems

The communities of Glen Afton, Glen Massey, Gordonton, Horsham Downs, Pukemiro, Renown, Rotokauri, Te Akau, Waiokowhai, Whatawhata, Port Waikato and Onewhero have no reticulated wastewater collection system in place. Portions of Horotiu are also unreticulated the WDC Growth 2070 is proposing further residential growth for this area, this AMP is proposing that a scheme is developed to provide wastewater services for properties currently unserved.

The remainder of the District (where not classified as urban or identified as a specific community) is zoned Rural, Lifestyle or Rural Residential. These areas are non-reticulated and rely on on-site wastewater systems for sewage treatment.

The condition and age of private on-site wastewater systems varies, with the more recent subdivided areas having newer and more sophisticated systems. Some of the areas present a general drainage health hazard due to high water table, small section sizes and poor draining soils.

Some non-reticulated areas have public health issues caused by onsite disposal systems. Funding was provided by the Ministry of Health for two extensions on the Huntly network, connecting Harris Rd and Te Ohaaki Rd into the scheme and a new scheme for Tauwhare Pa. This work was completed in 2011.

The Council in 2016 has installed a low-pressure system to service the Whanga Coast area to address failed septage systems there. The older areas of Pokeno were also serviced by on-site systems, these have now been connected to the Pokeno wastewater network, this work was completed in 2019.

Table 24: Wastewater Asset Summary

Concise Group	Quantity	Unit	Average Age	Gross Replacement Cost
Pipes	323,231.44	m	30	\$ 88,287,038.91
Point Assets	5,549	Each	29	\$ 34,763,831.37
Pump Station Assets	2,702	Each	14	\$ 19,754,750.25
Treatment Plant Assets	1,078	Each	12	\$ 25,539,921.71
<i>Total</i>				\$ 168,345,542.24

Source: AssetFinda, 2019

6 Wastewater Assets

Treated Effluent Discharge

Treated effluent from the schemes of Huntly, Central District, North Waikato and Meremere discharge into the Waikato River. This accounts 80% of the annual treated effluent discharge for the Waikato District.

The Mid Waikato scheme discharges into Lake Waikare. Raglan discharges into the Waingaroa harbour. The small schemes of Te Kowhai, Matangi, Tauwhare Pa and Maramarua discharge to land.

Treatment Plants

Wastewater Treatment Plants are specifically designed to effectively treat incoming sewage to a level that can be discharged to the environment without causing adverse environmental effects. The schemes have treatment systems that operate under Resource Consents to ensure the quality of the effluent being discharged is safe.

Waikato District Council has 9 wastewater treatment plants. The treatment plant assets are comprised of component assets categorised as follows:

- Oxidation Ponds
- Aerators
- Electrical Equipment
- Buildings
- Chemical Dosing
- Tanks
- UV
- Pumps
- Mechanical Equipment – Valves, etc
- SCADA and control
- Aquamats
- Recirculating Sand Filters
- Flow Meters
- Actiflo

At this stage major treatment plants treatment plant assets identified as most critical. A component level criticality assessment is needed to be undertaken for the treatment plant assets. This was undertaken by Australis Consultants in 2019 and Watercare have also a 2020 Jacobs Consultants review above ground assets condition at the treatment plants.

Pump Stations

Pump stations are strategically located to pump wastewater from low points within the system to maintain gravity flow to the treatment plants.

Council have installed low pressure systems, in these particular situations Council has taken responsibility of the connection from individual pump stations on each individual property and will be maintained along with the other distribution pump stations across the district. Te Ohaaki, Tauwhare Pa and Whaanga Coast are the current systems operating.

Waikato District Council has 85 pump stations and 9 schemes across the District. Each pump station includes some or all of component assets categorised as follows:

- Backflow Preventer
- Building
- Water Supply
- Pump
- Mechanical Equipment – Valves, etc
- Electrical Equipment and Controls
- Pipework
- SCADA/Telemetry

Pipes

The function of pipe reticulation is to convey wastewater away from developed areas, minimising risks to the environment and public health. The pipes are predominantly gravity mains and rising mains and in total there are 297 km of wastewater pipe across the District's networks.

The figure below shows the material types that are prevalent in the network.

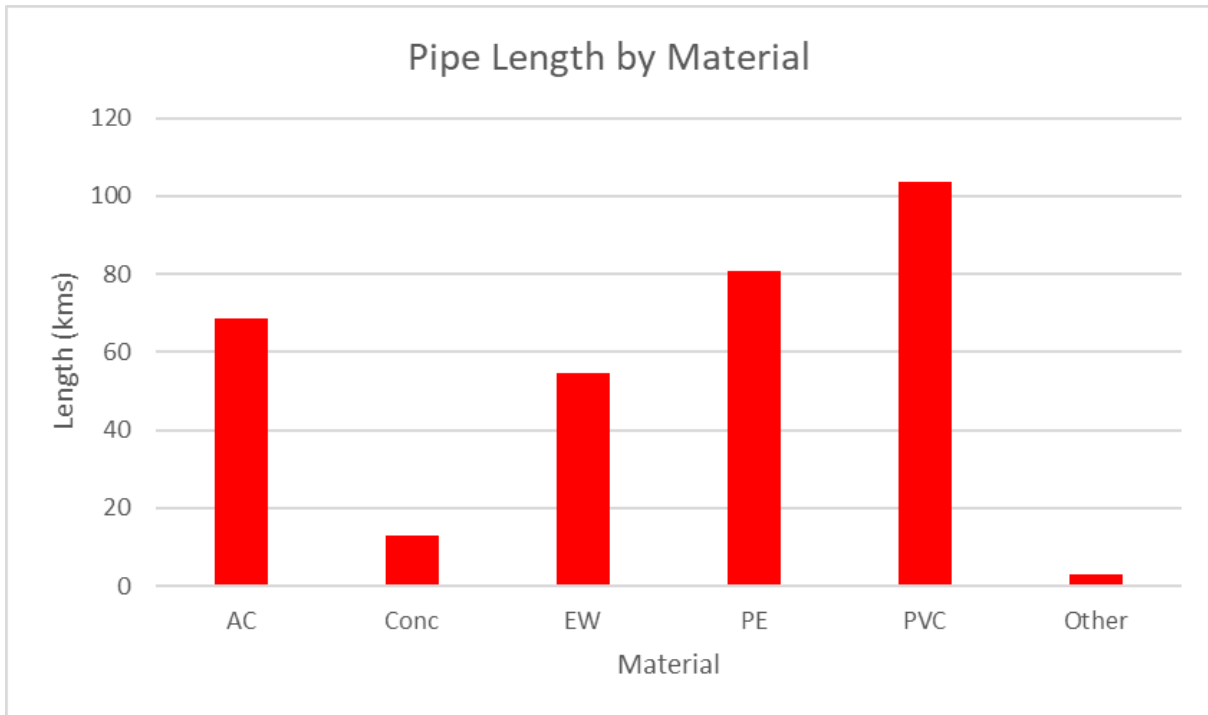


Figure 20: Pipe Length by Material

Source: AssetFinda, 2019.

The most common material is polyvinyl chloride (PVC) (32%, 103km), followed by PE (25%, 80KM), asbestos cement (AC) at 21% of the network (69 km) and earthenware (EW) (17%, 55km).

Pipes are the most significant asset in the network. In the last few years, the focus has been to replace earthenware pipe in areas where blockages and overflows have occurred, the plan is to continue to address areas with known operational issues. Along with implementation of the condition assessment programme, the worst areas can be prioritised for replacement.

Large portion of the EW pipes are located in the Huntly area. Recent CCTV inspection revealed most of EW material pipes are in a poor condition and it is important to focus in replacing these pipes. AC rising mains are another area where issues are arising, the focus has been on these rising mains renewing these with most renewed in Raglan and this will continue in other schemes in a prioritised manner.

Criticality assessments of the entire pipe network have been undertaken using a framework developed by Opus Consultants (Condition Assessment Strategy, Opus Consultants, 2013). Along with OPUS Condition Assessment Strategy Council had developed a guide to capture critical assets. The most critical pipes identified (rating 5) represents 6.67% of the network. These pipes are single supply pipes which service large parts of the network (bigger size pipes service large area) and located across bridges or under railways and state highways.

Table 25: Criticality Ranking of Wastewater Pipe Network

Criticality	Length	Percent of Network
1 (Least Critical)	17,186 m	5%
2	27,964 m	9%
3	231,351 m	72%
4	21,563 m	7%
5 (Most Critical)	22,062 m	7%
Total	320,128.75 m	100.0%

AssetFinda, 2019

Assets which are critical to the provision of the wastewater activity will be summarised once the criticality assessment work is completed for all assets across the activity. Criticality rating 5 & 4 assets will be flagged as high priority.

Point Assets

Table 26: Point Asset Quantity and Replacement Costs

Concise Asset Type	Quantity	Gross Replacement Cost
Connections	3,871	\$8,756,378.10
Manholes	4,561	\$33,490,539.23
Other	624	\$1,273,292.14
Total	9,056	\$43,520,209.47

- Valves, meters, inspection chambers asset are classified as other points assets

AssetFinda, 2019

Point assets account for 30% of the GRC for the network, with a total value of \$44million as at 2017.

Manholes represent the largest value of the point assets. Manholes are used where there are changes in pipeline grade, direction or diameter or as collection points for multiple private service connections. They are generally constructed of circular reinforced pre-cast concrete sections founded on pre-cast or site-constructed concrete bases, with concrete benching from inlet pipe/s to outlet pipe, to improve effluent flow.

Service connections represent the second largest segment of point assets.

The service connection is the length of pipe from the property to the Council reticulated system. The service connection pipe is generally the property owners' responsibility, and Councils' maintenance responsibility would typically end at the property boundary. The exceptions are the low pressure systems where Council responsibility begins on the property at the individual pump station.

Currently there remain properties not connected to the Council wastewater system in locations where connections are available. Council will allocate annual capital growth expenditure to accommodate the connection of these properties.

6.1.1 Telemetry and SCADA Systems

Telemetry is the technology which allows remote measurement and reporting of operational information. SCADA (Supervisory Control and Data Acquisition) is the software package that is positioned on top of a real time control system to control a process.

In simplified terms the strategy document (Waikato District Council SCADA Development Strategy, Streamline Ltd 2011) recommended that the Council move to a single communications platform, QTech RTU (radio telemetry units) and single SCADA system, Wonderware Archestra Software.

In 2013, following a major wastewater overflow event which was partially attributed to the failings of the telemetry/SCADA system, NEO was engaged to review the strategy and to provide direction in terms of a detailed design and implementation plan. The review highlighted a few changes in direction in light of the event and taking on board staffs needs in terms of operational and legislative requirements. As of end of 2019, NEO has delivered the upgrade from detailed design to trial implementation, A capex paper has been approved to complete the upgrade project in 2020/21.

6.1.2 Resource Consents

Council has a number of resource consents issued that relate to wastewater management activities including discharges to water, discharge to air and to land. In accordance with both Regional and District Plans, there are a number of requirements that must be met during the life of the consent. These requirements will stipulate monitoring conditions in the consent and will require the consent holder to report on the compliance with those conditions.

Council monitors discharges for a number of parameters including (BOD, Faecal Coliforms, Heavy Metals, Suspended Solids, Dissolved Oxygen, pH, Conductivity etc), as per the conditions stipulated in the relevant resource consents. Council is required to rectify any issues, where parameters are not met, in a timely manner and report back to Waikato Regional Council.

Management of Consents

Council has used CS Vue to manage its resource consents. CS Vue is a web-based compliance management system where resource consents and associated conditions are entered into a database, compliance requirements are identified and responsibilities assigned to individual staff members. Over recent years, use of CS Vue has reduced and is currently being underutilised. As staff have moved on, the system has lacked overall ownership and responsibility, hence consents have not been maintained in the system. It is proposed to transition consent compliance to Watercare corporate systems in 2020/21

In late 2019, an overall review of consent compliance was undertaken across the wastewater activities by Watercare. The review highlighted that the required reporting was not being consistently carried out, operational requirements were not being implemented and where volume and quality parameters were not being met, some of initiatives have been implemented to address non-compliance with varying levels of success. Watercare will look to review all consent management process and reporting with a view to improving compliance.

Below is the complete list of all current consents related to wastewater activities held by the Council.

Table 27: Volume limits for Wastewater Discharge Resource Consents

Discharge	Consent Number	Consent limit (m ³ /day)	Compliance Rating*	Expiry Date
To Water- Raglan Harbour (Raglan Scheme)	971390	2,600	Partial Compliance (Letter of Direction)	14 February 2020 Temporary 3-year consent applied for Dec 2019 (Issued 2005)
To Water – Waikato River (Central District)	119642	11,200	Partial Compliance (Letter of Direction)	31 March 2029 (Issued 2011)
To Water – Waikato River (Huntly)	119647	11,500	Partial Compliance (Letter of Direction)	31 March 2029 (Issued 2011)
To Water – Lake Waikare (Mid Waikato)	117991	3,600 (Average Annual limit 1,100m ³ /day)	Partial Compliance (Abatement notice)	2028 (Issued 4 July 2013)
To Water – Waikato River (Meremere)	105031	480 WWF 160 DWF	Partial Compliance (Abatement notice)	5 th August 2018 (Issued 2003)
To Land – Matangi	105551	52	Partial Compliance (Letter of Direction)	30 September 2021 (Issued 2001)
To Land – Maramarua	132607	6	Partial Compliance (Abatement notice)	15 December 2039
To Land – Te Kowhai	116151	12	Partial Compliance	30 August 2018 (review in progress)
To Land – Tauwhare Pa	121024	63	Full Compliance	31 October 2035 (Issued 2012)

As at July 2017

Table 28: Consents to Operate the Treatment Process or Network

Consent Type	Consent Number	Compliance Rating*	Expiry Date
Licence to Occupy – Lorenzen Bay (Raglan Wastewater)	118281, 11893	Not audited	30 April 2043 (Issued 2012)
Licence to Occupy – Raglan Harbour (Raglan Wastewater)	971391	Not audited	14 February 2020 (Issued 2005)
Discharge to Air – Raglan Plant (Raglan Wastewater)	971392	Partial Compliance (Letter of Direction)	14 February 2020 Temporary 3 year consent applied for Dec 2019 (Issued 2005)

Discharge to Air – Ngaruawahia Plant (Central District Wastewater)	119643	Partial Compliance (Letter of Direction)	31 March 2029 (Issued 2011)
Licence to Occupy – Outfall (Ngaruawahia Wastewater)	119645	Partial Compliance (Letter of Direction)	31 March 2029 (Issued 2011)
Discharge to Land – Biosolids (Ngaruawahia Wastewater)	124828	Not audited	30 November 2022 (Issued 2012)
Discharge to Air – Huntly Plant (Huntly Wastewater)	119648	Partial Compliance (Letter of Direction)	31 March 2029 (Issued 2011)
Licence to Occupy – Outfall (Huntly Wastewater)	119649	Partial Compliance (Letter of Direction)	31 March 2029 (Issued 2011)
Discharge to Water (via seepage) – Huntly Plant (Huntly Wastewater)	119650	Not audited	31 March 2029 (Issued 2011)
Discharge to Water (via flooding of wetlands – Huntly Plant (Huntly Wastewater)	119651	Not audited	31 March 2029 (Issued 2011)
Discharge to Air – Te Kauwhata Plant (Mid Waikato Wastewater)	117992	Not audited	2028 (Issued 2013)

As at July 2017

6.1.3 Trade Waste

In August 2012, Waikato District Council entered into a Shared Services agreement with Hamilton City and Waipa District Councils. The purpose of this agreement was for the Councils to work together to provide and receive services to increase efficiency, reduce cost and increase specialisation. Trade waste was seen as a priority area, which required focus which Shared Services could provide.

The main functions of the Trade Waste team are to:

- Manage the consent process to ensure that trade waste customers are being captured at building and land use consent stage
- Identify existing trade waste customers within the district and ensure that they are registered and assist in ensuring they are compliant.

From 1 October 2020, Watercare will assume responsibility of trade waste services from Shared Services.

7 Wastewater Schemes Descriptions

7.1 Central District Scheme

Overview

The Central District scheme collects and treats wastewater from Ngaruawahia, Horotiu, Taupiri and Hopuhopu.

Wastewater is pumped from the towns to the oxidation pond at Ngaruawahia, treated in the oxidation pond, wetland and gravel bed before being gravity discharged into the Waikato River.

There are 14 pump stations in Ngaruawahia, 5 in Horotiu, 2 in Hopuhopu and 5 in Taupiri all of which are connected to the SCADA system.

- **Ngaruawahia**
The Ngaruawahia wastewater scheme was installed in the early 1970's with the treatment pond being commissioned in 1972.
- **Hopuhopu**
The Hopuhopu scheme was originally installed to service the military camp constructed in the 1930's. By 1990 the New Zealand Army had left the site and the Hopuhopu wastewater treatment plant was gifted to Council. It is no longer used and has been decommissioned and demolished. All treatment is now via the Ngaruawahia treatment plant.
- **Taupiri**
An 8.6 km reticulation network with 5 pump stations was installed in the Taupiri settlement in 2007 to service the community. Wastewater is collected from the properties and pumped to the wastewater treatment plant in Ngaruawahia for treatment and disposal.
- **Horotiu**
The wastewater scheme in Horotiu was originally built by the Waipa District Council, the waste was treated at the AFFCO plant. In the mid 90's due to changes in AFFCO's consent, the Waikato District inherited the reticulation and waste was diverted into the Ngaruawahia treatment plant.

Treatment Plant Discharge and Quality

The Ngaruawahia treatment plant is consented to discharge treated effluent to the Waikato River, this consent was granted in 2011.

The WWTP comprises inlet screening, oxidation pond, solids removal, UV disinfection, gravel channels and a discharge to the Waikato River. There are 5 cage aerators and a series of curtains in the oxidation pond that form part of the treatment process.

There have been no significant capital upgrades since the 50 year Wastewater Strategy was prepared in 2014 and there are no significant WWTP upgrades identified in the 2015/16 consent compliance report.

Asset Description

The scheme has 4,815 connections and an average discharge rate of 1,737m³/day. Specific capacities at the treatment plant are shown in the table below.

Table 29: Capacities of the Ngaruawahia Treatment Plant

Asset	Capacity
Oxidation Pond	65,700m ²

Resource Consent was granted in 2011 and expires in 2046.

The table below summarises the assets at component level, indicating the expected life, age, condition and financial information for each item.

Table 30: Central Scheme Asset Information

Concise Group	Quantity	Unit	Average Age	Gross Replacement Cost
Pipes	64,716.37	m	30	\$ 17,191,564.52
Point Assets	1,046	Each	28	\$ 6,584,790.22
Pump Station Assets	690	Each	22	\$ 5,234,229.20
Treatment Plant Assets	278	Each	10	\$ 5,184,708.41
<i>Total</i>				\$ 34,195,292.35

Source: AssetFinda, 2019

Asset Condition

A comprehensive condition assessment study was completed by Jacobs in 2020. Generally, assets are in reasonable condition however electrical and control assets needs replacement.

Recently asbestos cement pipes in Waikato Esplande were found to be degraded and failing and were replaced in 2018, the opportunity was taken to upsize these pipes; this has enabled increased flows from the Horotiu area. The rising main to the WWTP has also been tested and found to at the end of its life, it has been programmed for renewal in a staged manner. It is likely to be replaced with a twin main as the two key stations (Waikato Esplanade and Regent St pump stations) currently both pump into it causing a performance drop of in wet weather conditions.

The rising mains which are suspended off the Waipa river and Waikato river road bridges will both be replaced due to their age and criticality.

Condition and performance Issues

Following the upgrade, the treatment processes are being refined to accommodate the changes/additions made. This has resulted in fluctuations in the quality parameters. While the Actiflo unit was originally specified to run only in the summer months to reduce the total suspended solids (TSS), staff have found that they need to operate the system in the winter period to ensure consent compliance.

Initially the sludge from the Actiflo unit went into geobags which will need removal in the future, and the supernatant is being returned into the oxidation pond. However the geobags were overwhelmed with sludge and the sludge is currently being directed back into the oxidation pond. This issue has yet to be resolved.

In terms of the reticulation, infiltration and inflow (I&I) is an issue. The main points of overflow from the network are at the pump stations, a programme has been completed to install emergency storage at key pump stations. This has caused a marked improvement in wet weather overflow performance in this network, further tank is proposed at Waipa Esplande pump station.

The assessment of the key pump stations (Waikato Esplande and Regent St) found that they will have insufficient capacity in 5 years due to growth and will require upgrading, this will be done in parallel to the rising main upgrade.

There are parts of the network which require flushing on a regular basis due to sags and build up in the pipes. These pipes will be put into the condition assessment programme for priority assessment.

Network Model - System Performance

Mott MacDonald was engaged by the Waikato District Council (WAIDC) in 2015 to build and calibrate a wastewater network model of the Central Districts wastewater catchment. The model analysed dry and wet weather flow for existing and future scenarios and identified problem areas and issues within the catchment. Watercare have peer reviewed the network model and found they have significant issues which would cause the model to overstate wet weather flows, the model will require some recalibration to accurately network. In addition, an analysis of the key pump stations which pump into rising main that discharges to the treatment plant needs to be incorporated into the model. This model upgrades will be undertaken in the upcoming LTP period.

7.2 Huntly Scheme

Overview

The Huntly scheme services the main township of Huntly, the Te Ohaaki Marae and the surrounding community. Wastewater is collected and pumped to the Huntly Wastewater Treatment Plant (WWTP), which is located to the north of Huntly. Wastewater is collected in a reticulated network and passes through two oxidation ponds and tertiary treatment of wetlands and UV, prior to final discharge to the Waikato River via a 1km pumped discharge line.

The scheme was developed in 1944 with the discharge straight to the river via a septic tank, in late 70's the treatment ponds were commissioned and put into operation.

The scheme includes 22 pump stations. All of the pump stations are connected to SCADA/Telemetry with the exception of the North End motel pump station.

Treatment Plant Discharge and Quality

The existing discharge consent contains quality and quantity conditions to the effluent volumes entering and exiting the treatment plant. The WWTP comprises inlet screening, septage receipt plant, oxidation ponds, UV disinfection, wetlands, "rock-lined" channels, and a discharge to the Waikato River. The oxidation ponds primary and secondary contain a total of 5 aerators and series of curtains.

A septage receiving facility was constructed in 2008 on the treatment plant site. Historically septage was being discharged across the district and was causing problems with the treatment processes; it was acknowledged that the majority of the septage was coming from within the district from properties with on-site systems, so a dedicated disposal point was created.

The septage goes through a receiving unit and is discharged into a holding pond, the liquid component is then discharged into the oxidation ponds, with the sludge being held in geobags for future removal. Improvements in the septage processing prior to being put in geobags are currently underway. As part of the upgrade works, the sludge was removed from the oxidation ponds in 2011.

Asset Description

The current capacity of the treatment plant and operating structures/equipment is adequate for the current demand and the forecast demand. Specific capacities at the treatment plant are shown in the table below.

Table 31: Capacities of the Huntly Treatment Plant

Asset	Capacities
Primary Pond (1)	76,500m ² (112,00m ³)
Secondary Pond (1)	36,000m ² (51,600m ³)
Wetlands (9cells, 2 rock filters)	29,000m ²
Inflow Structure	400mm
Consented Discharge	11,500 m ³ /day

In 2011, the resource consents for both Ngaruawahia and Huntly were renewed with an expiry date of 2029. The consents were issued with parameters set as cumulative totals for both plants. This allows flexibility in what treatment methodologies are used at either plant for the specific parameter.

Additional equipment is to be installed as part of the upgrade, including inlet screens, front-end sludge settling ponds and a septic tank receiving facility. In 2011, the network was extended to service the Te Ohaaki Marae and surrounding area, this puts additional load on the overall system.

Table 31 summarises the assets at component level indicating the expected life, age, condition and financial information for each item.

Table 32: Huntly Asset Information

Concise Group	Quantity	Unit	Average Age	Gross Replacement Cost
Pipes	71,534.85	m	49	\$ 20,268,505.24
Point Assets	1,212	Each	48	\$ 7,827,277.35
Pump Station Assets	643	Each	19	\$ 4,442,625.29
Treatment Plant Assets	285	Each	19	\$ 10,745,942.32
Total				\$ 43,284,350.20

Source: AssetFinda, 2019

Asset Condition

The previous investigation work has resulted in the identification of various public network and private property defects which are likely to be contributing to inflow and infiltration. Many private properties were found to have yards, driveways and roofs draining directly into the wastewater network, either plumbed in or due to defective (low) gully traps. These defects are likely to have an impact on wet weather peak flows.

A critical finding included two SW cesspits, located on the road outside 14 Ralph Street (the fire station) and outside 128 Rayner Road that were connected to the wastewater network in some

manner. These could be introducing large volumes of water during wet weather due to the large areas of impervious surfaces involved.

Gully trap defects were widespread but were not always a significant issue.

During private property investigations smoke emerging from lawns, gardens and around houses was noted as a potential indicator of defective laterals or private plumbing issues. Acting to further investigate and remediate laterals will depend on the need to reduce infiltration volumes and address poor lateral performance.

Almost half of the manholes in the area investigated were not able to be inspected due to being sealed, buried or not locatable. The GIS information was generally adequate however, in some areas it did not correspond well to actual asset locations. The general condition of manholes inspected was fair. Cracks, stains and poorly fitting or un-attached lids were common.

District wide CCTV inspection has shown that aged EW material pipes are in poor condition and large amount groundwater is getting into the wastewater network.

Condition and Performance Issues

The oxidation pond treatment process results in fluctuations in the quality parameters.

In the 2015/16 consent compliance report, another aerator has been installed in the primary pond and regular dosing of sodium nitrate was required during summer to improve the dissolved oxygen concentration in the ponds.

WDC had planned to upgrade Huntly WWTP in 2016/17 with an Actiflo unit (to remove suspended solids), however the issues with the performance of the Actiflo at Ngaruawahia treatment plant has meant that is no longer an option that will be pursued.

The septage facility has had numerous issues since its installation, issues with continual blockages and the electronic system for contractor access failing continually. There is concern that contractors are disposing of waste other than septage, and this is contributing to the issues as the system relies on honesty from the contractors. The system itself needs reassessment and may need to consideration of the type of unit used. A more robust, resilient system may be required.

Infiltration and inflow levels in the Huntly system are high. This has impacts not only on the reticulation, with overflows occurring at pump stations and low points in the network during rain events, but also at the treatment plant. The oxidation ponds have been known to overtop and the outfall pipeline to the river has a number of raised manholes which also have been known to surcharge. To make matters worse, when the river levels are high this also contributes to the water ingress through low lying manholes along the river.

The newest part of the network is the low pressure sewer installed in the north to service the Te Ohaaki community including local marae. There have been a few issues including blockage of the main line into the gravity system, due to the length, clearing of the network has been challenging. This has been addressed through installation of a flushing point. The other main issue with this new part of the network is dealing with the continual pump blowouts and blockages due to residents disposing of

waste material other than basic domestic waste, the proliferation of products that while the manufacturer are stating are biodegradable the older internal pipework is not able to handle. There are two major problems been identified as a part of wastewater modelling are the trunk sewer along Bailey St and Hancock St is flat and prone to sedimentation, it requires regular cleaning.

Generally, because of the soil conditions, ground movement is common in Huntly, this has resulted in some parts of the network with sags in the pipe and gradient shifts and along with the age of the infrastructure this is creating issues. Known areas are in Huntly West, Smith Street and James Henry Crescent.

7.3 Maramarua Scheme

Overview

The wastewater system was originally constructed for the Carter Holt Harvey Timber Mill workers' houses. When the mill closed and the houses were sold, a body corporate was formed that then petitioned Council to take on ownership and management of the scheme. Council has maintained and administered the scheme on behalf of the residents since July 1994. Council does not own the land which the treatment plant sits on.

The Maramarua scheme consists of 8 houses served by a small re-circulating sand filter and sand mound disposal wastewater treatment system. The wastewater is collected via gravity pipes and settled in two septic tanks before being gravity fed into a pump station / re-circulation tank, then pumped to a sand contactor. From the sand contractor effluent is drained to a treated effluent tank then pumped into a disposal mound. Very little capital or operational funds have been expended on the system.

Treatment Plant Discharge and Quality

Resource consent for the discharge of treated wastewater to land was granted in 2014 and expires in 2039. WDC replaced the main wastewater pipe to address I/I issues and Watercare has replaced the WWTP media to resolve process issues.

Asset Description

The current capacity of the treatment plant facility and operating structures/equipment is adequate under normal conditions, for the current demand and the forecasted demand. Specific capacities are shown in the table below.

Table 33: Capacities of the Maramarua Treatment Plant

Asset	Capacity
Main Pump Well	9.7 m ³ Concrete Tank
Concrete Chamber	500 mm (diameter)
Septic Tanks (2) Connected in series	3,300 litre concrete tanks
Sand Contractor	30 m ³ *surface area of concrete surround
Treated Effluent Tank	9 m ³
Disposal Mound	700 m ³ approx sand are with 300mm clay cap
Scheme Discharge	6 m ³ /day

The design population for the system is 8 dwellings with 6 m³/day scheme consented discharge. Currently 8 dwellings plus one office are served by the system.

The area is zoned Rural which means that should there be population growth, section sizes will be large enough to accommodate individual septic tanks, requiring no capacity upgrade for the Maramarua scheme.

The table below summarises the assets at component level indicating the expected life, age, condition and financial information for each item.

Table 34: Maramarua Scheme Asset Information

Concise Group	Quantity	Unit	Average Age	Gross Replacement Cost
Pipes	233.28	m	50	\$ 45,276.09
Point Assets	3	Each	50	\$ 17,267.13
Treatment Plant Assets	40	Each	14	\$ 204,060.00
<i>Total</i>				\$ 266,603.22

Source: AssetFinda, 2019

Asset Condition

A comprehensive condition assessment study was completed by Jacobs in 2020. Generally, assets are in reasonable condition however electrical and control assets needs replacement.

Condition and Performance Issues

Concerns have been raised of the impact on ground water sources and the effectiveness of the current system, Regional Council annual reports and test results of the local ground water sources will be provided to the concerned stakeholders.

The previous consent included a maximum discharge flow limit of 6 m³/day but no treated wastewater quality limits. The current consent includes an average discharge flow limit of 5 m³/day and 90th percentile flow limit of 8 m³/day(both calculated on an annual basis) as well as treated wastewater discharge limits of 20 mg/L for cBOD and 30 mg/L for suspended solids (both as 90th percentiles calculated on an annual basis). The maintenance for the plant has been very minimal. There are concerns about the effectiveness of the sand filter. This will be checked by staff along with the maintenance of the irrigation fields. The consent also required the treated wastewater to be analysed for nitrate nitrogen, ammonia nitrogen and E.coli but there are no consent limits.

7.4 Matangi Scheme

Overview

Matangi has a re-circulating sand filter wastewater treatment system serving 55 dwellings. Wastewater is collected from the individual septic tanks in the Matangi settlement and pumped into two Council septic tanks. From there, it is pumped into sand contactor beds, passing through on average four times to achieve bacteriological breakdown. The treated effluent is discharged into an irrigation field.

Treatment Plant Discharge and Quality

The consented discharge is 52 m³/day. The consent does not require standard discharge levels to be met. Quarterly testing is undertaken of all parameters and levels of nitrogen in kg/Ha/year. There are three sampling bores to measure contamination of ground water. There had previously been problems before the replacement of the sand filter media.

The resource consent for this scheme expires on 30 September 2021. The consent was reissued in 2008. The current resource consent does not contain treated wastewater quality limits. Any consent obtained beyond 2021 may be more stringent, which may require additional treatment or modifications to the land application system.

Asset Description

The current capacity of the treatment plant and operating structures/equipment is adequate for the current demand and forecasted demand. Specific capacities at the treatment plant facility are:

Table 35: Capacities of the Matangi Treatment Plant

Asset	Capacity
Septic Tanks (2)	55 m ³
Recirculating Tank (1)	55 m ³
Sand Contactor Beds (4)	256 m ²
Treated Effluent Pump Chamber (1)	1.8 m (dia) x 3 m
Soakage Beds	256 m ³
Drip Irrigation Field	750 m ²

The design population is for 50 dwellings. Currently the reticulated area contains 49 dwellings including Matangi School. The Council has no plans to extend the system.

Table 35 summarises the assets at a component level indicating the expected life, age, condition and financial information for each item.

Table 36: Matangi Scheme Asset Information

Concise Group	Quantity	Unit	Average Age	Gross Replacement Cost
Pipes	2,060.18	m	30	\$ 381,359.49
Point Assets	50	Each	24	\$ 221,994.35
Pump Station Assets	41	Each	9	\$ 307,472.74
Treatment Plant Assets	66	Each	16	\$ 414,990.09
Total				\$ 1,325,816.67

Source: AssetFinda, 2019

Asset Condition

Limited information currently is available, a programme to gain a better understanding of condition is underway at a district wide level.

Condition and Performance Issues

There are ongoing issues with the sand filters clogging at the treatment plant, the filters have been replaced several times over the life of the system. Analysis is required into the issues and whether it would be more cost effective to have textile filters instead.

The plant has very little automated control, the installation of a PLC would improve operations on site and remotely. With the reticulation, ongoing infiltration and inflow is an issue, anecdotal information suggests the main source of the infiltration are the septic tanks which are of varying condition. The septic tanks are cleaned out on a 3-yearly basis.

7.5 Meremere Scheme

Overview

Since 1990 Council has managed the Meremere wastewater scheme originally built during the 1960s by the Meremere Power Station to serve the workers' houses that made up the Meremere village.

Wastewater is collected from the village and treated in an oxidation pond. Baffles were installed in the pond to prevent short-circuiting and a rock filter added at the outlet for further filtration of the effluent. The treated effluent is pumped through UV disinfection at the site prior to discharge via a diffuser nozzle at the outlet into the Waikato River.

Treatment Plant Discharge and Quality

The existing resource consent to discharge treated wastewater into the Waikato River expired in 2018, a new MBR treatment plant will be commissioned by December 2021. A 35-year discharge consent is currently being sort from WRC.

Asset Description

The current design capacity of the treatment plant and operating structures/equipment is adequate for the current demand and forecasted demand. Specific capacities at the treatment plant are:

Table 37: Capacity of the Meremere Oxidation Pond

Asset	Capacity
Oxidation Pond	8,100m ³

The design population is 500. The present population of the reticulated area is 499. The proposed MBR plant will have capacity for growth to a population of 720.

Table 37 summarises the assets at component level indicating the expected life, age, condition and financial information for each item.

Table 38: Meremere Scheme Asset Information

Concise Group	Quantity	Unit	Average Age	Gross Replacement Cost
Pipes	7,124.51	m	47	\$ 1,914,601.45
Point Assets	113	Each	49	\$ 748,297.21

Pump Station Assets	68	Each	20	\$ 589,610.47
Treatment Plant Assets	35	Each	20	\$ 871,557.22
Total				\$ 4,124,066.35

Source: AssetFinda, 2019

Asset Condition

CCTV surveys have been undertaken on the majority of the network this has shown a mix of AC and EW pipes some of which are in poor condition and contributing to the high ground water infiltration issues Meremere suffers from.

Condition and Performance Issues

The main issue with the Meremere scheme is the level of inflow and infiltration during wet weather. The reticulation is known to be of poor quality due to the construction methods of the time and porous nature of the concrete manholes used. This overloads the oxidation ponds at the treatment plant and requires that discharge to the river occurs outside consented times. Recently Council have completed inflow and infiltration (I&I) investigations and significant work has been undertaken to rectify private faults. The renewal of some of the worst condition public sewers will be undertaken in 2021.

7.6 Raglan Scheme

Overview

The Raglan scheme services the main township of Raglan and settlement on Whaanga Coast. Wastewater is collected and conveyed to the Raglan Wastewater Treatment Plant (WWTP), which is located to the south west of Raglan. The wastewater scheme was first constructed in the 1970's, the treatment consisted of two oxidation ponds which discharged into the harbour mouth. The scheme services the Raglan urban area. In 2008/09 the treatment process was upgraded; the treatment consists of two anaerobic ponds and four aerobic ponds and a treated effluent storage pond. There are aquamats installed in the 1st bank of aerobic ponds, with UV disinfection installed at the end of the process which goes to a pump station that pumps the treated effluent on the outgoing tide.

A septage receiving facility has been built on site with the expectation, that the waste is discharged into the inlet of the treatment system. The original oxidation pond was retained with the view to drying a sludge removed from the ponds and the aquamats.

Table 39: Capacity of the Raglan Oxidation Ponds

Asset	Capacity
Anaerobic Ponds (2)	650m ² (each)
High Rate Oxidation Ponds (4)	
Roadside Balance Pond	2000m ³

The scheme has 17 pump stations to pump the wastewater to the treatment plant. The treated effluent is then pumped via an outlet pipe into the harbour mouth on the outgoing tide. There is screening on the influent and UV treatment on the discharge prior to the outfall line. A sludge pond with a pump station reprocesses liquid.

Treatment Plant Discharge and Quality

The current resource consent for the wastewater discharge from the Raglan treatment plant to Raglan Harbour expired in February 2020. The consent was granted in 2005. The process for applying for a new consent is underway and the application is expected to be lodged with WRC between November 2020 and June 2021.

The Raglan scheme is consented to discharge daily up to 2,600 m³. The consent requires discharge only during high tide and that Council must publicly display an indication of the discharge flow. The existing resource consent to discharge treated wastewater to Raglan Harbour expired in 2020 and so Watercare are continuing to investigate alternative discharge options, including reuse options, aquifer recharge and land disposal.

Asset Description

Specific capacities at the treatment plant are shown in the table below.

Table 40: Capacities of the Raglan Treatment Plant

Asset	Capacities
Oxidation Pond (2) Concrete Wavebands	3.7 hectares surface area 1.2m depth
Cage Rotor Aerator	
Submersible Pumps (2)	
Consented Discharge	2,600 m ³ /day until 2010 then 3,400 m ³ /day from 2010 onwards

Table 40 summarises the assets at component level, indicating the expected life, age, condition and financial information for each item.

Table 41: Raglan Scheme Asset Information

Concise Group	Quantity	Unit	Average Age	Gross Replacement Cost
Pipes	53,768.90	m	33	\$ 13,910,626.61
Point Assets	995	Each	31	\$ 5,554,411.90
Pump Station Assets	625	Each	13	\$ 3,922,932.20
Treatment Plant Assets	228	Each	15	\$ 4,429,136.38
<i>Total</i>				\$ 27,817,107.10

Source: AssetFinda, 2019

Asset Condition

The scheme has 4,815 connections and an average discharge rate of 1,737 m³/day.

Condition and Performance Issues

2014/15 and 2015/16 consent compliance reports, a new final pond has been installed to empty completely during discharge (to prevent algal growth and so improve total suspended solids concentration in discharge), the UV disinfection system was refurbished and wiper frequency increased (to improve performance), and additional Aquamats and airlines have been installed in all ponds (to increase treatment capacity). In 2019, an additional mechanical screen was installed at the plant inlet to provide more capacity and prevent incoming flows bypassing the screens.

The Raglan system experiences high infiltration and inflow levels. During wet weather, pump stations are known to overflow. This issue has improved with the installation on storage tanks at the Marine Parade Pump Stations which are key stations in this network. A further storage tank at the Wallis street pump station in the forthcoming LTP period. The new Rangatahi pump station which collects flows and pumps directly to the treatment plant also as storage tanks. The network has also suffered from asbestos rising mains which are prone to failure, a program to replace these has been undertaken in the last LTP period, there are a number still to replace. Network failures which result in wastewater enter the harbour lead closures for recreational use and shellfish gathering. These events cause significant reputational damage to both Watercare and Council as this community is extremely aware and environmentally focussed.

Network Model - System Performance

Waikato District Council (WAIDC) engaged Mott MacDonald in August 2015 to build and calibrate a wastewater network model of the Raglan catchment. The model analysed dry and wet weather flow for existing and future scenarios and identified problem areas and issues within the catchment. Watercare have peer reviewed the network model and found they have significant issues which would cause the model to overstate wet weather flows, the model will require some recalibration to accurately network. In addition, an analysis of the key pump stations is required and needs to be incorporated into the model. These model upgrades will be undertaken in the upcoming LTP period.

Dry Weather System Performance

Network hydraulic capacity is sufficient for existing and future dry weather flows. Infiltration and exfiltration are not considered to be significant issues however some catchments appear to have moderate infiltration or poor to very poor implied asset condition. Approximately 91% of the network is expected to experience low velocities (less than 0.6m/s) under existing peak dry weather conditions. These pipes are at a higher risk of siltation. All pumping stations are able to provide the 6 hours' storage although Wallis Street storage is at 6 hours and 42 mins which is close to the 6 hour limit.

7.7 Mid Waikato Scheme

Overview

The Mid Waikato scheme collects and treats wastewater from Te Kauwhata, the Springhill Correction Facility and the village of Rangiriri. The original plant was upgraded from 2005 – 2007 to accommodate the loading from Rangiriri, the Correction Facility and future growth in the area. A reticulation network was constructed in 2008 in the Rangiriri township (previously unreticulated) to enable

wastewater collection from the township and treatment at the Te Kauwhata plant, which is located to the South of Te Kauwhata township.

With the Lakeside development and growth occurring in existing zoned land Council successfully applied for Housing Infrastructure Funds (HIF), some of these funds were for a new MBR treatment plant with a river discharge.

Wastewater in the Mid Waikato scheme is currently treated in two high rate oxidation ponds with tertiary treatment by wetlands and rock filter. The treated effluent is discharged to Lake Waikere via a continuously metered submerged gravity outfall pipe. Coagulant dosing is used to reduce phosphorus. The system also receives leachate from the closed landfill. There are aquamats installed in the oxidation ponds. A number of ground water sampling boreholes are utilised for sampling in conjunction with water samples taken from the lake near the outfall.

The scheme has 5 pump stations in Te Kauwhata, one in Rangiriri and one from the prison to pump the wastewater to the treatment plant, all but one of which are connected to SCADA.

Treatment Plant Discharge and Quality

The existing discharge consent contains quality and quantities conditions to the effluent exiting the treatment plant. The total nitrogen loading to the wetland must be no greater than 50 kg/ha/day. **The Te Kauwhata WWTP currently has an abatement notice with respect to Nitrogen, Phosphorous and E. Coli exceedances.** Upgrades to the aeration system are underway and it is hoped this will improve the plants performance.

The consent for the scheme expires in 2025. The consent process has highlighted that the community are not happy with the discharge into the lake since then council has investigated other discharge options such as land disposal unsuccessfully. There is a current commitment to cease discharging to the lake in 2023.

The Mid Waikato servicing strategy was undertaken by Watercare in 2020, this looked at servicing options for water and wastewater in the Mid Waikato (Meremere to Huntly), it has recommended a stand-alone MBR plant at Te Kauwhata existing treatment plant site. Consultation with stakeholders is required to confirm this proposed solution and discharge point options.

Asset Description

The current capacity of the treatment plant and operating structures/equipment is adequate for the current demand. Specific capacities at the treatment plant are shown in the table below.

Table 42: Capacities of the Mid Waikato Treatment Plant

Asset	Capacities
Oxidation Ponds (2) Concrete Waveband	1.2 hectares surface area 1.0-1.5 m depth
Wetlands (4 cells, 1 rock filter)	2.17 hectares
Cage Rotor Aerators	
Consented Discharge	1,080 m ³ /day

In February 2000, an automatic dissolved oxygen (DO) monitoring system was installed at the treatment plant. This is connected to SCADA and effectively controls the operation of the aerators.

The scheme is designed to discharge 1,100 m³/day of dry weather flow.

Table 42 summarises the assets at component level, indicating the expected life, age, condition and financial information for each item.

Table 43: Mid Waikato Asset Information

Concise Group	Quantity	Unit	Average Age	Gross Replacement Cost
Pipes	34,394.84	m	18	\$ 8,845,920.34
Point Assets	547	Each	18	\$ 3,372,889.95
Pump Station Assets	201	Each	8	\$ 1,710,198.12
Treatment Plant Assets	80	Each	14	\$ 2,948,330.29
<i>Total</i>				\$ 16,877,338.70

Source: AssetFinda, 2019

Asset Condition

A comprehensive condition assessment study was completed by Jacobs in 2020. Generally, assets are in reasonable condition however electrical and control assets needs replacement.

Condition and Performance Issues

In the 2015/16 consent compliance report, the Aquamat area and aeration system capacity has been increased and the alum dose rate has been adjusted to ensure compliance with the phosphorus discharge limits (concentration and load). The 2015/16 compliance report also notes that wetland improvements were undertaken in 2019.

During rain events the wetlands and rock filters are known to flood, this is primarily due to the design. While there are Infiltration and Inflow issues in the network, the levels are not high and does not result in overflows to the environment. The older parts of the network, Eccles Ave and surrounds is suspected to have poor quality infrastructure.

Wastewater Model

Watercare are currently building and calibration a hydraulic model of the network this should be completed by the end of 2020.

7.8 Te Kowhai Scheme

Overview

The original Te Kowhai wastewater treatment system was commissioned in 1984 to treat effluent from the surrounding nine dwellings which housed some of the employees of the, now closed, Dairy Factory. The system was a standard Ministry of Works design, which was quite common at the time. At the time the system was installed Te Kowhai was part of the Waipa County Council area. Te

Kowhai was transferred to the Waikato District Council after the local body amalgamations in November 1989. The Te Kowhai scheme services 17 houses in the Te Kowhai community.

The Council upgraded the system with Innoflow Technologies re-circulating sand filter system in 1998. Wastewater is collected from the individual and privately owned septic tanks at the properties and discharged into a communal septic tank. After filtering the solids, the treated effluent is discharged into a re-circulating tank then to soakage trenches for disposal.

Scheme maintenance is minimal:

- The filter in the communal septic tank is cleaned quarterly
- Solids are removed every 2 – 3 years
- Council cleans the individual property septic tanks every 3 years.

Treatment Plant Discharge and Quality

The quality of the effluent that has passed through the sand filter generally compliant, but there are issues with the nitrogen levels. The re-circulating tank ensures bacteriological breakdown of the effluent by passing it at least four times through the sand filter beds. The pipes pumping the effluent through the sand filter beds are covered with gravel to minimise odour concerns.

The resource consent has no specific testing requirements other than frequency. Monthly testing is required for this scheme.

Asset Description

The specific capacities of the treatment plant are as shown in the table below.

Table 44: Capacities of the Te Kowhai Treatment Plant

Asset	Capacities
Septic Tank	27 m ³
Re-circulation Tank	23 m ³
Sand Filter Beds (I)	42 m ²
Scheme Discharge	12 m ³ /day

The design population for the Te Kowhai scheme is 17 dwellings which is the size of the current population connected to the scheme.

Table below summarises the assets at component level, indicating the expected life, age, condition and financial information for each item.

Table 45: Te Kowhai Asset Information

Concise Group	Quantity	Unit	Average Age	Gross Replacement Cost
Pipes	439.02	m	50	\$ 76,134.29
Point Assets	15	Each	50	\$ 95,047.02
Treatment Plant Assets	14	Each	26	\$ 145,450.00
<i>Total</i>				\$ 316,631.31

Source: AssetFinda, 2019

Asset Condition

A comprehensive condition assessment study was completed by Jacobs in 2020. Generally, assets are in reasonable condition however electrical and control assets needs replacement.

Condition and Performance Issues

The current scheme does not service the entire Te Kowhai community, a study was undertaken in 2012 to assess the ability of the plant to be expanded to cater for the rest of the community and future growth. The study stated that in order for expansion, more land would need to be acquired for treatment, no viable waterways are in the area to cater for a water discharge. A potential alternative option would be to approach Hamilton City to connect the scheme to their system, however this option is unlikely to occur for many years. The Council has indicated in Waikato 2070 growth strategy that it will allow significant residential growth in 10 years. The proposed LTP has allowed for the decommissioning of the plant in 2030 when the current consent expires, the construction of a network connecting Te Kowhai to Horotiu network is proposed in the LTP for 2028-2030 period. This will allow residential growth to occur in Te Kowhai plus leave the option open to divert flows from Horotiu o the Hamilton city network if this option ever becomes available.

7.9 Tauwhare Pa Scheme

Overview

Tauwhare Pa and the associated Papakainga is located between Matangi and Tauwhare villages. There have been concerns with the effect of the onsite systems on the local environment. In 2010, Council developed a proposal to provide a public wastewater system to the community. The Ministry of Health (MoH) was approached for funding through SWSS (Sanitary Works Subsidy Scheme), this was successful.

The treatment plant and associated reticulation was constructed in 2011.

Treatment Plant Discharge and Quality

The treatment comprises of an Innoflow package plant with textile filters that discharge to an effluent disposal field next to the treatment plant.

Asset Description

The reticulation is a low-pressure system with Eone pumps that convey the waste to the plant. There are 43 connections to the scheme.

Table 45 summarises the assets at component level, indicating the expected life, age, condition and financial information for each item.

Table 46: Tauwhare Pa Scheme Asset Information

Concise Group	Quantity	Unit	Average Age	Gross Replacement Cost
Pipes	1,453.17	m	9	\$ 183,687.40
Point Assets	5	Each	9	\$ 5,805.26

Pump Station Assets	174	Each	9	\$	543,200.56
Treatment Plant Assets	52	Each	9	\$	595,747.00
Total				\$	1,328,440.22

Source: AssetFinda, 2019

Asset Condition

As the scheme has only been constructed in the last 10 years, the assumption is that the condition is very good.

Condition and Performance Issues

Since commissioning there have been a few issues with the treatment plant and the reticulation.

The irrigation fields have had to be replaced due to damage which occurred during maintenance. A better understanding of the system by the operators is required, along with better controls on the use of the land by others. A more robust lease arrangement is required.

The main issue with the network is dealing with the continual pump blowouts and blockages due to residents disposing of waste material other than basic domestic waste, the proliferation of products that while the manufacturer is stating are biodegradable the older internal pipework is not able to handle. Harsh cleaning products in use have also contributed to the issues experienced at the treatment plant with non-compliance of the discharge parameters, BOD and TSS.

A wastewater bylaw and education programme would provide better controls on the system.

7.10 North Waikato Scheme

Overview

Previous to 2010, Franklin District Council owned and operated the wastewater system that services Tuakau and Pukekohe. As part of the Auckland amalgamation, the wastewater system was split. Watercare Services retained the treatment plant and the Pukekohe reticulation, the Tuakau network was handed over to Waikato District Council.

Significant residential growth has occurred in Pokeno over the last 10 years, in addition Council has allowed 2 dairy factories to be established in Pokeno. These wet industry flows make up over 70% of the Pokeno's daily flows and both factories have indicated a desire to increase flows further. This causes significant problems for network and treatment plant capacity. The proposed LTP allows for the upgrading of the network between Pokeno and Tuakau to meet the increased dairy factories flows, however this has to done in conjunction with having Watercare treatment plant capacity available and that currently is not available. Currently Council are in negotiations with Synlait to develop a development agreement to address funding of stage 1 flows, this will not address future flow aspirations the dairy companies especially Synlait have. This outstanding issue needs to be addressed, as the proposed network upgrades enable Pokeno growth plus developments such as Whangarata Industrial zone and Tata Valley Agri Tourist Project.

The Tuakau wastewater system was constructed in the early 1960's. A structure plan review was undertaken by Franklin District Council for Pokeno and was adopted in 2010. The structure plan is planned to accommodate a future population of just under 5,000 by 2045. At the time Pokeno did not have access to a public wastewater system, the decision was made to provide public reticulation and convey the wastewater to Tuakau for eventual treatment at the Watercare treatment plant west of Tuakau.

Treatment Plant Discharge and Quality

Currently Watercare owns and operates the treatment plant to which Tuakau discharges to. There are currently significant upgrade works being undertaken at the treatment plant. Future flow requirements for the North Waikato need to be agreed with Watercare as current proposals exceed the available treatment capacity to Council.

Asset Description

The Tuakau network is primarily gravity based with 3 pump stations; 2 of which capture the small catchments near the extremities of the network. The significant pump station is the Tuakau Interceptor pump station which all of the Pokeno flows pass through plus some local catchment from South Tuakau, this station has a number of upgrades proposed during the LTP period as increased flows from Pokeno occur. there are currently 3 connection points into the Watercare trunk sewer from the council system.

The Pokeno network constructed to date includes 4 pump stations and a dedicated rising main to convey the waste to Tuakau. The only properties currently serviced are in the new residential development on the west side of SH1. Council has extended the network to service the CBD and the existing village.

Table 47: North Waikato Scheme Asset Information

Concise Group	Quantity	Unit	Average Age	Gross Replacement Cost
Pipes	87,506.32	m	17.1015	\$ 25,469,363.48
Point Assets	1,563	Each	16	\$ 10,336,050.98
Pump Station Assets	260	Each	8	\$ 3,004,481.66
<i>Total</i>				\$ 38,809,896.12

Source: AssetFinda, 2019

Asset Condition

The assets in Pokeno are 10 years or younger and in good condition, Tuakau assets date from 1960 however many of the significant 3 branches have been upgraded in the last 20 years. CCTV survey have shown much of the original network is earthenware and average to poor condition.

Network Model - System Performance

Waikato District Council (WDC) commissioned Mott MacDonald in November 2013 to build and calibrate a wastewater network model of the Tuakau catchment. The Pokeno catchment was

represented in the model with very little network, this network has grown significantly since the model was built.

Watercare have peer reviewed the network model and found they have significant issues which would cause the model to overstate wet weather flows, the model will require some recalibration to accurately network. In addition, an analysis of the key pump stations has occurred and needs to be incorporated into the model. These model upgrades will be undertaken in the upcoming LTP period.

Future population growth predictions for Pokeno have been fluid and along with unconfirmed wet industry flows the capacity issues around Pokeno pump stations and rising mains are an unresolved issue.

8 Stormwater Schemes Overview

8.1.1 Assets Profile

This section provides an overview of the major assets for the stormwater activity including their condition, capacity and performance. It also outlines what is planned in order to operate the assets to the agreed levels of service, while optimising lifecycle costs.

Stormwater asset categories consist of Pipe, Point, Open Drains, Stormwater attenuation devices, and water quality devices as are described in the following sections. Council's stormwater systems serve the following areas within the District:

Stormwater Schemes in the Waikato District are shown on the figure below:

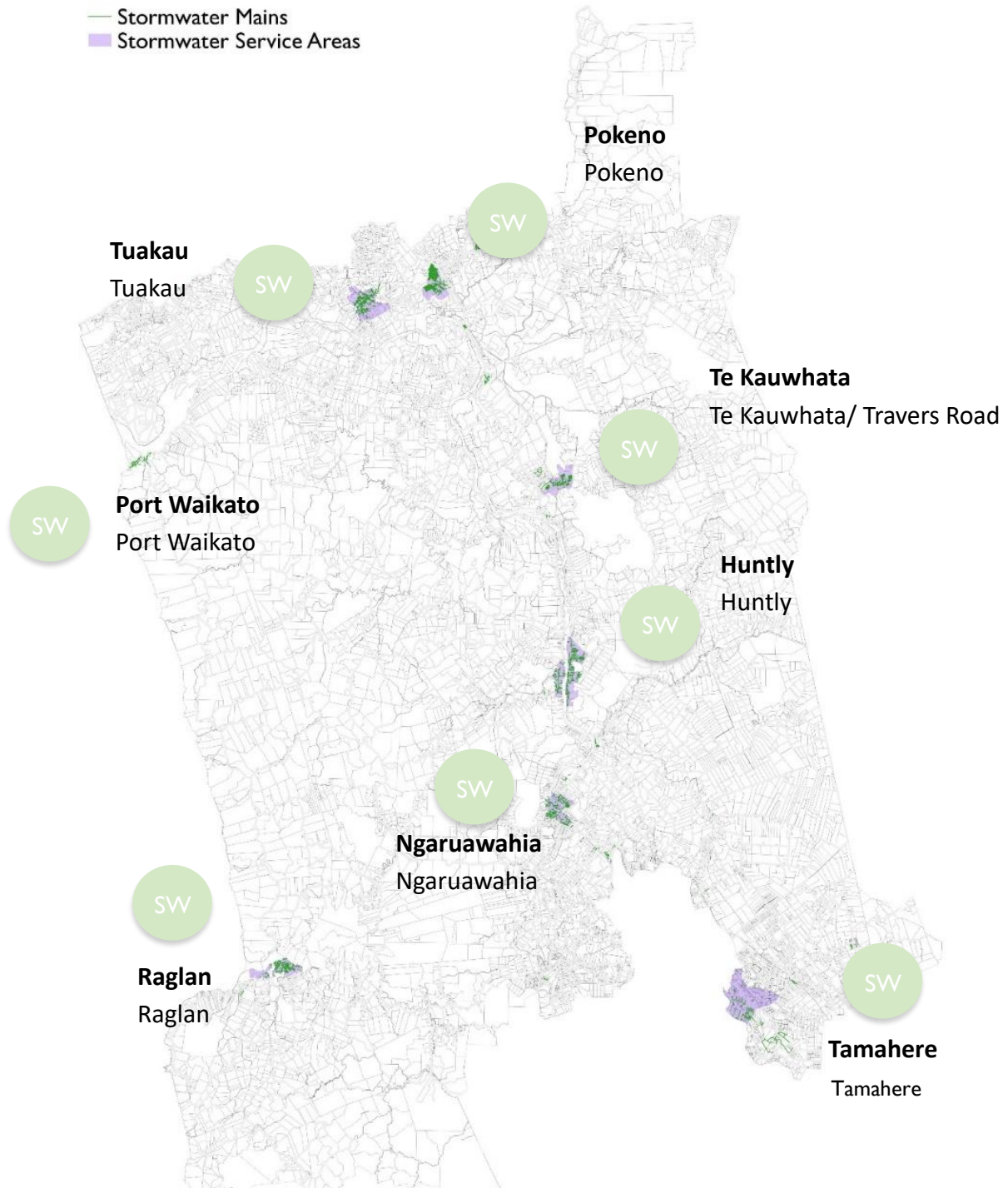


Figure 21: Location of Stormwater Schemes in Waikato District

9 Stormwater Assets

Pipe Assets

Pipe Assets includes the underground network reticulation that is used to convey stormwater away from developed areas or under embankments (such as a road crossing over a waterway), minimising risks to the environment, property, and public health. Council currently owns and operates approximately 129 km of known pipe assets (identified in the asset register); the majority this network constructed of concrete which is typical of stormwater. A summary of the material types used in the piped networks is given below. This summary does not include pipes under 300 mm in diameter or rural drainage assets. It is noted that at the time of asset data sourcing, 544 assets documented in the register (equivalent to the length of 6 km) were considered of an unknown material.

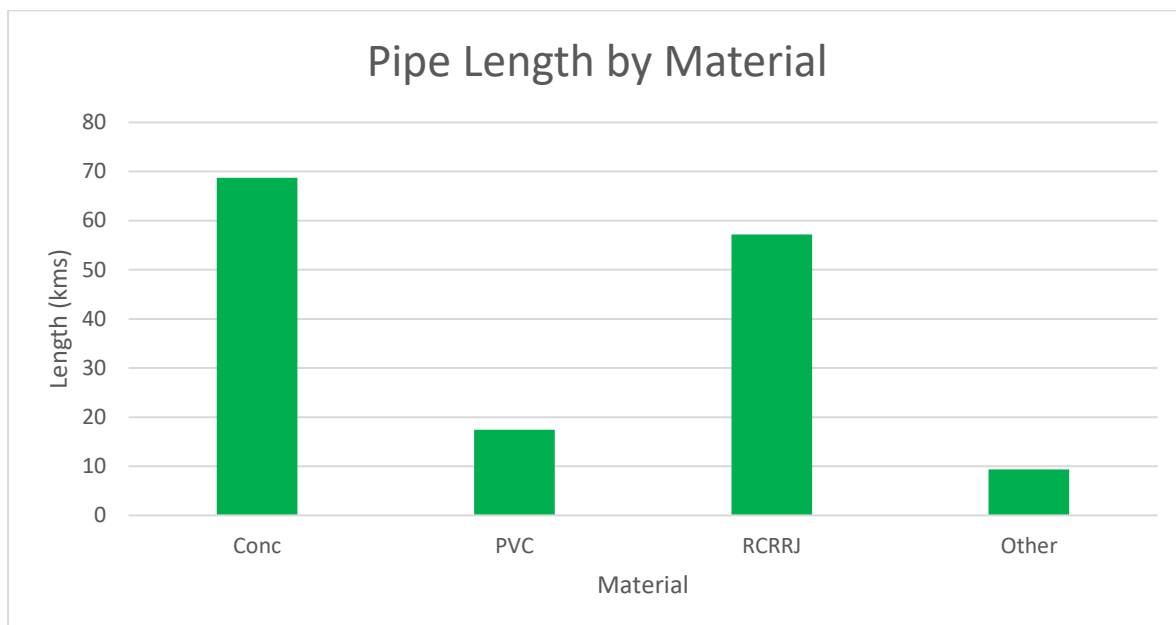


Figure 22: Pipe Length by Material (Source: AssetFinda, 2019)

A critical assessment of the entire piped network was undertaken using a framework developed by Opus Consultants (Condition Assessment Strategy, Opus Consultants, 2013) as provided in Table 2-43. The most critical pipes identified (rating 5) include pipes above 600 mm in diameter and those under rail and major road embankments (e.g. State highways) due to risk and cost of replacement. Rating 5 assets represents 0.4% of the network based on the 2017. It is noted that the stormwater pipe criticality should be updated based on size and location, this is yet to be undertaken and will form an activity improvement. These critical pipes are located under railways or state highways.

Table 48: Criticality (Source: AssetFinda 2019)

Criticality	Length	Percent of Network
1	94,569.52 m	62%
3	45,400.37	30%
5	11,704.94	8%
Total	128,845 m	100.0%

It is noted that when compared to water supply, stormwater rating 5 assets are a small percentage of the overall network and therefore could be considered less of an issue to Council. This is due to the limited number of crossings under lifeline assets and because the reticulation generally services very small catchments rather than concentrating around a treatment plant.

Point Assets

Point Assets can be divided into either plant or reticulation associated assets. The types of assets and quantities in each of these categories are broadly shown in Table 48 below.

Table 49: Types of Point Assets (Source: AssetFinda, 2019)

Asset Type	Quantity
Catchpits	474
Flood Gates and Weirs	31
Inlets and Outlets (Headwalls)	638
Manholes	3,571
Pump Station Assets	51
Rip-Rap	140
Other	653
Total	4,262

Pump Station Assets

Pump stations are utilised in the stormwater network to maintain gravity feed to outfall locations.

WDC owns three pump stations, located in Port Waikato, Ngaruawahia, and Huntly. The pump station at Duke Street, Ngaruawahia is monitored by telemetry, with a high-level alarm. Pump stations at Port Waikato and Huntly prevent nuisance flooding rather than protection of habitable floors, therefore telemetry at these locations is not considered appropriate.

There are an additional six stormwater pump stations in Huntly that WDC is dependent upon for flood mitigation but are owned by Waikato Regional Council.

Open Drains

Open drains provide for the collection and conveyance of stormwater through urban and rural areas. WDC promotes the construction of open drains (such as planted swales) in preference to pipes for new works as they can provide greater capacity and are an integral part of water quality treatment. The open drains category includes swales and channels (generally urban drains) and maintained open drains and open drains (generally rural drains). Drains are either constructed of natural materials (i.e. grass or planted swales) or lined with concrete and/or rock.

On a district wide view, almost all drains are unlined (i.e. earth) and Tamahere has the largest length of open drains due to the land drainage schemes there and the semi-rural nature of this region. The lengths of drain by location are shown below. The asset register (AssetFinda) currently has 48km of

open drain that is not actively maintained, along with 2km of swale drain, channel and 12 km of maintained open drain.

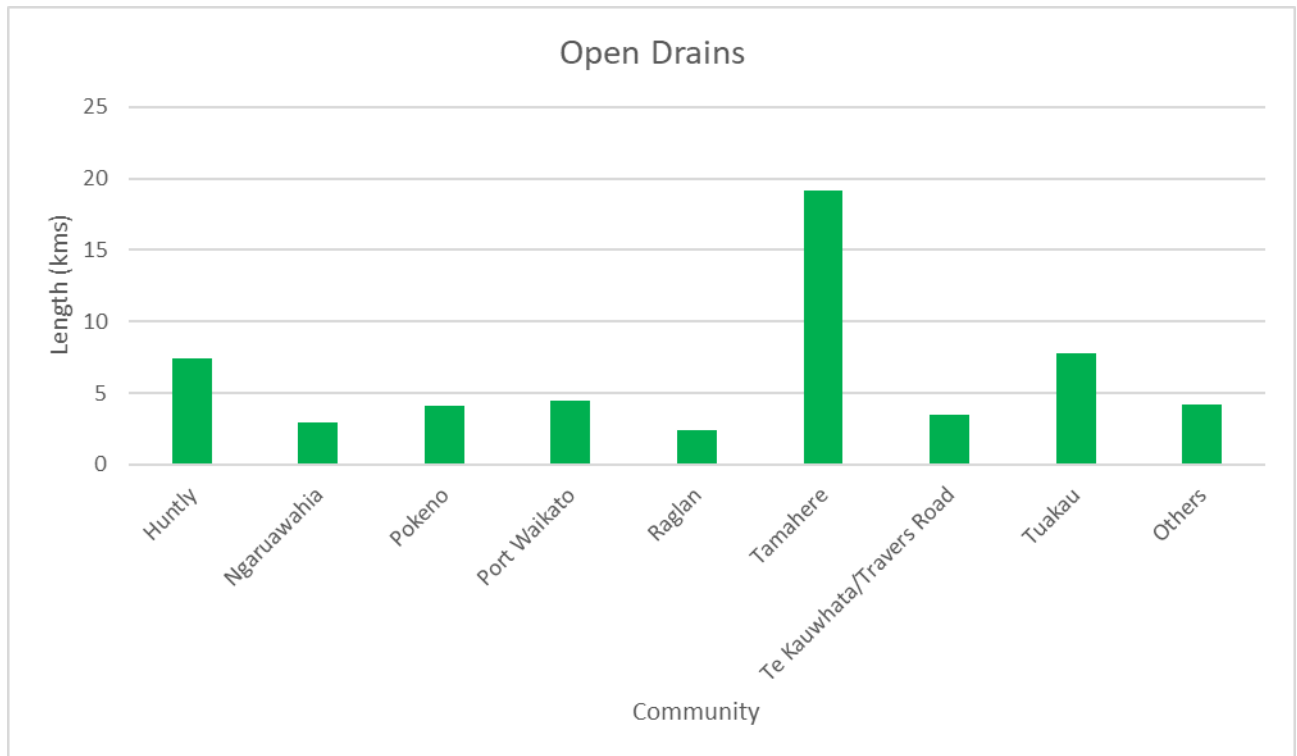


Figure 23: Length of All Open Drain by Location (Source: AssetFinda, 2019)

Council does not hold accurate install date data for these drains as they have generally been constructed by farmers and handed over to WDC on an ad hoc basis. The base life of rural open drains is undetermined – although the valuation has given open drains a nominal life of 100 years.

Responsibility of Open Drains Management

The majority of WDC’s rural open drains were handed over to the Waikato Regional Council in 2012 for administration and maintenance and are no longer the responsibility of WDC. The remainder of the rural open drains are concentrated in Tamahere and Te Kauwhata and are the responsibility of the WDC waters team.

Open drains, swales, channels and WRC rural drainage located along the sides of local roads (or within the road reserve) are the responsibility of the WDC roading team. It has been identified that an unknown amount of open drains is located alongside local roads within the asset database. These assets may be doubled up in the roading database, RAMM or would be better suited as a roading asset.

Open drains that are located in reserves, easements or private properties are the responsibility of the Watercare to maintain.

Stormwater Treatment and Attenuation Devices

Generally, stormwater treatment and attenuation devices within the WDC include (flood) detention and retention ponds, water quality treatment ponds (or wet ponds) or wetlands, raingardens, water quality specific swales, infiltration ponds or proprietary devices.

A count of the stormwater detention and treatment devices per community is given in Table 49 below.

Table 50: Stormwater Ponds by Community (Source: AssetFinda 2019)

Community	Count of detention and treatment devices
Horotiu	3
Huntly	2
Mercer	1
Ngaruawahia	1
Pokeno	8
Raglan	3
Tamahere Drainage District	1
Te Kauwhata	5
Tuakau	4
Western Districts	1

Attenuation Devices

All stormwater detention devices have come to WDC as vested assets constructed to meet resource consent conditions for new developments and are entered into the asset register at the 224C stage. Table 50 provides a summary of those devices vested to WDC.

Table 51: Devices vested to WDC

Town	Location/development	Vested Ponds
Ngaruawahia	West St	Detention Pond
	Horotiu Bridge	Detention Pond
	Northgate	Detention Pond
Huntly	Hartis Ave	Detention Pond
	Willow Lakes	Detention Pond
Te Kauwhata	Blunt Road	Detention Pond
	Jetco Pond	Detention Pond
	Wairanga Road (x2)	Detention Pond
Pokeno	Helenslee residential	Detention Pond
	Pokeno Heights (to be vested in 2017)	Detention Pond
	Hitchen Industrial	Detention Pond
Tuakau	Escotts Road	Detention Pond
		Detention Pond

Stormwater detention devices have special maintenance requirements relating to vegetation control, clearing of accumulated debris and removal of sediment. The Waikato District Council Stormwater Management Plan (Tonkin and Taylor, 2012) requires all stormwater detention devices to be inspected at least once a year. There are also maintenance and operation plans that have been provided at the vesting of each pond. These should be referred to and used as a basis of maintenance.

The Kowhai stormwater ponds (Kowhai St, Tuakau) have a requirement to survey the silt every five years. This was last done in 2012, with minimal silt build up after at least 10 years of operation.

Treatment Devices

Many of the stormwater treatment devices have come to WDC as vested assets constructed to meet resource consent conditions for new developments and are entered into the asset register at the 224C stage. At present the asset register is incomplete for these items and data regarding devices will need to be gathered over coming years.

It should be noted that there are several stormwater treatment devices that will be vested over the following three years. These will need to be included as part of maintenance. Currently many of the treatment devices such as wetlands and wet ponds and WQ swales have not been included in the asset management register to date, it is understood that they are not currently maintained on a regular basis. Stormwater water quality treatment have special maintenance requirements that is required in a regular basis. As such there should be an operational and maintenance plan developed for each device. An operational and maintenance plan should also be approved and received at the time of vesting for each device.

9.1.1 Overview of Resource Consents

WDC holds a number of stormwater resource consents.

In 2008, WDC was granted comprehensive consents for each of the main urban centres and village communities in the district at that time. These are listed in the table below. Comprehensive consents authorise the stormwater activity in that area, and the infrastructure that was in place at the time the consent was granted. Additionally, approved stormwater assets (vested by developers or new works by WDC) with an individual discharge consents granted are to be added to the consent by are updated annually to the WRC. This currently has not been occurring - improvement item has been raised to address the lack of process for this.



Process to add individual discharge consents and update annually to WRC.

Table 52: Comprehensive Stormwater Resource Consents

Location	Consent Number	Expiry Date
Huntly Urban Area	I05644	22/9/2028
Ngaruawahia Urban Area	I05645	22/9/2028
Raglan Urban Area	I05646	22/9/2028
Te Kauwhata Urban Area	I05647	22/9/2028
Meremere Urban Area	I05648	22/9/2028

Rangiriri Urban Area	105649	22/9/2028
Ohinewai Urban Area	105650	22/9/2028
Taupiri Urban Area	105651	22/9/2028
Hopuhopu Urban Area	105652	22/9/2028
Horotiu Urban Area	105653	22/9/2028
Pukemiro Urban Area	105654	22/9/2028
Glen Massey Urban Area	105655	22/9/2028
Te Kowhai Urban Area	105656	22/9/2028
Whatawhata Urban Area	105657	22/9/2028
Gordonton Urban Area	105658	22/9/2028
Matangi Urban Area	105659	22/9/2028

Note; WDC also holds several site-specific resource consents. These are listed in the table below.

Table 53: Site Specific Stormwater Resource Consents

Location	Consent Number	Expiry Date	In CS-Vue
Tuakau Urban Area	105051	14/11/2028	No
Pokeno Urban Area	108592	14/11/2028	No
Main Drain, Port Waikato	940572 940573	Expired	Unknown
Austen Street, Rangiriri	105649	22/09/2028	Yes
Tamihana Avenue & Russell Rd, Huntly	950710	Expired	Unknown
Onion Road, Te Rapa	121681	20/09/2045	No
Newell Road - Tamahere	119914	2/05/2043	No
Newell Road - Tamahere	119539	25/05/2044	Yes

Management of Consents

Council has used CS Vue to manage its resource consents. CS Vue is a web-based compliance management system where resource consents and associated conditions are entered into a database, compliance requirements are identified and responsibilities assigned to individual staff members. Over recent years, use of CS Vue has reduced and is currently being underutilised. As staff have moved on, the system has lacked overall ownership and responsibility, hence consents have not been maintained in the system. It is proposed to transition consent compliance to Watercare corporate systems in 2020/21

In late 2019, an overall review of consent compliance was undertaken across the waters activities by Watercare. The review highlighted that the required reporting was not being consistently carried out, operational requirements were not being implemented and where volume and quality parameters were not being met, some of initiatives have been implemented to address non-compliance with varying levels of success. Watercare will look to review all consent management process and reporting with a view to improving compliance.

From a financial perspective, it is now common practice to capitalise and value significant resource consents as intangible assets. All consents are now capitalised. Standard WDC practice is to record resource consents in the intangibles register at cost. However, there are currently no stormwater consents in the register. An improvement item has been created to address this.



Process to record stormwater consents in the intangibles register

9.1.2 Overview of Asset Conditions

Stormwater asset conditions are based on age, criticality and performance. WDC does not currently have reliable condition data for its stormwater assets and this has been highlighted as an improvement item.



Develop condition data for all stormwater assets

Due to the restricted data, stormwater condition is based on age at this stage.

- Age based condition data

The age-based condition assessment model uses the general condition as the basis for assessing the asset condition of Council's stormwater assets.

Table 54: Typical Condition Rating Model

Grade	Condition	Description of Condition
1	Very Good	Sound physical condition. Asset likely to perform adequately without major work for 25 years or more.
2	Good	Acceptable physical condition; minimal short-term failure risk but potential for deterioration in long-term (10 years plus). Only minor work required (if any).
3	Fair	Significant deterioration evident; failure unlikely within the next 2 years but further deterioration likely and major replacement likely within next 10 years. Minor components or isolated sections of the asset need replacement or repair now but asset still functions safely at adequate level of service. Work required but asset is still serviceable.
4	Poor	Failure likely in short-term. Likely need to replace most or all of assets within 2 years. No immediate risk to health or safety but works required within 2 years ensuring asset remains safe. Substantial work required in short-term, asset barely serviceable.
5	Very Poor	Failed or failure imminent. Immediate need to replace most or all of asset. Health and safety hazards exist which present a possible risk to public safety, or asset cannot be serviced/operated without risk to personnel. Major work or replacement required urgently.

Source International Infrastructure Management Manual (2011)

As can be seen from Figure 24 that the WDC stormwater age based condition profile is generally considered as good. This is due to the more recent construction of most of the stormwater infrastructure in the area and the long lifespan of the network (generally 100 years).

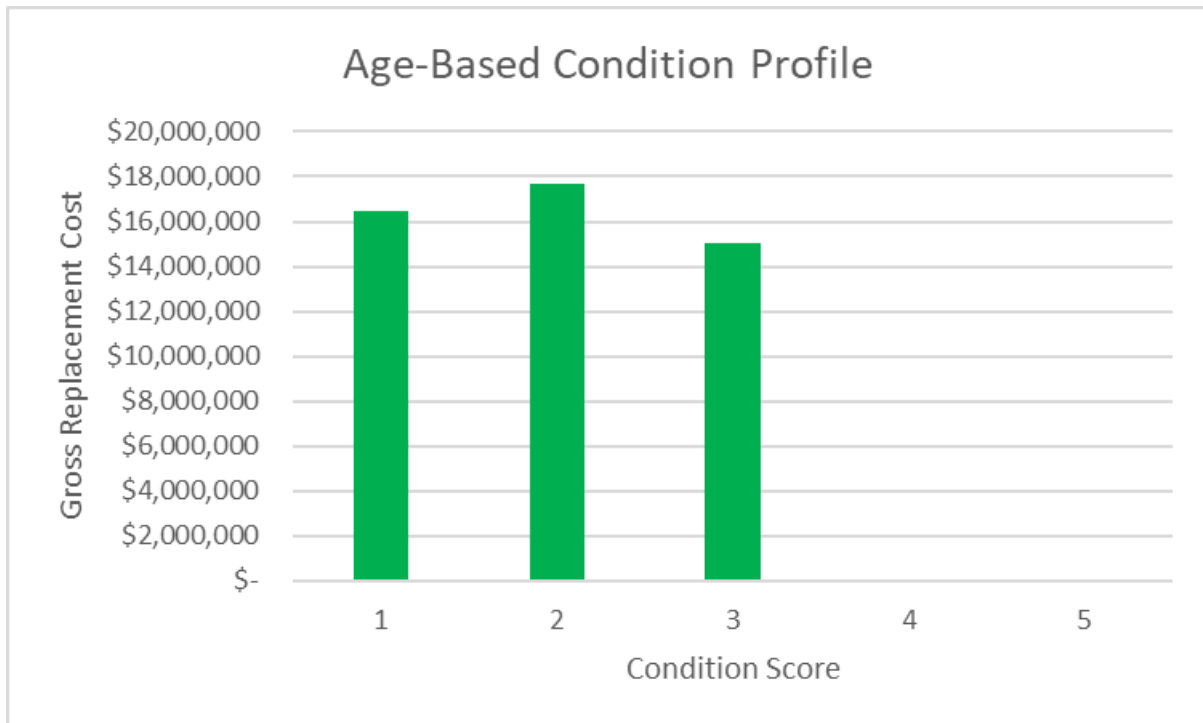


Figure 24: Age Based Condition of Stormwater Pipes (Source: AssetFinda 2019)

9.1.3 Asset Performance

Detailed assessment of stormwater performance has been completed in Tuakau, Pokeno and Hortiu, using 2D models with the existing reticulation incorporated. This analysis focused on the maximum depth of inundation and did not provide a good understanding of existing assets.

To address asset performance and highlight areas where assets may likely be undercapacity a 2019 overland flowpath mapping for the whole of the Waikato District. This model was undertaken to get a better understanding of areas that will need further investigation in the district. This modelling highlighted the critical areas for detailed stormwater assessment in the district. The modelling did not include roading culverts so will have inaccuracies at those locations. It was envisaged that once this modelling had been undertaken, focus areas of modelling would address areas where flooding is shown to be an issue. Undertaking this work is an improvement item for WDC.



Further assessment of critical areas of under capacity

It is noted that other flood mapping studies undertaken for the district are generally for CMP's or rapid flood hazard mapping to support structure plans. These studies do not consider the performance of stormwater reticulation assets but highlights areas that will require more detailed investigation,

either for existing assets or in proposed growth areas. The primary issue that has been identified is undersized road culverts on key stream crossings and cannot be used to identify asset performance.

A summary of stormwater CRMs received for the 2016/17 year is given in Table 54, below. This shows blocked pipes as the most common category, with most other categories having similar numbers. The LTP target is < 1 per quarter per 1000 and < 4 per 1000 per year.

Table 55: Count of Stormwater CRMs logged grouped by category (Source: AssetFinda June 30th 2017)

The number of complaints received by WDC about the stormwater system	Total
Stormwater Blocked pipe	12
Stormwater Open Drains	14
Stormwater Property Flooding	20
Stormwater Property Flooding Urgent	4
Number of Service Requests	50
Number of complaints per 1000 connections	3.72

The CRM data has limitations as the logged category is often found to be different from the actual fault on site. It is necessary for field staff to assess the problem on site and determine the correct fault category. The changes in assigned fault categories cannot be updated in the CRM system but they are logged in the maintenance records. Improving the CRM system is an ongoing corporate project as it is critical to reporting on the new mandatory performance measures. This is tagged as an improvement item for WDC.



Improve CRM System

LOS

The level of service for the Stormwater network is 10 year (CC) for primary drainage and 100 year (CC). WDC does not have a good understanding of the LOS of the majority of its assets but it is understood that the majority of primary assets pre 2018 have a LOS of 2 year (CC) or below to reflect the standards of the time. To be able to understand the primary network LOS, WDC will need to undertake urban network modelling. WDC would have some indication of the 100-year (CC) LOS to properties through assessment of the district wide modelling. While this modelling is available the assessment has not yet been undertaken and this is an improvement item for WDC.



Assessment of district wide modelling to understand primary network LOS

10 Stormwater Schemes Descriptions

A description of the stormwater schemes for the main townships in the district are presented in the sections below.

10.1.1 Huntly

The Huntly network is a gravity system intersected by the Waikato River. There is limited fall into the Waikato River and therefore the height of the river affects the performance of the system. Flood gates are used to protect the system from backflow from the river, with pump stations used to provide enough head for the water to discharge into the river.

A WDC pump station is located at Parry Street to alleviate flooding issues during high river levels and localised rain.

Lake Hakanoa channels flow from the surrounding Kimihia Ranges. The lake level is controlled by an outlet weir and the operation of the downstream pump station. Elevated lake levels occur about once a year, impacting the Huntly camping ground and domain.

Stormwater Modelling and LOS.

There is no modelling currently undertaken for Huntly other than that undertaken by WRC (Waikato River focus) and the WDC district wide rapid flood models. The township area would benefit from Stormwater Catchment Management Plan (SWCMP) with associated riverine models, an overland flow path mapping model and reticulation model to identify primary LOS upgrades.

An assessment of the district wide flood modelling and the WRC flood mapping would provide a good indication of whether secondary flow path LOS is being achieved. Although this modelling is available, the assessment is yet to be undertaken.

Stormwater Quality and Discharge

The local industries have varying degrees of onsite treatment. There is no requirement of sampling for discharge quality in Huntly at this stage, although it is anticipated that this will change with a new consent grant in 2028. WDC periodically collects grab samples from the Blundell Drain, Russell Rd, and Taihui Stream. This 6-12 monthly sampling has shown typical results for untreated urban stormwater runoff.

Waterway Improvements

A recent waterway assessment has not been undertaken. Existing information indicate that there is one waterway that requires erosion protection and planting however it is considered that given the urban environment there are likely other issues present. It is recommended that a waterway investigation and remediation plan implemented to address future works. This has been identified as an area for improvement.



Waterway investigation and remediation plan

Asset Description

The following table summarises the assets at component level, indicating the expected life, age, condition and gross replacement cost for each item.

Table 56: Huntly Asset Information (Source: AssetFinda 2019)

Concise Group	Quantity	Unit	Average Age	Gross Replacement Cost
Pipes	9,608.78	m	37	\$ 9,807,245.00
Open Drains	7,453.68	m	18	\$ 126,626.40
Point Assets	908.00	Each	33	\$ 3,497,772.18
Total				\$13,431,643.58

Asset Condition Profile

There is currently no reliable condition data for Huntly stormwater assets. Although a district wide condition survey was undertaken in 2015/16 targeting critical assets (such as those under highways and rail), the data sourced for stormwater was minimal.

In lieu of observed or measured condition information, the percentage of asset base life used has been taken as an indicator of likely asset condition. This assumes a straight-line decline in condition with use, which is a simplification, but provides an indicative condition profile. The results of this are shown below.

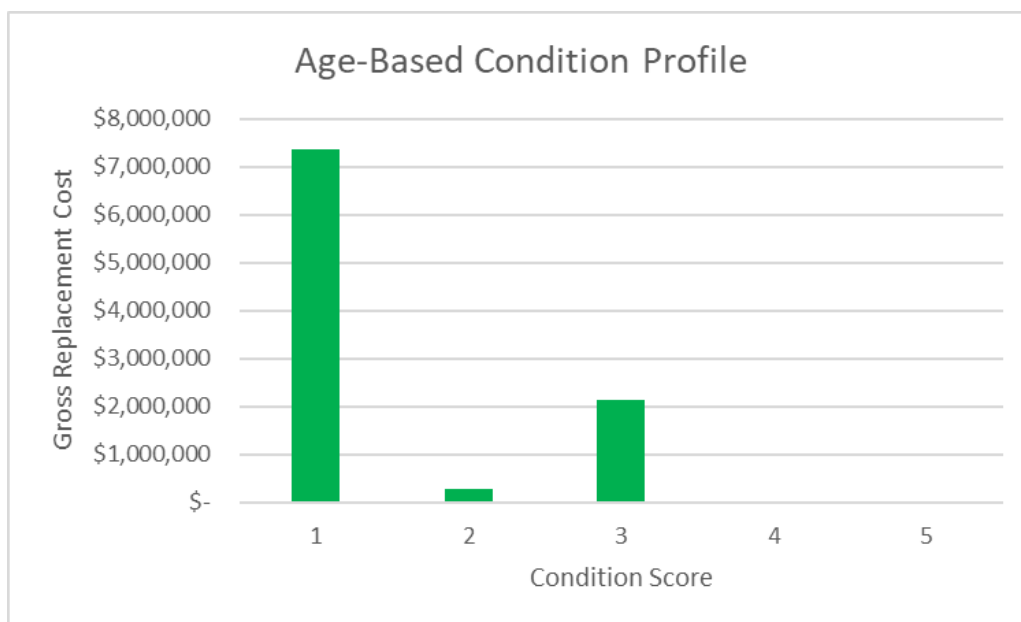


Figure 25: Huntly Condition Profile (Source: AssetFinda 2019)

10.1.2 Ngaruawahia

Ngaruawahia is situated where the Waipa River joins the Waikato River. A number of separate sub-catchments surround the confluence and the network includes a number of outfalls collected by open channels.

Predominantly Ngaruawahia is settled on flat / elevated land and is generally not affected by river levels. However, parts of Waipa Esplanade are low-lying and in this location a bund and floodgate protect the few low-lying houses.

Ngaruawahia has had recent upgrades to alleviate flooding in River Road between 2013 and 2018. However, it has been identified that pipes downstream of Gailbraith development are still undersized.

Stormwater Modelling and LOS

A rapid flood hazard model was completed in mid-2014 for Ngaruawahia to support the draft structure plan. This identified ponding constraints in one of the three proposed growth areas. As the development plan is completed, this ponding will need to be assessed, including whether it will be Council's responsibility for providing the relevant infrastructure.

In Horotiu area significant development is proposed on the Hamilton City side of the Te Rapa catchment, Watercare have recently completed flood hazard modelling of the Waikato DC portion of the catchment, significant industrial and further residential development is proposed for this area

An assessment of the district wide flood modelling and the WRC flood mapping would provide a good indication of whether secondary flow path LOS is being achieved. Although this modelling is available, the assessment is yet to be undertaken.

Stormwater Quality & Discharge

There are no known issues with industrial discharge. There is no requirement for sampling for discharge quality in Ngaruawahia.

WDC began collecting periodic grab samples from Luff Pl and Windsor Ave in 2012. This 6-12 monthly sampling has shown typical results for untreated urban stormwater runoff.

Waterway Improvements

A recent waterway assessment has not been undertaken at Ngaruawahia, however this has been done as part of the CMP at Horotiu. The Horotiu CMP indicates that there are large requirements and works required to manage waterway improvements in this catchment, but at this early stage the full works are not well understood.

Due to the lack of information on waterways at Ngaruawahia recommended that a waterway investigation and remediation plan implemented to address future works. This has been identified as an area for improvement.

Asset Description

The following table summarises the assets at component level, indicating the expected life, age, condition and financial information for each item.

Table 57: Ngaruawahia Scheme Asset Information (Source: AssetFinda 2019)

Concise Group	Quantity	Unit	Average Age	Gross Replacement Cost
Pipes	3,764.40	m	24	\$ 8,043,758.27
Open Drains	3,685.92	m	27	\$ 17,144.82
Point Assets	650.00	Each	22	\$ 2,411,550.65
<i>Total</i>				\$ 10,472,453.74

Asset Condition

There is currently no reliable condition data for Ngaruawahia stormwater assets. A district wide condition survey has been undertaken target critical assets which included number of Ngaruawahia assets.

Some observed or measured condition information is known, elsewhere the percentage of asset base life used has been taken as an indicator of likely asset condition. This assumes a straight-line decline in condition with use, which is a simplification, but provides an indicative condition profile. The results of this are shown below.

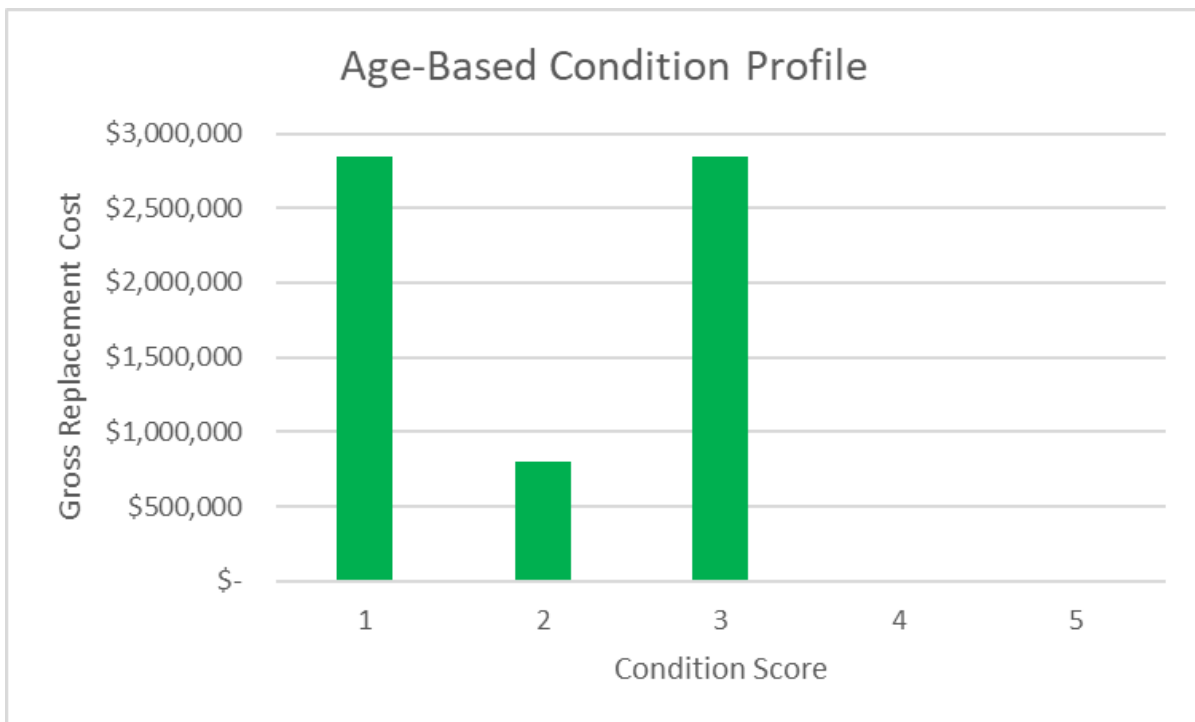


Figure 26: Condition Profile for the Ngaruawahia Scheme (Source: AssetFinda 2019)

10.1.3 Raglan

Raglan is a harbour side community on the south side of the Whaingaroa Harbour. The scheme is made up of a number of separate catchments that independently discharge to the harbour. The topography is mainly steep and a coastal strip of flat land. The ground is predominantly clay providing limited soakage.

In some parts of the community, there is not a lot of formal stormwater infrastructure, with drainage occurring as overland flow before being collected in swales.

The coastal strip is prone to high tides and storm surges. The two areas most affected are Lorenzen Bay and the area adjacent to the coastal marsh in Aroaro Bay. Both of these are protected by floodgates. The floodgates at Lorenzen Bay have previously been overtopped when a king tide and tropical storm coincided. The floodgate for Aroaro Bay is normally kept open to allow flushing of the salt marsh but is manually closed during large tides to prevent the adjacent tennis courts being flooded.

Raglan residents are part of a rating cost centre for stormwater.

Stormwater Modelling and LOS

Council completed a detailed 2D surface model with 1D reticulation in 2012. This was used as the basis for a master plan model scenario, where a hypothetical network was extended to all urban properties and new inundation maps prepared. It is proposed to make these results public as part of finalising the Raglan catchment management plan that was prepared alongside the modelling project.

An assessment of the district wide flood modelling and the WRC flood mapping would provide a good indication of whether secondary flow path LOS is being achieved. Although this modelling is available, the assessment is yet to be undertaken.

Stormwater Quality & Discharge

There are a number of floodgates in the scheme that control salt water intrusion into the system. The resource consent requires treatment of the stormwater prior to discharge. WDC has installed eight EnviroPods (gross pollutant traps) in catch-pits in the Raglan CBD area. These devices have also been utilised extensively in the Rangitahi Penisular development.

As part of its consent conditions, WDC collects first-flush samples from three sites in Bow St and one in Wainui Rd. One Bow St discharge is sampled monthly, with the remainder sampled quarterly. This sampling has shown typical results for untreated urban stormwater runoff.

Raglan also has the consent requirement to place EnviroPods in all of the catchpits within the CBD area. This has yet to be undertaken and is an improvement item.

Stormwater and Coastal Erosion

It is likely that Raglan is subject to both coastal and catchment erosion. The speed and quantity are currently unknown and no projects have currently been identified to quantify the effects.

Asset Description

The following table summarises the assets at component level, indicating the expected life, age, condition and financial information for each item.

Table 58: Raglan Asset Information (Source: AssetFinda 2019)

Concise Group	Quantity	Unit	Average Age	Gross Replacement Cost
Pipes	15,184.06	m	18	\$ 4,455,128.62
Open Drains	2,387.46	m	16	\$ 6,436.83
Point Assets	833.00	Each	17	\$ 2,880,700.52
<i>Total</i>				\$ 7,342,265.97

Asset Condition

Some observed or measured condition information is known, elsewhere the percentage of asset base life used has been taken as an indicator of likely asset condition. This assumes a straight-line decline in condition with use, which is a simplification, but provides an indicative condition profile. The results of this are shown in below.

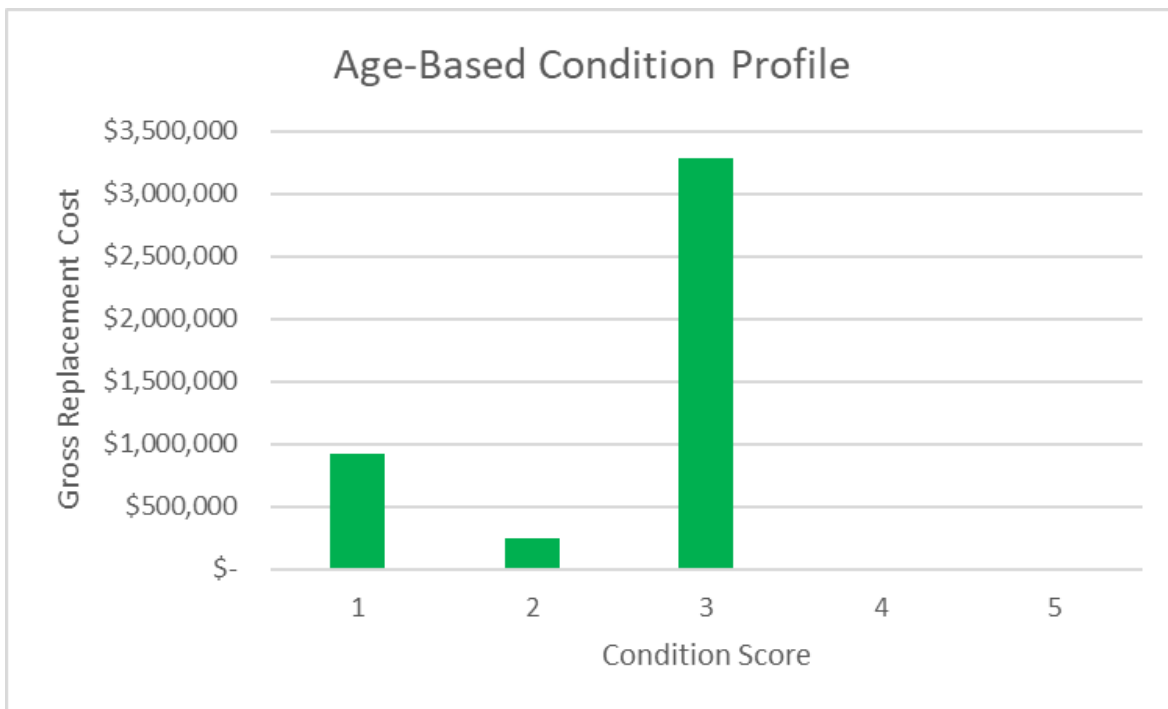


Figure 27: Condition profile for the Raglan Scheme (Source: AssetFinda 2019)

10.1.4 Te Kauwhata/Travers Road

The township of Te Kauwhata is located on a ridge with stormwater from one side discharging to the Whangamarino Swamp and the other side to Lake Waikare. The stormwater is piped to the two discharge points where it enters open drains before final discharge to either the swamp or lake.

The network was originally a combined stormwater and wastewater system. Since it has been separated, the stormwater utilises the old network.

Te Kauwhata residents are part of a rating cost centre for stormwater.

Stormwater Modelling and LOS

A stormwater model was completed by Beca in 2012 to assess the structure plan growth areas. This modelling was undertaken using a 1d model and will need to be updated to account for the significant amount of development in the region.

An assessment of the district wide flood modelling and the WRC flood mapping would provide a good indication of whether secondary flow path LOS is being achieved. Although this modelling is available, the assessment is yet to be undertaken.

Stormwater Quality & Discharge

Industry includes Carley's Transport – fertiliser distribution and stock transport. There is currently no onsite treatment of stormwater runoff.

There is no requirement for stormwater quality monitoring in Te Kauwhata. WDC periodically analyses a grab sample from the main drain next to Mahi Rd, which discharges into Lake Waikare. This 6-12 monthly sampling has shown typical results for untreated urban stormwater runoff.

Water quality is becoming a key WRC and WDC requirement, particularly in the Te Kauwhata region and the associated significant waterways. An improvement item to address water quality in the area will be identified.



Address water quality in the Te Kauwhata area

Asset Description

The following table summarises the assets at component level, indicating the expected life, age, condition and financial information for each item.

Table 59: Te Kauwhata Asset Information (Source: AssetFinda 2019)

Concise Group	Quantity	Unit	Average Age	Gross Replacement Cost
Pipes	14,399.19	m	14	\$ 4,667,865.20
Open Drains	3,518.92	m	18	\$ -
Point Assets	467.00	Each	13	\$ 2,404,440.19
<i>Total</i>				\$ 7,072,305.39

Asset Condition

Some observed or measured condition information is known, elsewhere the percentage of asset base life used has been taken as an indicator of likely asset condition. This assumes a straight-line decline in condition with use, which is a simplification, but provides an indicative condition profile.

The results of this are shown the figure below.

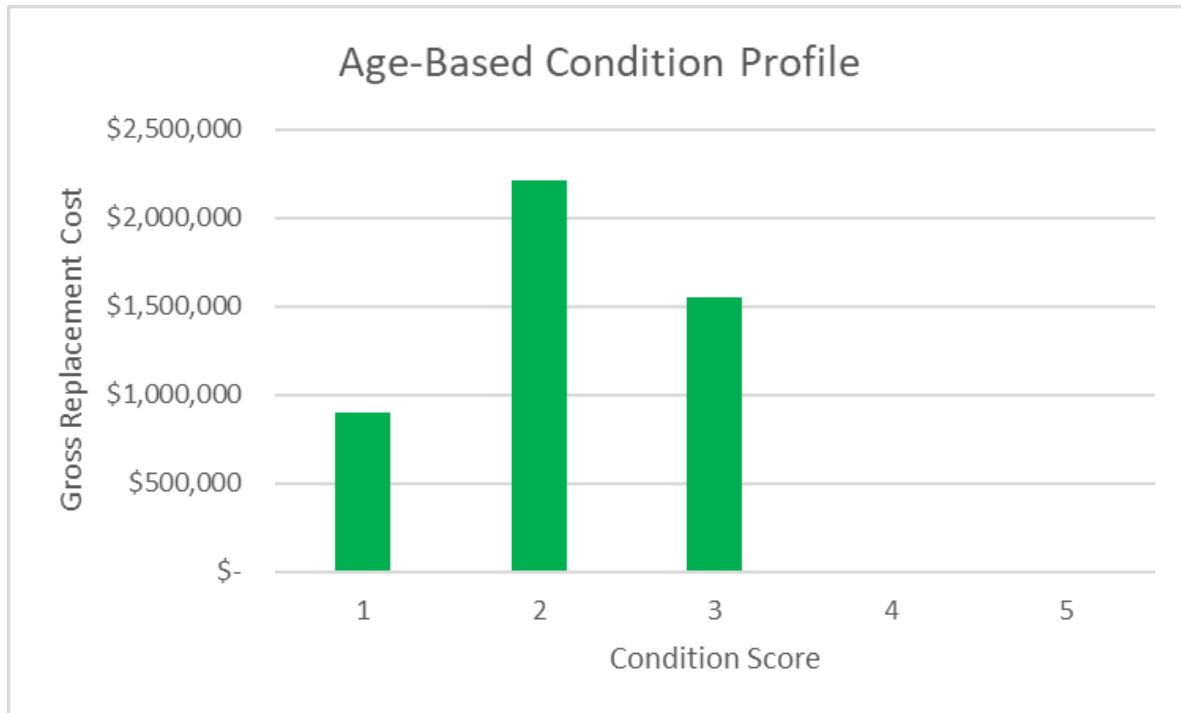


Figure 28: Condition profile for the Te Kauwhata Scheme

10.1.5 Tuakau

Tuakau stormwater reticulation has relatively short catchment lengths due to the proximity of the streams flowing through the township.

Stormwater Modelling and LOS

WDC completed riverine flood mapping for Tuakau in 2019 to assist in the support of future structure plans.

An assessment of the district wide flood modelling and the WRC flood mapping would provide a good indication of whether secondary flow path LOS is being achieved. Although this modelling is available, the assessment is yet to be undertaken.

Stormwater Quality & Discharge

WDC collects periodic samples from Kowhai ponds (quarterly, as required by the SWMP), Kairoa Stream at Matapo Drive, Whakapipi Stream at Jellicoe Ave, and the end of Elizabeth Street from an unnamed drain. This 6-12 monthly sampling has shown typical results for untreated urban stormwater runoff since it commenced in 2012. Kowhai ponds have been sampled since 2008.

Asset Description

The following table summarises the assets at component level, indicating the expected life, age, condition and financial information for each item.

Table 60: Tuakau Asset Information (Source: AssetFinda 2019)

Concise Group	Quantity	Unit	Average Age	Gross Replacement Cost
Pipes	20,935.73	m	19	\$ 6,174,535.86
Open Drains	7,758.00	m	17	\$ 1,007.18
Point Assets	762.00	Each	20	\$ 3,832,054.58
<i>Total</i>				\$ 10,007,597.62

Asset Condition

Some observed or measured condition information is known, elsewhere the percentage of asset base life used has been taken as an indicator of likely asset condition. This assumes a straight-line decline in condition with use, which is a simplification, but provides an indicative condition profile

The results of this are shown the figure below.

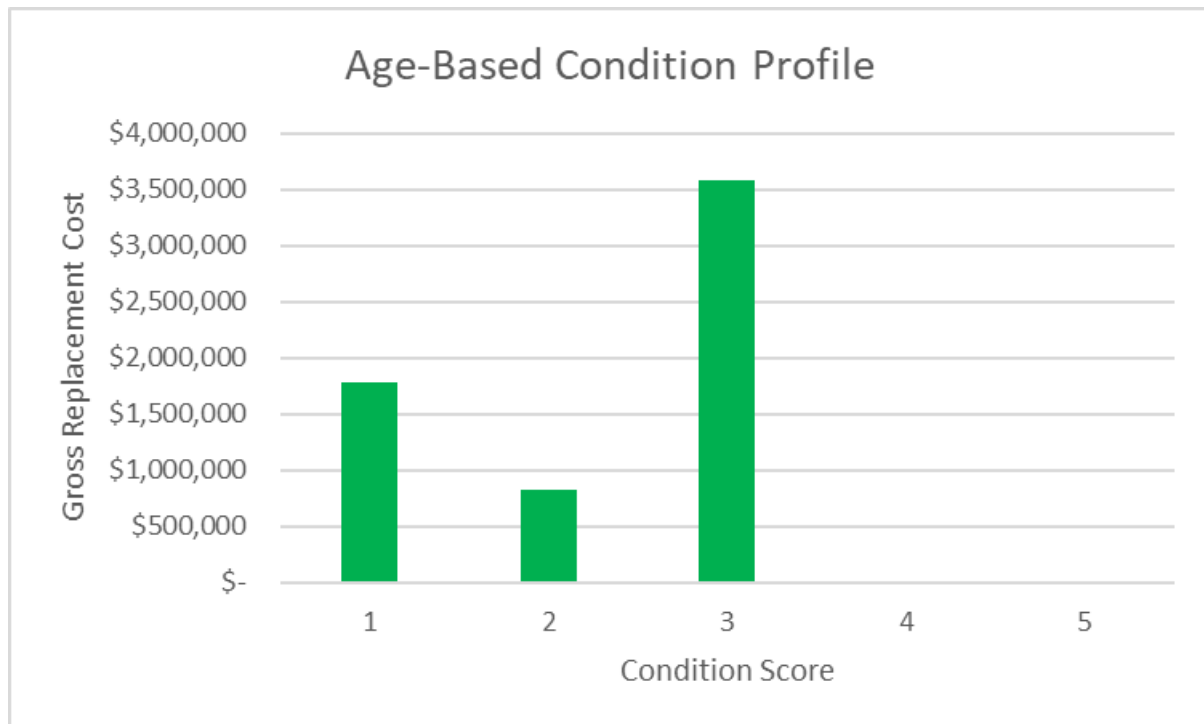


Figure 29: Condition Profile for the Tuakau Scheme (Source: AssetFinda 2019)

10.1.6 Pokeno

The Pokeno village has aging infrastructure. However, the significant growth areas around the village are recent or still under development and have new assets.

There are significant pond assets associated with the growth areas in Pokeno, both for the northern residential area and the southern industrial area.

Stormwater Modelling and LOS

A detailed modelling project was completed by OPUS Consultants in 2019 to support the Pokeno CMP. This work included a growth scenario and mitigation options and is also used by WDC for setting floor levels for new development in flood risk areas.

An assessment of the district wide flood modelling and the WRC flood mapping would provide a good indication of whether secondary flow path LOS is being achieved. Although this modelling is available, the assessment is yet to be undertaken.

Stormwater Quality & Discharge

WDC collects periodic grab samples from Selby St. This 6-12 monthly sampling has shown typical results for untreated urban stormwater runoff since it commenced in 2012.

Asset Description

The following table summarises the assets at component level, indicating the expected life, age, condition and financial information for each item. Pokeno has three distinct asset cohorts, with the original village assets installed in the 1960s, some assets installed around 2000, and then the new development that has created intensive growth in Pokeno since 2012.

Table 61: Pokeno Asset Information (Source: AssetFinda 2019)

Concise Group	Quantity	Unit	Average Age	Gross Replacement Cost
Pipes	34,401.94	m	6	\$ 11,335,628.42
Open Drains	4,066.61	m	50	
Point Assets	1,001.00	Each	6	\$ 7,137,728.74
<i>Total</i>				\$ 18,473,357.16

Asset Condition

Some observed or measured condition information is known, elsewhere the percentage of asset base life used has been taken as an indicator of likely asset condition. This assumes a straight-line decline in condition with use, which is a simplification, but provides an indicative condition profile

The results of this are shown the figure below.

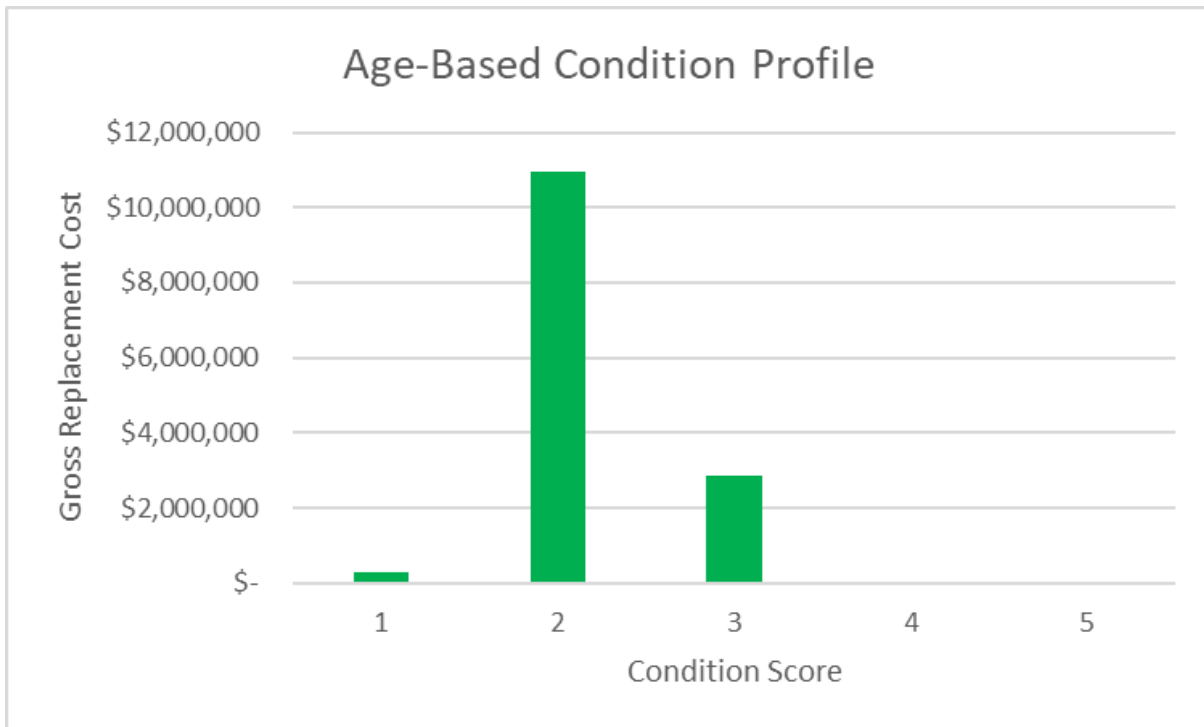


Figure 30: Age-based Condition Profile for Pokeno

10.1.7 Tamahere

Tamahere is located adjacent to the eastern boundary of Hamilton City along the Waikato River. The topography of Tamahere is predominantly flat river terraces, bisected by a number of incised gully systems, draining the area to the Waikato River, which forms the western boundary.

During a significant rainfall event the problem of erosion can occur because of concentrated flow through the gully system, increased flow velocities from section development and/or inadequate piping of watercourses and drains.

Stormwater Modelling and LOS

Comprehensive modelling has been undertaken for the Tamahere Structure Plan area. This involved a 2m 2D grid with the known reticulation modelled as a 1D network.

The model results are used to inform development decisions. No performance issues affecting existing habitable floors were identified, except for one undersized culvert.

A CMP has also been undertaken for Tamahere. This work included a growth scenario and mitigation options.

An assessment of the district wide flood modelling and the WRC flood mapping would provide a good indication of whether secondary flow path LOS is being achieved. Although this modelling is available, the assessment is yet to be undertaken.

Stormwater Quality & Discharge

No stormwater quality measurements are taken. There are known erosion issues in some gully heads.

Asset Description

The following table summarises the assets at component level, indicating the expected life, age, condition and financial information for each item.

Table 62: Tamahere Asset Information (Source: AssetFinda 2019)

Concise Group	Quantity	Unit	Average Age	Gross Replacement Cost
Pipes	3,637.15	m	11	\$ 1,519,288.08
Open Drains	19,136.95	m	46	\$ -
Point Assets	128.00	Each	11	\$ 612,278.80
<i>Total</i>				\$ 2,131,566.88

Asset Condition

Some observed or measured condition information is known, elsewhere the percentage of asset base life used has been taken as an indicator of likely asset condition. This assumes a straight-line decline in condition with use, which is a simplification, but provides an indicative condition profile.

The results of this are shown the figure below.

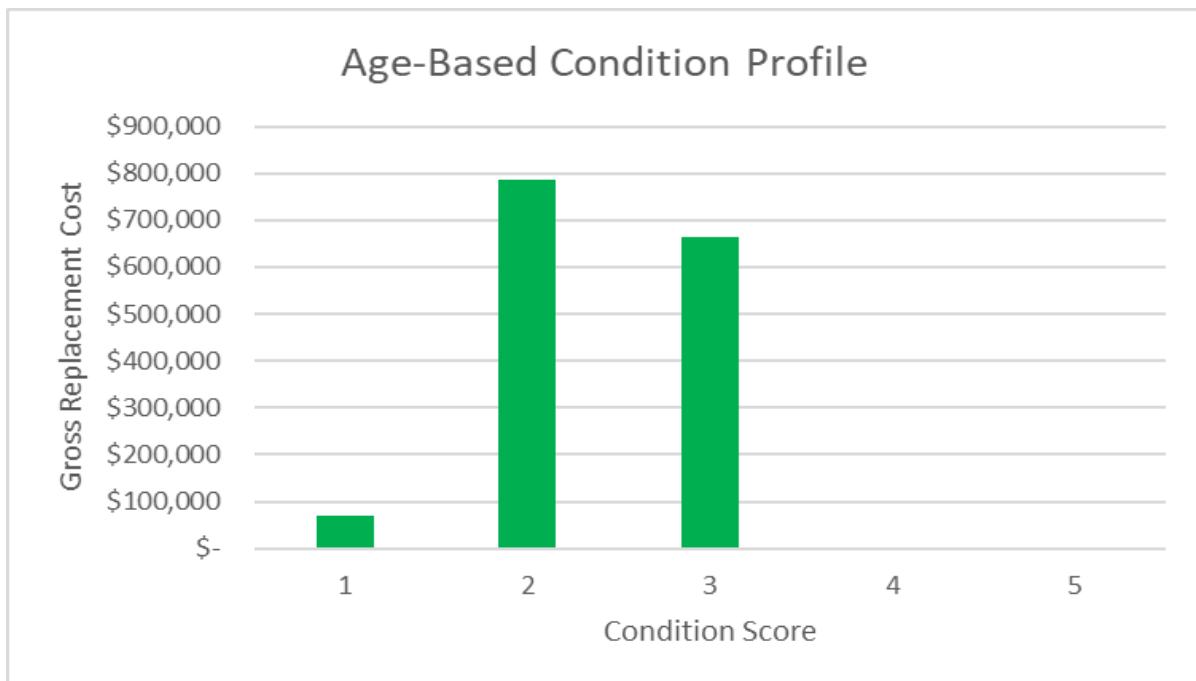


Figure 31: Age-based Condition Profile for Tamahere

10.2 Summary of Activity Valuation

Each year Waikato District Council re-values various asset classes for financial reporting. The revaluation work is carried out before and immediately following balance date on 30th of June as the resulting values are included in the Waikato District Council Annual Report for the year ending. The valuations also support various asset management processes at Waikato District Council.

The infrastructure assets that were included in this revaluation are:

- Water supply, including:
 - Water treatment plants
 - Pump stations
 - Reservoirs
 - Pipelines, including all fittings and connections
- Wastewater, including:
 - Wastewater treatment plants
 - Pump stations
 - Pipelines, including all manholes and fittings
- Urban and Rural Stormwater, including:
 - Pump Stations
 - Inlets and Outlets
 - Channels
 - Pipelines, including all manholes and fittings.
- Telemetry

Water Supply, Wastewater, Stormwater and Communication assets are also being segmented by the community served. Communication assets are not reported separately with values for this asset group being split equally between the water supply and wastewater valuation results.

The revaluation does not include the following assets:

- Land
- Capital works in progress
- Capitalised cost items associated with asset repairs, maintenance or labour
- Intangible assets including resource consents

11 Valuation Standards

Section 111 of the Local Government Act 2002 requires financial information to be included in Annual Reports to be prepared in accordance with generally accepted accounting practice. The applicable accounting standard for property, plant and equipment is Public Benefit Entity International Public-Sector Accounting Standard 17 Property, Plant and Equipment (PBE IPSAS 17). The revaluation always carried out in accordance with this Standard. It is also carried out in accordance with the New Zealand Infrastructure Valuation and Depreciation Guidelines, issued by the New Zealand Asset Management Support Group (NAMS) of IPWEA.

Asset Cost Data

A significant amount of work was carried out in 2018 to review and update the unit rates to reflect actual costs. This included comparing rates with those from other Councils in the Waikato/Bay of Plenty area and also using unit rates from a study of WDC costs carried out in 2017 by Jacobs to ensure valuation rates are a fair representation of actual construction costs in the Waikato area. For 2019, the 2018 data was cost indexed as appropriate using indices published by Statistics New Zealand. At the time of this indexing, indices were only available for the 1st quarter of 2019. To obtain indices for the 2nd quarter of 2019 (30/06/2019) values were obtained by trending out the last four quarters. A review was then carried out to ensure there was relativity of costs within asset groups which resulted in a number of changes although not significant in nature.

A review was also carried out of asset types with unknown materials and/or sizes. The most popular (largest quantity) related asset types were identified and their costs checked against those asset types with unknown materials and/or sizes which also resulted in some changes.

The replacement costs take into account all costs associated with the provision of the assets including:

- Planning and design costs
- Corporate overheads applicable to service provision
- Construction and commissioning costs
- Demolition and reinstatement costs.

The rates assume “brownfields” conditions for replacement i.e., all other services exist and it is necessary in defining rates for replacement to expect reinstatement of other assets or services if affected by the installation of the infrastructure asset. They also reflect commercial costs for provision of assets by contract and assume realistic quantities of assets within contracts to ensure cost effective allowances and rates.

Provisional unit rates to be used in the valuation were the subject of a workshop with WDC staff before being finalised.

Valuation Assumptions

- The replacement assets are based on the reproduction cost of the specific assets with adjustments where appropriate for optimisation due to over-design or surplus capacity.
- Replacement costs are those for modern equivalent assets.
- Remaining useful lives of assets reflect condition and remaining life studies carried out by Waikato District Council and the age and useful lives of the assets.
- Assets are depreciated on a straight-line basis.
- Communications assets have been apportioned equally between wastewater and water supply reflecting the estimated usage of these assets by the two networks.

Valuation Outcome

Table below summary of the assets at the end of financial year 2019.

Table 63: Summary of the assets at the end of financial year 2019

Asset Group	Optimised Replacement Cost 30 June 2019	Optimised Depreciated Replacement Cost 30 June 2019	Annual Depreciation 2019
Water Supply			
Reticulation	\$ 155,430,700	\$ 109,639,522	\$ 2,292,862
Treatment	\$ 15,604,343	\$ 8,094,859	\$ 563,581
Sub-Total	\$ 171,035,043	\$ 117,734,381	\$ 2,856,443
Wastewater			
Reticulation	\$ 160,707,026	\$ 97,478,506	\$ 2,407,084
Treatment	\$ 25,644,342	\$ 17,485,536	\$ 627,830
Sub-Total	\$ 186,351,368	\$ 114,964,042	\$ 3,034,914
Stormwater			
Rural	\$ 2,441,395	\$ 2,317,087	\$ 28,337
Urban	\$ 77,471,913	\$ 62,715,147	\$ 816,700
Sub-Total	\$ 79,913,308	\$ 65,032,234	\$ 845,037
Totals	\$ 437,299,719	\$ 297,730,657	\$ 6,736,394

All rates exclude Goods and Services Tax (GST).

Suggested Improvements for Future Valuation Recommended by AECOM

Standardisation of asset register spreadsheets	It was found that the layout of base asset register data varied between the spreadsheets supplied by WDC. This included some apparent variations in communities. It is suggested that this is standardised in the base data used in future valuations.
Asset Capitalisation Process	It is recommended that the asset capitalisation process to be used by Waikato District Council is formally defined as a quality process. There is probably nothing preventing Waikato District Council from requiring this capitalisation process to be also followed by developers with asset capitalisation forms being submitted to Waikato District Council along with as built plans as part of conditions of subdivision. Rates from the asset capitalisation process should be captured in a suitable unit rates database. The supply of completed asset capitalisation forms should be a requirement of the engagement of engineering consultants for construction contracts. This would provide an invaluable resource to be used in future valuations.

Catch-pits and sumps in stormwater point dataset	In the sw-point dataset there are a number of catch-pits and sumps where we believe the descriptions may not be entirely accurate. These assets could even be privately owned. We recommend that Waikato District Council carries out an investigation to better define what these assets are and confirm the ownership status. This does not have a material effect on the valuation.
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12 Asset Condition

WDC’s three waters condition assessment strategy, which provided a basis for developing a condition assessment programme with key priorities identified. To date Council have assign criticalities to each individual asset in all the three waters networks.

The condition assessment model in the table below should be used as the basis for assessing the asset condition of Council’s water assets.

Table 64: Typical Condition Rating Model

Grade	Condition	Description of Condition
1	Very Good	Sound physical condition. Asset likely to perform adequately without major work for 25 years or more.
2	Good	Acceptable physical condition; minimal short-term failure risk but potential for deterioration in long-term (10 years plus). Only minor work required (if any).
3	Fair	Significant deterioration evident; failure unlikely within the next 2 years but further deterioration likely and major replacement likely within next 10 years. Minor components or isolated sections of the asset need replacement or repair now but asset still functions safely at adequate level of service. Work required but asset is still serviceable.
4	Poor	Failure likely in short-term. Likely need to replace most or all of assets within 2 years. No immediate risk to health or safety but works required within 2 years ensuring asset remains safe. Substantial work required in short-term, asset barely serviceable.
5	Very Poor	Failed or failure imminent. Immediate need to replace most or all of asset. Health and safety hazards exist which present a possible risk to public safety, or asset cannot be serviced/operated without risk to personnel. Major work or replacement required urgently.

International Infrastructure Management Manual: 2015

In 2016, Council has further engaged Opus Consultants to undertake lifespan assessment for AC pipes. This assessment provided a higher level of confidence for profiling the deterioration rates of AC pressure pipes at township and district-wide level. The deterioration rates have been used to model the remaining operational life for the AC pipe assets. A district-wide deterioration rate based on the 27 AC pipe samples assessed as part of this project is 0.2179 mm / year (based on each pipe samples maximum external and internal deterioration depths). This is approximately 4 % slower than the national average of 0.2269 mm / year. These assessments are based on a visual inspection, CT Scanning and where necessary Phenolphthalein testing of the AC pipe samples.

p-CAT AC Condition Assessment

In 2019, Detection Services Pty Ltd was approached to conduct asset condition assessments of 6 different AC pipelines owned by Waikato District Council (WDC) for asset management purposes. This program is for sub-sectional pipeline condition assessment and localized fault detection by p-CAT pipeline condition assessment technique based on hydraulic transient analysis. The target pipelines are total of 12.5 km length.

P-CAT technology that enables the non-invasive diagnosis of pipeline condition over long distance along a pipeline with minimal disruption of current service there by allowing calculated decisions to be made regarding pipes which require rehabilitation.

The presence of pipe wall damage or lining loss has a visible impact on a resultant transient pressure wave trace. This observation is the basis of this advanced technique that uses fluid transient pressure waves for detecting the sizes and locations of pipeline defects. Changes in the thickness of pipe wall and lining gives rise to reflections which can be theoretically interpreted to obtain a distribution of damage along the pipeline. p-CAT injects a controlled transient pressure wave signal by a developed hydraulic transient generator that can travel long distance (generally, up to 2-5km for pipeline condition assessment) along a pipeline without a major deterioration of signal.

Therefore, the major advantage of p-CAT is the cost-effective pipeline condition assessment technique for relatively long-distance pipeline section (over 1 km) with 10-20 m spatial accuracy. The data acquisition systems collect the injected transient pressure wave signals and their reflections caused by pipeline characteristics, such as pipeline fault, wall thickness and material change and the pipeline configuration change. The collected data are then analysed and interpreted to provide insight into pipe condition. The process can identify changes in material properties over lengths of pipeline, severe blockages, air pockets, major leaks and non-sealing valves.

The tests were conducted on the 16th to 19th July 2019 (for sections A, C1, C2 and D1) and on the 22nd and 23rd July 2019 (for sections D2 and F) by Detection Services. The field tests were conducted on the pipeline with the purpose of assessing the pipeline condition and identifying known features and anomalies such as blockages, air pockets and wall thickness deterioration.

The analysis undertaken to determine the pipeline wall condition was based on the following assumption as per the standard AS1711-1975 and the GIS maps supplied by Waikato District Council:

Pipeline Section	Approx. Length (m)	Outside Diameter (mm)	Material and Class	Wall Thickness (mm)	Est. Install Date
A: Wainui Road, Raglan	683	177.3	DN150 AC Class D	17.8	1962
C1: Hetherington Road, Rotongaro	3909	121.9	DN100 AC Class D	12.7	1939
		177.3	DN150 AC Class D	17.8	
		232.2	DN200 AC Class D	22.9	
C2: Hetherington Road, Huntly	1128	121.9	DN100 AC Class D	12.7	1939
		177.3	DN150 AC Class D	17.8	

D1: Harris Street (west), Huntly	2097	232.2	DN200 AC Class D	22.9	1970
D2: Harris Street (east), Huntly	1074	121.9	DN100 AC Class D	12.7	1970
F: Hakanoa Street, Huntly	970	121.9	DN100 AC Class D	12.7	1970

The following pipeline wall condition was identified during the p-CAT™ analysis:

- **A: Wainui Road, Raglan:**
 - 97% of the total pipeline length has a remaining wall thickness of between 51 and 67%, which is highly deteriorated.
 - The remaining 3% of the total pipeline length was unable to be analysed due to the presence of air.
- **C1: Hetherington Road, Rotongaro:**
 - 74% of the total pipeline length has a remaining wall thickness of between 53 and 69%, which is highly deteriorated.
 - 20% of the total pipeline length has a remaining wall thickness of between 71 and 72%, which is also in a concerning condition.
 - The remaining 6% of the total pipeline length was unable to be analysed due to the open off-take and presence of air.
- **C2: Hetherington Road, Huntly:**
 - 60% of the total analysed pipeline length has a remaining wall thickness of between 47 and 69%, which is highly deteriorated.
 - 15% of the total analysed pipeline length has a remaining wall thickness of between 74 and 75%, which is also in a concerning condition.
 - The remaining 25% of the total analysed pipeline length was found to have a large air pocket in it.
- **D1: Harris Street (west), Huntly:**
 - 98% of the total pipeline length has a remaining wall thickness of between 57 and 68%, which is highly deteriorated.
 - The remaining 2% of the total pipeline length was unable to be analysed due to the unrecorded replacement or deterioration.
- **D2: Harris Street (east), Huntly:**
 - The whole pipeline has a remaining wall thickness of between 52 and 65%, which is highly deteriorated.
- **F: Hakanoa Street, Huntly:**
 - The whole pipeline has a remaining wall thickness of between 41 and 51%, which is highly deteriorated.

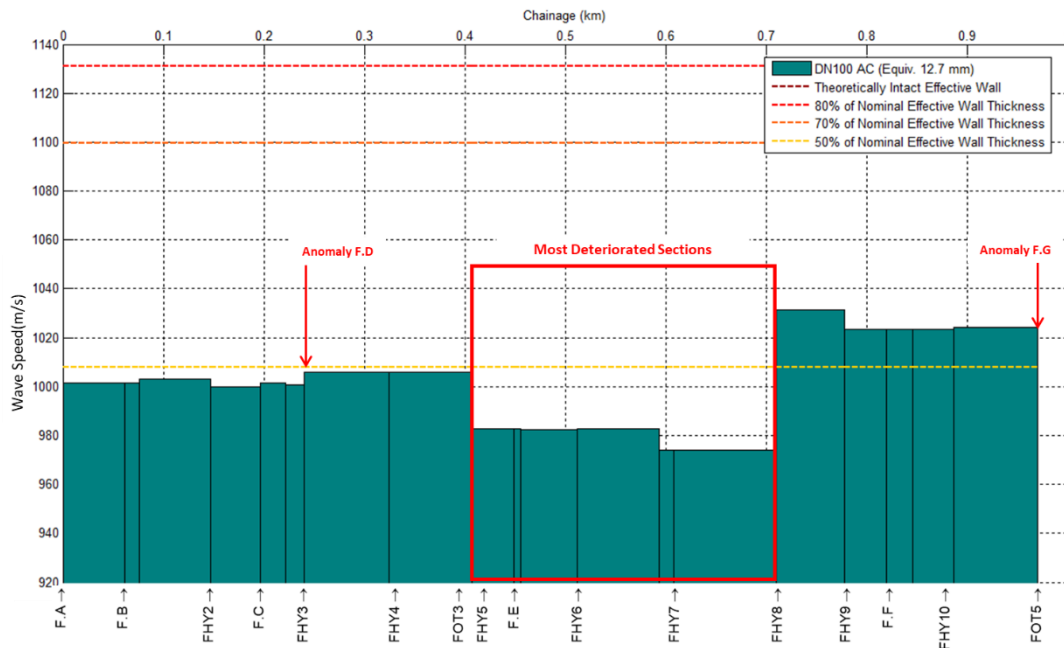


Figure 32: Example graph of pipeline wall deterioration for Section F (Hakanoa Street, Huntly)

Jacobs & Watercare Above Ground Assets Condition Assessment

In 2020, Jacobs was approached to conduct asset condition assessments of all the above ground assets owned by WDC. As part of this condition assessment program, Jacobs along with Watercare staff conducted a site-based condition assessment in two discrete phases.

- Phase one was based on a prioritised and discrete number of Waikato District Council assets assessed from the 12th March to the 26th March 2019.
- Phase two was based on the remaining unassessed Waikato District Council assets and was undertaken from the 13th December 2019 to 21st February 2020.

The scope of this activity covered the condition assessment of the mechanical, electrical, instrumentation & control, civil and structural assets. The development of this condition assessment report and associated data sets from phase 1 and phase 2 are developed from the Waikato District Council asset register for the Water and Wastewater Treatment plants and associated Networks.

The scope of the assessment included:

- Refinement of a condition assessment methodology for undertaking and documenting the asset condition assessment to an Industry and Watercare acceptable standard e.g. Condition Grades aligned with NZWW Manual Visual Assessment of Utility Assets 2008 as defined in the Watercare Asset Data Standard AI Ver 0.4 dated Sept 2018 and subsequent updates to asset condition criteria, NZS 4306-2005 and the International Infrastructure Management Manual 2015.
- Undertaking of a field condition assessment across Waikato District Council’s asset portfolio. The condition assessment and associated assets identified did not include pull-downs, or any destructive testing and was limited to visual inspection of assets, where such inspection was

safe and accessible. Assets that were also excluded due to low replacement costs or mandatory reporting requirements were:

- Safety equipment that has statutory and mandatory regulatory checks
 - Smoke Detectors
 - Emergency exit signs
 - Plant signage
 - Safety Showers
 - Lifting appliances
- The condition assessment was documented using Jacobs mobility solution and it included the capture of the relevant material i.e. asset photos, field observations, defects etc. (included in appendices).
 - To close out the assessment, a review and comparison of the Waikato District Council condition assessment with respect to findings of the Condition Assessments was undertaken and the results from this activity are captured.

Key findings

Of the 4,053 assets reviewed, 3,219 were physically inspected and assessed as part of the field assessment. The 834 assets that were not assessed consisted of assets that were asset register duplicates, un-assessable assets, decommissioned assets and assets not found. In addition to the 3,219 assets inspected, a further 898 new assets were identified in the field that were not captured in the original Waikato District Council’s asset register.

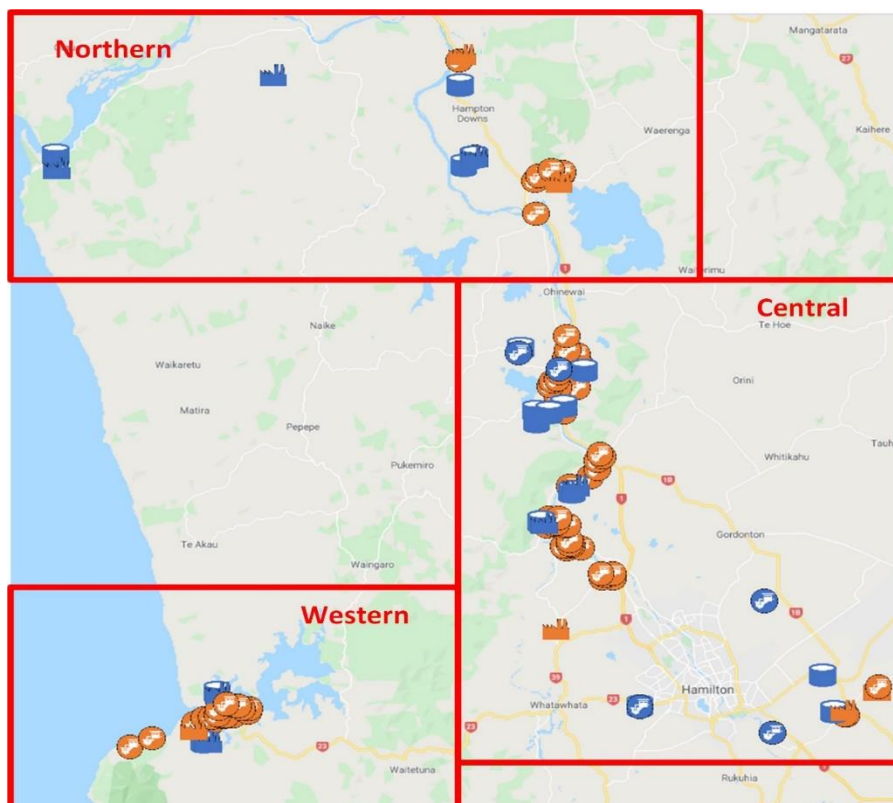


Figure 33: WDC Northern, Central and Western Regions

The field condition assessment scores were presented for the Water and Wastewater Treatment Plants, Reservoirs, Sewage Pump Stations, Pressure Booster Stations and Manholes within each region in the Waikato District.

The graph below summarizes the overall condition for the infrastructure within each region. The Jacob & Watercare condition assessment scoring across the region is slightly higher or comparable with the Waikato District Council condition scores. Most of the condition for above ground assets are sits between good to average condition. In general, these aggregated condition scores indicate some sites are comparable, some in a better state or a number in worst condition as originally reported by Waikato District Council.

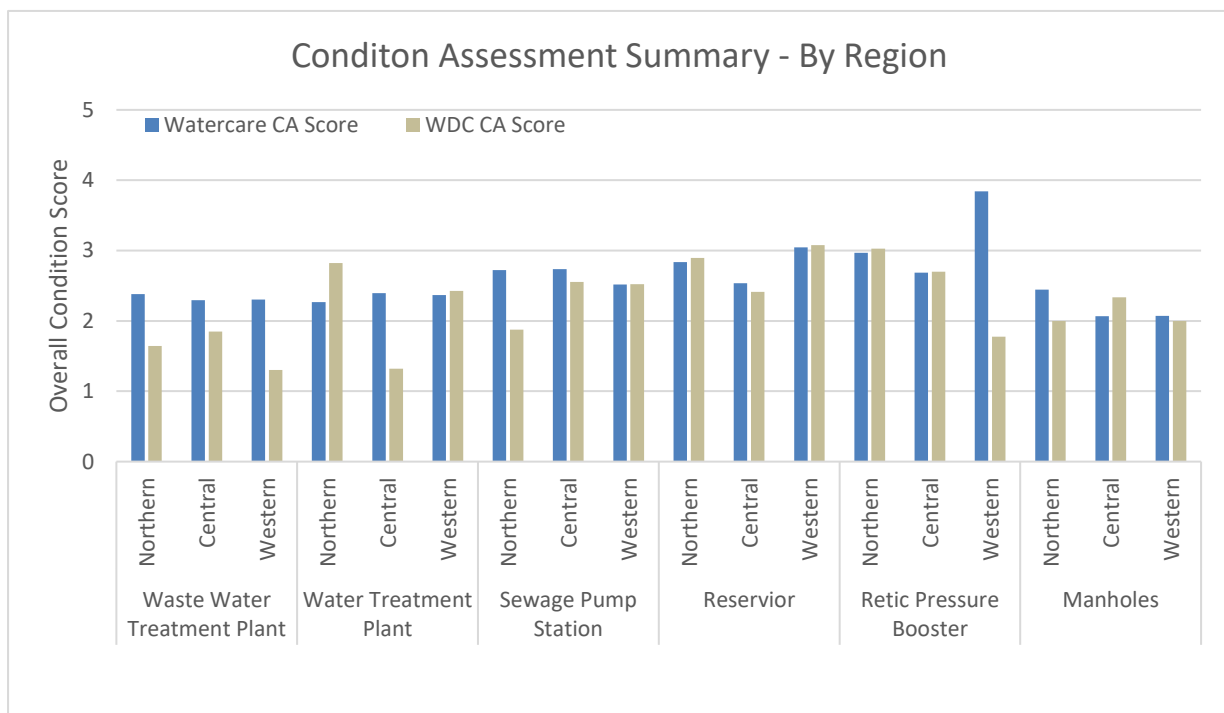
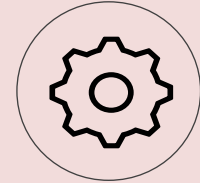


Figure 34: Infrastructure Condition Assessment Summary by Region

Part 3: Levels of Service

Levels of Service (LoS) define the form and quality of service that Council provides to the community. They are the balance between what the community wants and what the community is willing to pay for. This section:

- *highlights the current LoS provided by the Council,*
- *defines the desired LoS for the future and*
- *Outlines performance measures that will be used to monitor the delivery of the agreed LoS.*



I Customer Research and Expectations

Determining levels of service is by our understanding of customer needs. This is determined through interaction with the users of our activity.

Delivering services in the most cost-effective manner, and to encourage community involvement. Assist in setting of service levels. Legislation drives some service levels, like those addressing health and safety considerations.

Customer expectations change over time, so a periodic review of service levels is key.

To understand our customers' needs and expectations better Council undertook a blueprint process with the aim to provide a high level 'spatial picture' of how the district could progress over the next 30 years:

- Address the community's social, economic and environmental needs, and
- Respond to its regional context

The blueprint has provided Council with an effective and legible tool to move from vision to strategy and from strategy to action by setting out specific, prioritised initiatives at the district and local level.

From the consultation with the whole district, there has been the development of nine district-wide themes that would cover the main themes from the district. The table below shows the nine themes and a series of associated initiatives. Details of the initiatives relating to our activity is in Table 117 of Part 8: Financial Summary.

Table 65: Blueprint Initiatives

1	Identity	Create a world class Waikato River corridor identity and strengthen Raglan's local character
2	Nature	Protect and support enhancement of the natural environment with revegetated biodiversity links and clean waterways
3	Iwi	Build on the Joint Management Agreements and other agreements, celebrate Māori culture, and promote the use of Te Reo
4	Communities	Strengthen, enable and connect local communities and citizens, and support those most in need

5	Growth	Direct cohesive growth outcomes which support all community needs
6	Economy	Support the rural and urban economy, and attract more visitors, entrepreneurs, and employment uses
7	Transport	Leverage value off accessibility, help those disadvantaged by lack of transport options, prepare for future passenger rail
8	Infrastructure	Develop and maintain efficient infrastructure that is environmentally clean and will serve the community well into the future
9	Governance	Devolve some decision making and engage more effectively at community and Hapu level.

2 What are our Strategic and Corporate Goals?

2.1 Management Strategies

The overall management of infrastructure will be driven through strategies aimed at:

- Complying with legislative and strategic requirements;
- Meeting customer expectations and agreed levels of service; and
- Delivering value for money for ratepayers, funding partners and the Council.

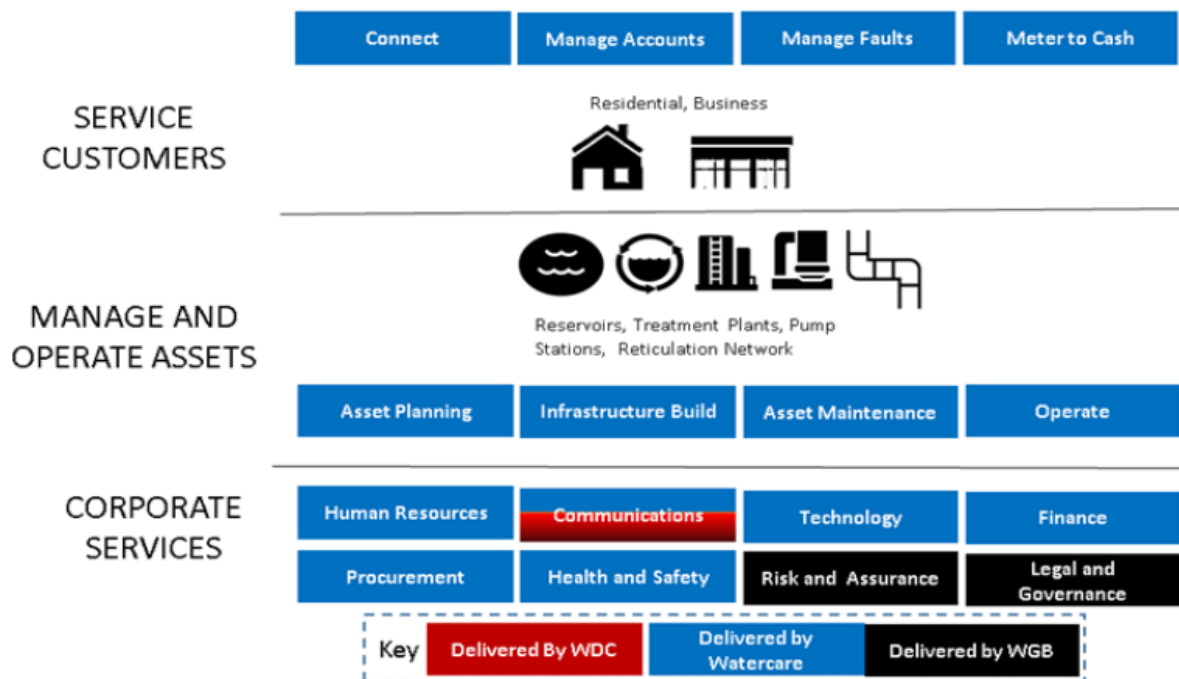


Figure 35: Three Waters Operation Model

3 Legislation, Industry Guidelines and Strategies that guide our activities





A variety of national legislation regulates the three waters activities. The acts mentioned below are described for convenience by their original title, but all amending acts are considered in accordance with the original act, they were not specified in this text. Go to <http://www.legislation.govt.nz> for the latest information on the Act.

3.1 What legislation influences our Three Waters activities?

Legislative requirements form the minimum level of service that Council has to undertake to comply with these. The key legislative requirements that help to determine the levels of service for the Three Waters activities are outlined in the table below.

 Local Government Act 2002	 Health (Drinking Water) Amendment Act	 Resource Management Act 1991
 Health and Safety at Work Act 2015	 Land Drainage Act 1908	 Climate Change Response (Zero Carbon) Amendment Act 2019
 Health Act 1956	 The Climate Change Response (Emissions Trading Reform) Amendment Act 2020	 Civil Defense Emergency Management Act (CDEM) 2002
 Local Government (Rating) Act 2002	 Waikato –Tainui Raupatu Claims (Waikato River) Settlement Act 2010	 Waikato Raupatu Claims Settlement Act 1995
 Building Act 2004 and Amendments	 Nga Wai o Maniapoto (Waipa River) Act 2012	 Utilities Access Act 2010
 Building Amendment Act 2013 Commencement Order 2014		

3.2 What are the Key Regional Policies?







 Waikato Plan	 The Waikato Regional Policy Statement	 The Waikato Regional Plan
 Waikato Stormwater Management Guideline		

3.3 What key Council Bylaws, Policies, Plans and Strategies that influence our activity?


Council has developed various policies and works in partnerships with other agencies, to fulfil its role and align its activities to other agencies and organisations throughout the region. This means that on establishing its programmes, Council must be aware of the following policies, strategies and guidelines.

A list of the Council’s Policies, Strategies, Bylaws and Plans and that impact on the levels of service for delivering the Three Waters activity are outlined in Table 3 below.

3.3.1 Key Council Policies

-  Activity Management Policy
-  Zero Harm Policy
-  Procurement Strategy, Policy and Manual
-  Risk Management Policy
-  Climate Response and Resilience Policy
-  Significance and Engagement Policy







3.3.2 Key Council Strategies

-  30-year infrastructure Strategy – **currently being done**

3.3.3 Key Council Bylaws

-  Trade Waste and Wastewater Bylaw
-  Water Supply Bylaw

3.3.4 Key Council Plans

-  Annual Report
-  Water Safety Plans
-  Annual Plan
-  Long Term Plan (LTP)
-  Water and Sanitary Assessments
-  Waikato Blueprints

Water Supply and Wastewater Policies

The table below lists some of the key Council policies that are relevant to 3 waters across the Waikato District.

Table 66: Council Policies Relating to Water Supply and Wastewater

Policy Name	Origin	Approved Date	Review (3 year)	Review (5 year)	Action
Backflow Prevention Policy	FDC	2008	2011	2013	Review
Water Policy	WDC	2005	2008	2010	Review
Water rates - Discontinuing Supply	FDC	2009	2012	2014	Review
Community Water Fluoridation Policy	WDC	2012	2015	2017	Keep as it is
Easements Policy	WDC	2014	2017	2019	Up to date
Flow Restrictor Removal and Reinstallation in Rural and Country Living Zones of the District Policy	WDC	2010	2013	2015	Review
Lead Developer Fund (Water/Wastewater)	WDC	2005	2008	2010	Review

Trade Waste Bylaw Charging Policy	FDC	2010	2013	2015	Review
Transferring /Selling Water Allocations	WDC	2004	2007	2009	Review
Trade Waste Agreements	FDC	2007	2010	2012	Review

Council's Stormwater Management Plan (2009) provides a district wide direction to the stormwater activity.

Location specific stormwater planning is provided through several catchment management plans (CMPs). The table below lists current and programmed CMPs.

Table 67: Stormwater Catchment Management Plans

Catchment Management Plan	Status	
	Completion Date	Review Required
Pokeno	2010 (update issued in 2020)	2028 as part of new comprehensive consent – minor updates will be required for the waterway assessment and monitoring.
Tamahere	2011	Review to be undertaken as 2028 CMP and also in year 3 of the AMP.
Tuakau	2014 (updates issued in 2019)	2028 as part of new comprehensive consent – minor updates will be required for the waterway assessment and monitoring.
Raglan	2010 (but has never been officially adopted).	Review to be undertaken as 2028 CMP and also in year 2 of the AMP. Additional review to be 2028 as part of new comprehensive consent – minor updates will be required for the waterway assessment and monitoring.
Ngaruawahia	2015	To be completed in year 5 of the LTP. Additional review to be 2028 as part of new comprehensive consent
Glen Massey.	2015	Additional review to be 2028 as part of new comprehensive consent
Taupiri.	2015	Additional review to be 2028 as part of new comprehensive consent
Horotiu.	2020	Additional review to be 2028 as part of new comprehensive consent
Glen Massey.	2015	Additional review to be 2028 as part of new comprehensive consent
Te Kowhai.	2015	Additional review to be 2028 as part of new comprehensive consent
Matangi	Not yet completed	Will be adopted as part of the Tamahere CMP update.
Huntly	Not yet completed	To be completed in year 5 of the LTP. Additional review to be 2028 as part of new comprehensive consent – minor updates will be required for the waterway assessment and monitoring.
Te Kauwhata	2009	To be completed in year 1 of the LTP. Additional review to be 2028 as part of new comprehensive consent – minor updates will be required for the waterway assessment and monitoring.
Port Waikato	2004	Reviewed and unlikely that revision is required as a low growth area. May be required in 2028 as part of new comprehensive consent

The Local Government Act 2002 and the Land Drainage Act 1908 are also important tools in administering the activity, primarily in areas where Council does not provide a service.

The table below lists some of the key strategies and guidelines that are relevant to the provision of 3 water services across the Waikato District.

Table 68: Strategies and Guidelines Relating to Water Supply and Wastewater

Strategy/Guideline Name	Status	Review Dates
Guidelines for Drinking Water Quality Management for New Zealand (3 rd Edition 2017)	Current	No review date specified (on MoH website)
Regional Infrastructure Technical Specifications (RITS)	Current	Adopted in June 2018. An Initial review would have been undertaken (June 2019). Two yearly reviews then apply (Next review date June 2021)
Water Demand Management Plan	Current	Last updated in 2015
Water Safety Plans (previously Public Health Risk Management Plans)		
- Huntly	Current	2023 (approved in 2018)
- North Western and Southern/Western District	Current	2023 (approved in 2018)
- Southern Districts	Current	2023 (approved in 2018)
- Western Districts	Current	2023 (approved in 2018)
- Raglan	Current	2020 (approved in 2015)
- Te Akau	Current	2020 (approved in 2015)
- Whangamarino/Te Kauwhata	Current	2023 (approved in 2018)
- Port Waikato	Current	2023 (approved in 2018)
- Onewhero	Current	2023 (approved in 2018)
- Tuakau – under review	Current	2023 (approved in 2018)
- Pokeno – under review	Current	2023 (approved in 2018)
- Nga – includes Taupiri - Hopuhopu	Current	2023 (approved in 2018)
Waikato District Growth Strategy (Waikato 2070)	Current	Last updated 2020
Future Proof	Current	Under review currently, to be completed in 2020

3.4 Industry Standards and Guidelines

A list of industry standards and guidelines that influence the provision of customer service levels are indicated in table 4. For all New Zealand Standards, refer to www.standards.co.nz

Table 69: Industry Standards and Guidelines

Industry Standard/ Guidelines	Description
Drinking Water Standards for New Zealand 2005	Council is obliged to comply with Drinking Water Standards for New Zealand 2005 (revised 2008) in delivering 3 waters services to the community

National Environmental Standard for Sources of Human Drinking Water

The National Environmental Standard for Sources of Human Drinking Water (NES) is a regulation made under the Resource Management Act (1991) that sets requirements for protecting sources of human drinking water from becoming contaminated. It came into effect on 20 June 2008. The NES requires regional councils to ensure that effects of activities on drinking water sources are considered in decisions on resource consents and regional plans.

While there is no national standard relating to wastewater and stormwater collection and treatment, the Council is obliged to comply with the requirements of the relevant Regional Authority (Waikato Regional Council), including any plans, rules and specific consents.

4 How do the Levels of Service link to Community Outcomes?

Section 10 (1) of the Local Government Act 2002 defines the purpose of local government:

- (a) *To enable democratic local decision-making and action by, and on behalf of, communities; and*
- (b) *To promote the social, economic, environmental, and cultural well-being of communities in the present and for the future.*

The previous values that had been implemented were repealed by section 6(1) of the Local Government (Community Well-being) Amendment Act 2019 (2019 No 17), hence reinstating the four well-beings or as they are best known as community outcomes.

A review of the Levels of Service framework was undertaken to provide a deeper connection between our performance measures and community outcomes. The new Level of Service framework is divided into 5 parts:

1. Community Outcomes
2. Activity Outcomes – how the activity contributes to the community outcomes
3. Levels of Service – the defined quality for a particular service area
4. Service Level Statements – the level of service the customer will experience
5. Performance measures – the metric and target used to measure achievement of the service level

The current Levels of Service that Council is aiming to achieve in the future are shown on the following pages and following a standard asset management hierarchy are grouped into three categories. These are:

1. Strategic – requires significant capital investment to solve problems
2. Tactical – linked to renewal investment
3. Operational – Focus on the operations of our activity

A review of the Level of Service statements and their performance measures were undertaken as part of the framework review and amended to provide a clearer understanding and measurement of the Levels of Service being provided to the community.

It should be noted that the Levels of Service are not intended as a formal customer contract. Rather Council's responsibility is initially to achieve these levels and then to achieve them more cost effectively through a process of improvement where it can be met within current budgets.

The table below describes how the water supply activity complies with the requirements of Section 10.

Table 70: Section 10, Local Government Act 2002 Compliance

Criteria	Activity Compliance
Cost effective for households and businesses	Customers pay for Council three water service as part of their annual rates and metered rates (where applicable). Charges are fixed based on actual operational costs and set three years in advance to provide certainty to the community. Only customers who receive the service receive a charge. Costs are also benchmarked against other Councils in New Zealand.
Efficient	<p>Council's water supply is efficient as:</p> <ul style="list-style-type: none"> • Over 95% of connections are metered allowing water use and losses to be monitored. This efficiency will improve once the district is fully metered by 2021 once funding is confirmed. • Council employs water restrictions during periods of peak demand • Council has a water management plan which describes demand management measures. This plan required by the Waikato Regional Council as to comply with water take consents. • Council has consents in place with the Regional Council with limits around water quality and quantity. Each plant has been specially design to meet those parameters. • Council has an infiltration and inflow strategy which describes measures to prevent and eliminate stormwater and groundwater entering the wastewater system. • Council has stormwater management plans and catchment management plans. Stormwater management is undertaken based on the outcomes of these studies.
Effective	<p>Council's three waters are effective as:</p> <ul style="list-style-type: none"> • Levels of service are agreed with the community. Works are planned in the draft LTP 2021/31 to allow Council to fully meet its three waters management level of service to ensure the three waters are reliable and safe. • Public health and legislative requirements are monitored. Works are planned in the draft LTP 2021/31 to allow Council to fully meet public health and legislative requirements. • Key issues are managed within a formal risk management framework • The community is surveyed about this activity and associated services.
Appropriate to present and anticipated future needs	Council has a long-term strategy for three waters activity, which is updated regularly with predicted population and other future demand information. Works are then programmed in the draft LTP 2021/31 and Infrastructure Strategy to allow Council to meet future needs.

5 What are the links between Levels of Service to the Organisation?

The wider organisational context for levels of service is shown on the figure below:

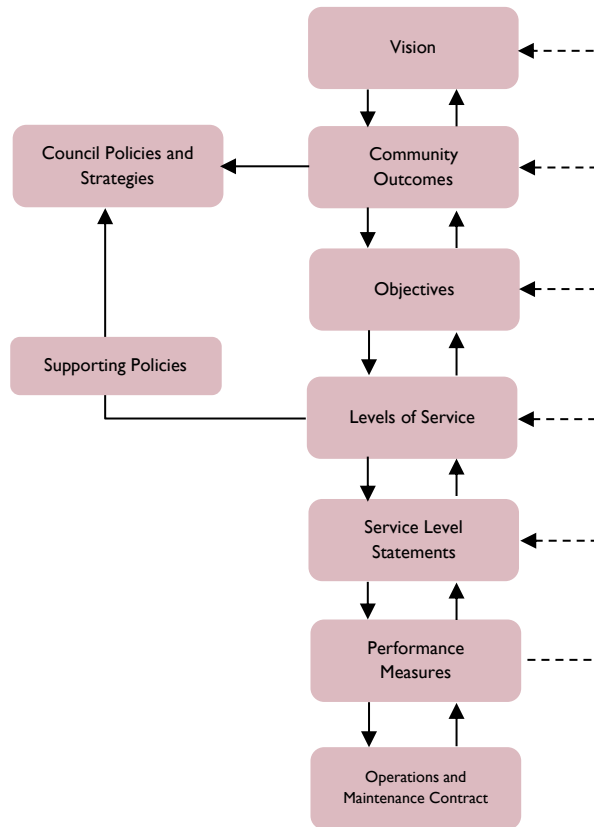












Figure 36: Level of Service Linkages

Table 71: National, regional, local objectives and linkage to Three Waters activity levels of service

National Objectives	Regional Objectives	Local Objectives	Water Supply		Wastewater		Stormwater	
			Activity Outcomes	Level of Service	Activity Outcomes	Level of Service	Activity Outcomes	Level of Service
Community Well-being Outcomes	Waikato Plan	Community Outcomes	Activity Outcomes	Level of Service	Activity Outcomes	Level of Service	Activity Outcomes	Level of Service
 <p>Human</p>	<p>We want a stronger, resilient Waikato region which is responsive to the changing needs of our people and our communities.</p> <p>We want Iwi to have a powerful voice so that Māori aspirations are expressed and integrated through successful joint initiatives.</p>	 <p>Supporting our communities We consider the well-being of all our people.</p>	<p>We aim to have water supply networks that require minimal intervention and provide quality drinking water that is safe to consume.</p>	<p>Bacterial Compliance</p> <p>Protozoal Compliance</p> <p>Urgent Fault Attendance</p> <p>Fire Hydrant Testing</p>	<p>Our wastewater system is operated to minimise health risks.</p>	<p>Sensitive Environment Overflow</p> <p>Non-sensitive Environment Overflow</p>	<p>Our stormwater systems are reliable, efficient, and effective and protect properties from flooding in urban areas.</p>	<p>System Reliability</p> <p>System Effectiveness</p>
 <p>Social</p>	<p>We want the Waikato to be nationally and internationally connected so we can continue to contribute to New Zealand and the world.</p>	 <p>Working together with you Collectively focussed on the right things.</p>	<p>Water supply is delivered to a standard that allows people to participate in social and economic opportunities.</p>	<p>Customer Satisfaction</p> <p>Non-urgent Fault Attendance</p>	<p>Our wastewater system meets the needs of the urban and commercial communities and is reliable, efficient, and effective.</p>	<p>Customer Satisfaction</p> <p>Wastewater Fault Attendance</p>	<p>Our stormwater network meets the needs of the community and customer request are dealt with promptly and appropriately.</p>	<p>Customer Satisfaction</p>
 <p>Natural</p>	<p>We want our land, water and natural environment and heritage places to be recognised as precious and finite.</p>	 <p>Sustaining our environment We are a community that believes in environmental sustainability.</p>	<p>Our water system is managed in a way that ensures the natural environment is healthy and protected</p>	<p>Water Consumption</p>	<p>Our wastewater system is managed in a way that ensures the natural environment is healthy and protected.</p>	<p>Wastewater System Discharge Compliance</p>	<p>Our stormwater systems support environmental sustainability and does not adversely affect or degrade the receiving environment.</p>	<p>Stormwater System Discharge Compliance</p>
 <p>Financial</p>	<p>Advancing Regional Economic Development: Waikato Means Business.</p>	 <p>Building our economy We attract diverse business, creating jobs and opportunities.</p>	<p>Water supply is delivered in a way that supports growing communities and is maintained and developed in a way that provides value for money.</p>	<p>Urgent Fault Resolution</p> <p>Non-urgent Fault Resolution</p> <p>Water Loss</p>	<p>Our wastewater infrastructure is efficient, cost effective and is maintained and developed in a way that provides value for money.</p>	<p>Wastewater Fault Resolution</p>	<p>Our stormwater infrastructure is efficient, cost-effective and supports growing communities.</p>	<p>Flood Event Attendance</p>
 <p>Physical</p>	<p>We want a region with the right infrastructure in the right place, at the right time, to enable us to succeed and prosper.</p>	 <p>Providing value for money Residents and ratepayers get value for money.</p>	<p>Water supply is delivered in a way that is efficient and ensures that our infrastructure meets current and future needs.</p>	<p>Urgent Fault Resolution</p> <p>Non-urgent Fault Resolution</p>	<p>Our wastewater activity provides value for money for ratepayers and ensures current and future needs are met.</p>	<p>Wastewater Fault Resolution</p>	<p>Our stormwater systems are managed efficiently to ensure that our infrastructure meets current and future needs.</p>	<p>System Reliability</p>

6 Current and Target Levels of Service

We propose the following current and new approved Levels of Service outlined in the table below. These have been developed to give a clear link to the reinstated community outcomes. These have been confirmed following council consultation through the Long-Term Plan 2021/31 process.

Strategic Level of Service Statements

- Developed to deliver on the major challenges that our district faces.
- Relate to the quantity or capacity of infrastructure, that is required to deliver on strategic outcomes for the community
- Need significant capital investment to solve problems.

Within our activity there is strong strategic direction with the development of many:

- strategies
- policies
- reserve management plans.

development of the level of service frameworks and performance measures were defined. Outlined in Table 72 below

Table 72: Strategic Levels of Service

	Level of Service	Performance Metric	Service Level Statement	Performance Target
Water Supply	Bacterial Compliance	Number of zones that comply with Part 4 of DWSNZ.	All zones comply with DWSNZ	18
	Protozoal Compliance	Number of zones that comply with Part 5 of DWSNZ.	All zones comply with DWSNZ.	15
	Water Consumption	Average water consumption per day per resident	Water consumed per resident per day meets the current target.	250L
Wastewater	Wastewater System Discharge Compliance	Number of Abatement Notices, Infringement Notices, Enforcement Orders	Meet the target of less than or equal to 2 notices/orders.	≤2
	Wastewater System Discharge Compliance	Number of Convictions	Meet the target of zero convictions	0
Stormwater	System Reliability	Number of flood events occurring in the district.	Maintain the current target for flood events per annum for properties connected to piped networks maintained by WDC.	<5

Stormwater System Discharge Compliance	Number of Abatement Notices, Infringement Notices, Enforcement Orders, Convictions	Maintain the baseline of no more than 0.	0
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Tactical Level of Service Statements

- Focus on maintaining or improving the condition of the existing Three Waters assets
- They relate to renewal programmes of work
- They link to renewal investment

Table 73: Tactical Levels of Service

Level of Service		Performance Metric	Service Level Statement	Performance Target
Water Supply	Water Loss	Percentage real water loss	Water loss from the water reticulated network meets the target for each township.	28% (Average – entire network)
Stormwater	System Effectiveness	Number of habitable floors affected (per 1000 properties) affected (for each flood event).	Maintain the current target for affected floors after the occurrence of a flood event.	0.3 per 1000 properties

Operational Level of Service Statements

- Focus on the operations and maintenance of our activity.

Table 74: Operational Levels of Service

Level of Service		Performance Metric	Service Level Statement	Performance Target
Water Supply	Urgent Fault Attendance	Attendance time	Fast attendance to urgent faults (meets current target).	≤1 hour
	Urgent Fault Resolution	Resolution time	Fast resolution of urgent faults (meets current target).	≤4 hours
	Non-Urgent Fault Attendance	Attendance time	Fast attendance to non-urgent faults (meets current target).	≤5 days

	Non-urgent Fault Resolution	Resolution time	Fast resolution of non-urgent faults (meets current target).	≤5 days
	Fire Hydrant Testing	Percentage tested per five years	All tested fire hydrants comply and provide adequate water supply.	100%
	Customer Satisfaction	The total number of complaints per 1000 connections on Clarity, Taste, Odour, Pressure or Flow, Continuity or supply	Number of complaints received current target.	≤25 (per 1000 connections)
		Percentage of complaints resolved and closed within 10 working days	Complaints are resolved in a timely manner.	95%
Wastewater	Sensitive Environment Overflow (dry weather)	Number of dry weather sewage overflows (per 1000 connections)	Number of dry weather overflows per 1000 connections affecting sensitive and non-sensitive receiving environments maintained at current target.	≤3
	Customer Satisfaction	The total number of complaints per 1000 connections on sewage Odour, Faults, Blockages, Council response to issues	Number of complaints received maintained at current target.	≤10 (per 1000 connections)
		Percentage of complaints resolved and closed within 10 working days	Complaints are resolved in a timely manner.	95%
	Wastewater Fault Attendance	Attendance time	Fast attendance to check faults and blockages (meets current target).	≤1 hour
	Wastewater Fault Resolution	Resolution time	Fast resolution of faults and blockages (meets current target).	≤4 hours
Stormwater	Customer Satisfaction	Total number of complaints per 1000 properties per quarter.	Number of complaints received is maintained at current target.	≤4 per 1000 properties
		Percentage of complaints resolved and closed within 10 working days.	Complaints are resolved in a timely manner.	95%
	Flood Event Attendance	Attendance time	Maintain the current target response time to attend a flooding event.	≤2 hours

7 Levels of Service and how the Council will measure them.

Customers have some expectations of Council's three waters services. The performance measures and performance targets which are to be used to define the levels of service for each of the service statements are identified in the summary tables following.

The performance measures fall into the following four categories:

- **Customer performance measures** – these allow the community to measure Council's level of service performance and are found in public facing documents, such as the Long-Term Plan.
- **Business performance measures** – these allow activity managers to measure the performance of their activities in relation to LoS and are found in internal documents, such as business plans.
- **Process performance measures** – these measures are used in the day-to-day operation of an activity.
- **Financial Measures** – These measures are used to monitor the financial performance of a Group, Business Unit, Project, or Process where financial targets or budgets have been set.

Following some high-profile wastewater overflows in Raglan in 2015 and 2016, Council embarked on the Wastewater Overflow Continuous Improvement Programme (CIP). For the Annual Plan 2017-2018, the focus is on the preparation of long term plans to protect waterways and environmentally sensitive areas.

As part of the Wastewater Overflow CIP, WDC has begun the process of applying for resource consent from the Waikato Regional Council for the overflows in the district. It is likely that the level of service for wastewater overflows will be reviewed and set as part of this process.

The CIP has identified a number of interventions to the wastewater network to reduce overflows. To give confidence that the interventions included in the CIP will meet the LTP target level of service, the target level of service assessed within the CIP has been set below the LTP targets.

The wastewater network in the district has been classified with an Asset Environmental Criticality (AEC), which reflects the chance that an overflow at that asset results in a negative impact on the sensitive receiving environment. The CIP focused on those assets with a high chance and therefore high AEC, which includes 52% of all rising main pipelines in the district and 36% of all gravity sewers. The CCTV programme carried out as part of the CIP so far has highlighted some asset condition issues with the gravity sewers throughout the district.

7.1 Actual Performance Customer Performance Levels

Recent performance information is provided in the table below:

Table 75: Actual Performance for 2018/19 - Water Supply

Performance Measure	Performance Target for 2016/17	Actual Performance for 2016/17	Actual Performance for 2017/18	Actual Performance for 2018/19
The extent to which Council's drinking water supply complies with:				
Part 4 of the drinking water standards (bacteria compliance criteria)	18.00	18.	18	18
Part 5 of the drinking water standards (protozoal compliance criteria)	15.00	4	4	4
Where Council attends a call out in response to a fault or unplanned interruption to its networked reticulation system, the following median response times measured				
Attendance for urgent call-outs: from the time that Council receives notification to the time that service personnel reach the site.	60 m	28 m	38 m	36 m
Resolution of urgent call-outs: from the time that Council receives notification to the time that service personnel confirm resolution of the fault or interruption.	240 m	106 m	88 m	117 m
Attendance for non-urgent call-outs: from the time that Council receives notification to the time that service personnel reach the site.	5 days	1 day	1 day	1 day
Resolution of non-urgent call-outs: from the time that Council receives notification to the time that service personnel confirm of the fault or interruption.	5 days	1 day	1 day	1 day
The total number of complaints received by Council about any of the following (expressed per 1000 connections to the 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	17	22.11	26.16	18.25
The average consumption of drinking water per day per resident within the Waikato District.		270L per day	189L per day	221L per day
The percentage of real water loss from Council's networked reticulation system				
Tuakau	<15%	14.5%	9.8%	16.1%
Pokeno	<15%	34.2%	44.3%	38.8%
Mid Waikato	<25%	34.4%	31.2%	37.8%
Central District	<20%	33.5%	27.1%	30.2%
Raglan	<25%	28.1%	28.6%	32.4%
Huntly	<15%	30.5%	21.8%	18.9%
Southern & Western Districts	<15%	15.3%	14.1%	17.8%
Onewhero	<20%	10.6%	17%	8.0%
Port Waikato	<20%	53%	28.1%	34.9%
Te Akau	<20%	34%	38.5%	14.6%

Table 76: Actual Performance for 2018/19 - Wastewater

Performance Measure	Performance Target for 2016/17	Actual Performance for 2016/17	Actual Performance for 2017/18	Actual Performance for 2018/19
The number of dry weather sewage overflows from Council's system expressed per 1000 sewage connections to that sewage system.	<5 events per annum	0	1.89	1.51
Where Council attends to sewage overflows resulting from a blockage or other fault in its sewage system, the following median response times measured:				
Attendance time: from the time that Council receives notification to the time that service personnel reach the site	60 min	28 min	42 m	45 m
Resolution time: from the time that Council receives notification to the time that service personnel confirm resolution of the blockage or other fault.	240 min	106 min	139 m	151 m
The total number of complaints received by Council about any of the following (expressed per 1000 connections to the sewage system):				
Sewage odour Sewage system faults Sewage system blockages Council's response to issues with its sewage system	25.00	7.28	7.01	11.01
Council's level of Compliance with resource consents for discharge from its storm water system, measured by the number of:				
Abatement notices	2	0	0	1
Infringement notices	0	0	0	0
Enforcement orders	0	0	0	0
Convictions	0	0	0	0

Table 77: Actual Performance for 2018/19 - Stormwater

Performance Measure	Performance Target for 2016/17	Actual Performance for 2016/17	Actual Performance for 2017/18	Actual Performance for 2018/19
The number of flooding events that occurs in the district.	<5 events per annum	Target met	Target met 0 events	Target met 0 events
For each flooding event, the number of habitable floors affected (expressed per 1000 properties connected to the stormwater system.)	0.3 affected per thousand properties per event	Target met	Target met 0 events	Target met 0 events
The median response time to attend a flooding event, measured from the time that Council receives notification to the time that service personnel reach the site.	< 8 hours	Target met	Target met 0 events	Target met 0 events
The number of complaints received by Council about the performance of its stormwater system, expressed per 1000 properties connected to the stormwater system.	<1 per 1000 properties per quarter	Target met	1.86	2.03
Council's level of compliance with resource consents for discharge from its stormwater system, measured by the number of: Abatement notices.	0	Target met	0	1

8 External Factors Affecting the Three Waters Activity

There are often several external factors which affect the LoS that Council provides for an activity. For example, compliance requirements, consent conditions, legislative and other reporting requirements, and reliance on other providers/suppliers.

Water Supply

Water take consents – Council requires resource consents from the Waikato Regional Council to take water from surface and ground water sources for its treatment plants. To allow Council to sufficiently plan for the current and future needs of its communities these consents must be granted over the long term and allow sufficient capacity for long term growth. Council must compete with other users when applying or renewing these consents and it must also comply with consent conditions.

Resource Management (Measuring and Reporting of Water Takes) Regulations 2010 – along with adherence with Regional Council consents, the Council is required to meet the requirements of legislation when extracting fresh water and requires standardised reporting of all water takes across the country. This regulation was made under the Resource Management Act 1991.

National Policy Statement on Freshwater Management 2011 – This policy will affect the way in which Council is allowed to abstract and discharge water, in particular it will affect the conditions in any future consents issued. Waikato Regional Council is required to give effect to this national policy.

Drinking Water Standards Compliance – The Health (Drinking Water) Amendment Act requires water suppliers to protect public health by supplying water at a minimum quality for drinking purposes. The New Zealand Drinking Water Standards 2005 (Revised 2008) sets this minimum standard. The standard details the requirements for Council as a water supplier in terms of quality and ongoing monitoring requirements. The Act also requires water suppliers to undertake a risk assessment relating to the treatment and distribution of the water (Water Safety Plan), and outline the measures taken to address the risks.

Bulk water providers – Council has three water supply agreements (Watercare, Hamilton City Council and Te Kauwhata Irrigation Association) in place for bulk water supply. The agreements detail the terms and conditions of supply and also provide costs for these supply arrangements.

Wastewater overflows – The community has been consulted over providing a more proactive approach to prevention of wastewater overflows. This has involved preparation of the Wastewater Overflow Continuous Improvement Programme.

Wastewater

Discharge consents – Council requires resource consents from the Waikato Regional Council to discharge wastewater to rivers/streams after it has been treated. To allow Council to sufficiently plan for the current and future needs of its communities these consents must be granted over the long

term and allow sufficient capacity for long term growth. Council must also comply with consent conditions which as community expectations on water quality increase, the discharge qualities become more stringent.

Watercare Agreement – Council currently has an agreement with Watercare to take wastewater and provide potable water to Waikato District. This agreement covers the expectations around the quality and volumes of wastewater to be discharged at the Watercare Facility, west of Tuakau. Should our wastewater not meet these agreed levels, Council may have to consider installation of pre-treatment in the future.

Stormwater

Stormwater consents - Council requires resource consents from the Waikato Regional Council to discharge stormwater into nearby rivers/streams. To allow Council to sufficiently plan for the current and future needs of its communities these consents must be granted over the long term and allow sufficient capacity for long term growth. Council must also comply with consent conditions. This external factor is likely to have a positive impact on environmental levels of service but a negative impact on cost based levels of service.

Waikato Regional Council Operations - WDC is reliant on several WRC operations to support the stormwater activity. These include stormwater pump stations and drainage districts to receive stormwater discharges, and stop banks for flood protection.

Mighty River Power - Waikato River levels are managed by Mighty River Power, which can affect the ability of WDC's schemes to discharge during periods of high flows. However, the overall effect of flow management on the Waikato River is positive, reducing the flood impact of extreme events.

Upstream Dischargers - Since handing over its rural drainage districts, WDC does not directly receive discharges from any upstream schemes.

8.1 Business, Financial and Process Levels of Service

The business plan is currently under development and the first draft is to be submitted in July 2020.

8.1.1 Firefighting Capacity

Compliance with the firefighting code of practice (SNZ PAS 4509:2008 New Zealand Fire Service Fire Fighting Water Supplies Code of Practice) is an area of concern for on-demand supplies across the district. Network models for the five major water supplies in the district help us understand the operational performance of the network and assist with growth planning. Firefighting performance and recommendations to address the deficiencies in the system will be incorporated into the next Long-Term Plan.



Firefighting performance and recommendations addressing deficiencies in the system

8.1.2 Water Loss

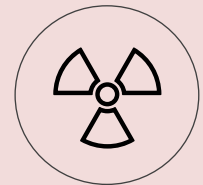
The use of percentages is not a useful measure for assessment of leakage performance of the system. The number of connections, the length of reticulation, system pressures can all skew the results and percentages are not a good comparison against schemes. It is recommended that an internal process measure is included which uses the international standard ILI (infrastructure leakage index) for assessing water loss and set the target at 2.0 at the end of the ten-year period of the LTP. In the New Zealand context ILI's of greater than 3.0 are considered unacceptable. See table below.

Table 78: Performance Measures - International Leakage Indices

Developed countries	General description of Real Loss Management Performance Categories for Developed and Developing Countries
ILI range	
Less than 2	Further loss reduction may be uneconomic unless there are shortages; careful analysis needed to identify cost-effective improvement.
2 to <4	Potential for marked improvements: consider pressure management, better active leakage control practices, and better network maintenance.
4 to <8	Poor leakage record; tolerable only if water is plentiful and cheap; even then, analyse level and nature of leakage and intensify leakage reduction efforts.
8 or more	Very inefficient use of resources; leakage reduction programmes imperative and high priority.

Part 4: Risk Management Planning

The purpose of risk management is to identify the risks associated with the three waters activity and its assets. This requires considering potential risks from many perspectives, including financial, operational, organisational, and public health and safety considerations to name a few.



1 Overview

Risk is the effect of uncertainty on objectives. Risk events are events which may compromise the delivery of the organisation’s strategic objectives.

The main risk to asset management planning is the inability to deliver on agreed Levels of Service due to unplanned events and situations. This section outlines Waikato District Council’s risk management strategy and process. It identifies negative effects and hazards linked to the activity and infrastructure assets. It also identifies critical assets and our approach to emergency response and zero harm.

2 How are critical assets defined?

Critical assets are defined as those assets that are likely to have more significant consequences than other assets if they fail. Failure of critical assets has the potential to have significant economic, social and environmental impacts for the community and Council. Critical assets typically require more proactive management to minimise or eliminate this risk.

Critical assets are essential items to the three waters activity that we depend on and require on a day to day basis to provide essential Council services.

2.1 Asset Criticality Criteria

The Asset Criticality Model used to assess network pipes criticality slightly differs from that used for aboveground assets. However, what the criticality scores mean is the same for all assets. Asset Criticality is rated from 1 to 5 as follows

Table 79: Asset Criticality Criteria

Criticality Rating	Asset Criticality	Consequence of failure
5	<p>High</p> <p>The asset serves the most important district-wide function for this network or asset portfolio and is essential to ongoing operation (eg single water treatment plant, a single bridge link, regionally significant park, Council HQ building, etc).</p>	<p>Catastrophic</p> <p>Failure could result in:</p> <ul style="list-style-type: none"> Essential services unavailable (> 1 day) Life threatening injury/fatality (Severity 1) Financial exposure per annum ≥ \$1.5M Sustained high profile adverse national or local media campaign or irreversible loss of community confidence

Criticality Rating	Asset Criticality	Consequence of failure
		<ul style="list-style-type: none"> Breach of policy, process or legislation requiring external investigation and resulting in significant tangible loss Significant environmental disaster causing widespread environmental degradation/damage and/or irreversible pollution or affecting future generations Significant prolonged effect to service levels/business function
<p>4</p>	<p>Medium-High The asset serves a major function within the network (eg. an arterial road, large trunk main, one of a small number of water reservoirs etc).</p>	<p>Major Failure could result in:</p> <ul style="list-style-type: none"> Essential services unavailable (<1 day), non-essential services unavailable (<7 days) A WorkSafe NZ notifiable injury or illness (Severity 2) Financial exposure per annum ≥ \$500k but <\$1.5M High profile adverse national or local media attention or loss of confidence from significant portion of community sector Breach of policy, process or legislation requiring external investigation and resulting in a tangible loss Major but localised environmental degradation/damage/pollution with long term effects or major off-site release Major but short-term effects to service levels/business function
<p>3</p>	<p>Medium The asset serves an important suburban function (eg. a Collector road, minor pumping station, distribution main, public pool, park, housing or community building).</p>	<p>Moderate Failure could result in:</p> <ul style="list-style-type: none"> Essential services unavailable (<4hrs), non-essential services unavailable (<3 days) Lost Time Injury (Severity 4) Financial exposure per annum ≥ \$100k but < \$500k Adverse local media coverage/business practice resulting in complaints/prolonged unresolved dispute requiring legal oversight Breach of policy, process or legislation requiring internal investigation including moderate treatment for the purpose of damage control Moderate localised environmental degradation/damage/ (medium term effect) or contained off site release Moderate short-term effects to service levels/business function
<p>2</p>	<p>Low-Medium The asset serves a primarily local function (eg a local road, pipe serving several streets, small community facility).</p>	<p>Minor Failure could result in:</p> <ul style="list-style-type: none"> Non-essential services impacted (<1 day) Restricted work injury or medical treatment injury or potential for medical treatment is required (Severity 5) Financial exposure per annum ≥ \$10k but < \$100k

Criticality Rating	Asset Criticality	Consequence of failure
		<ul style="list-style-type: none"> Minor adverse local media coverage/social media comment leading to localised complaints Breach of policy, process or legislation requiring internal investigation requiring minor treatment for the purpose of damage control Minor localised environmental damage/pollution Minor effects to daily business function
I	<p>Low The asset serves a minor local function (e.g. a water pipe serving a single street, small local reserve, etc).</p>	<p>Insignificant Failure could result in:</p> <ul style="list-style-type: none"> No tangible impact on services to customer (monitoring maybe required) First aid injury or potential for a person to seek first aid (Severity 6) Financial exposure per annum < \$10k Social media comment/questions but no subsequent public interest or event affecting an individual or small group Minor breach of policy or process requiring no investigation and only an approval or variance to prevent any damage control requirement Negligible localised environmental damage Negligible effects to daily business function

In general, failure of the highest criticality assets could be expected to have severe adverse impacts on WDC’s customers and stakeholders, affecting outcomes such as public health and safety, economic wellbeing, and environmental sustainability. Availability of suitable alternatives is limited. At the other end of the scale, failure of the lowest level of criticality would have little to no adverse impacts on customers, the local economy or the environment.

2.2 What are our critical Assets?

2.2.1 Three Waters Critical Pipes Assessment

The criticality ranking of water and wastewater pipe assets was adopted by WDC in May 2017 and is in accordance with the NAMS standard. It is based heavily on the location and size of pipes. Refer to Tables 4-2 and 4-3 below, with criticality rating scale 1 – 5, ‘1’ being the least critical through to ‘5’ being the most critical.

Where more than one of the criteria matches a pipe, the criticality ranking is based on the location. Note that a ranking of ‘0’ was assigned to ‘service’ line assets.

Table 80: Criticality ranking of the pipes based on location

Criticality	Description
5	Under Railway/ State Highway/River
4	Pipe bridges and aerial pipes (pressure pipes)
4	Under building (pressure pipes)
3	Pipe bridges and aerial pipes (gravity pipes)
3	Under building (gravity pipes)

Table 81: Criticality ranking of the pipes based on size

Criticality	Water	Wastewater	Stormwater
	Size		
5	>=300mm	>=400mm	>600mm
4	>=150mm	>=300mm	-
3	>63mm	>=150mm	>300 and <=600mm
2	<=63mm & >25mm	>=100mm	-
1	<=25mm	<=90mm	<=300

Using the above criticality criteria and ranking, the water, wastewater and stormwater pipes were assessed and ranked as shown in Tables 82 to 84 respectively.

Table 82: Criticality ranking of water supply pipe network

Criticality Ranking	Length of pipes (m)	Percentage of network (%)
5	34,169.16	4%
4	225,465.07	28%
3	238,815.90	30%
2	296,761.87	37%
1	4,227.28	1%

Table 83: Criticality ranking of wastewater pipe network

Criticality Ranking	Length of pipes (m)	Percentage of network (%)
5	22,062.68	7%
4	21,563.07	7%
3	231,351.80	72%
2	27,964.96	9%
1	17,186.24	5%

Table 84: Criticality ranking of stormwater pipe network

Criticality Ranking	Length of pipes (m)	Percentage of network (%)
5	11,704.94	8%
3	45,400.37	30%
1	94,569.52	62%

2.2.2 Aboveground Assets Criticality Assessment

A criticality assessment was undertaken for the treatment plant assets as programmed into the LTP 2018 – 28. A criticality ranking method was developed for the criticality assessment of all three waters aboveground assets based on Criticality Build-Up Criteria with criticality raw scoring shown in Table 70 below. Where the criteria is not relevant, a weighting of 0 is assigned.

Please note that all above ground **assets have been assessed at asset component level** and health and safety assessed for the operators/staff who may be present at site not for the end use customers or public.

Table 85: Criticality Build-up

CRITICALITY BUILD UP			WEIGHTING
Components	Health and Safety - Are there health and safety risks?	Multiple life-threatening illnesses, injuries or fatalities.	300
		Single life-threatening illness, injury or fatality.	225
		An illness, injury requiring moderate medical care.	150
		Health and safety monitoring required.	75
		Standard health and safety procedures applied.	0
	Business Continuity - What is the risk to business function and / or levels of service?	Significant effects to business function with prolonged and significant impact on levels of service.	200
		Major effects to business function with significant short-term impact on levels of service.	160
		Moderate effects to business function with moderate short-term impact on levels of service.	120
		Minor effects to business function with minor impact on levels of service.	80
		Negligible effects to business function with insignificant impact on levels of service.	40
	Compliance and Regulatory - What is the risk of exposure to liability? (legal action, fines, non-compliance against consent conditions)	Significant breach of obligations (i.e. law, legislation, regulations, code, consents etc.) with legal action and significant fines (> \$100k).	150
		Serious breach of obligations (i.e. law, legislation, regulations, code, consents etc.) with legal action and major fines (\$20k-\$100k).	120
		Moderate breach of obligations (i.e. law, legislation, regulations, code, consents etc.) with legal action and moderate level fine (\$5k-\$20k).	90
		Moderate breach of obligations (i.e. law, legislation, regulations, code, consents etc.) with legal action and low level fine (<\$5k).	60
		Minor breach of obligations (i.e. law, legislation, regulations, code, consents etc.) with warning.	30
	Environmental - What is the environment risk? (Ecology, soil contamination, water quality, noise levels, odour, dust, etc)	Significant and wide spread adverse effects on living organisms and environment by effluents, emissions, wastes, resource depletion, etc.	125
		Major but localised adverse effects on living organisms and environment by effluents, emissions, wastes, resource depletion, etc.	100
		Moderate localised adverse effects on living organisms and environment by effluents, emissions, wastes, resource depletion, etc.	75
		Minimal localised adverse effects on living organisms and environment by effluents, emissions, wastes, resource depletion, etc.	50
		Negligible or no localised adverse effects on living organisms and environment by effluents, emissions, wastes, resource depletion, etc.	0
	Financial - What is the financial risk? Asset replacement cost	Financial cost > \$1M in any 12month period.	150
Financial cost \$150k - \$1M in any 12month period.		100	
Financial cost \$50k - 150k in any 12month period.		60	

CRITICALITY BUILD UP		WEIGHTING	
	only, do not evaluate cost of consequences.	Financial cost \$10k - 50k in any 12month period.	40
		Financial cost <\$10k in any 12month period.	10
	Reputation / Image - What is the risk of Council's reputation / image? Potential for negative media coverage and / or negative experiences / perceptions by stakeholders and the community.	Serious or sustained national media attention.	75
		Short term national media attention.	60
		Short term local media attention.	45
		Some minor public attention.	30
		Minor internal interest.	15
	Resourcing - Are there risks related to capacity of staff and / or supplier delivery confidence?	Significant and prolonged lack of internal staff capacity requiring additional external resources. Significant level of uncertainty with supplier delivering in full, on time and to specification.	50
		Significant but short-term lack of internal staff capacity requiring external resources. High level of uncertainty with supplier delivering in full, on time and to specification.	40
		Moderate but short-term lack of internal staff capacity, possible use of external resource. Moderate level of uncertainty with supplier delivering in full, on time and to specification.	30
		Internal staff capable but require monitoring and management. Some level of uncertainty with supplier delivering in full, on time and to specification.	20
		Staff fully capable. Negligibly level of uncertainty with supplier delivering in full, on time and to specification.	0

Each main asset and main components are assessed by using the Criticality Build Up table above to determine their total raw criticality score. Assets are thereafter assigned their corresponding Criticality Rating from 1 to 5, 5 being the highest and most critical. Refer to Table 86 below.

Table 86: Criticality Rating

Criticality Rating	Raw criticality score
5	> 799
4	600 - 799
3	400 - 599
2	200 - 399
1	0 - 199

The following table shows the distribution of our water, wastewater and stormwater aboveground assets with respect to their resulting criticality rating.

Table 87: Criticality Rating of Aboveground Assets

Rank	Storm Water P.S.	Water Network P.S.	Water Network Reservoirs	Wastewater Treatment	Water Treatment	Range
5	0%	0%	0%	0%	0%	>799
4	0%	0%	0%	0%	0%	>599
3	0%	0%	5%	1%	9%	>399
2	11%	9%	3%	12%	12%	>199
1	89%	91%	92%	88%	79%	>0
1	88	283	508	1062	980	>0
2	11	29	14	143	149	>199
3	0	0	28	8	113	>399
4	0	0	0	0	0	>599
5	0	0	0	0	0	>799
Total	99	312	550	1213	1242	
No. of assets and main components						

Table 88: Criticality Rating of Aboveground Assets

Rank	Summary	Range
5	0%	>799
4	0%	>599
3	4%	>399
2	10%	>199
1	86%	>0
1	3015	>0
2	355	>199
3	149	>399
4	0	>599
5	0	>799
Total	3519	
No. of assets and main components		

Three waters aboveground assets are managed based on their criticality rating and as per the activity management process as outlined in Table 74 below.

Table 89: Use of criticality range for activity management processes

Criticality Rating Range	Condition Assessment	Renewal Strategy	Risk Assessment
High 4 - 5	Regular condition monitoring.	Renew at end of expected asset life or when condition monitoring score reaches 4 – Fair.	Consider likelihood of failure. Assess potential for: <ul style="list-style-type: none"> <input type="checkbox"/> Redesign or modification to, eliminate or reduce asset criticality. <input type="checkbox"/> Asset duplication. <input type="checkbox"/> Spares held. <input type="checkbox"/> Service provider agreements.

Medium 2 - 3	Monitor condition when the asset is at 80% of its expected life and regularly thereafter.	Renew when condition monitoring score reaches 5 – Poor or when asset fails.	Consider likelihood of failure. Assess potential for: <input type="checkbox"/> Redesign or modify to eliminate or reduce asset criticality. <input type="checkbox"/> Spares held. <input type="checkbox"/> Service provider agreements.
Low 1	Condition monitoring if asset not performing as expected.	Renew when asset fails.	Not required.

As a part of a data validation study, it was identified that the following steps are necessary to improve data confidence level and have thereafter been completed.

- Existing treatment plant asset hierarchy classification have been reviewed.
- Condition assessment data reflects on renewal planning
- Capitalised WIP figures (new asset found inclusion)
- Assigned critical scores to the asset components
- Label asset components to be completed

At this stage all treatment plant assets are captured in an excel spreadsheet as AssetFinda does not have the ability to register at a component level. This is an active spreadsheet regularly updated by Asset Information officer.



Identify critical assets, assess all for criticality



Identify significant negative effects, procedure to mitigate these



Identify associated risks and risk management strategies for critical assets, procedures in place for rapid and structured response to emergency failures



Identify associated risks and risk management strategies for critical assets, risk management considered at both corporate and service levels

3 What is the Risk Management Framework?

Waikato District Council has adopted a corporate level risk framework using the AS/NZS ISO 31000:2009 Risk Management – Principles & Guidelines as a basis.

The objectives of the Council’s Risk Management framework are to develop a comprehensive and organised approach to risk management across the Waikato District Council, and to integrate risk management activities into business, strategy, preparation, and core operations to ensure that key risks are defined, controlled and communicated.

Benefits from applying effective risk management include:

- Identifying and managing existing and new risks in a planned and coordinated manner; preventing the need for emergency response – contributing to a more proactive approach to managing assets;
- Developing a “risk aware” culture that encourages all staff to identify risks and associated opportunities as part of their business as usual activities; and
- Improved achievement of Council’s vision, values and strategies – with the Executive Team having an active and informed knowledge of the range and priority of the risks that need to be managed by the organisation.

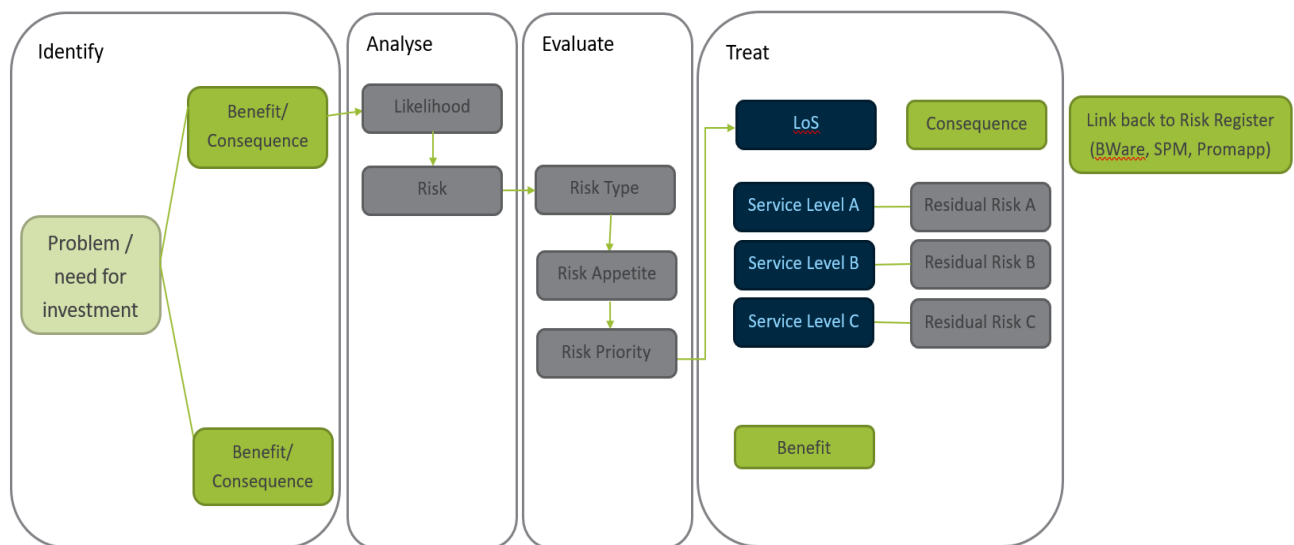


Figure 37: AMP approach to Programme Development and Investment Prioritisation using a Risk Management Framework

3.1 Risk Management Policy

The Waikato District Council Risk Management Policy and associated Risk Management Framework were originally adopted in March 2014. This policy describes the systems that the Council has in place to identify and manage risks which could prevent the Council from achieving its strategic objectives. The policy was reviewed and updated in March 2018.

The Council’s approach to risk management, the risk management process, and the main risk reporting procedures are set out in detail in the Risk Management Framework.

3.2 What is our Risk Appetite?

Council has documented the levels of risk they will tolerate in its Risk Appetite Statement, published 9 April 2020.

Risk appetite is the conscious decision about which risks and how much of each, the organisation is willing to take on as it delivers on the vision of liveable, thriving, and connected communities. Council’s risk appetite reflects our business model, our risk capacity, our internal risk management capabilities and our culture. Our appetite for risk is influenced by a number of factors including (but not limited to) the business environment, our people, our community needs and wants, our business systems and

our policies. Having a clearly defined risk appetite gives clarity to the wider organisation about the nature and degree of risks that can be taken with our strategic, operational and project work.

Defining risk appetite is intimately linked to defining the overall strategy of an organisation and is therefore a task for the Executive Leadership Team and Council through Audit & Risk Committee.

3.2.1 Benefits of Communicating Organisational Risk Appetite

Defining and articulating appetite has a positive influence on our culture and behaviours. It gives our people an improved understanding of what risk management means to their roles and helps them to apply effective risk management practices.

Risk appetite is a key component of effectively communicating risk expectations and ensuring a common approach across the three identified 'lines of defence';

- Those managing risk
- Those setting and overseeing the risk management practices, and,
- Risk assurance providers

Discrepancies between the Council's agreed risk appetite and residual risk levels determine whether more controls are required to appropriately manage a risk or whether there is space for more opportunity to be sought.

3.2.2 Summary of Risk Appetite

Council is willing to take well defined risks at a moderate to high level where it will result in the achievement of strategic objectives; specifically in projects, growth, financial management and internal culture areas. Council understands that the successful achievement of its objectives is significantly supported by its perceived reputation with its customers. Accordingly, Council is not willing to accept risks that would adversely impact its reputation, nor where there is employee or customer wellbeing is compromised.

3.3 What is the Hazard and Risk Management Standard?

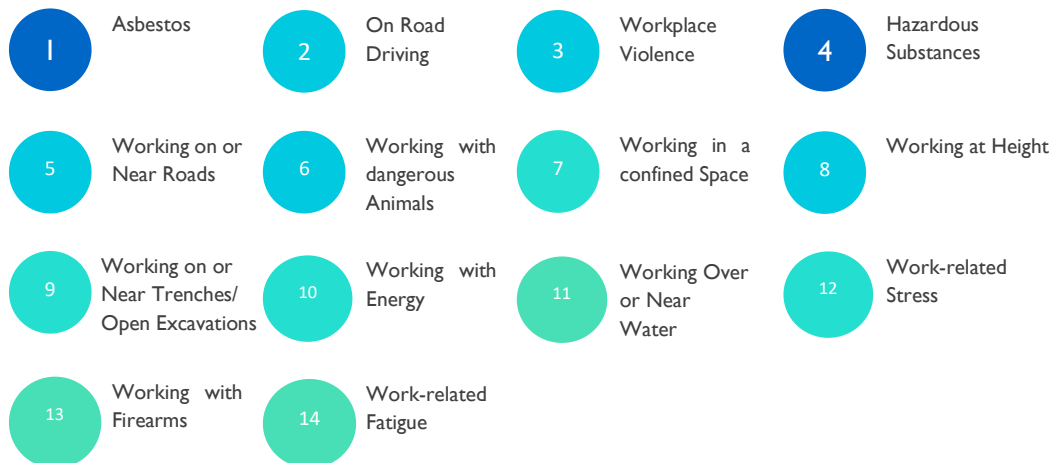
Council hazard and Risk Management Standard provide guidance on managing health and safety risks associated with all facilities and operations. Minimising or mitigating Health and Safety Hazards and Risks is essential to making our workplace safer.

From an Asset Management perspective, **Managers and Team Leaders** are responsible for;

- Assisting with identifying, assessing and managing hazards
- Reporting and providing assurance to the Executive Leadership Team on the outcome of hazard and risk management activities
- Ensuring that hazard and their risks in their area of control are effectively managed with prioritised corrective or mitigated action aimed at preventing events and harm
- Ensuring all hazard are reported, and that systems are in place to notify key stakeholders within specified timeframes

- Ensuring that adequate health and safety risk management activity records are retained and filed
- Ensuring that workers are given the opportunity to participate in and are consulted as part of the hazard identification and risk control process
- Allocating appropriate resources to identify and manage hazards and risks
- Ensuring workers are provided with information about hazards and controls that are necessary to keep themselves and others safe
- Ensuring personal protective equipment (PPE) is available and worn by workers


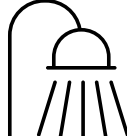

Critical Safety Risks are activities regularly undertaken by a Person Conducting a Business or Undertaking (PCBU) that if not adequately controlled could result in a serious injury or fatality for example working in a confined space or working at height. These are defined separately in the Critical Safety Risk Management Standard. The list of activities classified as Critical Safety Risks are:



Critical Safety Risks relevant to Three Waters are provided in the following table.

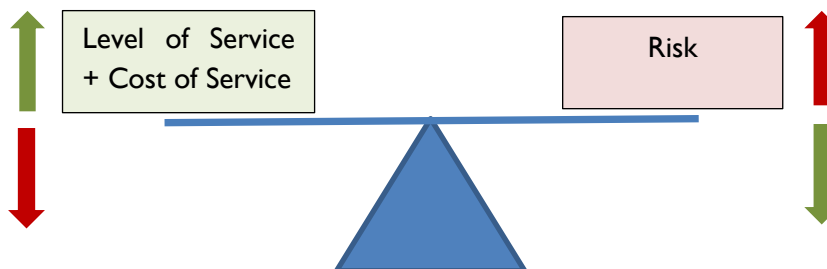
Critical Safety Risks

Table 90: Critical Safety Risks - Three Waters

WATER SUPPLY	WASTEWATER	STORMWATER
 <p>Critical Safety Risk: Extremely Important</p> <p>Related Risks:</p> <ul style="list-style-type: none"> Asbestos On road driving Working in or near trenches/open excavations Working over or near water 	 <p>Critical Safety Risk: Extremely Important</p> <p>Related Risks:</p> <ul style="list-style-type: none"> Asbestos On road driving Hazardous substances Working in a confined space Working in or near trenches/open excavations 	 <p>Critical Safety Risk: Extremely Important</p> <p>Related Risks:</p> <ul style="list-style-type: none"> Asbestos On road driving Working in a confined space Working in or near trenches/open excavations

3.4 Risk Management Process

The Risk Management Process for management of council’s assets focusses on ensuring that risks are identified and treatment plans are in place for all associated activities. This enables the development of activity management programmes that address risk to align with Council’s risk appetite. The following diagram provides a guide on how risk is balanced against Levels of Service and Cost of Service to ensure that the appropriate treatment, maintenance and renewal plans are achieved for best value for money outcomes:



The data management processes through SPM enable the consideration of many risk factors to better understand the condition and needs of the asset component. At a high level, this includes the following:



3.5 Risk Monitoring

Where risks are not mitigated through investment, the community assets team follow the following risk monitoring process to continually check for change and action accordingly.

Table 91: Risk Monitoring and Review Requirements

Report to	Period	Content
Council	Annually (start of financial year)	Report to council on top 10 strategic level risks facing the organisation. Full status report with information on current or revised strategic level risk profile, treatment plans in place, effectiveness of treatment plans, audit history of treatment plans, risk management tools
	6-monthly	Report to council on trends of top 10 strategic risks, any changes to strategic risk profile, management of risk profile, any emerging risks
Audit and Risk Committee	Quarterly	Top 10 strategic risks, key operational and project risks . Effectiveness of risk treatment plans, risk trends, emerging risks.
Executive Leadership Team	Monthly	Overview of strategic risk profile, key operational and project risks . Effectiveness and priority of risk treatment plans, risk trends, new and emerging risks, organisational risk activity (engagement).
Business Units	As part of regular team meetings	Operational risk should form part of team meetings to review and monitor the management of identified risks. Discuss and review the effectiveness of treatment plans along with any emerging risks. Where necessary, decisions should be made what risks may need to be escalated for ELT knowledge.
Project Teams	As part of regular team meetings	Project risk management should form part of project team meetings to review and monitor the management of identified risks. Discuss and review any emerging risks and report / review status of risks as project work progresses. Where necessary, decisions should be made what risks may need to be escalated for ELT / project Portfolio Owners knowledge.

4 Risk Registers

4.1 What are our Corporate Risks?

Within Council the Executive Leadership Team maintain a Strategic Risk Register which contains critical business level risks that have effect across the whole business. This level of risk is also monitored by the Audit and Risk Committee. Treatments and actions associated with these risks are

managed in Promapp and progress is reported on a quarterly basis. The table below demonstrates the strategic risks.

4.2 What are our Activity Management Risks?

The risk registers for the current and future three waters activities of Waikato District Council are recorded in Promapp (risk module) and have been developed in consultation with key staff.

The risk registers will be reviewed annually, however there will be a requirement by:

- risk managers (*people assigned overall responsibility for each risk*) and
- treatment owners (*people or persons assigned responsibility to confirm treatments are operational and effective*)

To ensure proactive risk management is being conducted. The frequency of these actions for each risk is specified and managed via the Promapp risk module.

The water supply and wastewater activity risks were developed by various staff across the Waters team who are now operate under Watercare Services Limited. The risks were assessed as a team and the inherent risk rating was calculated. The treatments do require further development and will be done in conjunction with members of the Waters team.

The table below describes the risks specific to the water supply activity. Treatments and actions are managed in Promapp. Actions that are required to achieve the desired improvements are indicated along with how progress on these actions will be monitored and reported. Where applicable, action tasks detail timeframes for achievement, and responsibility for these actions.

For most registers there is some work required to match the risks to mitigation measures and then specific actions. The latter two are listed under the treatment field in Promapp.

Table 92: Risk Responses

Response	Definitions
Avoid	To terminate exposure to a potential risk, generally the organisation needs to exit the activity which gives rise to the risk, or not start an activity which would give rise to the risk.
Exploit	For risks which present an opportunity for Waikato District Council, a legitimate approach is to increase Waikato District Council’s exposure to the risk; generally, this would represent a situation where Waikato District Council can gain an advantage through their management of this risk.
Transfer / Share	Risk transfer is getting another party to undertake the activity.
Reduce	For risks which present a threat to Waikato District Council, but which cannot be avoided, the development of additional controls or mitigation strategies.
Accept	Accepting the risk by informed decision. This means continuing with the business activity / project as currently defined, aware of how much risk is involved, monitoring changes in overall risk is involved, monitoring changes in overall risk, and ensuring appropriate levels of contingency at the Waikato District Council level.

5 What are our risk responses?

The Waikato District Council has a suite of response strategies for the potential risks identified above, they include avoiding, exploiting, transferring / sharing, reducing or accepting the risk. These response strategies are summaries in the table below.

6 How do we respond to emergencies?

6.1 Civil Defence Emergency Management

Civil defence emergency management is the collective resilience of our Council, our partners and stakeholders, and our communities to manage a disaster in our district.

How well we prepare ourselves and understand the likelihood and consequence of our hazards will determine how well we respond and recover from any event. CDEM is Council business. All the planning, management and activities that we do as part of our business-as-usual contributes to how we will manage an impact of any size on our assets and provide support to our communities when normal services are disrupted.

In an emergency of any scale we will have a specialist team in our Emergency Operations Centre (EOC) coordinating and prioritising Council's response to the areas of impact within our community. Council staff will be working collectively with stakeholders to get our organisation, services and community back up and running.

Waikato District Council has developed a Local Civil Defence Emergency Management Plan, that outlines specific activities and arrangements for the Waikato district.

6.2 Business Continuity Plans

In the event of an emergency we may not be able to maintain a full level of service due to the disruption that we could experience. Business continuity planning supports Council to maintain a minimum service level to our community and stakeholders during and following an emergency.

Waters essential supplies are the service providers. The service providers are responsible for ensuring they have adequate levels of essential supplies (e.g. staff, pipe fittings, chemicals, vehicles/fuel, testing kits, etc.)

The key suppliers are:

- Watercare Services Ltd (Waikato) – Contractor and service provided for three waters
- Watercare Services Ltd (Auckland) – Bulk water supplier and Wastewater treatment services to Northern District
- Hamilton City Council – Bulk water supplier to Southern and Western Districts
- Te Kauwhata Water Association – Bulk water supplier to Te Kauwhata
- Shared Services – Compliance in trade waste, sampling and analysis, education and communication in Smart Water including water alert levels (may cease within the next year)
- WDC Information Management – The SCADA telemetry system Watercare use to monitor and control waters infrastructure plant and networks is housed at Ngaruawahia, Tuakau and Huntly

WDC sites. If there is a fault or issue that requires a reset, it has to be done in Ngaruawahia and IM are required to meet external provider and assist with reset.

In the case of a critical operating mode, only field staff required to operate Water and Wastewater infrastructure will be physically attending work, all other staff may operate remotely.

6.3 Resilience

The National Infrastructure Unit defines resilient infrastructure as:

“Infrastructure that is able to deal with significant disruption and changing circumstances such as natural hazards and shock events or events which evolve over time such as changing demographics.”

The focus for resilience within this plan will be on the ability to provide essential services following a high consequence event such as a natural disaster. Resilience of critical assets is particularly important for continuation of service delivery.

Organisational aspects of resilience are outlined in the previous sections. Technical aspects of resilience are:

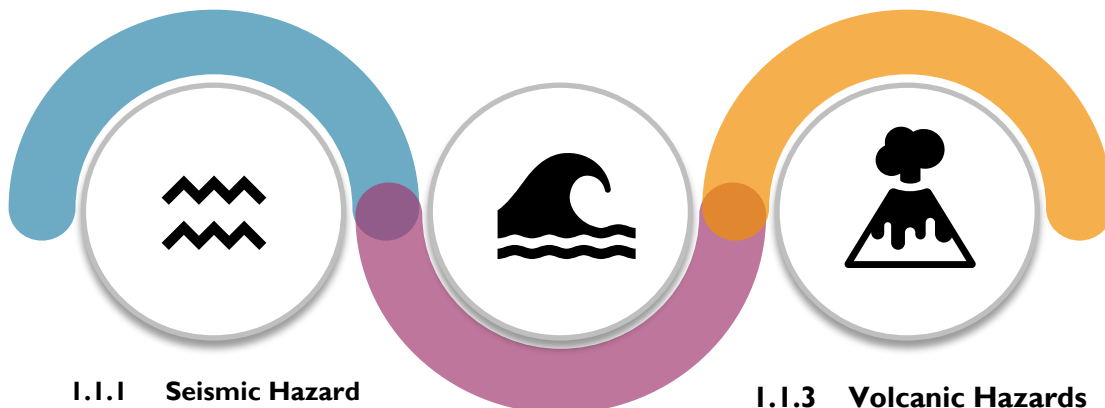
- Robustness/Resistance - The strength or the ability of elements, systems, and other units of analysis, to withstand a given level of stress or demand without suffering degradation or loss of function.
- Redundancy - The extent to which elements, systems, or other infrastructure units exist that are substitutable, i.e. capable of satisfying functional requirements in the event of disruption, degradation, or loss of functionality.

1.1.2 Flooding Hazard

Many areas of coastline exposed to erosion and flooding.

Waterways and low-lying plains vulnerable to inland flooding.

About 43 per cent of the region is prone to soil erosion.



1.1.1 Seismic Hazard

Many active faults within the region.

About 20 per cent of Waikato region’s population live on soils prone to movement during an earthquake.

1.1.3 Volcanic Hazards

Three volcanic zones within Waikato.

An eruption of Mt Ruapehu with a 12 km high column.

- Reliability - The extent to which the infrastructure components are inherently designed to operate under a range of conditions and hence mitigate damage or loss from an event.

Other Adverse Weather Conditions

- Storms
- Cyclones
- Hurricanes

7 Risk Insurance

7.1 What insurance is held for our activity?

Waikato District Council insures assets as part of the Local Authorities Shared Services (LASS) group. This is outlined in the Local Authorities Shared Services Manual 2015-16. The type and level of insurance cover taken is dependent on the level of risk associated with the activity. Insurance policies taken out by the Council cover infrastructural assets above and below ground. Types of cover include property and business interruption such as material damage as a result of fire, storm, explosion, flooding etc., and the consequential loss of profits from that event. Council employees are also covered for liability risks of a work-related injury that is not covered under ACC.

All contractors who undertake work for the Council are required to show that they hold adequate insurance for Public Liability, Professional Indemnity and Contract Works. The level of insurance cover for the contractor is dependent on the nature of work and associated risk exposure.

Under the insurance programme, Council has the following insurance policies:

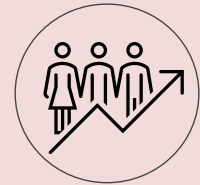
- Material Damage – Excluding Fire
- Material Damage - Fire
- Business Interruption
- Boiler Explosion
- Material Damage - Infrastructure
- Forestry
- Aviation Airport Owners and Operators Liability
- Employers Liability
- Statutory Liability
- Crime
- Personal Accident
- Marine Hull
- Motor Vehicle
- General Liability and Professional Indemnity – RiskPool
- Cyber Liability

The underground assets are only insured for material damage as a result of a natural catastrophe including Earthquake, Natural Landslip, Flood, Tsunami, Tornado, Windstorm, Volcanic Eruption, Hydrothermal & Geothermal activity and Subterranean Fire and Business Interruption.

Part 5: Managing Growth

The ability to predict future demand for services enables Council to plan and identify the best way of meeting that demand. That may be through a combination of demand management and investing in improvements.

This section provides an overview of the key drivers of demand the demand management measures Council has planned to put in place.



I What are Growth and Demand Implications?

The following defines the implications of both growth and demand regarding the ongoing function/delivery of asset management.

Growth - In relation to the asset management activities, growth mainly refers to the growth in population or areas that are growing due to new residential or commercial developments, e.g., new connections due to additional properties.

These changes increase the demand for services and assets, which essentially leads to requirements around transport, three waters, open space, and public facilities. Growth can also relate to increases in commercial/industrial activities, particularly if they are reliant on the above.

Demand – Demand for services can be influenced by several factors besides growth. Climate change, type of developments (e.g., commercial development will generally have greater requirements), customer expectations and trends (e.g., roading connections, inefficient water usage versus environmental awareness, seasonal demand, and household technology) also have implications for the level of service.

Growth and demand planning highlights areas within the activity that are likely to face long term pressures from changes in the status quo. The key drivers that are likely to change the operating landscape for the activity include:

- Population growth and demographics
- Geographical Demand
- Property utilisation
- Service delivery Requirements
- Community expectations and external Issues
- Requirements of legislation
- Climate Change

I.1 Waikato District Council's Vision

Liveable, Thriving and Connected Communities.

Our Vision and Community Outcomes set the goals we want to achieve in everything we do.

The Activity Management Plan (AMP) will enable the vision to be achieved through effective long-term planning.

1.2 Waikato 2070

The Waikato District Council Growth & Economic Development Strategy (Waikato 2070) was developed to provide guidance on appropriate growth and economic development that will support the wellbeing of the district. The document was prepared using the Special Consultative Procedure, Section 83, of the Local Government Act (2002) and adopted by Council in May 2020.

Waikato 2070 is a guiding document that the Council uses to inform how, where and when growth occurs in the district over the next 50-years. The growth indicated in Waikato 2070 has been informed by in-depth analysis and combines economic, community and environmental objectives to create liveable, thriving, and connected communities. The growth direction within Waikato 2070 will ultimately inform long-term planning and therefore affect social, cultural, economic, and environmental wellbeing.

The strategy takes a broad and inclusive approach to growth over the long term, considering its economic, social, environmental, cultural, and physical dimensions. Waikato 2070 is concerned with the growth and development of communities throughout the district, including rural and urban environments.

Also, Waikato 2070 informs the Council of the timing of release for each growth cell identified in the development plans and therefore provides an indication of what and where infrastructure and services will be required to ensure growth cells go online in a timely manner. Therefore, Waikato 2070 feeds into and informs the:

- Activity Management Plans
- Long-Term Plan
- 30-year Infrastructure Strategy

to inform the need and timing for infrastructure and services throughout the district.

Growth cells identified in Waikato 2070 in each of the town or village development plans are in varying planning stages and fall under one or more of the following:

- Zoning is in place for development in the Operative District Plan,
- Area/s are proposed for a change in zoning in the Proposed District Plan,
- Area/s have submission/s seeking a change in zoning on the Proposed District Plan,
- The area is not yet identified in either the Operative District Plan or the Proposed District Plan.

1.3 Priority Focus Areas and Outcomes

As part of the development of the Waikato District Council Growth and Economic Strategy (Waikato 2070¹) four key themes were identified as priority focus areas they are:

- Growing our Communities
- Building our Businesses
- Embracing our Identity
- Empowering our People

These focus areas influence the Council's aspiration to achieve the following outcomes:

- Support growth in targeted areas as identified in the Waikato 2070;
- Maintain and manage existing assets, in accordance with statutory and regulatory requirements;
- Modernise and upgrade infrastructure, where it is prudent to do so;
- Ensure services and infrastructure are provided for and operate in a sustainable manner, to support the four community well-beings (Local Government Act 2002) economic, environmental, social and cultural;
- Ensure that assets are managed in alignment with planning, acquisition, operation, maintenance, renewal and disposal of assets;
- Achieve more within existing budgets by continuously looking at more innovative and efficient methods to deliver services;
- Move the cost of providing a particular service to those who use them, i.e. user pays.

¹ This has been subject to a Special Consultative Procedure under the Local Government Act 2002.

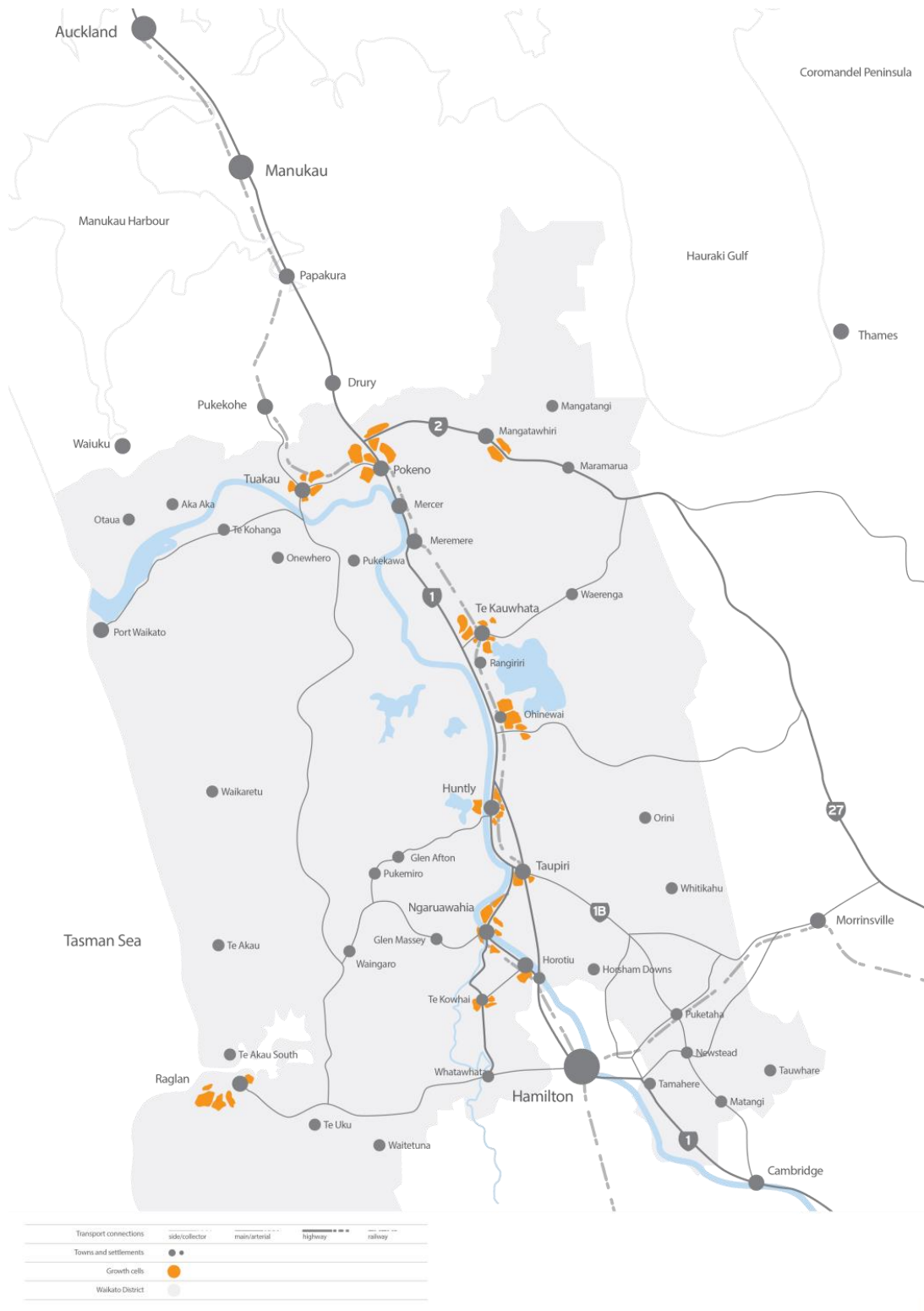


Figure 38 - Waikato 2070 Growth Areas Map

Table 93 - Waikato 2070 Focus areas and implementation methods

Key Focus Area Direction	Key Implementation
<p>GROW OUR COMMUNITIES</p> <ul style="list-style-type: none"> Deliver well-planned and people friendly communities Promote sustainable and cost-effective land use patterns <p>BUILD OUR BUSINESSES</p> <ul style="list-style-type: none"> Support existing businesses to grow and attract new businesses to the district Help deliver inclusive growth <p>EMBRACE OUR IDENTITY</p> <ul style="list-style-type: none"> Promote our culture Celebrate our history Protect our environment <p>EMPOWER OUR PEOPLE</p> <ul style="list-style-type: none"> Increase capability and capacity Build a resilient local workforce 	<ul style="list-style-type: none"> Promote resilience through a range of measures; Involve iwi and the community in decision making on the different levels of service and affordability, and aspirations identified in the Waikato District Council Blueprints; Support sustainable economic growth and development in various Council policies and plans; Accommodate natural hazards and climate change in strategic land use plans and in manage development overtime. Promote a sustainable environment by maintaining existing infrastructure and services and aligning levels of service and affordability. Adopt an integrated and environmentally sustainable approach to planning and implementing development. Integrate the provision of supporting infrastructure and services with land use planning, including transport, water and open space. Ensure our towns offer employment and housing choices with high amenity environment that avoids development resulting in social isolation; Greater coordination and sharing in the planning and operation of supporting stormwater infrastructure and services Obligations to continually improve water quality in the river in accordance with the Vision and Strategy for the river in the Regional Policy Statement and Regional Plan, as well as in terms of the Waikato Tainui Environmental Plan; Protect transport networks, strategic sites, corridors and areas for future development; Encourage land uses that utilise our highly productive land by promoting agriculture production; Collaborate and connect communities with various agencies to ensure opportunities for communities; Protect our natural, cultural and historical heritage; Promote ecological and environmental protection and restoration.

2 National, Regional, Sub-Regional and Local Growth Documents

2.1 National Policy Statement on Urban Development

The Future Proof sub-regional area², described below, has been identified within a tier 1 high growth area in the National Policy Statement on Urban Development (2020) (“NPS-UD”), which came into effect in August 2020. The NPS-UD has been designed to improve the responsiveness and competitiveness of residential and business land development markets and requires local authorities to ensure adequate development capacity.

The key aspects of the NPS-UD include:

- Introducing directive intensification policies to enable people to live in areas of demand close to urban centres and well-served by public transport,
- Removing the ability to set car parking requirements in district plans (except accessible car parking),
- Requiring responsive consideration of plan changes, and
- Enabling greater focus on quality of capacity enabled through the development of a Future Development Strategy, Housing and Business Assessments, ongoing monitoring and using evidence.

Future Proof partners regularly track and monitor development to ensure that demand is met, and future housing and business trends are taken into consideration. This includes ensuring different housing typologies to provide choices for everyone in our communities are considered.

2.2 Waikato Regional Policy Statement

The Waikato Regional Policy Statement provides an overview of resource management issues in the Waikato region. It provides a range of policies to achieve integrated management of natural and physical resources across resources, jurisdictional boundaries, and agency functions. It guides the development of sub-ordinate plans (regional as well as district) and the consideration of resource consents. The Activity Management Plan consider the requirements set out in the Waikato Regional Policy Statement, to ensure the regional resource management issues identified are appropriately managed, remedied or avoided within our district.

2.3 Future Proof: Sub-Regional Growth Strategy

The Future Proof Growth Strategy and Implementation Plan is a 30-year plan specific for Hamilton City, Waipa District and Waikato District (Future proof sub-region) area shown in Figure 39 . The strategy was initially adopted in 2009 and updated in May 2017. The strategy provides a framework to manage growth in a collaborative way for the benefit of the future proof sub-region both from a

² Future Proof is a joint project set up by partners to consider future development and growth. The partners include Ngāa Karu Atua o te Waka, Waikato-Tainui, Tainui Waka Alliance, Waikato Regional Council, Waipa District Council, Waikato District Council, Hamilton City Council, Waka Kotahi, and Waikato District Health Board.

community and a physical perspective. The strategy is currently under review and will be released in December 2020.

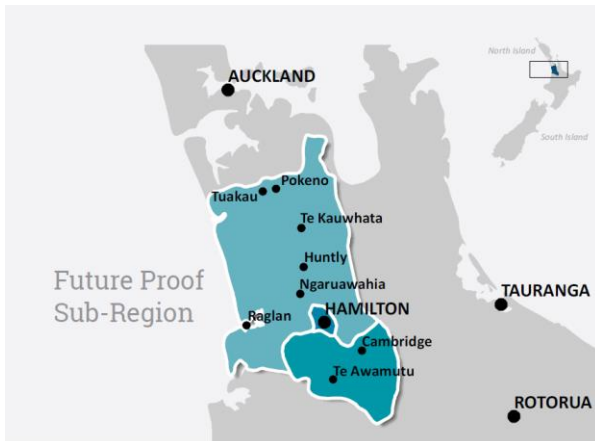


Figure 39 - Future Proof Sub-Region

Future Proof addresses the big picture and discusses what the region might look like in 50 years' time. Community feedback indicated that a 'business as usual' approach to growth was not sustainable. Therefore, the strategy aims to provide direction for a mixture of the following:

Compact Settlement – a managed increase in the number of households in urban areas and in some cases increasing the density of housing; and

Concentrated growth – a major shift to intensify housing, especially in Hamilton City.

The Future Proof Strategy vision is:

In 2061 the Hamilton, Waipa and Waikato sub-region:

- Has a diverse and vibrant metropolitan centre strongly tied to distinctive, thriving towns and rural communities;
- Is the place of choice for those looking for opportunities to live, work, invest and visit;
- Is the place where natural environments, landscapes and heritage are protected, and a healthy Waikato River is at the heart of the region's identity;
- Has productive partnerships within its communities, including tangata whenua;
- Has affordable and sustainable infrastructure; and
- Has sustainable resource use.

The Tangata Whenua vision for the Future Proof Strategy is:

- Kia tuku atu nga karu atua o te waka hei arahi, hei arataki, hei tiaki.
- To enable guidance, leadership, and nurturing, knowing our future by planning today.

2.4 Impact of Auckland Unitary Plan

Future Proof partners are responding to the effects of the Auckland Unitary Plan, which was adopted in July 2016. The unitary plan, which is under appeal, allows for the construction of 400,000 more houses in the Auckland area.

Over the next 30 years, Auckland Council anticipates zoning changes enabling around 50,000 dwellings and 30,000 jobs in the southern Auckland greenfield development areas which include the Drury-Opaheke and Pukekohe-Paerata structure plans area. It is anticipated the increased provision in south Auckland will result in some spill-over effects into the Waikato. These include:

- A demand for more housing in the northern Waikato so residents can be close to new employment opportunities in south Auckland, have a more affordable housing or an alternate lifestyle choice;
- A demand for employment land as industry is pushed out of the city limits;
- Greater pressures on rural land for subdivision;
- Displacement of horticulture out of Auckland and into northern Waikato which has an impact on our region's natural resources; and
- Growth pressures on existing townships, such as Tuakau, Pokeno and Te Kauwhata.

2.5 Waikato Blueprint: District Wide and Local Area Blueprints 2019

The Waikato Blueprint was developed in consultation with communities through local area workshops to provide a picture of how the district could progress over the next 30 years with a focus on addressing the communities' social, economic, and environmental needs.

The Blueprint was developed and delivered through a series of intensive consultation and Inquiry-By-Design workshops between July-November 2018 and adopted in June 2019. The aim of the Blueprint was to provide a high-level picture of how the community aspires the district to progress within the next 30 years. The Blueprint has been given consideration in several documents, including Waikato 2070, and subsequent planning undertaken by Council such as the development of the 2021-2031 Long Term Plan.

3 What are the impacts of COVID-19?

Although our district is in a growth phase, the impacts on asset management will be variable over the short, medium, and long term. The financial market and particularly the COVID-19 crisis could have short-term impacts on whether the residential, industrial, and commercial growth is maintained at its current rate of over 1.5 percent year on year.

In the short to medium term, the Proposed District Plan (PDP) review will have a significant impact on asset management and the requirements for new asset infrastructure and facilities, with the new areas zoned for development being a big driver for this.

Upgrades will be required in all the main towns in the district over various timeframes with key areas being:

- Tuakau, Pokeno in the north

- Huntly
- Taupiri
- Ngaruawahia
- Horotiu central
- Raglan in the west

Future Proof provides a vehicle for the sub-region to respond to government initiatives collectively as a sub-region, e.g. COVID-19 economic stimulus package made up of shovel ready projects.

The impact of COVID-19 has meant a reassessment of growth predictions for population and households in the District.

The population and household projections used as the basis for this AMP has shifted from the high to the medium forecasted figures in the Waikato 2070 strategy.

4 Population and Household Demand

Some parts of the district have had static population growth and historically declining economic and social indicators and high deprivation, whereas others have experienced the opposite.

Future growth, development and investment choices must respond to these trends and be facilitated in a way which promotes the advancement of the more disadvantaged through:

- housing
- employment
- education choices and opportunities.

Maintaining Council's existing assets and providing new ones will be critical to this future growth and investment.

The population in the Waikato District in 2020 was 81,473.

Overall, population in the Waikato District is increasing by 1.5% year on year, and the population is expected to continue growing in the following key towns and villages:

- **North Waikato (Tuakau and Pokeno)**, due to the proximity to Auckland, where there is a variety of employment options.
- **Mid Waikato (Te Kauwhata and Huntly)**; with the opening of the Waikato Expressway this brings challenges and opportunities for Huntly, which will see the township change over the coming years. Te Kauwhata is located just off the Waikato Expressway providing strong transport connections to the north and south. Ohinewai is a new area that could undergo significant change if a rezoning under the Proposed District Plan progresses to allow a new industrial and residential area.
- **Hamilton-Waikato Metropolitan Area (Taupiri, Ngaruawahia, Horotiu, Te Kowhai)**

- **West Waikato (Raglan)**, which has a high amenity environment 35 minutes' drive from Hamilton including the Whaingaroa Harbour and the West Coast with surrounding farm and bush areas.
- Hamilton peri-urban areas due to high demand for residential, lifestyle and industrial land within 20km of Hamilton.

The surrounding rural areas of the district towns have a mixture of high-quality soils, steep land and a range of forestry, bush and wetland areas which are serviced by several small villages such as:

- Port Waikato
- Eureka
- Meremere
- Onewhero
- Maramarua

Growth in these villages will be limited to current planning provisions.

The figures below show the population and household projections for the Waikato District for 2020 to 2060. Based on household projections prepared by the University of Waikato (Cameron, 2020) the Waikato District's population is projected to increase by approximately 15,500 - 19,000 additional people over the next 10 years.

To understand the distribution of the growth across the district Waikato District Council has a Spatial Distribution Model (2020) this has been used to inform the household projection numbers for each town or village.

By 2060 the District's total population is estimated to reach between 128,500 - 149,500.

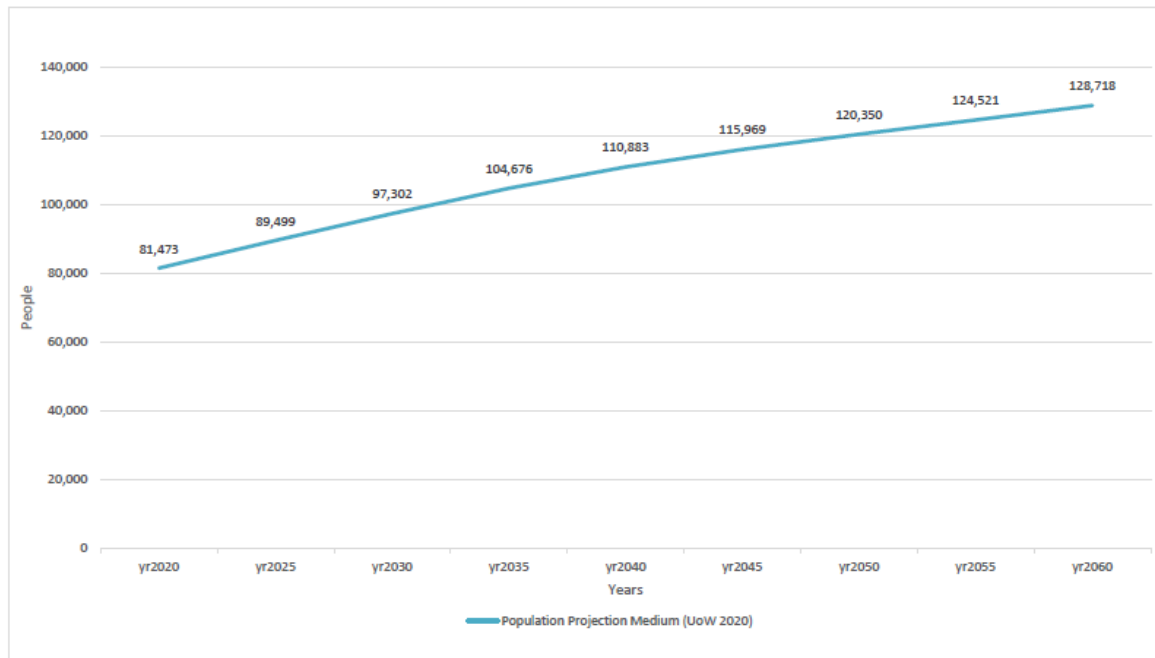


Figure 40 - Waikato District Population Projection 2020-2060 (medium) (Cameron 2020)

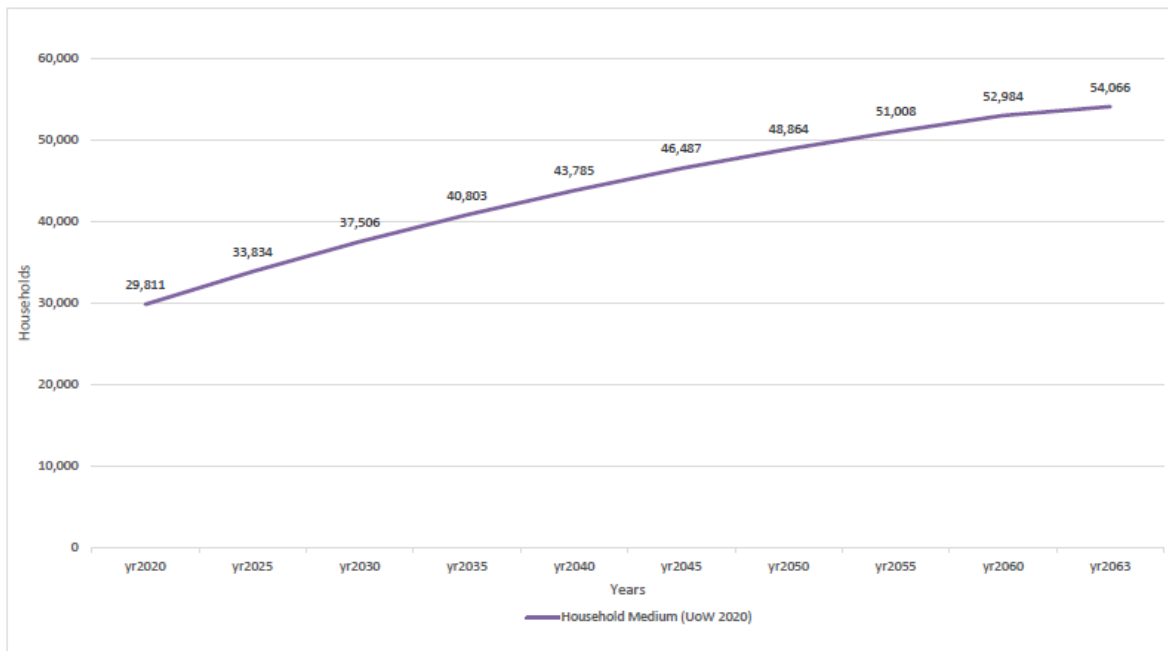


Figure 41 - Waikato District Household Projection 2020-2060 (medium) (Cameron, 2020)

Table below shows the medium projected population of the district by village / rural and township over the next 10 years:

Table 94: 10-Year Medium Projected Population by Village / Rural and Township

Settlement	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Towns												
Horotiu	916	941	985	1,035	1,078	1,121	1,164	1,206	1,248	1,290	1,333	1,374
Huntly	7,629	7,714	7,757	7,798	7,858	7,917	7,976	8,032	8,093	8,158	8,219	8,303
Ngaruawahia	7,910	8,093	8,245	8,328	8,418	8,512	8,622	8,755	8,882	9,007	9,132	9,260
Pokeno	4,228	4,492	4,997	5,216	5,513	5,837	6,119	6,418	6,700	6,946	7,200	7,451
Raglan	4,815	4,970	5,009	5,068	5,119	5,180	5,247	5,311	5,379	5,449	5,520	5,590
Tuakau and Surrounds	9,496	9,645	9,792	9,952	10,120	10,309	10,462	10,608	10,776	10,957	11,118	11,283
Te Kauwhata and Surrounds	3,110	3,411	3,486	3,641	3,793	3,943	4,091	4,237	4,381	4,521	4,658	4,789
Rural and Villages												
Eureka-Tauwhare	2,309	2,347	2,361	2,403	2,437	2,468	2,498	2,527	2,558	2,589	2,621	2,652
Gordonton-Kainui	1,810	1,824	1,833	1,863	1,891	1,913	1,939	1,965	1,991	2,017	2,042	2,063
Hamilton Park	1,719	1,734	1,739	1,755	1,769	1,782	1,794	1,807	1,819	1,832	1,845	1,857
Horsham Downs	996	999	1,000	1,003	1,006	1,009	1,011	1,014	1,017	1,019	1,021	1,023
Huntly - Rural	2,270	2,291	2,297	2,305	2,313	2,327	2,342	2,358	2,373	2,388	2,406	2,423
Mangatangi	1,136	1,158	1,164	1,193	1,209	1,224	1,239	1,254	1,269	1,284	1,299	1,314
Maramarua	1,645	1,686	1,714	1,761	1,801	1,837	1,872	1,908	1,943	1,978	1,999	2,002
Mercer	151	152	156	217	237	240	299	308	311	368	380	394
Meremere	451	452	452	452	452	452	452	452	452	454	470	503

Settlement	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Ohinewai	243	245	246	247	248	250	251	252	255	255	258	261
Onewhero	1,449	1,462	1,473	1,510	1,537	1,562	1,587	1,612	1,637	1,663	1,688	1,713
Pokeno - Rural	809	839	1,014	1,157	1,304	1,457	1,587	1,727	1,868	1,972	2,113	2,234
Port Waikato	990	997	1,001	1,013	1,023	1,032	1,041	1,050	1,059	1,068	1,077	1,086
Pukekawa	1,465	1,478	1,486	1,515	1,535	1,555	1,574	1,593	1,612	1,631	1,649	1,668
Pukemoremore	2,538	2,563	2,568	2,573	2,578	2,588	2,598	2,609	2,620	2,632	2,644	2,656
Rotokauri	1,139	1,159	1,163	1,184	1,195	1,205	1,216	1,226	1,236	1,246	1,256	1,265
Tamahere	6,319	6,447	6,476	6,509	6,546	6,581	6,630	6,677	6,727	6,779	6,832	6,881
Taupiri Community	1,910	1,969	2,005	2,049	2,091	2,134	2,175	2,229	2,291	2,350	2,410	2,465
Te Akau	2,293	2,320	2,335	2,366	2,402	2,433	2,464	2,495	2,527	2,560	2,593	2,627
Te Kowhai	1,901	1,935	1,943	1,970	1,993	2,015	2,035	2,049	2,066	2,087	2,107	2,129
Te Uku	2,098	2,125	2,131	2,142	2,158	2,170	2,183	2,195	2,208	2,221	2,235	2,248
Tuakau – Rural	1,136	1,191	1,307	1,408	1,506	1,592	1,693	1,797	1,884	1,969	2,066	2,157
Waerenga	1,039	1,046	1,049	1,058	1,065	1,072	1,079	1,085	1,092	1,098	1,105	1,111
Whatawhata	3,610	3,667	3,682	3,714	3,755	3,788	3,820	3,853	3,886	3,921	3,956	3,990
Whitikahu	1,943	1,957	1,962	1,968	1,982	1,993	2,004	2,015	2,026	2,038	2,051	2,063

Source: Council Analytics Team – WDC District Wide Projections Town Village 17.12.2020

4.1 Population Demographics

Figure 42 shows the expected difference in gender and age distribution from 2013 to 2038. By 2038, 22% of the population is projected to be aged 65+ years, up from 12% in 2013.

Conversely, the population aged 0-14 years is expected to decline from 24% in 2013 to 20% in 2038.

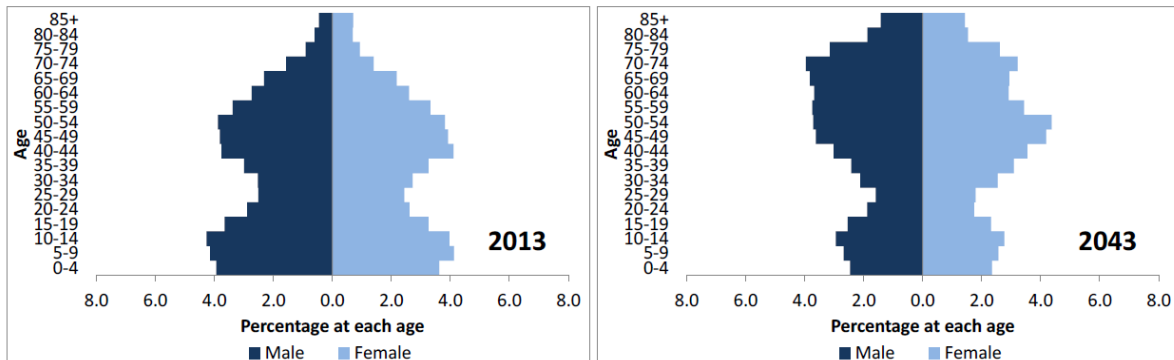


Figure 42 - Age-Sex structure for Waikato District, 2013-2043 (medium-variant projection) (Cameron, 2020)

There is unlikely to be any significant demographic changes to the Waikato District population other than the rise in the aging population. The impacts on infrastructure assets are likely to remain unchanged, but the types of services that the district provides may need an extension. The district will see growth in most urban areas and a requirement for the addition of infrastructure or upgrades to infrastructure, but this is not impacted by specific demographics.

4.2 Population Effects on the Assets

Although our District is in a growth phase, the impacts on asset management will be variable over the short, medium, and long term. The financial market and particularly the Covid-19 crisis could have short term impacts on whether the residential, industrial, and commercial growth is maintained at its current rate of over 3 per cent.

In the short to medium term, the Proposed District Plan (PDP) review will have a significant impact on asset management and the requirements for new asset infrastructure and facilities, with the new areas zoned for development being a big driver for this.

Upgrades will be required in all the main towns in the district over various timeframes with key areas being Tuakau, Pokeno in the north, Huntly, Taupiri, Ngaruawahia, and Horotiu central and Raglan in the west. These are described in more detail in Section 6.

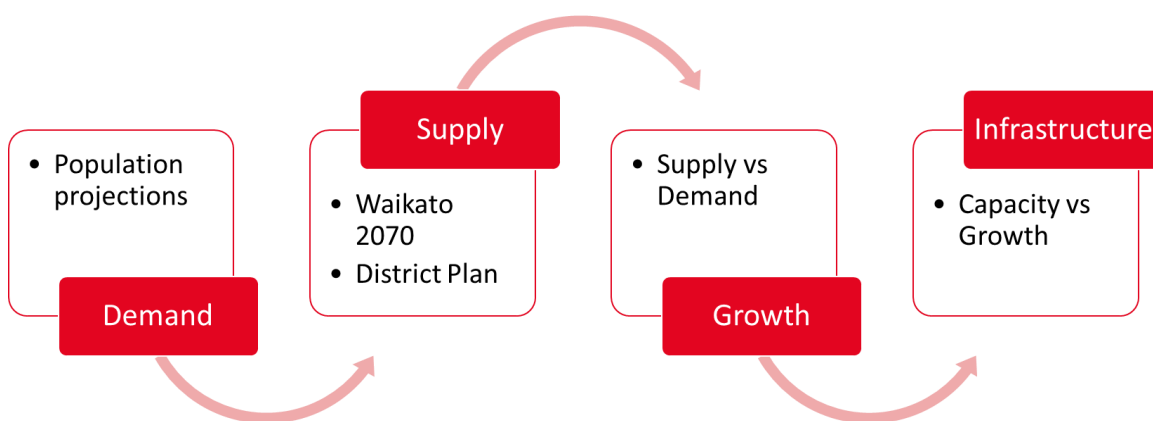
5 Aligning Growth and Infrastructure

Growth forecasting and strategic infrastructure planning processes need to be connected and tightly aligned to facilitate growth and stimulate economic development in an efficient manner. Waikato 2070 is an integrated growth and economic development district level strategy to support effective development and infrastructure planning.

The interaction between the growth and the provision of infrastructure is complex and nuanced. Creating a long-term programme of the infrastructure required to facilitate growth requires a thorough assessment process. We have defined this process by the following phases to move from a population forecast to an infrastructure programme:

1. Demand
2. Supply
3. Growth
4. Infrastructure

Assessment Phase	Data Sets	Tasks
Demand	Population projections	<ol style="list-style-type: none"> 1. District Wide Projections (med, high) 2. Disaggregate population to town (med, high)
Supply	Land projections	<ol style="list-style-type: none"> 3. Available land size and timing 4. Assessment of realistic proportion able to build on 5. 20% over capacity target
Growth	Growth forecast	<ol style="list-style-type: none"> 6. Compare demand and supply 7. Identify supply side constraints or excess supply 8. Inform District Plan to identify additional blocks or reallocation
Infrastructure	Infrastructure capacity	<ol style="list-style-type: none"> 9. Assess infrastructure capacity 10. Demand assessment based on growth forecast (not population demand) 11. Capital programme development to meet demand, \$ and year



6 Predicting Demand for Infrastructure

Predicting Infrastructure Demand is complicated. It follows a multiple phase assessment process with a set of assumptions for each for each piece of the analysis.

Providing the right amount of infrastructure at the right time is a balancing act:

- Providing too much infrastructure, or providing it too soon, places a large financial burden on Council, ratepayers, and developers.
- Not provisioning enough infrastructure may restrict growth, and mean Council is forced to provide infrastructure at short notice, shortcutting the appropriate planning and funding processes.

These two potential outcomes do not bear an equal risk to Council, however. The first outcome of allowing for too much infrastructure that may not be needed just yet is a lower risk option than not having enough infrastructure in the planning pipeline.

Development contributions cannot be calculated accurately without capital works projects for growth being included in the 10-year plan.

Having a high level of certainty of infrastructure need allows for more accurate financial forecasting, more robust delivery planning and better coordination with other works. The more accurate the growth predictions, the more accurate the infrastructure plan.

The timing of infrastructure interventions to satisfy demand needs to be planned carefully as some pieces of infrastructure have long lead times to procure, design, and build.

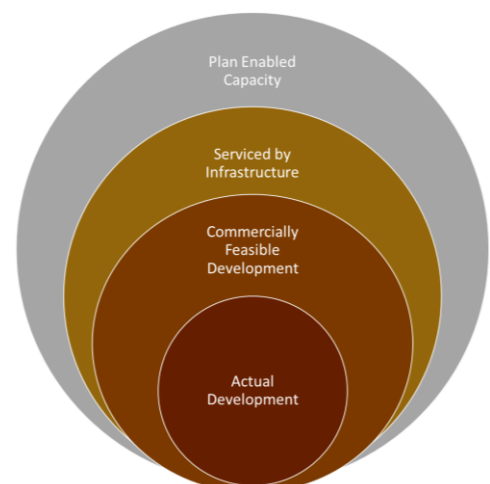
Not all infrastructure is created equal either when it comes to servicing growth areas:

- Core infrastructure in the form of connector roads and main water networks need to be in place to open growth cells for development.
- Other core infrastructure like water treatment plant capacity, or road network capacity can be planned to be delivered as the population grows.
- Community infrastructure such as playgrounds and libraries can be delivered as populations grow or as levels of service gaps appear.

These infrastructure types can be categorised as either:

- Leading Supply
- Leading Demand
- Lagging Demand

The following table describes some examples of infrastructure types and their relationship to growth forecasts.



Activity	Infrastructure	Lead/Lag	Growth Parameter
Transport	New roads	Lead	Supply
	Network Capacity	Lead	Demand
3 Waters	Pipe Networks	Lead	Supply
	Treatment plants	Lead	Demand
Solid Waste	Collection capacity	Lead	Supply
	Processing capacity	Lead	Demand
Open Spaces	Parks and playgrounds	Lag	Demand
Community Facilities	Community Hubs	Lag	Demand

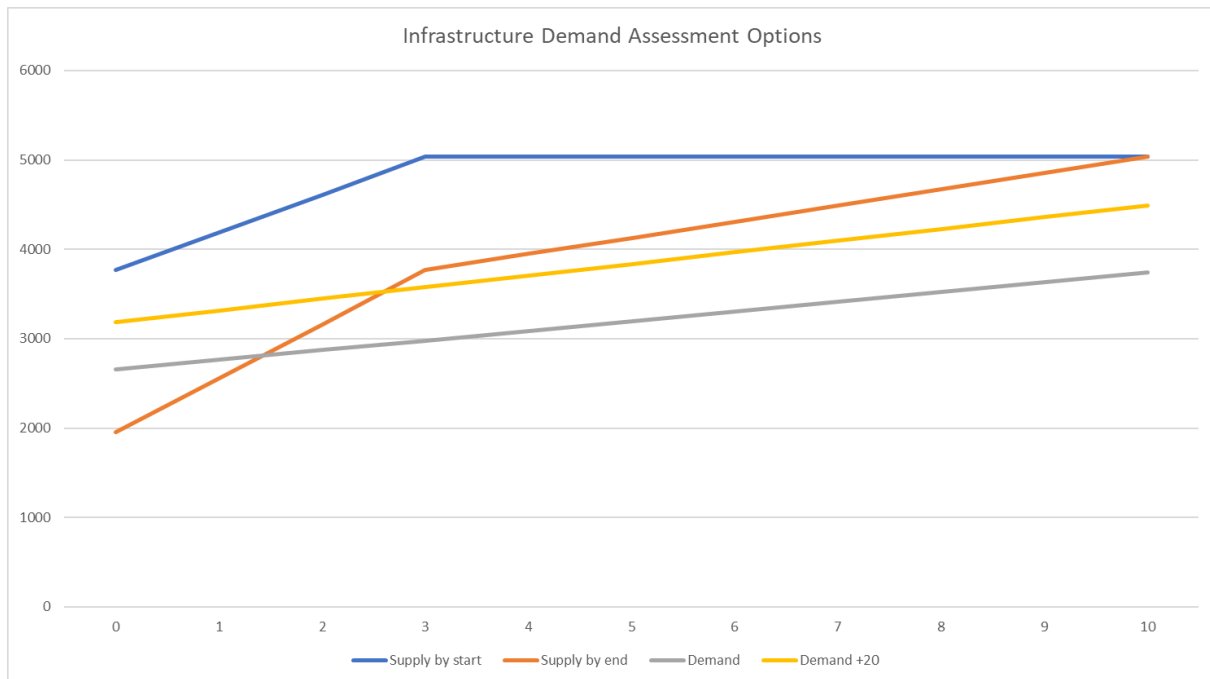
There is also a question of the staging of growth cell development. Waikato 2070 identifies growth cells and their potential timing, but many townships have multiple growth cells being developed in the same time, say in 3-10 years. In the real world, the most efficient way of provisioning for this growth would be to open growth cells in a logical sequence to spread the investment in infrastructure over multiple years.

For the supply side infrastructure demand assessments, we consider that the infrastructure will be in place to open the growth cells fully by the end of the period the cells are planned to be developed. For example, if there are 3 growth cells in Pokeno that will be opened in the 3–10-year period, we will assume these will be staggered over that time. This helps smooth out resource loads for the planning and delivery of the infrastructure.

The National Policy Statement on Urban Development Capacity (2016) stipulates that a buffer of 20% should be added to the demand line to ensure any unforeseen growth has been contemplated and can fit within planning processes.

So in our contemplation of the number of persons or households that infrastructure will need to be provided for, there are 4 potential lines of demand.

1. Infrastructure in place for the **start** of the indicated supply period
2. Infrastructure in place for the **end** of the indicated supply period
3. The **medium** population growth projection
4. The medium population growth projection + **20%**



The chart above provides an example of the differentiation in forecasts for the number of households based on the four different demand predictions.

We think using the following metrics is appropriate:

- End of the supply period to have the infrastructure delivered for supply side infrastructure types.
- Medium +20% demand line is appropriate for the demand side infrastructure as this is what the National Policy Statement encourages us to do.

Uncertainty in Predicting Growth

Times have potentially never been more uncertain than now. Undertaking long term planning during a pandemic is no small feat. Our underlying assumptions for the growth predictions cannot always be relied on in a fast-changing world.

To combat this uncertainty about the future we are proposing a much more frequent and robust process for reviewing actual growth, reforecasting growth projections and reassessing infrastructure demand.

The 3yearly LTP cycle is not frequent enough for our needs now, so we are proposing an annual review of actual versus planned growth, planning, and delivery.

- The annual report will assess achievement against plan
- Actual growth figures will be compared against our planned growth.
- Growth models will be revised to meet any changes in the underlying models.
- The annual plan will facilitate any changes needed, and any further consultation requirements.
- Asset Management Plans will be updated annually based on a revised growth forecast.

7 Residential Growth

For each of the Towns and Villages that have residential development areas identified in Waikato 2070 a graph is included in the following pages which outlines the following.

Demand

- The line on each graph represents the Medium Household Projection for each Town or Village (Cameron, 2020).

Supply

The stacked bars on each graph are made up of existing households, infill, and growth cells.

- The existing number of households is the total number of households within each town or village boundary (WDC, Dwelling Count, 2020.).
- The infill number is the theoretical plan-enabled number of the additional households that could be created within the town or village boundary but not within an identified growth cell. This number is calculated on the Proposed Waikato District Plan provisions and does not take into consideration market demand for infill housing or geographical and infrastructure constraints (Waikato District Council, 2020).
- The growth cells show the theoretical number of possible households in each growth cell if Waikato 2070 was realised. The timing of each growth cell is as follows.
 - Short term, 1-3 years (2020-2023)
 - Medium term 3-10 years (2023-2030)
 - Long term 10-30 years (2030-2050)
 - Beyond 30 years (2050+)

The growth cell numbers are an estimate of the total number of households expected within each growth cell. These numbers have been informed by a variety of methods such as indicative developer plans, Proposed Waikato District Plan provisions or possible future plan provisions. Where a growth cell has been identified in an already developed area, the number reflects the additional number of possible households (Waikato District Council, 2020).

The total supply number is the total theoretical supply of households and is the sum of the existing households, infill, and growth cell numbers. It is important to note that the supply numbers provide a general indication of what is likely to happen and are subject to numerous assumptions.

7.1 North

In the north of the district, subdivisions within residential zoned areas have continued at a fast rate to meet the demand for housing close to Auckland. These areas also include new commercial and industrial developments in this area of the district.

Activity Management Plans consider how to cater for the future growth in Tuakau, Pokeno and Te Kauwhata. The rezoning (as part of the proposed district plan) intends to provide for urban and some rural- residential growth in a staged manner over 30 years, which allows for coordination of infrastructure alongside planned development.

7.1.1 Tuakau

Residential and commercial growth has been mainly static due to the poor access to SH1 and limited residential land use zoning. The last three years have seen Tuakau experienced in-fill development occurring in the town urban limits and on the fringes. As property prices continue to increase in Auckland and the surrounding areas, the attractiveness for Tuakau will increase.

Growth planning at Tuakau has been underway for several years, with the initial preparation of the Tuakau Structure Plan, with which a plan change to the Operative District Plan (notified in June 2016) was developed and later withdrawn to have the change in land use zoning incorporated into the Proposed District Plan:

- Tuakau has short term commercial, and industrial areas (Whangarata Business Park) and residential development in the south of Tuakau programmed for 1-3 years.
- Medium-term residential land along Dominion and Barnaby/Harrisville Roads is programmed for 3-10 years.
- Long terms to the west future, residential areas are programmed for 30 years or beyond depending on the rate of growth.

Lately, Tuakau has been taking the overflow of residents from Pukekohe or directly from Auckland as it has shown rapid growth. The proposed future population of Tuakau will likely reach 8000 people in the next 50 years as these new residential areas open in combination with new industrial areas and employment.

This will require a range of infrastructure from water and wastewater, new roads, and upgrades to existing ones, longer-term the addition of a rail station and new passive and active recreation opportunities.



Figure 43 - Development Plans Key

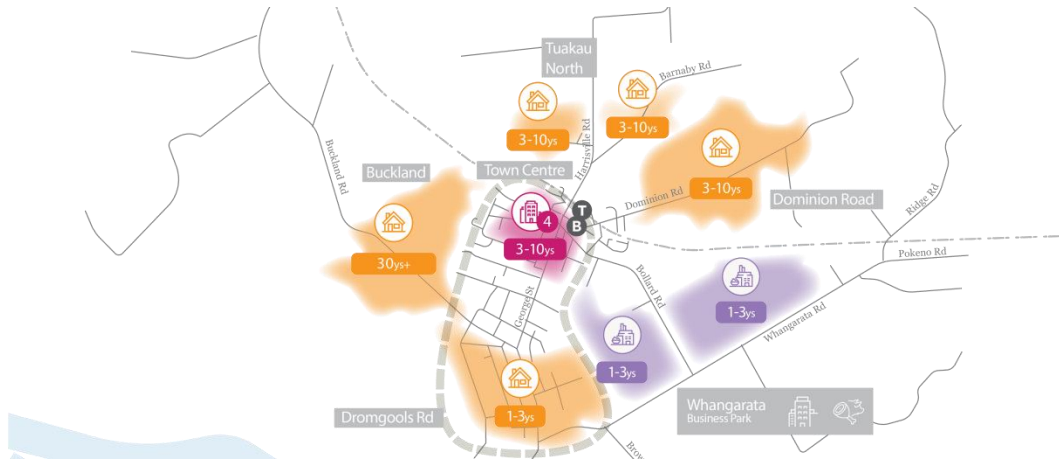


Figure 44 - Tuakau Town Development Plan

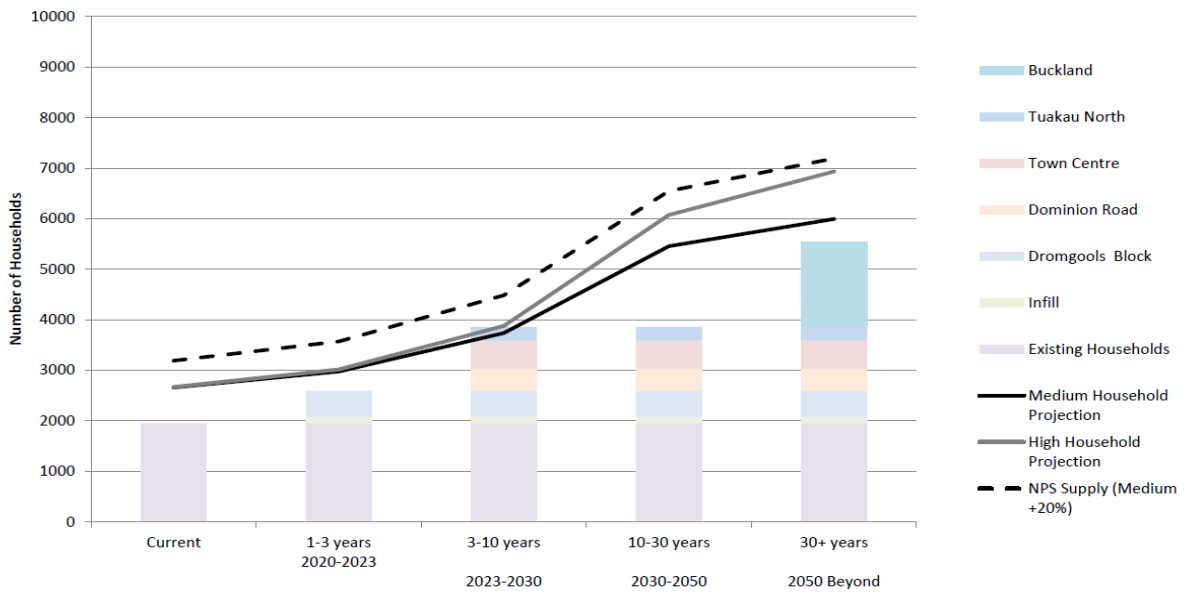


Figure 45 - Tuakau household projection and supply numbers (Waikato District Council, 2020)

7.1.2 Pokeno

Pokeno is located to the north of the Waikato River, near the boundary of the Waikato District and east of Tuakau with an interchange at SH1 near the junction of SH2. Pokeno has seen rapid growth from its small village origins in both large residential subdivisions and industrial areas in a short space of time. This has been driven by Auckland's growth and the proximity of Pokeno to the Waikato's agricultural production.

The surrounding land consists of mainly steep to moderate farmland, bush areas, the main trunk line passes through Pokeno, between Tuakau and Mercer. Pokeno experienced rapid growth with earlier plan changes, allowing for increased residential development with most residents working in Auckland, rural-residential and industrial zoning within the strategic growth nodes.

Given this rapid population growth, there is an expectation for appropriate recreation, educational and community facilities. SH1 splits the eastern growth areas from the rest of Pokeno and as the village grows the challenge will be to maintain this connection (roading and pedestrian) and effectively servicing these future growth areas (water/wastewater). Protecting the rural landscape and wetlands to the east will also be a key requirement.

Applications for additional growth within the town have been received by Waikato District Council by way of submissions on the Proposed District Plan and submissions through Waikato 2070.

- Short term residential growth areas for Pokeno include the Hitchen Block to the south west and Hillpark Drive adjacent to SH1 to be progressed in the next 1-3 years.
- The medium-term residential growth areas to be progressed over the 3-10 years are Havelock Village to the south and Pokeno East.
- The Munro Block to the west is a mix of smaller residential blocks scheduled with 3-10 years and a larger block scheduled for 10-30 years.
- The Pokeno East commercial cluster north of SH2 is likely to be progressed in the long term of 10-30 years. This is to provide for further employment opportunities as the residential development grows.

The Town Centre of Pokeno will see an intensification of buildings that are 2 to 4 stories of mixed-use activity including a large supermarket. The intensification will be driven by increased land values and require a range of infrastructure upgrades.

The key benefits of Pokeno and why it has seen high industrial growth in recent years is proximity to the SH1 and SH2 a key benefit over the neighbouring town of Tuakau and its proximity to Auckland and Hamilton. The possible future population of Pokeno is expected to be 16,000 people as these new residential areas open.

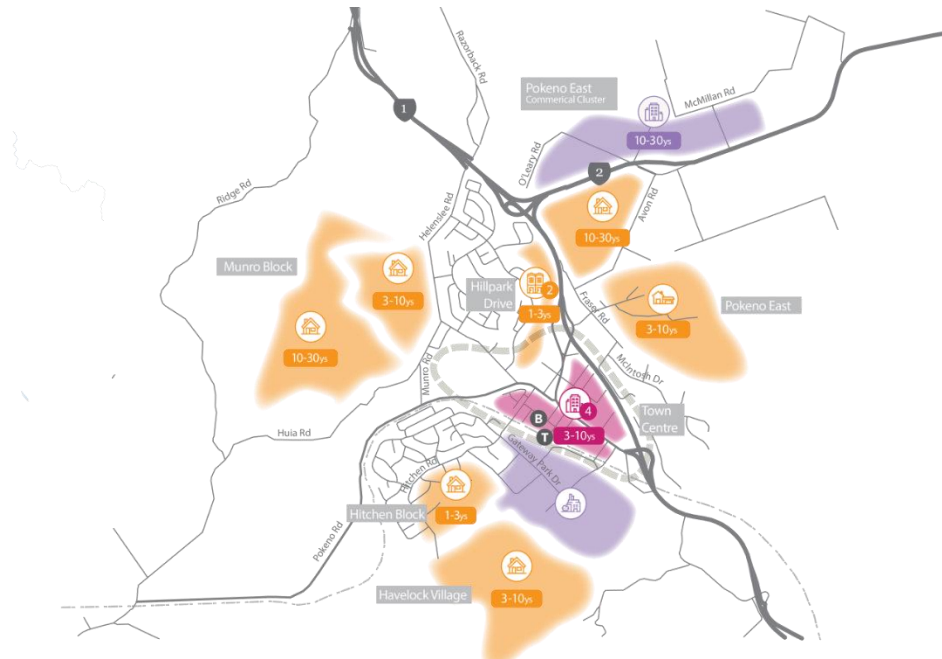


Figure 46 - Pokeno Town Development Plan

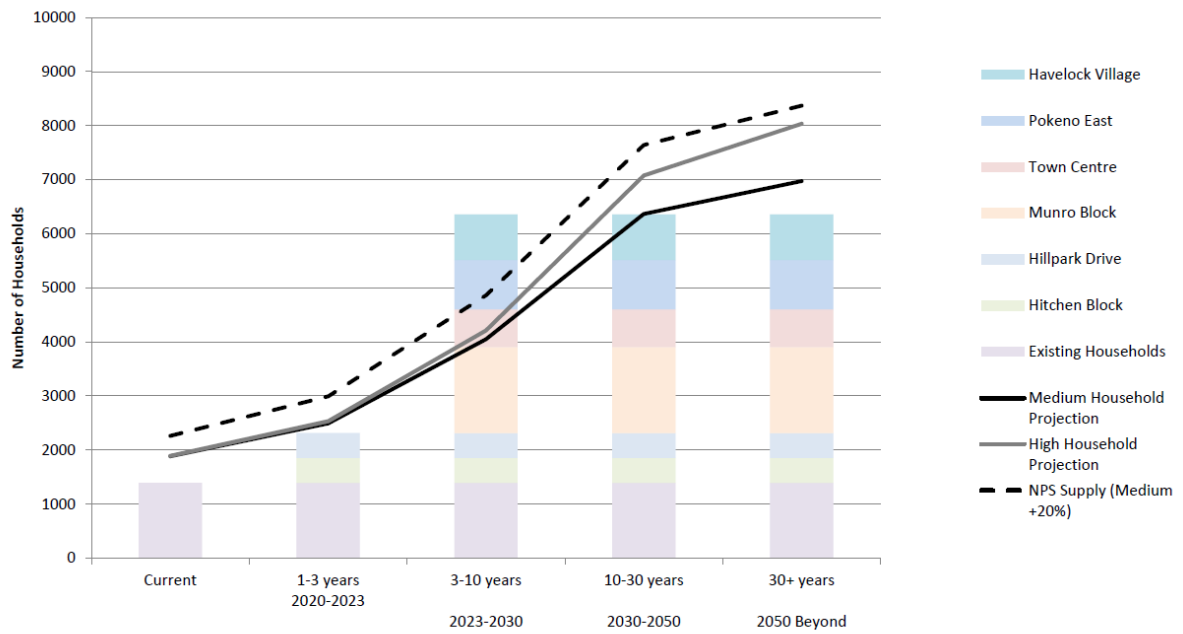


Figure 47 - Pokeno Household Projection and Supply Numbers (Waikato District Council, 2020)

7.1.3 Mangatawhiri, Mangatangi and Maramarua

The Mangatawhiri and Mangatangi area has a Development Plan in Waikato 2070. Development is proposed in the long term beyond 30 years. A future employment area has been identified due to the proximity to the State Highway connections between the Auckland, Waikato, and Bay of Plenty regions.

Future upgrades of SH2 would be essential to the development and could be developer-led with larger self-contained lifestyle lots in the surrounding area. The possible future population of these combined areas and the surrounding rural area is expected to be approximately 6,000 people.



Figure 48 - Mangatawhiri and Mangatangi Development Plan

7.1.4 Mercer, Meremere and Hampton Downs

Mercer, Meremere and Hampton Downs are peri-urban areas and population is anticipated to stay relatively static, no growth cells for these areas are proposed. Mercer, Meremere and Hampton Downs development plans will experience localised growth allowed for under district plan rules.



Figure 49: Mercer, Meremere and Hampton Downs Development Plan

7.1.5 Other Northern Villages

It is not anticipated that other small areas in the north will increase in population significantly beyond what is currently existing.

Pukekawa, Onewhero and Port Waikato villages are anticipated to remain relatively static and will receive some small-scale localised housing developments permitted under planning rules. No growth cells for these areas are identified in Waikato 2070.

7.2 Mid Waikato

7.2.1 Te Kauwhata

Te Kauwhata is situated at the northern edge of Lake Waikare and south of the Whangamarino wetland, east of SH1 and accessed by an interchange. Te Kauwhata has had an earlier structure plan and plan changes, allowing for increased residential, rural-residential and industrial zoning within these strategic growth nodes.

Te Kauwhata has seen lifestyle drivers contributing to its overall growth, given its locational advantage between Auckland and Hamilton. With no major industries other than a long-established vineyard Rongopai Wines and now Invivo Wines, Te Kauwhata has supported agriculture in a rural landscape.

Waikato 2070 noted that applications for additional growth within the town are scheduled at:

- Short term identifies to the south the Lakeside growth cell which will be developed over the next 1-10 years and a small residential area to the north in Blunt Road of 1-3 years. Residential and Lifestyle development in the northwest on Travers Road with a small commercial area will continue to progress.
- Medium term two small residential areas to the south east near Mahi Road and north east near to Swan Road are programmed for 10-30 years.
- A future commercial or industrial area for employment is identified to the south of Te Kauwhata Road north of Lake Kopuera and is programmed for the long term beyond 30 years.

With the increase in housing and commercial areas, future upgrades to the town centre will be required. Te Kauwhata will also have to manage active and passive recreation opportunities as the population increases. Waikato 2070 signals that the possible future population of Te Kauwhata will likely reach 10,000 people in the next 50 years.

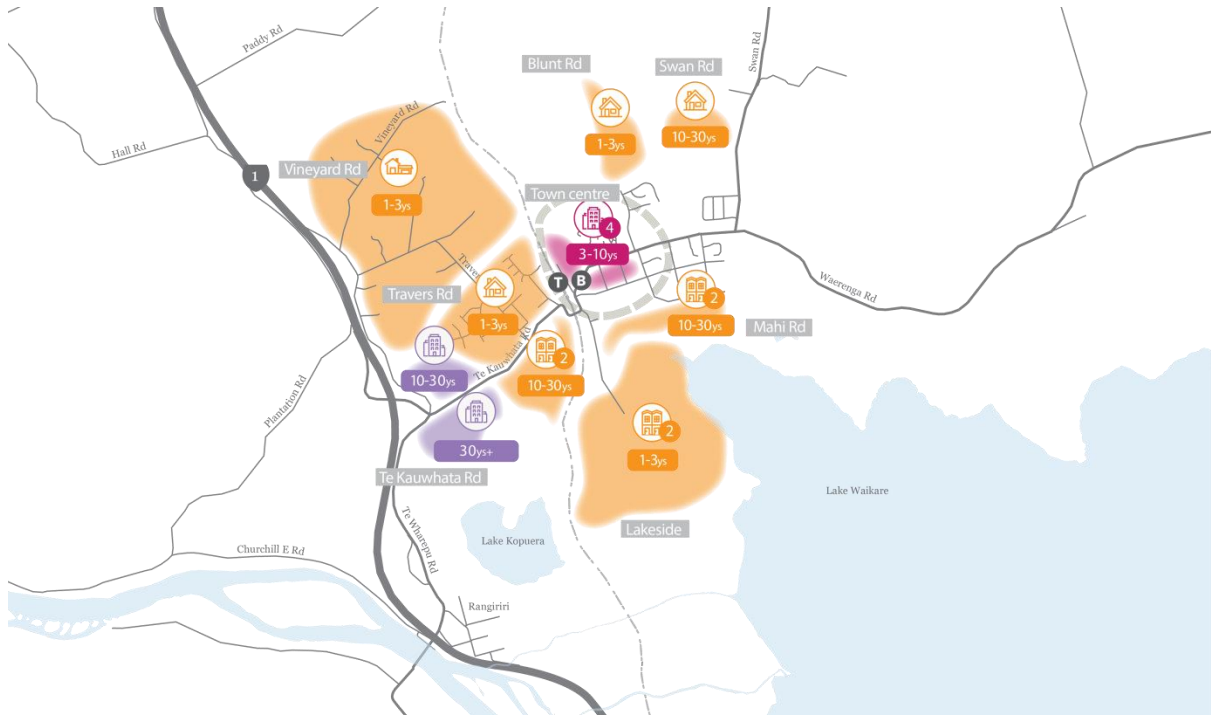


Figure 50 - Te Kauwhata Town Development Plan

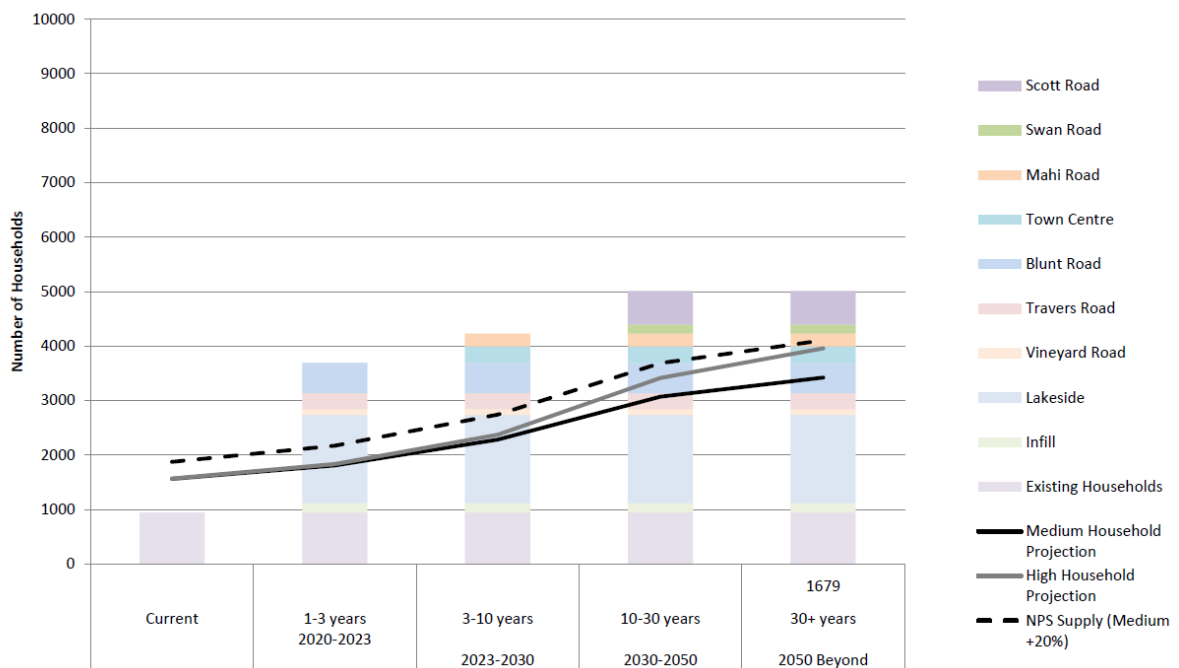


Figure 51 - Te Kauwhata Household Projection and Supply Numbers (Waikato District Council, 2020)

7.3 Central

7.3.1 Ohinewai

Ohinewai is located on the eastern bank of the Waikato River and accessed by an adjacent SH1 interchange near the main trunk line adjacent to the expressway located between Rangiriri and Huntly. Ohinewai is strategically placed, and there is potential for large scale development to occur whilst avoiding flood-prone areas.

Waikato 2070 has indicated that Ohinewai could expand to a large industrial node over the next 30 years. This strategically protects the land allowing it to attract future industrial uses and ensuring that the Waikato does not run out of industrial land (D Kemp 2019).

- Ohinewai is programmed to receive a mixture of growth of mainly commercial and industrial with potential for residential in a 1–10-year time frame subject to proposed rezoning (as part of the district plan review).
- The intention is to provide for the growth in a staged manner over the next ten years to allow the coordination of infrastructure alongside proposed development. Further north a large commercial and industrial area could be progressed in 10-30 years as part of the Ohinewai North Industrial Cluster identified in the Waikato 2070.

Given Sleepyhead are investigating the area and their business will be based around manufacturing, a cluster focused on manufacturing, furniture, house fittings, machinery and equipment could have good synergies with a more construction orientated Huntly.

This would be supported by the access provided along Great South Road into Huntly and the rail link that passes through both areas. There has been a shortfall in manufacturing jobs of up to 77% in 2017 throughout the Waikato (D Kemp 2019). Ohinewai residential development could add another 1,000 people to the small village.

7.3.2 Huntly

Huntly is located on the banks of the Waikato River and is at present the largest town in the Waikato District. Although Huntly is severed by the river and the railway (main trunk line) there are good opportunities for commercial, industrial, and residential development.

Waikato 2070 identifies the following growth areas within Huntly. Some areas covered by a growth cells also are covered by submissions on the Proposed Waikato District Plan.

- In the short term, an area east of Lake Hakanoa on the surrounding hills is zoned for development and this could take place in 1-3 years.
- In the medium term, a mix of commercial and industrial areas located to the north of the township is identified within the 3–10-year timeframe, along with the East Mine Business Park and the Kimihia Lakes recreation development. Residential development around Kimihia is also identified to take place in the 3–10-year timeframe.
- Huntly West across the Waikato River is identified in the 3–10-year timeframe and is proposed to have a higher density of 2 stories.

- The Town Centre could see an increase in density over the next 3-10 years, with height levels of up to 4 storeys proposed. Mixed use development is encouraged to occur within proximity to the future rail station.
- The Brickworks growth area located south of the town is identified in the 10–30-year timeframe.

There may be redevelopment opportunities for housing on the western side of the river. The start-up rail service from Hamilton to Auckland, for which Huntly is a stop via an upgraded platform, also gives live and work opportunities to new start-up businesses. Increasing commercial and industrial opportunities with a focus on construction could raise employment and support Ohinewai. Waikato 2070 signals that the possible future population of Huntly will likely reach 12,500 people, this could see a combined possible future projection for Huntly and Ohinewai of 13,500 in the next 50 years.

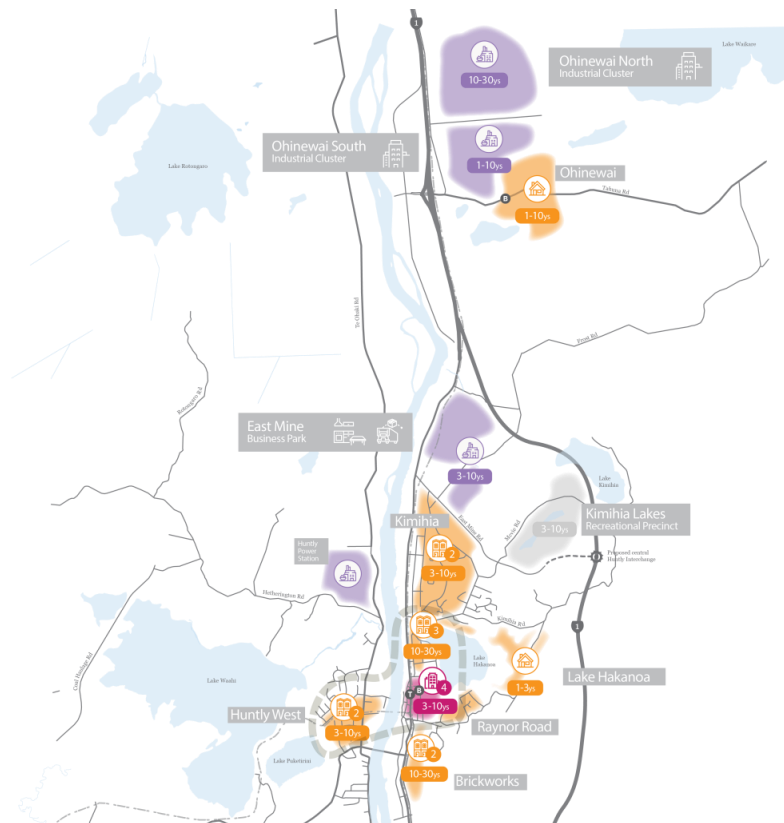


Figure 52 - Huntly and Ohinewai Town Development Plan

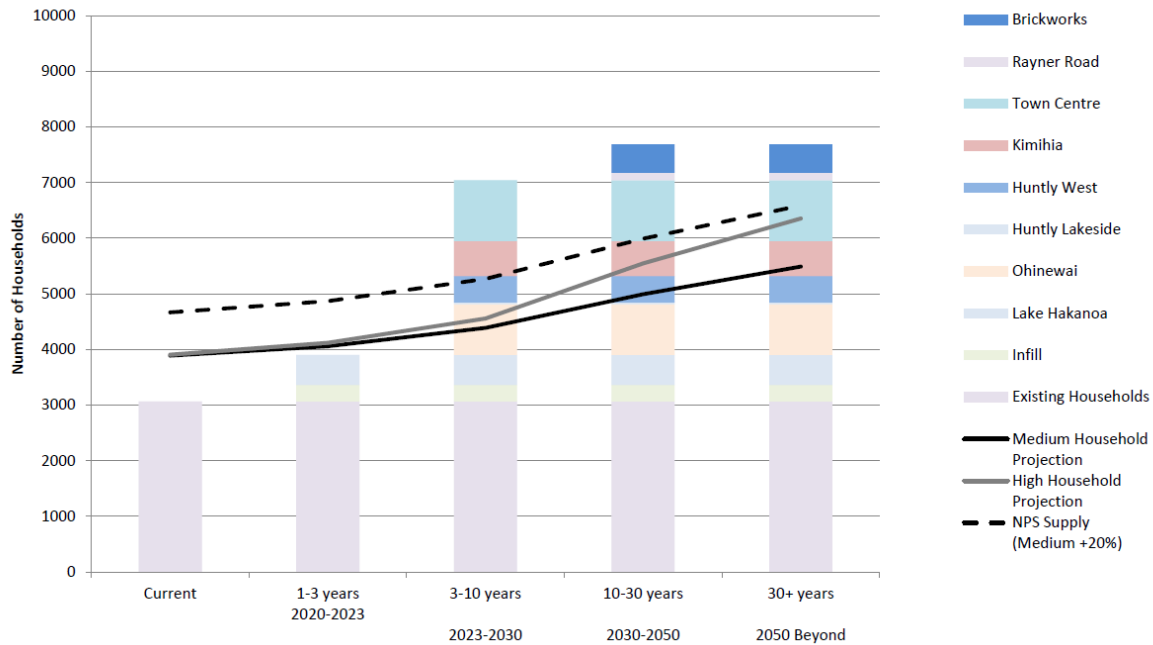


Figure 53 - Huntly and Ohinewai household projection and supply numbers (Waikato District Council, 2020)

7.3.3 Taupiri

Taupiri is located east of the Waikato River and Hakarimata Ranges and is connected to Huntly and Ngaruawahia by Great South Road, as well as being situated on an interchange of the Waikato Expressway. Since the opening of the Waikato Expressway, Taupiri has seen a developer-led demand for more residential housing, most likely driven from the spill-over in growth effects associated with Hamilton and the increase in rural employment.

Waikato 2070 identifies the following growth areas within Taupiri. Some areas covered by growth cells also are covered by submissions on the Proposed Waikato District Plan.

- The Waikato expressway now sits to the east of the Taupiri Village, and a residential area is identified in the 1–10-year timeframe near Te Putu Road.
- South of the town centre are large areas identified for residential development within the 10–30-year timeframe.
- Adjacent to these residential areas identified are three new areas as part of a commercial and industrial employment cluster, being Taupiri East identified in the 3–10 years and Taupiri West identified in the 10–30-year timeframe.
- The Taupiri Town Centre is identified to have an increased density of up to 4 stories in the 10–30-year timeframe.

Care needs to be taken if Taupiri shows rapid expansion in residential development due to its proximity to the Waikato Expressway and Hamilton as a satellite village. The development of appropriate services in roads, footpaths, water infrastructure and passive/active recreational activities will be required. Waikato 2070 signals that the possible future population of Taupiri will likely reach 4000 people in the next 50 years as these new residential and employment areas open.

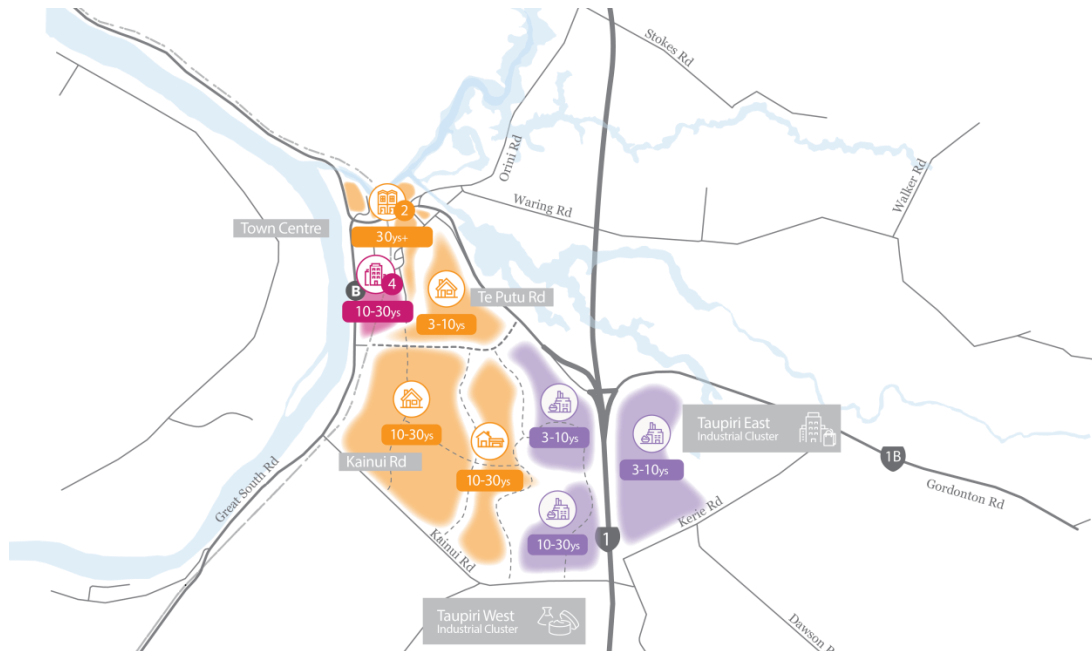


Figure 54 - Taupiri Town Development Plan

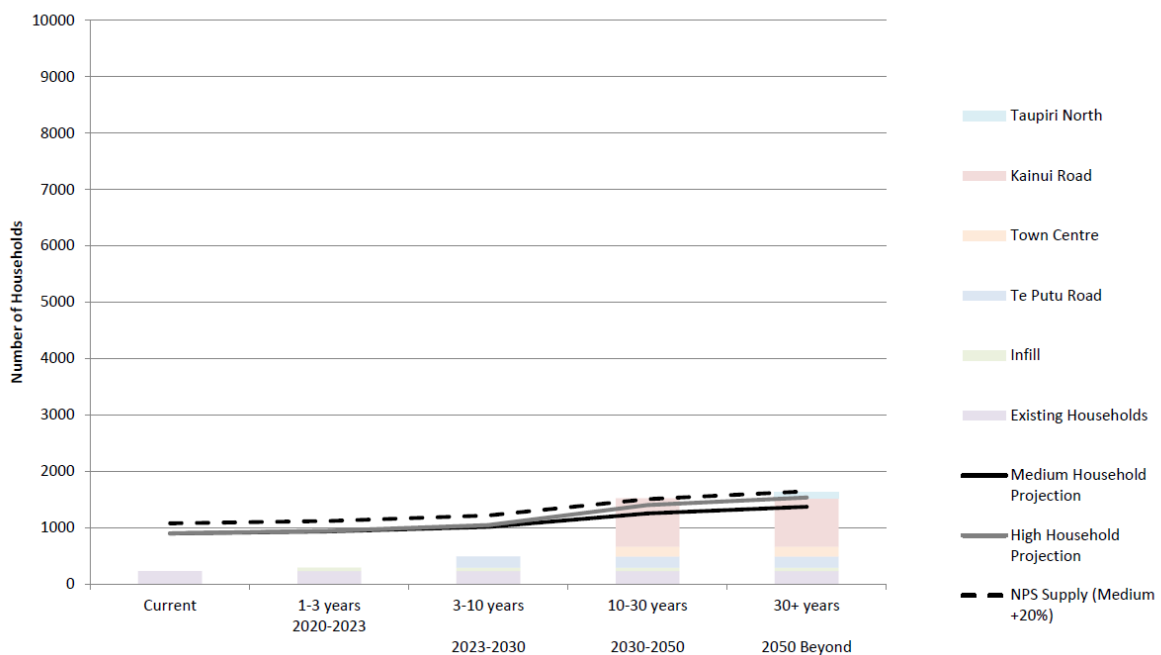


Figure 55: Taupiri household projection and supply numbers

7.3.4 Ngaruawahia

Ngaruawahia is located at the confluence of the Waikato and Waipa rivers at the foot of the Hakarimata Ranges. Ngaruawahia can be accessed from SH1 at Horotiu interchange and is located on the rail line between Huntly and Horotiu. Ngaruawahia including Hopuhopu and some of the surrounding villages have a completed structure plan that was adopted in 2017. Stage one of the structure plan was approved as part of a District Plan change. Subsequent stages of development were included into the Proposed Waikato District Plan.

Waikato 2070 identifies the following growth areas within Ngaruawahia. Some areas covered by a growth cells also are covered by submissions on the Proposed Waikato District Plan.

- In the short term, new residential growth has been identified to the north across the Waikato River on Galbraith Street in the 1–3-year timeframe.
- Northeast at Star Road is a residential area identified in the 10–30-year timeframe, and to the west adjacent to the Waikato River residential growth is also identified in the 10–30-year timeframe.
- North of Ngaruawahia is the Hopuhopu Business Park, a commercial or industrial area identified for local servicing in the 10–30-year timeframe.
- The Town Centre is identified to increase in density over the next 10-30 years to an approximate height of 4 stories, and southeast and west of the Town Centre are two higher residential areas also identified within the 10–30-year timeframe.
- Further South at Saubrey Road is a residential area identified in the 3–10-year timeframe.

Ngaruawahia has opportunities for regeneration to cater for more services and retail given its proximity to its location in the landscape that includes the river, hills, and proximity to Hamilton. The start-up rail service from Hamilton to Auckland will pass through Ngaruawahia, and a stop in the future will give live and work opportunities along with strong access to the Hopuhopu business park. Waikato 2070 signals that the possible future population of Ngaruawahia will likely reach approximately 10,500 people in the next 50 years as the new industrial, commercial, and residential areas open.

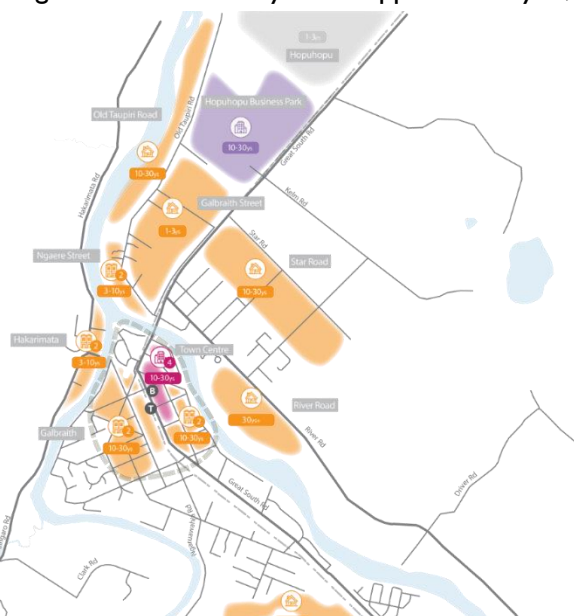


Figure 56: Ngaruawahia Town Development Plan

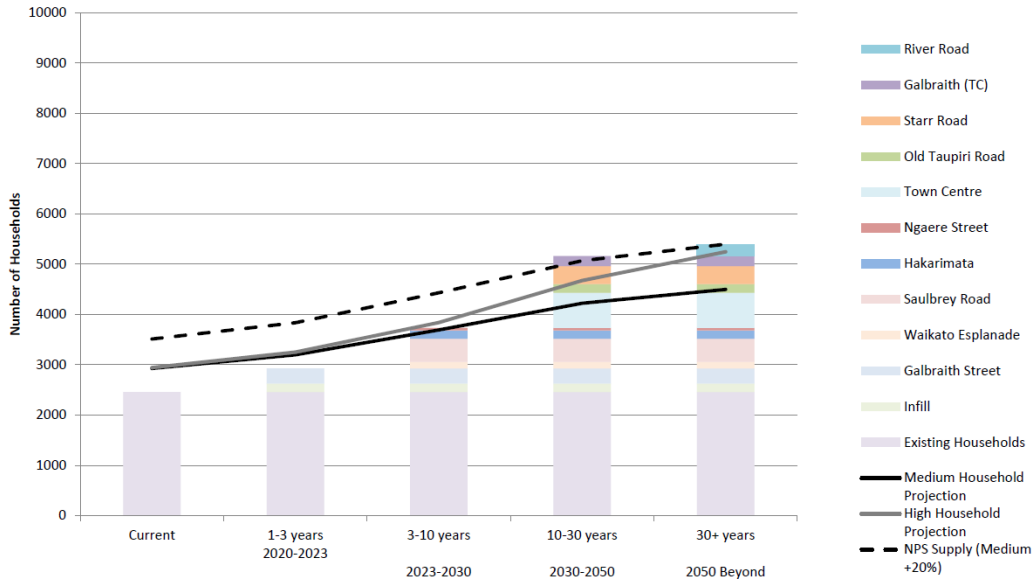


Figure 57: Ngaruawahia Household Projection and Supply Numbers

7.3.5 Horotiu

Horotiu is situated on the northern boundary of Hamilton City and has seen rapid development of its industrial node. Waikato 2070 identifies a further 50ha of employment land in Horotiu to cater for demand for industrial land. There will be localised residential growth as permitted under planning provisions. The Kernott Road residential growth cell is dependent on the Te Awa Lakes development within the Hamilton City boundary which is currently under appeal.

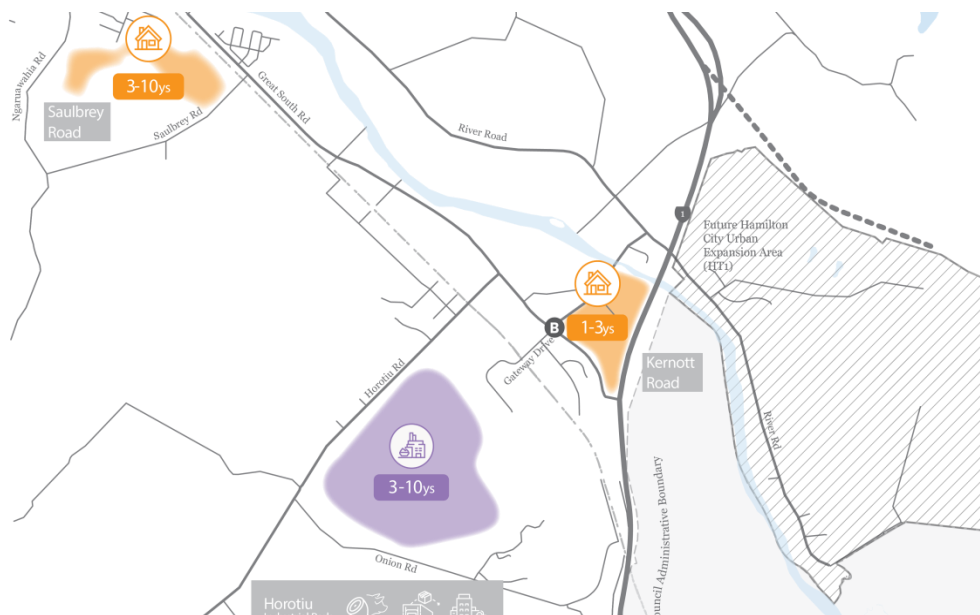


Figure 58: Horotiu town Development Plan

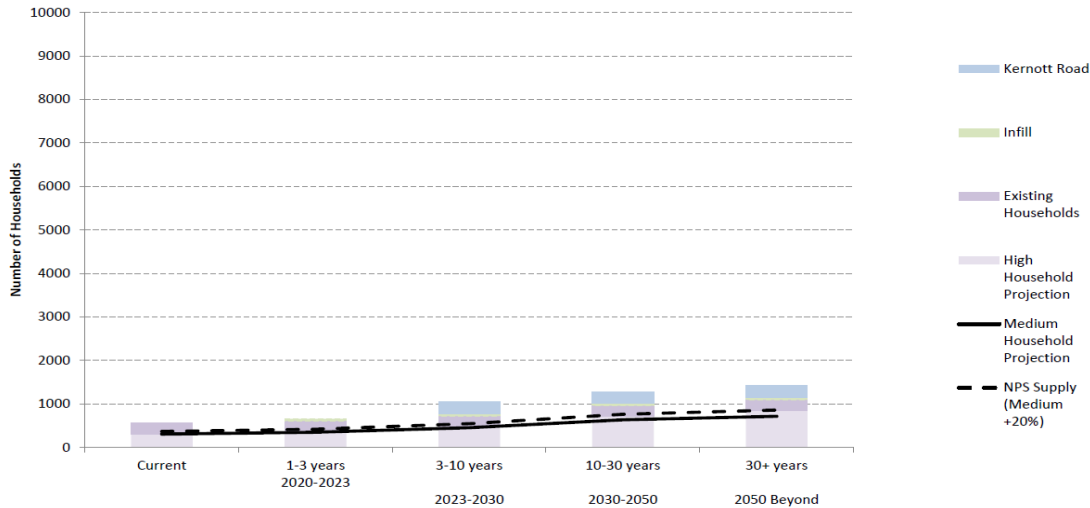


Figure 59 - Horotiu Household Projection and Supply Numbers (Waikato District Council, 2020)

7.3.6 Te Kowhai

Te Kowhai is located off SH39 on Horotiu Road about 6km southwest of Horotiu and east of the Waipa River. Te Kowhai is identified to have two residential areas, both identified in the 10–30-year timeframe. The Airpark Precinct is identified to be developed in the next 3-10 years.

How Te Kowhai transitions from a small hamlet to a larger village will require an understanding of where and when key infrastructure is needed. Additional water and wastewater may need connections back to Horotiu and the existing network, and passive/active recreational facilities and areas will need to be provided for. Waikato 2070 signals that the possible future population of Te Kowhai will likely reach 4000 people in the next 50 years.



Figure 60: Te Kowhai Village Development Plan

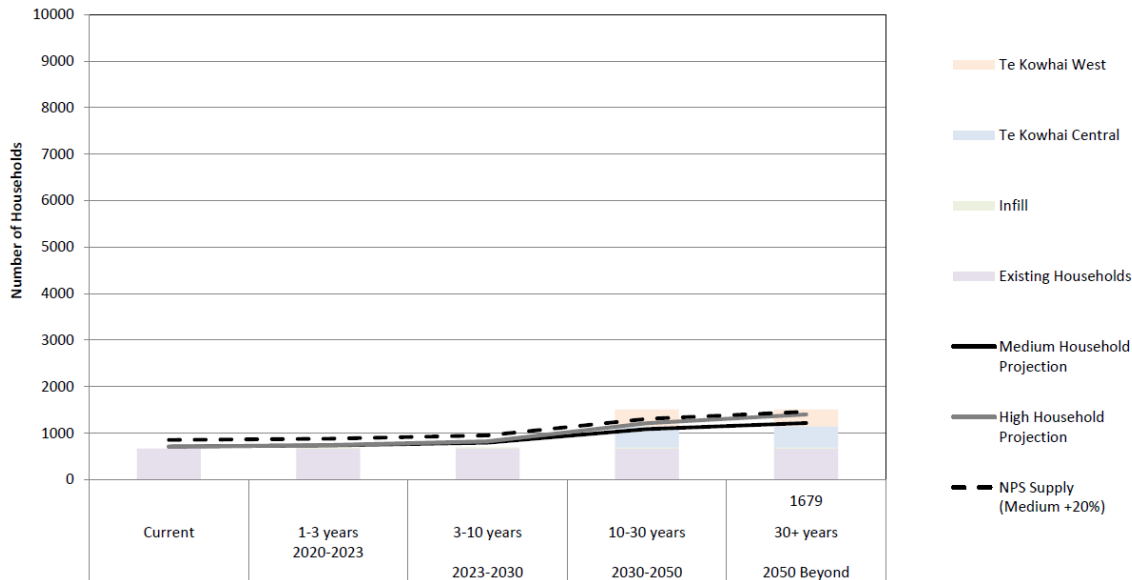


Figure 61 - Te Kowhai Household Projection and Supply Numbers (Waikato District Council, 2020)

7.4 West

7.4.1 Raglan

Raglan is located on the West Coast of the Waikato District at the Whaingaroa Harbour and is accessed by SH23. The local population is very environmentally conscious and is seeking comprehensive treatment solution to their wastewater management. Given the high tourism numbers that support the town, public facilities and spaces will also need to be of high quality and capacity to meet visitor demand (for example, through Raglan Wharf upgrades).

Waikato 2070 identifies the following growth areas within Raglan. Some areas covered by a growth cells also are covered by submissions on the Proposed Waikato District Plan.

- To the east of Raglan at Lorenzen Bay, residential development is identified in the 1–10-year timeframe and at Flax Cover in 3-10 years.
- To the south of Raglan, stage I of Rangitahi Peninsula development is progressing, with the whole area identified to be residential within 1-10 years.
- South and west of the Peninsula the Afon Oporoturu growth cell is identified for residential in the 10–30-year timeframe, and further west and north at Te Hutewai and Rakaunui, residential areas are identified beyond 30 years.

The business capacity assessment shows the demand for industrial land is stable, so more people are involved in work from home, cottage industry or commuting (D Kemp, 2019). The uptake of housing in Rangitahi is a split of 55% residents and 45% non-residents (ref Waikato 2070 submission). If this growth continues, then half of the population growth will be a lifestyle choice commuting to Hamilton with a smaller proportion to Auckland (remote working may exacerbate this).

Improvements in connector and local roading, and footpaths (walking/cycling) will be required. Waikato 2070 signals that the possible future population of Raglan will likely reach 12,500 people in the next 50 years.

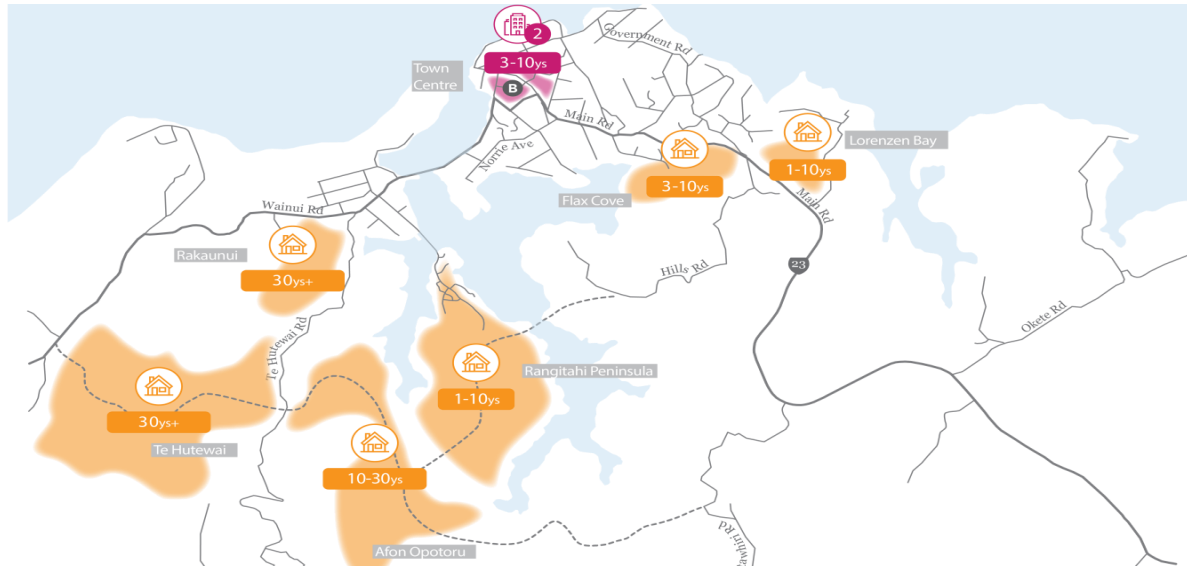


Figure 62: Raglan Town Development Plan

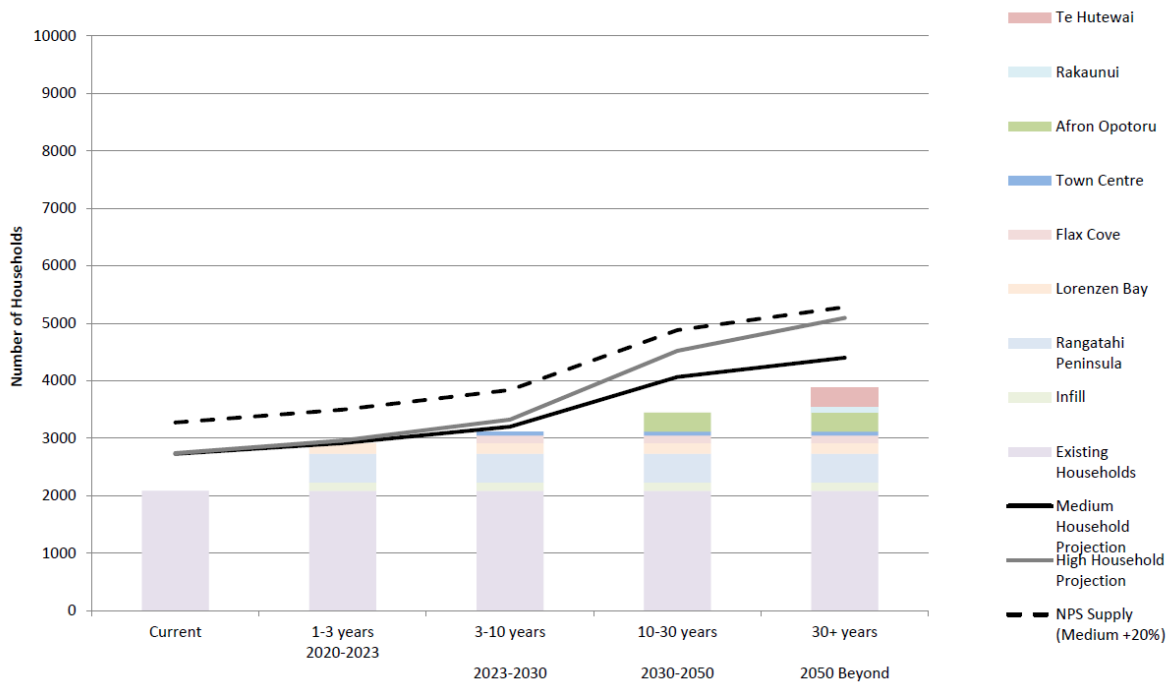


Figure 63: Raglan and Whale Bay household projection and supply numbers (Waikato District Council, 2020)

7.4.2 Other Western Villages

It is not anticipated that other small areas in the central area will increase in population significantly than currently what is existing.

Whatawhata, Te Uku and Te Mata villages are anticipated to remain relatively static, and will receive some small-scale localised housing developments permitted under planning rules. No growth cells for these areas are proposed.

7.5 South

Tamahere, Matangi and Gordonton will continue to see increases in Countryside Living and strengthening of the Village centres, but no specific residential areas are proposed to be developed other than the Tamahere Country Club retirement village. The population should remain relatively static or will have small increases, and no growth cells for these areas were identified in Waikato 2070.

8 Employment Growth and Development

8.1 Industrial

The Waikato District is predominantly a rural area with only a small proportion of land currently zoned for industrial use. The two key areas of industrial development in the district are Pokeno and Horotiu, both of which are food processing clusters (dairy, meat). These will be strengthened with freight, logistics and manufacturing, and Horotiu will become an inland port.

There is an increase in the demand of commercial and manufacturing/industrial land in the Waikato District as land supply becomes short for large suitable sites in Auckland and Hamilton cities. Waikato 2070 identifies several new growth cells, and these are clustered around our existing towns and villages to help diversify the district's economy and provide employment opportunities for the Waikato District's communities.

Without these new employment opportunities to match the growing population, the district risks becoming a dormitory commuter district with people travelling between Auckland, Hamilton and Tauranga for work and services, which would have negative long-term impacts on our communities.

As D Kemp notes in his Industrial Land Evaluation report to Waikato District Council (Kemp, 2019) there is a projected need for industrial land, and if this land is not available, businesses will go elsewhere. The report identifies likely demand for industrial land under three scenarios of existing, recent, and high growth in Figure 24 below (Kemp, 2019).

Table 95: Likely demand for Waikato 'Industrial Land' under each scenario

*The Likely Demand for Waikato 'Industrial Land'
Under Each Scenario*

	Existing Economy		Waikato 'Recent Growth'		High Growth	
General industries	40		46		86	
Food & Clean Production	41		52		64	
Construction & Utilities	40		78		126	
<i>Total Industries</i>	121		176		276	
Transport & Storage	9		10		40	
Wholesaling	21		47		124	
<i>Total Logistics</i>	30	20%	57	24%	164	37%
<i>Total Industrial Land</i>	151		232		440	
Vehicle and Parts Sales	0		0		0	
Bulky Goods & Hire Services	1		2		11	
Retail Services	0		0		0	
Office Based Services	2		5		9	
<i>Retail & Support Services</i>	3		7		20	
TOTAL Ind Land Demand (Ha)	154		239		460	
<i>Showroom Space (ha)</i>	4		8		40	
* 'High Growth' = highest of Waikato and Regional North Island recent growth (calculated as increased jobs/1000 resident population increase from 2000 to 2017)						
Regional North Island defined as North Island excluding Metropolitan Areas (of Auckland, Hamilton, Wellington, Lower Hutt, Upper Hutt TLAs)						
Home based businesses have been deducted from each activity (such as the building & construction industries)						

Waikato 2070 identifies and seeks to provide industrial/commercial areas for development in Tuakau, Pokeno, Mangatawhiri, Te Kauwhata, Ohinewai, Huntly, Taupiri and Horotiu. These areas are either zoned in the Operative District Plan (Waikato 2013 and Franklin 2000 sections), under consideration within the Proposed District Plan and identified in the development in 1-10 years or identified for later timeframes and subject to future planning processes. Some of the key land use changes are noted in **Error! Reference source not found.** below.

This industrial growth (with the accompanying residential growth) will impact on the assets of the Waikato District. Additional demand from these growth areas will necessitate a range of capital upgrades and new infrastructure in critical areas of transport (roading/rail) and water, wastewater management.

The impacts of any future industrial development on roading and water use will need to be reviewed when:

- Structure plans are developed, and new zoning is incorporated in the district plan,
- Consent applications are received by WDC seeking industrial development (i.e., resource consents or building consents).

Table 96: Anticipated Industrial Growth and Demand

Industrial Node	Existing Sectors	Anticipated Growth & Demand
Horotiu	AFFCO Freezing Works (currently have own treatment, may change in the future) Northgate Industrial Park <ul style="list-style-type: none"> RX Plastics Waikato Valley Chocolate Ports of Auckland 	<ul style="list-style-type: none"> Primary Sector Support Services and Manufacturing Warehousing and Logistics Inland Port, freight movement and logistics
Pokeno	<ul style="list-style-type: none"> Yashili Dairy Factory Hynds Mining and Aggregates (current have their own water supply) water bottling plants Synlait Dairy Factory 	<ul style="list-style-type: none"> Warehousing and Logistics Primary Sector Support Services Construction Sector Services Manufacturing Light industrial
Tuakau	<ul style="list-style-type: none"> Tuakau Timber Treatment Products Van Den Brinks Tuakau Grains 	<ul style="list-style-type: none"> Brinks/Lowe development Warehousing and Logistics Primary Sector Support Services
Ohinewai	<ul style="list-style-type: none"> None in Ohinewai 	<ul style="list-style-type: none"> Manufacturing Sleepy Head Commercial Construction Services Wet Service Industry
Huntly	<ul style="list-style-type: none"> Genesis Energy Power Station Small timber construction materials Fletchers Built Smart 	<ul style="list-style-type: none"> Manufacturing Commercial Construction Services Expanded services

This D Kemp's (2019) 'Recent Growth' Scenario projects a future demand of 239 ha is needed in the Waikato District for Industrial Land from 2017 to 2045. The equivalent of 241 ha projected by the 'Business Development Capacity Assessment 2017' for the Waikato District. This includes a 15% margin above the actual projected demand as set out in the table below:

Table 97: Business Development Capacity Assessment Demand for Waikato 'Industrial Land' 2017-2047

Ward	Demand 2017-2047	Available Supply 2017	Centres in ward
	Ha	Ha	
Awaroa ki Tuakau	75.2	119.5	Ohinewai, Tuakau
Onewhero	4.0	0	
Whangamarino	14.6	47.1	Meremere, Te Kawkata
Hukanui-Waereng	11.0	21.6	
Whaingaroa	12.9	0.8	
Huntley	19.1	7.2	Huntley
Ngaaruawahia	11.6	4.1	Ngaaruawahia
Newcastle	68.7	89.7	Whatawhata
Raglan	7.1	7.4	Raglan
Eureka	14.1	0	
Tamahere	2.6	1.9	
Total	240.8	299.2	

(Market Economics July, 2018 NB includes a 15% margin above the model's projected demand)

8.2 Commercial Growth

Waikato 2070 identifies Town Centre areas in the following localities Tuakau, Pokeno, Te Kauwhata, Huntly, Taupiri, Ngaruawahia and Raglan. The purpose of the town centre area is to encourage a mix of activity such as retail development on the ground level and office space or apartments on subsequent levels to revitalise town centres and encourage a higher density of development where public transport and access such as walking, and cycling is more readily available.

Growth is anticipated from commercial developments, predominantly in the North and Central part of the district. Tuakau and Pokeno will grow and become the commercial centres of the northern part of the district. Pokeno, with the redevelopment of the town centre and the availability of residential and industrial land close to the expressway, will attract more commercial activity than what is currently present.

Te Kauwhata, Ohinewai and Huntly communities along the expressway will also attract more commercial interest. With the significant residential development occurring in Te Kauwhata, there will be accompanying business demand within the immediate future and longer-term.

The Commercial Growth areas of Ohinewai will make use of large land parcels and the connection to roading (expressway) and rail (Main trunk line) to develop a manufacturing hub with good freight and logistics (Kemp, 2019). This will require appropriate feeder roads to be constructed and maintained (Great South Road into Huntly).

Ngaruawahia's key new commercial areas will be the Town centre and Hopuhopu business park (a mixture of industrial and commercial).

Inclusive of the large business parks to be progressed in the district, additional land will be set aside for service trades and cottage industries. Other land categories include clean production that minimises impacts on adjacent land and showroom spaces requiring high visibility.

9 How will Climate Change impact growth?

The New Zealand Climate Change Office indicates with the increasing variability of weather patterns and increasing frequency of high-impact adverse weather events (e.g., droughts, flooding, and coastal erosion) will become a growing challenge, with impacts on our communities and our infrastructure.

For further information on climate change, refer to Part 6: Sustainability section of the AMP.

10 References

- Cameron, M. P. (2020). *2020 Update of Population, and Family and Household, Projections for Waikato District, 2013-2063*. University of Waikato.
- Kemp, D. (2019). Industrial and Employment land needs. Prosperous Places.
- Waikato District Council. (2020). Waikato District Council Capacity Model.
- Waikato District Council. (2020). Waikato District Spatial Distribution Model.
- Waikato District Council (2020) Strategic Planning Team. *Waikato 2070 Supporting Document – October 2020*

11 Three Waters Demand Characteristics

11.1 Activity Demand Issues

Water Supply:

WDC provides reticulated water supply to the community for domestic, industrial, dairy, agricultural uses and firefighting capability. The urban areas receive an “on demand” supply with surrounding rural areas receiving a “trickle feed” supply. Council had completed a water-use efficiency review for 12 water supply schemes. Council is required to have Water Demand Management Plans (WDMP) for some of the water consents. Through the development of the Action Plan for the Sub Regional Strategy, it was agreed that there should be a sub-regional template developed for the WDMPs, which each Council use.

Council’s first water demand management plan was completed in December 2007. It has been updated three times since then in August 2008, July 2009 and April 2015. Pokeno, Tuakau, Onewhero and Port Waikato were not included in any previous WDC WDMPs as they were part of the Franklin District Council which was disestablished as part of the boundary readjustments between the Waikato and Auckland Councils in 2011. The purpose of the WDMP is to provide a detailed understanding of current and future water demands and opportunities for improving water efficiency both district wide and for each of the Council’s water supply schemes.

Public water supply systems are designed to provide sufficient water for domestic, commercial and industrial demands and provide the water for firefighting purposes. However, there is no direct legislation that requires the council to provide firefighting water supply. Still, where reticulated water mains are provided, fire hydrants must be installed and kept in good working order. The actual amount of water used in a year for firefighting is relatively small compared to the daily rate of use is substantial. In many cases, the potable demand is not critical, and the supply for firefighting purposes will generally determine the pipe sizes required for a water supply network.

Wastewater:

As a consequence of more efficient use of potable water, this may have a follow on effect on wastewater in reducing the demand for the service. As people look to more efficient uses of water and potential recycling of grey water, this reduces the demand pressures on the wastewater system.

The types of customers and their consequential demands have not been analysed. In conjunction with the rates department and the trade waste team, this analysis can be undertaken as future improvement to understanding the overall demands.

The forecast flows for each year from 2017 to 2048 were estimated by multiplying the forecast population for the year by the relevant factor on a scheme by scheme basis as summarised in table below. The basis for the flow forecasts presented in this report are largely consistent with those used in the 50 year Wastewater Strategy prepared by MWH in 2014.

ADWF was estimated using a per capita generation rate of 200 L/person/day or the observed per capita rate, which was higher. The exception was for the smaller schemes of Maramarua, Te Kowhai and Matangi, where a lower per capita rate consistent with those given in AS/NZS 1547:2012 – On-site Domestic Wastewater Management was used. Tauwhare Pa scheme serves a similar sized population to Matangi, however a per capita generation rate of 200 L/person/day was used as it is more consistent with the observed per capita rate.

ADF and PWWF was estimated largely using observed ratios of ADF:ADWF and PWWF:ADWF. In all cases a minimum factor of 1.3 was used to convert ADWF to ADF. For the smaller schemes with no growth in connection numbers where the population declines due to decreasing household occupancy, the PWWF has been fixed at the 2016 estimate.

Table 9: Average and Peak Flows 2017

Scheme	2017 Population	ADWF (L/p/day)	ADF/ADWF	PWWF/ADWF	Comment
Central District	6,506	200	1.3	3.7	ADWF based on 2016 inflows and population. ADF & PWWF factors based on 2014 Report. 2016 appears 'dry year' (1.2 and 3.1 observed)
Huntly	7,799	210	1.5	5.5	ADWF & ADF factors based on 2016 inflows and population PWWF factor based on 2014 Report as 2016 appears 'dry year' (4.8 observed)
Mid Waikato	1,258	200	1.3	6.3(current) 3.0 (new)	2016 WWTP inflow data adjusted for Springhill resulted in unusually low per capita rates (<150 L/p/day) compared to 2014. WWTP and Springhill flow data needs review. ADWF based on Central District. ADF & PWWF factors based on 2014 report. Springhill - assumed ADWF of 300 m ³ /day and PWWF of 600 m ³ /day based on 2016 data. Springhill trade waste discharge and agreement needs reviewing. Private plan change since 2014 Report: 150 connections per year for 10 years from 2020
Raglan	4,052	240	1.5	4.2	2016 daily inflow data appears unusually high (about four-fold higher than consent data for same period). WWTP flow data needs review. ADWF & PWWF factor based on 2016 compliance report flows and population ADF factor based on 2014 Report as monthly compliance data not available (1.1 in compliance report) Whale Bay reticulated since 2014 Report, and now included in residential connections
Meremere	540	200	1.5	14	Inflow data available for 2016. ADWF higher than observed (170 L/p/d) to be consistent with other larger schemes. ADF & PWWF factor based on 2014 report (2.3 and 16 observed) One PWWF factor used for Pokeno and one for Tuakau (ie same value for current and new connections) based on WDC observations
Tuakau/Pokeno	6,215 (4,224 / 1,991)	200	1.3	(5.0 / 3.0)	ADWF and ADF based on 2014 Report as limited, unreliable data Tuakau and Pokeno PWWF factors provided by WDC (same value for current and new connections) Yashili – 1,400 m ³ /day, Brinks Chicken – 200 m ³ /day, Lowe Corp – 200 m ³ /day
Matangi	150	145	1.3	3	No growth allowed (whereas 2014 Report allowed growth up to 2035) ADWF and ADF based on 2014 report PWWF adjusted to better match historic data
Maramarua	21	115	1.4	11	No growth allowed (as for 2014 Report) ADWF, ADF and PWWF based on 2014 report. 2016 appears "dry" year
Tauwhare Pa	125	200	1.4	2.3	No growth allowed (whereas 2014 Report allowed growth up to 2030) ADWF, ADF and PWWF based on 2014 report.
TeKowhai	50	115	1.6	2.1	No growth allowed (whereas 2014 Report allowed growth up to 2030) No 2016 outflow data. ADWF and ADF based on 2014 report. PWWF adjusted to better match historic data

Source : Stantec, WDC WW Forecasts 201

Stormwater

The stormwater reticulation is almost entirely located within urban limits. However, when the rural drainage is considered, the characteristics of the properties served by the stormwater activity become much broader.

A breakdown of the properties served is given in Table 10, below. This analysis is based on valuation land use categories as WDC does not differentiate between land use types for stormwater rates.

Table 10: Breakdown of Stormwater Connections (based on the rate payers data).

Township	Count
Huntly	2798
Horotiu	128
Matangi	61
Meremere	221
Ngaruawahia	1955
Pokeno	631
Port Waikato	395
Raglan	1786
Tamahere	1936
Taupiri	184
Te Kauwhata	554
Tuakau	1711
Grand Total	12360

Note: This is based on quantity of stormwater ratepayers and will be underestimation as it does not take into account those properties that do not pay a stormwater rate.

12 Demand Forecast – Water Supply

Demand forecasting enables Waikato District Council to identify areas that are likely to experience significant pressures and plan accordingly.

As part of the planning process Council considers the asset use, demand and capacity, the implementation and planning for quality and process improvements and environmental impacts. Key information gathered during the forecasting process includes historic data, observed patterns and trends – use, demand and popularity, statistical estimates and projections, commercial activity and anticipated business migration and pending legislative changes.

12.1 Projected Growth of the Water Supply Activity

In 2014 MWH developed a 50 Year Water Supply Strategy. As part of the strategy Water Supply Demand Balance Forecasts were developed for the 50 year period. The demand forecasts were updated in 2017 by MWH (now part of Stantec).

A simple litre per capita (or per residential connection) per day approach was adopted. In this approach, the historical bulk water demands were analysed to determine an overall litre per capita per day figure, which was then multiplied by the projected population. The per residential connection measure was used for the more rural water supply areas and for Raglan due to uncertainties around population served (for example Raglan has high seasonal fluctuations in population).

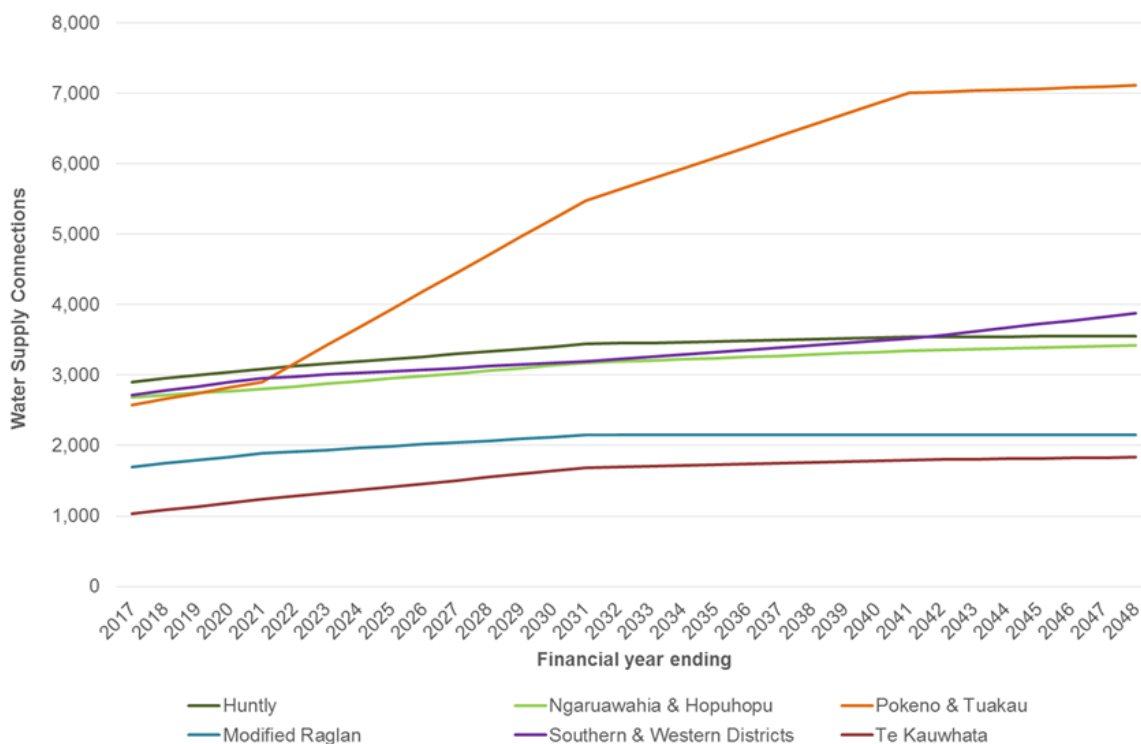


Figure 62: Water Connection Forecast 2017 (Stantec)

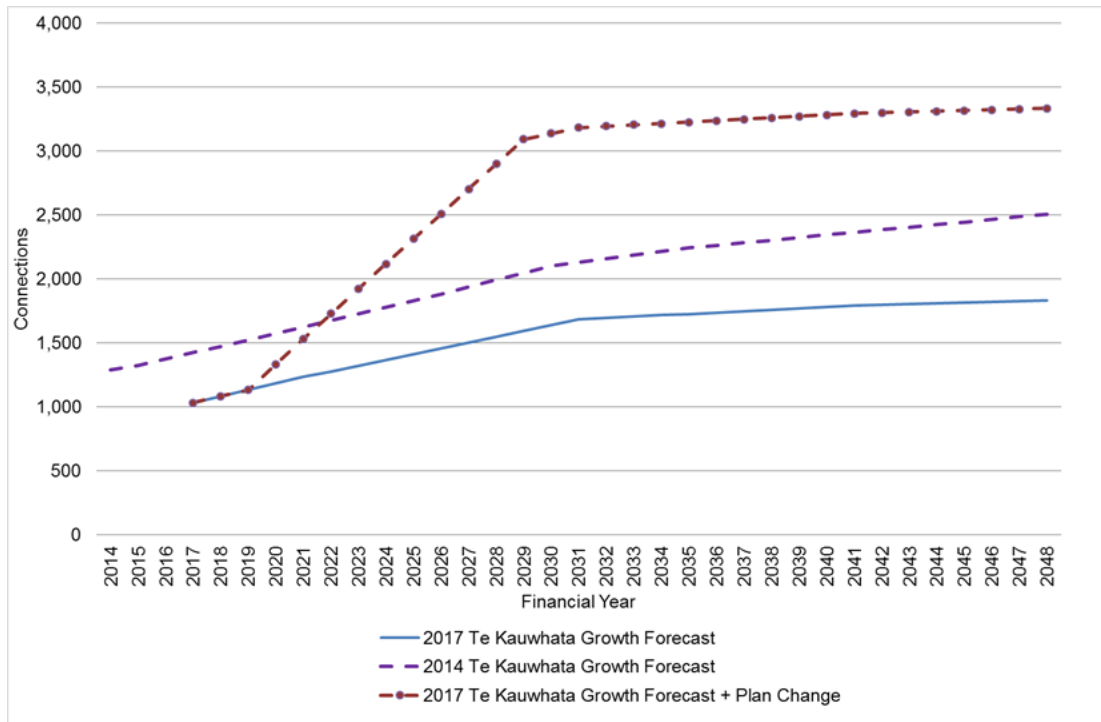


Figure 64: Te Kauwhata Water Connection Forecast 2017 with Plan Change (Stantec)

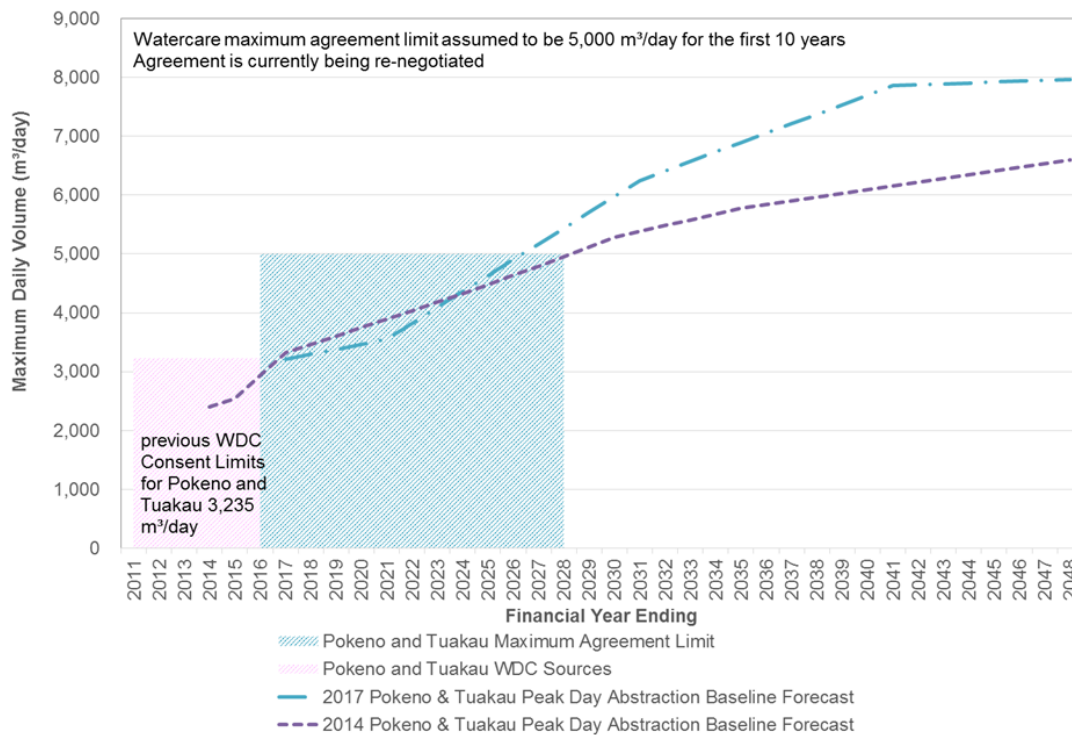


Figure 63: Tuakau/Pokeno Demand Forecast 2017 (Stantec)

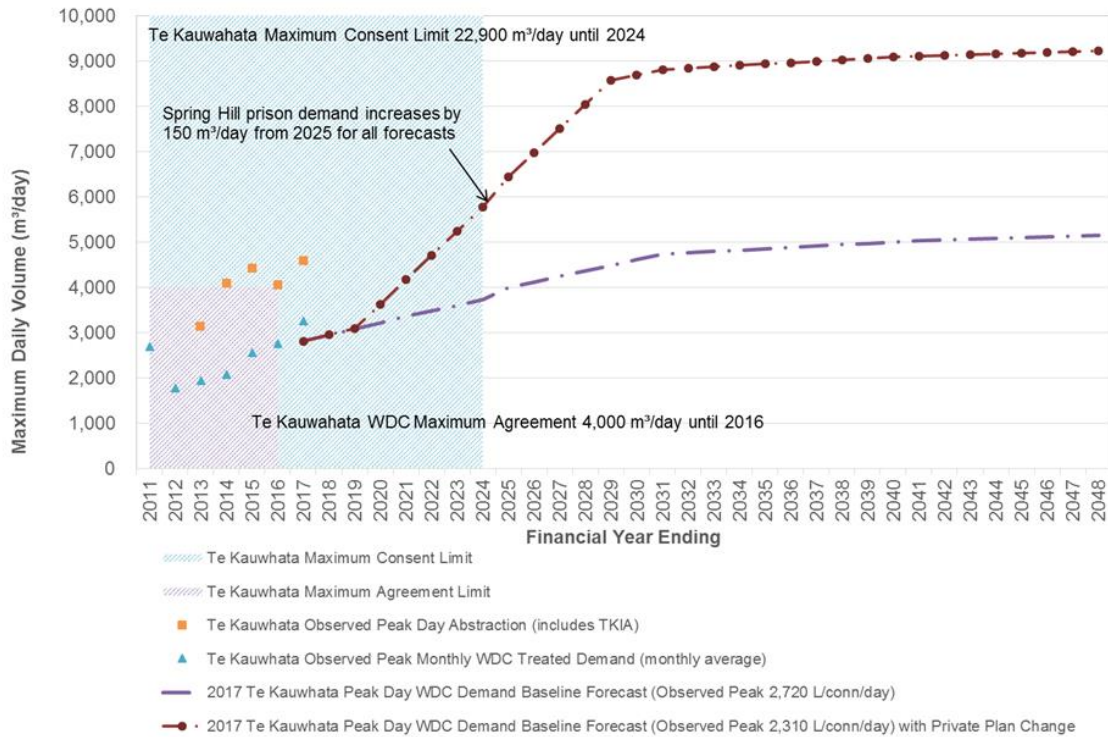


Figure 65: Te Kauwhata Water Demand Forecast 2017 (Stantec)

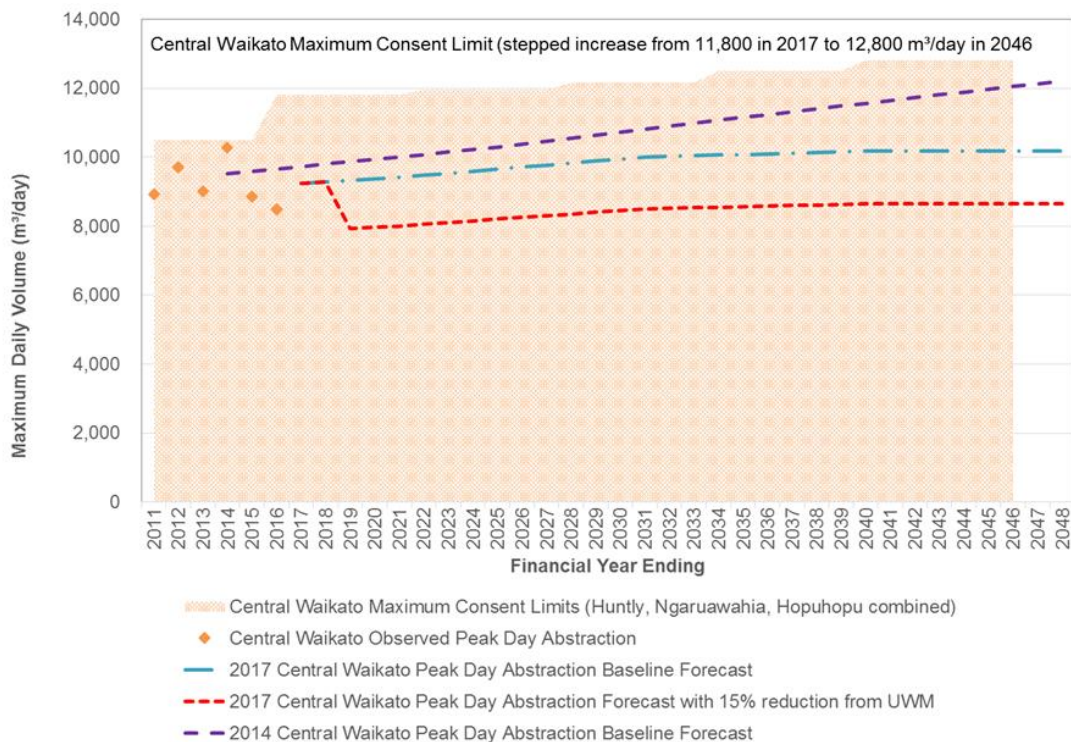


Figure 66: Central Waikato Water Demand Forecast 2017 (Stantec)

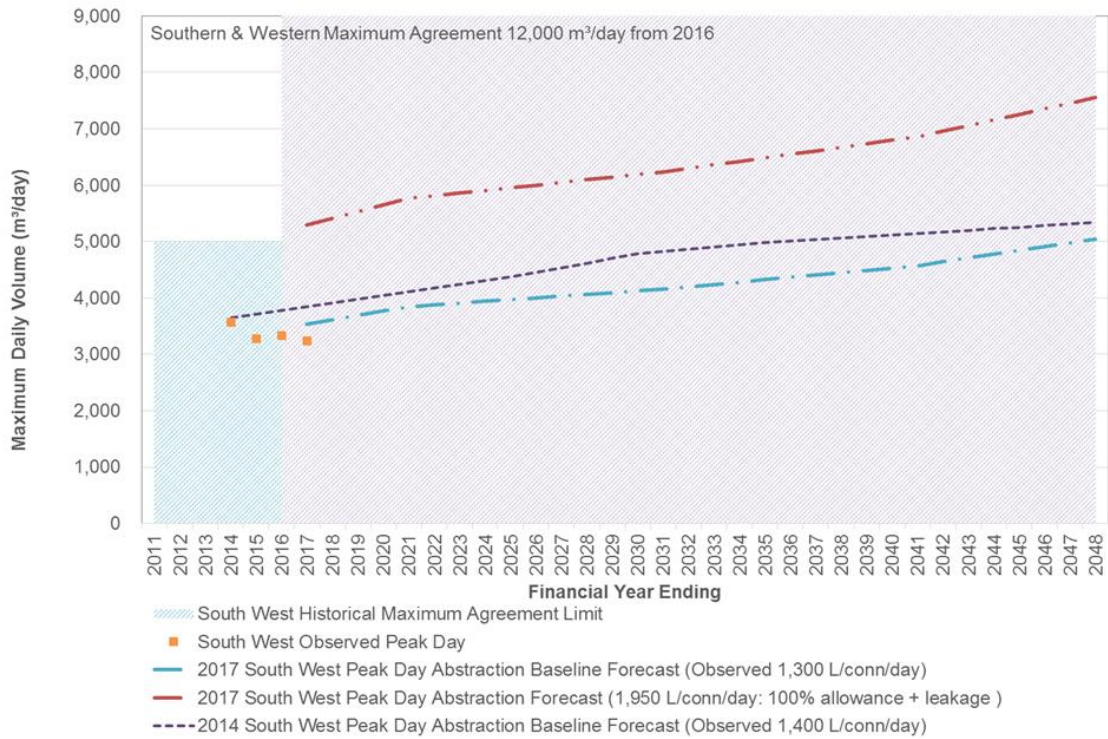


Figure 67: Southern and Western District Water Demand Forecast 2017 (Stantec)

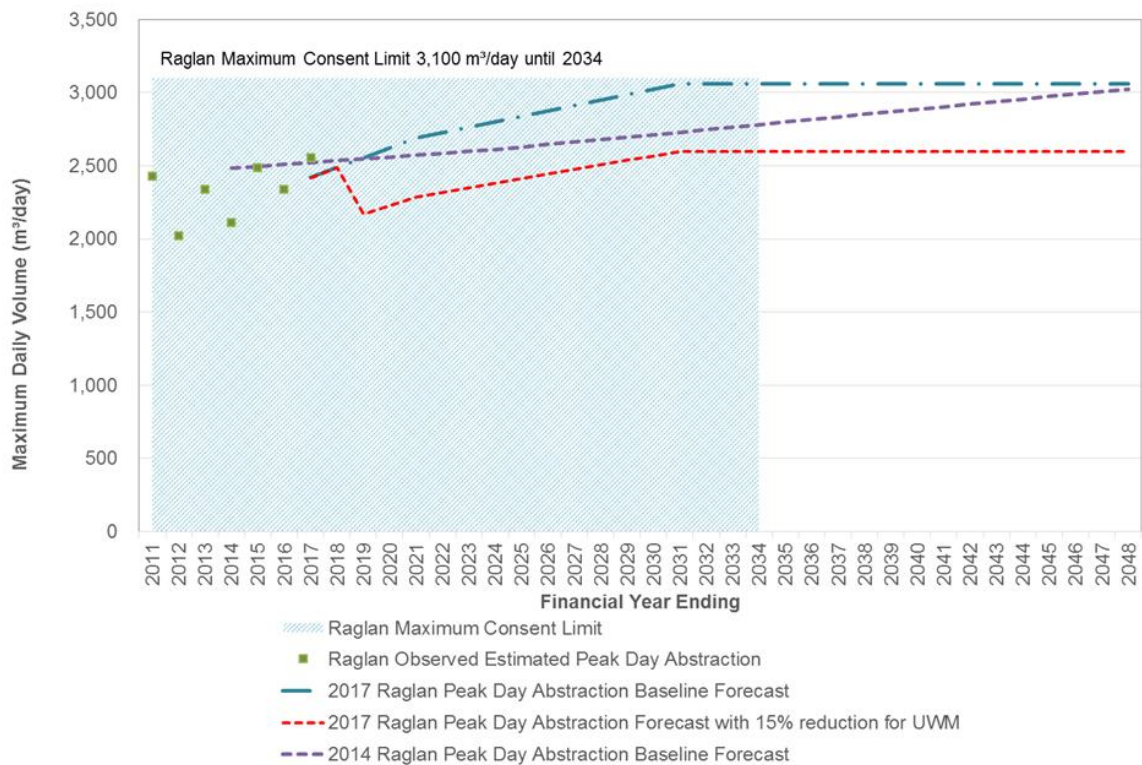


Figure 68: Raglan Water Demand Forecast 2017 (Stantec)

Key conclusions from the Waikato District 2017/18 to 2047/48 water supply demand balance forecasts for each water supply scheme area are as follows:

- Under the 2017 assumptions for future growth in connections and peak day demands of 1,050 L/residential connection/day, the combined Pokeno and Tuakau peak day demands are expected to exceed the assumed 5,000 m³/day Watercare maximum agreement limit before the end of the 10 year period (by 2026). The combined Pokeno and Tuakau peak day demand forecast needs to be updated after more reliable flow metering data becomes available.
- The Te Kauwhata peak day treated demand forecast to 2047/48 using the baseline Census Area Unit (CAU) growth forecast shows that the recent peak day treated demands have already reached the Whangamarino water treatment plant capacity and supply deficit will increase with the predicted baseline growth. The required plant capacity upgrade will be significantly greater if the growth from the Private Plan Change proceeds.
- The Central Waikato peak day abstracted demand forecast is below the maximum consent limit through to 2048, even without allowing for the expected demand reduction from universal water metering and volumetric pricing.
- The new combined water take consent for Huntly and Ngaruawahia/Hopuhopu also has low flow restrictions. The Central Waikato peak day abstracted demand forecast is only below the low flow maximum consent limit with the assumed 15% reduction due to the implementation of universal water metering and volumetric pricing.
- The Southern and Western Districts peak day demand forecast is well within the Hamilton City Council agreement maximum day limit of 12,000 m³/day.
- The Raglan water treatment plant capacity is robust and could accommodate an increased rate of growth without the need for capacity augmentation, especially under the forecast including 15% demand reduction for Universal Water Metering (UWM).
- No growth is forecast in any of the three very small water supply schemes, Port Waikato, Onewhero and Te Akau. The three very small water supply schemes all have ample water supply limits (maximum day consent limits) and treatment plant capacity for the forecast demands.

Key recommendations for Council to consider include:

1. Review the connection growth forecast for Tuakau when updated information becomes available (for example from the North Waikato Integrated Growth Management Project)
2. Review water supply flow monitoring approach for Pokeno and Tuakau. When reliable water demand data becomes available, review and update the water demand forecasts for Pokeno and Tuakau.
3. The more advanced sector-based demand forecast approach should be considered in the future after completion of the implementation of universal water metering. A sector-based demand forecast approach would involve preparing a bottom-up demand forecast with separate demand and growth assumptions for each category of demand e.g. residential customers, non-residential customers such as commercial, industrial and institutional and non-revenue water (real and apparent losses).

Table 11: Schemes Water Production and Consumption

Scheme	Water Production (Maximum Treatment Plant Capacity) m ³ /day	Maximum Consent (m ³ /day)	Annual Consumption (m ³ /year) (From Annual Report 2015/16)	Real Losses (CARL), Thomas Consultants Water Balance Report	Non Revenue Water (Financial Indicator %)	Total No. of Connections	Average Daily Demand (m ³ /day)	Peak Daily Demand (m ³ /day)
Huntly	8,000	6,700	1,089,901	320 l/conn/d	31.6%	2,809	3,350	4,689
Central District	4,550	5,100	1,040,128	366 l/conn/d	34.7%	2,627	3,166	4,558
Mid Waikato Te Kauwhata and surrounds)	3,800	22,900 (4,000) As per agreement with TKIA)	579,084	6.2 m ³ /km/d	36.3%	1,089	1,656	2,815
Raglan	3,300	3,100 (Riki spring)	576,404	260 l/conn/d	28.9%	1,741	1,614	2,421
Te Akau	68	68	1,258	N/A	35.9%	26	4	23
Southern and Western Districts		12,000 (as per agreement with Hamilton City Council)	774,170	1.1 m ³ /km/d	17.6%	2,840	1,903	3,533
Onewhero	65	No Consent, permitted activity	1,900	N/A	12.9%	12	7	21
Pokeno		5,000 (as per agreement with Watercare)	157,150	3.3 m ³ /km/d	36.1%	735	2,138	3,207
Tuakau			532,608	103 l/conn/d	16.8%	2054		
Port Waikato	143	80	11,393	N/A	54.6%	17	28	73

Source: Water Balance Report 2017, Thomas Consultants. Demand Balance Forecasts 2017/18 to 2047/48, MWH

12.2 Meeting Future Demand

The 50 Year Water Supply Strategy is focused on understanding the future needs of each community and includes the development of options that consider both availability of water resources and the capacity of infrastructure to deliver this across the district. The strategy leverages from existing information and reviews it holistically from a district –wide perspective to identify options to improve efficiency. The strategy also provides a foundation for WDC to write up the water supply aspects of Council’s infrastructure strategy.

Table 12: Demand Projects

Scheme	Description	Indicative Capital Cost Estimate	Forecast Financial Year for Capital Cost	Comments
Central Waikato area	Transmission from Huntly to Ngaruawahia via Taupiri/Hopuhopu allow 8.5km 300mm pipeline 7.4km 225mm and 4000m ³ /day pump station	\$12,530,000	2017	Ngaruawahia to Hopuhopu completed and Hopuhopu to Huntly will be complete in Oct-Nov 2017
Central Waikato area	Construct additional storage and a booster pump station at Horotiu	\$2,500,000	2017	Jackson Street reservoir expected to be completed Aug 2017
Central Waikato area	Construct a new Tainui reservoir at Hopuhopu to replace the existing reservoir	\$1,100,000	2017	Expected to be completed Oct 2017
Southern District	Additional storage reservoir of 2,890m ³ required to provide 24 hours of storage at Annual Average Daily Demand	\$2,170,000	2017/18	No land cost included. New storage needed urgently as current reservoir provides less than 6 hours storage at Annual Average Daily Demand.
Western District	Additional storage reservoir of 185m ³ required to provide 24 hours of storage at Annual Average Daily Demand	\$185,000	2015/16	No land cost included. New storage needed urgently as current reservoir provides less than 1 hour storage at Annual Average Daily Demand.
Tuakau	2.7km of 375mm dia pipeline trunk mains from Watercare BSP to Harrisville Road reservoirs	\$3,230,000	2015/16	Completed
Te Kauwhata	New WTP required 3,340 m ³ /day (could be staged construction). Includes addition of UV disinfection	\$5,652,000	2017/18 Peak day demand trigger 3,080 m ³ /day	Land cost not included. May need new site due to limited existing site. Current WTP design capacity expected to be exceeded by 2017/18.
Pokeno	4.7km of 300mm dia pipeline trunk mains from Harrison Grierson layout	\$4,100,000	2015/16	Completed

	(that are not being built summer 2014/15)			
Pokeno	Pokeno reservoir	\$1,400,00	2017	Expected to be completed by Oct – Nov 2017
Te Akau	Nominal amount for treatment upgrade of a cartridge filter and small capacity UV installation.	\$30,000	Uncertain	Timing depends on NZDWS compliance dates
Tuakau	Additional storage reservoir of 1,520m ³ required to provide 24 hours of storage at Annual Average Daily Demand	\$1,125,000	2028/29	No land cost included. Average day demand trigger 2,405 m ³ /day.
Te Kauwhata	Additional storage reservoir of 1,200m ³ required to provide 24 hours of storage at Annual Average Daily Demand	\$1,200,000	2029/30	No land cost included. Average day demand trigger 3,000 m ³ /day

13 Demand Forecast – Wastewater

13.1 Projected Growth of the Wastewater Activity

Initially Council engaged MWH NZ Ltd in 2014 to develop a 50 Year Wastewater Strategy, part of the strategy included preparing Wastewater influent flow forecasts for the 50-year period. In 2017 reviewed and updated forecasts were prepared by Stantec.

For the basis of the forecast, influent flows to the WWTP were developed rather than the WWTP discharge flows as influent flows are the basis for the design of any WWTP upgrades. For the larger schemes, historic WWTP inflows were compared to discharge flows to estimate attenuation (if any) of peak flows through the WWTP. It was assumed that properties rated for the wastewater service had a single connection to the network.

The forecast population for each year from 2018 to 2048 was estimated by multiplying the forecast total number of wastewater connections for the year by the forecast household occupancy for that same year on a scheme by scheme basis.

- Matangi, where it was assumed that only 6% of new households forecast equated to new connections. WDC have estimated that about 6% of the growth will be due to infilling within the existing reticulated scheme boundary. The remainder of the growth will be outside the scheme boundary and serviced by on-site wastewater systems. Council does not intend to extend the wastewater scheme boundary to include outlying areas.
- Maramarua, Tauwhare Pa and Te Kowhai, where it was assumed that there was no growth in the wastewater scheme (ie all new households forecast in the census area unit were assumed to be serviced by on-site wastewater systems).

A review of the resulting annual number of new connections forecast for each scheme initially identified negative new connections for Raglan between 2032 and 2048 (-8 or -9 connections per year) and for Tuakau between 2032 and 2041 (-5 connections per year). For the purpose of this report, it was assumed that there was no annual decline (or growth) in connection numbers for these years (assumed 0 connections per year in place of negative values). The 'original' forecast and the 'modified' forecast annual new connections are shown for both Raglan and Tuakau in this Section, however only the 'modified' forecast is used in the remainder of this Report.

For Mid Waikato two additional scenarios were also considered:

- a private plan change for an additional 1,500 lots over and above WDC's household projections based on Statistics New Zealand's data. For the purpose of this report, it was assumed that the private plan change would result in an additional 150 wastewater connections each year for 10 years from 2020.
- Discharging Mid Waikato flows to Huntly WWTP. For this scenario, it was assumed that the population was the WDC household projection plus the private plan change for an additional 1,500 lots.

The forecast household occupancy for a particular year was calculated by dividing the forecast population for that year by the forecast household numbers from WDC's projections for the relevant census area unit(s).

Population growth data was provided for specific areas. However, the area boundaries do not necessarily correspond to the areas serviced by the individual wastewater schemes. Therefore it was necessary to make assumptions in order to make predictions. Growth rates were determined using population data from communities that were assumed to be either wholly or partially serviced by the schemes.

The on-going increases in flow that can be seen from the following figures, is driven by population growth. These flow predictions do not take into consideration the possibility of volumetric charging for wastewater or any other demand management incentives in addition to those already in place.

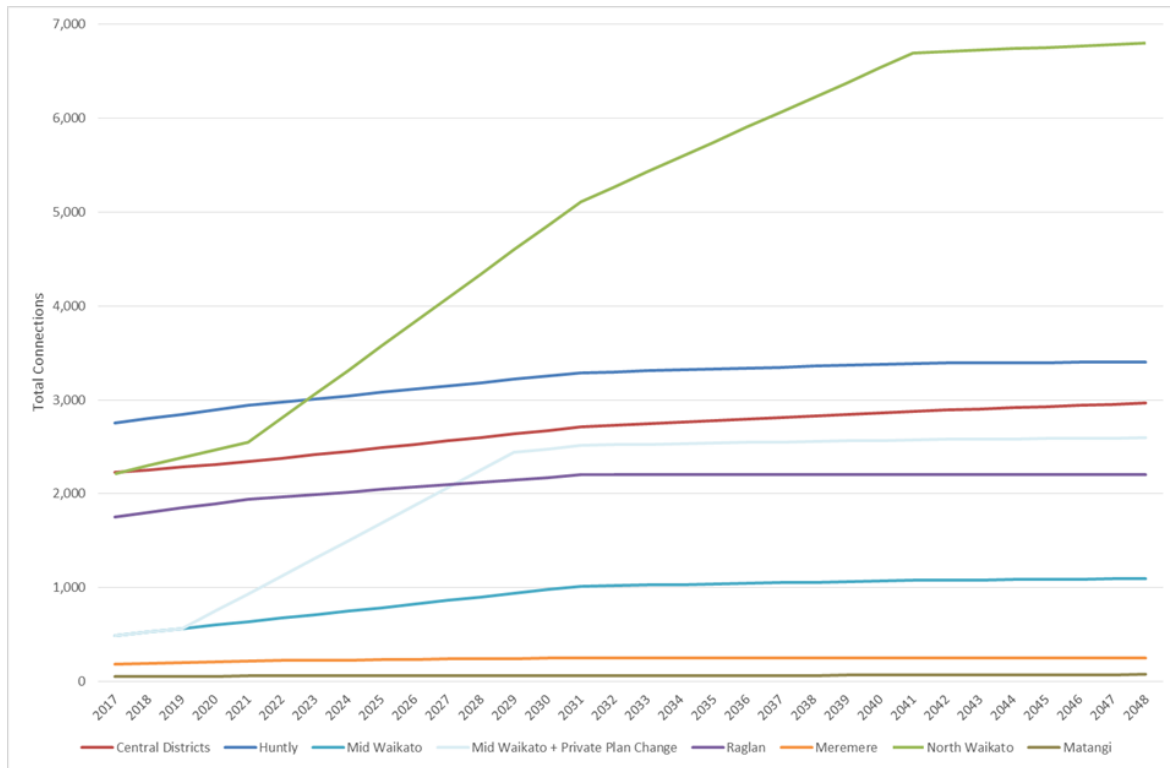


Figure 69: Wastewater Connection forecasts
Source: Stantec, WDC WW Forecasts 2017

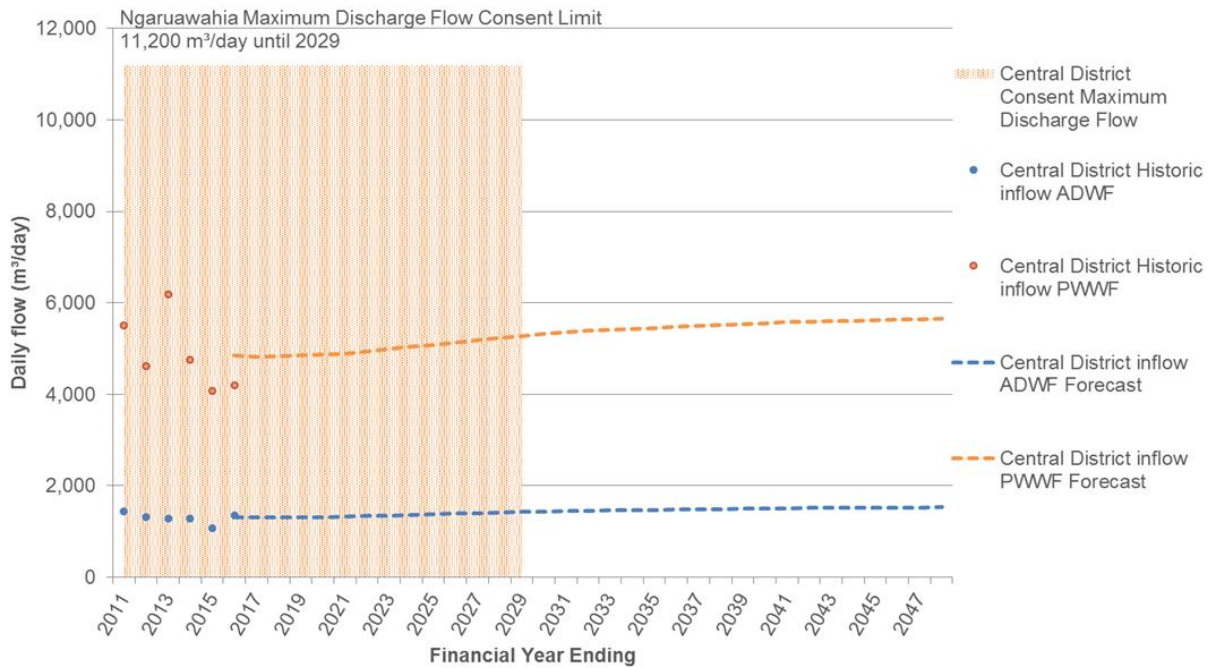


Figure 70: Central District (Ngaruawahia) Flow Forecast
Source: Stantec, WDC WW Forecasts 2017

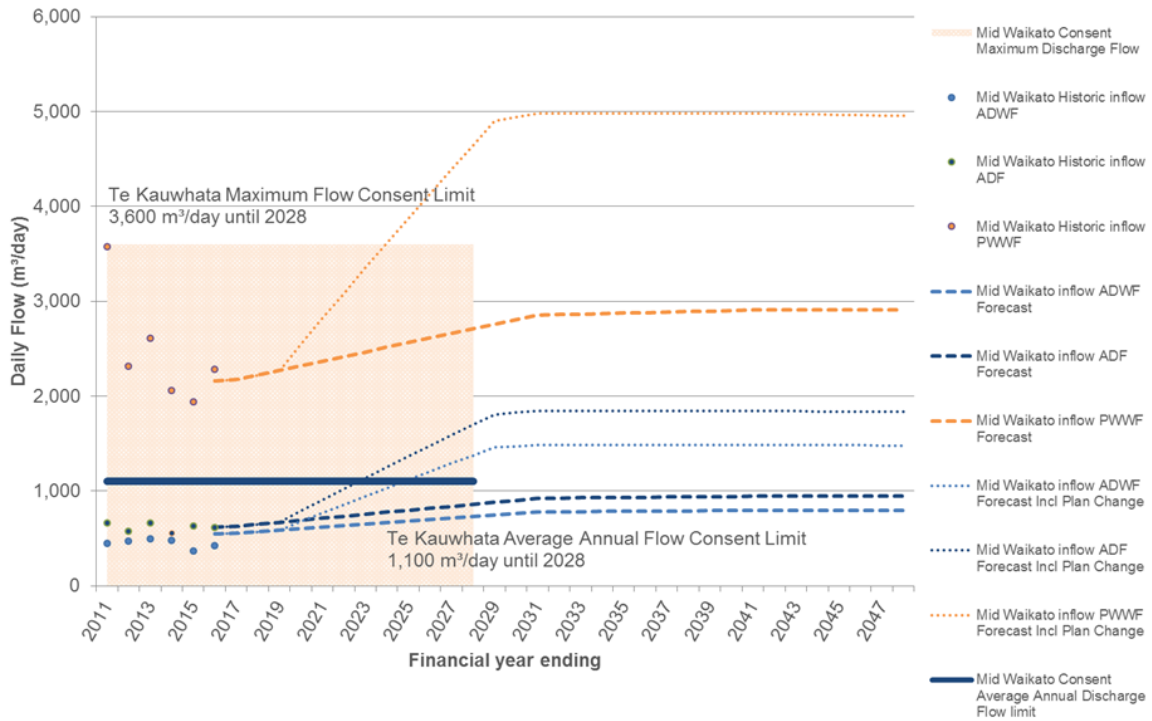


Figure 71: Mid Waikato (Te Kauwhata) Flow Forecast

Source: Stantec, WDC WW Forecasts 2017

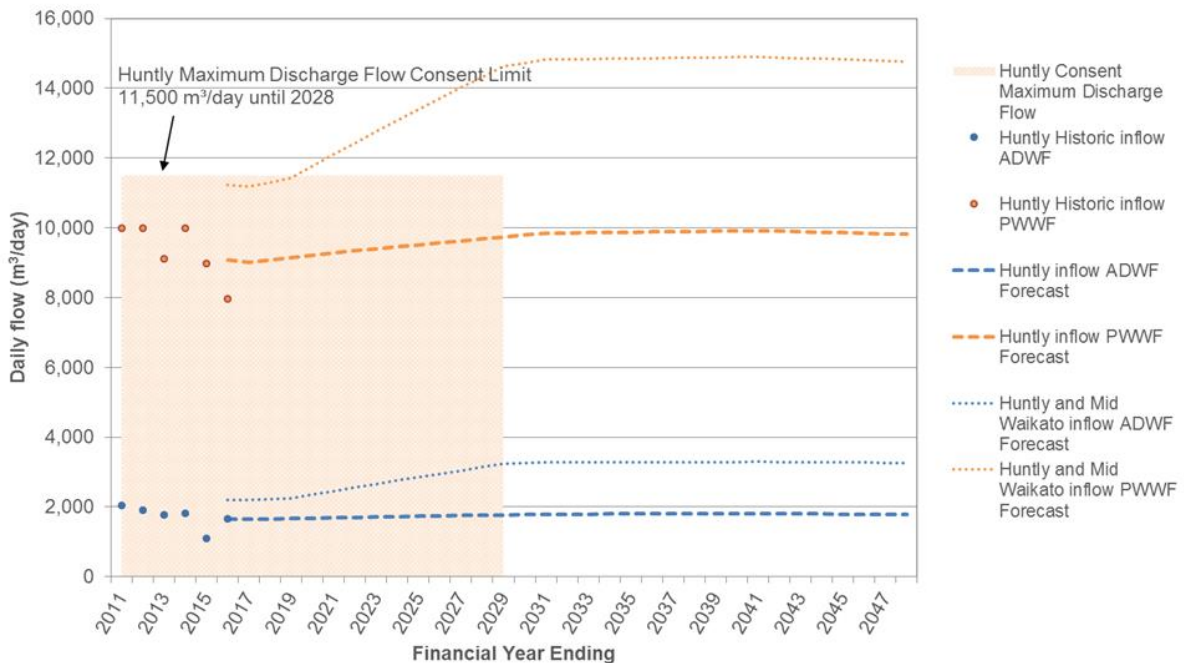


Figure 72: Huntly Wastewater Flow Forecast

Source: Stantec, WDC WW Forecasts 2017

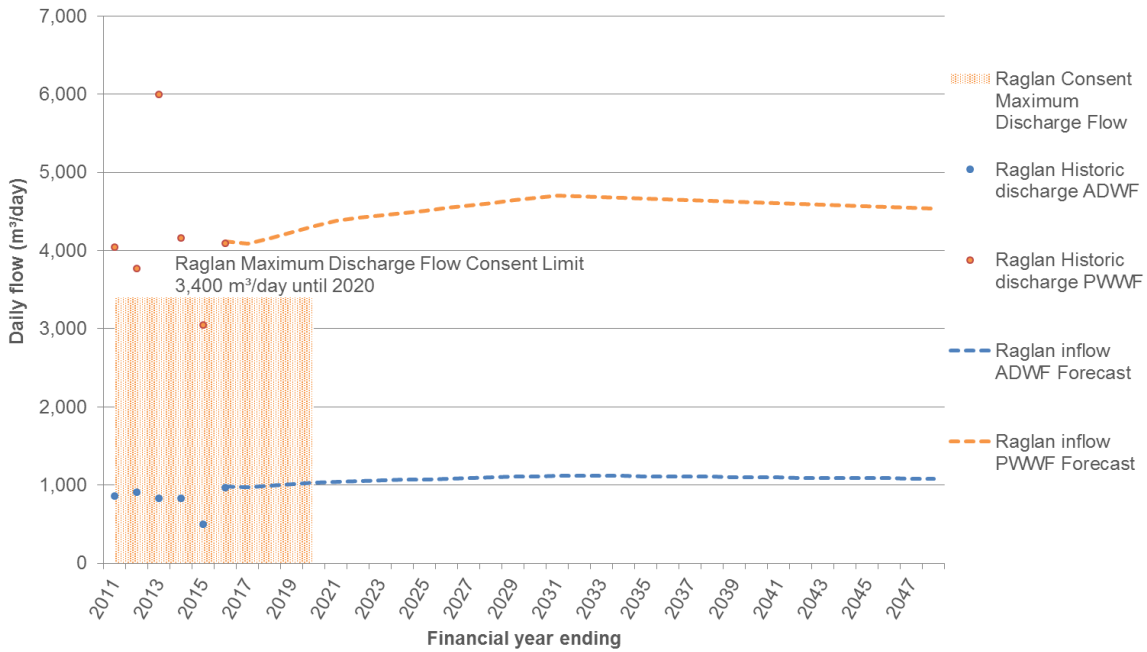


Figure 73: Raglan Wastewater Flow Forecast

Source: Stantec, WDC WW Forecasts 2017

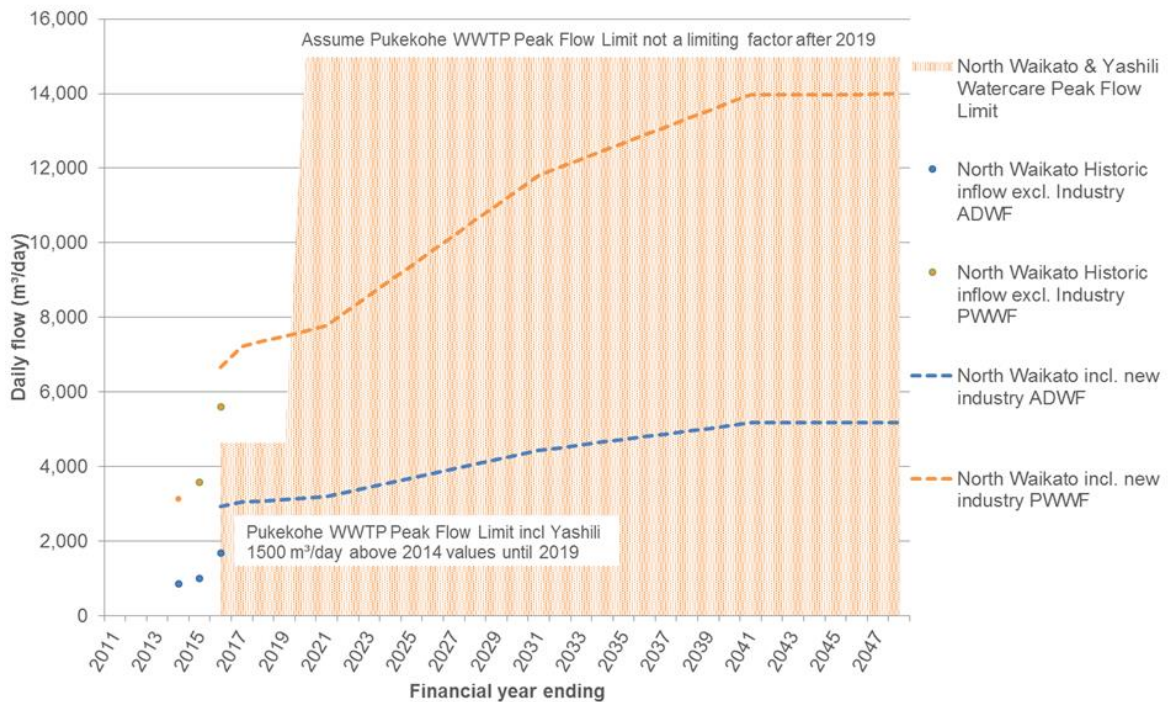


Figure 74: North Waikato (Tuakau/Pokeno) Wastewater Flow Forecast

Source: Stantec, WDC WW Forecasts 2017

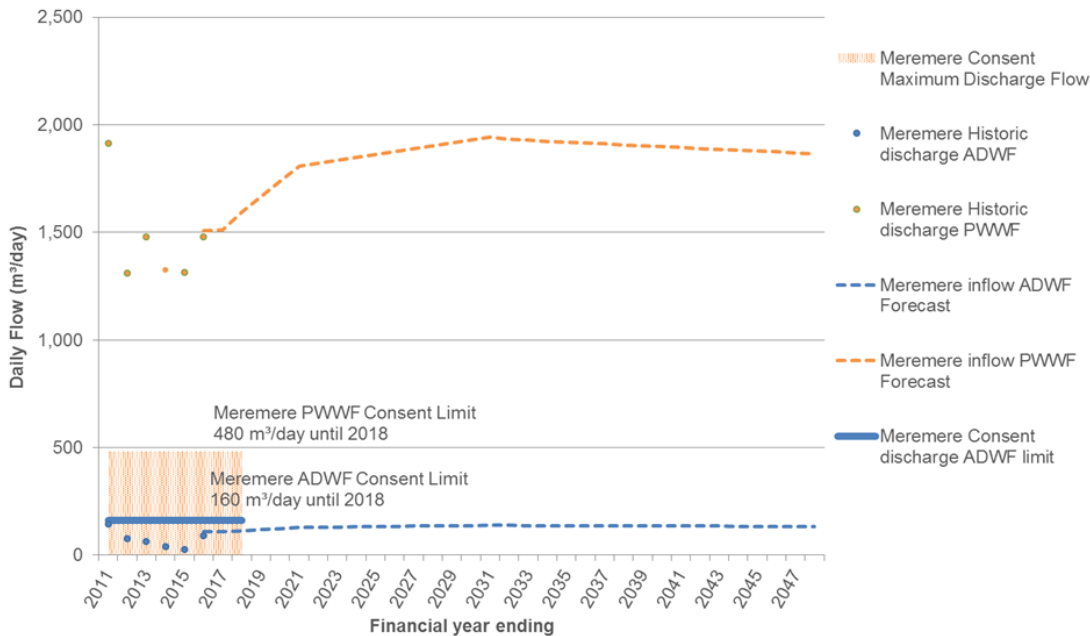


Figure 75: Meremere Wastewater Flow Forecast

Source: Stantec, WDC WW Forecasts 2017

14 Demand Forecast – Stormwater

14.1 Projected Growth of the Stormwater Activity

The data around projected growth for stormwater is minimal however it can be heavily correlated to urban growth and development. To undertake projected growth in stormwater the following assumptions have been made:

- Average lot size is 600 sq.m and overall fraction impervious is 60% (including road, houses and hardstand areas).
- It has been assumed that 10 metres of stormwater reticulation will be provided per household. This considers an average lot front of 20 metres, trunk mains and tie-ins. Further to this it has been assumed that 50% of stormwater reticulation will be undertaken using swales.
- It has been assumed that wetlands and attenuation areas are equivalent to 4% of the development area. This has been undertaken under the assumption that wetlands and attenuation devices are equivalent to 2% of the development area each.
- The projected growth is based on new developments only.

The projected growth for stormwater activity based on increased median house hold developments is presented in Table 3-11. Note that the current projections for Te Kauwhata do not include the new 1500 subdivisions that have recently been passed through a land use change. Therefore, this projection has been incorporated separately into the table.

Table 13: 2028 projections for stormwater activity

Key Growth Locations	Household Medium Projection (no. Houses)	Development area projection (600 sq.m lots) (ha)	Length of SW pipe and overland swale (km)	Wetlands and Attenuation Devices (ha)
Tuakau	2118	127	10.6	3.0
Raglan	1751	105	8.8	2.5
Waikato Western Hills	1977	119	9.9	2.8
Onewhero	1739	104	8.7	2.5
Te Kauwhata	1132	68	5.7	1.6
Te Kauwhata (with 1500 lot subdiv)	2632	158	13.2	3.8
Tamahere-Tauwhare	2442	147	12.2	3.5
Huntly (All)	3158	189	15.8	4.5
Ngaruawahia	2026	122	10.1	2.9

It is likely that the above projections of stormwater infrastructure are based on new developments and the costs to Council will be minimal, other than maintenance and renewal projects. Works that are expected to increase the demand for services include retrofitting of detention and water quality devices to exiting urban development areas and upgrades identified as part of Catchment Management Plans. Works identified in Catchment Management Plan are listed are presented in Table 3-12

Table 14: Existing CMP Recommended Capital Works

Catchment Management Plan	Stormwater improvements to be undertaken by Council (Structural)	Details	Recommended Actions
Pokeno	Bridges	<p>Pokeno Road, Hitchen Road and McDonald Road bridges be upgraded to accommodate the 1% AEP peak flood flow without overtopping the carriageways and to provide a structure clear of the 1% AEP flood level.</p> <p>The Great South Road Bridge opening on the Tanitewhiora Stream is to be widened underneath to improve flood hydraulics upstream.</p>	Pokeno Bridge has been earmarked for upgrade in the future. Other bridges have not been targeted for upgrade.
	Stream Channel Widening	The stream channels immediately upstream and downstream of the large State Highway 1 arch culvert on the	Stream widening has not been identified for future upgrade.

		Tanitewhiora Stream are to be widened to ease the transition from stream channel to culvert and improve flood hydraulics upstream.	
	Culvert Upgrades	The culvert under Market Street be upgraded to accommodate the 1% AEP peak flow without overtopping the carriageway.	Culvert has not been identified for future upgrade.
Te Kauwhata	Culvert Upgrades	Upgrade Travers Road Culvert to a larger diameter	This upgrade is occurring within the next 12-18 months. Budget has not been identified.
	Infrastructure Capacity	Upgrade existing stormwater network	Some existing stormwater network upgrades have been undertaken as part operational maintenance.
	Stream Reconfiguration and Maintenance	Digging out and clearing of the Travers Road stream to increase carrying capacity and reduce roughness.	This upgrade has not been identified in the LTP.
	Railway and Travers Road Culvert Maintenance	Regular maintenance of the railway culvert, including vegetation clearance.	This upgrade has not been identified in the LTP.
Tamahere	Storage and detention	Storage/detention of stormwater in the upper catchments through construction of ponds and wetlands.	This upgrade has not been identified in the LTP.
	Waterway and culvert capacity	Increase the capacity of waterways/culverts and or configuration of the waterways at the critical downstream points and in the flood affected areas.	This upgrade has not been identified in the LTP.
	Overland Flows	Management of overland flowpaths by identifying and designating flowpaths. Rules should then be formally established to prevent obstructions from being built across the flowpaths.	This upgrade has not been identified in the LTP.
	Flooding	Construction of stop banks at critical locations along the waterways.	This upgrade has not been identified in the LTP.

	Infrastructure Capacity	New pipe networks considered to mitigate flooding in localised areas including: Roads and properties in the vicinity of the main waterways, connection of overland flow path systems to the main streams and as a connection between channels, swales and overland flow path systems.	This upgrade has not been identified in the LTP.
Raglan	Pipe Upgrade and Network Extension	Install stormwater reticulation system along the road to capture road runoff and discharge safely into receiving environment. Install stormwater reticulation to manage runoff from private property.	Raglan stormwater reticulation extensions are currently being undertaken to based on CMP.
Tuakau	Culverts	A number of culverts could be upgrades to improve flood conveyance.	This upgrade has not been identified in the LTP.
	Fish Passage	A number of weirs are potential barriers to fish. These could be removed.	This upgrade has not been identified in the LTP.
Port Waikato	Stream Diversions	Undertake western diversion and main drain diversion,	This upgrade has not been identified in the LTP.
	Bunding	Bunding of main drain on both banks	This upgrade has not been identified in the LTP.
	Water Quality	Install settling ponds, sediment traps, soakage trenches	This upgrade has not been identified in the LTP.
	Soakage	Install additional soakage areas within areas that have high soakage potential. Install catchment wide soakage tranches within road reserves where possible.	This upgrade has not been identified in the LTP.
	Road Verge Raising	Raise Road verges to prevent road runoff entering private properties.	This upgrade has not been identified in the LTP.
	Road Lowering	Lower surfaces to improve secondary flow paths	This upgrade has not been identified in the LTP.
	Temporary Ponding	Construct temporary ponding areas	This upgrade has not been identified in the LTP.
	Road side drain improvement	Upgrade the capacity of road side drains.	This upgrade has not been identified in the LTP.

	Install Rain Gardens	Install Raingardens where appropriate	This upgrade has not been identified in the LTP.
	Riparian Planting	Provide Riparian planting along each bank of the perennial water courses	This upgrade has not been identified in the LTP.
	Wetlands	Develop existing wetlands into a recreational water feature	This upgrade has not been identified in the LTP.

14.2 Activity Demand Issues

The following table outlines the demands on each scheme and any current issues.

Table 15: Anticipated Growth and Demand Effects

Scheme	Scheme Length (m)*	Expected Growth & Demand	Current Issues (LoS or Demand)
Huntly	36,984	Nil	Regional Flooding Zone Infrastructure Subsidence Zone.
Tuakau	27,313	High	Managing developer lead growth. Rezoning is occurring.
Ngaruawahia	22,027	Medium	Managing developer lead growth with some limitations due to lack of available land.
Tamahere / Tamahere Drainage District	24,589	High	Managing high subdivision growth.
Raglan	17,972	Medium	Managing developer lead growth on Rangitahi Peninsula and growth through rezoning.
Pokeno	24,073	High	Managing high developer lead growth and impacts to flood plain storage.
Te Kauwhata / Travers Road Drainage District	13,880	High	Managing Developer lead growth. Flooding at Travers Road.
Other		Low	None.

* Combined length of open drains and gravity mains.

14.3 Meeting Future Demand

Future demand on stormwater infrastructure will be met by:

Planning for the Future:

- Update and undertake catchment management plans to understand and manage the risks associated with current and future development.

Investment in Urban Growth Areas:

- Development and growth-related costs of stormwater infrastructure are transferred to developers through both design and construction of required infrastructure or development contributions.
- Renewals:
- Management of renewals by optimised decision making (balancing the financial and customer risks of having sufficient ongoing funds to deal with demand and increases in maintenance or operational costs, balanced against the cost of renewal).
- Replacement of stormwater pipes that have met their design life with pipes/alternatives that are appropriate to the catchment and the risk to the community.

Managing Levels of Service:

- Levels of service are regularly reviewed to ensure they remain up to date and in alignment with community demand, expectation and ability to pay.
- The relationship between levels of service and the cost of the service (the price/quality relationship) is agreed through consultation with the community to determine the levels of service they are prepared to pay for.
- Stormwater does not currently comply with target levels of service in some areas, and consequently there are capital projects planned to address the level of service deficit.

Legislative and Regulatory:

- WDC review and enforcement of regulatory requirements to ensure future demand on stormwater and water quality is being mitigated and met.
- WDC review and enforcement of legislative requirements to ensure future demand on stormwater and water quality is being mitigated and met.
- Development of structure plans to ensure stormwater and water quality is managed efficiently through the forward works program.

15 Demand Management – Water Supply

15.1 Demand Management Strategies

Demand management strategies provide alternatives to the creation of new assets in order to meet demand and looks at ways of modifying customer demands in order that the utilisation of existing assets is maximised and the need for new assets is deferred or reduced.

Demand management is practised continuously to maintain the total demand at reasonable and sustainable levels. The five key components of demand management when promoted as a package or strategy rather than in isolation can dramatically reduce the demand on the network.

The key components with examples are provided below:

Table 16: Demand Management Strategies

Demand Component	Water Examples
Legislation/Regulation	<ul style="list-style-type: none"> • Development of Water Management Plans • Regional Plan and District Plan • Compliance with resource consents
Education	<ul style="list-style-type: none"> • Education on water conservation • Demonstrate savings to be made from minimising potable water consumption
Incentives	<ul style="list-style-type: none"> • Provide incentives for the use of non-potable water sources • Water metering and pricing
Operation	<ul style="list-style-type: none"> • Identification of restricted activity areas to maintain security of supply • Leakage control, detection and repairs • Controlling supply pressure (e.g. PRVs) • Works programmes for renewals, upgrades and new works • Pressure Management pilot study
Demand Substitution	<ul style="list-style-type: none"> • Promote storm water use for gardens, Provide water reuse alternatives in new builds

15.2 Demand Management Actions

In addition to the above, new technologies can be effective in reducing impacts of growth and demand and the associated costs, such as:

- New materials may become available which provide for a longer life of the assets;
- New construction/rehabilitation methods may make way for savings in reinstatement or renewal costs as well as time savings; and
- New treatment systems may achieve high quality water discharged to rivers and streams at reasonable costs.

15.3 National and Regional Legislation/Regulation

The National Policy Statement for Freshwater Management 2011 will have an effect on demand for water supply. Accounting for water quantity is one of the objectives of the policy and emphasis is on the water supply authority to account for the water they supply.

Regional Polices and Plans

The Waikato Regional Policy Statement provides an overview of resource management issues in the Waikato region. It provides policies and a range of methods to achieve integrated management of natural and physical resources across resources, jurisdictional boundaries and agency functions, and guides the development of sub-ordinate plans (regional as well as district) and the consideration of resource consents. The Waikato Regional Plan contains policy and methods to manage the natural and physical resources of the Waikato region. The plan implements the Regional Policy Statement.

15.3.1 Waikato Regional Plan Variation 6 – Water Allocation

The purpose of Variation 6 to the Waikato Regional Plan is to manage the allocation and use of fresh water from the Waikato River. This variation became operative in April 2012. This change prioritises allocation to municipal and existing users over other types of user.

This affects Council's water supply activity as requests for increases in allocation to meet future demand will be under increased scrutiny and Council is expected to show that water efficiency measures are being implemented and are effective.

15.3.2 National Infrastructure Plan 2011

The National Infrastructure Plan is a forward looking strategic document that sets out a vision for infrastructure across New Zealand to be resilient, co-ordinated and contributes to economic growth and increased quality of life across the five sectors of transport, telecommunications, energy, water and social infrastructure.

The strategic opportunities identified relating to Water are:

- Better demand management practices and consistent performance criteria for water infrastructure;
- Promote partnerships and activities within the sector; and
- Ensure that the management of water assets contributes to improved social, economic, environmental and cultural wellbeing of communities.

In order to realise these opportunities the government has assessed each sector against a number of principles and water supply needs improvement across the following areas:

- Investment Analysis (does not occur or is ineffective);
- Resilience (occurs but could be further developed);
- Funding Mechanisms (does not occur or is ineffective);
- Accountability and Performance (occurs but could be further developed);
- Regulation (does not occur or is ineffective); and
- Coordination (occurs but could be further developed).

As the government focuses on addressing the issues identified in the plan, this will have a resulting impact on the water activity.

15.4 District Policies and Legislation

15.4.1 Water Policies

Existing water policies need to be reviewed in regards to the effect on demand. Potential new policies will need to be developed to provide guidance on supplying wet industry (industries which use a large volume of water).

15.4.2 Waikato District Plan

Although commercial and industrial activity has the potential to contribute to an increase in demand, the main driver for future demand for water services is population growth.

Waikato District Council has addressed increasing demand for water and water services by a mix of measures to provide capacity for additional demand, as well as education and incentives to curb demand and reduce or delay the need for new infrastructure or infrastructure upgrades.

Management is typically through land use zoning in the District Plan. This determines where residential, commercial and industrial development may take place and the conditions or restrictions that are placed on the development.

All development is required to comply with Council's Development Manual and contributions from developers are maximised in accordance with Council's Development Contributions Policy to take into account the impact of new developments on infrastructure.

15.5 Education

Current education initiatives such as Smart Water will have an effect on demand. As people become more aware of using water efficiently and water conservation measures are implemented, demand per population for the water supply will decrease.

15.6 Incentives

All water connections now have water meters and charging commenced in July 2017. Education material was provided to residents so they could monitor their water use and determine if their properties had significant leaks.

15.7 Operation

An improved understanding of the operation of the water supply network will aid in identifying opportunities for improvement and optimisation of the network. Current initiatives currently in progress such as the water loss reduction programme will affect demand for the water supply activity.

15.8 Demand Substitution

Through the Water Supply Bylaw, Council requires properties on restricted flow must have on site storage. This is to mitigate the effect of peak demands on the system as well as to allow for interruptions to the supply and for fire-fighting.

In the Waikato District Plan installation of rainwater tanks and other water efficiency devices are encouraged.

15.9 Water Demand Management Action Plan:

Council delivered a district wide Water Conservation and Demand Management Plan to the Regional Council in 2015. Specific actions are still to be developed.

To minimise the requirement to increase capacity of the network, network modelling and data capture can be used to help to reconcile the accuracy of asset data as well as identifying the condition of the assets and capacity issues to allow timely upgrades and renewals.

Network modelling has been set up for a number of schemes including Te Kauwhata, Southern Districts, Ngaruawahia, Raglan and Huntly. Models will need to be updated regularly depending on the growth rates.

With the smaller schemes little benefit is achieved through hydraulic modelling due to the size.

15.10 Water Demand Management Targets

Waikato District Council has set two targets through the water demand management plan to address water sustainability water loss (reduce to 15%) and water-use efficiency – 10% reduction in peak Demand.

15.11 Water Restrictions

Rural properties in the District should have reticulated water have restricted flow meters with a standard allocation of 1.8m³ per 24 hours. Some rural properties (in North Waikato, Huntly, Ngaruawahia and Southern Districts) have on demand supplies for historical reasons. Council needs to revisit the policy around these properties and assess whether this is consistent with the direction of the water supply activity heading into the future.

Waikato District Council has adopted through the bylaw the ability to impose water restrictions to manage demand. All towns will follow alert levels issued by Hamilton City and restrictions or bans on the use of sprinklers during summer.

The table that follows provides information on alert levels and corresponding water restriction notices for sprinkler use. Drought and reservoir operational problems can result in further issuing of water restriction notices.

Table 17: Water Alert Levels and Restrictions

Alert level	Restriction
Level 1	Sprinkler systems permitted between 6-8am and 6-8pm only. No restriction on commercial/non-residential properties.
Level 2	Sprinkler systems permitted between 6-8am and 6-8pm on alternate days only. No restriction on commercial/non-residential properties.
Level 3	Total ban on domestic sprinklers – only hand held hosing permitted. Restriction on outdoor water use for commercial/non-residential properties.
Level 4	Total ban on all external non-essential use of water. Restriction on all external water use for commercial/non-residential properties.

16 Demand Management – Wastewater

16.1 Demand Management Strategies

Demand management strategies provide alternatives to the creation of new assets in order to meet demand and looks at ways of modifying customer demands in order that the utilisation of existing assets is maximised and the need for new assets is deferred or reduced.

Demand management is practised continuously to maintain the total demand at reasonable and sustainable levels. The five key components of demand management when promoted as a package or strategy rather than in isolation can dramatically reduce the demand on the network.

The key components with examples are provided below:

Table 18: Demand Management Strategies

Demand Component	Wastewater Examples
Legislation/Regulation	<ul style="list-style-type: none"> Compliance with resource consents
Education	<ul style="list-style-type: none"> Education on the relationship between water use and wastewater production. Demonstrate the savings in cost and to the environment by minimising what ends up in the wastewater system Educating communities regarding items that should not enter the system
Incentives	<ul style="list-style-type: none"> Use dual flush toilets to save costs on water bills and to reduce space/volume requirements in the wastewater network and treatment facilities.
Operation	<ul style="list-style-type: none"> Setting design levels of service and advising the community Minimising infiltration and illegal connections Monitoring existing septic tanks maintenance and monitoring water quality to determine potential pollution Rain water reuse with on-site storage for use in toilets etc. Investigating reticulation in small rural areas and the possible funding avenues that could make this a reality Regularly CCTV mains and inspect property connections for signs of infiltration and remedy Seal system manholes and other entry points from direct storm water ingress. Works programmes for renewals, upgrades and new works Undertake optimisation review of existing plant and reticulation network Works programmes for renewals, upgrades and new works Pressure Management

16.2 Demand Management Actions

In addition to the above, new technologies can be effective in reducing impacts of growth and demand and the associated costs, such as:

- New materials may become available which provide for a longer life of the assets;
- New construction/rehabilitation methods may make way for savings in reinstatement or renewal costs as well as time savings;
- New treatment systems may achieve high quality water discharged to rivers and streams at reasonable costs.

16.3 National and Regional Legislation/Regulation

The risk of major change is high due to the changing nature of the government and politics. If major changes occur it is likely to have an impact on wastewater.

16.3.1 National Infrastructure Plan 2011

The National Infrastructure Plan is a forward looking strategic document that sets out a vision for infrastructure across New Zealand to be resilient, co-ordinated and contributes to economic growth and increased quality of life across the five sectors of transport, telecommunications, energy, water and social infrastructure.

The Strategic Opportunities identified relating to Water (including wastewater) are:

- Better demand management practices and consistent performance criteria for water infrastructure;
- Promote partnerships and activities within the sector; and
- Ensure that the management of water assets contributes to improved social, economic, environmental and cultural wellbeing of communities.

In order to realise these opportunities the government has assessed each sector against a number of principles and wastewater needs improvement across the following areas.

- Investment Analysis (does not occur or is ineffective);
- Resilience (occurs but could be further developed);
- Funding Mechanisms (does not occur or is ineffective);
- Accountability and Performance (occurs but could be further developed);
- Regulation (does not occur or is ineffective); and
- Coordination (occurs but could be further developed).

As the government focuses on addressing the issues identified in the plan, this will have a resulting impact on the wastewater activity.

Regional Polices and Plans

The Waikato Regional Policy Statement provides an overview of resource management issues in the Waikato region. It provides policies and a range of methods to achieve integrated management of natural and physical resources across resources, jurisdictional boundaries and agency functions, and guides the development of sub-ordinate plans (regional as well as district) and the consideration of resource consents. The Waikato Regional Plan contains policy and methods to manage the natural and physical resources of the Waikato region. The plan implements the Regional Policy Statement.

16.4 District Policies and Legislation

16.4.1 Trade Waste and Wastewater Bylaw 2016

Under Section 10 of the Local Government Act, Council needs to provide effective and efficient wastewater infrastructure. The regulation of trade waste allows Council to control the quality and quantity of trade waste and recover the additional costs of trade waste collection and treatment. The management of wastewater assists in protecting wastewater infrastructure from damage, removing

substances that could affect the environment, and controlling storm water discharges to the wastewater System.

16.4.2 Waikato District Plan

Although commercial and industrial activity has the potential to contribute to an increase in demand, the main driver for future demand for wastewater services is population growth.

Management is typically through land use zoning in the District Plan. This determines where residential, commercial and industrial development may take place and the conditions or restrictions that are placed on the development. Variation 16: District Wide Growth and Rural and Coastal Subdivision have been adopted, this change to the district plan limits development in rural areas.

16.5 Education

There are no current education initiatives relating to wastewater. With the development of the Smart Water programme, it is anticipated that this will extend into the wastewater sphere, as people use less water, less wastewater is produced.

Raglan 3P's education program in place, potentially going district wide education program. There is also private/public boundary education.

16.6 Incentives

Future incentives are currently being considered as part of the 50 Year Wastewater Strategy.

16.7 Operation

An improved understanding of the operation of the network will aid in identifying opportunities for improvement and optimisation of the network. Current initiatives in progress such as the development of a district wide infiltration and inflow management plan will eventually have an impact on the wastewater infrastructure.

16.8 Demand Substitution

Council currently does not promote demand substitution, this will be considered as part of future initiatives.

16.9 Wastewater Management Techniques

Management techniques for the wastewater activity include:

- Understanding current capacity;
- Minimising inflow into systems from storm water;
- Undertaking inflow and infiltration investigation;
- Ensuring appropriate development; and
- Undertaking condition surveys to assist with determination of renewals and upgrades.

16.10 Wastewater Network Modelling

To minimise the requirement to increase capacity of the network, network modelling and data capture can be used to help to reconcile the accuracy of asset data as well as identifying the condition of the

assets and capacity issues to allow timely upgrades and renewals. With the smaller schemes little benefit is achieved through hydraulic modelling due to the size.

The table below contains all the reports available on WDC wastewater network modelling.

Table 19: Network Model Summary

Locality	Town	Year	Modelled by	Title
Central Districts	Ngaruawahia	2015	Motts	Central Districts Flow Monitoring
	Taupiri			
	Horotiu			
	Hopuhopu			
			2016	Motts
Huntly		2015	Motts	Huntly System Performance
Raglan		2010	GHD	Report for Raglan Wastewater - Network Modelling
		2015	Motts	Data Gap Analysis
		2017	Motts	Raglan System Performance and Options Analysis
Te Kauwhata		2009	GHD	Report for Te Kauwhata Wastewater - Network Modelling
		2016	Motts	Model Gap Analysis
Tuakau		2014	Motts	Tuakau Wastewater Modelling - Model Update and Calibration
		2014	Motts	Tuakau Wastewater Modelling - System - Performance Report

16.11 On-site Wastewater Systems Collection

On-site wastewater systems and septic tanks within and from outside the District are emptied by contractors and discharged at the Huntly wastewater treatment plant's septic facility. When the system was first commissioned, the expectation was that all properties not serviced by a Council system within the district would regularly maintain their onsite systems and dispose of waste at the Council septic facility. The demand was not realised, but this has highlighted the concern that on site systems are not being properly maintained. There are current issues with the septage facility, the system is not actively monitored and there are problems with controlling the quality of wastes coming in. This is suspected to be causing the quality issues at the Huntly Wastewater Treatment Plant, investigations are currently underway.

An additional septage facility has been constructed at the Raglan Wastewater Treatment Plant, this was built to provide a dedicated disposal facility for the local area. Currently septic tankers are discharging into the network. The site has yet to be commissioned as there are some issues with the design.

Council has recently been working with the Regional Council to develop closer ties in particular, to work closer with respect to requirements for onsite wastewater maintenance and reporting.

16.12 Storm water/Groundwater Infiltration

Storm water/groundwater infiltration also puts additional load on the treatment plants ultimately compromising the capacity for further residents to join the reticulated network. Council takes measures to investigate and remedy storm water infiltration including visual inspections, smoke detection surveys, flow monitoring and network modelling.

Of the larger systems Huntly, Raglan, Meremere and Te Kauwhata have had a history of known problems with storm water infiltration. Onsite inspections, smoke testing and CCTV have been undertaken recently in Huntly and Raglan. The issues are related the lack of ability to enforce repairs to private drainage, a wastewater bylaw is one avenue for providing a clear understanding of expectations of the service and subsequent ability to enforce compliance.

If infiltration/inflow could be reduced this would affect the demand for wastewater services. This issue has been considered in the CIP to reduce wastewater overflows.

17 Demand Management – Stormwater

17.1 Demand Management Strategies

Demand management strategies provide alternatives to the creation of new assets in order to meet demand. The aim of demand management is to modify customer demands to a level more compatible with existing asset and service levels and come in the form of non-structural initiatives.

17.2 Non-Structural Demand Management Strategy Initiatives

Demand management initiatives include implementing non-asset related solutions to manage the demand for a service. Waikato District Council will implement the following demand management strategies to minimise the need for investment into storm water assets.

Flood Protection:

Flood protection demand strategies relate to the level of flood protection to be provided and implementing restrictions of the type and design of development on flood prone land. WDC will continue to monitor system performance and modify design standards/District Plan ordinances as necessary.

Minimising Environmental Effect of Urban Runoff:

Waikato District Council will monitor the environmental impact of stormwater discharges to natural water and consider design and management options for drainage systems as necessary to reduce the pollutant loading of stormwater entering drainage systems. Options include public education, regulation, groundwater recharge, swales and retention facilities.

Regulation:

Waikato District Council will monitor and enforce provisions of the Local Government Act and Drainage Act to ensure that watercourses and secondary flow paths are not restricted by activities

on private property (landscaping, construction of bridges, filling, etc.). Development of Stormwater Management Plans Compliance with Resource Consents.

Capacity Upgrade:

Changing climatic systems may change flood patterns and stormwater volumes, the Council will continue to monitor flood levels and rainfall data to evaluate whether design standards are adequate.

Education:

Education on stormwater disposal, Demonstrate savings to be made from minimising stormwater discharge.

Incentives:

Provide incentives for managing stormwater onsite

Operations:

Identification of restricted activity areas to monitor discharge. Works programmes for renewals, upgrades and new works

Demand Substitution:

Promote stormwater use for gardens; provide water reuse alternatives in new builds.

18 Demand Management Actions

Demand management actions include national and regional legislation/regulation, district policies and legislation, education, incentives, operation, demand substitution and flood risk management.

18.1 National and Regional Legislation/Regulation

18.1.1 National Infrastructure Plan 2011

The National Infrastructure Plan is a forward looking strategic document that sets out a vision for infrastructure across New Zealand to be resilient, co-ordinated and contributes to economic growth and increased quality of life across the five sectors of transport, telecommunications, energy, water and social infrastructure.

The strategic opportunities identified relating to the three waters activities are:

- Better demand management practises and consistent performance criteria for three waters infrastructure
- Promote partnerships and activities within the sector
- Ensure that management of three waters assets contributes to improved social, economic, environmental, and cultural wellbeing of communities.

In order to realise these opportunities the government has assessed each sector against a number of principles. The three waters activity needs improvement across the following areas:

- Investment Analysis (does not occur or is ineffective);

- Resilience (occurs but could be further developed);
- Funding Mechanisms (does not occur or is ineffective);
- Accountability and Performance (occurs but could be further developed);
- Regulation (does not occur or is ineffective); and
- Coordination (occurs but could be further developed).

As the government focuses on addressing the issues identified in the plan, this will have a resulting impact on the stormwater activity.

18.1.2 Regional Policies and Plans

The WRC has published three regional documents that relate to stormwater: the Regional Policy Statement (2000), the Regional Plan, and the Regional Flood Hazard Mitigation Plan (1997).

The WRC Regional Policy Statement discusses water quality issues and natural hazards in relation to stormwater.

- S3.4.5 Water Quality and S3.4.6 Flow Regimes outline implementation items to protect water quality and existing natural flows (including subsurface recharge) across the region.
- S3.8 Natural Hazards identifies flooding as a hazard for the region and outlines the role that the regional council has in supporting hazard management.

The WRC Regional Plan outlines the rules for stormwater discharges in Section 3.5, classifying the activity as either permitted or controlled.

The Regional Flood Hazard Mitigation Plan outlines a strategy for avoiding and reducing flood hazard risk, to give effect to the hazard management objectives of the RPS.

18.2 District Policies and Legislation

18.2.1 Stormwater Policies

Council currently does not have any stormwater policies.

18.2.2 Waikato District Plan

The Waikato District Plan is the primary tool for Council to manage the location and nature of development.

Management is typically through land use zoning in the District Plan. This determines where residential, commercial and industrial development may take place and the conditions or restrictions that are placed on the development.

Engineering requirements in the plan promote the use of alternative solutions, including swales and rain gardens. On-site attenuation requirements mean that, except in very large events, development should not be increasing peak flows above greenfield levels.

All development is required to comply with Council's Development Manual and contributions from developers are maximised in accordance with Council's Development Contributions Policy to take into account the impact of new developments on infrastructure. This Development Contributions

Policy is currently being updated to reflect the potential growth impacts around the district and the proposed changes to the Local Government Act in 2014.

18.3 Education

Council has had an education budget as part of its comprehensive resource consent conditions. However, due to resourcing issues, this budget has not been fully utilised to date.

18.4 Incentives

Council does not currently offer any incentives to change stormwater demand.

18.5 Operation

WDC proactively checks main structures and drains to ensure they continue to function properly. This reduces the need for redundancy in the design to cater for blockages. Minor reticulation is modelled as blocked when determining flood levels, to keep the requirement for proactive inspections realistic.

18.6 Demand Substitution

Council encourages the use of water sensitive designs where these are appropriate options to traditional hard engineering. The Te Kauwhata structure plan includes typical road cross sections that have water sensitive features. Studies that compare traditional stormwater reticulation against water sensitive design indicate that in many cases capital and operational costs can be similar. Water sensitive design however can improve other adverse effects such as increased flooding, erosion and changes to environment and waterway morphology as a result of changes to the discharge regime on the receiving waters.

The Council encourages commercial developers to include stormwater treatment and retention solutions such as retention ponds, tanks, increased planting and permeable paving etc.

18.7 Flood Risk Management

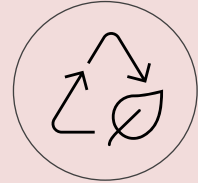
Ways to manage flood risk to residential and commercial areas include:

- Limiting development areas in flood plains or flood prone areas though the district plan;
- Assessing flood hazard in terms of the depth*velocity relationship.
- Providing conditions around filling in the floodplain (floodplain storage);
- In extreme cases where existing houses are at risk, these could be relocated;
- Levels of service could be reduced, i.e. where short term ponding is acceptable e.g. ponding stormwater on roads or parks. This reduces the need to upsize existing or provide new infrastructure;
- Ongoing works program to mitigate known flooding 'hotspots' which cause ongoing problems in the community;
- Council's on-going maintenance of known drainage 'hotspots'. This ongoing monitoring and associated maintenance (e.g. debris removal) helps to improve drainage systems to minimise flood damage; and

Allocating development contributions to take into account the impact of new developments on infrastructure.

Part 6: Sustainability Management

This section looks at the processes set up at Council for assessing and managing sustainability and Climate Change for the Three Waters Activity and its integration with Council's other activities.



I Regulatory Framework

I.1 What does sustainability mean?

Sustainability is about ensuring that all resources are used and managed for a balance of environmental, social, cultural and economic well-being. Asset management practices include actions that recognise the need for these four well-beings, namely:

- The **natural environment** needs to be preserved for future generations and not degraded as a result of Council's asset management operations and development projects;
- **Financially**, there is a limit to what ratepayers, developers, and therefore Council, can afford. Expenditure needs to remain within this limit and the costs need to fall equitably on the generations which derive the benefits;
- **Social relationships** between individuals, interest groups and local government are valuable, and Council needs to facilitate and encourage this by providing infrastructure;
- **Our history, customs and creativity are valuable to us.** Their preservation and enhancement over time is facilitated by providing venues where they can be practiced, preserved and displayed.

I.2 Statutory and Regulatory

In taking a sustainable approach to service delivery, Council must ensure that they and their contractors comply with:

- Local Government Act (2002) Amendment Act 2019
- Resource Management Act 1991
- Reserves Act 1977
- Building Act 2004
- Council's own District Plan and policies

Other acts and regulations also apply to these activities.

2 What are the main impacts of our activity?

Section 14 of the Local Government Act 2002 requires local authorities to take a sustainable development approach, by taking into account the social, economic, and cultural interests of people and communities; the need to maintain and enhance the quality of the environment; and the reasonably foreseeable needs of future generations.

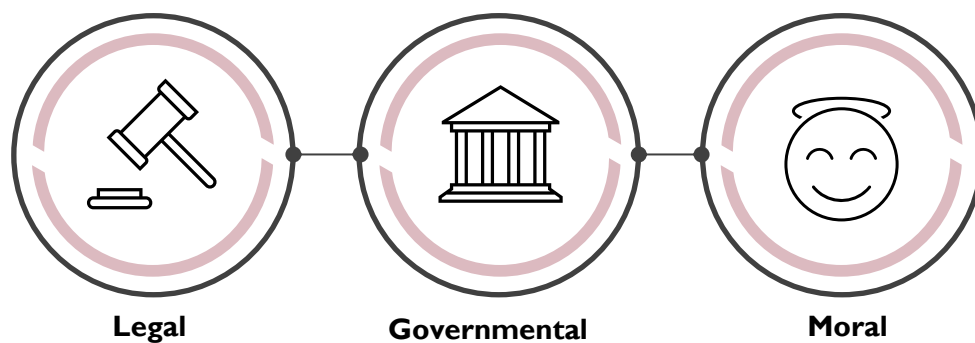
In recent years, the demand for water from the Waikato River has increased. Council is now legally required to ensure that water is used in a sustainable way. Sustainable development is about maintaining the delicate balance between improving people's standard of living and well-being over time, while at the same time preserving the resources and ecosystems on which we and future generations depend.


3 How are we dealing with Climate Change and Adaptation?

It is recognised that we need to progress from discussion to action regarding climate resilience, it is likely that climate hazards will significantly disrupt our vision for:

“liveable, thriving and connected communities” within the next 30 years.

It is accepted that without drastic action, the world will face a significant climate crisis. We have a legal, governmental and moral obligation to balance our communities' current needs, economic growth and our future.



For this reason, we want to progress our climate resilience from discussion to action in an effort to address this, on Monday 31 August, Council formally adopted an internal Climate Response and Resilience Policy .

The policy is important because it:

- Acts to protect people from risk;
- Provides a foundation to establish a consistent, standardised, all-of-organisation approach to climate resilience;
- Demonstrates and operationalises Council's commitment to take climate action;
- Acts as an enabler helping people to make decisions; requests have been received for a climate policy to assist with planning;

- Aligns the organisation with climate related legislation;
- Sets a framework within which a Climate Resilience Action Plan will be developed, in collaboration with our communities and regional partners;
- The Climate Action Project is underway to develop Councils action plan and we have made a commitment to finalise the plan prior to the end of December 2020. There is also plans to develop and implement a Climate Action Strategy that includes goals, objectives, actions, and indicators for Council



Development of Council Climate Action Strategy

The Waikato District is likely to see extremes of weather becoming more frequent. This includes warmer and wetter weather not necessarily at the same time as a result of climate change with average temperatures increasing as much as 3°C over the next 70-100 years. This could result in longer, drier summers and flooding which will put extra demand on the council's infrastructure including:

- Water activity for wet industries, garden water and irrigation (businesses that rely on water)

Rising sea levels will limit growth along the coastal regions (Port Waikato/Raglan) due to potential inundation, erosion and flooding placing development pressure on inland areas and existing infrastructure. The council has developed Proposed District Plan Natural Hazard Provisions for land use, subdivision land development currently at risk and on land that is potentially at risk in the future. This is in line with the official Government predictions and guidance³ to be used in planning the development and location of key infrastructure. The assumption of a 1m sea-level rise over at least 100 years). Hazard modelling and assessments have incorporated climate change projections where relevant, i.e. rainfall patterns and sea-level rise based on projected climate change scenarios.

The main effects of climate change on assets will be increased damage to assets over their lifecycle, leading to increased maintenance costs and possible construction costs if the asset has to be built more resiliently.

³ "Climate Change Projections for New Zealand," Ministry for the Environment, Sept. 2018; and "Climate Change Effects and Impacts Assessment: A Guide for Local Government in New Zealand," Ministry for the Environment, May 2008.

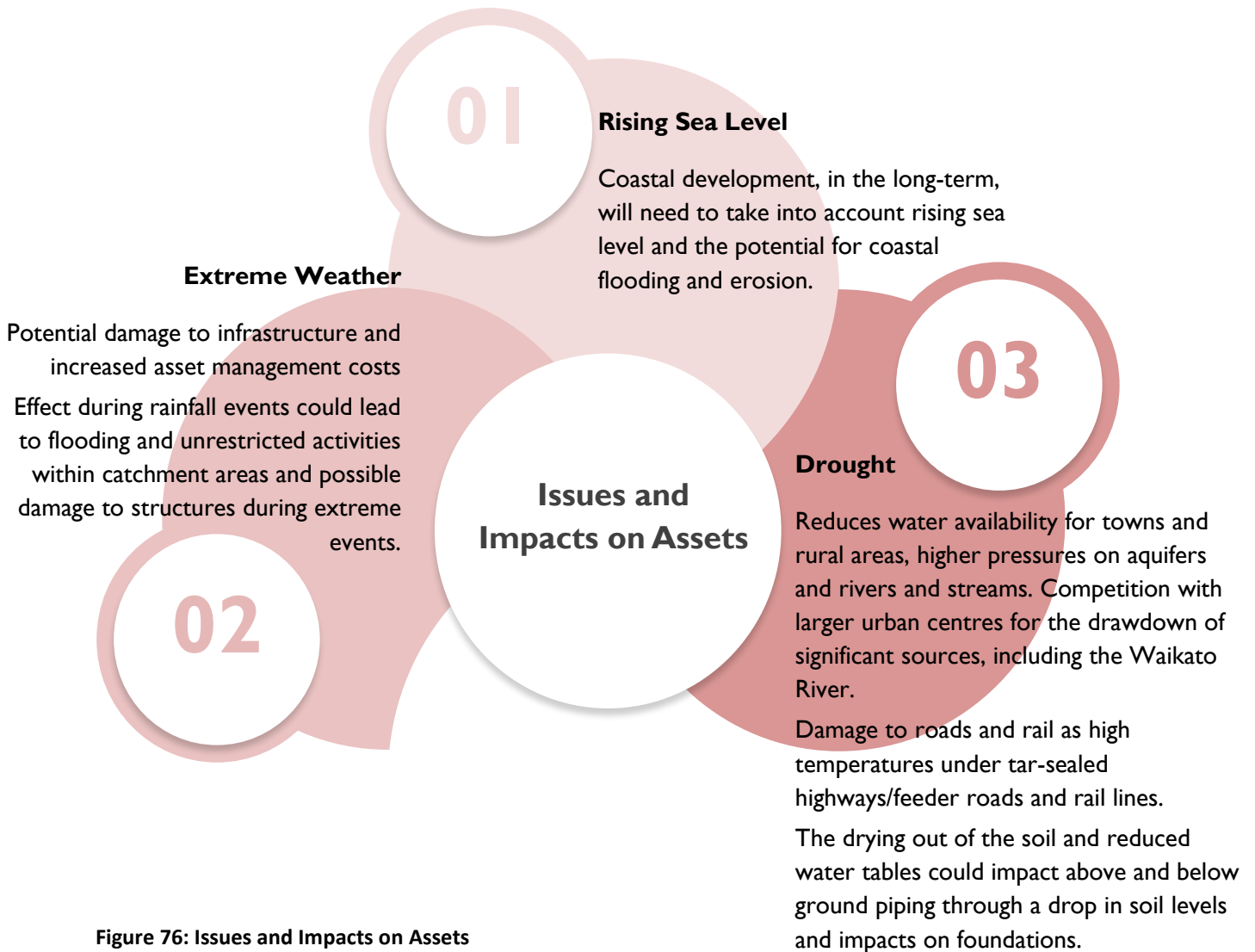


Figure 76: Issues and Impacts on Assets

4 What is the Paris Agreement?

The Paris Agreement’s central aim is to work with nations to strengthen the global response and threat of climate change by keeping a global temperature rise well below 2 degrees Celsius this century, above pre-industry levels pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius. For there to be any progression around the globe on climate change, the Paris Agreement requires all parties to put forward their best efforts through NDCs (Nationally Determined Contributions). These NDCs are specific to each country, helping them to achieve their own goals, yet help the globe combat against climate change.

New Zealand’s NDC is to reach a goal of reducing greenhouse gas emissions by 30 per cent below 2005 greenhouse gas levels which takes into effect in the 2021. New Zealand’s goal is to achieve this by the year 2030, giving New Zealand 9 years to reach this goal in order to help fight against climate change.

Alongside the NDC goal, New Zealand has developed domestic goals which are as follows;

- Net zero emissions of all greenhouse gases other than biogenic methane by 2050
- 24 to 47 per cent below 2017 biogenic methane emissions by 2050, including 10 per cent below 2017 biogenic methane emissions by 2030.

4.1 Carbon Emission Stocktake and Roadmap

In 2020, council engaged Martin Lynch from the Waikato Local Authority Shared Services (WLASS) to perform a Carbon Emissions Stocktake for the 19/20 financial year; results are outlined in the following diagram. As a result of this stocktake, it has identified that there needs to be new approaches on how to undertake the three waters activities to reduce carbon emissions. The Carbon Zero roadmap outlined in Figure 2 is a guide on how reductions can be achieved to ensure Council is compliant with the Climate Change Response (Zero Carbon) Act 2019, which came into force November 2019.

Waikato District Council GHG Emissions FY19 (2,433 TCO₂e)

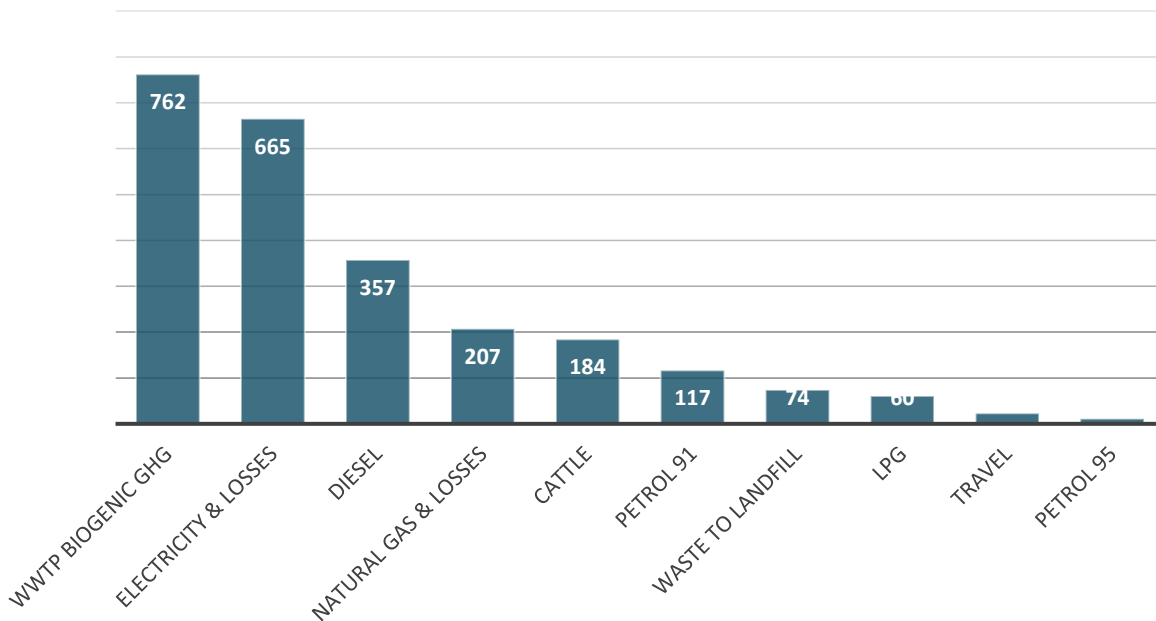


Figure 77: Carbon Emissions 2018-19 (Source - Martin Lynch - Waikato LASS)



The wastewater activity contributes directly to approximately 31.4% of the Carbon Emissions produced by Council through the wastewater treatment schemes, in order to further understand the opportunity to reduce biogenic emissions, analysis by wastewater treatment plant process type is required.

Waikato District Council Carbon Zero Road Map To 2030

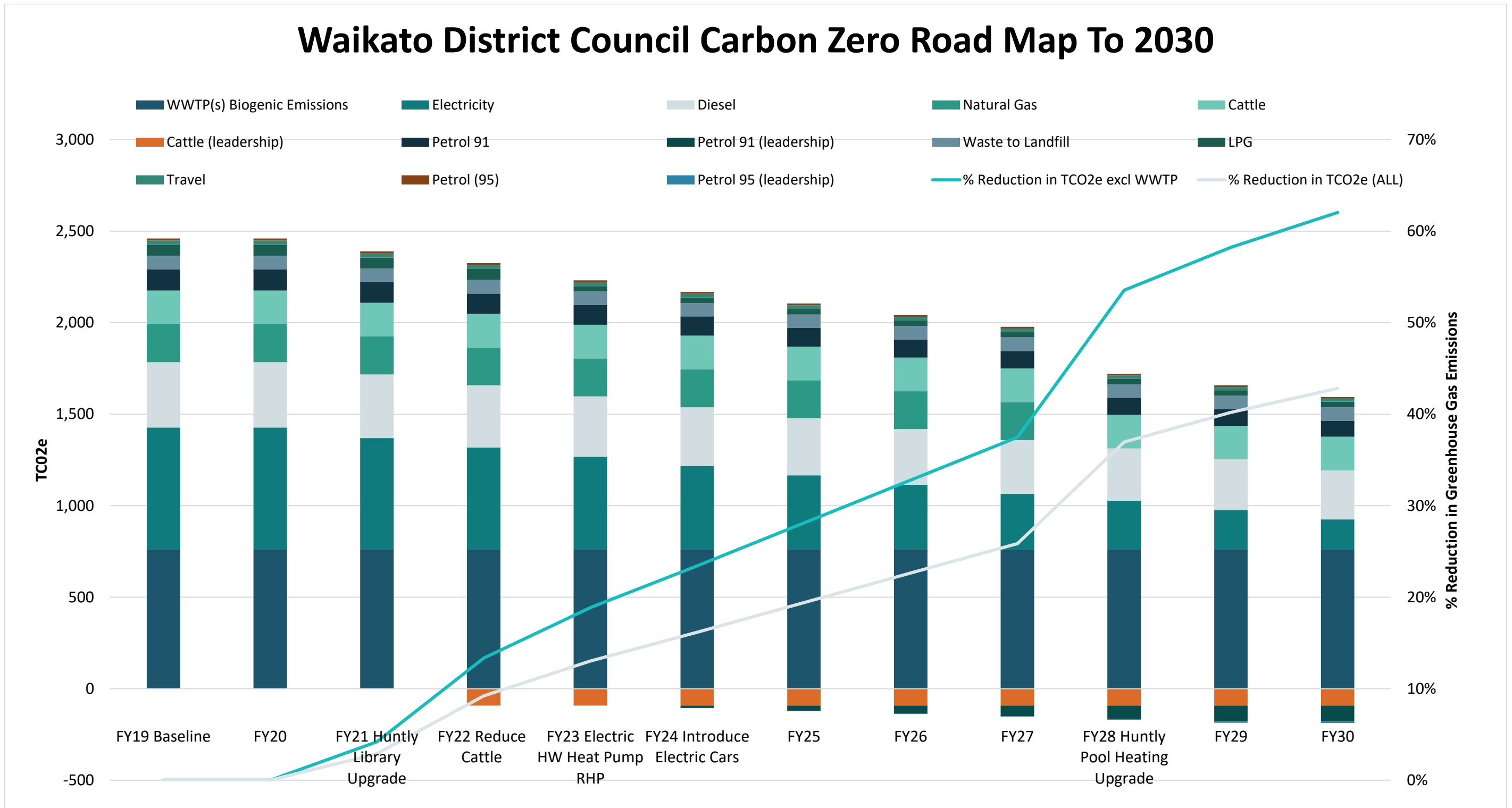


Figure 78: Carbon Change and Adaptation

5 Sustainability Challenges

Sustainable Environment – Council’s strategic focus is to have an integrated approach to providing sustainable, attractive, affordable, and safe options for living, in a way that is in tune with what ratepayers want. This needs to result in more streamlined processes that cost less while still providing required results for both community and the council.

Sustainable Communities – Council’s strategic focus is to support economic growth, rather than spatial growth, to enrich our communities through employment, improved quality of life, rather than simply encouraging population growth.

5.1 Negative Effects of Water Supply Activity

Table 98: Significant Negative Effects of the Watery Supply Activity

Significant Negative Effect	How we are Addressing This
Potential contamination of the raw water supply	Emergency response plans, operational procedures and monitoring of the raw water supply quality. Ensuring all Water Safety Plans (formerly known as Public Health Risk Management Plan, PHRMP) are developed from the Water Safety Plan Guides for Drinking Water Supplies, 2014, and are kept up to date.
Discharge of backwash water from treatment plants and chlorinated water from maintenance activities or pipe failures	Ensuring compliance with resource consents and the RITS, establishing and implementing a maintenance programme with activities effectively planned and coordinated.
Effects on river ecology caused by river water extraction during low flows	Ensuring compliance with resource consents, keeping up to date with Waikato Regional Council’s river level and flow data.
Depletion of aquifer resources	Ensuring compliance with resource consents.
Health and Safety risks associated with the operation, maintenance, or construction of water supply infrastructure	Ensuring compliance with legislation and health and safety management plans, Contractors required to comply with both Watercare and their own H&S plans. Maintaining an incidents register.
Insufficient water supplies during times of drought and emergency	Ensuring water sources security and capacity to supply future growth projections. Identifying potential new sources and back up supplies. Implementation of conservation measures.
Drinking water not meeting the Drinking Water Standard 2005	Improving water quality monitoring capacity and processes. Activities may include more test points.
Inadequate pressure and flow to fight fires	Ensuring compliance with SNZ PAS 4509:2008 New Zealand Fire Service Firefighting Water Supplies Code of Practice. Carrying out modelling/pressure testing and implement remedial works.
Water abstraction from streams and rivers can have an adverse effect on the mauri of the water body	Continuing to better identify cultural significance of water catchments through early engagement with iwi and comply with all resource consent conditions.
Insufficient water available during times of drought and emergencies	Implementing conservation measures and prioritising use for public health requirements

Base Source: Waikato Long Term Plan 2018/2028

5.2 Negative Effects of Wastewater Management Activity

The table below describes the significant negative effects associated with the wastewater activity.

Table 99: Significant Negative Effects of the Wastewater Activity

Significant Negative Effect	How We Are Addressing This
Discharges to land and waterways not complying with resource consents	Improving processes (may be capital related) and continuing to monitor discharges through improved telemetry.
Odour from manholes, pump stations and at treatment plants	Manholes and pump stations sealable lids and activated carbon odour control devices; to be reviewed and deployed as appropriate.
Surcharges from manholes	Investigating causes and look to undertake remedial works if needed. E.g. disjointed joint or broken pipe. Jetting and cleaning of main and routine CCTV of the network.
Health and safety risks associated with the operation, maintenance, or construction of wastewater infrastructure	Ensuring compliance with legislation and health and safety management plans, Contractors required to comply with both Watercare and their own H&S plans. Maintaining an incidents register.
Pump station overflows (could also be weather related)	Investigating causes, upgrading pumps where required. Pumps routinely (monthly) checked and cleaned (external washdowns and high- pressure hose)
Chemical spills at treatment plants	Ensuring procedures are in place for correct identification, storage and handling of chemicals to ensure compliance with the recent changes in legislation. Ensuring appropriate bunded areas and storage facilities are in place, as well as appropriate personal protective equipment (PPE).
The cost of providing, operating and maintaining the schemes is high due to energy requirements	Commissioning an internal energy saving study to investigate possible ways and methods for energy provision that are less costly than our current operation.
Unless properly maintained there can be problems with foul odour at treatment plants	Continuing to investigate alternative solutions for the sustainable local management of sewage sludge. Reviewing boundary planting of the buffer zone.
Creates an ongoing need for the disposal of sewage sludge	Developing a biosolids strategy to address historic accumulation in ponds, reviewing local solution and considering a centralised biosolids treatment facility.

Base Source: Waikato Long Term Plan 2018/2028

5.3 Negative Effects of Stormwater Management Activity

The management of stormwater provides a significant contribution to improving the sustainability of communities and the environment and mitigating the impacts of increased development and urbanisation through improved drainage, hazard management and the inclusion of water quality treatment devices. The following table outlines the sustainability challenges that currently impact stormwater management in the district and how they are managed by Council.

Table 100: Significant Negative Effects of Stormwater Management Activity

Significant Negative Effect	How We Are Addressing This
Discharges to land and waterways not complying with resource consents	Improving processes (may be capital related) and continuing to monitor runoff and discharges.
Discharge of contaminants to waterways and streams impacting upon public health and the environment (includes but not limited to wastewater overflows and stormwater runoff containing sediments, oils, greases and heavy metals)	Improving processes. Ensuring compliance with the council's consents, Stormwater Strategy, associated CMP's, the Regional Infrastructure Technical Standards (RITS) and the Waikato Regional Council Stormwater Management Guidelines, for new developments.
Erosion of streams and river beds	Implementing RITS and the Waikato Regional Council Stormwater Management Guidelines and the council's consents, Stormwater Strategy, associated CMP's.
Chemical spills affecting waterways	Establishing procedures and emergency response plans together with the Waikato Regional Council.
Health and safety risks associated with the operation, maintenance, or construction of stormwater infrastructure.	Ensuring compliance with legislation and health and safety management plans.
Potential impacts on customer satisfaction due to service failure/delays/responsiveness	Monitoring customer requests for service and report on Levels of service. Ensuring all customer complaints are resolved.
Disruption during the implementation of works.	Works will be implemented under resource consent and contract conditions dictating how the service will be maintained (case by case basis).
Individuals can affect the stormwater network and neighbouring properties by altering natural flowpaths	Ensuring natural flowpaths are maintained in any new developments' stormwater designs. Monitor new developments to ensure natural flowpaths are maintained. Ensuring compliance with the council's consents, Stormwater Strategy, associated CMP's, the Regional Infrastructure Technical Standards (RITS) and the Waikato Regional Council Stormwater Management Guidelines, for new developments.
Flooding can affect public health and safety	Continuing to advise land owners of potentially flood-prone areas when new flood mapping is developed. Ensuring all flood mapping is made publicly available online and is referenced in the LIMs. Proactively addressing areas of high flood risk through capital works.
Stormwater can cause public health issues through bacterial contamination of beaches	Establishing procedures and emergency response plans together with the Waikato Regional Council.
Contamination of the receiving environment is unacceptable to tangata whenua	Continuing to better identify sites of cultural significance and continual consultation with Iwi.

Base Source: Waikato Long Term Plan 2018/2028

6 Sustainability Initiatives

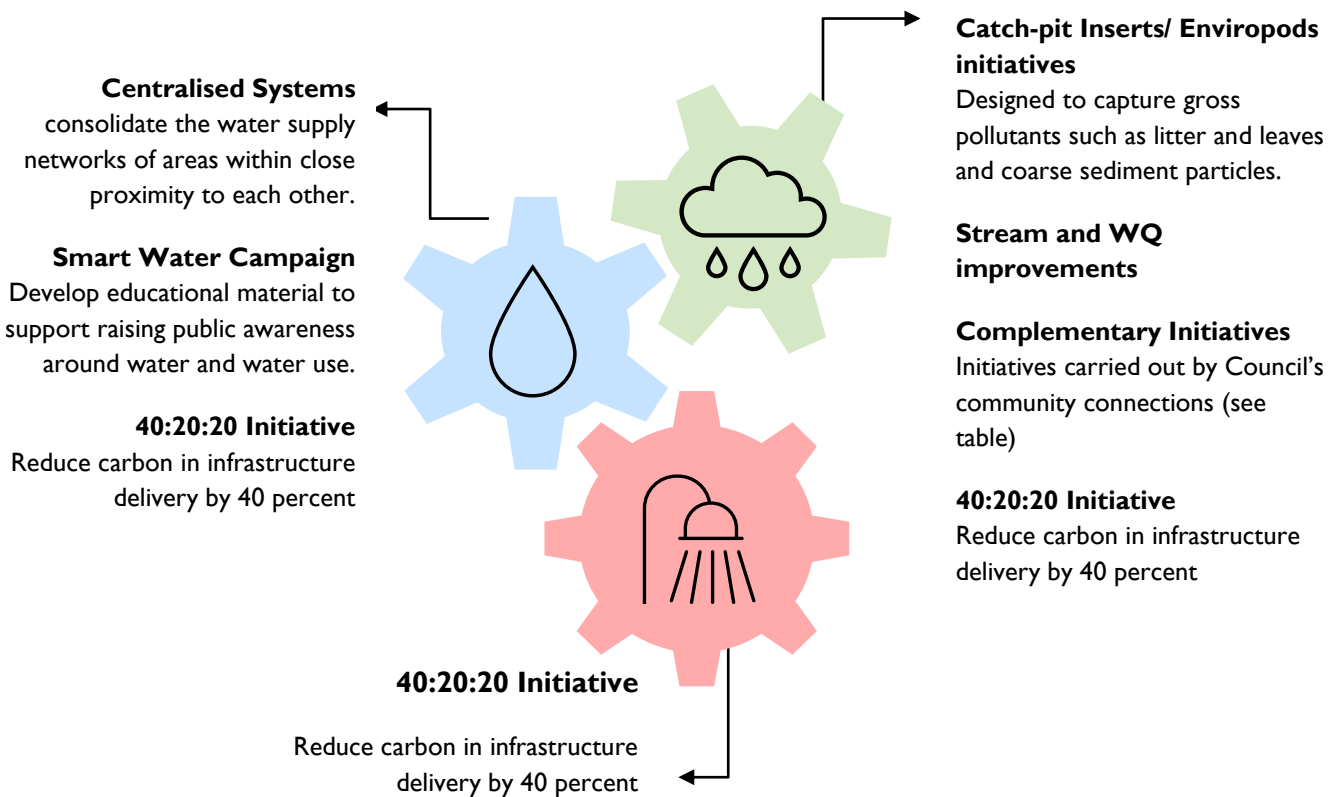


Figure 79: Three Waters Sustainability Initiatives

6.1 Centralised Systems

Council has identified the need for centralised systems, with the aim to consolidate the water supply networks of areas within close proximity to each other and identified in Council's Growth Strategy to have significant residential zones enabled within the next few years. This allows for:

- A reduced number of resource consents, with possibility of consolidating water take consents from one for each water supply scheme to one for two or more water supply schemes now interconnected.
- Improved Security of Supply for water supply networks now interconnected. For instance, Huntly and Ngaruawahia water supply networks now linked with the recent Huntly to Hopuhopu bulk watermain.

6.2 Smart Water Campaign

The Smart Water campaign was an initiative rolled out via the Waikato Regional Council in 2008 working with the region's councils. The objective of the Smart Water campaign was to develop educational material to support raising public awareness around water and water use.

In subsequent years, Hamilton City and Waikato District Council's continued to use the Smart Water Brand as part of their own Water Conservation and Education process and to support the two Council's Water Conservation and Demand Management Plans (WCDMPs).

In 2013, through the shared services partnership with Hamilton City and Waipa District Councils, a Smart Water coordinator role was established. The scope of this role was to:

- Develop and implement a Smart Water educational programme for residential, industrial/commercial customers and schools;
- Liaison with external parties to support and enhance the Smart Water educational programmes across the sub region;
- Management of the three Councils' WCDMPs and ensuring the actions are being implemented
- Overall management of the Smart Water Campaign for the three Councils (water restrictions and education campaign).

From October 2019, upon Watercare's engagement with WDC to operate their three waters networks, Watercare became a partner to the arrangement. From 1st October 2020 Watercare will assume responsibility for Smart Water from Shared Services.

6.3 40:20:20 Initiative

Our Waters Infrastructure Delivery team (under Watercare) is moving in a new direction with an ambitious 40:20:20 programme to achieve wins in sustainability, safety and costs. The 40:20:20 targets we are aiming to achieve by 2024 are:

- Reduce carbon in infrastructure delivery by 40 per cent
- Reduce the cost in infrastructure programme by 20 per cent
- Reduce the number of injuries during construction by 20 per cent year on year by improving the well-being of all people involved in delivering our infrastructure.

Tactics that will support the 40:20:20 target include a focus on standard product designs, budgeting for carbon emissions, reviewing supply and build elements of infrastructure and reimagining the way we engage. This will require new thinking and challenging the way we work to find safer, more sustainable and efficient solutions.

6.4 Stormwater

Along with Council's Response to the existing stormwater sustainability challenges, Council also proactively undertakes several initiatives to combat the impacts of stormwater on communities and the environment.

4.3.1 Catch-pit Inserts/Enviropods Initiative.

Council has installed catch-pit inserts/Enviropods in the CBD areas of Raglan, Ngaruawahia, Tuakau, Te Kauwhata and Huntly. The catch-pit inserts are designed to capture gross pollutants such as litter and leaves, and coarse sediment particles. The catch-pit inserts provide little or no removal of nutrients and fine sediments. However, they do remove larger contaminants from stormwater that may otherwise be discharged to the receiving environment. There are no plans to actively increase the catch-pit insert/enviropod capacity into other areas of the district apart from Raglan where the consent indicates that enviropods will be placed in all catchpits. It is expected that more catchpit insets/enviropods will occur through new developments.

4.3.2 Stream and WQ improvements.

Council have identified through all the CMP's that active waterway improvements are needed to improve erosion, sedimentation, water quality and biodiversity (including fish passage) of their urban waterway. Many of these items involve working together with the Open Spaces and roading teams to ensure an integrated and holistic approach. These items have been scheduled within the coming years.

4.3.3 Complementary Initiatives

Council undertakes a number of initiatives throughout the District that are complementary to its stormwater management. These are summarised in the table below

Table 101: Waikato District Council Initiatives Complementary to the Stormwater Activity

Initiative	Responsible Team	Timeframe
Aroaro Bay Wetland – continuing an ecological enhancement programme for the Aroaro Wetland next to Whaingaroa Harbour. The work includes undertaking pest plant control and native species planting to rehabilitate 2ha of saltwater marsh and associated habits.	Community Connections	On-going
Esplanade reserve planting district wide – ongoing native species planting and habitat restoration programme	Community Connections	On-going
Project working with schools to undertake a native species planting programme utilising funds from WRA 12/036	Community Connections	2013 – 2021
Partnering with Waikato Rivercare to support a range of native species planting and habitat restoration projects	Community Connections	On-going
The Pokeno Sportfield stream relocation – fish habit and planting project	DC funded – Open Spaces	2020 - 2021

7 Sustainability Initiatives for the Future

7.1 Water Supply and Wastewater Management

As part of the Metro area study (lead by others), a sub-regional action plan will be developed and will include a number of actions related to sustainable operation and maintenance of the water and wastewater activity.

The following are future initiatives Council is looking to implement:

- Bringing leading technologies to wastewater treatment, starting with Meremere MBR
- Improving rain-gauge and flow monitoring to improve data interrogation and targeted I&I.
- Use Integrated Catchment Management Plans and Water Impact Assessments to help achieve integrated and cost-effective management of land use and the three waters.
- Develop sub-regional optimised decision-making processes for three waters management and apply them when assessing technology (including new and green technology), infrastructure, processes and programmes of work.

7.2 Stormwater Management

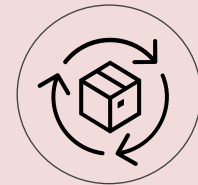
The 50-year stormwater strategy is developing long term initiatives. This strategy is now 10 years old and due for revision based on today best practise. It is expected that the strategy will be updated over the next three years and will identify the treatment of stormwater prior to discharge as a key long-term sustainability project for the activity.



Systems to record and report on sustainability initiative

Part 7: Lifecycle Management

Lifecycle cost is the total cost to Council of an asset through its life including, creation, operations and maintenance, renewal, and disposal. Council aims to manage its assets in a way that optimises the balance of these costs.

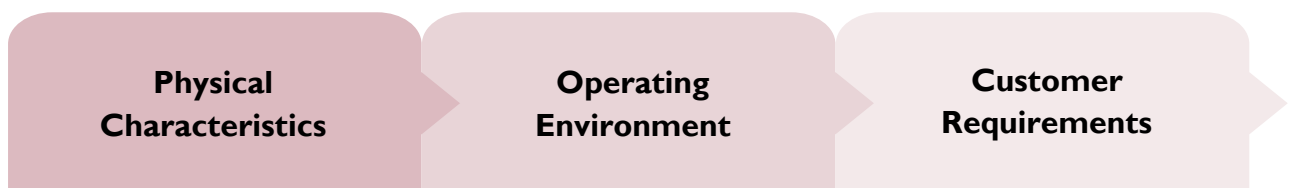


I What is lifecycle management?

Lifecycle Asset Management focuses on management options and strategies to minimise risks to assets, and any potential risk of assets.

It considers all relevant consequences from initial planning through to renewal, replacement, disposal or rationalisation of assets.

Lifecycle Asset Management acknowledges that assets are always in a state of decay and their useful life is primarily influenced by;



Lifecycle Asset Management enables Waikato District Council to identify issues, determine appropriate response options and identify strategies and programmes for response to identified issues/opportunities in order to deliver Levels of Service and achieve both asset and organisational goals and objectives.

The Lifecycle Asset Management section contains the prioritisation of works:

- That meets the short and long term needs of our community;
- That offers value for money; and
- In a sustainable manner to the least whole-of-life cost.

The prioritisation of planned maintenance, renewal/replacement and capital projects is based on:

- Level of Service requirements;
- Criticality and risk assessment associated with investment levels that potentially change the level of service;
- Age and condition of the infrastructure;
- Budgetary constraints;
- Growth – required by and supporting population and economic growth.

These key outcomes have been considered for each activity at an asset group level.

2 How Management of Infrastructure is Undertaken?

Lifecycle management for three waters assets are split into three main categories. The figure below illustrates the components of these categories.

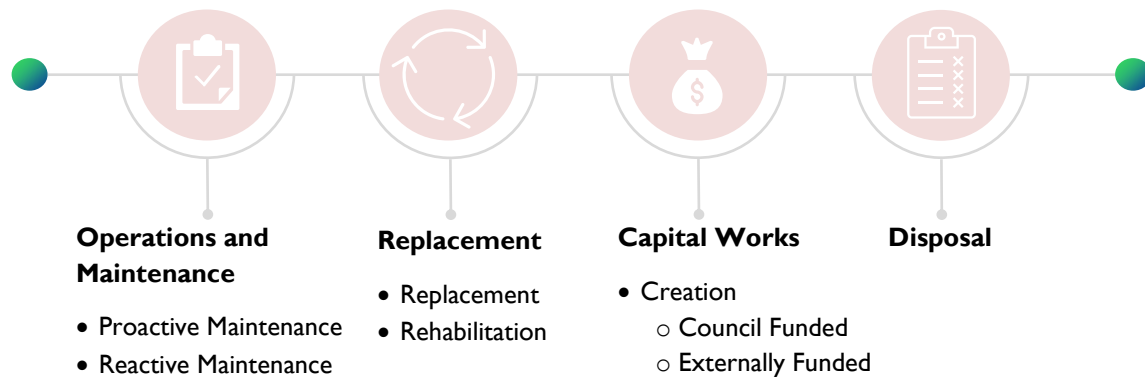


Figure 80: Lifecycle Management Categories

3 What is Operations and Maintenance, and how is it undertaken?

Operations and Maintenance work is that required for the day-to-day operation of the network to consistently achieve optimum use. A key facet of asset management planning is determining the most cost-effective blend of planned and unplanned maintenance.

The operation and maintenance of assets is undertaken through:

- **Operations** - Activities designed to ensure efficient utilisation of assets, and therefore that the assets achieve their service potential.
- **Maintenance** – Maintenance strategies are designed to enable existing assets to operate to their service potential over their useful life. This is necessary to meet service standards, achieve target standards and prevent premature asset failure or deterioration. There are two types of maintenance:
 - **Preventative Maintenance** – A base level of maintenance carried out to a predetermined schedule. Its objective to maintain the service potential of the asset system.
 - **Reactive Maintenance** – Maintenance carried out in response to reported problems or system defects. Its objective is to maintain day to day Levels of Service.

3.1 Operating and Maintenance Practices

3.1.1 District Wide Operating and Maintenance Practices

Water Supply

The Waters Treatment and Services team carries out maintenance on the water and wastewater networks and treatment plants with specialist contractors engaged as required. City Care has the

contract for operation and maintenance of the water and wastewater assets in the former Franklin District (Water supplies in Port Waikato, Onewhero, Tuakau and Pokeno).

Current maintenance activities include:

- Monitoring
- Testing
- Meter readings
- Preventative maintenance inspections and activities
- Reactive maintenance.

The majority of the existing operating and maintenance practices across the three waters activity have been in place for many years and have not been altered, in particular in the treatment plant area. Lack of documented operational plans and processes have meant that staff rely on institutional knowledge to operate the system. Generally, staff have ensured the systems run, but may not be up to current industry standards.

WINZ Database and Ministry of Health Compliance

Council is required to use the WINZ (Water Information New Zealand) database to demonstrate Drinking Water compliance. The following table outlines Council's current compliance level for the 16/17 year from the Ministry of Health Annual Report on Drinking Water Quality.

Table 102: Ministry of Health Drinking Water Quality Summary for Waikato District Council

Scheme	Distribution Zone	Population	Size	Bacteria	Protozoa	Chemical
Huntly	Huntly	7,210	Medium	✓	×	×
Huntly	Rotongaro	130	Small	✓	×	×
Ngaruawahia	Horotiu	459	Small	✓	×	×
Ngaruawahia	Ngaruawahia	5,691	Medium	✓	×	×
Western Districts	North Western Dist, Waikato DC	115	Small	✓	✓	✓
Western Districts	Western Waikato DC	33	Small	✓	✓	✓
Pokeno	Pokeno	4567	Minor	✓	×	✓
Raglan	Raglan	2750	Minor	×	×	✓
Southern Districts	Southern Districts, Waikato DC	5,466	Medium	✓	✓	✓
Ngaruawahia	Hopuhopu	200	Small	✓	×	✓
Ngaruawahia	Taupiri	529	Minor	✓	×	✓
Mid Waikato	Te Kauwhata / Rangiriri	1,410	Minor	✓	×	✓
Mid Waikato	Whangamarino Rural / Meremere	739	Minor	✓	×	✓
Tuakau	Tuakau North	823	Minor	✓	×	✓
Tuakau	Tuakau South	3,119	Minor	✓	×	✓
Port Waikato	Port Waikato	<500	Small	✓	×	✓

Scheme	Distribution Zone	Population	Size	Bacteria	Protozoa	Chemical
Onewhero	Onewhero	<500	Small	✓	×	✓
Te Akau	Te Akau	<500	Small	✓	×	✓

Operations and Maintenance Manuals

Operations and Maintenance (O&M) manuals have only been generated in response to a treatment plant upgrade. Over the years, the manuals have been developed to differing standards and qualities. Through the resource consent review, it was identified that O&M manuals are a requirement for some consents with regular reviews required to be undertaken.

WDC normally requires O&M manuals for ponds that are vested with Council by developers, but there are significantly more vested ponds than there are manuals. For all other assets, WDC only requires as built drawings at handover.

An improvement item has been raised to ensure that a process is in place to have auditable maintenance records to support compliance with resource consent conditions. In 2020 overarching operations management plans have been developed for network assets and treatment assets.



Process for auditable maintenance records supporting compliance with resource consent conditions

Planned Operational Project Works

- DW CCTV Inspection and Cleaning Programme

This 5-year programme covers all WW and critical SW pipes within the district. At the time of writing, the programme is into its 4th year. The WW network is cleaned and jetted, then CCTV is conducted on the clean pipes. Data from the contractor is fed back to staff and from this condition assessment gradings are fed into the asset management system, giving reliable information which informs the renewals programme. The added benefit of this work is that large scale cleaning of the network significantly decreases failures in the system, ensuring the network is operated at maximum efficiency. Faults such as dips and breaks in the lines can be rectified very quickly and sources of potential blockages such as intruding roots and fat are removed from the system. To date more than 80% of the DW WW network and 15% of the SW network has been cleaned and inspected.

Electrical

- Electrical PS Maintenance Inspections (*Annual rotational basis*)

WSL contracts McKay Electrical Ltd to service and maintain all electrical assets DW. A major part of this work is the routine annual inspections of all WW PS', Water Booster PS', Reservoirs and SW PS'. A thorough examination of all electrical assets is conducted, and each individual site is maintained once a year. A report is sent through to WSL staff and a remedial work schedule is generated from this. Tables below are summarised operational management plans for three waters.

Water Network

Table 103: Operational Management Plans - Water Supply

Maintenance Type	Maintenance Routine	Maintenance Details
Bulk Meter Inspection	Monthly	Bulk meter reads are carried out monthly by Reticulation staff and these numbers are fed back to the Waters Billing and Compliance team for bill processing and usage compliance checks. At the time of writing, there are 13 bulk meters DW that are read monthly.
Main Flushing	Monthly	Sediments can accumulate over a period and scour off the pipes, resulting in discolouration and taste issues. Whilst this is a purely cosmetic issue and water quality has historically remained within the limits set in the DWS, it causes concern with customers for obvious reasons. To prevent the accumulation of sediments, key lines in both Huntly East and West are flushed monthly. This involves a reticulation serviceman opening a hydrant using a hydrant stand and opening the valve to allow full flow for a period of no less than 10 minutes, but more often for a period of 25-30 minutes. The water is flushed for this minimum 10-minute timeframe or until it visually runs clear. Flushing may decrease in periods of Water Restrictions as a significant volume of water is used in this process and can result in strain on the network.
Booster Pump Station Inspections	Monthly in house - Annually by contractors	Booster PS checks involve a mechanical and basic electrical inspection to ensure that all equipment (pumps, valves etc) are functioning as intended. The amps of running pumps are checked to ensure they are operating within acceptable ranges, manual and automatic operation modes checked, line pressures checked to ensure it is between acceptable values and valves and associated pipework inspected to identify deformities or potential failure points. More in depth electrical maintenance is carried out by WSL electrical contractors McKay Electrical Ltd.
Te Kauwhata Irrigation Flushing	Monthly	The flushing of the TKIS lines, like that of Huntly above, is carried out by reticulation servicemen monthly. Although WDC/WSL do not own this network, the work is carried out on behalf of the TKIS and resultant labour costs are charged back to the client. The flushing employed here follows the same methodology as the flushing detailed above.
Fire Hydrant Checks	Bi-Monthly Rotational Basis	Fire Hydrant checks are carried out in each area on an annual basis, with the inspections rotating on a 2-monthly basis. The areas inspected are as follows: <ul style="list-style-type: none"> - Huntly - Ngaruawahia - Raglan - Southern Districts - Central (Te Kauwhata/Meremere)

Maintenance Type	Maintenance Routine	Maintenance Details
		Hydrant checks involves identification and marking of the hydrant lid with coloured paint, a physical test of the hydrant valve to ensure it operates smoothly and as intended and an inspection to ensure no leaks are present. This task is crucial for Fire and Emergency to ensure the assets are functional when required.
Huntly Rural Flushing	6 Monthly	This task is carried out with less frequency than that of the urban flushing as iron and manganese deposits are not as abundant in this area of the network and flow pressure is lower than that of the urban area, resulting in less hydraulic scouring. The methodology employed here however is generally the same as the flushing detailed previously, although in some areas there are no hydrants to flush from. In this instance, the line is bled from the end via a 50mm tapping band. As the flow rates at these points in the network are often very low, the flush may be drawn out over a period of several hours.
District Wide Main Flushing	6 Monthly	Routine flushing of all areas outside of Huntly occurs on a 6-monthly rotational basis. The methodology employed is identical as previously discussed. The need for flushing outside of the Huntly urban zone is not required as often as sediment accumulation in the network is significantly reduced elsewhere in the District.
Critical Pipe checks	6 Monthly	Critical pipes are exposed above ground water pipes that cross bridges (such as Tainui Bridge in Huntly) and other infrastructure. A visual inspection is carried out that assesses the integrity of the pipe based on security of the line to the infrastructure it is attached to (brackets, railings etc.), absence/presence of rust and paint coating and absence/presence of deformities in the pipework.
Reservoir Inspections	6 Monthly	Reservoir inspections are carried out in conjunction with the critical pipe checks detailed above. These inspections are carried out at all potable water reservoirs DW and are a visual check assessing the integrity of the reservoir roof and walls, absence/presence of leaks, visually ensure no birds or vermin can access the reservoir (e.g. mesh is intact) and assess ladder and access hatch integrity. Valves and pipework are also inspected to ensure they are free of rust, deformities and other potential failure points.
Scour Irrigation Lines	Annual	Irrigation line scouring is done on behalf of the TKIS. It involves the isolation of a portion of the irrigation network and a purge of standing water with high-volume, high velocity and low-pressure air via scour valves. This works in tandem with the monthly flushing and removes sediment therefore improving the water quality. As with the monthly flushing, the labour cost here is charged back to the client.

Wastewater Network

Table 104: Operational Management Plans - Wastewater

Maintenance Type	Maintenance Routine	Maintenance Details
WWPS inspection and washdown	Monthly	All WWPS DW are inspected and washed on a monthly basis. This involves the lifting of all pumps, checking the impellor and other mechanical parts and repairing/adjusting accordingly, checking guide rail integrity, checking safety running both pumps in a manual setting and ensuring amperage is within a correct range and a full clean of the wet well chamber to remove fat and grease build up. If excessive silt or rag is observed in the base of the wet well, vacuum tankers will be arranged to carry out a thorough cleaning. Some WWPS have carbon odour filters installed (Marine Parade PS, Waikato Esplanade PS, Springhill Prison PS), and these are checked to confirm correct functionality and determine when media requires replacement. In the event of electrical issues being noted, McKay Electrical will be sent a job tasking to rectify.
Raglan critical PS inspections	Weekly	<p>Critical PS' in Raglan are identified by a close proximity to the harbour and therefore an elevated risk should an overflow occur. As a result, the following PS' are monitored weekly in addition to monthly inspections and washdowns as detailed above. The following PS' have been identified as critical:</p> <ul style="list-style-type: none"> - Lorenzen Bay PS - Marine Parade PS - Greenslade Rd PS - Nero St PS - Wallis St PS - Daisy St PS <p>The inspections here are not as in depth as the monthly checks, more of a monitoring exercise to ensure correct functionality and comprise of a visual check of the base of the wet well, a manual run of the pumps and a check of the amperage to ensure correct operation and mitigate the risk of failure resulting in blockages that can cause WW to enter the receiving environment.</p>
Raglan MH inspections	Annually	100m MH's are defined by all MH's located within 100m of the harbour. These, like the PS' above, have been identified as being of critical importance due to the residual risk of sewer spillage into the receiving environment. The manholes are inspected for structural integrity, haunching checked, lids are checked, I&I investigated and the pipework downstream and upstream is checked for blockages and deformities using an instrument called an SL Rat. The SL Rat uses sonar pulses to identify precisely where any irregularities are situated, allowing the team to engage

Maintenance Type	Maintenance Routine	Maintenance Details
		relevant contractors (drainlayers for replacement and jetting/vacuum tanker operators for root intrusion or debris clearance).
District Wide manhole inspections	Rotational Annual Basis	The DW MH inspections are conducted in a similar manner to that of the 100m Raglan MH inspections. These are carried out annually on a rotational basis. The process is identical to the previously discussed methodology.
Septic Tank cleaning at Matangi, Te Kowhai, Kauri Marae	3 Yearly	The cleaning of septic tanks located at the above sites is based on a historic agreement between WDC and the customer. The supernatant is continuously fed via gravity feed to the associated WWTP and the cleaning is effectively just solids removal. This work was most recently conducted in Quarter 1 of 2019 and is therefore not programmed until Q1 2022. The work is arranged by WSL and carried out by a 3 rd party contractor.
WW non-return inspections	Annually	This involves the physical inspection of non-return valves located at PS'. The valves and valve chamber are visually inspected for defects and irregularities. The majority of non-return valves DW are ball type non-returns, however there are several flap-type non-returns (specifically in Taupiri) in situ as well. Once a visual inspection is complete, a mechanical inspection is conducted. This entails Isolation of the pump and rising main that passes through the non-return on the main isolation switch on the PS cabinet. The nuts and bolts are removed, and the valve plate removed to allow for a thorough inspection of the valve. Wear on the non-ball requires replacement of associated parts. Debris and rag are also cleared during this process to ensure correct operation.
WW jetting	3 Monthly	This involves the jetting and cleaning of key lines in the reticulation network. Contractors are engaged to carry this work out and work is done area by area. This is usually conducted in April/May, just prior to the arrival of inclement weather to ensure flows can be conveyed in the network efficiently.
Christmas Jetting of key lines	Annually	The Christmas jetting programme is conducted in late November / early December each year and is carried out in addition to the quarterly jetting discussed above. This work is conducted to ensure major WW lines DW are clear prior to the Christmas Holiday period to minimise faults and prevent unnecessary call outs for both WSL staff and contractors.
Septic tank clean at 114	6 Monthly	A service agreement between WDC and the property owner at 114 Wairenga Rd, Te Kauwhata is in place which involves a 6-monthly cleaning of the domestic septic tank located at the rear of the property. WDC/WSL have a sewer PS located on this

Maintenance Type	Maintenance Routine	Maintenance Details
Wairenga Rd, Te Kauwhata		property and therefore conduct cleaning of the septic tank on the customers behalf. This task is carried out by a vacuum tanker contractor and the waste product is transported to the Te Kauwhata WWTP for treatment.
Low Pressure network flushing points and air valves inspections	Annually	Low Pressure (E-One) pumping systems are in various places throughout the district. These are domestic sewer pumps serviced and maintained by WSL. Due to the nature of these pumps, blockages can be a common fault and therefore the checking of flushing points and air valves minimises this occurring. The flush points are checked for any accumulated debris or rag that could cause blockages or obstruction and the air valves inspected to ensure the efficient release of air pockets from the system that could result in faults. The valves are inspected to determine correct sealing and for signs of wear.

Stormwater Network

Table 105: Operational Management Plans - Stormwater

Maintenance Type	Maintenance Routine	Maintenance Details
Urban drain inspection and spraying	Annually	Urban drain inspections are carried out by WSL annually to determine the degree of maintenance required to maintain an efficient SW network. This work is done in summer months (Nov-Mar) in preparation for the winter rainfall. Open drains are inspected for vegetation growth and debris accumulation. Urban SW piped sections have MH's inspected for structural integrity and lines are checked for root intrusion and sediment accumulation. Based on the assessments conducted by WSL staff, suitable contractors will be arranged to carry out required remedial works, be that spraying, root removal, CCTV and cleaning of SW pipes etc.
Floodgate inspections	Annually	This work is conducted by a 3 rd party contractor (Ngaruawahia Drainage) on behalf of WSL. The work comprises a comprehensive inspection of floodgates DW and remedial works are carried out if required. The integrity of the floodgates is checked and vegetation and debris that could cause disruption to SW flow is removed via digger.
Raglan Enviropods	2 Monthly	Raglan Enviropods are inspected by WSL staff to ensure they are free of sediment and debris and to assess the condition of the Enviropod itself. The cleaning and maintenance of these assets is contracted to Xtreme Zero Waste. A report is generated by WSL staff and this is fed back to the Billing and Compliance Team for WRC.

Flood Pump Inspection	Annually	The Flood PS at Port Waikato is inspected annually to determine condition and operation of the asset. The pipework is inspected for degradation and deformities and the pump itself is serviced annually (coinciding with the inspection work) by a contractor to ensure optimal operation.
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Treatment Plants

Table 106: Routine Operations and Maintenance - Treatment Plants

Activity	Key Routine Operations and Maintenance
Water Treatment Plants	<p>Water treatment plants are operated and maintained to comply with the Drinking-water Standards for New Zealand 2005 (Revised 2018)</p> <p>The operations and maintenance task list for each water treatment plant is based on the Water Outlook procedures developed by WDC. This task list is comprehensive and will include weekly instrument verifications, quarterly instrument calibration, annual flow meter calibrations, safety compliance checks and routine daily/weekly plant checks.</p>
Wastewater Treatment Plants	<p>Wastewater treatment plants are operated and maintained to comply with various consent conditions as agreed with the Waikato Regional Council.</p> <p>The operations and maintenance task list for each wastewater treatment plant is based on the Water Outlook procedures developed by WDC. This task list is comprehensive and will include weekly instrument verifications, quarterly instrument calibration and annual flow meter calibrations, safety compliance checks, regular environmental compliance checks and routine daily/weekly plant checks.</p>
Botulism Management	<p>A botulism management plan has been developed for each of the following sites</p> <ul style="list-style-type: none"> • Huntly Wastewater Treatment Plant • Ngaruawahia Wastewater Treatment Plant • TeKauwhata Wastewater Treatment Plant • Raglan Wastewater Treatment Plant • Meremere Wastewater Treatment Plant
Water Reticulation Pressure Booster Plants	All booster plants are operated and maintained in conjunction with the Watercare Waikato networks team
Testing and Sampling	Testing and sampling for water quality, wastewater quality and networks data will be reviewed by the water quality scientist to monitor the current standards being achieved and to assess operational practices for enhancement. This will help to quantify future capital spend in the upgrading of plant and equipment.

3.1.2 District Wide Operations and Maintenance Deficiencies

Water Supply

The operation and maintenance deficiencies of the water supply assets are listed below.

Pipes

- **Unreliable Materials** - Small amounts of AC ribbed pipes and 50mm AC still in the network. On average the AC pipes are not lasting as long as had originally been expected
- **Water loss** – Better monitoring strategies will be in place in coming LTP period to measure and reduce water loss throughout the district.
- **Supply zones** - Council would like to install bulk meters at strategic points throughout the network in order to monitor consumption patterns and leakage
- **Critical assets** – A critical assets framework has been developed and has been applied to the existing assets, a regular condition assessment programme is in place to assess the condition of the most critical assets.

Point Assets

Table 107: Key Operating and Maintenance Issues of Point Assets

Point	Key Issues
Hydrants	<ul style="list-style-type: none"> • There is a hydrant flow rate testing programme in place with 10% tested each year. Grading requires static pressure to also be recorded. This will now be incorporated in the testing programme. • A hydrant flushing programme has been instigated in the last few years and needs to be reviewed. • Many hydrants across the district currently don't meet the firefighting code of practice
Service Connections	<ul style="list-style-type: none"> • The asset register is not 100% complete and has some misleading regarding the number and types of service connections existing on the network • There is a database of all the Backflow Prevention Devices (BPDs) on the network • 10% of BPD are tested each year in each scheme • Backflow preventer requirements for commercial/industrial sites are outlined in Building Act and NZDWS 2005 (Revised 2018) (These devices are tested by the property owners).
Valves	<ul style="list-style-type: none"> • Condition and performance is unknown. This is of concern as complications can arise when it is necessary to close (or open) a valve for a shutdown and it is found to be inoperable (or passing etc). • No proactive maintenance programme is currently in place for valve inspection or maintenance. The operating procedure has tended towards "fix when fails". • A shutdown procedure had been developed to capture which valves are operated and to ensure they are then opened at the end of the shutdown (other than on site turning valve cover upside-down when closed).
Meters	<ul style="list-style-type: none"> • Unaccounted for water (UFW) – difficult to measure in unmetered areas

Pump Stations

- No comprehensive maintenance programme is currently in place.

Reservoirs

- Access to tanks is secure however security requirements will need addressing for grading
- Timber tanks are not secure from stormwater and vermin
- Some concrete reservoirs are not secure from stormwater
- Timber tanks without roof liners are subject to chemical contamination
- All timber tanks need maintenance
- Metal roofs have been known to be blown off concrete tanks during high winds
- There is not sufficient capacity in the existing reservoirs.
- New reservoirs will need to be designed to earthquake standards. Existing reservoirs have not been designed to modern earthquake standards and consequently could be a risk. Earthquake standards require reservoirs to have structural investigation
- Sampling points required at reservoirs for grading
- Reservoirs do not all have bypass systems in place for isolation from the network
- Redundancy of control is required

Treatment Plants

- Not all treatment plants are compliant with DWSNZ 2005 (Revised 2018).
- Te Akau South has had continuous chlorination installed but no ability to monitor the levels remotely. Issue of proving security of the bore.
- Remote location of Te Akau prohibitive for sampling and maintenance
- Standard Operating Procedures (SOP) and Operating Manuals are limited and out-of-date
- Critical assets not specifically identified across the schemes

SCADA/Telemetry

An upgrade of the SCADA system is currently underway.

Wastewater

The operation and maintenance issues and deficiencies of the wastewater assets are listed below.

3.1.3 Point Assets

Table 108: Key Operating and Maintenance Issues of Point Assets

Point Asset	Key Issues
Manholes	<ul style="list-style-type: none"> • Meremere, Huntly and other areas with older manholes cast insitu have problems with cracked or broken haunching and ground water ingress; • Blockages in manholes; • Stormwater inflow and infiltration; • Locating buried manholes (in carriageway, driveways, gardens etc); • Maintenance for manholes is mainly reactive e.g. complaints re surcharging; • Programme for planned manhole maintenance being put together currently;
Service Connections	<ul style="list-style-type: none"> • Exact number of connections unknown – need to match rating database with AssetFinda • The condition of the service connections is unknown; • Stormwater infiltration and inflow and blockages within the reticulation system;

Point Asset	Key Issues
	<ul style="list-style-type: none"> • Root intrusions are a common cause of blockages and breaks; • Typically, there are not many customer complaints relating to service connection. Predominantly reported problems stem from items of customer property being accidentally flushed or dropped into drains • Building Inspectors are supposed to send as-builts to be recorded in the asset register however in the past there was a long period where no information was collected and therefore connections were not added to the asset register.
Other Point Assets	<ul style="list-style-type: none"> • There are 5 outfalls in the network; Meremere, Huntly, Ngaruawahia, Raglan and Te Kauwhata, that require ongoing maintenance • It is assumed the inspection bend assets have been listed in the register from new as-built.

3.1.4 Pipes

- Infiltration and inflow are concerns in all areas;
- Hydrogen Sulphide attack in areas where pump stations are discharging into gravity systems;
- Some lines with dips are causing problems. These need to be on a scheduled maintenance programme to keep regularly jetted;
- Earthenware pipes in carriageways should be looked at for replacement;
- Computer modelling of wastewater network needs to continue, to date Raglan and Te Kauwhata are underway.
- Huntly has shown subsidence areas affecting new pipes
- Data not being recorded correctly in Council systems.

3.1.5 Pump Station

- Overflows (pumping and storage). There are planned works in place in 2021/22 LTP to reduce overflows through emergency storage installations;
- A number of pump stations cannot keep up with wet weather flows resulting in overflows;
- Most pump stations have redundancy pumps at normal flow levels.

3.1.6 Treatment Plant

Table 109: Key Operating and Maintenance Issues of Treatment Plants

Treatment Plant	Key Issues
Re-circulating Sand Contactors	<ul style="list-style-type: none"> • Most of the systems installed are 10 years old 1st generation Innoflow technology. All have had refurbishment and maintenance already. Council may move to the next generation technology. Tauwhare Pa is a new scheme which has had the next generation of Innoflow Technologies installed. • Non-compliance with resource consent conditions; • Consent requirements may become stricter and include low level testing;
Oxidation Ponds	<ul style="list-style-type: none"> • The wetlands require a lot of maintenance; • The ponds do not provide reliable treatment, resulting in consent compliance breaches; • Algal blooms occur occasionally.
General	<ul style="list-style-type: none"> • Odour complaints are received occasionally regarding the Raglan plant.

Treatment Plant	Key Issues
	<ul style="list-style-type: none"> • Current capacity is not sufficient for infiltration & wet weather flows at some plants (exceeding allowable discharge limits & affecting compliance with contaminant limits); • Treatment plant sites are fenced with farm fences and signage. All of the plants are in rural settings; • Unauthorised duck shooting at some sites.

3.1.7 SCADA/Telemetry

An upgrade of the SCADA system is currently underway.

Stormwater

The operation and maintenance deficiencies of the stormwater assets are listed below.

3.1.8 Urban Open Drains

The following issues are present for WDC urban open drain assets and have been sourced from the O and M team.

- Issues with enforcing development standards on site.
- Access for maintenance.
- Scouring can be a problem in large events.
- Ownership and completeness of data.
- Flooding issues due to blockages (such as fallen trees, collapsed banks, silt build up and vegetation growth etc).
- Capacity of the drains / streams can be an issue in some areas, causing flooding,
- In coastal areas tide can affect open drains.
- Stream / drain erosion.
- Trees falling over blocking streams / drains.
- Water weeds which do not die off with chemicals used for usual spraying.
- Unclear if assets are for conveyance and/or water quality.

3.1.9 Rural Open Drains

While most of the rural drains have been handed over to WRC, the following issues are still present for the remaining rural open drain assets owned by WDC.

- Unknown what rural drains are private, WDC or WRC owned. Note that some titles show the drains to be WDC however this is not in the system.
- High workload from non-WDC assets, primarily relating to private rural land drainage issues.
- Access for inspections.
- Scouring and slumping has been an issue in the rural areas.
- Completeness and accuracy of data. Some rural pipes are listed in the rural drains data set and conversely in the urban pipes data set there are rural pipes and drains listed.
- Trees falling down and blocking rural drains during large storm events.
- Issues with enforcing development standards.

- Purpose of fencing and access for maintenance.
- Effectiveness and capacity issues.
- Capacity of the drains / streams can be an issue in some areas, resulting in flooding.
- In coastal areas tide can affect open drains.
- Stream / drain erosion.
- Trees falling over blocking streams / drains.
- Water weeds which do not die off with chemicals used for usual spraying.
- Incorrect grade of drains.
- Drains excavated too deep. Flooding of streams after rain events.
- Erosion of open drains near flap gates.
- Scouring has been an issue in the rural areas.

3.1.10 Points

The following issues are present for WDC point assets.

- Condition of the assets is not well known; asset information doesn't describe the assets (is it an inlet or an outlet or a scruffy dome)
- Completeness of data
- There is no programme for inspecting the network
- No available maintenance programmes
- It is estimated that some assets listed as sumps may in actuality, be soak-holes
- Clarity of ownership (between parks, roading etc)
- Limited stormwater treatment at outlet point
- Doubt of effectiveness of soak-holes – development standards.

3.1.11 Pipes

The condition, size and type of the pipe-network is not well known,

Blockages are only identified during storm events or CRM.

- Limited maintenance programme,
- Capacity of the pipes can be an issue in some areas.
- To date maintenance has been predominantly reactive.
- Completeness of data.
- Services have been thrust through the stormwater pipes.
- Some pipes are damaged, collapsed, broken and / or leaking.
- Incorrect grade of pipes due to bad workmanship or subsidence.
- Drains excavated deeper than pipe inlets and / or pipes too shallow.

To date maintenance has been predominantly reactive. Council is looking to move towards a programme of proactive routine maintenance.

3.1.12 Pump Stations

- Maintenance is reactive.

3.1.13 Detention Basins

- Ownership and completeness of data.
- Condition of the assets is not well known.
- Long term operational costs are not well understood.
- Maintenance is not well understood well.
- As built data is missing and not shown on intra-maps, which means that maintenance is not occurring.
- Some ponds require annual maintenance however there is no budget for this
- Some ponds have weed infestations

3.1.14 Wetlands

- Wetlands are currently no dealt with by assets operation and maintenance.

3.1.15 Water Quality Treatment Swales

- Long term operational costs are not understood
- Maintenance is not well understood.
- Unsure where these assets are.

3.1.16 Drainage Reserves

- Ownership and completeness of data.
- Maintenance is reactive.
- Long term operational costs are not understood.
- Maintenance is not well understood.

3.1.17 Overland Flow Paths

- Built over and / or obstructed – designed (E.g. by a developer or natural a natural flow towards a low point).
- Locations are generally unknown.

Three Waters Schemes – Operating and Maintenance Issues

The three waters operating and maintenance deficiencies within each of the schemes are detailed below.

Table 110: Operating and Maintenance Deficiencies - Water Supply

Scheme	Operating and Maintenance Deficiencies	Planned Interventions & Recommendations
Hopuhopu/ Taupiri	<ul style="list-style-type: none"> Significant water loss in the system, assumption that this is primarily on the Waikato Tainui network. Old Hopuhopu reservoir still exists and is in service causing some operational issues with the new reservoir now operational alongside. 	<ul style="list-style-type: none"> Program underway to decommission the old Hopuhopu Reservoir. The full operation of the new reservoir upon decommissioning of the old will need to be commissioned first.
Huntly	<ul style="list-style-type: none"> Brown water frequently experienced in the network Lack of redundancy in the network, many parts of the system are single feed. Minimum levels of service not being met with low pressure in parts of the network Jackson St reservoir’s roof and valving are in a poor condition 	<ul style="list-style-type: none"> Water supply hydraulic modelling underway to better understand the constraints in the system Jackson’s St reservoir roof and valves replacement cost included in current LTP
Central District	<ul style="list-style-type: none"> Central district experiences high head losses and minimal pressures in areas due to it being an ageing network. Inability to meet fire-fighting requirements in parts of the network 	<ul style="list-style-type: none"> Water supply hydraulic modelling underway to better understand the constraints in the system
Mid Waikato	<ul style="list-style-type: none"> Low pressure in parts of the network, and the inability to provide minimum flow rates to restricted flow properties. No centralised database of all water allocation and properties on restricted flow. The Te Kauwhata reticulation is predominantly Class B uPVC which will not withstand high pressure pumping. These pipes may require replacement; 	<ul style="list-style-type: none"> Pump station upgrade underway Class B uPVC lines will be included in priority renewal list when the maintenance cost escalates
Raglan	<ul style="list-style-type: none"> Large influx of holiday population during summer increases the demand on the water service; There are some areas of known low pressure in Raglan Pump capacity issue (being addressed as part of upgrade) Inability to meet firefighting requirements in parts of the network Sudden population growth 	<ul style="list-style-type: none"> Water supply hydraulic modelling required to understand the constraints in the system

Scheme	Operating and Maintenance Deficiencies	Planned Interventions & Recommendations
Te Akau South	<ul style="list-style-type: none"> Equipment on site not linked to any data collection and no telemetry Lack of turnover in the reservoir due to the size of the community and variable usage Meters located within properties 	<ul style="list-style-type: none"> Couple of options have been presented in 2021 LTP to keep this town supplied with quality drinking water without being too costly to Council for a small town
Southern Districts & Western Districts	<ul style="list-style-type: none"> Low pressures in more elevated areas like Eastern Hukanui and Southern Tamahere 	<ul style="list-style-type: none"> PS upgrades underway to increase boosting capacity. A programme to install more flushing points and dedicated sampling points is required due to growth and the spread of the area served.
Onewhero	<ul style="list-style-type: none"> The small system has inadequate records for operations and maintenance Non-compliant with drinking water standards 	<ul style="list-style-type: none"> Couple of options have been presented to keep this town supplied with quality drinking water without being too costly to Council for a small town.
Pokeno	<ul style="list-style-type: none"> High Non-revenue water % Lack of pressure control with the network – less elevated areas experience very high pressures while the more elevated areas like North Pokeno struggle to get minimum pressures at times. 	<ul style="list-style-type: none"> Field testing and logging of flow between the different pressure zones will kick-off to determine the likely causes of NRW and to narrow down the suspect areas. Plan to implement a programme of works to reconfigure the network. This will include zone valves with meters, PRVs and a PS to boost the more elevated areas of North Pokeno.
Port Waikato	<ul style="list-style-type: none"> Non-compliant with drinking water standards 	<ul style="list-style-type: none"> Couple of options have been presented to keep this town supplied with quality drinking water without being too costly to Council for a small town.
Tuakau	<ul style="list-style-type: none"> Pressure levels of service below minimum at more elevated areas. 	

Table 111: Operating and Maintenance Deficiencies – Wastewater

Scheme	Operating and Maintenance Deficiencies	Planned Interventions & Recommendations
Central District	<ul style="list-style-type: none"> • Effluent quality is currently not meeting the environmental requirements; • Infiltration is a problem and overloads the reticulation resulting in wet weather overflows in parts of the network; • No independent metering on the Tainui outlet into the network to monitor infiltration. • Taupiri scheme poorly constructed, assets may need replacement earlier than expected. • Key Pump stations require upgrade as growth occurs in Ngarauwahia and Horotiu. • Existing Rising main to WWTP is in extremely poor condition and also has multiple pump stations discharge into it. 	<ul style="list-style-type: none"> • Requires investigation to improve effluent quality, Actiflo operation requires attention • Requires investigation and possible solution for better management of oxidation ponds • Desludging existing ponds are programmed in LTP • District wide CCTV investigation is in place to address infiltration issues plus storage tanks installed in 2 key stations, further proposed. • Wastewater hydraulic model to be updated • Taupiri scheme is holding up at this stage, no replacement is planned but closer monitoring required • Rising main to be replaced
Huntly	<ul style="list-style-type: none"> • Infiltration rates are exacerbated by the growth of tree roots into pipe joints and lack of gully traps; • Occasional exceedance of allowable consented nutrient discharge levels from treatment plant; • Flooding of wetland from adjacent swamps; • Sewer lines in Huntly West in poor condition with aging pipes, dips in lines, cracked earthenware, fat build up and lack of maintenance; • General blockages in the network; • Current and future capacity is sufficient except for during times of severe wet weather; • Wetland was poorly constructed making maintenance difficult as it is not possible to get machinery onto the banks; • High risk rising main crossing rail bridge bringing flows from 	<ul style="list-style-type: none"> • District wide CCTV survey has identified poor condition pipes and assisted in addressing infiltration issues. • Cleaning of key trunk sewer and other pipelines has assisted in network performance • Storage tanks to be installed in 2 key Pump stations. • Critical rising main across Waikato river to be renewed this LTP period. • Oxidation pond to be desludged in this LTP period.

Maramarua	<ul style="list-style-type: none"> Overloaded due to infiltration; The sand beds filter media has been replaced within 10 years of installation (expected life was 20 years); First generation plant technology is not providing the quality of treatment required. Council is looking at moving to 2nd generation (textile filter); The treatment plant is situated at a considerable distance in comparison to the other wastewater schemes. This causes issues with maintenance; The treatment plant is located in a paddock not owned by Council and has no control over what the Body Corporate owners do on the land. 	<ul style="list-style-type: none"> District wide CCTV investigation is in place to address infiltration issues. Filter media at WWTP has been replaced in 2020
Matangi	<ul style="list-style-type: none"> This area experiences high ground water levels during winter; Better flow measurement is needed on the system. Needs to be connected to SCADA to get daily flow information required for the consent. There is currently no flow meter on the inlet; The pumps are operating more often due to high ground water; There is insufficient capacity for additional properties to be connected to the system; Matangi WWTP can't meet discharge consent conditions (disposed to relatively high-water table); 	<ul style="list-style-type: none"> District wide CCTV investigation is in place to address infiltration issues.
Meremere	<ul style="list-style-type: none"> Storm water entry into wastewater network. Remedial works have included inspecting and renovating (as necessary) all manholes; smoke detection survey and visual property inspections. These works have helped with a reduction in pump hours with significant works to reduce storm water entry are still to be undertaken; Major renewals are required due to the age of the scheme assets including the upgrade of pipework and of the submersible pumps, switchboards and communication units; The reticulation is in poor condition (1950s earthenware pipes, cracked and displaced). Many of the manholes are without bases. <p>WWTP discharge consent renewal underway, current oxidation pond system will not be able to meet future conditions</p>	<ul style="list-style-type: none"> District wide CCTV investigation is in place to understand condition issues. Defects contributing to infiltration and inflow have been remediated. Poor condition pipes and manholes to be renewed Required pump station assets replacement are added to pump station renewal program. Oxidation pond treatment pond to supplemented with a side stream MBR treatment plant in 2021.

Raglan	<ul style="list-style-type: none"> • Infiltration and direct inflow of storm water into wastewater reticulation network. Remedial works have included visual property inspections and smoke detection surveys and rehabilitation of manholes and pipes. Infiltration investigations are ongoing; • Ongoing odour complaints from one adjacent neighbour. Complaint is possibly atmospheric triggered; • Discharge consent in renewal process may drive upgrades at WWTP • Pump station overflows occur at Wallis Street during extreme weather conditions • Asbestos rising mains at end of life, still some remaining to be renewed. 	<ul style="list-style-type: none"> • Storage tanks have been installed at 2 key pump stations, Wallis St PS to have tank fitted in this LTP period. • CCTV investigation is in place • Manhole survey is in place • Upgrade of wastewater hydraulic model required to understand high I/I zones and network constraints. • Upgrade of rising main at Wainui Rd to occur in 2021 • Upgrade of plant to meet consent conditions proposed in this LTP period, consenting process will determine required upgrades.
Te Kauwhata	<ul style="list-style-type: none"> • Infiltration and direct inflow of stormwater into wastewater network is a concern. • Some manholes require remedial work; • The WWTP has multiple breaches of discharge conditions, Aquamats are in poor condition. 	<ul style="list-style-type: none"> • District wide CCTV investigation is in place to address infiltration issues. • WWTP programmed to be upgraded MBR plant to address compliance and growth issues.
Te Kowhai	<ul style="list-style-type: none"> • The current treatment system installed in 1998 was built on top of a Ministry of Works system; • The Te Kowhai scheme has been re-consented. Council was required to install a flow meter as a condition of the new consent and do additional testing; • There is limited space on the current site for expansion of the plant. 	<ul style="list-style-type: none"> • District wide CCTV investigation is in place to address infiltration issues.
North Waikato	<ul style="list-style-type: none"> • Accelerated growth in Pokeno, faster than expected high wet industry flows. • Limits on the discharge to the Watercare plant, limit the ability to accept new trade waste customers. 	<ul style="list-style-type: none"> • District wide CCTV investigation is in place to address infiltration issues. • Significant network upgrades proposed to the trunk system that transports flows from Pokeno to Tuakau and then to Watercare branch sewer.
Tauwhare Pa	<ul style="list-style-type: none"> • Ongoing issues with residents disposing of waste not permitted in system • Treatment plant is not meeting resource consent conditions 	<ul style="list-style-type: none"> • No O and M interventions have been currently identified.

Table 112: Operating and Maintenance Deficiencies - Stormwater

Scheme	Operating and Maintenance Deficiencies	Planned Interventions
Huntly	<ul style="list-style-type: none"> • There are issues with localised flooding. Where this occurs depends on river levels and storm paths. South Huntly West has some road flooding issues, Rosser St took three days to drain following the June 2014 storm. • Rosser Street has capacity issues and root intrusion / blockage issues.) • Taihua Stream erosion issues (Hakanoa Street). • A number of concrete half-pipe drains are not in the asset register. • Some open drains are close to railway lines and have limited access. • Willow Lake Road / Pandora Rise retention pond is infested with weed and requires annual maintenance. • Some open drains are becoming eroded near flap gates. 	<p>No O and M interventions have been currently identified. It is proposed that the following O and M are included in the plan:</p> <ul style="list-style-type: none"> • Need to address erosion issues of the Taihua Stream in Huntly on Hakanoa Street. This is causing private property fences to fail and loss of land. Opus is looking at this. (The cost will be approximately \$750,000 to remedy included in the LTP). • Rosser Street pipe network requires regular flushing, root cutting and debris removal. • Willow Lake Road / Pandora Rise retention pond is infested with weed and requires annual maintenance (Approx \$10,000/yr)
Ngaruawahia	<ul style="list-style-type: none"> • Issues with fall from the northern side of the Waikato River. • High water table on the northern side causes problems. • Access issues of open drains for maintenance from landowners. • Localised flooding. • Tributary Stream of the Waipa River (Waignaro Road) flooding issues. • Issues with soakage (new golf course subdivision). 	<p>No O and M interventions have been currently identified. It is proposed that the following O and M are included in the plan:</p> <ul style="list-style-type: none"> • Flooding of an unnamed tributary stream of the Waipa River (Waingaro Road, Ngaruawahia). This stream is flowing but restricted by the grade of the culvert under Thick Penny Lane. Look at relaying this. (Cost Unknown)
Raglan	<ul style="list-style-type: none"> • Low lying coastal areas are prone to storm surge. • Limited soakage and doubt of effectiveness of soakage in some areas • Missing asset data • Flooding of streams. • Collapsed pipe at 3 Cross Street. • Private stormwater pipes directing discharge into other people’s properties causing flooding and erosion. 	<p>No O and M interventions have been currently identified. It is proposed that the following O and M are included in the plan:</p> <ul style="list-style-type: none"> • Missing asset data particularly in Raglan. Require investigation and updating of GIS data. (Cost Unknown) • Pipe drain behind arts centre to control erosion and storm surges (Approx. Cost \$50,000) • Repair collapsed pipe and extend this pipe at 3 Cross Street, Raglan. (Approx. Cost Unknown).

Scheme	Operating and Maintenance Deficiencies	Planned Interventions
	<ul style="list-style-type: none"> • Lots of existing assets which belong to Waikato District Council but are not recorded on Intramaps. Big Gaps in data. • Difficult to identify areas that have missing asset data as a lot of properties are serviced by roadside swales or overland flow. 	
Te Kauwhata	<ul style="list-style-type: none"> • Minor flooding. • Previously combined sewer, now used for stormwater. • Travers Road drain Flooding issues • Blunt Road Stormwater Detention Pond gets overgrown with weeds and rushes and requires annual maintenance 	<p>No O and M interventions have been currently identified. It is proposed that the following O and M are included in the plan:</p> <ul style="list-style-type: none"> • Flooding issues from the Travers Road Drain requires investigation
Tuakau	<ul style="list-style-type: none"> • Kairoa stream suffers from willow infestation. • Overgrown drainage reserves E.G. Moria Drive. • Trees falling over and blocking flow paths 	<p>No O and M interventions have been currently identified. It is proposed that the following O and M are included in the plan:</p>
Pokeno	<ul style="list-style-type: none"> • Staying on top of the assets created by the large development projects. • Localised flooding issues 	<p>No O and M interventions have been currently identified.</p>
Port Waikato	<ul style="list-style-type: none"> • Flooding issues at Maunsell Road in two separate areas • Flooding of streams. • Flooding issues at Mission Road 	<p>No O and M interventions have been currently identified. It is proposed that the following O and M are included in the plan:</p> <ul style="list-style-type: none"> • Need to address flooding issues at Maunsell Road (flooded 5 times since 8th March 2017) and Mission Road both in Port Waikato. Investigation and potentially redesign will be required here. Unsure of the cost • Need to address flooding issues at 139 Maunsell Road. Need to divert catchment behind the houses and away from contour drain to help water get away cost is approximately (Approx. Cost Unknown).
Mercer	<ul style="list-style-type: none"> • Uncertainty around ownership of assets, including a stormwater pond. 	<p>No O and M interventions have been currently identified</p>

Scheme	Operating and Maintenance Deficiencies	Planned Interventions
Horotiu	<ul style="list-style-type: none"> • Vesting of pond is still pending. 	No O and M interventions have been currently identified
Tuawhare	<ul style="list-style-type: none"> • No known issues. 	No O and M interventions have been currently identified
Te Kowhai	<ul style="list-style-type: none"> • Some small lengths of reticulation are missing from the asset register • There are issues with localised flooding 	No O and M interventions have been currently identified
Taupiri	<ul style="list-style-type: none"> • Backwater effects cause ponding in Murphy Lane when the Waikato River is elevated. • Flooding in Te Putu Street when the river is elevated 	No O and M interventions have been currently identified
Tamahere	<ul style="list-style-type: none"> • Gulley head erosion to be addressed. • Issues with fall as this is a very flat area • Protection of overland flow paths during development. • Trees falling over and blocking flow paths 	No O and M interventions have been currently identified. It is proposed that the following O and M are included in the plan:

3.2 Capacity Assessment of the Three Waters Activities

Table 113: Scheme Capacity Summary - Water Supply

Scheme	Capacity Issues	Network Modelling	Public Health Risk Management Plan adopted
Hopuhopu & Taupiri	The newest Waikato 2070 Growth Strategy highlights significant residential and industrial rezone enabled growth in the Taupiri area particularly around the new service station. This additional demand needs to be investigated to ensure sufficient consent limits are set when Ngaruawahia/Huntly consent is renewed in 2024.	Underway	2009
Huntly	The annual consented take from the Waikato River at Huntly’s Jackson St intake will increase from 1337ML currently to 1672ML by 2039 through to its expiry in 2046. This is a maximum daily take of between 6ML and 7ML. Huntly currently has a peak demand of 4.5ML, 2MLD has been allocated to Ngaruawahia via the newly commissioned Huntly to Hopuhopu watermain. The recent Waikato2070 Growth Strategy if approved, will enable a significant residential capacity in Huntly and the north of Huntly (Ohinewai) which will initially be supplied from Huntly. This will require a consent take increase even before the next consent renewal date.	Underway	2011
Central District	<p>Ngaruawahia WTP is operating at capacity and there is no physical space for expansion. A Huntly to Hopuhopu WM was implemented and commissioned to enable Huntly to supplement demand of Ngaruawahia, Hopuhopu and Taupiri with 2MLD of Huntly treatment capacity allocated to the Ngaruawahia area. There is some growth expected in the Ngaruawahia and Horotiu areas which overall will require an assessment of water take consent to enable this growth.</p> <p>Note: The Central District Modelling work and Master Plan currently underway includes Ngaruawahia, Horotiu, Hopuhopu, Taupiri and Huntly areas with a merged hydraulic model.</p>	Underway	2009
Mid Waikato	<p>Mid-Waikato is projected to grow to a population of 10,898 people in the next 10 years.</p> <p>The existing water take for Te Kauwhata (owned by others) allows a maximum daily take of 22.9ML with maximum annual take of 2000ML and is up for renewal in 2024.</p>	Completed 2020.	2012

Scheme	Capacity Issues	Network Modelling	Public Health Risk Management Plan adopted
	Te Kauwhata WTP is currently undergoing an upgrade to 4.5MLD to take the supply area through to 2025 project population. Another upgrade to 9MLD or a new WTP (recommended) is required to enable growth beyond 2025.		
Onewhero	No expansion is planned, but analysis has been undertaken for options for compliance with the NZDWS2008.	Not Planned	To be done
Pokeno	Upgrades have been identified for Pokeno to deal with the forecasted growth. The current bulk supply from the Watercare Waikato WTP is sufficient, may require a supply increase in the near future depending on how growth in Pokeno eventuates.	Completed 2019.	To be done
Port Waikato	No expansion is planned, but analysis has been undertaken for options for compliance with the NZDWS2008.	Not Planned	To be done
Raglan	The current peak day water take consent limit for Raglan is sufficient to meet the forecast demands through to consent expiry in 2034. The peak day demands are forecast to reach 3,300 m ³ /day by the end of the planning horizon (an additional 200 m ³ /day over the existing consent limit).	Planned 2020/21	2009
Te Akau	No expansion for the future. Continuous monitoring to meet protozoa requirements will need to be assessed.	Not Planned	2009
Tuakau	There is some growth projected in Tuakau. Tuakau is currently supplied from Watercare’s Waikato Water Treatment Plant via a bulk supply point under an agreement which also cover’s Pokeno supply. Any increase required to the currently agreed take would be a Pokeno and Tuakau increase together, of which 80% would probably be required for Pokeno.	Planned 2025	2013
Southern Districts & Western Districts	The existing water supply agreement with Hamilton City Council indicates a possible future limit of 12,000 m ³ /day. Under the demand forecast based on historic data, Southern and Western District demands are forecast to come close to 8,000 m ³ /day in the future scenarios. Under the demand forecast based on the maximum allowance, Southern and Western District demands are forecast to come close to 6,000 m ³ /day by the end of the planning horizon.	Planned 2025	Adopted

Table 114: Scheme Capacity Summary – Wastewater

Scheme	Key Comments and Conclusions
Central District	<ul style="list-style-type: none"> No WWTP upgrades since 50-year Wastewater Strategy Existing consent to discharge to Waikato River expires 2029, with combined summer nutrient load limits for Ngaruawahia and Huntly WWTPs

Scheme	Key Comments and Conclusions
(including Ngaruawahia, Hopuhopu, Horotiu and Taupiri),	<ul style="list-style-type: none"> • Currently complies with all treated wastewater discharge limits, except ammonia nitrogen (possibly due to washout following wet weather and low pond temperatures) • Predicted peak WWTP inflows below consent limit to 2048 • Predicted combined summer nutrient discharge load below consent limit to consent expiry. Any new consents may be more stringent
Huntly (including Huntly and Te Ohaaki)	<ul style="list-style-type: none"> • No major WWTP upgrades since 50-year Wastewater Strategy. New Actiflo (for solids removal) on hold pending outcome of Housing Infrastructure Funding application (see Mid Waikato) • Existing consent to discharge to Waikato River expires 2029, with combined summer nutrient load limits for Ngaruawahia and Huntly WWTPs • Currently complies with all treated wastewater discharge limits, except ammonia nitrogen (possibly due to washout following wet weather and low pond temperatures) • Predicted peak WWTP inflows below consent limit to 2048 • Predicted combined summer nutrient discharge load below consent limit to consent expiry. Any new consents may be more stringent
Mid Waikato (including Te Kauwhata and Rangiriri)	<ul style="list-style-type: none"> • No major WWTP upgrades since 50-year Wastewater Strategy. • WDC awaiting outcome of Housing Infrastructure Funding application, which may see Mid Waikato flows pumped to Huntly and a major upgrade of Huntly WWTP • Existing consent to discharge to Lake Waikare expires 2028. Any new consents may be more stringent. • Currently complies with all treated wastewater discharge limits except total nitrogen and total Kjeldahl nitrogen. WDC installed additional Aquamats in 2015/16 to try and address current capacity issue • Predicted average and peak WWTP inflows below consent limits to 2048 using baseline CAU growth forecast (Scenario 1) but exceed limits before consent expiry if private plan change proceeds (Scenario 2). • Predicted peak inflows exceed Huntly consent limits from 2020 if Mid Waikato flows are transferred to Huntly (Scenario 3) and likely to require a WWTP upgrade
Raglan (including Raglan and Whaanga Coast)	<ul style="list-style-type: none"> • No major WWTP upgrades since 50-year Wastewater Strategy. • Existing consent to discharge to Raglan Harbour expires 2020. • Currently complies with all treated wastewater discharge limits except total suspended solids. WDC plan to install a tertiary membrane system to address this non-compliance. • Peak WWTP inflows currently exceed consent limits, but the WWTP may attenuate predicted peak flows below limit until consent expiry except on “wet” years. • WDC currently investigating alternative discharge options, including land disposal. Any new consents may be more stringent.
Meremere	<ul style="list-style-type: none"> • No WWTP upgrades since 50-year Wastewater Strategy • Existing consent to discharge to Waikato River expires 2018 • Currently exceeds treated wastewater discharge limits for ammonia, total Kjeldahl nitrogen, total suspended solids and biochemical oxygen demand.

Scheme	Key Comments and Conclusions
	<p>WDC undertaking inflow and infiltration (I&I) remediation with goal of improving WWTP performance</p> <ul style="list-style-type: none"> Peak WWTP inflows currently exceed consent limits, with negligible attenuation at WWTP WDC currently investigating alternative long-term treatment and discharge options as part of the re-consenting process. Any new consents may be more stringent.
North Waikato (Tuakau and Pokeno)	<ul style="list-style-type: none"> Wastewater flows discharge to Pukekohe WWTP, under Watercare Agreement that states maximum discharge flow from North Waikato is 1,500 m³/day over and above 2014 flows until 2019, when the Pukekohe WWTP will be upgraded. The Agreement also includes maximum concentration and load limits. Limited, unreliable flow data so predicted flows based on typical unit generation rates. Current Watercare Agreement need reviewing as predicted increase in peak WWTP inflows from residential population alone exceeds allowance (2,600 m³/day between 2014 and 2019). In addition, WDC has allocated key industry an increase of 1,800 m³/day from 2014 to 2019.
Matangi	<ul style="list-style-type: none"> No WWTP upgrades since 50-year Wastewater Strategy Existing consent to discharge to land expires 2021 Peak WWTP discharge flows have exceeded consent limit for three of past five years. WDC plan to carry out inflow and infiltration (I&I) investigations to address Currently no treated wastewater quality discharge limits. Any new consents may be more stringent Potential treatment and land application capacity issues
Maramarua	<ul style="list-style-type: none"> No growth allowed No WWTP upgrades since 50-year Wastewater Strategy. New consent granted in 2014 Existing consent to discharge to land expires 2039 Currently complies with all treated wastewater discharge limits Peak WWTP discharge flows have exceeded consent limit since new consent granted Potential treatment capacity issues
Tauwhare Pa	<ul style="list-style-type: none"> No growth allowed No WWTP upgrades since 50-year Wastewater Strategy. Existing consent to discharge to land expires 2035 Currently exceeds all treated wastewater discharge quality limits. WDC currently carrying out influent investigations to understand cause of non-compliances Peak WWTP discharge flows have generally not exceeded consent limit to date.
Te Kowhai	<ul style="list-style-type: none"> No growth allowed No WWTP upgrades since 50 year Wastewater Strategy. Existing consent to discharge to land expires 2018. Any new consents may be more stringent.

Scheme	Key Comments and Conclusions
	<ul style="list-style-type: none"> • Compliance data not available for 2015/16 • Peak WWTP discharge flows have generally not exceeded consent limit to date. • Potential treatment and land application capacity issues

3.3 Deferred Maintenance

If work is to be deferred, the impact on the assets and their ability to provide the required levels of service will be considered in the decision-making process. All deferred works will be reconsidered and re-prioritised in the following years annual plan programme or, if urgent, undertaken immediately.

The deferral of some items of work will not have a detrimental effect on the levels of service provided by the assets. Repeated deferral however may incur a liability in future years. There is evidence of deferred maintenance with three waters assets.

3.4 Projected Operational Expenditure

Operations and maintenance cost projections are summarised in table at the end of this document. They are based on an analysis of historical costs and estimated costs for maintaining new assets resulting from growth and future capital development programmes.

4 Asset Renewal and Replacement Plan

Renewal forecasts are intended to provide for the progressive replacement of individual assets that have reached the end of their useful life.

The rate of asset renewal is intended to maintain the overall condition of the asset system at a standard, which reflects its age profile, and ensures that the community's investment and LOS is maintained.

Renewal works fall in two categories:

- **Rehabilitation:** Involves the major repair or refurbishment of an existing asset. Rehabilitation produces an extension in the life of an asset. It does not provide for a planned increase in the operating capacity or design loading.
- **Renewal:** Does not provide for a planned increase to the operating capacity or design loading. Some minor increase in capacity may result from the process of renewal, but a substantial improvement is needed before system development is considered to have occurred. Expenditure around renewal is outlined in the figures below.

The level of expenditure on cyclic asset replacement varies from year to year, reflecting:

- The assets age profile of the system
- The condition profile of the system (condition ratings are used to review the remaining life of assets prior to programming renewals)
- The on-going maintenance demands
- Customer service issues
- The differing economic lives of individual assets comprising the overall asset system

4.1 Renewal / Replacement Strategies

Identification of Renewal Needs

Renewal / replacement needs are identified by analysing condition reports, maintenance records (asset failure and expenditure history), request for service records, and observations of staff and contractors.

The short and long-term asset renewal programmes are prepared from specific renewal needs identified from the above information.

In the longer-term renewal forecasts will be based on an assessment of remaining asset lives and condition (integrated with valuation process) once the Asset identification, condition grading improvements have been instigated.

4.1.1 Prioritisation of Renewal Projects

Renewal projects are justified and prioritised using a risk-based process

Decisions on renewal works consider the short and long-term effects on the operating and structural integrity of the system.

Renewal works are designed and undertaken in accordance with industry standards (or known future standards) and system design loadings.

Short – term renewal priorities are reassessed annually taking into account of additional information that becomes available.

4.1.2 Deferred Renewals

The Council recognises that although the deferral of some items on cyclic renewal programmes will not impede the operation of many assets in the short term, repeated deferral will create a future Council liability.

4.1.3 General

Condition grading based on the PRAMS/NAMS guidelines for all assets are used to determine the position in the lifecycle and end of life for assets.

A number of factors influence the useful lives of assets, these include factors such as the level of use, location, environmental factors such as weather, amount of vandalism in the locality.

4.1.4 Funding

Renewals are funded from mostly depreciation with some exceptions in regard to Direct Contribution (DC) spending.

4.2 Renewals Forecast

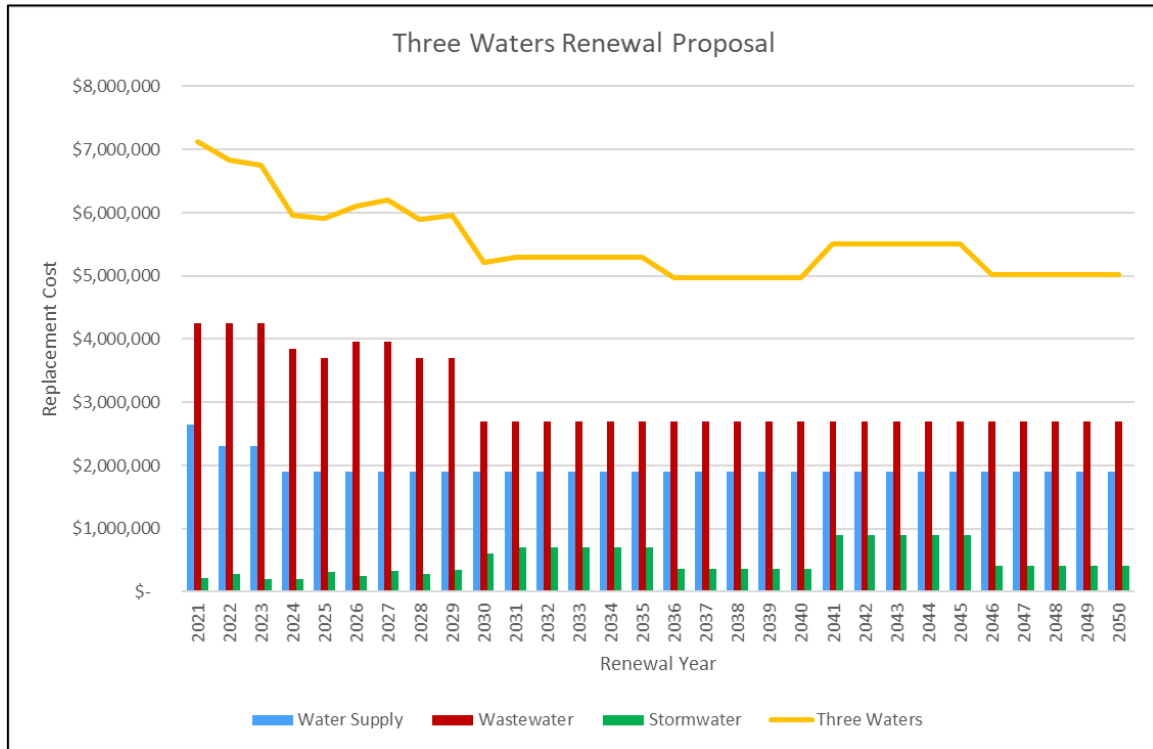


Figure 81: Three Waters Renewals Proposal

Source: AssetFinda, 2020

Water Supply

Pipes

Pipes are the most significant asset in the network. The spike in 2021 indicates that a significant amount of the network (AC pipe) is past its estimated useful life. \$1 million proposed for every year for next 30 years. Priority list created for imminent renewals.

This profile assumes associated valves and hydrants are renewed at the same time.

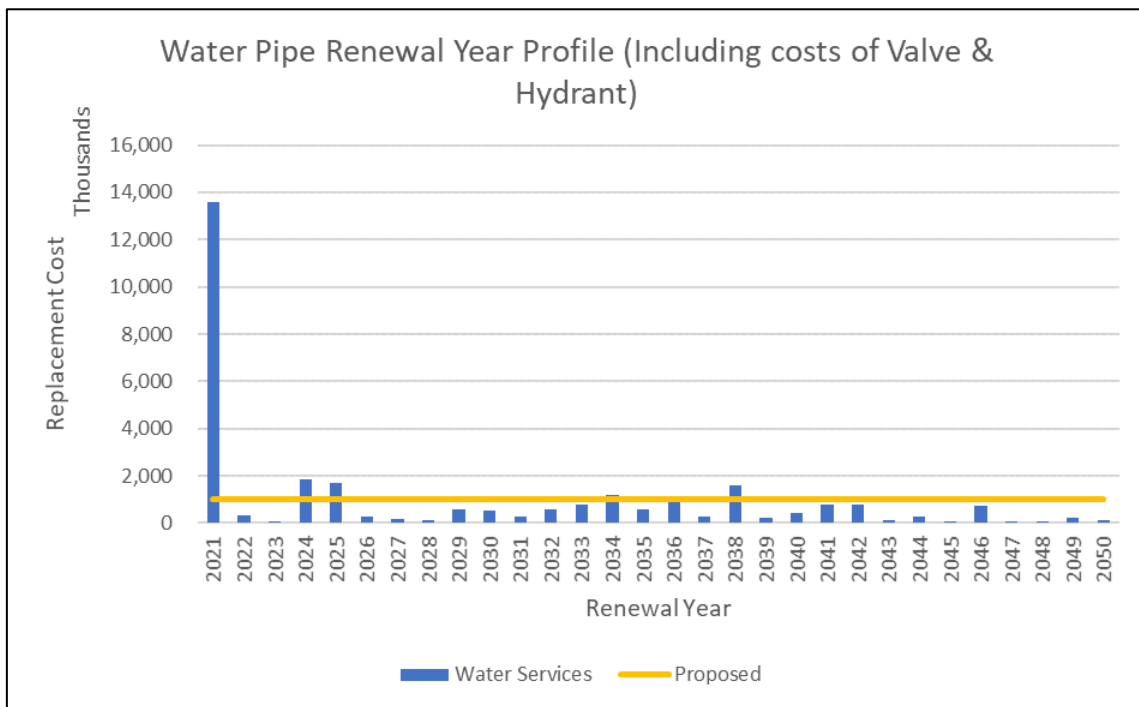


Figure 82: Water Pipe Renewal Year Profile

Source: AssetFinda, 2020

Water Meters

There is a significant amount of water meters that will reach the end of their expected life in 2032. \$300k proposed for the water meter renewal for next 30 years.

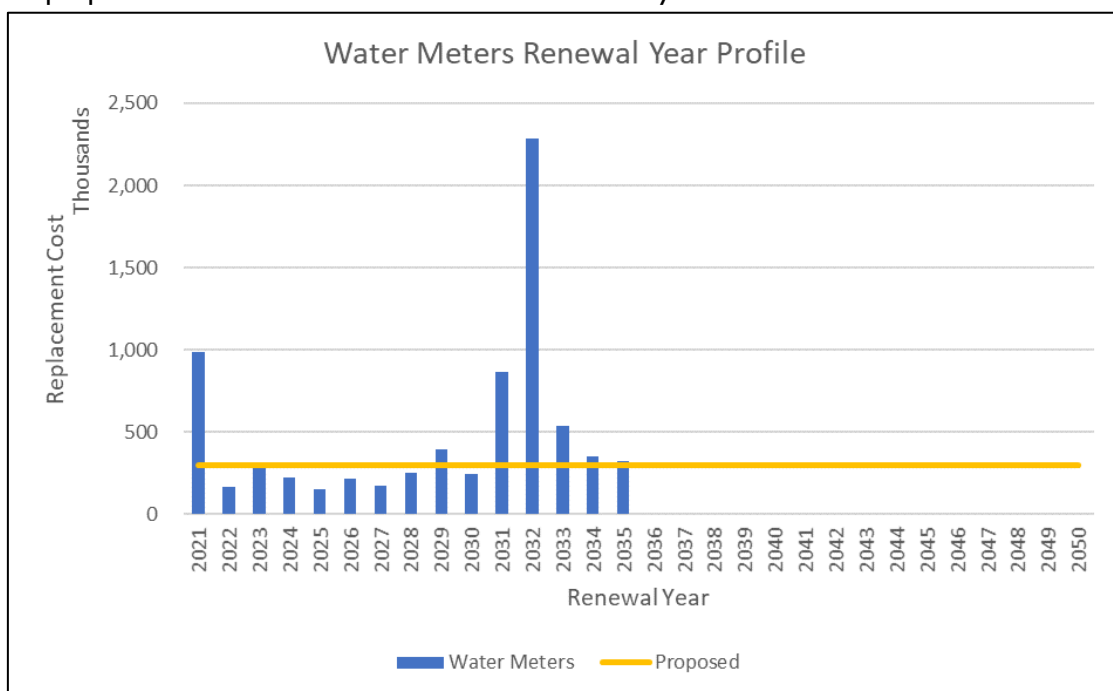


Figure 83: Water Meters Renewal Year Profile

Source: AssetFinda, 2020

Booster Pump Station

Recent condition assessment indicates there was a large increase in asset condition due to a Hills Rd booster pump station being damaged from a land slide. However, repair work had been commenced soon after the condition assessment and Hill Rd booster pump station is currently active. Below are the retic pressure booster stations summarised by in the graph. Recent Watercare condition scores are in blue and previous Waikato District Councils condition scores are in grey. \$50k per year proposed in the 2021 LTP for reactive renewal. Most of the poor condition assets identified in Jacobs condition assessment (proactive renewal) will be renewed at the end of 2020.

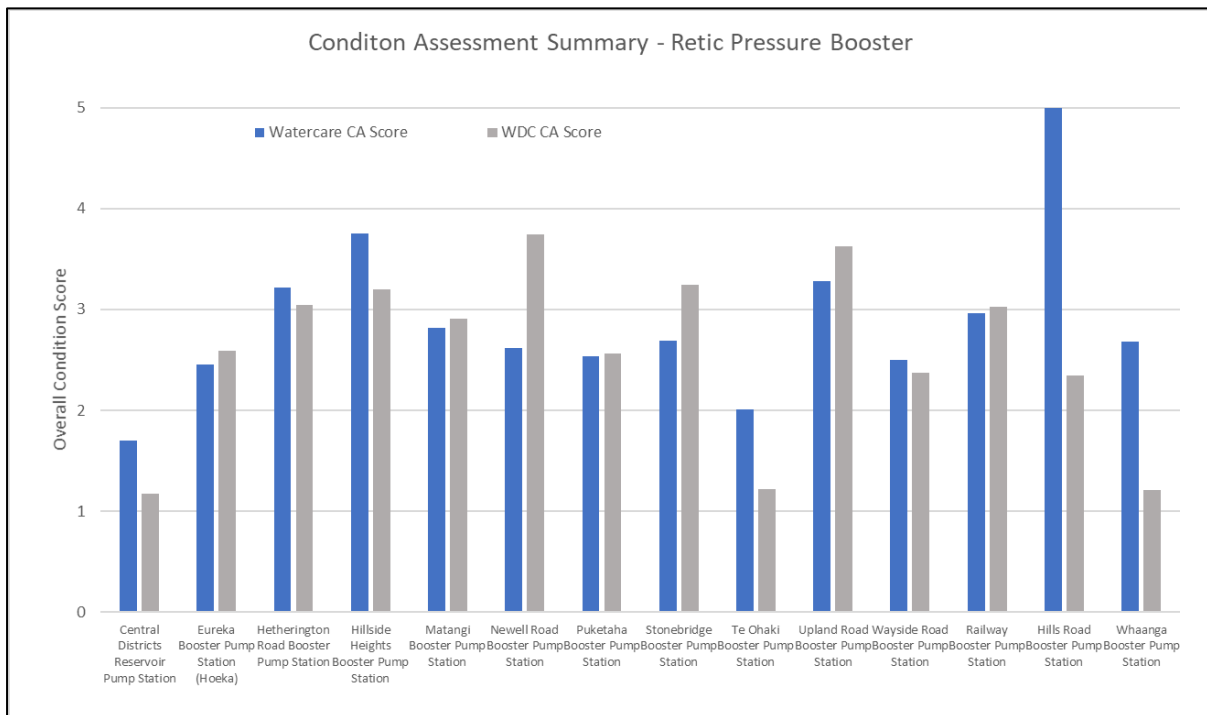


Figure 84: Condition Assessment Summary - Retic Pressure Booster

Water Treatment Plants

The Water Treatment plants overall had similar condition scores from the Watercare Condition assessment compared to the Waikato District Council’s original assessment. This is primarily due to the civil and structural assets not being assessed in phase 2 and the average grading of these assets from phase 1 being applied to the overall site grading at the same asset percentages in the site grading roll-up.

Onewhero Water Treatment plant is an example of the difference in ratings which is due to some assets being replaced since the Waikato District Councils assessment and the exclusion of the civil/structure assessment. This combination effected the final condition for the plant but there should be some follow up investigation regarding the civil and structural assets to ensure the condition score is reflective of the overall site.

Below is the water treatment graph, condition scores by location. The Watercare condition scores are in blue and the Waikato District Councils condition scores are in grey. \$800k per year proposed in the 2021 LTP for the first 3 years based on \$600k proactive renewal and \$200k for reactive renewal. From the year 4 onwards ongoing renewal cost will be \$400k (\$300k proactive and \$100k reactive).

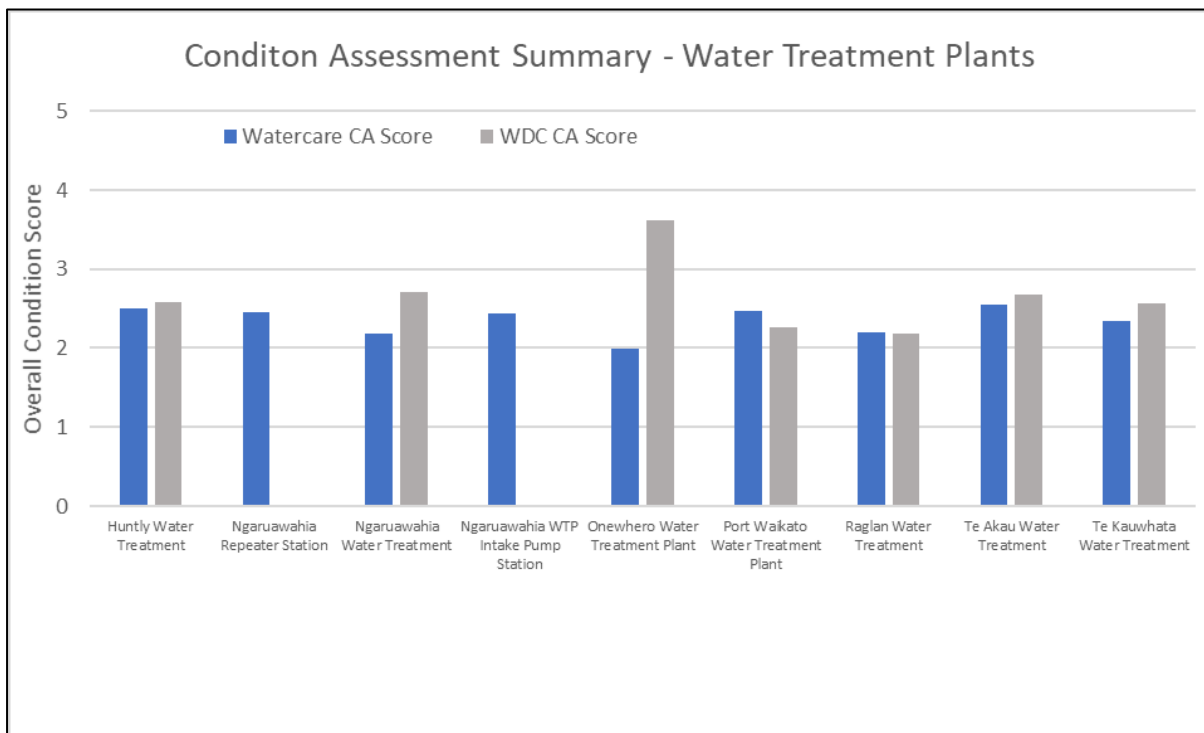


Figure 85: Condition Assessment Summary - Water Treatment Plants

Water Reservoirs

The Water Reservoirs overall had a similar condition rating compared to the Waikato District Council’s original assessment. There is some variance in scoring for some sites, but this is due to new mechanical assets being installed at these sites. An example of this is in the central region Waikato District Council has replaced all the valves and flow meters with new assets. One other consideration is the civil and structural assessments were not carried out and an average grading overall was applied to the site roll-ups. Majority of the poor condition assets is reservoir assets are electrical assets and the valves. Replacing these assets in the reservoirs are an expensive exercise and needed proper management of water supply for the affected area. It is best to undertake the renewal work one reservoir at a time. In 2021 LTP, in year one \$500k proposed for Jackson Rd reservoir (located inside the Huntly WTP) which need a roof replacement and valves replacements. Following years \$150k proposed to do the renewal works. Below are the water reservoirs summarised by each region in the graphs. Watercare’s condition scores are in blue and Waikato District Councils condition scores are in grey.

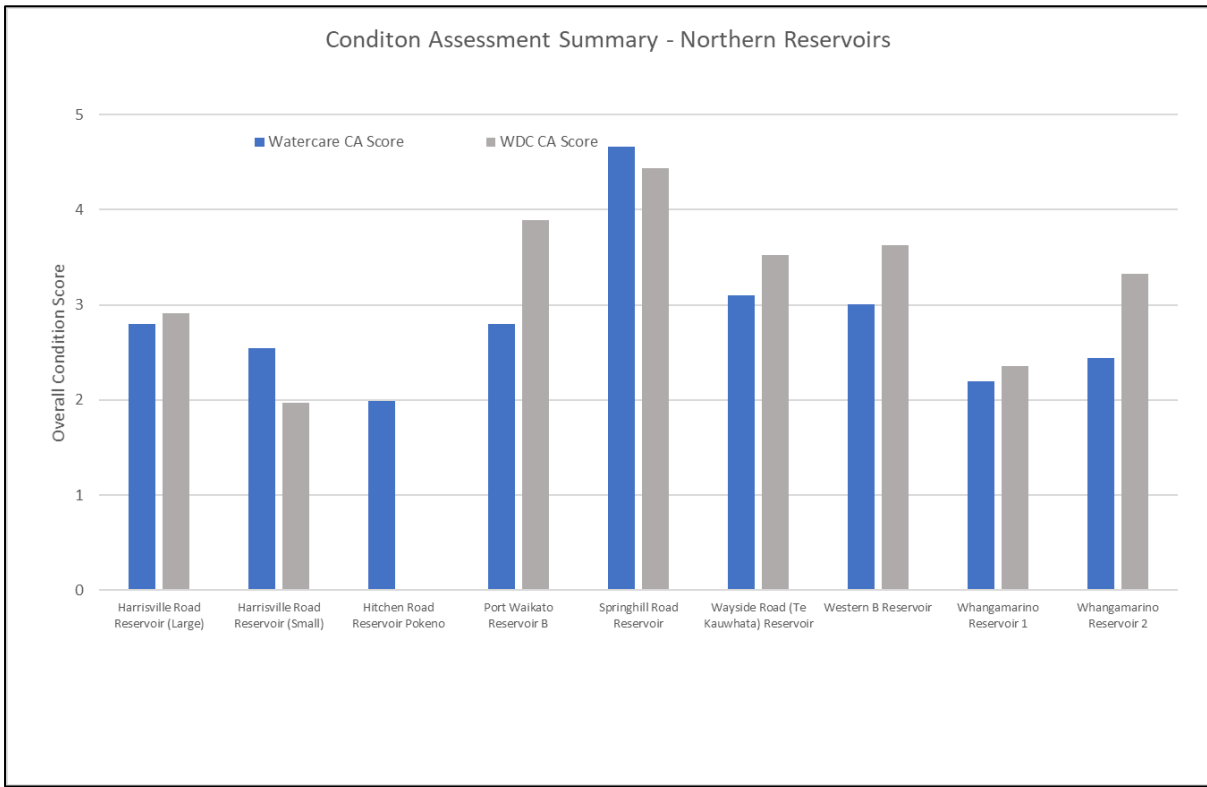


Figure 86: Condition Assessment Summary - Northern Reservoirs

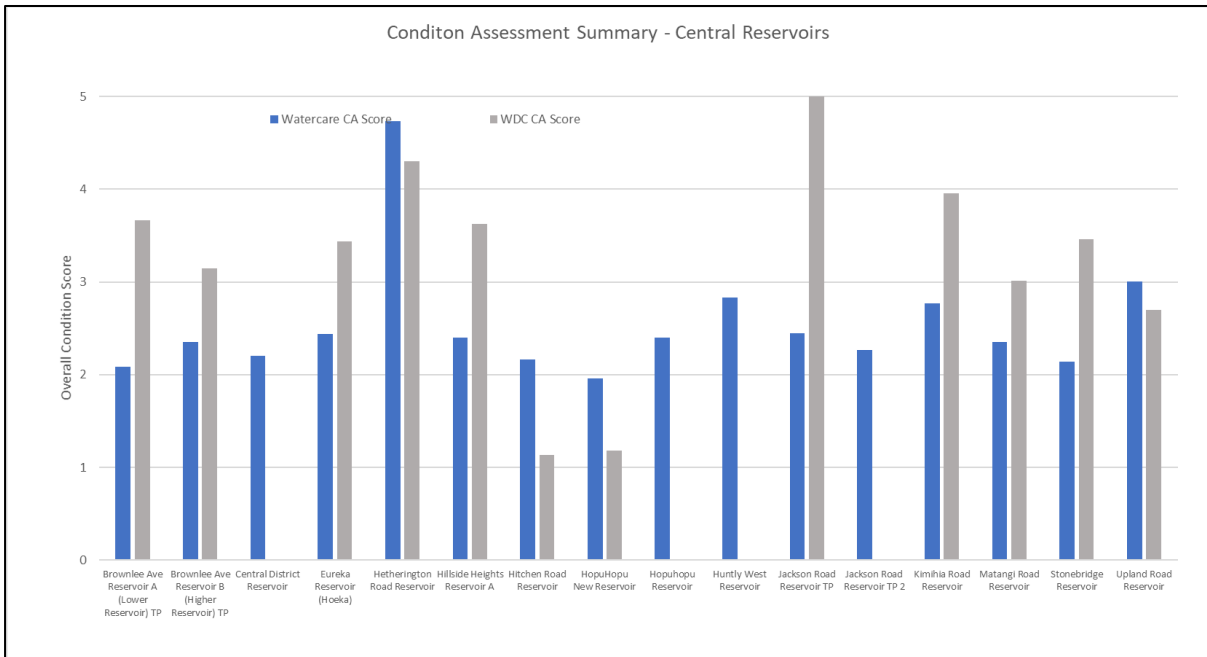


Figure 87: Condition Assessment Summary - Central Reservoirs

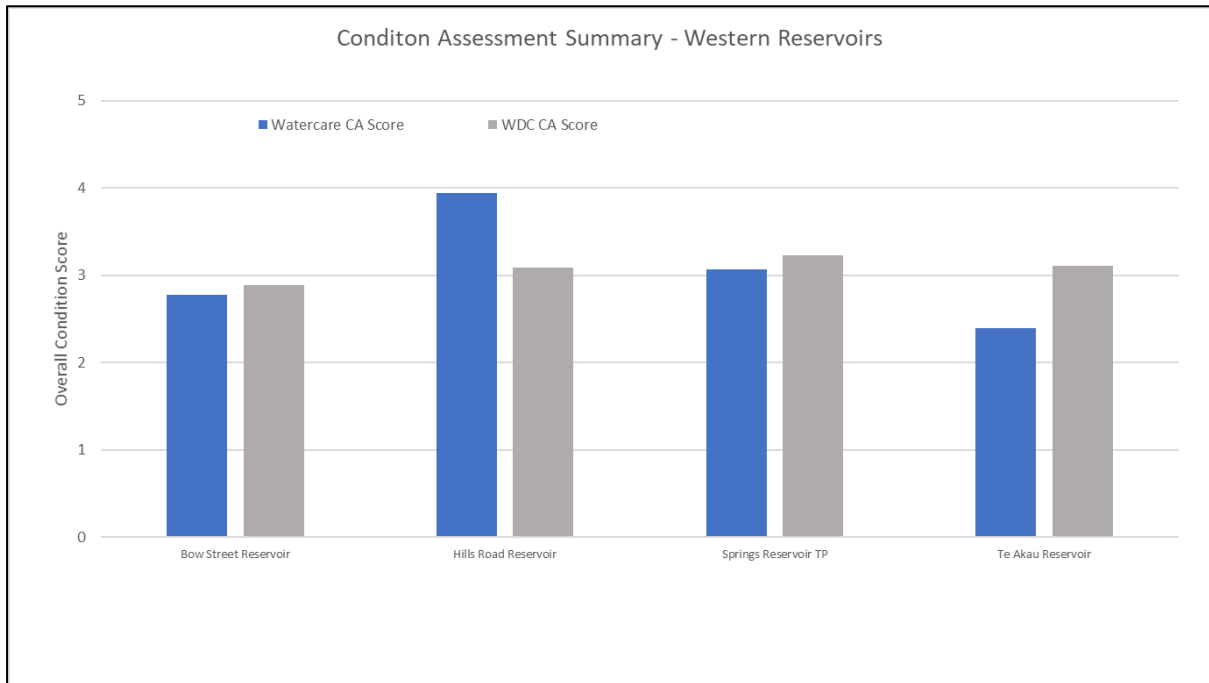


Figure 88: Condition Assessment Summary - Western Reservoirs

Wastewater

The figures below under each wastewater asset show the estimated life-end dates within the Waikato District against the 2020 replacement costs.

Due to the large spikes for replacement that occur, replacements of assets are averaged out over 10-year periods. This ensures that work programmes are more manageable and provides better financial management of expenditure.

Pipes

The pipes are the most significant asset in the network. There are significant assets requiring replacement in 2029, 2033, 2035, and 2037. In the past wastewater renewal budget often used in the emergency renewal work, and planned renewal often pushed out in the future. As we can see from the graph below significant renewal required just after 10 years. Best practice is to reduce the renewal to acceptable level, starting from 2021 LTP. Renewal model shows WDC required \$69M at the end of 30 years for the renewal. \$3M proposed every year for first 10 years then reduced to \$2M for afterwards which will add up to \$69M.

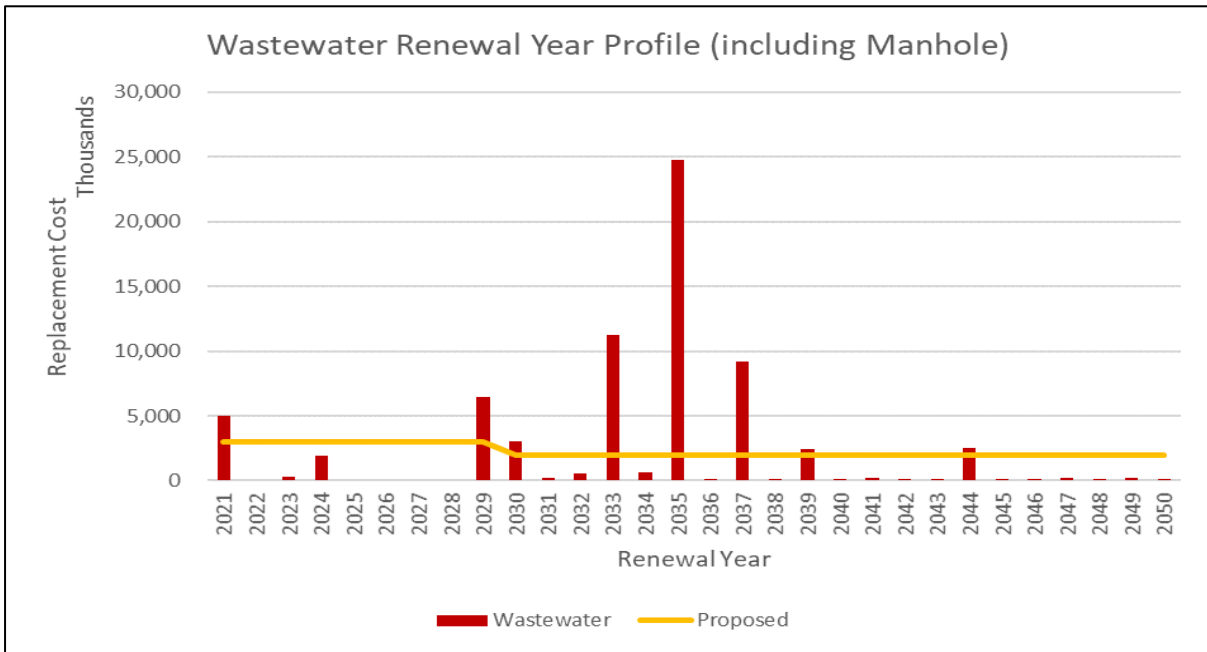


Figure 89: Wastewater Renewal Year Profile (Including Manhole)

Source: AssetFinda, 2020

Pump Stations

Pump stations make up 12% of the GRC for the network, with a total value of \$19.6 million. Recent condition assessment shows that most of the pump stations are performing efficiently, in the current LTP \$300k per year proposed for the renewal. \$200k will be planned renewal and \$100k will be unplanned renewal.

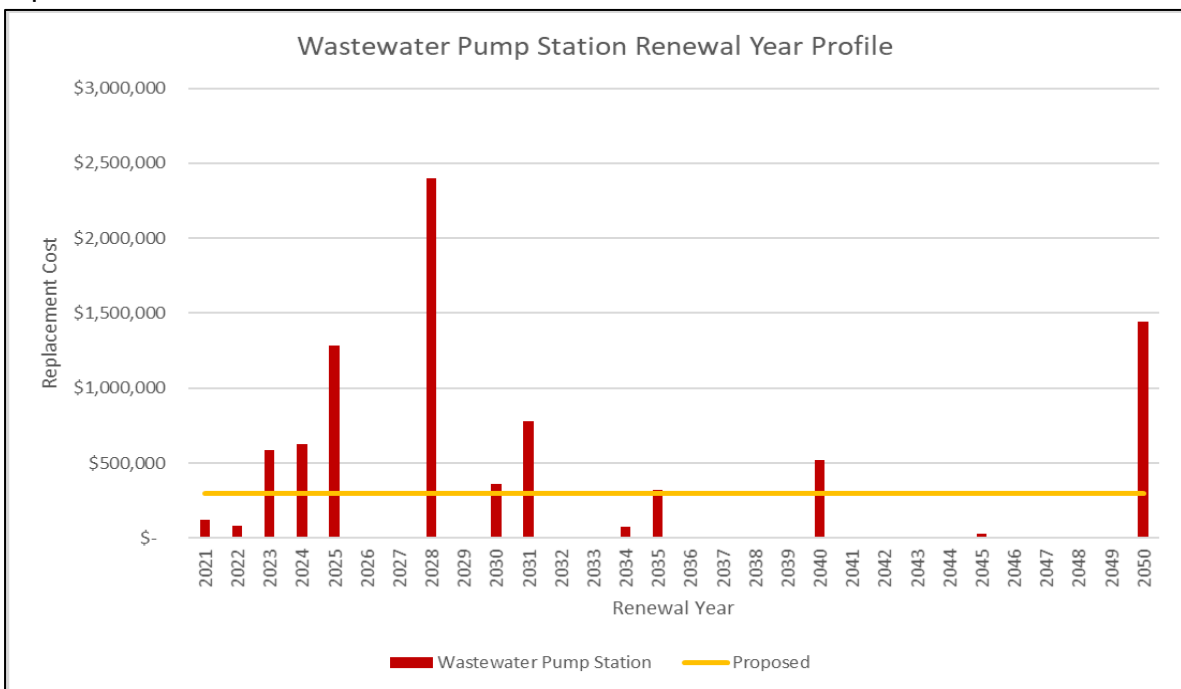


Figure 90: Wastewater Pump Station Renewal Year Profile

Source: AssetFinda, 2020

Wastewater Treatment Plants

Jacobs recent condition assessment reflects that the wastewater treatment plants overall had an increased condition rating compared to the Waikato District Council’s original assessment. Recently WDC also received number abatement notices from Waikato Regional Council, due to poor management of the treatment process. \$800k for initial three years proposed in the current LTP. Below are the final Watercare condition scores in blue and the Waikato District Councils condition scores representative in grey.

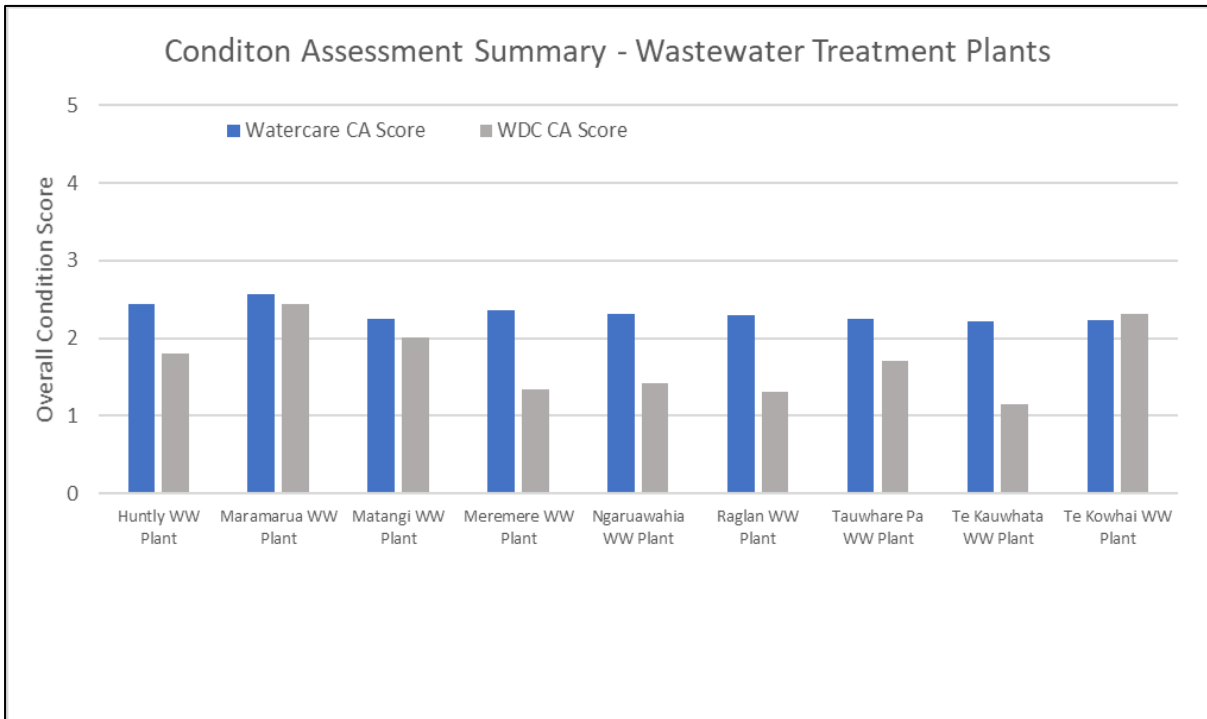


Figure 91: Condition Assessment Summary - Wastewater Treatment Plants

Stormwater

Point Assets

A breakdown of the financial information for plant points and reticulation points is given in below. With only three pump stations in the activity, the reticulation points dominate the asset values.

The estimated life-end dates for the point assets against the 2020 replacement costs are shown in the figure below. The forecast mirrors the installation life, highlighting that most assets have been installed after 2000.

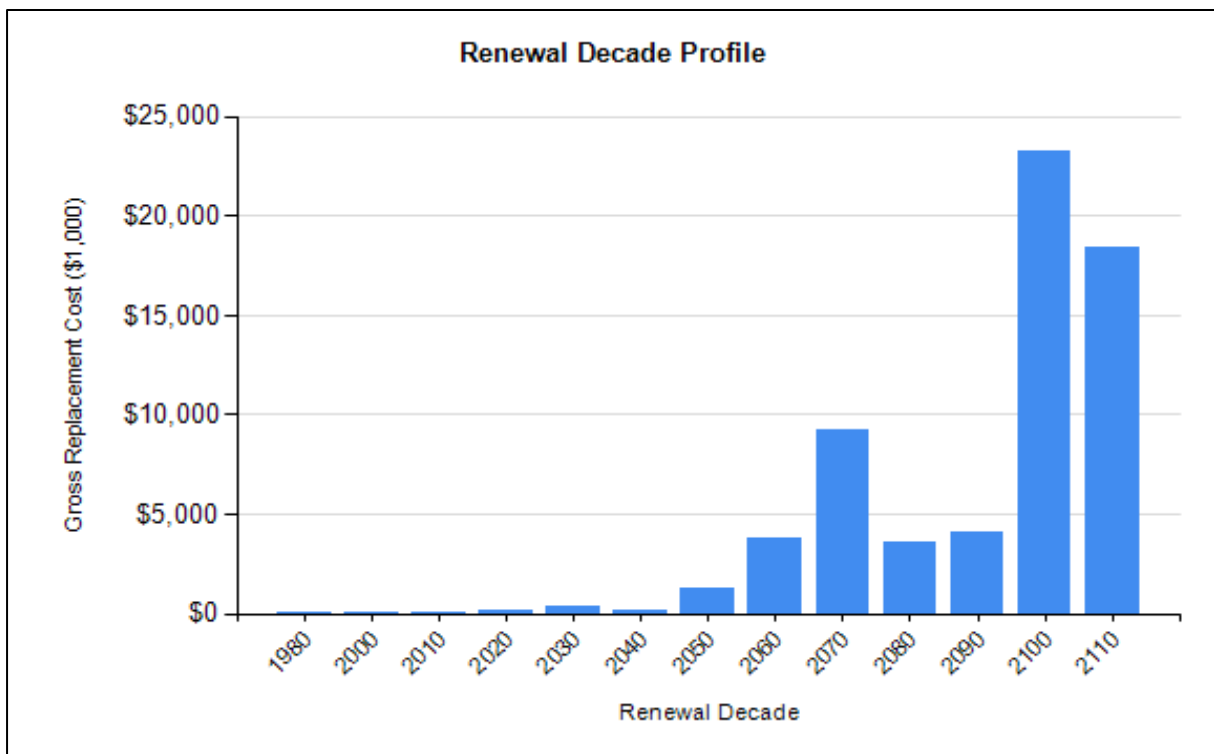


Figure 92: Estimated Point Assets Renewal Cost

Source: AssetFinda, 2020

Pipes

The renewals profile for stormwater pipes is shown below. Life-end dates are calculated using the estimated base life assigned to each asset, which is typically 100 years for stormwater pipes. The renewals profile is consistent with the installation date profile for stormwater assets with very few renewals forecast in the next 40 years, then the oldest assets appearing in the last 10 years of the forecast. \$200k per year proposed in the current LTP.

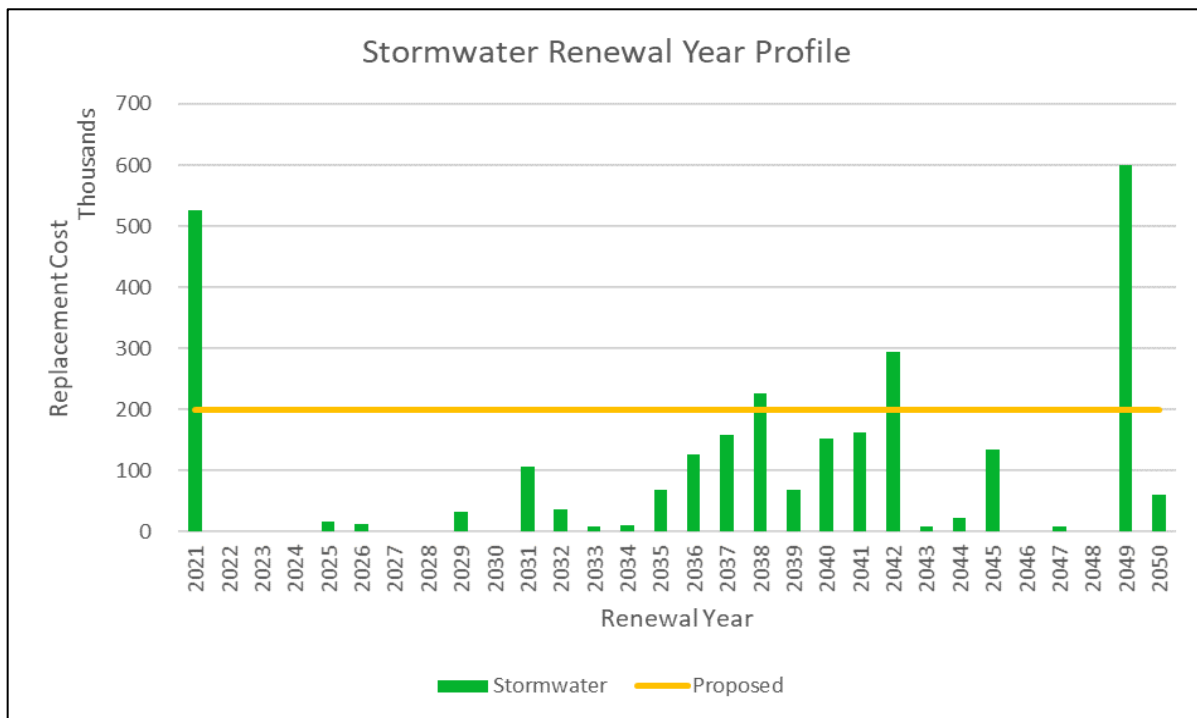


Figure 93: Stormwater Renewal Year Profile

Source: AssetFinda, 2020

Open Drains (Urban and Rural)

Drains are assumed to have an indefinite life and are not included in replacement planning. To match this, they are not depreciated in the valuation. Works on drains are normally restricted to maintenance, although they have historically been upgraded to be lined or piped, usually to address scouring issues. WDC approach to future is a preference to open drains over the piped network. This is resulting in a stream daylighting program that has commenced in Raglan but may extend to other townships in the district.

4.3 What are New Asset Requirements?

Along with the requirement to continue to provide additional assets to meet the District’s needs there is a necessity to develop the infrastructure to support existing operations and provide a suitable level of amenity for visitors.

New capital assets for the three waters may be required in response to the following:

- Addressing performance gaps in the current levels of service
- Providing for the development of additional areas to meet demand
- Meeting increases in levels of service
- Providing new technologies or innovations to improve efficiency/sustainability
- It is anticipated that, overall, a similar level of service will continue to be provided into the future for WDC water supply, wastewater and stormwater and this will be reflected in designs and infrastructure provision.

4.3.1 Prioritisation and Timing

Prioritisation of new capital items has involved consideration of the following criteria:

- Level of usage of assets
- Demand information
- Technical assessments
- Issues identified in planning documents (e.g. Sanitary Services Assessment for Cemeteries)
- Risk factors

4.3.2 Selection and Design

Service, functionality, price, availability, reliability, aesthetics, safety, sustainability and maintenance requirements are assessed when consideration is given to creating or acquiring new assets.

4.3.3 Forecast New Capital Assets Costs

A number of new capital works are planned over the 10-year planning period. These capital projects will allow Council to continue to provide three waters services to the desired service level standards and to meet the needs of additional capacity requirements that are forecast to occur.

These projects are included in the table below.

Capital works are generally initiated through triggers such as:

- Growth
- Levels of Service
- Regulatory
- Operational efficiency
- Vested (gifted) through subdivisions.

Budgeted provision is made on an annual basis to connect properties to the water network in areas where the network is available.

Projects – Water Supply

The operating projects include the improvement plan items from the 50-year Water strategy and inspection of critical assets.

Table 115: Projected Operations and Maintenance Project Expenditure Districtwide (000's)

Project Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031-2036	2036-2041	2041-2046	2046-2051	2051-2056	2056-2061	2061-2066	2066-2071
Water Zone Management Plans and Modelling	200	150	350	250	200	400	200	400	150	\$ 200	\$ 1,200	\$ 1,200	\$ 1,350	\$ 1,200	\$ 1,200	\$ 1,200	\$ 1,200	\$ 1,200
District Wide Major Development WS Assessments	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 500	\$ 500	\$ 500	\$ 500	\$ 500	\$ 500	\$ 500	\$ 500
District Wide Aboveground Assets Condition Assessment	\$ -	\$ 175	\$ -	\$ -	\$ 175	\$ -	\$ -	\$ 175	\$ -	\$ -	\$ 525	\$ 525	\$ 525	\$ 525	\$ 525	\$ 525	\$ 525	\$ 525
Planning NRW/Leak Detection Investigations	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300
District Wide water supply leak detection	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 500	\$ 500	\$ 500	\$ 500	\$ 500	\$ 500	\$ 500	\$ 500
District Wide Water Demand Management and Planning	\$ 100	\$ 50	\$ 50	\$ 50	\$ 50	\$ 100	\$ 50	\$ 50	\$ 50	\$ 100	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250
District Wide water supply backflow testing	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300
District Wide Water Supply Consent Compliance Study	\$ 25	\$ 25	\$ 25	\$ 25	\$ 25	\$ 25	\$ 25	\$ 25	\$ 25	\$ 25	\$ 125	\$ 125	\$ 125	\$ 125	\$ 125	\$ 125	\$ 125	\$ 125
Health and Safety Meter Reading	\$ 75	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Decommissioning (one-off)	\$ 205	\$ 103	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Projects – Wastewater

The operating projects include the improvement plan items from the 50-year Wastewater strategy, inspection of critical assets, and education.

Table 116: Projected Operations and Maintenance Project Expenditure Districtwide (000's)

Project Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031-2036	2036-2041	2041-2046	2046-2051	2051-2056	2056-2061	2061-2066	2066-2071
District Wide WWTP Maintenance	\$ 1,773	\$ 308	\$ 2,634	\$ 610	\$ 308	\$ 308	\$ 610	\$ 308	\$ 308	\$ 610	\$ 1,840	\$ 4,469	\$ 4,167	\$ 2,142	\$ 1,840	\$ 2,142	\$ 1,840	\$ 2,142
District Wide Planning & Management	\$ 98	\$ 408	\$ 98	\$ 50	\$ 225	\$ 125	\$ 50	\$ 225	\$ 125	\$ 50	\$ 600	\$ 425	\$ 600	\$ 425	\$ 600	\$ 425	\$ 600	\$ 425
District Wide Hydraulic Assessment and Update	\$ 70	\$ 70	\$ 70	\$ 70	\$ 70	\$ 70	\$ 70	\$ 70	\$ 70	\$ 70	\$ 350	\$ 350	\$ 350	\$ 350	\$ 350	\$ 350	\$ 350	\$ 350
Wastewater upgrade projects scoping and investigations	\$ 120	\$ 120	\$ 120	\$ 120	\$ 120	\$ 120	\$ 120	\$ 120	\$ 120	\$ 120	\$ 600	\$ 600	\$ 600	\$ 600	\$ 600	\$ 600	\$ 600	\$ 600
District Wide wastewater infiltration and inflow	\$ 50	\$ 50	\$ 50	\$ 50	\$ 50	\$ 50	\$ 50	\$ 50	\$ 50	\$ 50	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250
District Wide Condition Assessment	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250	\$ 1,250	\$ 1,250	\$ 1,250	\$ 1,250	\$ 1,250	\$ 1,250	\$ 1,250	\$ 1,250
District Wide wastewater reticulation planning and management	\$ 60	\$ 60	\$ 60	\$ 60	\$ 60	\$ 60	\$ 60	\$ 60	\$ 60	\$ 60	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300
District wide Structure Plan Works	\$ 70	\$ 70	\$ 70	\$ 70	\$ 70	\$ 70	\$ 70	\$ 70	\$ 70	\$ 70	\$ 350	\$ 350	\$ 350	\$ 350	\$ 350	\$ 350	\$ 350	\$ 350

Projects – Stormwater

Table 117: Projected Operations and Maintenance Project Expenditure Districtwide (per '000s)

Project Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031-2036	2036-2041	2041-2046	2046-2051	2051-2056	2056-2061	2061-2066	2066-2071
District Wide Stormwater Treatment Opex Costs	\$ 172	\$ 224	\$ 229	\$ 291	\$ 263	\$ 328	\$ 289	\$ 360	\$ 316	\$ 393	\$ 1,602	\$ 1,669	\$ 2,186	\$ 2,462	\$ 2,799	\$ 3,057	\$ 3,474	\$ 3,899
District Wide Planning and Management	\$ -	\$ 106	\$ -	\$ -	\$ 5	\$ -	\$ -	\$ 5	\$ -	\$ -	\$ 150	\$ 5	\$ 105	\$ 5	\$ 105	\$ 5	\$ 105	\$ 5
District Wide SW LOS mapping	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100
District Wide SW condition assessment	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 750	\$ 750	\$ 750	\$ 750	\$ 750	\$ 750	\$ 750	\$ 750
District Wide SW Asset Data capture and Update	\$ 75	\$ 145	\$ 145	\$ 145	\$ 145	\$ 50	\$ 50	\$ 50	\$ 50	\$ 50	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250
Stormwater Masterplan	\$ 50	\$ 50	\$ 50	\$ 10	\$ 10	\$ 10	\$ 10	\$ 10	\$ 10	\$ 10	\$ 110	\$ 110	\$ 110	\$ 110	\$ 110	\$ 110	\$ 110	\$ 110
District wide Stream/Waterway improvements - maintenance	\$ 50	\$ 60	\$ 70	\$ 80	\$ 90	\$ 100	\$ 110	\$ 120	\$ 130	\$ 140	\$ 190	\$ 240	\$ 290	\$ 340	\$ 390	\$ 440	\$ 490	\$ 540
District Wide SW Catchment Management Plan Updates	\$ 150	\$ 250	\$ 150	\$ 150	\$ 150	\$ -	\$ 20	\$ 40	\$ 20	\$ 20	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150

Asset Development Plan

Asset development provides for a planned increase in service capability of the three waters activity to:

- Close any gaps between the current three waters targets and target service standards
- Accommodate growth
- Ensure appropriate funding mechanisms are in place such as Development Contributions.

Asset development and asset renewal can occur simultaneously. The purpose of asset renewal is to prevent a decline in the service potential of the assets whereas asset development is concerned with the service improvements, measured by asset performance.

5 Management, Renewal and Operations Standards

The Waikato District Council waters activity management, renewal and operations and maintenance are managed in accordance with the following standards:

- Generally accepted accounting practice
- The International Infrastructure Management Manual
- Lifecycle renewals and finance
- Relevant Resource Consents and the Resource Management Act 1991
- Health and Safety Plans
- The general policies from the Reserve Management Plans

6 Disposals

As part of the whole life cycle management of assets, it is vital to consider the costs of asset disposal in the long-term financial forecasts for an asset. The cost of asset disposal is expected to be incorporated within the capital cost of new works, or asset renewals.

Disposal is the retirement or sale of assets whether surplus or superseded by new or improved systems. Assets may become surplus to requirements for any of the following reasons:

- Under utilisation
- Obsolescence
- Provision exceeds required level of service
- Assets replaced before its predicted economic life
- Uneconomic to upgrade or operate
- Policy changes
- Service provided by other means (e.g. private sector involvement)
- Potential risk of ownership (financial, environmental, legal, social).

6.1 What is the Disposal Plan?

Water Supply

Future changes to water supply schemes across the district are unlikely to result in major disposals across the schemes.

Council has supplied water to Pokeno and Tuakau from the Watercare Waikato Treatment Plant, and Hopuhopu/Taupiri is supplied from Ngaruawahia. No decisions have been made on the disposal of the treatment plants at these sites. Any disposal plans will be presented to Council to be accepted before any changes are made.

Significant disposals exempt assets that reach the end of their useful life within the 10-year period and are replaced as part of the renewal programme.

Wastewater

Waikato District Council has no plans to dispose of any wastewater assets within majority of the wastewater schemes at this time. This exempts assets that reach the end of their useful life within the 10-year period and are replaced as part of the renewal programme.

Stormwater

As part of the whole life cycle management of assets, it is vital to consider the costs of asset disposal in the long-term financial forecasts for an asset. The cost of asset disposal is expected to be incorporated within the capital cost of new works, or asset renewals.

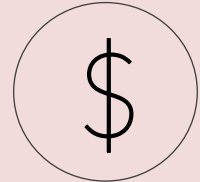
Disposal is the retirement or sale of assets whether surplus or superseded by new or improved systems. Assets may become surplus to requirements for any of the following reasons:

- Under utilisation
- Obsolescence
- Provision exceeds required level of service
- Assets replaced before its predicted economic life
- Uneconomic to upgrade or operate
- Policy changes
- Service provided by other means (e.g. private sector involvement)

Potential risk of ownership (financial, environmental, legal, social)

Part 8: Financial Planning

Council has planned a prudent financial approach to managing its assets and services. This section sets out financial statements, funding strategy, depreciation forecast and charges for the Three Waters activities in the Waikato District.



I Overview

The Local Government Act 2002 (Part 6(3)) requires local authorities to manage their finances “prudently and in a manner that promotes the current and future interests of the community.” This implies compliance with applicable Financial Reporting Standards, which include New Zealand equivalents to International Financial Reporting Standards (NZ IFRS).

In determining how activities will be funded local authorities are required to take the following into consideration:

- The contribution to the achievement of Community outcomes (strategic alignment);
- Beneficiaries of each activity (beneficiary / user pays principles);
- The period over which benefits from the activity will occur (intergenerational equity issues);
- The extent to which identifiable individuals contribute to the need to incur expenditure (exacerbator and user pays principles);
- The costs and benefits of funding the activity compared to other activities (cost / benefit, prioritisation principles);
- The impact of funding the activity on the wellbeing of the community (ability to pay principles);

This Asset Management Plan provides the basis for meeting these requirements.

2 How much does the Three Waters Activity cost and how is it funded?

Funding sources available for the water Three Waters activities includes:

- Targeted Rates.
- Usage by volume charges for metered customers; and
- Development Contributions from new developments
- Loans raised for capital works.

Targeted rates, volumetric charges and development contributions are set by Council triennially through the Long-Term Plan, and any changes are put forward through the Annual Plan, which is developed annually.

Expenditure on the water supply activity represents a significant Council investment. The table below explains how council is funded.

The following table summarises the ways in which the three waters activity is funded:

Table 118: Three Waters Activity Funding Source

Activity Category	Funding Source	Changes from the last LTP (if any)
Water Supply	Targeted Rates	No Changes
	General Rates	No Changes
	Contributions from new developments	No Changes
Wastewater	Targeted Rates	No Changes
	General Rates	No Changes
	Contributions from new developments	No Changes
	Loans raised for capital works	No Changes
Stormwater	Targeted Rates	No Changes
	General Rates	No Changes
	Drainage District fees	No Changes
	Contributions from now developments	No Changes

3 Capital

As a result of including the Asset Finda database, the information that is available to staff with regards to renewal forecasting can now be completed with a higher degree of accuracy. Heading into the new LTP, there is an upgrade planned to a more robust asset management system. This will ensure that more analysis is actively carried out to plan works and deliver value for money.

With this new level of precision available to staff we can forecast component renewals across the entire portfolio.

Capital and Renewals expenditure will be funded from the following sources:

- Depreciation
- Loans (either internal or external)
- Development / Financial contributions
- Private or Community contributions
- Government Subsidies (where applicable)

The following table summarises the ways in which the capital aspects of the Three Waters activity are funded:

Table 119: Capital Funding Sources

Activity Category	Funding Source	Changes from the last LTP (if any)
-------------------	----------------	------------------------------------

Water Supply	Improve LoS - Targeted rates and loans Growth – development funds and loans	No Changes
Wastewater	Improve LoS - Targeted rates and loans Growth – development funds and loans	No Changes
Stormwater	Improve LoS - Targeted rates and loans Growth – development funds and loans	No Changes

Depreciation is provided on a straight-line basis on buildings. The depreciation is calculated at rates that will write off the cost (or valuation) of the assets to their estimated residual values over their useful lives.

3.1 Development Contributions

Development contributions provide a source of funding for future capacity upgrading work. These works offset the cumulative depletion of any spare capacity within each network caused by new users. Development contribution charges are calculated as per Council's development contribution policy and reflected in Council Fees and Charges documents.

4 Financial Statements and Projections

4.1 Cash Flow Forecasts

The financial summaries in this Asset Management Plan cover a minimum 10-year planning period and are based on financial projections covering the lifecycle of the assets.

The following tables summarise the 10-year financial forecast for the Three Waters Activity under the following headings:

- Maintenance and Operations
- Major Projects
- Capital expenditure next 10 years
- Financial Summary

Growth budget (capital works) identified is funded from Development Contributions for which Council has a policy for implementing charges to recover these costs.

Increased Level of Service (Capital Works) is new work requested by the public and generally results from the customer satisfaction surveys or consultation with communities who would like additional surveys.

Vested Assets are assets gifted to Council as part of a sub division and which Council has accepted the ongoing liability for its maintenance and ultimately its replacement.

5 Maintenance & Operations Costs

5.1 Water Supply

Current LTP- WSL Opex Costs	Excludes Inflation beyond Yr1, Includes Growth, Pay-rise & Contracted Increases									
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Labour	1,342,450	1,378,636	1,415,726	1,453,744	1,492,712	1,532,654	1,573,595	1,615,559	1,658,573	1,702,662
Consultants	800,000	800,000	825,000	725,000	850,000	925,000	675,000	1,050,000	625,000	725,000
General Overheads	248,792	248,792	260,911	248,792	248,792	252,658	240,741	240,938	253,248	241,316
Rent and Rates	75,947	78,252	80,061	81,924	83,843	85,819	87,855	89,951	92,111	94,335
Operating Cost - Chemicals	293,075	299,171	305,394	311,746	318,230	324,849	331,607	338,504	345,545	352,732
Operating Cost - Energy	478,029	478,028	478,029	478,028	478,028	478,028	478,029	478,029	478,029	478,028
Other Operating Cost	301,052	301,052	301,052	301,052	301,052	301,052	301,052	301,052	301,052	301,052
Shared Services	315,350	315,350	315,350	315,350	315,350	315,350	315,350	315,350	315,350	315,350
Maintenance	1,113,921	1,093,421	1,093,421	1,113,921	1,067,796	1,042,171	1,062,671	1,042,171	1,042,171	1,062,671
Meter Reading Contract	136,043	136,043	136,043	136,043	136,043	136,043	136,043	136,043	136,043	136,043
CCO Estimated Overheads - WSL	274,530	281,394	288,429	295,639	303,030	310,606	318,371	326,330	334,489	342,851
Existing WDC Contracted Costs	1,759,056	1,804,355	1,850,940	1,898,850	1,948,127	1,998,815	2,050,958	2,104,602	2,159,794	2,216,584
Existing BAU Costs	7,138,246	7,214,495	7,350,355	7,360,090	7,543,004	7,703,047	7,571,271	8,038,530	7,741,404	7,968,625
Irregular Projects + Upgrades										
New Projects	100,000	19,512	-	-	-	-	-	-	-	-
Decommissioning	102,500	102,500	-	-	-	-	-	-	-	-
Customer & Systems Transition	155,104	155,104	155,104	155,104	155,104	155,104	155,104	155,104	155,104	155,104
Irregular Opex Costs	-	-	-	-	-	-	-	-	-	-
Irregular Projects + Upgrades	357,604	277,116	155,104	155,104	155,104	155,104	155,104	155,104	155,104	155,104
Grand Total	7,495,850	7,491,611	7,505,459	7,515,194	7,698,108	7,858,151	7,726,375	8,193,634	7,896,508	8,123,729
Contract Margin	394,518	394,295	395,024	395,537	405,164	413,587	406,651	431,244	415,606	427,565
Total Contract Amount	7,890,368	7,885,906	7,900,483	7,910,730	8,103,272	8,271,737	8,133,027	8,624,878	8,312,114	8,551,293

5.2 Wastewater

Current LTP- WSL Opex Costs	Excludes Inflation beyond Yr1, Includes Growth, Pay-rise & Contracted Increases									
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Labour	1,410,458	1,448,477	1,487,447	1,527,390	1,568,332	1,610,298	1,653,313	1,697,403	1,742,596	1,788,918
Consultants	370,000	680,000	370,000	370,000	545,000	445,000	370,000	545,000	445,000	370,000
General Overheads	261,396	261,396	274,128	261,396	261,396	265,458	252,937	253,143	266,077	253,541
Rent and Rates	79,794	82,217	84,117	86,074	88,090	90,167	92,305	94,508	96,777	99,114
Operating Cost - Chemicals	212,062	216,472	220,975	225,572	230,263	235,053	239,942	244,933	250,028	255,228
Operating Cost - Energy	559,349	559,349	559,350	559,349	559,349	559,349	559,349	559,350	559,350	559,349
Other Operating Cost	316,303	316,303	316,303	316,303	316,303	316,303	316,303	316,303	316,303	316,303
Shared Services	215,886	218,705	221,594	224,556	227,591	230,703	233,892	237,161	240,511	243,946
Maintenance	2,019,640	1,999,140	1,963,265	1,932,515	1,912,015	1,912,015	1,932,515	1,912,015	1,912,015	1,968,390
Meter Reading Contract	-	-	-	-	-	-	-	-	-	-
CCO Estimated Overheads - WSL	308,847	316,568	324,482	332,594	340,909	349,432	358,168	367,122	376,300	385,707
Existing WDC Contracted Costs	-	-	-	-	-	-	-	-	-	-
Existing BAU Costs	5,753,737	6,098,628	5,821,662	5,835,750	6,049,250	6,013,777	6,008,725	6,226,939	6,204,957	6,240,497
Irregular Projects + Upgrades										
New Projects	141,000	141,002	193,349	384,990	384,990	384,991	384,990	384,989	384,989	384,990
Decommissioning	-	-	-	-	-	-	-	-	-	-
Customer & Systems Transition	174,492	174,492	174,492	174,492	174,492	174,492	174,492	174,492	174,492	174,492
Irregular Opex Costs	1,773,250	307,500	2,634,250	609,875	307,500	307,500	609,875	307,500	307,500	609,875
Irregular Projects + Upgrades	2,088,742	622,994	3,002,091	1,169,357	866,982	866,983	1,169,357	866,981	866,981	1,169,357
Grand Total	7,842,479	6,721,622	8,823,753	7,005,107	6,916,232	6,880,761	7,178,082	7,093,920	7,071,938	7,409,854
Contract Margin	412,762	353,770	464,408	368,690	364,012	362,145	377,794	373,364	372,207	389,992
Total Contract Amount	8,255,241	7,075,392	9,288,161	7,373,797	7,280,244	7,242,906	7,555,875	7,467,284	7,444,145	7,799,847

5.3 Stormwater

Current LTP- WSL Opex Costs	Excludes Inflation beyond Yr1, Includes Growth, Pay-rise & Contracted Increases									
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Labour	410,263	421,322	432,657	444,276	456,185	468,391	480,903	493,728	506,873	520,347
Consultants	375,000	651,000	445,000	405,000	410,000	160,000	180,000	205,000	180,000	180,000
General Overheads	76,033	76,033	79,736	76,033	76,033	77,214	73,572	73,632	77,394	73,748
Rent and Rates	23,210	23,915	24,467	25,037	25,623	26,227	26,849	27,490	28,150	28,830
Operating Cost - Chemicals										
Operating Cost - Energy	2,741	2,741	2,741	2,741	2,741	2,741	2,741	2,741	2,741	2,741
Other Operating Cost	92,004	92,004	92,004	92,004	92,004	92,004	92,004	92,004	92,004	92,004
Shared Services										
Maintenance	539,988	594,819	603,059	662,734	637,794	696,063	662,483	722,014	684,050	744,586
Meter Reading Contract	-	-	-	-	-	-	-	-	-	-
CCO Estimated Overheads - WSL	102,949	105,523	108,161	110,865	113,636	116,477	119,389	122,374	125,433	128,569
Existing WDC Contracted Costs	-	-	-	-	-	-	-	-	-	-
Existing BAU Costs	1,622,188	1,967,356	1,787,825	1,818,689	1,814,015	1,639,117	1,637,941	1,738,983	1,696,646	1,770,825
Irregular Projects + Upgrades										
New Projects	-	-	-	-	-	-	-	-	-	-
Decommissioning	-	-	-	-	-	-	-	-	-	-
Customer & Systems Transition	58,164	58,164	58,164	58,164	58,164	58,164	58,164	58,164	58,164	58,164
Irregular Opex Costs	-	-	-	-	-	-	-	-	-	-
Irregular Projects + Upgrades	58,164	58,164	58,164	58,164	58,164	58,164	58,164	58,164	58,164	58,164
Grand Total	1,680,352	2,025,520	1,845,989	1,876,853	1,872,179	1,697,281	1,696,105	1,797,147	1,754,810	1,828,989
Contract Margin	88,440	106,606	97,157	98,782	98,536	89,331	89,269	94,587	92,358	96,263
Total Contract Amount	1,768,792	2,132,126	1,943,147	1,975,635	1,970,715	1,786,612	1,785,374	1,891,733	1,847,168	1,925,251

6 Major Projects (in nominal dollars)

<u>Water Supply</u>	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Decommissioning	102,500	102,500	-	-	-	-	-	-	-	-
Condition Assessment- Water	-	175,000	-	-	175,000	-	-	175,000	-	-
Leak Detection- Non-Revenue Water	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
<u>Wastewater</u>	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Pond De-sludge	1,773,250	307,500	2,634,250	609,875	307,500	307,500	609,875	307,500	307,500	609,875
Condition Assessment- Wastewater Treatment Plant	-	100,000	-	-	100,000	-	-	100,000	-	-
Wastewater upgrade projects scoping and investigations	120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000
<u>Stormwater</u>	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
District Wide Stormwater LOS mapping	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
District Wide Stormwater Asset Data capture and Update	75,000	145,000	145,000	145,000	145,000	50,000	50,000	50,000	50,000	50,000
District Wide Stormwater Catchment Management Plan Updates	150,000	250,000	150,000	150,000	150,000	-	20,000	40,000	20,000	20,000

7 Financial summary

Current LTP- WSL Opex Costs	Excludes Inflation beyond Yr1, Includes Growth, Pay-rise & Contracted Increases									
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Labour	3,163,172	3,248,435	3,335,830	3,425,410	3,517,229	3,611,344	3,707,811	3,806,690	3,908,042	4,011,927
Consultants	1,545,000	2,131,000	1,640,000	1,500,000	1,805,000	1,530,000	1,225,000	1,800,000	1,250,000	1,275,000
General Overheads	586,221	586,221	614,776	586,221	586,221	595,331	567,251	567,713	596,719	568,605
Rent and Rates	178,951	184,383	188,645	193,034	197,556	202,212	207,009	211,949	217,038	222,279
Operating Cost - Chemicals	505,137	515,643	526,369	537,318	548,493	559,902	571,549	583,437	595,573	607,960
Operating Cost - Energy	1,040,119	1,040,118	1,040,120	1,040,118	1,040,118	1,040,118	1,040,119	1,040,119	1,040,119	1,040,118
Other Operating Cost	709,359	709,359	709,359	709,359	709,359	709,359	709,359	709,359	709,359	709,359
Shared Services	531,237	534,056	536,945	539,906	542,942	546,053	549,242	552,511	555,862	559,296
Maintenance	3,673,550	3,687,380	3,659,746	3,709,170	3,617,605	3,650,249	3,657,669	3,676,199	3,638,237	3,775,648
Meter Reading Contract	136,043	136,043	136,043	136,043	136,043	136,043	136,043	136,043	136,043	136,043
CCO Estimated Overheads - WSL	686,326	703,484	721,071	739,098	757,576	776,515	795,928	815,826	836,222	857,127
Existing WDC Contracted Costs	1,759,056	1,804,355	1,850,940	1,898,850	1,948,127	1,998,815	2,050,958	2,104,602	2,159,794	2,216,584
Existing BAU Costs	14,514,170	15,280,478	14,959,843	15,014,529	15,406,270	15,355,941	15,217,938	16,004,451	15,643,007	15,979,947
Irregular Projects + Upgrades										
New Projects	241,000	160,514	193,349	384,990	384,990	384,991	384,990	384,989	384,989	384,990
Decommissioning	102,500	102,500	-	-	-	-	-	-	-	-
Customer & Systems Transition	387,760	387,760	387,760	387,760	387,760	387,760	387,760	387,760	387,760	387,760
Irregular Opex Costs	1,773,250	307,500	2,634,250	609,875	307,500	307,500	609,875	307,500	307,500	609,875
Irregular Projects + Upgrades	2,504,510	958,274	3,215,359	1,382,625	1,080,250	1,080,251	1,382,625	1,080,249	1,080,249	1,382,625
Grand Total	17,018,680	16,238,752	18,175,202	16,397,154	16,486,520	16,436,193	16,600,562	17,084,700	16,723,256	17,362,572
Contract Margin	895,720	854,671	956,590	863,008	867,712	865,063	873,714	899,195	880,171	913,820
Total Contract Amount	17,914,400	17,093,423	19,131,791	17,260,162	17,354,231	17,301,255	17,474,276	17,983,894	17,603,427	18,276,392



Financial forecasts based on sound asset information and analysis, assumptions of the future



Forecasts (10 year +) based on current comprehensive AMP with detailed supporting assumptions/reliability factors.

8 Procurement Strategy

A procurement strategy enables decision makers to understand longer term goals such as realising value for money and encouraging supplier improvement and to consider these goals when making procurement decisions. Councils Procurement Strategy is currently in the process of being developed and its aim will be to outline various engagement processes and how to select the appropriate method.

Watercare's procurement policy is in-line with its strategic priorities

- Customer Focus
- Business Excellence
- Financial Responsibility
- Fully Sustainable

Sustainable Procurement

In essence, sustainable procurement is about meeting the needs of today without compromising the ability of future generations to meet their needs. When procuring goods/services/works we will assess the economic, environmental, social and cultural outcomes of the activity and consider:

- Value-for-money over the whole of life, rather than just the initial cost
- Minimising environmental impacts over the whole of life of the goods/services/works
- Strategies to avoid unnecessary consumption and that manage demand and minimise waste
- Our supplier's social responsibility practices, including compliance with legislative obligations to its employees
- Our obligations under the Treaty of Waitangi and our relationships with local Iwi

9 Key Financial Forecasts

The financial estimates presented below have been calculated through a bottom-up budget process. The operating expenditure has been built from an asset base and factors in the reality of resourcing and maintainability of assets.

Revenue has been based from the 2018-19 Annual Plan that is considered the baseline for the development of the 2021-2031 estimates. Once Waikato District Council has been through the budgeting process Council approved budgets will replace what is currently displayed.

9.1 Financial Forecast Assumptions

The cost figures arrived above are the best possible estimates at the time of preparation. More accurate figures will be prepared during each year's annual plan preparation. Some of the works in the plan need more investigation and therefore the works may vary depending on the options available.

The following Three Waters activity management assumptions have been made in preparing the financial forecasts:

- **Growth** – Demand forecasts are made on population forecast predictions made by the University of Waikato. Refer to Part 5 (Managing Growth) of the AMP for further details.
- **New developments** - The majority of the infrastructure required to service new developments will be funded by developers.
- **Renewal** - timing is based on the assumption that assets will be replaced at the end of useful life and specialist reports where legislation and standards are required.
- **Level of Service** – There will be no significant changes in levels of service. Refer to Part 3 (Levels of Service) of the AMP for further details.
- **Useful life of assets** - Is based on a mixture of manufacturers' recommendations and staff experience and judgements.
- **Natural Disasters** – No provision has been made for the cost of repairing damage or other additional costs consequent upon a natural disaster such as major flooding or substantial earthquake apart from the costs of insurance.
- **Climate change** – No provision has been made for the effects of climate change of current assets. Going forward assets will be placed on higher ground and away from erosion prone areas.
- **Ownership** – Assets will remain in Council ownership throughout the planning period.
- **Expenditure** - All expenditure is stated in dollar values as at July 2020. No allowance has been made for inflation.
- **Operational costs** are based on an asset-based bottom-up budget with the exclusion of unplanned maintenance which is based on historical trend.
- **Regulations** - It is assumed that regulations relating to this activity will change over the planning period in-line with the new Water Services Regulator Bill.
- **Maintenance and operations allocations** are largely based on maintaining current service levels. As above, there are no significant changes to Levels of Service (refer to AMP Part 3).
- **Delivery** - The Operation and Maintenance of three waters has been outsourced to Watercare.
- **Asset Values** - The determination of asset replacement value, depreciated value, and renewal projections are based on the valuation data as at 30 June 2019.
- **Depreciation** - The depreciation has been calculated on a simple straight-line basis.

9.1.1 Risk to Significant Forecasting Assumptions

The table below outlines the risks to significant forecasting assumptions. Should these assumptions prove to be incorrect there could be a significant effect on the level of rates to be collected from the community. If this were to occur, Council would re-evaluate the works programmes to determine if the expenditure is appropriate or whether the scope of the proposed works could be scaled down. Rates may then be altered accordingly.

Table 119: Risks to Significant Forecasting Assumptions

Assumption	Risk	Likely Financial Effect	Consequence/ Mitigation Strategy
Level of Service – Changes in customer expectations regarding levels of service will not alter significantly	There is significant change in customer expectations	Impact on operating and capital budgets	Review level of service and budgets at the next LTP round
Level of Service – Changes from the Water Services Regulator Bill will have minimum financial impact. <small>*No provision could be made in the existing plan as the outcome cannot be assessed.</small>	There is significant change in regulatory requirements and more funding is required for compliance.	Impact on operating and capital budgets	WDC to hold in a provisional amount.
Growth Strategy – Council has based its budgets on a sustainable growth strategy	Another growth scenario or a combination of growth scenarios is selected, which may impact on settlement patterns and intensification of development	Impact on demand projections of asset management plans and consequent impact on work programmes	Adjustment of the Annual Plan forecast.
Depreciation expense – Council is assuming that present estimates of depreciation are adequate.	Depreciation expense calculations prove to be inaccurate after revaluation	Impact on long-term financial forecasts	Review budgets during the annual plan process
Planning Information – Asset renewal is based on assumed useful economic life	Asset data results in overestimation or underestimation of the need for renewal or replacement	Depreciation costs and renewal programmes may be over or underestimated	Undertake an on-going condition and performance monitoring programme for estimation of useful life of assets over a three year period. Update Annual Plan as necessary.
Population Growth – Over the next ten years the projected population growth for the district is estimated to be 1.5% per annum.	Should the population growth be higher than projected, or growth in individual wards exceed expectations, then there would be extra pressure on Council to provide and maintain additional infrastructure. Should the population growth be lower than projected there would be less revenue required to maintain new infrastructure to customer expectations.	Extra costs to attend to customer complaints and maintain levels of service. Operations and maintenance costs higher than required	Review population forecasts on an annual basis and adjust Annual Plan work programmes accordingly

9.2 Renewals Forecast

The following shows the proposed 10-year renewals programme for the next 10-year period:

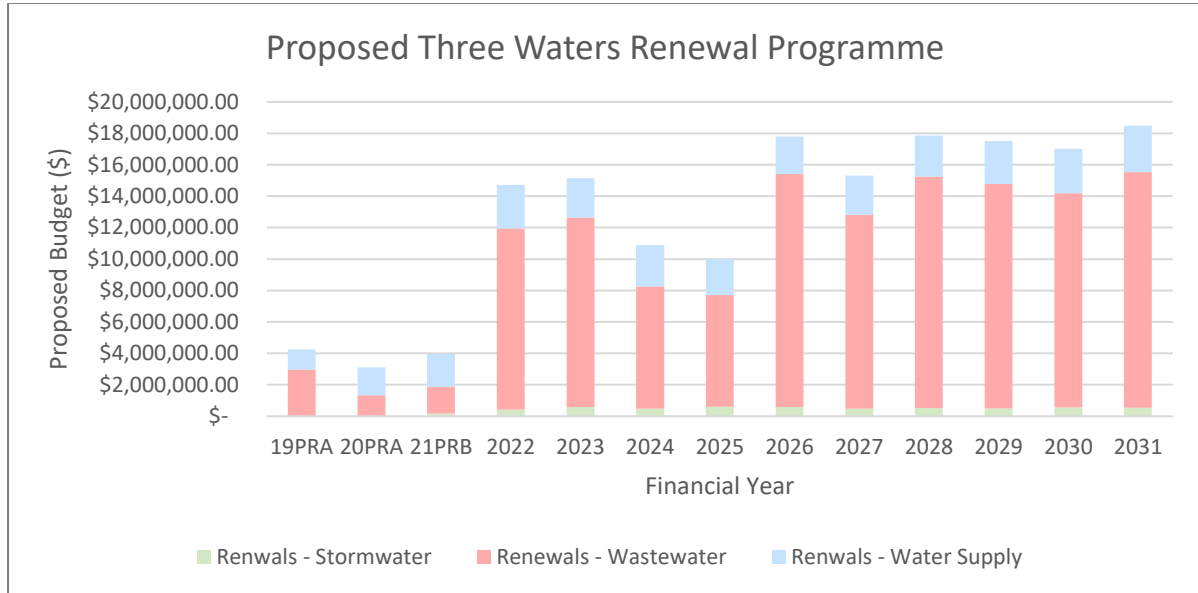


Figure 94: Proposed Three Waters Renewal Programme

9.3 Forecast Capital Projects

Several new capital works are planned over the 10-year planning period. These capital projects will allow Council to continue to provide three waters services to the desired service level standards and to meet the needs of additional capacity requirements that are forecast to occur.

Included are a number of initiatives that were established and prioritised during the development of the Community Blueprints, these are outlined in Part 3: Levels of Service.

Table 120: Three Waters Community Blueprint Initiatives

Initiative Number	Description	Location	Priority
DW8.1	Progress the contract arrangement with Watercare for the delivery of water operations within the district.	District Wide	Top
DW8.2	Pokeno-Tuakau wastewater network upgrade, and the Tuakau wastewater pump station capacity upgrade.	North Waikato	Very High
DW8.3	Raglan Wastewater Upgrade.	Raglan	Very High
DW8.4	Te Kauwhata wastewater treatment plant (WWTP) (short and long term).	Te Kauwhata	High
DW8.5	- Horotiu to Ngaruawahia wastewater network; - Huntly to Ngaruawahia water main upgrade; and - Ngaruawahia network capacity planning.	Central Waikato	High
DW2.3	Complete the ongoing data capture and condition assessment of storm water assets.	District Waikato	Medium
DW2.4	Build a greater awareness of the Waikato Regional Council (WRC) storm water guidelines across WDC.	District Waikato	Medium
DW2.5	Drive Low Impact Urban Design (LIUD) approaches through Catchment Management Plans and Integrated Catchment Management Plans.	District Waikato	Medium
DW2.6	Lead by example by applying low impact storm water approaches in Council works.	District Waikato	Medium
DW2.7	Investigate options to promote LIUD, e.g. through a remission of Development Contributions or an eco-design advice service.	District Waikato	Medium
DW2.8	Develop a better understanding of the rural drainage asset base and roles and responsibilities (WDC and WRC).	District Waikato	Medium
DW2.9	Confirm the Council's approach to drainage, and ensure it is reflected in the consenting process.	District Waikato	Medium
DW2.10	Ensure developers know rural drainage WRC requirements up front.	District Waikato	Medium
DW8.6	Pokeno and Tuakau water main upgrades.	North Waikato	Medium
DW8.7	Te Kauwhata water-take consent renewal.	Mid Waikato	Medium
DW8.8	- Tamahere/Matangi water supply storage; - Onewhero (spring water) future services; and - Te Akau (bore water) end of water services.	Southern Waikato and Small Schemes	Medium
DW8.9	Raglan WWTP Renewal.	Raglan	Medium
DW8.10	Huntly and Ngaruawahia WWTP discharge consent renewals.	Central Waikato	Low
DW8.11	Potential for any Te Kowhai/Horotiu water and wastewater upgrades enabling sustainable growth using cross boundary solutions (Hamilton CC).	Southern Waikato and Small Schemes	Low

The following figure shows the capital projects (including capital renewals) planned for the next 10-year period:

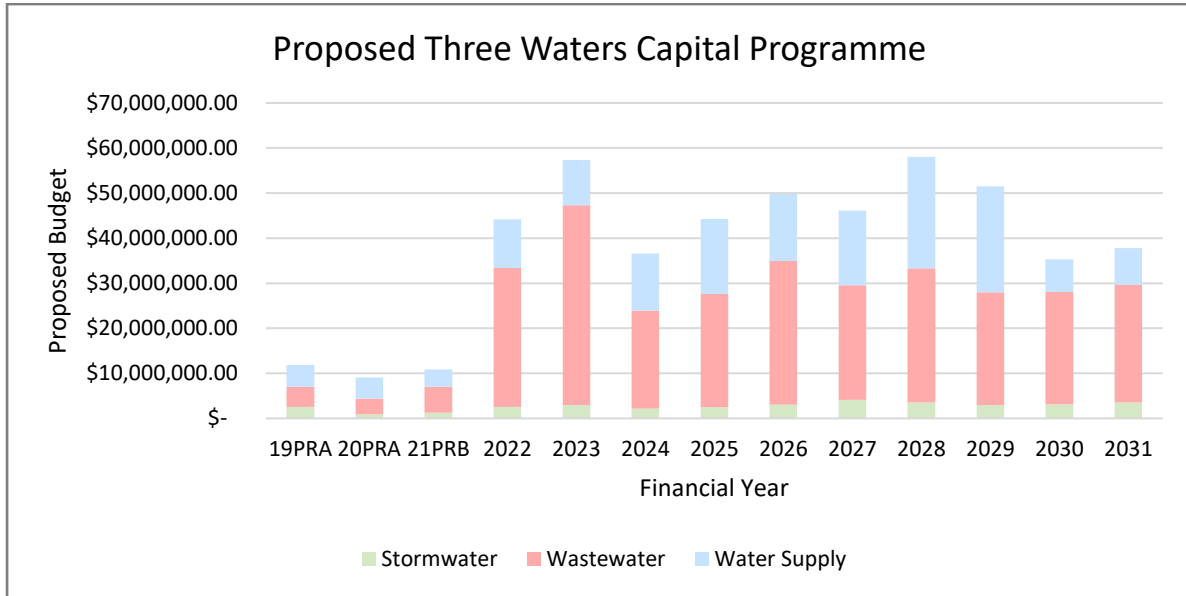


Figure 95: Capital Projects (Including Renewals) for the next 10-Year Period

Water Supply Capital Projects

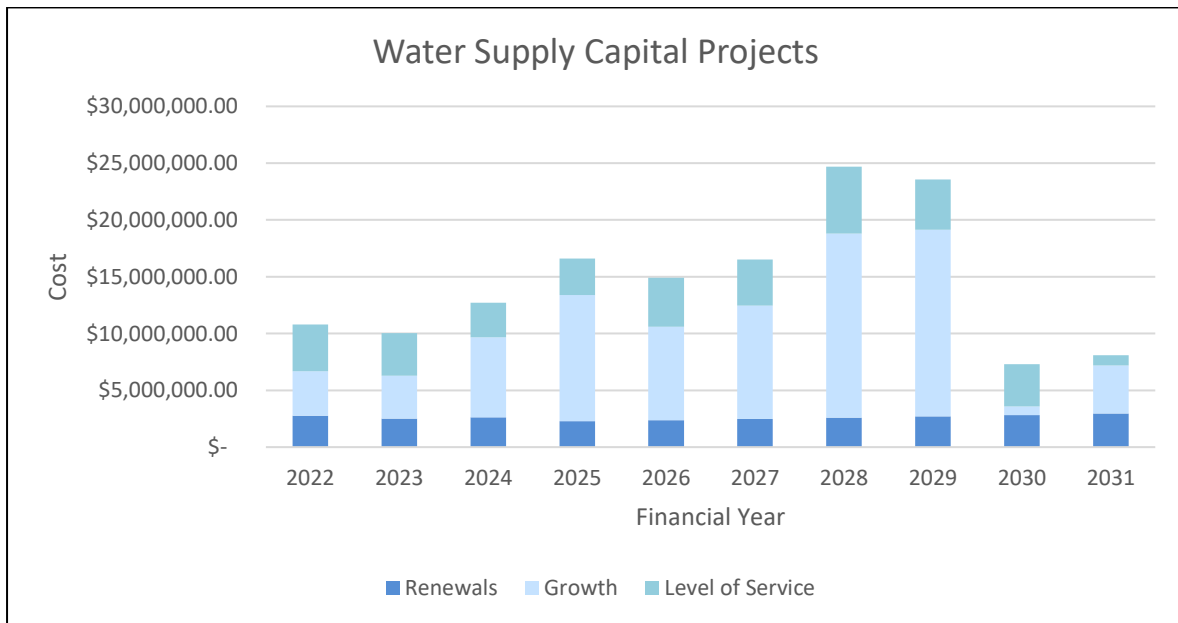


Figure 96: Water Supply Capital Projects - 10 Year Forecast

Wastewater Capital Projects

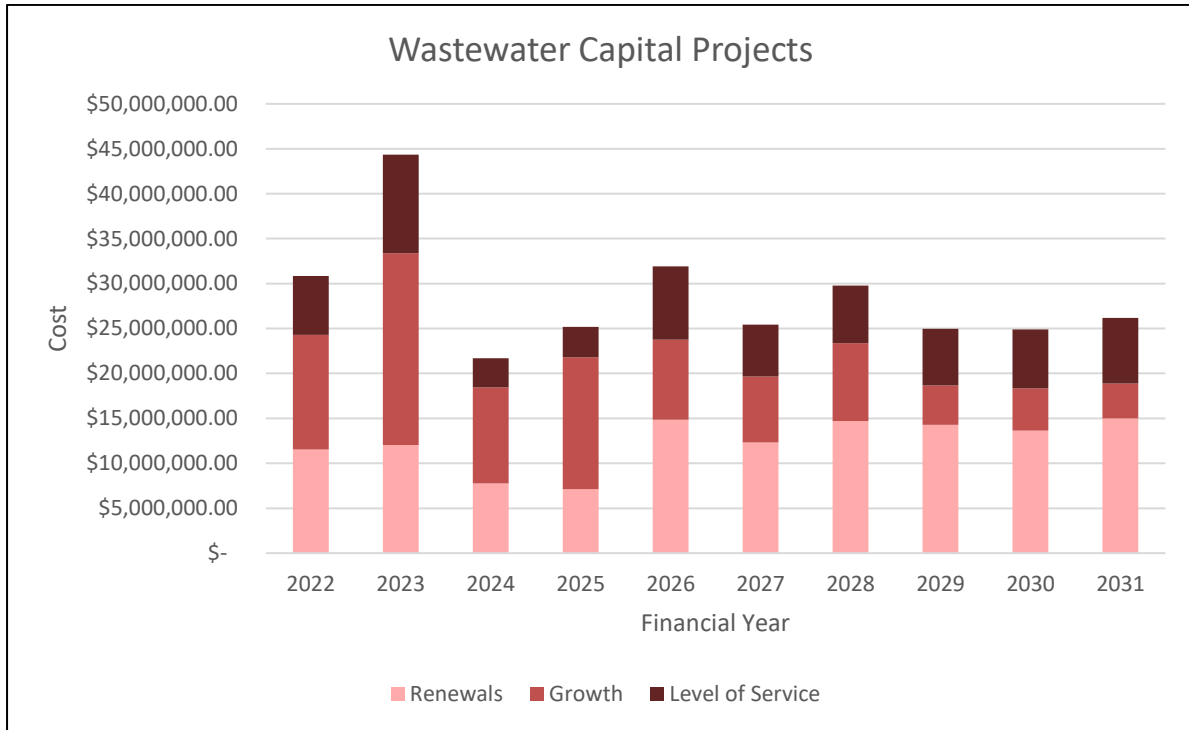


Figure 97: Wastewater Capital Projects - 10-year Forecast

Stormwater Capital Projects

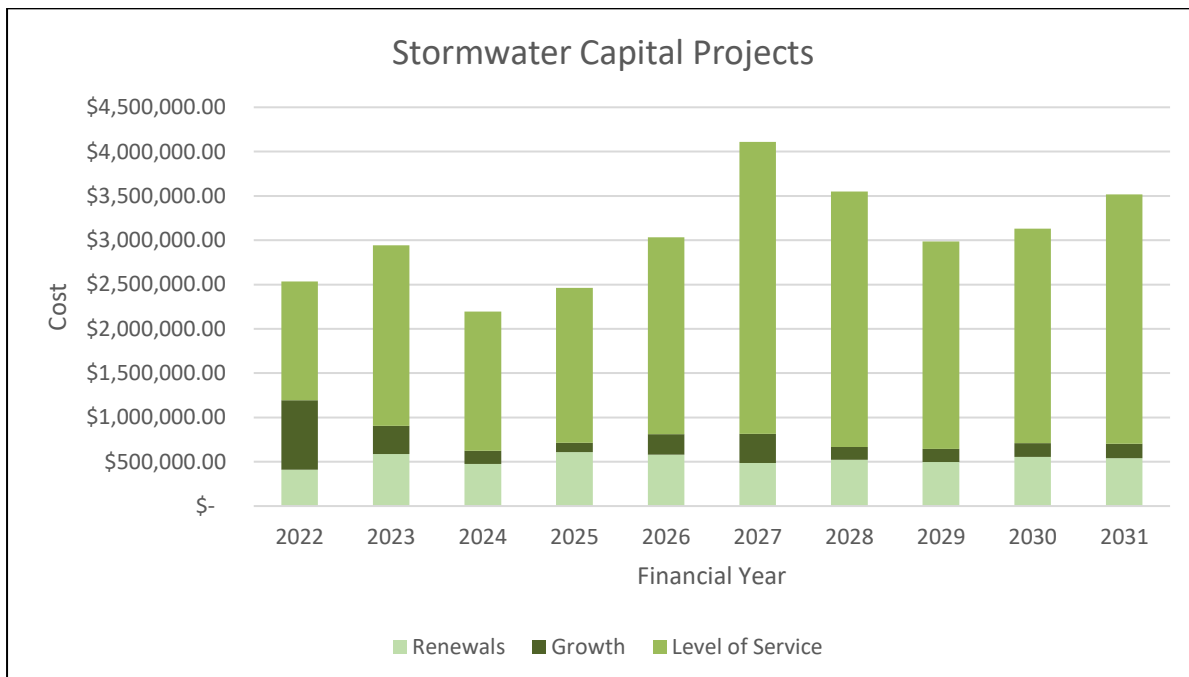


Figure 98: Stormwater Capital Projects - 10-year Forecast

9.4 Operational Expenditure

The following figure shows the 10-year operational programme for the three waters activities.

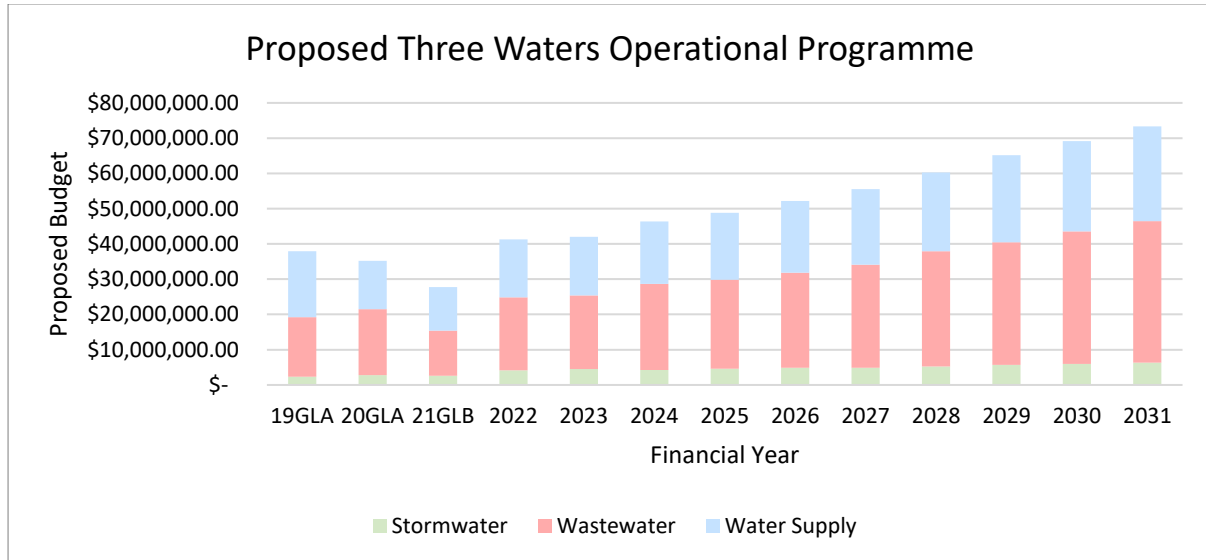


Figure 99: Proposed Operational Programme - Three Waters

Water Supply Operational Programme



Figure 100: Proposed Operational Programme - Water Supply

Wastewater Operational Programme



Figure 101: Proposed Operational Programme - Wastewater

Stormwater Operational Programme

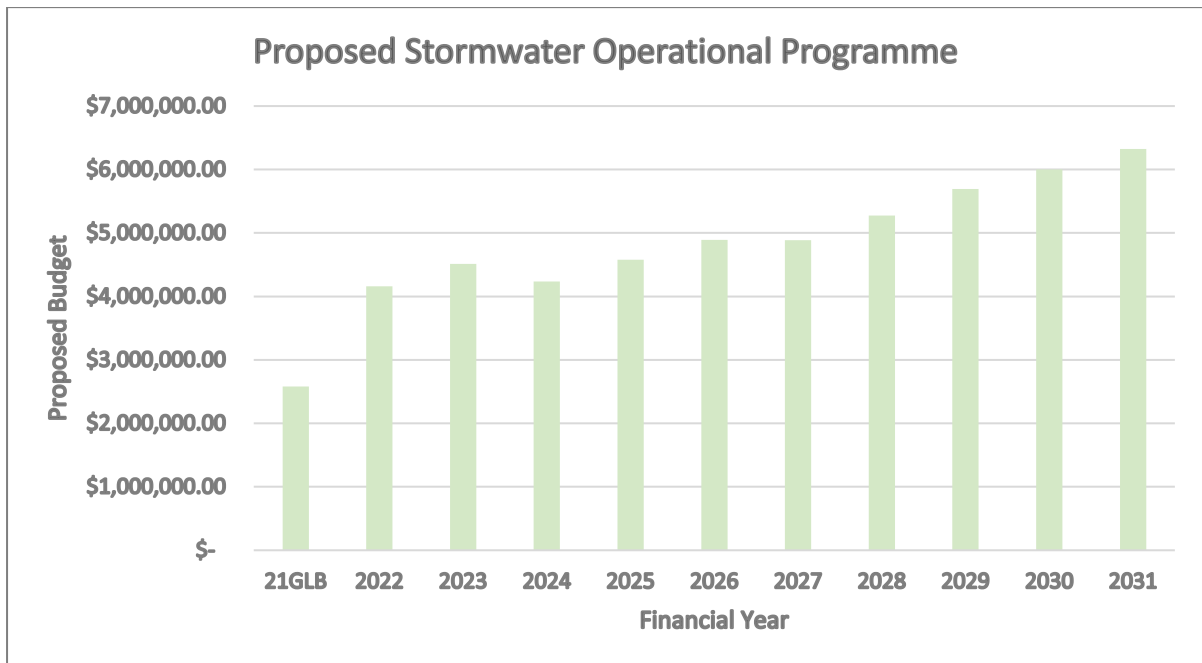


Figure 102: Proposed Operational Programme - Stormwater

10 Water Supply Capital Projects

Group	Project	Location	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Renewals	Treatment Plant Renewals	District Wide	\$832,000.00	\$873,600.00	\$916,406.00	\$479,738.00	\$501,806.00	\$524,388.00	\$547,461.00	\$571,550.00	\$596,126.00	\$621,760.00
	Reticulation Renewals	District Wide	\$1,040,000.00	\$1,092,000.00	\$1,145,508.00	\$1,199,347.00	\$1,254,517.00	\$1,310,970.00	\$1,368,652.00	\$1,428,874.00	\$1,490,315.00	\$1,554,399.00
	Pump Station Renewals	District Wide	\$52,000.00	\$54,600.00	\$57,276.00	\$59,967.00	\$62,726.00	\$65,548.00	\$68,433.00	\$71,444.00	\$74,516.00	\$77,720.00
	Reservoir Renewals	District Wide	\$520,000.00	\$163,800.00	\$171,827.00	\$179,902.00	\$188,178.00	\$196,645.00	\$205,298.00	\$214,332.00	\$223,547.00	\$233,160.00
	Connection Renewals	District Wide	\$312,000.00	\$327,600.00	\$343,652.00	\$359,804.00	\$376,355.00	\$393,291.00	\$410,596.00	\$428,662.00	\$447,095.00	\$466,319.00
Sub-Total			\$2,756,000.00	\$2,511,600.00	\$2,634,669.00	\$2,278,758.00	\$2,383,582.00	\$2,490,842.00	\$2,600,440.00	\$2,714,862.00	\$2,831,599.00	\$2,953,358.00
Growth	Reticulation Extensions	Huntly		\$65,520.00								
	Reticulation Extensions	Raglan	\$572,000.00	\$109,200.00	\$114,551.00	\$119,935.00	\$125,452.00	\$131,097.00	\$136,865.00	\$142,888.00	\$149,032.00	\$155,439.00
	Watermain	Puketaha Road							\$136,865.00	\$400,085.00		
	Reticulation Extensions	Pokeno			\$343,652.00	\$1,319,281.00	\$1,254,517.00	\$1,310,970.00				
	Reticulation Extensions	Tuakau		\$436,800.00	\$1,603,712.00	\$2,878,432.00						
	Reticulation Upgrades	Huntly			\$114,551.00	\$119,935.00	\$125,452.00	\$131,097.00	\$136,865.00			
	Reticulation Upgrades	Ngaruawahia		\$546,000.00	\$572,754.00	\$599,673.00	\$627,258.00					
	Reticulation Upgrades	Raglan	\$182,000.00									
	Network Improvement including NMIT Crossing	Pokeno		\$54,600.00	\$51,548.00	\$83,954.00						
	Pump Station Renewals	Tuakau	\$78,000.00				\$627,258.00					
	Booster Pump Station	Te Kauwhata	\$41,600.00	\$43,680.00								
	Booster Pump Station	Pokeno, Helenslee				\$119,935.00	\$501,806.00					\$777,199.00
	Booster Pump Station	Tuakau, Dominion				\$143,921.00						
	Reservoir Extensions	Matangi						\$26,219.00	\$410,596.00			
	Reservoir and Pump Station	Gordonton						\$104,878.00	\$177,924.00	\$171,465.00	\$596,126.00	
	Reservoir Extensions	Tamahere				\$35,981.00	\$163,088.00	\$170,426.00				
	Reservoir Extensions	Pokeno	\$520,000.00	\$1,638,000.00	\$2,291,016.00							
	Hills Reservoir No.2	Raglan		\$873,600.00	\$1,374,610.00		\$627,258.00	\$1,310,970.00				
	Reservoir Upgrades	Tuakau			\$572,754.00	\$3,055,936.00						
	Treatment Plant Renewals	Te Kauwhata					\$220,795.00	\$346,096.00	\$15,055,180.00	\$15,717,608.00		
	Treatment Plant Upgrades	Mid Waikato	\$72,800.00									
	Treatment Plant Upgrades	Te Kauwhata	\$320,320.00									
	Reticulation Extensions	Te Kauwhata	\$129,792.00				\$3,863,912.00	\$4,499,249.00				\$1,243,519.00
	Reticulation Upgrades	Te Kauwhata				\$2,638,563.00						\$2,067,350.00
	Reservoir Extensions	Te Kauwhata	\$2,000,960.00				\$77,590.00	\$1,940,235.00	\$151,920.00			
Sub-Total			\$3,917,472.00	\$3,767,400.00	\$7,039,148.00	\$11,115,546.00	\$8,214,386.00	\$9,971,237.00	\$16,206,215.00	\$16,432,046.00	\$745,158.00	\$4,243,507.00
Level of Service	Reticulation Extensions	Huntly		\$65,520.00			\$62,726.00	\$589,937.00	\$273,730.00			
	Reticulation Extensions	Raglan	\$104,000.00	\$109,200.00	\$114,551.00							
	Matangi Watermain	Matangi									\$1,341,284.00	

Group	Project	Location	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
	Watermain	Tauwhare Pa						\$327,742.00				
	Watermain	Puketaha Road							\$547,461.00	\$1,600,338.00		
	New Meremere Watermain	Meremere			\$1,202,784.00							
	New Rangiriri Watermain	Rangiriri		\$960,960.00								
	reticulation extensions	Tuakau		\$109,200.00	\$343,652.00	\$359,804.00						
	reticulation upgrades	Huntly			\$400,929.00	\$419,772.00	\$125,452.00	\$131,097.00	\$136,865.00			
	reticulation upgrades	Ngaruawahia		\$546,000.00	\$572,754.00	\$599,673.00	\$627,258.00					
	reticulation upgrades	Raglan	\$1,118,000.00			\$1,199,347.00	\$1,630,872.00					
	network zone boundaries modificatio	Eureka	\$208,000.00	\$1,638,000.00								
	Network Improvement incl NMIT Crossing	Pokeno		\$54,600.00	\$51,548.00	\$83,954.00						
	Network Upgrades	Tuakau	\$78,000.00				\$627,258.00					
	pump station renewals	Te Kauwhata	\$62,400.00	\$65,520.00								
	Booster PS	Tuakau Dominion				\$35,981.00						
	Newell Road PS Upgrade	Newell Road	\$72,800.00									
	reservoir extensions	Matangi						\$104,878.00	\$1,642,384.00			
	Gordonton Reservoir & PS	Gordonton						\$419,510.00	\$711,699.00	\$685,859.00	\$2,384,504.00	
	reservoir extensions	Tamahere				\$143,921.00	\$652,348.00	\$681,704.00				
	connection extensions	District Wide	\$88,400.00									
	treatment plant upgrades	Huntly							\$479,028.00			
	treatment plant upgrades	Ngaruawahia	\$916,980.00					\$458,840.00				
	treatment plant upgrades	Raglan	\$312,000.00									
	Hills Reservoir No.2	Raglan		\$218,400.00	\$343,652.00							
	treatment plant renewals	Te Kauwhata					\$30,108.00	\$47,195.00	\$2,052,979.00	\$2,143,310.00		
	treatment plant upgrades	Te Kauwhata	\$43,680.00									
	reticulation extensions	Te Kauwhata	\$365,248.00					\$526,897.00	\$613,534.00			
	reticulation upgrades	Te Kauwhata				\$359,804.00						\$886,007.00
	pump station upgrades	Te Kauwhata	\$62,400.00									
	Reservoir extensions	Te Kauwhata	\$703,040.00				\$27,262.00	\$681,704.00	\$53,377.00			
	Sub-Total		\$4,134,948.00	\$3,767,400.00	\$3,029,870.00	\$3,202,256.00	\$4,310,181.00	\$4,056,141.00	\$5,897,523.00	\$4,429,507.00	\$3,725,788.00	\$886,007.00
	Grand Total		\$10,808,420.00	\$10,046,400.00	\$12,703,687.00	\$16,596,560.00	\$14,908,149.00	\$16,518,220.00	\$24,704,178.00	\$23,576,415.00	\$7,302,545.00	\$8,082,872.00

II Wastewater Capital Projects

Group	Project	Location	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Renewals	reticulation extensions	Tuakau			\$71,595.00							
	reticulation renewals	District Wide	\$2,600,000.00	\$2,730,000.00	\$2,863,770.00	\$2,998,367.00	\$3,136,292.00	\$3,277,425.00	\$3,421,632.00	\$3,572,184.00	\$3,725,788.00	\$3,885,996.00
	reticulation renewals	Huntly			\$343,652.00							
	reticulation renewals	Ngaruawahia	\$1,300,000.00									
	reticulation renewal	Wainagro		\$245,700.00								
	pump station extensions	Te Kauwhata				\$26,985.00	\$282,266.00					
	pump station renewals	District Wide	\$312,000.00	\$327,600.00	\$343,652.00	\$359,804.00	\$376,355.00	\$393,291.00	\$410,596.00	\$428,662.00	\$447,095.00	\$466,319.00
	low pressure WW pump scheme	Te Ohaki			\$171,827.00	\$179,902.00						
	Low Pressure WW Pump Scheme	Tauwhare Pa	\$156,000.00	\$163,800.00								
	pump station upgrades	Horotiu		\$65,520.00	\$297,832.00	\$163,112.00						
	pump station upgrades	Pokeno	\$41,600.00									
	treatment plant planning and manage	District Wide	\$728,000.00	\$764,400.00	\$229,102.00	\$239,870.00	\$250,903.00	\$262,194.00	\$273,730.00	\$285,774.00	\$298,063.00	\$310,880.00
	treatment plant planning and management	Huntly							\$684,326.00	\$714,436.00		
	treatment plant planning and manage	Ngaruawahia							\$479,028.00	\$500,106.00		
	treatment plant planning and management	Matangi	\$520,000.00									
	treatment plant planning and manage	Te Kauwhata	\$676,000.00									
	treatment plant renewals	District Wide	\$832,000.00	\$873,600.00	\$916,406.00	\$479,738.00	\$501,806.00	\$524,388.00	\$547,461.00	\$571,550.00	\$596,126.00	\$621,760.00
	treatment plant upgrades	Huntly					\$7,213,472.00	\$7,538,078.00	\$8,554,080.00			
	treatment plant upgrades	Ngaruawahia								\$8,216,023.00	\$8,569,312.00	\$9,714,992.00
	treatment plant upgrades	Raglan	\$178,500.00	\$1,727,250.00	\$2,405,567.00	\$2,518,628.00	\$3,073,566.00					
	treatment plant upgrades	Matangi		\$131,040.00	\$137,461.00							
	treatment plant upgrades	Te Kauwhata	\$4,149,600.00	\$5,023,200.00								
	treatment plant upgrades	Maramarua				\$143,921.00						
	Pressure Pump Renewal	Whale Bay						\$340,853.00	\$355,850.00			
	pump station upgrades	Te Kauwhata	\$52,000.00									
Sub-Total			\$11,545,700.00	\$12,052,110.00	\$7,780,864.00	\$7,110,327.00	\$14,834,660.00	\$12,336,229.00	\$14,726,703.00	\$14,288,735.00	\$13,636,384.00	\$14,999,947.00
Growth	reticulation extensions	Horotiu				\$520,000.00					\$520,000.00	
	reticulation extensions	Tuakau			\$214,783.00			\$393,291.00	\$2,463,575.00			
	reticulation renewals	Ngaruawahia	\$780,000.00									
	pump station extensions	Te Kauwhata				\$26,985.00	\$282,266.00					
	pump station extensions	Pokeno	\$520,000.00									
	pump station upgrades	Ngaruawahia		\$81,900.00								
	pump station upgrades	Horotiu	\$1,206,400.00	\$1,168,440.00	\$1,191,328.00	\$1,252,118.00	\$188,178.00	\$3,932,911.00	\$2,744,149.00	\$1,103,091.00	\$745,158.00	
	pump station upgrades	Pokeno	\$624,000.00	\$5,241,600.00	\$6,873,048.00	\$10,362,356.00	\$2,509,033.00					
	pump station upgrades	Tuakau	\$3,744,000.00	\$3,931,200.00								
	treatment plant upgrades	Huntly					\$2,885,388.00	\$3,015,231.00	\$3,421,632.00			
	treatment plant upgrades	Ngaruawahia								\$3,286,409.00	\$3,427,725.00	\$3,885,996.00
	treatment plant upgrades	Raglan	\$178,500.00	\$1,727,250.00	\$2,405,567.00	\$2,518,628.00	\$3,073,566.00					

Group	Project	Location	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
	treatment plant upgrades	Te Kauwhata	\$5,678,400.00	\$9,172,800.00								
Sub-Total			\$12,731,300.00	\$21,323,190.00	\$10,684,726.00	\$14,680,087.00	\$8,938,431.00	\$7,341,433.00	\$8,629,356.00	\$4,389,500.00	\$4,692,883.00	\$3,885,996.00
Level of Service	Reticulation renewals	Ngaruawahia	\$520,000.00									
	reticulation renewal	Wainagro		\$81,900.00								
	Wastewater pump station LOS impr - emrgncy storage		\$676,000.00	\$709,800.00	\$744,581.00	\$779,575.00	\$815,436.00	\$852,130.00	\$889,624.00	\$928,768.00	\$968,705.00	\$1,010,359.00
	pump station upgrades	Ngaruawahia		\$627,900.00								
	wastewater management plan development	Te Kauwhata	\$136,000.00									
	treatment plant upgrades	District Wide	\$312,000.00	\$327,600.00	\$343,652.00	\$359,804.00	\$376,355.00	\$393,291.00	\$410,596.00	\$428,662.00	\$447,095.00	\$466,319.00
	treatment plant upgrades	Huntly					\$4,328,083.00	\$4,522,847.00	\$5,132,448.00			
	treatment plant upgrades	Ngaruawahia								\$4,929,614.00	\$5,141,587.00	\$5,828,995.00
	treatment plant upgrades	Raglan	\$153,000.00	\$1,480,500.00	\$2,061,914.00	\$2,158,825.00	\$2,634,485.00					
	treatment plant upgrades	Matangi		\$87,360.00	\$91,641.00							
	treatment plant upgrades	Te Kauwhata	\$4,732,000.00	\$7,644,000.00								
	treatment plant upgrades	Maramarua				\$95,947.00						
	pump station upgrades	Te Kauwhata	\$52,000.00									
Sub-Total			\$6,581,000.00	\$10,959,060.00	\$3,241,788.00	\$3,394,151.00	\$8,154,359.00	\$5,768,268.00	\$6,432,668.00	\$6,287,044.00	\$6,557,387.00	\$7,305,673.00
Grand Total			\$30,858,000.00	\$44,334,360.00	\$21,707,378.00	\$25,184,565.00	\$31,927,450.00	\$25,445,930.00	\$29,788,727.00	\$24,965,279.00	\$24,886,654.00	\$26,191,616.00

12 Stormwater Capital Projects

Group	Project	Location	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Renewals	Network Renewals	District Wide	\$208,000.00	\$218,400.00	\$229,102.00	\$239,870.00	\$250,903.00	\$262,194.00	\$273,730.00	\$285,774.00	\$298,063.00	\$310,880.00
	reticulation upgrades	Huntly	\$8,580.00	\$87,088.00	\$3,150.00	\$19,789.00	\$3,450.00	\$21,631.00	\$3,764.00	\$3,929.00	\$24,590.00	\$4,274.00
	reticulation upgrades	Ngaruawahia	\$19,760.00	\$16,380.00	\$34,366.00	\$5,997.00	\$6,272.00	\$6,555.00	\$6,843.00	\$7,145.00	\$7,452.00	\$7,772.00
	Various WQ, waterway and capacity upgrades Dist	Taupiri	\$72,800.00	\$81,900.00	\$80,186.00	\$239,870.00	\$62,726.00	\$65,548.00	\$68,433.00	\$71,444.00	\$74,516.00	\$77,720.00
	reticulation upgrades	Te Kauwhata	\$5,460.00	\$5,734.00	\$6,014.00	\$18,890.00	\$6,586.00	\$20,648.00	\$7,185.00	\$7,502.00	\$23,473.00	\$8,161.00
	Various WQ, waterway and capacity upgrades Dist	Te Kowhai	\$3,120.00	\$3,276.00	\$3,436.00	\$4,318.00	\$5,645.00	\$3,933.00	\$4,106.00	\$4,287.00	\$4,471.00	\$4,663.00
	reticulation upgrades	Pokeno	\$40,560.00	\$42,588.00	\$67,012.00	\$38,979.00	\$203,859.00	\$42,607.00	\$44,481.00	\$46,438.00	\$48,435.00	\$50,518.00
	reticulation upgrades	Tuakau	\$31,200.00	\$45,046.00	\$51,548.00	\$40,478.00	\$42,339.00	\$63,910.00	\$66,722.00	\$69,657.00	\$72,653.00	\$75,777.00
	Renewals 3 storm water PS renewal	District Wide	\$20,800.00	\$87,360.00					\$47,902.00			
Sub-Total			\$410,280.00	\$587,772.00	\$474,814.00	\$608,191.00	\$581,780.00	\$487,026.00	\$523,166.00	\$496,176.00	\$553,653.00	\$539,765.00
Growth	Pokeno -DHLPON-FI Construct stormwater pond FI	Pokeno	\$502,680.00	\$202,089.00								
	Ngaruawahia stormwater reticulation upgrades	Ngaruawahia	\$10,868.00	\$9,010.00	\$18,901.00	\$3,298.00	\$3,450.00	\$3,606.00	\$3,764.00	\$3,929.00	\$4,099.00	\$4,274.00
	Raglan stormwater reticulation upgrades	Raglan	\$21,840.00	\$22,932.00	\$24,055.00	\$25,187.00	\$39,517.00	\$220,243.00	\$28,741.00	\$30,006.00	\$31,297.00	\$32,642.00
	Te Kowhai Various WQ, waterway and capacity upgrades Dist	Te Kowhai	\$1,040.00	\$1,092.00	\$1,145.00	\$1,439.00	\$1,881.00	\$1,311.00	\$1,369.00	\$1,429.00	\$1,490.00	\$1,555.00
	Pokeno stormwater reticulation upgrades	Pokeno	\$26,520.00	\$27,846.00	\$43,815.00	\$25,486.00	\$133,293.00	\$27,858.00	\$29,084.00	\$30,364.00	\$31,669.00	\$33,031.00
	Tuakau stormwater reticulation upgrades	Tuakau	\$37,440.00	\$54,054.00	\$61,857.00	\$48,573.00	\$50,808.00	\$76,692.00	\$80,066.00	\$83,589.00	\$87,183.00	\$90,932.00
Sub-Total			\$785,451.00	\$317,023.00	\$149,773.00	\$103,983.00	\$228,949.00	\$329,710.00	\$143,024.00	\$149,317.00	\$155,738.00	\$162,434.00
Level of Service	District Wide Treatment Plant Proprietary Devices	District Wide	\$5,148.00	\$6,224.00	\$7,388.00	\$8,635.00	\$147,971.00	\$63,845.00	\$190,858.00	\$128,885.00	\$224,963.00	\$639,946.00
	District Wide consent reapplication 15 consents	District Wide					\$188,178.00	\$707,924.00	\$1,026,489.00			
	District Wide storm water extension	District Wide	\$166,400.00	\$163,800.00	\$171,827.00	\$179,902.00	\$188,178.00	\$196,645.00	\$205,298.00	\$214,332.00	\$223,547.00	\$233,160.00
	Huntly stormwater reticulation upgrades	Huntly	\$69,420.00	\$704,614.00	\$25,487.00	\$160,113.00	\$27,913.00	\$175,014.00	\$30,452.00	\$31,793.00	\$198,957.00	\$34,585.00
	Ngaruawahia stormwater reticulation upgrades	Ngau	\$68,172.00	\$56,512.00	\$118,560.00	\$20,689.00	\$21,640.00	\$22,614.00	\$23,609.00	\$24,648.00	\$25,708.00	\$26,813.00
	Horotiu WQ, waterway and capacity upgrades Dist	Horotiu	\$208,000.00	\$218,400.00	\$252,012.00	\$239,870.00	\$250,903.00	\$288,414.00	\$301,104.00	\$714,436.00	\$298,063.00	\$310,880.00
	Houpuhoupu Various WQ, waterway and capacity upgrades Dist	Houpuhoupu	\$26,000.00	\$27,300.00	\$28,637.00	\$29,983.00	\$31,363.00	\$32,775.00	\$34,216.00	\$35,722.00	\$37,258.00	\$38,860.00
	Glen Massey Various WQ, waterway and capacity upgrades Dist	Glen Massey	\$57,200.00	\$27,300.00	\$28,637.00	\$29,983.00	\$31,363.00	\$32,775.00	\$34,216.00	\$35,722.00	\$74,516.00	\$194,300.00
	Taupiri Various WQ, waterway and capacity upgrades Dist	Taupiri	\$72,800.00	\$81,900.00	\$80,186.00	\$239,870.00	\$62,726.00	\$65,548.00	\$68,433.00	\$71,444.00	\$74,516.00	\$77,720.00
	Raglan stormwater reticulation upgrades	Raglan	\$82,160.00	\$86,268.00	\$90,496.00	\$94,748.00	\$148,661.00	\$828,533.00	\$108,124.00	\$112,881.00	\$117,735.00	\$122,798.00
	Eureka Various WQ, waterway and capacity upgrades Dist	Eureka	\$26,000.00	\$27,300.00	\$28,637.00	\$29,983.00	\$31,363.00	\$32,775.00	\$34,216.00	\$35,722.00	\$37,258.00	\$38,860.00
	Matangi Various WQ, waterway and capacity upgrades Dist	Matangi	\$26,000.00	\$27,300.00	\$28,637.00	\$29,983.00	\$31,363.00	\$32,775.00	\$34,216.00	\$35,722.00	\$37,258.00	\$38,860.00
	Tamahere stormwater reticulation upgrades	Tamahere	\$104,000.00	\$109,200.00	\$114,551.00	\$119,935.00	\$125,452.00	\$131,097.00	\$136,865.00	\$214,332.00	\$298,063.00	\$310,880.00

Group	Project	Location	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
	Te Kauwhata stormwater reticulation upgrades	Te Kauwhata	\$20,540.00	\$21,568.00	\$22,624.00	\$71,061.00	\$24,777.00	\$77,675.00	\$27,031.00	\$28,220.00	\$88,301.00	\$30,700.00
	Meremere Various WQ, waterway and capacity upgrades Dist	Meremere	\$26,000.00	\$27,300.00	\$28,637.00	\$29,983.00	\$31,363.00	\$32,775.00	\$34,216.00	\$35,722.00	\$37,258.00	\$38,860.00
	Whatawhata Various WQ, waterway and capacity upgrades Dist	Whatawhata	\$26,000.00	\$27,300.00	\$28,637.00	\$29,983.00	\$31,363.00	\$32,775.00	\$34,216.00	\$35,722.00	\$37,258.00	\$38,860.00
	Te Kowhai Various WQ, waterway and capacity upgrades Dist	Te Kowhai	\$99,840.00	\$104,832.00	\$109,969.00	\$138,165.00	\$180,650.00	\$125,854.00	\$131,390.00	\$137,172.00	\$143,071.00	\$149,222.00
	Mercer Various WQ, waterway and capacity upgrades Dist	Mercer	\$26,000.00	\$27,300.00	\$28,637.00	\$29,983.00	\$31,363.00	\$32,775.00	\$34,216.00	\$35,722.00	\$37,258.00	\$38,860.00
	Pokeno stormwater reticulation upgrades	Pokeno	\$88,920.00	\$93,366.00	\$146,911.00	\$85,454.00	\$446,921.00	\$93,407.00	\$97,517.00	\$101,808.00	\$106,185.00	\$110,751.00
	Tuakau stormwater reticulation upgrades	Tuakau	\$139,360.00	\$201,202.00	\$230,247.00	\$180,802.00	\$189,119.00	\$285,463.00	\$298,024.00	\$311,137.00	\$324,516.00	\$338,470.00
	Sub-Total		\$1,337,960.00	\$2,038,986.00	\$1,570,717.00	\$1,749,125.00	\$2,222,630.00	\$3,291,458.00	\$2,884,706.00	\$2,341,142.00	\$2,421,689.00	\$2,813,385.00
	Grand Total		\$2,348,628.00	\$2,943,781.00	\$2,195,304.00	\$2,461,299.00	\$3,033,359.00	\$4,108,194.00	\$3,550,896.00	\$2,986,635.00	\$3,131,080.00	\$3,515,584.00

12.1 Confidence Levels

Confidence ratings are made using the criteria outlined below:

Table 8-121: Confidence Rating Criteria

Grade	General Meaning
A	Highly Reliable - Data based on sound records, procedure, investigations and analysis which is properly documented and recognised as the best method of assessment.
B	Reliable - Data based on sound records, procedure, investigations and analysis which is properly documented but has minor shortcomings.
C	Uncertain - Data based on sound records, procedures, investigation and analysis which are incomplete or unsupported, or extrapolations from limited sample for which grade A or B data is available.
D	Very Uncertain - Data base on unconfirmed verbal report and/or cursory inspection and analysis.

Accuracy ratings are made using the criteria outlined below:

Table 8-122: Accuracy Rating Criteria

Grade	Description	Accuracy
1	Accurate	100%
2	Minor inaccuracies	+ / - 5%
3	50% estimated	+ / - 20%
4	Significant data estimated	+ / - 30%
5	All data estimated	+ / - 40%

The confidence in the asset data used as a basis for the financial forecasts is detailed below which provides an assessment of the confidence in, and the accuracy of the 10-year financial forecast and supporting asset data:

Table 8-123: Financial Forecast Confidence Level

Activity	Confidence Grade	Accuracy
Operations / Maintenance	Highly Reliable	2
Depreciation	Reliable	2
Funding Costs	Reliable	2
Capital Expenditure	Reliable	2
Debt Repayment	Reliable	2
Overall	Reliable	2

The overall confidence level is reliable

The overall accuracy is 2 indicating that the accuracy of the financial forecasts has minor inaccuracies.

Table 8-124: Confidence levels for each expenditure type - Water Supply

Activity	Reason	Confidence Level			Accuracy		
		Years 1-3	Years 4-10	Years 10+	Years 1-3	Years 4-10	Years 10+
Operations Fixed	High level of historic information supports this expenditure	B	B	C	2	2	3
Operations Variable	Expenditure has been derived from a combination of actual and extrapolated data which is based on assumptions	B	B	C	2	2	3
Revenue	Expenditure has been derived from a combination of actual and extrapolated data which is based on assumptions. Demand is likely to change based on the installation of meters in Huntly, Ngaruawahia and Raglan.	C	C	C	3	3	3
Renewal	Expenditure has been derived from a combination of actual and extrapolated data which is based on asset age and some condition data.	B	B	C	2	2	3
Capital	Expenditure has been derived from a combination of finalised and draft programmes which have been determined through either robust analysis or collated based on assumptions	B	C	C	2	3	3

The overall confidence level is reliable for the years 1-3 and uncertain for the years 10+.

The overall accuracy is 3 indicating that the accuracy of the financial forecasts is 50% estimated

Table 8-125: Confidence levels for each expenditure type - Wastewater

Activity	Reason	Confidence Level			Accuracy		
		Years 1-3	Years 4-10	Years 10+	Years 1-3	Years 4-10	Years 10+
Operations Fixed	High level of historic information supports this expenditure	B	B	C	2	3	3
Operations Variable	Expenditure has been derived from a combination of actual and extrapolated data which is based on assumptions	B	B	C	2	2	3
Revenue	Expenditure has been derived from a combination of actual and extrapolated data which is based on assumptions	C	C	C	3	3	3
Renewal	Expenditure has been derived from a combination of actual and extrapolated data which is based on assumptions	B	C	C	2	3	3
Capital	Expenditure has been derived from a combination of finalised and draft programmes which have been determined through either robust analysis or collated based on assumptions	B	C	C	2	3	3

The overall confidence level is reliable for the years 1-3 and uncertain for the years 10+.

The overall accuracy is 3 indicating that the accuracy of the financial forecasts is 50% estimated

Table 8-126: Confidence levels for each expenditure type – Stormwater

Activity	Reason	Confidence Level			Accuracy		
		Years 1-3	Years 4-10	Years 10+	Years 1-3	Years 4-10	Years 10+
Operations Fixed	High level of historic information supports this expenditure	B	B	B	2	2	2
Operations Variable	Expenditure has been derived from a combination of actual and extrapolated data which is based on assumptions	C	C	C	3	3	3
Revenue	Expenditure has been derived from a combination of actual and extrapolated data which is based on assumptions	C	C	C	3	3	3
Renewal	Expenditure has been derived from a combination of actual and extrapolated data which is based on assumptions	C	C	C	3	3	3
Capital	Expenditure has been derived from a combination of finalised and draft programmes which have been determined through either robust analysis or collated based on assumptions	C	C	C	3	3	3

The overall confidence level is reliable for the years 1-3 and uncertain for the years 10+.

The overall accuracy is 3 indicating that the accuracy of the financial forecasts is 50% estimated.

Funding Strategies

12.2 Policies for Funding the Three Waters Activity

Expenditure on the three waters activities represents a significant Council investment. The table below explains how council is funded.

Table 127: Council Funding Explanations

Council Funding	Explanation
Council Reserves	These reserves have been established by council for specific purposes and have specific conditions of use on these funds.
General Rate	The general rate is based on the capital value of rateable properties. It is levied on all properties and funds things that all rate payers benefit from.
Replacement Reserves	The total yearly depreciation expense (less non funded depreciation) is put into replacement fund reserves. Only capital works and loan repayments can be funded from this source.
Targeted Rate – Capital	Contributions under the LGA are levied in circumstances where the effects of growth require council to incur capital expenditure to provide new or additional infrastructure. Reserves exist for Structure Plans, Development Contributions, Financial Contributions and Capital Targeted rates.
Targeted Rate – Operational	Legislation states that if we rate for a specific reason, the income received can only be used for that specific purpose. The reserves monitor operational costs in relation to special rates and user pays.
Loans Raised	Loans are raised for level of service improvements. The expectation is that future rate payers will benefit from the improvements and hence should share in paying for the improvement.
Income applied to Capital	User charges like water connection charges are used to fund user pays infrastructure. Subsidies like the NZTA subsidy are also used to fund infrastructure.

12.3 Funding of Operating Expenditure

12.3.1 Water Supply

Operating expenditure is funded from targeted rates and water by meter charges.

Targeted Rates

The Council sets targeted rates for water supply based on the provision (connected to the supply) or availability (property situated within 30 metres of water network) of a water supply to land. This rate is set as a fixed charge per connection or 50% of this fixed charge for availability in the main urban

areas. Properties with metered connections are charged 25% of the connected rate as they contribute through their consumption charges. Non-metered commercial properties and commercial properties with accommodation are charged 100% of the connected rate.

Water by Meter Rate

The Council has set a rate for water according to the quantity of water consumed by any person receiving the same as measured or controlled by meter. The District Wide Targeted Rate has been set across water supply schemes within old WDC areas on a per cubic metre basis. The charges of Southern and Western Districts are excluded from the District Wide Targeted Rate as they are supplied by Hamilton City and the charging regime is different. Tuakau, Pokeno, Onewhero and Port Waikato received a volumetric charge only the charges are set as stepped charges based on volume (more than 200m³ per 6 months).

There are 4 targeted rate reserves – North Waikato (Tuakau, Pokeno, Onewhero, Port Waikato), Southern Districts, Western Districts and District Wide (which encompasses all remaining water supplies).

12.3.2 Wastewater

Operating expenditure is funded from targeted rates and wastewater by meter charges.

Targeted Rates

The council proposes to set a District Wide targeted rates to fund expenditure on wastewater activities for those properties that receive the wastewater service.

The rates are differentiated by residential or commercial use.

Properties in the residential differential are further differentiated by connection or availability of the service.

For the purpose of this rate:

- Residential is defined as any part of a rating unit that is used primarily for residential purposes. This is the base differential.
- Availability is defined as any rating unit situated within 30 metres of a public wastewater drain to which it is capable of being effectively connected – set as 50 per cent of the fixed amount for connected properties.
- Commercial is defined as any part of a rating unit that is not categorised as residential, commercial (non-rateable) or commercial (assistance for the elderly). The rates are set and assessed as 100 per cent of the residential connected differential for rating units with up to two pans, and 50 per cent of the residential connected rate for the third subsequent pans for the additional use they make of the wastewater systems.
- Commercial (non-rateable) is defined as organisations classified by the Act as fully non-rateable or organisations that are non-profitable as determined by the Council. The rates are set and assessed as 100 per cent of the residential connected differential or rating units with up to two pans, and 10 per cent of the connected rate for the third and subsequent pans in accordance with the Council's aim to assist non-profit organisations.

- Commercial (assistance for the elderly) is defined as organisations that are supportive of the elderly, including retirement homes, rest homes and Council – owned pensioner flats, as determined by the Council. The rates are set and assessed as 100 per cent of the residential connected differential for rating units with up to two pans and 20 per cent of the connected rates for the third and subsequent pans in accordance with the Council’s aim of assisting with the elderly.

12.3.3 Stormwater

Operating expenditure is funded from targeted rates, general rates, and drainage district fees.

Targeted Rates

The Council sets targeted rates for stormwater collection and disposal based on whether properties are within an area of benefit from a Council owned stormwater system. This is taken as the urban limit for towns having a reticulated stormwater network.

Drainage district targeted rates are charged to properties within the gazetted boundaries of the drainage district, according to the rating structure for the drainage district.

12.4 Funding for Renewal Expenditure

Renewal works are funded from replacement fund reserves. The replacement fund reserve is funded from revenue at a rate equal to depreciation. Assets are depreciated on a straight-line basis over their remaining life with depreciation recognised as an operating expense.

12.5 Replacement Fund Reserve

12.5.1 Wastewater Replacement Fund Reserve

Graph below shows the forecast credits and debits to the replacement fund and the balance at the end of each year.

12.6 Funding for Levels of Service Expenditure

Capital works that will improve levels of service are funded from targeted rates and loans. Capital works that are required to service growth is funded from development funds and loans. Developers themselves fund most of infrastructure works within developments.

12.7 Funding for Growth Capital Expenditure

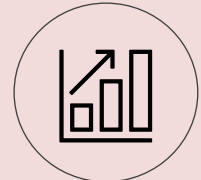
Development contributions provide a source of funding for future capacity upgrading work. These works offset the cumulative depletion of any spare capacity within each network caused by new users. Development contribution charges are calculated as per Council’s Development Contribution Policy and reflected in Council Fees and Charges documents.

13 Assessment between AMP and Adopted LTP 2021/31

To be completed upon adoption of the LTP.

Part 9: Continuous Improvement

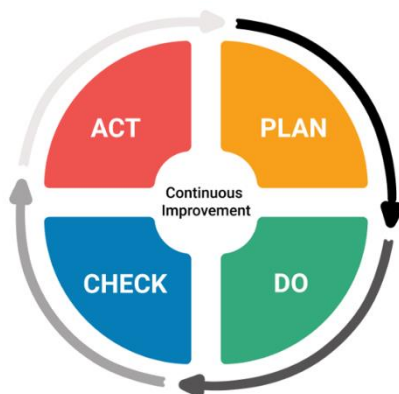
This section identifies the maturity of Waikato District Council asset management practices, improvements made since the last Activity Management Plan review and a plan for future asset management improvement areas for improvements identified in earlier sections of the plan.



I Overview

Council is committed to fostering an environment of continuous improvement and the three waters activity adheres to this approach.

The following continuous improvement functions fall into four parts of the Plan, Do, Check, Act process:



Plan – Set an Asset Management Maturity Target

Do – Assess current practice

Check – Compare current practice against target

Act -Set Improvement Actions

Figure 103: Generic Approach to Continuous Improvement

2 What Asset Information System do we use?

Waikato District Council uses the AssetFinda asset management system for its three waters activity. This system includes functionality to include an asset register of all utility assets which are represented spatially. Mapped geometries are connected to asset attribute information and held together inside the AssetFinda database. The assets are held in three discrete tables within the database – pipes, points and plant.

The finance team do not hold a separate fixed asset register and utilise AssetFinda, which can be used to manage revaluation and depreciation calculations.

Implementation of this system required the development of standards and processes for:

- Asset identification

- Asset data collection:
 - Physical attributes
 - Condition
 - Performance
 - Finance
- Data entry
- Updating
- Validation.

The system was introduced in stages from 2002 and has been fully operational since 2003. In future aspiration is all assets data to be migrated to Cloudsuite EAM, an enterprise asset management software developed by Infor. The new software will provide an integrated system of asset data storage, works request, asset planning, workflow management, asset performance monitoring, to name a few.

2.1 Data Accuracy and Confidence

Table below provides the confidence framework (NAMS IIMM) used to determine the confidence in the asset data used in this AMP.

Table 128: Data Confidence Grading System (IIMM)

Confidence Grade	Description Grade
A Very High	Highly Reliable <2% uncertainty Data based on sound records, procedure, investigations and analysis, documented properly and recognised as the best method of assessment.
B High	Reliable ± 2-10% uncertainty Data based on sound records, procedures, investigations and analysis, documented properly but has minor shortcomings, for example the data is old, some documentation is missing, and reliance is placed on unconfirmed reports or some extrapolation.
C Medium	Reasonably Reliable ± 10-25% uncertainty Data based on sound records, procedures, investigations, and analysis which is properly documented but has minor shortcomings' for example the data is old, some documentation is missing and reliance is placed on unconfirmed reports or significant extrapolation.
C Low	Uncertain ± 25-50% uncertainty Data based on sound records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which grade A or B is available.
D Very Low	Very Uncertain > 50% uncertainty Data based on unconfirmed verbal reports and/or cursory inspection and analysis.

Since the 2018 valuation, Waikato District Council has carried out a considerable amount of work to improve the quality of data for above ground assets. This has involved inspections of the assets to ensure asset data accurately reflects the assets including attributes and asset condition. Waikato District Council has a process of ongoing checks on the quality of asset data. This is resulting in ongoing improvement in the quality of asset data. This has included:

- Reviews of asset data installation dates and asset life expectancies.

- Network continuity checks using hydraulic models.
- Asset inspections by Waikato District Council and subsequent updating of asset data as required.
- Updated asset data provided by maintenance contractors.

2.1.1 Water Supply

Table 129: Water Supply - Data Accuracy and Confidence by Category

Data Category	Confidence Grade	Comments (improvement strategy)
Network	B High	Planned maintenance and renewal to minimise network outages.
Asset Inventory	C Medium	Improved management of asset inventory by review of asset management software systems,
Maintenance	C Low	There are plans underway to capture maintenance histories through Work Orders (to confirm asset information).
Condition	C Medium	Above and underground asset register improvement, including condition assessment data.

The table below reflects the confidence in the asset data for the water activity. The tables show the accuracy, completeness of the data for each asset type.

Table 130: Overall Inventory Data Accuracy and Completeness by Asset Type

Asset Type	Very High	High	Medium	Low	Very Low	Target
Pipes		✓				High
Points		✓				High
Pump Stations	✓					Very High
Reservoirs	✓					Very High
Treatment Plants	✓					Very High
Water Source	✓					Very High
Telemetry and SCADA		✓				Very High
Resource Consents		✓				Very High

There are plans underway to capture maintenance histories through Work Orders, this will also enable the ability to confirm asset information at the time of maintenance work being undertaken.

There is also an asset data improvement programme developed which identifies data gaps and improvements. This programme is outlined in the continuous improvement section and will be prioritised.

2.1.2 Wastewater

Table 131: Wastewater - Data Accuracy and Confidence by Category

Data Category	Condition Grade	Comments (improvement strategy)
Network	B High	Planned maintenance and renewal to minimise network outages.
Asset Inventory	C Medium	Improved management of asset inventory by review of asset management software systems,
Maintenance	D Very Low	There are plans underway to capture maintenance histories through Work Orders (to confirm asset information).
Condition	B High	Above and underground asset register improvement, including condition assessment data.

The table below reflects the confidence in the asset data for the wastewater activity. The tables show the accuracy and completeness of the data for each asset type.

Table 132: Overall Inventory Data Accuracy and Completeness by Asset Type

Asset Type	Very High	High	Medium	Low	Very Low	Target
Pipes		✓				High
Pump Stations	✓					Very High
Treatment Plants	✓					Very High
Point Assets				✓		High
Telemetry and SCADA		✓				Very High
Resource Consents		✓				Very High

There are plans underway to capture maintenance histories through Work Orders. This will also enable the ability to confirm asset information at the time of maintenance work being undertaken.

There is also an asset data improvement programme developed which identifies data gaps and improvements. This programme is outlined in the continuous improvement section and will be prioritised.

2.1.3 Stormwater

Table 133: Stormwater - Data Accuracy and Confidence by Category

Data Category	Condition Grade	Comments (improvement strategy)
Network	C Medium	Planned maintenance and renewal to minimise network outages.
Asset Inventory	C Low	Improved management of asset inventory by review of asset management software systems,

Maintenance	D Very Low	There are plans underway to capture maintenance histories through Work Orders (to confirm asset information).
Condition	C Low	Asset register improvement, including condition assessment data.

The table below reflect the confidence in the asset data for the stormwater activity. The tables show the accuracy and completeness of the data for each asset type.

Table 134: Overall Inventory Data Accuracy and Completeness by Asset Type

Asset Type	Very High	High	Medium	Low	Very High	Target
Pipes				✓		High
Rural Drains				✓		High
Urban Drains				✓		High
Point Assets				✓		High
Pump Stations	✓					Very High

Indications from the asset data team are the overall data accuracy and completeness ratings are uncertain in themselves. Whilst small projects are undertaken to investigate assets and improve the completeness piped reticulation assets this area still has much more work to do. An activity improvement has been proposed to undertake asset data survey for the district over the next five years. This asset survey will provide a greater understanding of the stormwater reticulation in the district and provide input into detailed stormwater models.

Roadside swales and drains are not being treated consistently, and it is possibly that a number of the assets recorded as stormwater are actually roading assets, or vice-versa. An improvement item has been created to address this.

WDC field staff have handheld iPads with access to mapped asset data. These tools enable field staff to access digital maps for viewing on site. This has allowed a considerable amount of information to be updated into the data register over the last few years. This information is still in the process of being verified, however the information that is captured is generally reliable. Information from developers is reliable, as are historic as-built's.

2.2 Reliability (Performance)

Service reliability standards are met by minimising the number of outages, the duration of any single service outage and the number of properties affected by that outage and increasing or ensuring security of supply. The frequency of outages across the network can be minimised with planned maintenance and renewals programmes. The outage duration is restricted by responsive and effective reactive maintenance, and emergency response plans.

As more data is collected it will be possible to track the changes in request types over subsequent years to determine if there are any trends that could indicate how the service is performing.

3 What is the status of asset management practices?

3.1 Activity Management Policy

Waikato District Council developed and adopted its inaugural Activity Management Policy in 2017. The policy establishes the first level of Council's asset management framework for managing infrastructure assets in a structured, coordinated, and financially sustainable manner. The objectives of this Policy:

- Outline the target level of activity management practice appropriate for each activity.
- To provide a consistent approach to asset management planning within Council and to ensure plans reflect the strategic direction of Council.
- Demonstrate to the community that Council recognises the critical importance of managing the District's assets and activities in an efficient and cost effective manner in order to deliver levels of service appropriate to current and future generations.

3.2 Current and Target Maturity Scores

The following current and target scores were set internally and reviewed by Robert Ashley (DIAM) and are based on an asset management maturity assessment, undertaken by **Wauwhi Infrastructure in 2017**. A formal assessment has not been done due to the Watercare contract currently being in the transition phase, this will need to be undertaken in the next iteration of the AMP based on Watercare practices when the contract is fully operational.

The tables below show the actual vs target asset maturity levels as per the Activity Management Policy for each of the water supply, wastewater, and stormwater activities.

Summary Results – Water Supply

Table 135: Current and Target Maturity Scores - Water Supply

Reference	Summary Results	Current Score	Appropriate Target	Difference
IIMM 2.1	AM Policy and Strategy	50	75	25
IIMM 2.2	Levels of Service and Performance Management	50	75	25
IIMM 2.3	Forecasting Demand	70	80	10
IIMM 2.4	Asset Register Data	50	75	25
IIMM 2.5	Asset Performance and Condition	35	70	35
IIMM 3.1	Decision Making	50	75	25
IIMM 3.2	Managing Risk	30	65	35
IIMM 3.3	Operational Planning	35	70	35
IIMM 3.4	Capital Works Planning	55	90	35
IIMM 3.5	Financial Planning	50	75	25
IIMM 4.1	Asset Management Teams	55	80	25
IIMM 4.2	Asset Management Plans	50	75	25
IIMM 4.3	Management Systems	30	60	30
IIMM 4.4	Asset Management Information Systems	50	75	25

IIMM 4.5	Service Delivery Mechanisms	55	80	25
IIMM 4.6	Audit and Improvement	50	75	25
	Overall Score	47	75	27

IIMM 2	Understanding and Defining Requirements	51	75	24
IIMM 3	Developing Asset Management Lifecycle Strategies	44	75	31
IIMM 4	Asset Management Enablers	48	74	26
	Overall Score	48	75	27

Overall Results – Water Supply:

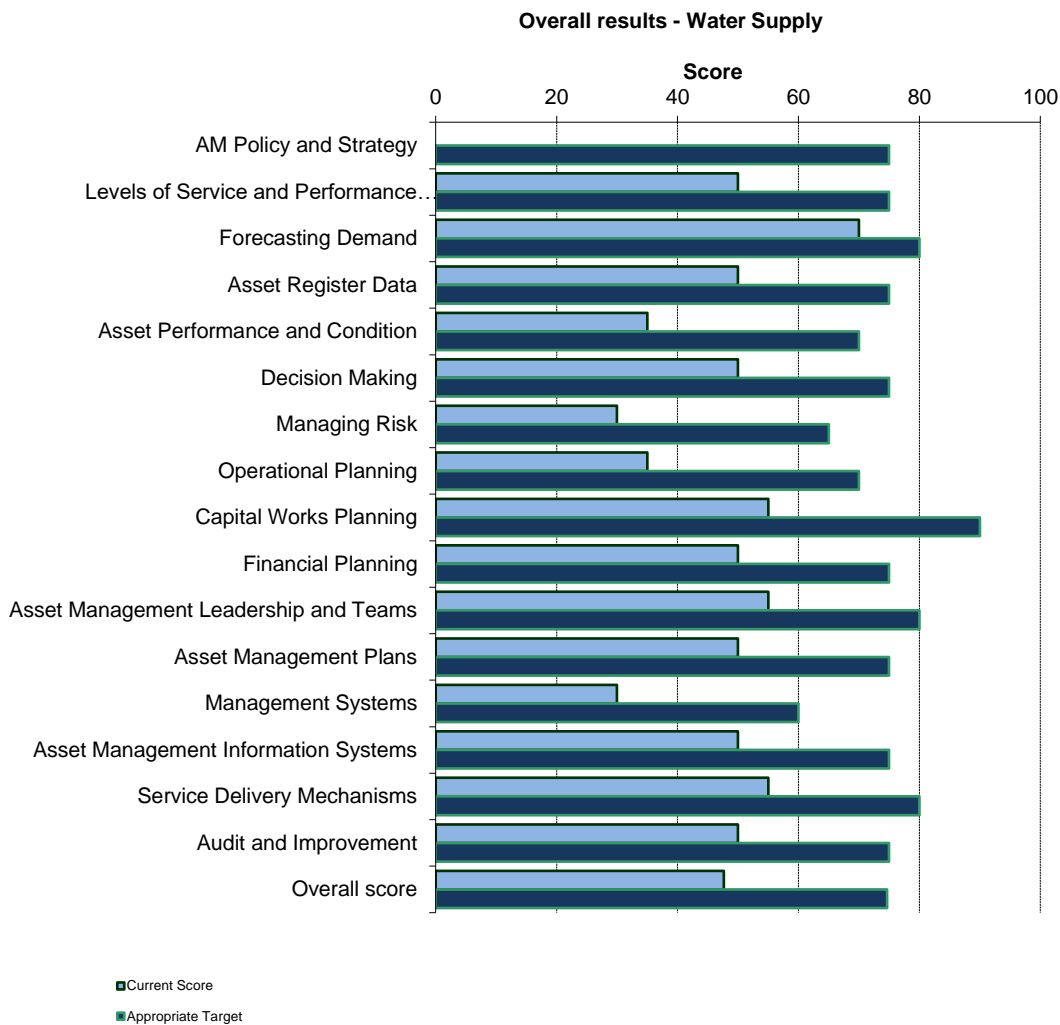


Figure 104: Overall Results - Water Supply

Percentage variance from the target: 36%

ICR score (out of 15): 10

The strategic assessment for the water supply activity scored 48 out of 75, or a percentage of 64% of the target.

Summary Results – Wastewater

Table 136: Current and Target Maturity Scores - Wastewater

Reference	Summary Results	Current Score	Appropriate Target	Difference
IIMM 2.1	AM Policy and Strategy	55	75	20
IIMM 2.2	Levels of Service and Performance Management	50	70	20
IIMM 2.3	Forecasting Demand	70	80	10
IIMM 2.4	Asset Register Data	35	65	30
IIMM 2.5	Asset Performance and Condition	65	75	10
IIMM 3.1	Decision Making	35	65	30
IIMM 3.2	Managing Risk	55	75	20
IIMM 3.3	Operational Planning	35	65	30
IIMM 3.4	Capital Works Planning	50	85	35
IIMM 3.5	Financial Planning	35	65	30
IIMM 4.1	Asset Management Teams	65	80	15
IIMM 4.2	Asset Management Plans	55	75	20
IIMM 4.3	Management Systems	35	55	20
IIMM 4.4	Asset Management Information Systems	50	70	20
IIMM 4.5	Service Delivery Mechanisms	55	75	20
IIMM 4.6	Audit and Improvement	35	65	30
	Overall Score	49	71	23

IIMM 2	Understanding and Defining Requirements	55	73	18
IIMM 3	Developing Asset Management Lifecycle Strategies	42	71	29
IIMM 4	Asset Management Enablers	49	70	21
	Overall Score	49	71	23

Percentage variance from the target: 32%

ICR score (out of 15): 10

The strategic assessment for the wastewater activity scored 49 out of 71, or a percentage of 69% of the target.

Overall Results – Wastewater:

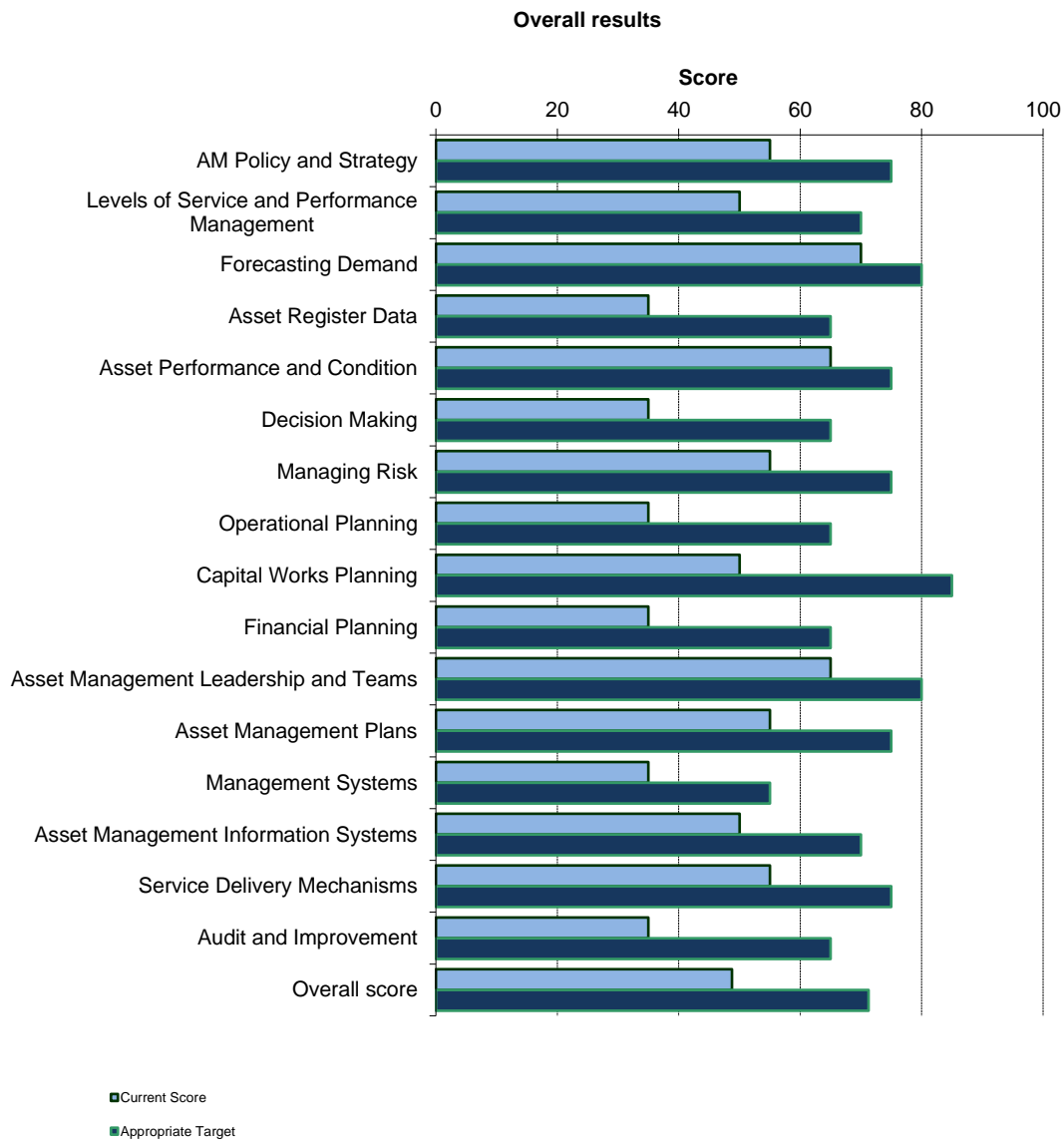


Figure 105: Overall Results - Wastewater

Percentage variance from the target: 32%

ICR score (out of 15): 10

The strategic assessment for the wastewater activity scored 49 out of 71, or a percentage of 69% of the target.

Summary Results – Stormwater

Table 137: Current and Target Maturity Scores - Stormwater

Reference	Summary Results	Current Score	Appropriate Target	Difference
IIMM 2.1	AM Policy and Strategy	65	80	15
IIMM 2.2	Levels of Service and Performance Management	50	70	20
IIMM 2.3	Forecasting Demand	65	80	15
IIMM 2.4	Asset Register Data	50	70	20
IIMM 2.5	Asset Performance and Condition	50	70	20
IIMM 3.1	Decision Making	55	75	20
IIMM 3.2	Managing Risk	50	70	20
IIMM 3.3	Operational Planning	55	75	20
IIMM 3.4	Capital Works Planning	55	85	30
IIMM 3.5	Financial Planning	50	70	20
IIMM 4.1	Asset Management Leadership and Teams	55	75	20
IIMM 4.2	Asset Management Plans	65	80	15
IIMM 4.3	Management Systems	50	60	10
IIMM 4.4	Asset Management Information Systems	65	80	15
IIMM 4.5	Service Delivery Mechanisms	65	80	15
IIMM 4.6	Audit and Improvement	65	80	15
	Overall Score	57	75	18

IIMM 2	Understanding and Defining Requirements	56	74	18
IIMM 3	Developing Asset Management Lifecycle Strategies	53	75	22
IIMM 4	Asset Management Enablers	61	76	15
	Overall Score	57	75	18

Overall Results – Stormwater:

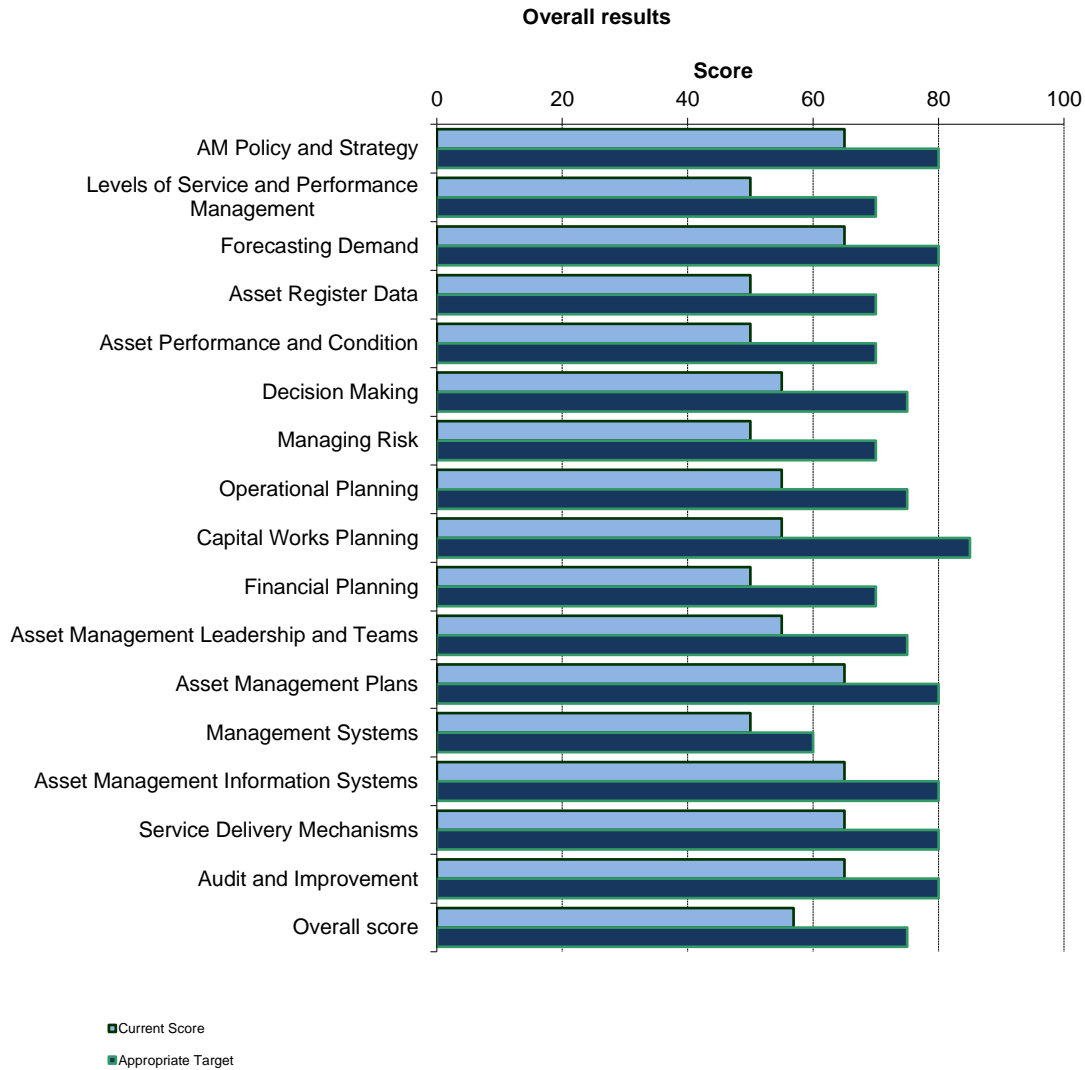


Figure 106: Overall Results - Stormwater

Percentage variance from the target: 24%

ICR score (out of 15): 11

The strategic assessment for the stormwater activity scored 57 out of 75, or a percentage of 76% of the target.

4 How are we going to improve?

4.1 Historical Improvement Plan

The improvement programme for the previous Long Term Plan period (2018-2028) has been updated to reflect what improvements have been achieved and where work still needs to be done. Many of the items have been identified as on-going works. These cannot be considered complete and have been included in the programme for 2021-2031 to ensure the continual improvement in these areas.

4.2 Proposed Actions and Timetable

Council is committed to on-going improvement in the quality of its Three Waters management practices. The improvement tasks shown in the current improvement plan.

Table 112 will be undertaken as identified below in the timeframes shown. They highlight the fact that, generally, we are light in Policy, Strategy and some procedures for our assets once completed.

The proposed improvements are identified to improve current management practices for:

- Activity Management Plan processes and information systems
- Bring data into line with desired management practices
- Optimise the way that the activity is carried out

The purpose of the Improvement Plan is to:

- Identify, develop, and implement AM planning processes
- Identify and prioritise ways to cost-effectively improve the quality of the AM plan
- Identify indicative timeframes, priorities, and human and financial resources required to achieve AM planning improvements

The 2021-2031 Improvement Plan is subject to constant reappraisal and change. While reappraisal is an on-going-process, the Improvement Plan will form the basis of our annual business planning.

The criteria in 109 is used to prioritise actions identified to meet the desired business practice for asset management processes, data and information, information systems, and implementation tactics.

Table 138: Prioritisation Ranking

Priority Ranking	Description
1	Needs to be implemented urgently to support current LTP processes and / or poses a significant risk.
2	Needs to be implemented as soon as practicable to meet “core” asset management practice.
3	Needs to be addressed in developing the next version of the plan for the next LTP cycle.
4	No immediate need for implementation but should be addressed over time.
5	Desirable to implement at some time but will not adversely affect the quality of the plan or asset management practice.

5 Three Waters Improvement Plan

ID	Maturity Assessment Category	Improvement Action	Priority	Status	Percentage Complete	2021/22	2022/23	2023/24	Forecast Completion Date	Responsibility	Cost Estimate / Budget
1	Asset Register Data	Process to record stormwater assets in the intangibles register.	3	Underway	60%	70%	80%	90%	Ongoing improvement plan	Watercare	Budgeted in 2021 LTP OPEX
2	Asset Management Information System	Migrate all asset data to Cloudsuit EAM, an enterprise asset management software established by Infor.	2	Underway	5%	45%	100%		2021-2022	Watercare	
3	Asset Performance and Condition	Develop condition data for all stormwater assets.	2	Underway	15%	25%	35%	45%	Ongoing improvement plan	Watercare	Budgeted in 2021 LTP OPEX
4	Asset Performance and Condition	Further assessment of critical areas of under capacity	2	Underway	40%	60%	80%	100%	By 2023 most of the models in the district will be updated. However, this improvement is ongoing.	Watercare	Budgeted in 2021 LTP OPEX
5	Asset Register Data	Improve CRM System	3	Deferred	0%						
6	Asset Performance and Condition	Assessment of district wide modelling to understand primary network LOS.		Planned	40%	60%	80%	100%	By 2023 most of the models in the district will be updated. However, this improvement in ongoing.	Watercare	Budgeted in 2021 LTP OPEX
7	Asset Performance and Condition	Address water quality in the areas showing level outside trigger values.	3	Planned	0%	25%	50%	75%	By 2025, depending on monitoring results	Watercare	Internally Funded
8	Asset Performance and Condition	Waterway investigation and remediation plan for water quality areas investigated.	3	Planned	0%	10%	20%	30%	Depend on water quality investigation	Watercare	Internally funded
9	Monitoring Systems	Improvement of SCADA Systems	1	Underway	20%	80%	90%	100%	2022	Watercare Contract	Transition Budget
10	Levels of Service and Performance Management	Bylaws, policies and legislation up to date and relevant	3	Not started	0%	20%	50%	100%	2022	Carole Nutt	Internally Funded
11	Levels of Service and Performance Management	Improve data associated with water loss	2	Planned	0%	30%	60%	70%	Staged investigations starting with mid Waikato areas	Watercare	Budgeted in 2021 LTP CAPEX
12	Forecasting Demand	Network size and capacity – collate and improve information regarding capacity of networks in relation to growth model.	3	Underway	40%	60%	80%	100%	By 2023 most of the models in the district will be updated. However, this improvement in ongoing.	Watercare	Budgeted in 2021 LTP OPEX

ID	Maturity Assessment Category	Improvement Action	Priority	Status	Percentage Complete	2021/22	2022/23	2023/24	Forecast Date	Completion	Responsibility	Cost Estimate / Budget
13	Levels of Service and Performance Management	Identification of all stormwater assets maintained by Watercare	2	Underway	80%	90%	100%		2022		Watercare/ Roading/ Parks	Internally funded
14	Levels of Service and Performance Management	Firefighting performance and recommendations addressing deficiencies in the system	3	Underway	40%	60%	80%	100%	By 2023 most of the models in the district will be updated. However, this improvement in ongoing.		Watercare	Budgeted in 2021 LTP OPEX
15	Managing Risk	Business plans and commercial enterprises/associations are discussed and risks (including financial) are considered.	1	Complete	100%	100%	100%	100%	Annual Document		Watercare Contract	Annual Document
16	Managing Risk	Identify critical Assets, assess all for criticality (including facilities assets)	2	Underway	60%	100%	100%	100%	Ongoing work		Watercare Contract	Internally funded
17	Managing Risk	Identify significant negative effects, procedure in place to mitigate these.	2	Underway	90%	100%	100%	100%	Ongoing work		Watercare Contract	Internally funded
18	Managing Risk	Identify associated risks and Risk Management strategies for critical assets, procedures in place for rapid and structured response to emergency failures	2	Underway	90%	100%	100%	100%	Ongoing work		Watercare Contract	Internally funded
19	Managing Risk	Identify associated risks and Risk Management strategies for critical assets, risk management considered at both corporate and service level	2	Underway	90%	100%	100%	100%	Ongoing work		Watercare Contract	Internally funded
20	Operational Planning	Development of Council Climate Action Strategy	3	Planned	0%				Planned for the 2021-2023 period		Council	Council funded
21	Operational Planning	Systems to record and report on sustainability initiatives	3	Not Planned	0%				Integrated into best practice requirements		Watercare/Council	Council funded
22	Operational Planning	Process for auditable maintenance records supporting compliance and resource consent conditions	2	Underway	5%	45%	50%		2021-2022		Watercare	
23	Financial Planning	Financial forecasts based on sound asset information and analysis (fully scoped and estimated), assumptions (that are specific and well-reasoned) of the future. Are adequate to ensure long term sustainability and include	1	Underway	80%	90%	90%	100%	Ongoing work		Watercare Contract	Internally funded

ID	Maturity Assessment Category	Improvement Action	Priority	Status	Percentage Complete	2021/22	2022/23	2023/24	Forecast Date	Completion	Responsibility	Cost Estimate / Budget
		reference to the source of funding and user charges and development contributions										
24	Financial Planning	Forecasts (10 year +) based on current comprehensive AMP with detailed supporting assumptions/reliability factors and high confidence in accuracy.	1	Underway	80%	90%	90%	100%	Ongoing work		Watercare Contract	Internally funded
25	Decision Making	List all assumptions and possible effects, significant assumptions (including the useful life of significant assets) and level of uncertainty including (for the 1 financial forecasts) are stated, impacts and mitigation as required	2	Underway	50%	60%	70%	0%	Ongoing work		Watercare Contract	Internally funded
26	Financial Planning	List all assumptions and possible effects, where any significant assumptions involve a high level of uncertainty – include an estimate of the potential effect on the financial estimates	1	Underway	In progress				Ongoing work		Council	Council funded
27	Forecasting Demand	Confidence level demand/growth forecasts, known and documented with process for updating (reliability of demand forecasts known to reduce risk of under or overinvestment in infrastructure.	2	Underway	In progress				Ongoing work		Council	Council funded
28	Audit and Improvement	Identify improvements to AM processes & techniques, Improvement program that details the requirements to achieve the appropriate practice i.e., Improvements aligned with estimated appropriate AM level	2	Underway	Not Started	0%	100%		2022/2023		Council	Council funded
29	Asset Management Plan	AM Plan adopted by Council including improvement programme, AM improvements programme adopted and appropriately funded (note this is in AM area not general improvements)	3	Underway	In progress	-	-	100%	2021-2024		Council	Council funded
30	Asset Management Plan	AM Plan regularly updated and should reflect progress on improvement plan, demonstrated management commitment to achievement of the Improvement Plan.	2	Underway	90%	90%	100%	100%	2021		Watercare contract	Funded