8.2.1

New Plymouth District Council

WATER SUPPLY

Asset Management Plan

2024 – 2034

Te Kaunihera-ā-Rohe o Ngāmotu
New Plymouth District Council

Contents

Preamble/Foreword

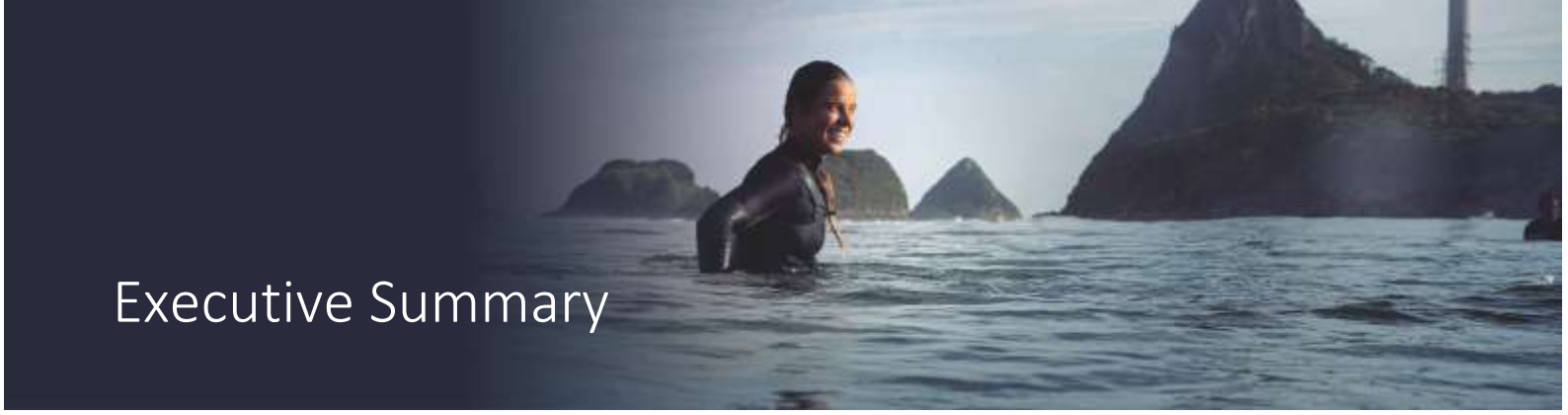
This 2024 Asset Management Plan has been prepared as part of the 2024-2034 Long-Term Plan (LTP) supporting information.

Asset management is considered by New Plymouth District Council to be an essential element of governance for local authorities and allows us as an organisation to take a planned approach towards our service delivery arrangements, levels of service, associated risks and financial forecasts. This Asset Management Plan (AMP) provides clarity to the organisation regarding the level of work required to implement comprehensive and quality lifecycle asset management strategies. This will ensure the delivery of targeted and essential infrastructure to the district and its residents.

The overall intent for this AMP is to provide a high-level document that supports the legislatively required 2024-2034 LTP and focuses on providing a desired level of service through the management of assets in the most cost-effective manner for present and future customers.

This AMP is the result of a substantial body of work over an 18-month timeframe, produced from the efforts of a cross-functional team of representatives including service managers, engineers, financial planners, senior managers, data technicians as well as asset management champions throughout the organisation.

This AMP has been produced concurrently with the 2024-2034 LTP, and all financial information is aligned with the approved budgets under the 2024-2034 LTP.



Executive Summary

This Asset Management Plan is a key supporting document for the Long-Term Plan that helps drive achievement of Council's vision. It describes the assets required to deliver the Parks & Open Spaces service; the Levels of Service we will deliver; the corresponding actions that are necessary to ensure we meet the expectations of our community and the consequences of the decisions made by the Elected Council.

1.1 Our Assets

There are four separate water supplies in the district - New Plymouth (including Omata, Bell Block, Waitara and Urenui), Inglewood, Ōākura and Ōkato. Combined, these facilities supply approximately 33.2 million litres of water per day to just over 30,000 households and businesses in defined urban and rural areas.

Our service develops, operates, and maintains infrastructure associated with these water supplies, which includes treatment plants, pump stations, pipe networks and storage facilities such as reservoirs. We ensure our water supplies comply with the New Zealand Drinking Water Standards (NZDWS), and that water is used sustainably, particularly when demand is high. We also make sure there is water available for firefighting in urban areas.

The assets involved in providing the Water Supply include those in the following major categories:

- P&E – intakes, treatment plants, reservoirs, and pumping stations
- Reticulation network – pipes, pipe bridges, valves, manholes, chambers, hydrants, service connections
- Consents – to take water from sources and for structures needed as part of the system
- Hydraulic models - tools to support asset planning

These assets capitalized in the asset management system had a total Gross Current Replacement Cost (GCRC) of $418.8M and a Depreciated Replacement Cost (DRC) of $204.7M as of 30 June 2022.

1.2 Our Drivers

The agreed Customers Level of Service (LoS) for the Water Supply activity are:

- Provide water that is safe to drink
- Maintain the reticulated water network in good condition
- Respond to faults and unplanned interruptions to the water supply network in a timely manner
- Manage demand to minimise the impact of water supply activities on the environment

Inflation (ie: spending more to do the same) and resourcing (ie: limited talent pool and competing market) are two common key challenges that the three waters activity is facing. In addition to those key challenges, the Water Supply activity faces the following key challenges.

Our infrastructure is aging and in poor condition, leading to a renewals backlog

Our water supply infrastructure is aging, leading to an increasing backlog of assets requiring renewal. We have 250km of water supply mains in poor condition ($91M GCRC), with 50% of the water mains asset network life already consumed.

We have limited understanding of water supply P&E assets, and a review of asset criticality and condition assessment is required. The current backlog of water supply P&E assets needing renewal has a GCRC of $9.6M.

We need to improve the resilience of the system as some critical assets are vulnerable to natural events

We have lack of resilience or redundancy in critical assets that are vulnerable to natural events. Having Lake Mangahamoe as the sole water source and one water treatment plant provides limited resilience to potential adverse events such as natural disasters.

The water supply network east of the Waiwhakaiho River is more vulnerable than other areas of the district due to the sole vehicle bridge crossing on State Highway 3 (SH3), and the associated potential loss of service of water services attached to the bridge during a natural event.

Growth is occurring and we need to enable it

Growth areas are currently unserved or need major upgrades to enable growth. Currently there is insufficient capacity in the Eastern Feeder to supply sufficient water to the Mountain Road reservoirs. The Water Conservation Programme (WCP) has been helping to offset this problem; however, it is expected that as we grow the water supply levels of service will be severely compromised due to capacity issues and upgrades will be required for the network.

Firefighting deficiencies

Modelling has identified several areas of the network that do not meet our target firefighting LoS requirements and need to be upgraded.

Sustainability

Council has a vision of becoming a Sustainable Lifestyle Capital, however:

- We are not using water efficiently and we could be taking less water from the natural environment. The large dataset available through the Universal Water Metering (UWM) project as part of the WCP provided a better representative water consumption number, and our residential consumption is higher than previously estimated.

- Water supply systems served from surface water sources are under increasing pressure to reduce their take, especially during low flow periods that coincide with high peak demand.
- We need to reduce the long-term carbon emissions to help us mitigate and limit the impacts of climate change.

Te Mana o te Wai and cultural considerations.

Te Mana o te Wai imposes a hierarchy of obligations by prioritising the health and wellbeing of water bodies and freshwater ecosystems first. After regionally implementing Te Mana o te Wai, there is an expectation that water take resource consent conditions may be changed.

To achieve Te Tiriti o Waitangi requirements, relationships with local iwi and hapū are developing into partnerships Increased cost to fund and time to facilitate iwi/hapū involvement will be needed.

1.3 Our Plan

Water Conservation Programme (WCP) - Universal Water Metering (UWM) project

As part of the WCP, the UWM project is underway and will be 80% complete at the end of 24/25FY with all meters installed by 2025. This programme will help us to achieve the target of reducing 25% of the gross per capita consumption and consequently reduce the water we take from the environment.

Having this programme in place will help us to obtain resource consents and to have more accurate data to understand better our network performance. Also, it will offset some of the investment needed due to growth over the next thirty years.

Continue the asset renewal programme to maintain existing Levels of Service

We are continuing with the asset renewals programme for reticulation, P&E to maintain current LoS to reduce the backlog. We are looking to adopt an asset criticality framework and to create a programme to develop and implement a condition inspection of water supply assets.

Major structural replacements and upgrades proposed for the New Plymouth Water Treatment Plant

We are proposing to perform major upgrades to the New Plymouth Water Treatment Plant (NPWTP) to address the earthquake risk and improve the resilience of the system. Implementing this project will also help up to address hydraulic constraints and operational and maintenance issues, improve the working environment that is not complying with best standard practice, comply with legislative requirements and the national drinking water standards (Drinking Water Standards New Zealand 2022), and implement permanent fluoridation arrangements as directed by the Ministry of Health.

Looking for groundwater as a supplementary water source for the New Plymouth System

We will be performing groundwater field investigations as we are looking for groundwater as a supplementary water source for the New Plymouth System in the eastern areas of the district. Finding water will avoid the duplication of approximately 6.5km of the Eastern Feeder (an estimated $52M) as it will solve the capacity issues and consequently will enable growth in the eastern areas.

Having an additional source will improve the resilience of the system, especially in the eastern and northern areas of the district if combined with the completion of the water pipe bridge in Waitara through SH3. Additional benefits of having a supplementary water source are;

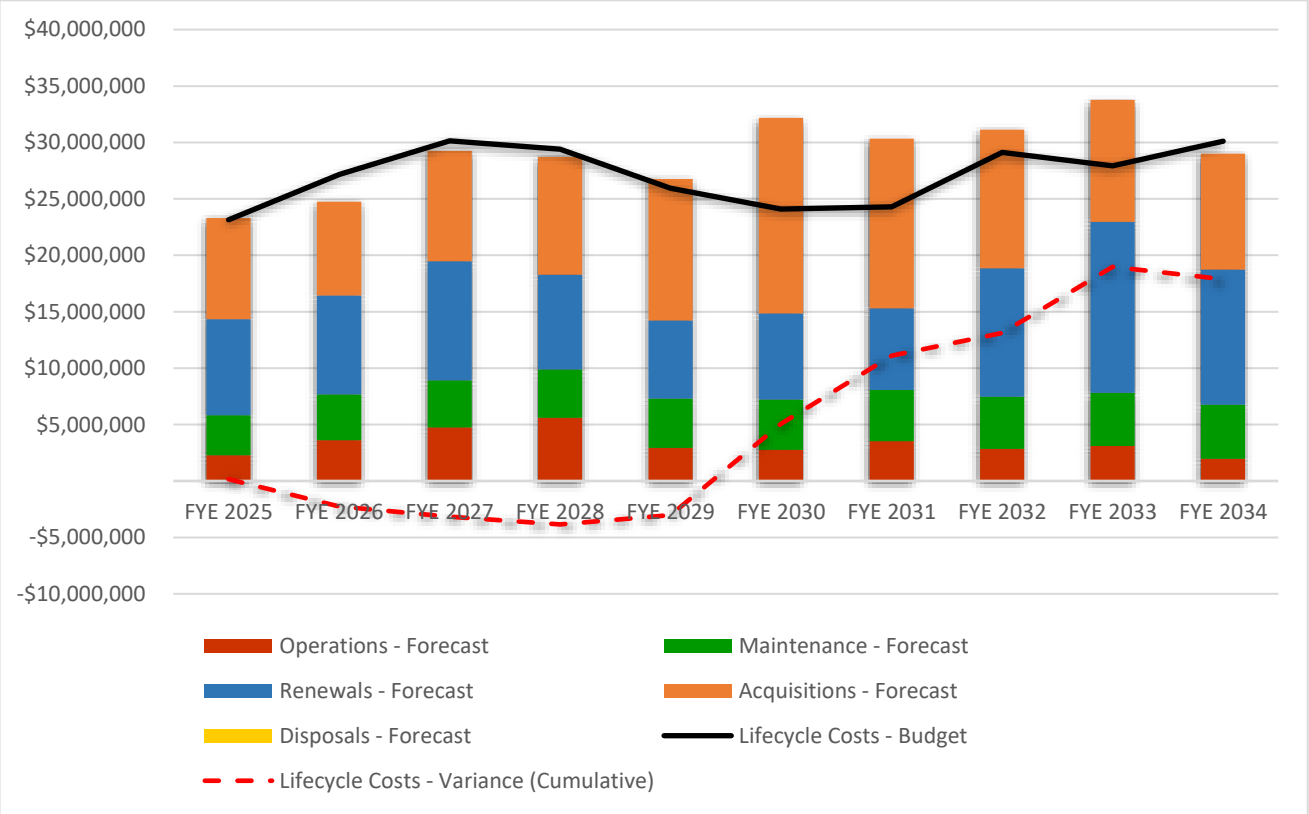
- to help us reduce our dependence on surface water, especially during summer when we experience peak demands together with low flow periods,
- to cope with potential changes in resource consent conditions for the New Plymouth System after the implementation of Te Mana o te Wai, and
- to work collaboratively with the hapū of the rohe to understand the cultural considerations associated with this project.

Enable Growth

Different projects have been identified in unserved or growth areas that need major upgrades to enable growth.

1.4 The Cost

The financial projections from this AMP are shown in the following figure. These projections include forecast costs for acquisition, operation, maintenance, renewal, and disposal. These forecast costs are shown relative to the proposed budget.



All figure values are inflation-adjusted. The Waitara Industrial Supply Decommissioning Programme (disposal) has been included as part of the consequential and seed funding opex (Operations) as it can't be capitalized. The forecast values only consider the projects included in the first budget submission of the LTP, and excludes the projects that have been removed from the budget request before the submission. Section 6.4 refers to some of these projects and budgets.

The forecast values only consider the projects included in the first budget submission of the LTP and excludes projects that have been removed from the budget request before the submission. Some examples of the projects with a reduced budget or delay from the ten year period in the ELT/TRU submission include;

- supplementary source and water treatment plant for the New Plymouth water supply system
- renewals budget for the next ten year period to maintain current LoS has been reduced, and some renewals will not happen
- reduction on the budget of the Water Master Planning (WMP) project.

Almost 60% of the operational costs budget is consequential or seed funding opex budget associated with capital projects or projects that cannot be capitalized (Lake Mangamahoe safety upgrades project or the Waitara industrial supply decommissioning).

Reviewing the lifecycle summary costs for NPDC for the timeframe of this AMP, the organisation's budgets are in reasonable shape for the forecasted costs. However there exist clear financial gaps between the funds Council has available versus what Council needs to spend to meet the future demands of district residents.

The high prevalence of renewal costs stems from a historical lack of renewals (backlog). The majority of the requested renewals funding has been provided, however total renewals funding received is not sufficient to fully cover the renewals backlog.

Several projects to enable growth will be completed in the ten year period and have been included as part of the acquisition budget (Smart Road development project and the Supplementary source WTP and conveyance system were delayed before the first ELT/TRU budget submission, and are not represented in the acquisition forecast).

The variance is due to the exclusion of projects in the ten year period of the LTP. These projects are the firefighting reticulation improvements programme, resilience improvements identified after ex-Cyclone Gita, Bell Block water supply network upgrades, the full WCP, New Plymouth WTP filter upgrade (seismic and media) and Veale Road pump station upgrade, and other smaller projects.

1.5 The Risks

The main risks associated to the water supply assets are:

- Infrastructure assets failure because of poor condition or life consumed: the bulk of the requested renewals funding has been provided, however will not be sufficient to fully cover the backlog.
- Service delivery failure caused by; severe weather, a natural disaster, a fire, a chemical spill or accidental or malicious action. There are projects that will help to reduce the risk, however there are key projects such as the Supplementary water source and WTP for the New Plymouth System and the resilience improvements identified during ex-Cyclone Gita that will not be completed during this AMP timeframe.
- Impact on the water takes resources consent conditions after the implementation of Te Mana o te Wai; the Supplementary water source for the New Plymouth System could help to cope with uncertainties related to the implementation of Te Mana o te Wai. However, this project will not be completed during this AMP timeframe.

- Not being able to comply with new regulations or the directions from central government; the New Plymouth WTP will be upgraded to comply with regulations during this AMP timeframe.
- Inability to obtain new resources consents associated with the water supply system: The UWM project is underway and will be completed within this AMP timeframe. However, other initiatives associated with the WCP have been removed from the LTP.
- Insufficient planning or funding to enable growth: We are planning for growth, and different projects were identified to enable growth.
- Inadequate provision of water for firefighting to the network; the implementation of a firefighting upgrades programme have been removed from this AMP timeframe. We have LoS gaps related to firefighting and there is no plan to start to close these during the current LTP timeframe.

  Since the 2021 AMP a new risk has arisen in terms of delivering on the work programme and aspirations within the AMP. This is the risk of delayed or non-delivery due to lack of resources created by the current organisational restructure being undertaken by Council, which is also impacting capacity to deliver due to unfilled roles and may continue to impact resourcing depending on the final outcome.

1.6 Future Change

We want to continue to work with mana whenua, and so we need to continue our journey towards partnership with iwi and hapū.

We need to agree and implement resilience and firefighting LoS to better prioritise projects.

We need to better understand the condition of our assets.

We are looking to create standards to design, build and manage future NPDC assets according to low carbon principles.

Introduction

2.1 Background

2.1.1 Organisation Context

New Plymouth District Council (NPDC or Council) serves the New Plymouth District (the district) situated in North Taranaki, in the North Island of New Zealand. Dominated by the majestic Mount Taranaki/Egmont, the Taranaki region has historically been built upon the dual economic pillars of dairy and petrochemical industry but has recently pivoted away from this dual reliance towards a wider economic foundation encompassing other industries to build regional economic resilience. While New Plymouth is the only city in the district, it encompasses a number of small towns including the communities of Waitara, Inglewood, Urenui, Ōākura and Ōkato. The district is currently home to a population of approximately 89,000 people, a figure which is forecasted to reach around 93,500 by 2029.

Providing adequate delivery of services and meeting the expectations and demands of a growing population will bring a number of challenges and opportunities which the organisation will need to plan for, fund, operate and maintain to provide the appropriate levels of service over the planning period.

The current operating environment of NPDC is being significantly impacted by the ongoing effects of the global COVID pandemic, the international instability caused by the war in Ukraine and the political reforms initiated by both the previous and the current central government. These challenges have created increased financial pressure to all Council departments and to the majority of Councils across New Zealand. More detail about these issues is provided in Section 4 – Demand.

2.1.2 Service Context

There are four separate water supplies in the district - New Plymouth (including Omata, Bell Block, Waitara and Urenui), Inglewood, Ōākura and Ōkato. Combined, these facilities supply approximately 33.2 million litres of water per day to just over 30,000 households and businesses in defined urban and rural areas.

Our service develops, operates, and maintains infrastructure associated with these water supplies, which includes treatment plants, pump stations, pipe networks and storage facilities such as reservoirs. We ensure our water supplies comply with the NZDWS and that water is used sustainably, particularly when demand is high. We also make sure there is water available for firefighting in urban areas.

The source water for the New Plymouth water supply system is the Waiwhakaiho River (plus other minor streams) via Lake Mangamahoe. The most recent major upgrade of the NPWTP was undertaken between 2006 and 2008. There are 14 reservoirs, four pump stations and 19 supply zones within the New Plymouth water system.

The source water for the Inglewood water supply system is the Ngatoro Stream. The Inglewood WTP was substantially upgraded between 1995 and 1999. There are two reservoirs and three supply zones within the Inglewood system.

The source water for the Ōākura water supply system is a groundwater aquifer underlying the Ōākura WTP site. During 2021 the Ōākura WTP was substantially upgraded. There two reservoirs and two supply zones within the Ōākura system (booster pumps are used to supply rural reticulation).

The source water for the Ōkato water supply system is the Mangatete Stream. The Ōkato WTP was substantially upgraded during 2019. There is one reservoir and two supply zones within the Ōkato system (booster pumps are used to supply rural reticulation).

A reticulation system was initially installed from the early 1900's; cast iron pipes were used mainly around the CBD area but large shipping costs meant this material became less favourable. During the 1960-70s, mostly AC pipes were installed throughout the network but as polyethylene and polyvinyl chloride (PVC) pipes became cheaper and stronger these were used more widely.

There are also systems or assets associated to the water supply system that have no active or expected future users and are currently mothballed and not being used;

- The Mangorei Weir and Mangamahoe Low Head Dam are expected to be decommissioned before financial year 2024/2025, then are not being considered as part of this AMP.
- The Waitara Industrial Supply was originally built by the Waitara Borough to support the township's meat processing facilities. The system used to convey raw water from the Waiongana River to Waitara but has not operated in the last 15 years.

2.1.3 Affordable Water Reform

Under the previous Labour-led government's 'Affordable Water' reforms, the responsibility for the provision of the district's stormwater, wastewater and drinking water services was planned to move to management under a new Water Service Entity (WSE) from 01 April 2025. As a consequence of the 2023 General Election a new National-led coalition government with New Zealand First and Act New Zealand has been elected into power. National has indicated in their party manifesto that they will repeal the existing legislation regarding water reform within their first 100 days in power, however, what form the replacement law will take and the subsequent impact to Council is currently unknown at this stage.

This AMP has been developed under a working assumption that water reform is imminent, however the timing is not clear at this stage. The proposals and recommendations indicated are based upon the best available information for the existing assets and future needs of the region at this current point in time. Current assumptions are that NPDC will be responsible for these assets for the first two years of this AMP minimum, with any further changes to be determined as new legislation is passed.

2.1.4 Asset Summary

The assets involved in providing the water supply include assets in the following major categories:

- Plant and Equipment:
    - Headworks and intakes
    - Water Treatment Plants
    - Reservoirs (Storage)
    - Pumping Stations
- Reticulation network
    - Manholes
    - Mains
    - Hydrants
    - Backflows
    - Meters
    - Valves
    - Services
    - Tobies
- Consents
- Hydraulic models

Raw water is extracted at four locations in the district through nine headwork and intake installations. Raw water is conveyed to four WTPs located in the District that treat water to meet drinking water standards. There are 19 reservoirs distributed throughout the District used to store potable water that are critical to the continuity of supply at acceptable levels of service for public consumption and firefighting. The great majority of urban customers are served by gravity; however, the supply system also includes six water pumping stations that boost water flow and pressure to meet required levels of service for customers. NPDC's water supply network comprises more than 800km of mains. Apart from the mains (trunk, distribution and rider mains), the reticulation network

includes pipe bridges, valves, manholes, chambers, hydrants, service connections (backflow preventors and meters).

There are thirty resource consents associated to the four water supply systems and we have four hydraulic models that are used as key tools to support its strategic asset planning and operational requirements.

There are also systems or assets associated to the water supply system that have no active or expected future users and are currently mothballed and not being used (Waitara Industrial Supply, Mangorei Weir and Lake Mangamahoe Low Head Dam). These systems also have their associated resource consents. Options are currently being considered to decommission these assets.

The assets capitalized in the asset management system had a combined value GCRC of $418M and a DRC of $205M at 30 June 2022.

2.2 Asset Management Planning

2.2.1 Goals and Objectives

Asset Management Plans (AMPs) are developed by NPDC to provide guidance on how to manage infrastructure and property assets to meet defined levels of service. They are used as supporting documents for the Infrastructure Strategy and Long-term Plan (LTP), which are required under the Local Government Act 2002 (clauses 101B and 93 respectively).

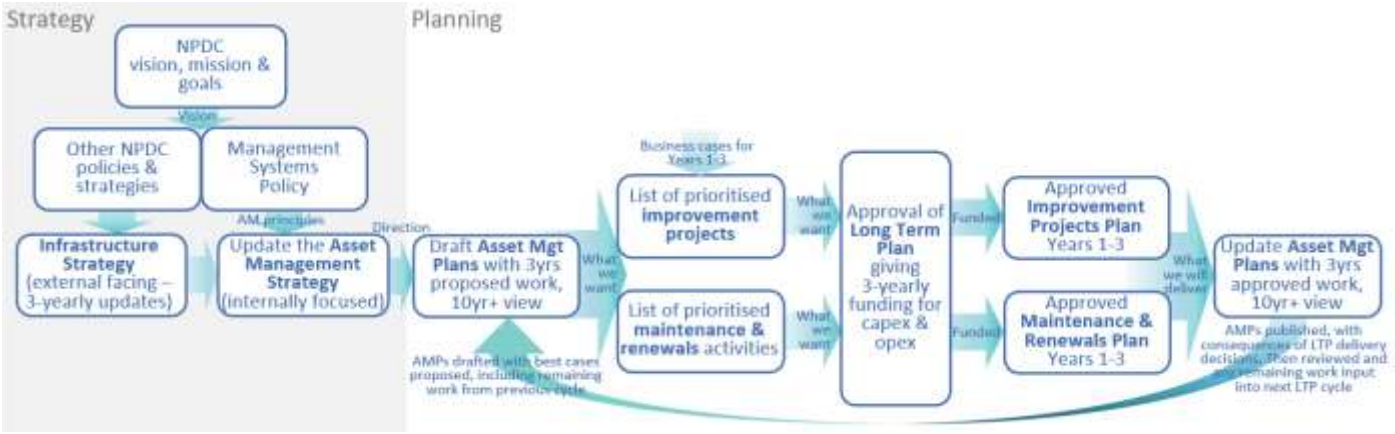
This AMP identifies and addresses the following key elements:

- Defining the levels of service and monitoring overall performance,
- Identifying and managing the impacts of changing demand,
- Assessing the complete lifecycle requirements for the asset portfolio and developing cost-effective strategies for management of those assets,
- Identifying, assessing, and treating risks and improving asset resilience,
- Outlining the trade-off between service and risk,
- Connecting the forecast costs to the financial LTP, and
- Identifying and acting on opportunities for improvement.

2.2.2 Process

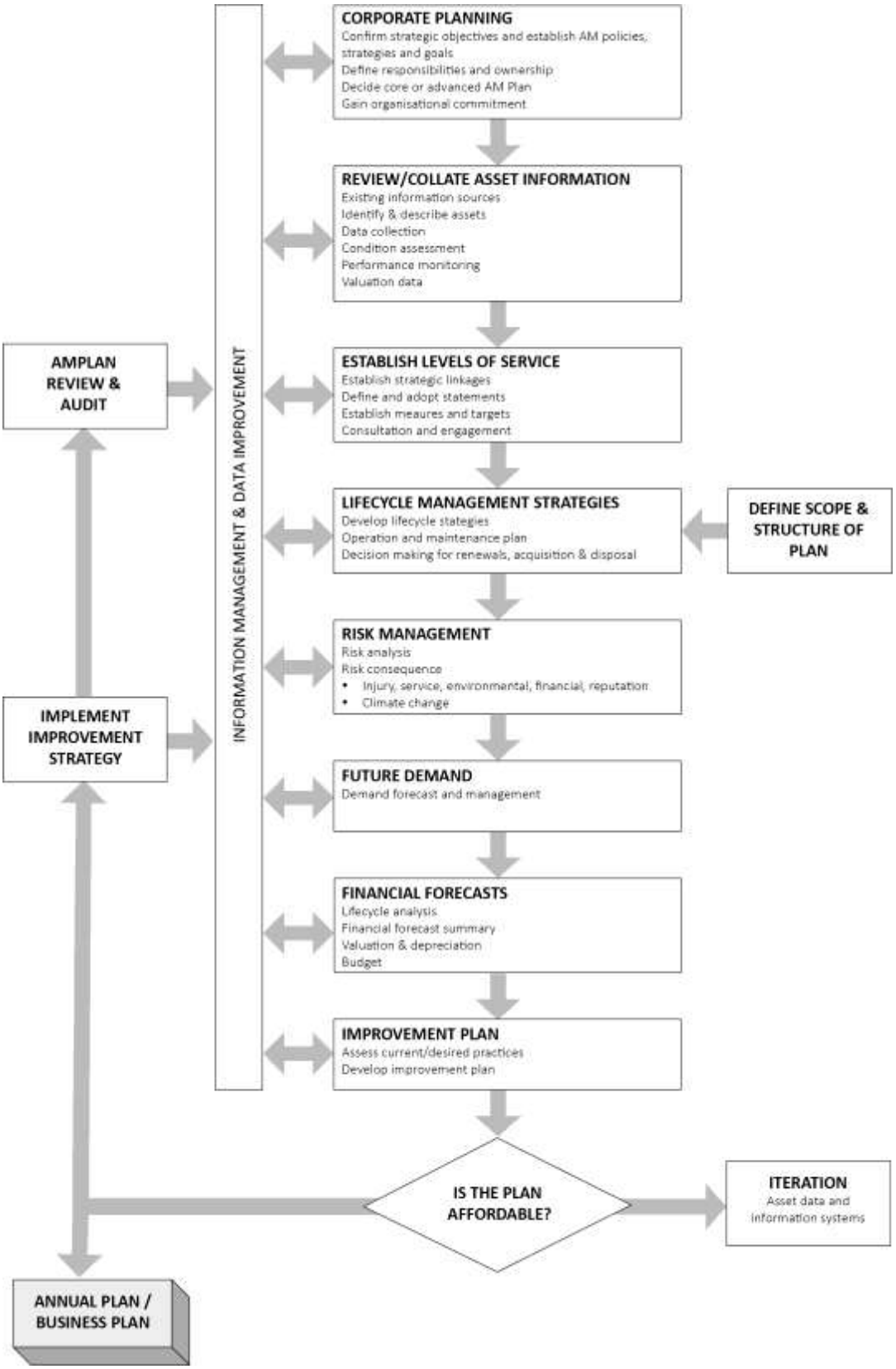
The development of AMPs is part of an overall governance process that is outlined in the Asset Management Strategy. A summary of this process is given in Figure 2.2.2.1.

Figure 2.2.2.1: Asset management governance process



NPDC's AMPs are prepared following the International Infrastructure Management Manual (IIMM) Road Map as shown in figure 2.2.2.

Figure 2.2.2.2: IIMM Asset management planning road map



2.2.3 Key Stakeholders

The key stakeholders involved in the preparation and implementation of this AMP are outlined in table 2.2.3.

Table 2.2.3: Key stakeholders

Stakeholder	Role in Asset Management Plan
New Plymouth Council Elected Members & Mayor	• Represent the needs of community, • Define the long-term vision, mission and goals for the district, • Ensure that services remain financially sound and sustainable, • Hold Council staff to account for delivery of services at the desired service level.
NPDC Chief Executive	• Endorsement of AMPs and actions contained within, • Drive engagement at organisation's top-level for alignment of Asset Management (AM) planning with LTP and other organisational-wide strategic plans, strategies, and policies, • Sets standards, timeframes and expectations for AMPs and strategic direction of organisation.
General Manager Operational Excellence	• Delivery of Council's Infrastructure Strategy and key supporting documents, • Sponsor the development of the AMPs including authorising appropriate resources, • Set high-level priorities and timeframes for plan preparation, • Endorse, support, and provide resources for the implementation of actions resulting from the plan, • Support improvement of asset management practices, including supporting implementation of relevant new policies, processes and procedures.
Manager Three Waters	• Accountable asset owner, • Delivery of day-to-day operations, maintenance and minor renewals, • Management of internal and contract resources.
Operational team	• Delivery of day-to-day operations, maintenance and minor renewals, • Management of internal and contract resources.
District Planning	• Provide growth assumption.
Project Managers	• Deliver capital project works to meet operational needs and fulfill the change requirements defined in the relevant business case, • Lead significant acquisition, renewal and disposal works including planning, procurement and commissioning of new assets.
External parties – regulators	• Set requirements in the form of regulations and legislation.
External parties – customers and consumers	• Provide feedback by responding to Council surveys and public engagement sessions, • Final users of potable water.
Tangata whenua	• Fulfil customary role as kaitiaki over land, water, wāhi tapu, flora and fauna and other taonga.

Stakeholder	Role in Asset Management Plan
External parties - FENZ	• Safeguard life and property from the effects of fire.
External parties - Contractors and / or consultants	• Complete non-routine or specialised work, or to provide surge capacity when internal resources are not available, • Specialist advice or additional capacity when appropriate.
External parties - Manawa Energy	• Lake Mangamahoe bed and dams and the diversion and tunnel structures to divert water from the Waiwhakaiho River to the lake (source of water for the New Plymouth System) are owned by Manawa Energy.
External parties - Suppliers	• There is a large supply chain behind the Water Supply activity, providing everything from testing equipment to large diameter pipelines.

Levels of Service

This section outlines the major inputs considered when defining the level of service to be delivered by Council, the current level of service targets that Council is aiming for, how those targets are measured and the consequences to our levels of service resulting from the available budget.

3.1 Customer Research

Understanding the requirements of our internal and external stakeholders and iwi partners is critical to delivering the service that best meets their needs. Council utilises several consultation tools to understand the priorities of residents, visitors, special interest groups, community boards, local businesses, and iwi. These include:

- Annual independent community survey – Research First
- In-house visitor feedback surveys
- Council website hosted surveys
- Formal consultation for Long Term Plan and Annual Plan documents
- Public and Council meetings
- Hearings
- Social media posts

3.1.1 Community Survey

An independently managed community survey is undertaken annually by Research First to understand customer satisfaction across all of Council's activities. Feedback from the 2023 New Plymouth Community Survey has been summarised in the Tables below.

Overall residents are satisfied with their water supply (almost 9 of 10 residents) and 65% of the residents with piped water supply were very satisfied (higher than the provincial peer group average that is 54%) and 94% are at least fairly satisfied. This result is consistent with last year, which saw satisfaction levels increase to the previous high results seen between 2008 and 2014.

Table 3.1.1: Community survey results for water supply

Performance Measure	Satisfaction Level			
	Not Very Satisfied	Fairly Satisfied	Very Satisfied	Don't Know
Overall satisfaction with water supply	7%	30%	57%	6%
Satisfaction with piped water supply	5%	29%	65%	0%

Figure 3.1.1 shows the overall level of satisfaction with water supply over time, showing that the satisfaction level since 2005 is quite stable.

Figure 3.1.1: Overall level of satisfaction with water supply over time

Source: https://www.npdc.govt.nz/media/xkxou1iw/npdc-annual-customer-survey-report-2023.pdf

3.1.2 Other feedback

NPDC has been through the first round of consultation for the Long-Term Plan 2024-2034 during mid-2023[1]. Participants were asked for their views on five specific areas, with an open option to provide their own thoughts on any issues they considered important. From the five specific areas only two have direct impacts on the Water Supply activity ten-year asset management: 1 - Wild weather: Preparing for wild weather events, and 2 - Rates: Keeping rates affordable.

Residents were in agreement as to the importance of both areas under consideration. They expressed a strong desire for the affordability of rates to be maintained and were more supportive of reducing the programme of works and other large-scale projects than a reduction in the level of services. The focus should be on the essential services. Just over half of the representative survey would be prepared to accept some increase in rates to pay for better preparation for wild weather events.

Residents have a strong viewpoint on the importance of futureproofing the district's infrastructure (including water networks) for wild weather events. Opinions highlighted the importance of infrastructure resilience against extreme weather events and the need for improved community safety. The respondents discussed several solutions to improve the district's preparedness for extreme weather events in the future. These include prioritising infrastructure to withstand severe weather events, reducing emissions and transitioning to a greener future, enhancing emergency response and disaster management strategies, supporting community resilience, and prioritising core services while reducing unnecessary spending.

3.1.3 Critical customers engagement

Critical customers' needs associated to potable water supply can be distinguished for business as usual (operational critical customers) and when assessing resilience (resilience critical customers).

[1] https://www.npdc.govt.nz/media/pk4jdal1/final-report-research-first-public-engagement.pdf

Operational critical customers

Some customers require a higher level of service than the average person. The needs of these critical customers are known and monitored, with regular reviews to ensure information is current. These critical customers are listed below depending on their purpose:

1. To maintain public health:
    a. Hospitals
    b. Rest Homes
    c. Health Providers (Dentists etc)
2. To maintain business continuance:
    a. Large Users – (50,000 m^3/yr)
    b. Hairdressers
    c. Schools, Early Childhood Services and Tertiary Education
    d. Marae
    e. Veterinary Clinics
    f. Premises Preparing Food

When there is a planned water supply shutdown, such as for maintenance, renewal or an upgrade, we liaise with all dialysis patients and other water-critical customers in the affected area to agree on a suitable day and time for the shutdown. We also arrange a letter drop to all customers we believe are likely to be affected and advise the fire service - in both cases we do this at least 24 hours before the shutdown (earlier in most cases).

When a shutdown is needed for emergency repairs or a planned shutdown has an effect that wasn't anticipated, the amount of communication depends on the extent of the leak, available manpower, the duration of the water interruption and the number of affected customers. System restoration, when possible, is prioritised for critical customers.

Resilience critical customers

Critical customers play a key role when assessing resilience, especially after large events where the supply of potable water could have been disrupted for more than a week and in multiple locations.

To perform the Potable Water Resilience Assessment (section 6.3), customers were identified based on the Lifeline Vulnerability assessment provided by CDEM where critical customers should be considered if disruption has a significant impact on community wellbeing. Then each of the customers were assessed under a customized Critical Customers Framework, as there is currently no commonly accepted national method to assess the relative criticality of all customers[2]. After applying the framework, customers were effectively ranked and the resulting “Top 15” have been given specific attention to better understand their needs, their state of self-reliance and their own circumstances when faced with similar hazards to NPDC. Between the identified “Top 15” customers are; the hospitals, civil defence centres, rest homes and medical centres or urgent care facilities, the

[2] The assessment and framework of critical customers developed under this project has been considered as a case of study in the 2023 edition of “Aotearoa-New Zealand Critical Infrastructure: A National Vulnerability Assessment” prepared by The New Zealand Lifelines Council (Download Part B: Main Report)

port and airport, the New Plymouth WWTP, the energy and oil and gas facilities, maraes, and some large industries (including high water consumers with national influence).

Most of the "Top 15" customers have been approached directly. The objectives of engagement were;

- to mutually understand customer potable water needs during and following events,
- to mobilise the customer's ability to contribute to their own, and the NPDC's water networks resilience, and
- to raise awareness.

The key takeaways from engagement were;

- all the customers were keen to have open, honest and productive conversations.
- customers generally have a low level of awareness and understanding of their water needs.
- many customers assumed potable water would always be available (those impacted by ex-cyclone Gita were exceptions).
- the most critical customer is Taranaki Base Hospital; currently it can keep operating for 8 hours without water supply. It is expected that after upgrades are completed, it will be able to be self-reliant for approximately 3 days.
- Most of the customers need to cease operations without water supply or other interdependencies.
- Rest Home certification requires self-reliance for 3 days however none of the rest homes that we have interacted with have been able to confirm if they are compliant to this level.

Details related to the Critical Customers Assessment performed under the Potable Water Resilience Assessment can be found in ECM 8857344.

3.2 Strategic and Corporate Goals

3.2.1 NPDC's Vision, Mission and Goals

This AMP is prepared under the direction of the New Plymouth District Council vision, mission, goals and objectives, which are shown in Image 3.2.1 below.

Image 3.2.1: NPDCs Vision, Mission and Goals

3.2.2 Alignment

How these goals will be addressed by this AMP is summarised in Table 3.2.2.

Table 3.2.2: Organisational goals and how these are addressed in this Plan

Goal	How Goals are addressed
Trusted **Building credibility**	We are working on an integrated approach with the Water Master Planning project to better understand the opportunities and priorities for future improvement and investment in water supply infrastructure so that the district's communities have safe, reliable and efficient water supplies with an appropriate level of resilience. The implementation of the WCP will support in the improvement of our understanding where water is used so we can operate the network more effectively. The Asset renewals programmes for reticulation, P&E are in place to maintain current Levels of Service.
Thriving Communities and Culture **Equitable & inclusive**	NPDC is committed to collaborate with iwi and hapū. The Water Master Planning project will continue to identify current deficiencies and future upgrade requirements in the level of service and account for growth in a planned way. We are working together with FENZ to identify a practical and achievable target level of service for firefighting. The WCP includes different demand management initiatives that involves the application of selected actions to encourage efficient and equitable use of water.

Goal	How Goals are addressed
Environmental Excellence **Efficient & resilient**	The WCP will help to nurture our environment by leaving more water for the natural environment and help us adapt to climate change by reducing our energy consumption and improving our drought resilience. A Supplementary Source for the water supply system will reduce our dependence on surface water, taking care of our environment while embracing Te Ao Māori. A resilience assessment has been completed that focuses on understanding the potable water assets that are at higher risk due to natural hazards (critical assets) and on establishing resilience levels of services. The New Plymouth Supplementary Source and the NPWTP major upgrades will help to improve the resilience of the New Plymouth system. Completing the trunk main through SH3 in Waitara will improve the resilience of the eastern and northern areas of the district. We are looking to build and manage future NPDC assets according to low carbon principles.
Prosperity **High performing & equitable economy**	Through integrated planning, we are working on a holistic view that allows for more targeted and integrated expenditure. Integrating the improvements identified by the different workstreams will lead to reduced costs for an equivalent outcome. The New Plymouth Supplementary Source and the major upgrades to the NPWTP will help us to grow a resilient, equitable and sustainable economy.

3.2.3 Te Mana o te Wai

Te Mana o te Wai is a concept that refers to the fundamental importance of water and recognises that protecting the health of freshwater protects the health and well-being of the wider environment. It protects the mauri of the wai. Te Mana o te Wai is about restoring and preserving the balance between the water, the wider environment, and the community.

This concept has been introduced by the National Policy Statement for Freshwater Management (NPS-FM) 2020[3] and will be the foremost fundamental concept guiding our approach to water in New Zealand.

Te Mana o te Wai imposes a hierarchy of obligations by prioritising the health and wellbeing of water bodies and freshwater ecosystems first. The second priority is the health needs of people (such as drinking water) and the third is the ability of people and communities to provide for their social, economic and cultural wellbeing now and in the future.

The NPS-FM allows for the development of regional and local definitions for Te Mana o te Wai that will need to be incorporated into the approach.

3.2.4 Other Strategies

In addition to the above, there are other strategies whose drivers and objectives are relevant to the management of our infrastructure. These strategies and their relevant drivers/ goals are captured in Table 3.2.4

[3] National-Policy-Statement-for-Freshwater-Management-2020.pdf (environment.govt.nz)

Table 3.2.4: Other strategic objectives and how these are addressed in this Plan

Strategy and Policy	Objective/ driver	Description
Infrastructure Strategy	Ensuring our existing assets remain fit for purpose	The asset renewals programmes for reticulation, P&E are in place to maintain current levels of service; section 5.3 describes the details of our renewals plan. Section 5.2 details what we are looking into in terms of operations, maintenance and improvements needed in this area.
	Resilience and adapting to climate change	A resilience assessment has been completed that focuses on understanding the potable water assets at higher risk due to natural hazards (critical assets) and on establishing resilience levels of services (Refer to section 6.1 and 6.3). The New Plymouth Supplementary Source and the NPWTP major upgrades will help to improve the resilience of the New Plymouth system. Completing the trunk main through SH3 in Waitara will improve the resilience of the eastern and northern areas of the district. Section 4.7 describes how we are managing the Impacts of climate change on our assets and services.
	Providing for sustainable growth and the changing needs of our community	The WCP will help to nurture our environment by leaving more water for the natural environment and adapts to climate change by reducing our energy consumption and improving our drought resilience. A Supplementary Source for the New Plymouth system will reduce our dependence on surface water, taking care of our environment while embracing Te ao Māori. We are looking to build and manage future NPDC assets according to low carbon principles. New or upgrade of network projects are being considered to enable growth areas.
Asset Management Strategy	Improve our planning	We are investing in planning while keeping the water supply Planning Project (Refer to section 4.2).
	Improve our asset data	The implementation of the WCP will support in the improvement of our understanding of where water is used so we can operate the network more effectively.
	Improve our processes	The improvements actions that are described is section 8.2 will help us to improve our processes to function more efficiently.
	Reduce our emissions	We are looking to build and manage future NPDC assets according to low carbon principles.
He Puna Wai	Partnership with iwi	NPDC is committed to collaborate with the iwi and hapū and, and as part of the He Puna Wai agreement, has been working together with iwi in a spirit of partnership and collaboration to develop sustainable long term strategy for District's three waters systems. Alongside He Puna Wai, NPDC host the Three Waters Hui. This working group consists of local Hapū and iwi representatives together with NPDC officers, where collaboration and presentation of ideas related to the three waters long term planning and projects are tabled and discussed.

Strategy and Policy	Objective/ driver	Description
Environmental Sustainability Policy[4]	Water efficiency	This internal policy seeks to provide leadership in the area of water efficiency and requires the identification and capitalisation on opportunities to reduce water use. This internal policy requires council to adopt a Water Conservation Plan where the water consumption/efficiency targets will be established.

3.3 Legislative Requirements

There are many statutory and legislative requirements relating to the management of assets. Requirements that have a significant impact on the delivery of the water supply are outlined in Table 3.3. Other statutory and regulatory requirements are captured in Appendix 1.

Table 3.3: Significant Statutory and Legislative Requirements and other key documents

Legislation/ regulation	Relevance to service/ assets
Water Services Act 2021	This act aims to ensure that drinking water suppliers provide safe drinking water to consumers, establishes a framework to provide transparency about the performance of three waters operators, provides mechanisms to build and maintain capability and establishes a framework for continuous improvement.
DWSNZ (Revised 2018)	The availability of safe drinking-water for all New Zealanders, irrespective of where they live, is a fundamental requirement for public health. The DWSNZ provide requirements for drinking-water safety.
The Water Services Economic Efficiency and Consumer Protection Act 2023	Establishes an economic regulation and consumer protection regime for the three waters activities.
Health (Drinking Water) Amendment Act 2007	This aims to protect public health by improving the quality of drinking-water provided to communities. Water Safety Plans are required under this act for water suppliers. They identify the public health risks associated with that drinking-water supply, critical points in that drinking-water supply, and the mechanisms for preventing public health risks and reducing and eliminating those risks if they do arise. Water Safety Plans must be approved by the Ministry of Health.
Resource Management Act 1991 and Amendments (RMA)	This is the primary legislation dealing with the management of natural and physical resources. It provides a national framework to manage land, air, water and soil resources, the coast, subdivision and the control of pollution, contaminants and hazardous substances.
National Policy Statement for Freshwater Management (NPS-FM) (2020)	The NPS-FW provides local authorities with direction on how to manage freshwater under the RMA. This regulation introduces the concept of Te Mana o te Wai as explained in Section 3.2.2.

[4] Policy to be implemented in March 2024.

3.4 Customers Values

As a Local Government organisation, Council's primary customers are ratepayers who do not have the choice of a different supplier. In addition, Council is providing services to community groups, businesses, emergency services and visitors to the region. It is therefore essential that Council not only meet statutory requirements but that there is a strong understanding of customer needs and expectations including:

- What is important to the customer,
- Whether the customer sees value in what is provided and,
- How customer satisfaction is expected to change based on the current budget.

Table 3.4.1 describes the key deliverable from the perspective of the customer, and how these values are expected to be impacted over the ten-year term of this AMP. These are measured in terms of customer satisfaction which is typically determined through direct feedback via survey, service requests or complaints.

Table 3.4.1: Customer Values

Measure	Reporting Level	Current Performance	Target				Expected trend
			2024/25	2025/26	2026/27	2034/35	
Service objective	**Respond to faults and unplanned interruptions to the water supply network in a timely manner.**						
The total number of complaints (per 1,000 connections) received about any of the following: • drinking water clarity, taste or odour; • drinking water pressure or flow; • continuity of supply; and • NPDC's response to any of these issues.	Annual Report	16.91 	16 or less				No change. Current measure allows for 115 or less complaints for each quarter. The target in 2020/21 was 10 or less and was also not achieved. It is expected that the target will be reviewed.

Current performance can be seen at a glance using the icons within the table. Results included are from 2022/2023 period. These icons are described in table 3.4.2 below.

Table 3.4.2: Key

Icon			
Status of current performance	Performance target met	Substantially achieved, target not met by a slim margin (~2%)	Target not met.

3.5 Levels of Service

The standard of service provided by Council is defined by the agreed level of service and the Levels of Service (LoS) can be grouped into two key categories:

- Customer Levels of Service: measure how the customer receives or experiences the service, in the context of what matters most to the customer.
- Technical Levels of Service: measure the service the organisation provides in terms that are relevant to delivery, this includes technical indicators that may not be understandable to the layperson.
- Resilience Levels of Service: measure the performance of the network after an event. Details about this LoS have been provided in section 6.3.

The same level of service may be measured by considering either or both perspectives. This ensures that customers are able to interpret performance in a manner that is understandable to them, while regulators can also see that Council performance is meeting the required targets.

Council's performance against these LoS is measured using replicable, factual measures that are SMART:

- **S**pecific – it is clearly defined what the measure relates to,
- **M**easurable – success or failure can be measured without interpretation bias,
- **A**chievable – something that is possible to achieve,
- **R**elevant – something Council can reasonably be expected to have an impact on,
- **T**ime-bound – a timeframe for completion or measurement is defined.

3.5.1 Customers Levels of Service

The agreed Customers LoS for water supply are:

- Provide water that is safe to drink
- Maintain the reticulated water network in good condition
- Respond to faults and unplanned interruptions to the water supply network in a timely manner
- Manage demand to minimise the impact of water supply activities on the environment

Table 3.5.1.1: Customers Level of Service Measures for the Water Supply Activity

Measure	Reporting Level	Latest Result (2022/23)	Target				Expected trend
			2024/25	2025/26	2026/27	2034/35	
Level of Service Statement	**Provide water that is safe to drink.**						
Compliance with the Water Services (Drinking Water Standards	LTP	Substantially achieved[5]	Full Compliance				No change.

[5] Technical non-compliance and the water was safe to drink at all times. Non-compliant with the sampling rules for one month, but fully compliant with the Drinking Water Standards.

Measure	Reporting Level	Latest Result (2022/23)	Target				Expected trend
			2024/25	2025/26	2026/27	2034/35	
for New Zealand) Regulations 2022 and DWQAR 2022.							Full compliance is still expected to provide potable water that is safe to drink. It is likely this measure will be superseded by Taumata Arowai performance measures and reporting.
Our level of compliance with Part 5 of the Drinking-water Standards (protozoal compliance criteria).	Annual Report	Full Compliance 	Full Compliance				Full compliance is still expected to provide potable water that is safe to drink. It is likely this measure will be superseded by Taumata Arowai performance measures and reporting.
Level of Service Statement	**Maintain the reticulated water network in good condition.**						
The percentage of real water loss from NPDC's networked reticulation system.[6]	LTP	19% 	20% or less				No change. This target has already been reduced (2020/21 target was 25% or less).
Level of Service Statement	**Respond to faults and unplanned interruptions to the water supply network in a timely manner.**						
The median response time to urgent callouts (from the time that NPDC receives notification to the time that service personnel reach the site)	LTP	0.58 	1 hour or less				No change.
The median resolution time for urgent callouts (from the time NPDC receives notification, to the time that service personnel confirm resolution of the fault or interruption).	LTP	1.51 (<250 dia.) No callouts (≥ 250 dia.) 	4 hours or less for mains <250 diameter 8 hours or less for mains ≥ 250 diameter				No change.
The median response time to non-urgent callouts (from the time NPDC receives notification to the time that service personnel reach the site).	LTP	42.76 	70 hours or less				No change.
The median resolution time for non-urgent callouts (from the time NPDC receives notification to the	LTP	64.88	116 hours or less				No change.

[6] Water loss calculation: We calculate the percentage of water loss by dividing the annual volume of water loss by the total amount of treated water supplied for the year (obtained from water meter records from the Water Treatment Plant). To calculate the annual volume of water loss, we determine the minimum night flow (the average flow between 2am and 4am for the lowest 20 days of the year divided by the number of connections) and subtract the legitimate night usage per property (assumed to be six litres per property per hour). The difference is the estimated volume of water loss per property.
To get the annual volume of water loss, we multiply the estimated volume of water loss per property by the number of connections, and then multiply that figure by 365.

Measure	Reporting Level	Latest Result (2022/23)	Target				Expected trend
			2024/25	2025/26	2026/27	2034/35	
time that service personnel confirm resolution of the fault or interruption).							
Level of Service Statement	**Ensure customers are satisfied with our water supply service.**						
The total number of complaints (per 1,000 connections) received about any of the following: • drinking water clarity, taste or odour; • drinking water pressure or flow; • continuity of supply; and • NPDC's response to any of these issues.	LTP	16.91 	16 or less				No change.
Level of Service Statement	**Provide a good quality and safe water supply.**						
The percentage of residents satisfied with the quality and safety of the district's water supply	LTP	New measure	80				Future trend to be determined once current performance is better understood.
Level of Service Statement	**Manage demand to minimise the impact of water supply activities on the environment.**						
Average consumption of drinking water per day per resident within New Plymouth district.	LTP	315 	300 litres per day – Expected to be reduced after the implementation of the WCP.				A 25% reduction in gross per capital water consumption has been adopted by the WCP. It is expected that this will be reflected in the residential average consumption, and then the target will be adjusted for the average residential consumption.
The number of abatement notices received.	LTP	One 	None				An abatement notice has been received in FY 2022/23 for Lake Mangamahoe intakes due to fish intake requirements and was not reported in the Annual Report. Fish screens are scheduled to be installed between 2024 and 2026.
The number of infringement notices received	LTP	None 	None				No change.
Number of enforcement orders received.	LTP	None 	None				No change.
Number of convictions received.	LTP	None	None				No change.

Measure	Reporting Level	Latest Result (2022/23)	Target				Expected trend
			2024/25	2025/26	2026/27	2034/35	
							

Current performance can be seen at a glance using the icons within the table. Results included are from 2022/2023 period. These icons are described in table 3.4.2 below.

Table 3.5.1.2: Key

Icon			
Status of current performance	Performance target met	Substantially achieved, target not met by a slim margin (~2%)	Target not met.

3.5.2 Technical Levels of Service

The agreed Technical LoS for water supply are:

- Our maximum and minimum desirable working pressure for water supply is within the performance criteria.
- Our system performs under the agreed system performance measures.
- Our system meets the firefighting targets (proposed LoS).

The Technical LoS for water supply are captured in Table 3.4.2 along with the current performance.

The New Zealand Fire Service Water Supplies Code of Practice SNZ PAS 4509:2008 is a voluntary code of practice that governs the minimum required flows and pressures for firefighting. NPDC are working with Fire and Emergency New Zealand (FENZ) to identify a practical and achievable target level of service for firefighting based on this document for ratification by Council. As such the below firefighting levels of service are "proposed" pending ratification.

NPDC's proposed target firefighting Level of Service for most residential areas is FW2. The exception to this is for communal sleeping facilities located within this zone such as school hostels, rest-homes and hotel/motels which are FW3. The level of service for commercial and industrial varies between FW2 and FW6 depending on its location, density and use. This is still being refined based on the achievability of meeting the proposed targets.

Table 3.5.2.1: Technical Level of Service Measures for the Water Supply activity

Category	Threshold for Failure (Target)	Current performance	Expected Trend
Maximum and minimum desirable working pressure for water supply is within the Levels of Service.			
Low pressure in rural areas (including	< 20 m	More than 99% of customers met the target. Customers that fail this LoS criteria are usually isolated nodes at high elevations areas (Carrington, Highlands	Improve -

Category	Threshold for Failure (Target)	Current performance	Expected Trend
restricted supply)		Park, Brooklands, Ōmata, Inglewood, and Bell Block Zones), and /or near reservoir sites (NPWTP, Henwood Rd, Mountain Rd, Tikorangi, Urenui and Onaero domain, Ōākura, Ōkato and Inglewood Reservoirs).	Carrington after implementing upgrades due to growth. Omata due to the Water Conservation outcomes (reduced head losses). Bell Block upgrades project will help with issues in the Bell Block area. Supplementary source for the New Plymouth (Central and Eastern Feeders).
Low pressure in urban areas	< 25 m		
High Pressure for all customer type	> 100 m	More than 99% of customers met the target. High pressures can be observed in the low elevation areas in the northern parts of the New Plymouth network, the Port, Merrilands / Glen Avon near the boundary of the zones, Tikorangi and Ōākura. Also, this can be observed upstream the pressure reduction valves in Brooklands, Merrilands and Fitzroy.	Improve - Move PRVs in certain areas to include high pressure nodes or reviewing set point.
Systems perform under the agreed system performance measures.			
Pipe high headlosses	> 5 m/km (for small pipes: ≤DN150) > 3 m/km (for large pipes: >DN150)	High headlosses are observed/predicted in many zones throughout the network as follows: - Central and Eastern Feeders up to Bell Block. - Along Barrett Road and Karamea Road in Barrett zone. - At the entrance to the zone in Glen Avon on Queens Road, Atiawa Street and Smart Road. - Several undersized pipes on Wills Road, Devon Road and Mountain Road in Bell Block. - Inglewood West is limited to a small area of the network, including pipes on Rata Street, Ngahere Street. - Trunk main from the Ōākura reservoirs and South Road and another location is the discharge main exhibit in Ōākura boosted. There are also several pipes in Veale, Brooklands, Lower Highlands Park, Fitzroy Residential, Glen Avon, Waitara, Tikorangi, Urenui and Ōkato where high headloss is observed.	Improve – Implementing the following projects will reduce the high headlosses: Supplementary source for the New Plymouth (Central and Eastern Feeders). The Barrett trunk main completion project. The Smart Road project will solve issues in the Glen Avon area. Renewals programme, together with firefighting upgrades programme will support improvements throughout the district.
Pipes high velocity	> 1.5 m/s	The model predicts that velocities do not exceed the threshold limit in most of the network. There are a limited number of pipes where the maximum velocity exceeds the target. Most notably in the Veale zone, around the Veale Road pump station and NPWTP reservoirs.	Related to the high head losses. Implementation of the water conservation programme will help to improve LoS.
Reservoir storage	24 hrs storage, average day demand (total reservoir volume)	The storage capacity in Veale Road Reservoir is below the 24 hours average day demand. Henwood Road and Mountain Road Reservoirs also showed a storage capacity below the target, however the hydraulic model did not consider the additional reservoirs that have been recently constructed in both sites.	Improve - Unload Veale Road Reservoir and load Mang 1 and 2 Reservoirs to balance the storage capacity. Supplementary source for the New Plymouth will solve issues
	< 8 hrs average day peak week demand (50% reservoir volume)		

Category	Threshold for Failure (Target)	Current performance	Expected Trend
			in the Mountain Rd reservoirs.
Reservoir turnover time - Maximum Residual Time	Average day low & peak demand week > 72 hrs	There are 13 sets of reservoirs (could be one, two or three in the same location), the ones that do not meet the threshold are: - Tikorangi: slightly above for the average day low demand week - Urenui: above threshold for both the low demand and peak demand suggesting that the reservoir is oversized. - Inglewood: above threshold for both the low demand and peak demand, however there are no issues with low residual chlorine due to long residence times. - Ōākura: above for the average day low demand week, but there is a sharp reduction for peak demand illustrating the variation in network demand over the course of the year. - Ōkato: above for the average day low demand week, but there is a sharp reduction for peak demand illustrating the variation in network demand over the course of the year.	No change.
Minimum flows and pressures required for firefighting			
Residential areas	Not meeting FW2 (most areas) or FW3 (sleeping facilities)	2,823 out of 37,469 dwellings (7%) that could complete the analysis in the residential areas do not meet the proposed target: Cluster around Junction Rd in Brooklands - High elevation areas in Glen Avon - Some dwellings in Bell Block - Onaero failed to achieve any LoS during the simulations and the cause of the issue is being seek. - Urenui. - General residential areas located in high elevation areas around New Plymouth. - Some dwellings in Ōkato. - Most of Ōākura, what is limited to pipe capacity. - Some dwellings in Inglewood.	Improve – A firefighting upgrades programme will support the improvements throughout the district (combined with the renewals programme). WCP will help to improve this LoS. The Smart Road project will solve issues in the Glen Avon area. Renewals programme (together with upgrade). Bell Block upgrades project will help with issues in the Bell Block area.
Non-residential areas	Not meeting proposed FW classification (FW2-FW6 depending on area)	1,490 out of 3,380 dwellings (44%) that could complete the analysis in the residential areas do not meet the proposed target: - Bell Block industrial area. - Dwellings in the high elevation areas around the Port. - TSB stadium in Brooklands. - Some dwellings in the Fitzroy industrial area and business area. - Some buildings in the Waitara Town Centre area and central industrial area. - The local centre in Ōākura.	Improve – A firefighting upgrades programme will support the improvements throughout the district (combined with the renewals programme). Bell Block upgrades project will help with issues in the Bell Block area.

Category	Threshold for Failure (Target)	Current performance	Expected Trend
		- Some business areas in the CBD. - 19 sleeping facilities throughout the district. - One Marae.	The Barrett trunk main completion project will improve the LoS in the Port area. Carrington after implementing upgrades due to growth. A fire pump station at the Urenui reservoir.

Note: All the results presented on this table are outcomes from the hydraulic models that have been calibrated in 2020.

3.5.3 National Level of Service Framework

A proposed National Levels of Service and Performance Framework that has been developed in accordance with legislative and industry regulation and practice. The framework has been designed to be adaptable, establish a benchmark, promote consistency, encourage stakeholder engagement, and provide a means of measurement.

The proposed national levels of service and performance framework includes draft performance measures and a schedule for reporting. Additionally, it addresses future considerations for levels of service such as carbon reduction and dam safety compliance.

It is expected that the new water entity for the Taranaki Region will adopt the latest national level of service framework once is established to ensure effective management of service levels. It is expected that this framework will be crucial for aligning the entity's investment decisions with the maintenance of service levels.

Future Demand

4.1 Demand Drivers

Demand drivers are those factors which impact the extent to which an asset or service is required and used, or the type of service required. Demand drivers include factors such as:

- Population size, growth and demographics
- Urban development including residential dwelling growth, location, makeup and quantity
- Consumer requirements, preferences, expectations and patterns of use
- Technology type, use, rate of change, level of interaction and customer expectations
- Legislative environment including central government reform
- Cultural considerations and/or aspirations (giving effect to Te Mana o te Wai)
- Environmental factors such as those occurring through climate change, and
- Resilience to natural hazards

The specific factors relevant to each service and the impact of those drivers are expanded upon below.

4.2 Demand Forecasts

NPDC prepares and adopts a range of non-financial forecasting assumptions to support the preparation of significant plans including AMPs and the LTP. These assumptions present a likely future scenario of projected changes in key demand drivers. By adopting one set of forecasting assumptions Council can have confidence that each plan will be aligned and focused towards fulfilling the same organisational objectives and long-term outcomes for the community.

4.3 Water Supply Planning

During the last seven years the Water Master Planning project has been working to identify the current deficiencies and future upgrade requirements to meet the level of service and account for growth in a planned way. The project pursues an integrated approach to planning for its four water supplies: New Plymouth, Inglewood, Ōākura and Ōkato. We are seeking to better understand the opportunities and priorities for future improvement and investment in water supply infrastructure so that the district's communities have safe, reliable and efficient water supplies with an appropriate level of resilience.

The project aim is to have targeted expenditure through integrating resilience improvement with renewal, LoS and growth projects leading to reduced costs for an equivalent outcome.

This project builds on completed or currently progressed work and uses the assessments and calibrated hydraulic models from that work to further analyse and evaluate the impacts of growth,

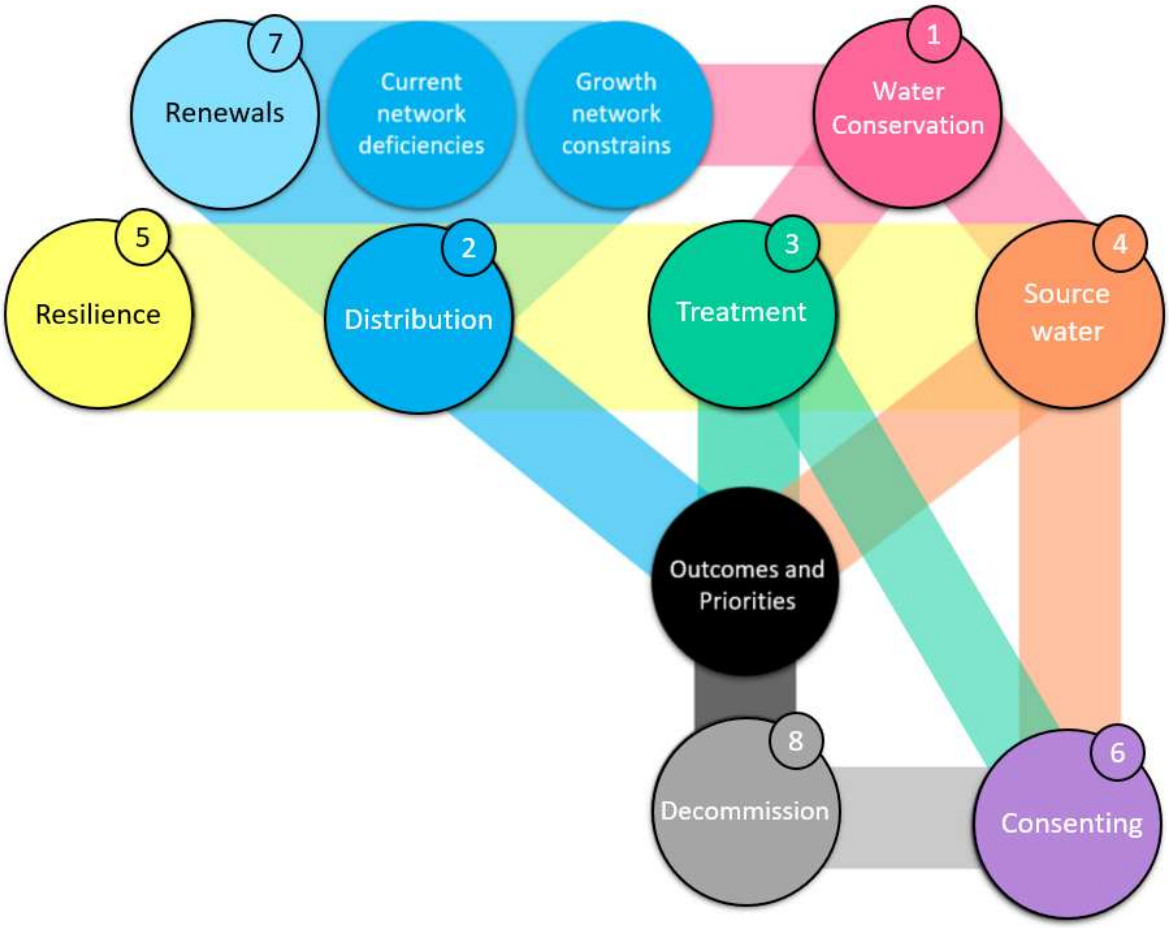
water conservation, natural hazards, environmental considerations, and regulatory changes on the district's water supplies.

The Water Master Planning project is an evolving project with different workstreams that are developed simultaneously that will be defined and scoped as results and information are acquired. The project encompasses eight distinct but inter-related workstreams and multiple activities to be undertaken within each of the workstreams:

1. **Water Conservation:** In 2021 NPDC committed to a number of initiatives with the aim of achieving a 25% reduction in gross per capita consumption by 2030. The aim was to reduce future investment costs, protect and enhance the natural environment and improve our ability to obtain consents. How this workstream progresses influences the long-term planning of the system (distribution, treatment and source water).
2. **Distribution:** The focus is to assess the ability of the network to provide adequate levels of service (and performance) and identify deficiencies (levels of service, performance and firefighting capabilities) within the water network by using hydraulic modelling. This has been performed considering current demand (understanding current deficiencies) and also future demand considering 30 years of growth (understand future constrains in the network).
3. **Treatment:** This workstream considers any upgrade of the system between the source of water and the water treatment plant reservoirs. Initially the focus has been to create an Improvement Plan for the NPWTP as there are a number of issues at the water treatment plant that require a coordinated approach to resolving.
4. **Source water:** Due to growth, resilience and environmental drivers a supplementary source is needed for the New Plymouth water supply. This workstream is to identify and evaluate the options and coordinate the way forward considering the implication in other workstreams.
5. **Resilience:** This workstream focuses on understanding the potable water assets that are at higher risk due to natural hazards (critical assets) and is also working on the establishment of current and future (aspirational) resilience levels of service.
6. **Consenting:** Provide the needed information to lodge and continue with ongoing engagement with Mana Whenua and stakeholders for the water supply related consents.
7. **Renewals and condition assessment:** The renewals and condition assessment programme is delivered though a separate process, that is informed by some of the outcomes from this project (firefighting capabilities and targets).
8. **Decommissioning:** This stream covers the decommissioning of the assets that are currently mothballed and not being used by Council or any other active user.

The following figure shows the interaction of the different workstreams, the resilience workstream being an overarching workstream that has strong inter-relationship with the other workstreams.

Figure 4.3.1: Water Master Planning project integration of workstreams



4.4 Demand Impact and Management Plan

The impacts of relevant demand drivers on water supply service and how those impacts are managed is shown in table 4.4.

Council utilises a variety of demand management strategies to control the extent to which demand has an impact on customer satisfaction and levels of service. These demand management strategies include:

- Changing the management of existing assets such as:
    - balancing peak and off-peak demand,
    - optimising utilisation,
    - reducing wastage,
- upgrading existing assets,
- providing new assets, and
- reducing levels of service to meet customer appetite/willingness to pay.

Table 4.4.1: Demand Management

Demand driver	Current position	Projection	Impact on services	Demand Management Plan
Population growth and land use intensification	Estimated district population in 2024: 89,000	2034 projected population: 98,800 (11% increase). This will also result in land use intensification in central areas. As the population grows, there will be a higher demand for services, leading to the need for investment in new infrastructure and sustainable water sources.	Land use intensification impacts are expected to be compensated by the reduction per capita in demand to be achieved by the WCP. If the reduction in demand is not achieved, some intensified areas might require extension of new and capacity upgrades to existing infrastructure. Future urban zone or development areas are currently unserved or need major upgrades to enable growth.	Growth models were performed considering land use infill and greenfield areas based on the District Plan growth assumptions. Calibrated hydraulic models are used to assess the level of service (including firefighting capabilities) and system performance (current and future). A supplementary water source for the New Plymouth System is being considered to cope with uncertainties associated with growth and will avoid the duplication of 6 km of the Eastern Feeder due to growth. Specific projects are considered to enable growth (Puketapu, Smart Road, Carrington Zone and Ōākura development areas). Projects have been identified to achieve system performance and Levels of Service due to growth (i.e. Barrett trunk main completion, Brooklands firefighting upgrades, Bell Block upgrades).
Economic activity	New Plymouth District GDP 2022: $7.02B	Expected to increase at a steady rate of 1.5%/year	Economic growth, such as the introduction of new industry, can significantly increase demand for water supply. Upgrades to enable growth and to achieve the firefighting levels of services are needed.	Commercial/Industrial Growth Projections have been included as part of the 30 years growth model used as base data for the hydraulic models. Upgrades are being recommended in the industrial areas associated with growth to meet firefighting (i.e. Bell Block upgrades).
Government reforms	Three Waters Reform, Resource Management Act Reform and Local Government Act review all underway but expected to be repealed or changed within 6-months.	Formal reforms to be repealed in favour of a Local Government led approach. Increased compliance costs anticipated. May be a drive for regionalisation of	Variety of proposed changes to legislation to replace the reforms. More certainty required to identify resourcing implications.	Council to continue standard practice of monitoring and reviewing change when new legislation is drafted.

Demand driver	Current position	Projection	Impact on services	Demand Management Plan
		management of some major assets.		
Te Mana o te Wai	Refer to section 4.4			
International instability	War in Ukraine and the Covid pandemic is driving up the cost of fossil fuels and causing supply chain shortages & delays.	Significant cost increases in fossil fuel (e.g.: gas for boilers, diesel for generators). Significant delays sourcing equipment parts from overseas.	Spending more (increased opex and capex costs) to do the same projects.	A combination of a reduction in the proposed scope of work and an increase in budgets.
Policy and regulatory changes	Taumata Arowai's Drinking Water Quality Assurance Rules 2022 is now requiring new contact times. Current compliance with requirements of the Health and Safety at Work Regulations 2017 is not fully met. The MoH directed to reinstate fluoridation in the New Plymouth Supply.	Increased compliance requirements. The expectation is that regulations may change to provide safer water.	Some existing assets may need to be renewed before the end of their useful lives due to changes in regulations. The clearwater tank on its own provides insufficient chlorine contact under future drinking-water operational compliance rules and with future WTP flows. New assets will be required to meet regulations or mandates.	We are working on the NPWTP major upgrade project that will replace the existing clearwater tank with an UV system to guarantee the bacterial compliance. Permanent fluoridation arrangements are being considered under this project to allow for long term fluoridation as directed by the MoH.
Improved iwi engagement	Refer to section 4.4			
Consumer behaviour change	New Plymouth's residential water consumption is high. In 2021 NPDC committed to a number of water conservation initiatives.	The aim of the WCP is to achieve a 25% reduction in gross per capita consumption by 2030.	Consumer behaviours directly impact demand, such as choosing to adopt water conservation practices to reduce demand for water. This will reduce the need of capital investment due to growth.	A WCP has been established to support the community with the change of behaviour. Water conservation scenarios have been included as part of the 30 years growth model to understand the impact in the long-term planning due to growth.
Climate change	Refer to section 4.6			
Resilience to natural disasters	Community expectations are changing in areas as network resilience	We have a responsibility to prepare for	Disruption and/or loss of water supply for more than a week is	A resilience assessment has been performed to identify the water supply assets at a higher risk

Demand driver	Current position	Projection	Impact on services	Demand Management Plan
	and vulnerability to flooding. Our water supply networks are vulnerable to a number of hazards.	disasters. Risks and events that could disrupt our services are short-term and long-term. More resilient infrastructure will be required. NPDC is exposed to low frequency hazards with catastrophic consequences: large earthquake and volcanic eruption.	expected to happen after a large event. Some existing assets may need to be upgraded, and new assets will be required to increase the resilience of the network.	(critical assets) – Refer to Section 6.1. Infrastructure projects include provisions for upgrading or expanding parts of the system, (during which resilience can also be improved) have been identified. Refer to Section 6.3.
Firefighting requirements	SNZ PAS 4509:2008 cannot be fully adopted, but we have agreed with FENZ on targeted Levels of service for different areas based on risk and network capacity constraints. Several areas of the district are not meeting the agreed firefighting levels of service.	A more consistent approach that can be applied nationally should be developed. Under section 73 of the Fire and Emergency New Zealand Act 2017, FENZ must review the code of practice every three years. Compliance might be required.	Firefighting capacity will need to be improved through the network to achieve the targeted levels of service. Pipe upgrades or new pipes will be needed throughout the network.	Hydraulic models (current and 30 years growth model) have been used to give an understanding of capacity, set levels of service, and identify improvements. Upgrades have been identified for specific areas (i.e. TSB Stadium in Brooklands zone). A firefighting upgrades programme will support the improvements throughout the district.

4.5 Cultural Aspirations

Better recognition of the concepts captured in Te Tiriti o Waitangi is becoming an increasingly significant driver (refer to Section 3.2.2), both morally and legally, for many activities in New Zealand, especially those associated with the management of natural resources. For the three waters activities a key element of this has been the inclusion of the concept of Te Mana o te Wai in various regulatory documents including the National Policy Statement for Freshwater Management 2020 (NPS-FM).

The NPS-FM requires freshwater to be managed in a way the gives effect to Te Mana o te Wai. How this will be achieved is yet to be defined but could potentially include changes to our water take resource consent conditions to safeguard the ecosystem health and mauri of waterbodies. This could consequently have impacts on the amount of water available for the existing water supplies to meet both current and future water demands. Moreover, supplies served from surface water sources are under increasing pressure to reduce their take, especially during low flow periods.

To achieve Te Tiriti o Waitangi requirements the expectation is that relationship with local iwi and hapū will develop into partnership. One of the actions that will help progress towards achieving iwi aspirations is the development of a Māori engagement framework.

As stated in section 3.2.3, NPDC is committed to collaborating with iwi and hapū giving effect to the He Puna Wai agreement and hosting the Three Waters Hui. For some specific projects - i.e. the supplementary water source for the New Plymouth System, we are working collaboratively with the affected hapū in order to address the cultural considerations at an early stage and allow for a partnership approach. This project is also being considered as a safeguard to ecosystem, to cope with uncertainties associated the implementation of Te Mana o te Wai and to supplement supply during an extended period of low flow in the Waiwhakaiho River.

4.6 Sustainability

Council has a vision of becoming a Sustainable Lifestyle Capital. Council's sustainability efforts are driven by a focus on:

- conservation of energy and resources (such as water)
- nurturing, and reducing our impacts on the environment
- increasing biodiversity in our district
- increasing recycling and working towards zero-waste
- sustainable procurement practices
- planning and building communities and infrastructure that interact with the environment, and
- working toward net-zero emissions

NPDC's commitment is captured in a number of documents as shown in Figure 4.6.1.

Figure 4.6.1: Decision-making documents relevant to sustainability

* Policies internal to NPDC

Table 4.6.2 summarises the changes to the Water Supply activity that could be made to increase overall sustainability.

Table 4.6.2 Sustainability initiatives

Proposed new/ changed asset	Long-term impact/ sustainability concern	Outcome of planned change	Implementation Plan
Use the water efficiently.	Water is a precious commodity, essential to life, our community and the environment. We do not have an unlimited amount of water, so we should value it accordingly. Ecological assessment indicates effects of the current takes on the environment are minor. However, if we continue with current water consumption and expected population growth this could increase to having some effects. In addition, during times of low flow the more water left in the river the better, particularly as low flow typically coincides with peak demand. This effect on the environment is forecast to increase due to the predicted effects of climate change.	This programme aims to reduce water consumption. If we can reduce our demand by 25% this water becomes immediately available for the environment. Reducing the water consumption (and consequently taking less water from the water sources) helps to sustain river flows contributing to improved ecosystem health. Reducing water consumption also reduces wastewater flows and associated environmental impacts of discharges, chemical and energy use. This in turn reduces operational emissions which aids climate change mitigation. Moreover, by deferring or eliminating capital investments, associated environmental impacts related to construction are also deferred or eliminated.	Implement a WCP considering the following actions: • Water Conservation Officer • Universal water metering • Improve data and benchmarking water consumption • Create standards for rainwater use and grey water re-use • Green plumber to support the community • Education/Community Engagement Programme • General education and specific water conservation programmes for organisations • Pressure management
Emissions Reduction	Reduce long-term carbon emissions. This will help us to mitigate and limit the impacts of climate change.	NPDC reaching net zero emissions by 2050. Decarbonisation Process will save 20% to 30% of NPDC's emissions year on year and offers potential cost savings of close to $1billion by 2050. NPDC's use of resources and materials for operations and infrastructure projects are the organisation's largest source of emissions when you exclude closed landfills. NPDC can reduce these emissions by integrating low carbon principles within its planning, design, procurement and supply chain.	NPDC is looking to implement a decarbonisation programme to procure, design, build and manage future NPDC assets according to low carbon principles. For the programme to reduce the most emissions, decarbonisation requires the reduction of the whole-of-life carbon within the things we buy and infrastructure we build.

Proposed new/ changed asset	Long-term impact/ sustainability concern	Outcome of planned change	Implementation Plan
Waitara Industrial Supply System – Waiongana Weir removal	The system is not actively used. The Waiongana weir affects the natural course of the river and may have cultural impacts on the environment.	Restoring the natural environment.	Decommissioning of the Waitara Industrial Supply System including the Waiongana weir.

NPDC, like many organisations, is working to reduce carbon emissions in recognition of the requirements of the Paris Agreement to minimise the increase in global average temperature and address climate change. The New Zealand Government signed this agreement and NPDC as a territorial authority of New Zealand are bound to meet these requirements.

Council has made a commitment to reducing the district's overall contribution to greenhouse gas emissions and has prepared a District-wide Emissions Reduction Plan that outlines the current state, identifies how reducing emissions could impact climate change, what NPDC's role in emissions reduction is, and specific actions that will be taken as we work towards meeting the national targets as indicated in Aotearoa New Zealand's first emissions reduction plan.

4.7 Climate Change Adaptation

Climate change is anticipated to result in a number of impacts, such as greater extremes of temperature and weather, more frequent severe weather events, and elevated sea-levels. These impacts are likely to have direct consequences on Council assets, the services they provide, and the communities that depend on those services.

Council has identified the potential impact of climate change on its water supply assets and the actions that will be taken to manage these issues is indicated in Table 4.7.1 below.

Table 4.7.1 Managing the Impacts of Climate Change on our Assets and Services

Climate Change Description	Projected Change	Potential Impact on Assets and Services	Management
Severe weather events	Increase in rainfall quantity and duration, increase in strong wind events.	The damage depends on whether this is ponded or flowing water (e.g. rivers). One of the main impacts on water supply is floodwaters potentially scouring bridges which support attached pipes.	After Cyclone Gita, NPDC conducted an initial screening assessment of 67 pipe bridges identified throughout the region. Apart from the pipe bridges identified as part of the NPDC assessment, an additional eight pipe bridges were identified and assessed as part of this project. A better understanding of the water pipe bridges condition needs to be performed in the future including, site inspections, freeboard allowance, and overall construction (among others). Flood maps for higher intensity rainfalls need to be performed to understand the

Climate Change Description	Projected Change	Potential Impact on Assets and Services	Management
			impacts (currently just 100-year return period flood maps are mapped).
Increased temperature	Climate change is predicted to make Taranaki's summers drier. This may mean more extreme events, such as longer or frequent droughts.	Reduce water availability and adversely affect the ability of the existing water supply to meet current and future demands. Increase the frequency of contamination of sources due to drought is from algae bloom, with cyanobacteria bloom being of particular concern.	In 2021 NPDC committed to several water conservation initiatives. A supplementary water source for the New Plymouth system is being considered as a safeguard to ecosystem, with emphases in surface water.
Community environmental expectations	Community expectations are changing in key areas such as ecological and environmental impacts.	More sustainable and resilient infrastructure will be required. Upgrading existing systems, reducing energy consumption, investing in renewable energy, and implementing efficient water management practices will be necessary. Greater emphasis is being placed on environmental sustainability by ordinary citizens, and this is reflected in progressively more stringent regulatory protections for water over time.	Water conservation programme in place to reduce per capita water consumption. A supplementary water source for the New Plymouth System is being considered as a safeguard to ecosystem, with emphases in surface water. Carbon reduction options are being considered in the projects options assessment. Council plans to implement an infrastructure decarbonisation programme to design, build and manage future NPDC assets according to low carbon principles.
Elevated sea-level	Rising sea levels are expected, with a potential increase in coastal flooding and erosion hazards.	Some pipe bridges have been identified as part of the resilience assessment that would likely be impacted by coastal flooding. Of these, the Waitara Pipe bridge and the Onaero bridge are the only critical assets within the potentially impacted assets.	A Hazards and Criticality assessment has been performed to understand the potential impacted assets (refer to section 6.1). The Waitara Resilience Main Phase 3 project is proposed to finish the trunk main through SH3 and will contribute to improved resilience of the eastern-northern areas of the district.

The resilience assessment described in section 6.3 has considered the hazards and the criticality of assets when exposed to those hazards. Climate change was considered indirectly when assessing the different hazards such as flood, drought, coastal flooding, costal erosion, etc. The expected impacts of climate change - including higher intensity storms (both wind speeds and rainfall), increased drought and sea level rise (affecting coastal hazards) - were included as part of the assessment.

Lifecycle Management Plan

The lifecycle management plan section details how Council plans to manage and operate its assets to meet the agreed levels of service (refer to Section 3) while managing lifecycle costs.

5.1 Background data

5.1.1 Asset data and information

Asset data is collected and managed by Council within several key systems including:

- TechOne Enterprise Asset Management system (TechOne/EAM) – manages financial information, customer information and requests, asset registers and history, work order management and maintenance scheduling. It is linked with the TechOne Enterprise Content Management (ECM) system which manages records.
- ArcGIS – manages spatial records (GIS).
- RedEye – manages all drawings including concept, working and as-built drawings.
- SharePoint – supports the sharing of working and in-draft documentation, the collection of data into lists and the sharing of information and processes to internal parties via 'wiki' pages. Resource consents are stored in SharePoint and the system identifies and retrieves consent conditions and provides quality assurance.
- Water Outlook - for gathering and managing the Supervisory Control and Data Acquisition (SCADA) system and processing data.
- Water Online - for reporting compliance data to the Ministry of Health.
- Infoworks - for pipe network modelling.
- P3M - Council's Portfolio, Programme and Project Management (P3M) framework is used to identify the need of new water supply assets and to manage the operational and capital expenditure projects.

The quality of Council's asset data is essential for supporting effective decision-making in relation to our maintenance, renewal and upgrade work programmes. Information such as asset condition, remaining useful life (RUL) and asset valuations are central to the discussions in this AMP.

Asset data is captured through a variety of processes including;

- when new assets are acquired (e.g. capital projects, community developments, operational renewals),
- when maintenance works are undertaken,
- when new valuations or condition assessments are completed, and
- when assets are disposed of.

Consistent and timely capture of data has been identified as an area for improvement – both externally with contractors and subcontractors at asset installation, completion and commission stages, as well as internally between teams – and will ensure that maintenance is undertaken appropriately and assets capitalised promptly within the system.

5.1.2 Asset hierarchy

An asset data hierarchy is a systematic and structured framework of business units, processes, systems and equipment into generic groups based upon organisational relationships and functions. The hierarchy allows Council to identify its assets and related components, as well as creating a clear and logical framework for asset management. A well-defined asset hierarchy is critical to Council's overall AMIS. The asset hierarchy includes the asset class and components used for asset planning and financial reporting, and service level hierarchy used for service planning and delivery. Data is continually updated with details from asset condition assessments and asset repairs, improvements and completion of other operational works.

Current data confidence levels are indicated in Table 7.5.2.

The organisation's asset hierarchy is currently a work in progress, as Council is undergoing a system migration to an updated online version of TechOne. The migration towards an updated version of TechOne is a multi-stage rollout, and will deliver improvements to our asset data such as:

- Recording of land assets within the asset management system for whole-of-life asset management and reporting.
- Implementing the review and alignment of our asset data schemas delivered by the AIR project. This will align the ADAPT asset register to relevant asset management standards as well as identifying the business processes that they support.
- Providing the organisation an opportunity to undertake a data cleanse of our asset data prior to the data migration, to improve overall asset data accuracy and asset data system integrity.

5.1.3 Scope

The assets covered by this AMP are listed in Table 5.1.3.

Table 5.1.3: Water supply assets

Asset category	Description	Amount + Unit	GCRC ($million)	Fair Value ($million)
Plant and Equipment (P&E)	Headworks and intakes	9	$7.7	$3.7
	WTP	4	$42.0	$18.8
	Pump Station	6	$0.8	$0.3
	Reservoir	21	$37.2	$23.0
Reticulation	Manholes	53	$0.3	$0.2
	Mains	818 km	$265.2	$121.2
	Pipe bridges	67	$0	$0
	Hydrants	3,711	$12.4	$6.4

Asset category	Description	Amount + Unit	GCRC ($million)	Fair Value ($million)
	Backflows	1,489	$1.5	$1.2
	Meters	202 km	$5.5	$3.3
	Valves	6,451	$10.8	$5.8
	Services	28,051	$34.6	$20.7
	Tobies	28,051	$0	$0
Resource Consents		30	$0	$0
Hydraulic Models		4	$0	$0
Total			**$ 418.1**	**$ 204.7**

Notes:

- Valuations of all the above assets were conducted in June 2022.
- A full asset valuation is undertaken every 3 years.
- The new reservoirs in Mountain Rd and Henwood Rd were not capitalized by June 2022, and are not included as part of the valuations.
- The resource consents and hydraulic models are recognised as assets under the Asset Accounting policy and should be capitalised. These assets have not yet been capitalised and undertaking this process is identified as an action in Section 8.2.
- The resource consents listed are the required ones to operate the four water supply systems (one for New Plymouth, four for Inglewood, two for Ōākura and one for Ōkato). Two consents associated to the Waitara Industrial Supply system were also included in the total number.
- The pipe bridges ("pipes") have been included as part of the mains. There is not a separate category/description for other related assets in the assets register.
- Tobies have not been included and capitalized in the asset management system, the estimated GCRC of these assets is $7.4M.
- The assets associated to the mothballed Waitara Industrial Supply System were included in the table. The system includes: 1 headworks and intake, 2 reservoirs, approximately 12 km of pipes and its associated assets and two consents. The GCRC associated with this system is approximately $4M.
- The asset records showed an additional GCRC of $1M of water supply assets without description to be categorized.

The assets described in this plan are primarily owned and maintained by NPDC. Council also provides support and assists in the management of assets wholly or partly owned by other parties including (but not limited to) those owned by Taranaki Regional Council, through joint ventures, via Council Controlled Organisations (CCO's), shared community assets, and assets owned by community groups that utilise Council facilities.

These assets are typically excluded from the full lifecycle planning process because, while Council has a vested interest, the organisation cannot dictate future actions to be taken in the management of these assets. Table 5.1.3 details the assets that are specifically being excluded from this lifecycle management plan section and the reason(s) why.

Table 5.1.3: Assets excluded from this plan

Asset	Details	Why excluded
Lake Mangamahoe Dams	Lake Mangamahoe is the source water for the New Plymouth System and is retained by two separate dams; Main Dam and Saddle Dam. These assets have been identified as Critical Assets in Section 6.1.	The Main and Saddle Dams and the lakebed at Lake Mangamahoe are owned, operated and maintained by Manawa Energy.
Waiwhakaiho Diversion Structure and Tunnel	Lake Mangamahoe is located downstream of the diversion structure and the tunnel from the Waiwhakaiho River. The structure provides the majority of the water to the lake (approximately 85%). This asset has been identified as Critical Assets in Section 6.1.	The diversion structure at the Waiwhakaiho River is owned, operated, and maintained by Manawa Energy.

5.1.4 Asset capacity and performance

Council aims to construct and maintain assets to meet design standards and specified performance requirements where these are available. However, there are insufficient resources to address all known deficiencies. Locations where deficiencies in service performance are known are detailed in Table 5.1.4.

Table 5.1.4: Known service performance deficiencies

Asset & Location	Service Deficiency	Management Plan
Central and Eastern Feeder – between Reservoir #1 at the NPWTP and the Waiwhakaiho River crossing.	The condition assessment performed shows the pipe still has 30 years of remaining life. During the calibration of the hydraulic model, the roughness along the Central and Eastern Feeder was increased considerably to match the field test pressures. Based on this there is an indication of potential blockages or issues that need to be further investigated.	Investigations to reassess the headlosses and potentially specific sections replacement (short term). Condition assessment to be repeated. Central Feeder renewal project (in the long term).
Eastern Feeder – between the Waiwhakaiho River Crossing and the Mountain Rd Reservoirs.	Water flows preferentially to the Henwood Rd reservoirs rather than Mountain Rd reservoirs as Henwood Rd is at a lower elevation. With the current feeder trunk capacity under peak demands the Mountain Rd reservoirs level drops when Henwood Rd reservoirs are being filled, and only recovers when the Henwood Rd reservoirs are full. This behaviour is indicative of a system with marginal capacity that requires active control to operate. Currently we are adjusting the valve to deliver balanced flow between both reservoirs, indicating a lack of a robust system that properly feeds Mountain Rd Reservoir. This problem will increase as population growth increases.	A supplementary water source for the New Plymouth system is being considered to avoid the duplication of 6km of the Central and Eastern Feeder due to current operational issues that will be exacerbated due to growth.
Pipe between the clearwell and Reservoirs 1 and 2 in the NPWTP.	There are hydraulic constrains in the treated water pipe and it is not able to deliver the WTP capacity flow.	Major upgrades to the NPWTP project prioritized.

Asset & Location	Service Deficiency	Management Plan
Sludge management at the NPWTP	High operational costs for removing and disposing of sludge from the sludge lagoons, in part due to groundwater ingress to the lagoons; there are also difficulties in securing a long-term disposal site.	The Water Master Planning project is looking for feasible solutions to this problem. Implementation under the long-term solution for disposal of NPWTP solids residuals project.
Sludge management at the Inglewood WTP	Inglewood WTP holding tank used for settling solids from clarifier sludge and filter backwash water is difficult and expensive to desludge. The tank has already reached end of life.	Inglewood WTP sludge management improvements project.
Clarifiers at the NPWTP	Several issues related to the operation and maintenance of the tube settlers: • tubes are brittle and easily damaged, so they are difficult to remove, realign and repair, • they impede visual inspection and maintenance of the sludge cones, • require a lot of cleaning and it is difficult to keep the tubes clean (particularly with safety concerns around access), • due for replacement within the next 5 years. Gravilectric desludging system in each clarifier needs replacing due to age and maintenance issues	Trials as part of the NPWTP improvements plan are being considered. NPWTP sludge cone Gravilectric weigh cell replacement project.
Settled water channel / filter inlet channel at the NPWTP	Lime solids deposition occurs in the filter inlet channels and access for cleaning is difficult (beneath walkway). Also, maintaining the individual filter inlet valves is difficult due to the lack of upstream isolation.	A project is underway to investigate the installation of stoplogs in the filter inlet channels.
Clearwater tank at the NPWTP	Lime solids deposition in the tank and it is difficult to access for cleaning/maintenance. Lime solids deposition in the filtered water channel has in the past affected flow control for the WTP.	Major upgrades to the NPWTP project prioritized.
Administration building and chemical storage building at the NPWTP	Various issues with working in this building: • the working environment does not meet NPDC best practice standards, • the staff welfare facilities require renewal, • administration area is cold due to clearwater tank underneath, • inadequate space and suboptimal layout for laboratory, control room, and SCADA/Historian equipment, • poor visibility of visitors at main access gate, • MCC Room – emergency exits do not meet requirements of AS/NZS 3000, and room cooling/ventilation may be inadequate, and • Chemical Delivery Area – is adjacent to the staff/visitor carpark and main building entrance which poses risks to staff, visitors and vehicles.	Major upgrades to the NPWTP project prioritized.
Waitara industrial raw water supply system (from the	The system was originally built by the Waitara Borough to support the meatworks in Waitara township and for more than 15 years has no active users and has no expected future users.	Decommissioning of the Waitara Industrial Supply System

Asset & Location	Service Deficiency	Management Plan
Waiongana River to Waitara town).	The system includes a weir, intake structure, settling ponds, two open reservoirs, approximately 12km of reticulation assets and two consents. NPDC is responsible for the maintenance of the system.	
River intake falling main at Lake Mangamahoe	Sediment buildup has been identified in the pipe, reducing its capacity to convey water to the NPWTP.	NPWTP Lake Mangamahoe Rive Intake Fish Screens

The above service deficiencies were identified from the Water Master Planning project (refer to Section 2.3).

5.1.5 Asset condition

Asset condition is monitored and recorded on the asset register using a rating system, as detailed in Table 5.1.5.

Table 5.1.5: Condition rating system

Condition rating	Description of condition	As a percentage of useful life (water mains)
1	Excellent - free of defects, only planned and/or routine maintenance required	Excellent - 0%
2	Good - minor defects, increasing maintenance required plus planned maintenance	Good - 50%
3	Average - defects requiring regular and/or significant maintenance to reinstate service	Average - 75%
4	Poor - significant defects, higher order cost intervention likely	Poor - 90%
5	Very poor - physically unsound and/or beyond rehabilitation, immediate action required	Very poor - 100%
6 (or 0)	Unknown, not currently assessed or non-existent	-

Across Council asset portfolios, several issues have been identified with the current approach to asset condition assessment being undertaken at present. These include;

- an inability to easily record the date on which the assessment was undertaken and consequently a lack of awareness of data currency,
- condition assessment data that has not been entered into the asset register but remains in separate hardcopy or other electronic documents, and
- inconsistencies in rating approach (including basing the rating on asset age rather than a physical assessment).

Addressing the above issues and filling gaps in the historical data are actions identified within the Asset Management Strategy improvement plan for all asset groups.

For water mains assets, the condition grades are based on remaining useful life and as such are not considered to be an accurate representation of actual condition. However, it is the best available information to infer the potential condition of an asset when there is no inspection programme in place.

Water pipes condition assessment has been based mostly on breakage and maintenance history as an analogue for condition, along with some AC pipe sampling. To select the candidates for condition inspection, we utilize an age-based renewal selection analysis, or we request the advice from the Operations Team for any specific risk areas. Other specific condition assessments (i.e. P-Cat™ and ePulse®) are implemented on demand when specific assessments or identification of issues triggers the need.

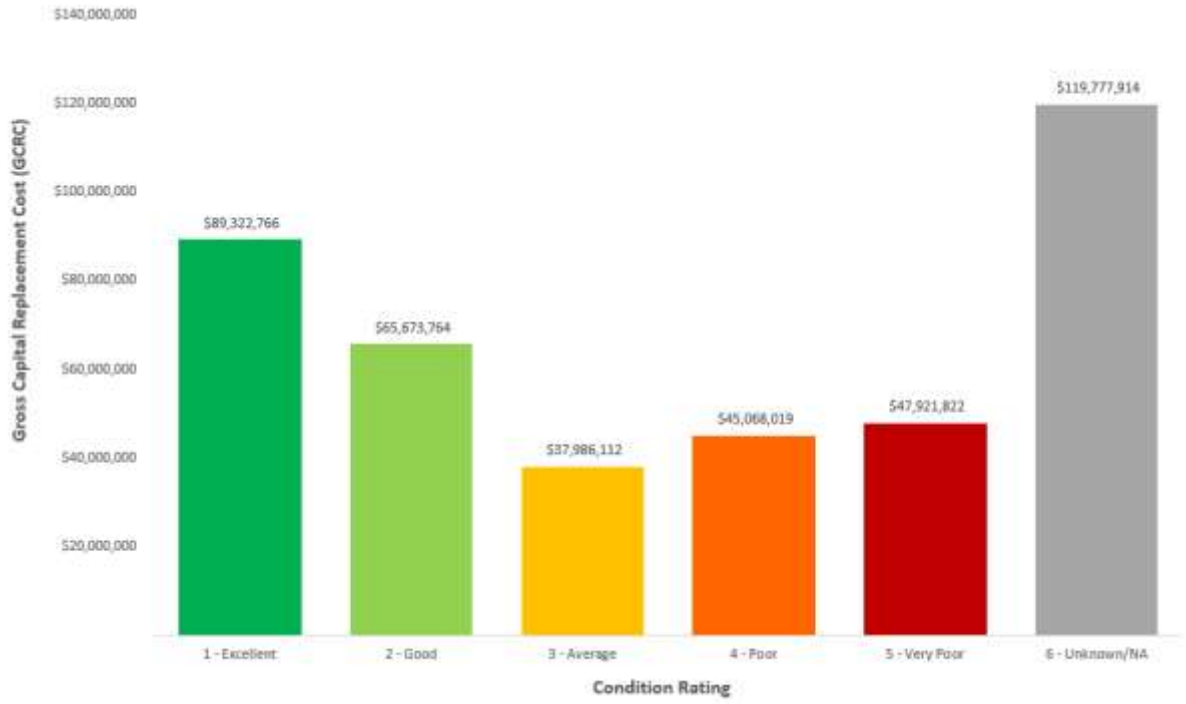
For water supply P&E assets, there is no formalised condition assessment programme in place.

The following improvements have been identified for the water supply assets:

- Creation of an asset condition assessment programme for reticulation assets based on the piloted P-Cat™ and ePulse® trials where we obtained good results.
- Improvement of asset data capture processes for maintenance and repair activities to better inform the condition assessment and renewal programme for the reticulation assets.
- Creation of a condition assessment programme for the P&E assets (treatment plants, pump stations and reservoirs).

The condition profile of the Water Supply activity assets is shown in Figure 5.1.5.1.

Figure 5.1.5.1: Asset condition profile (based on the remaining useful life)

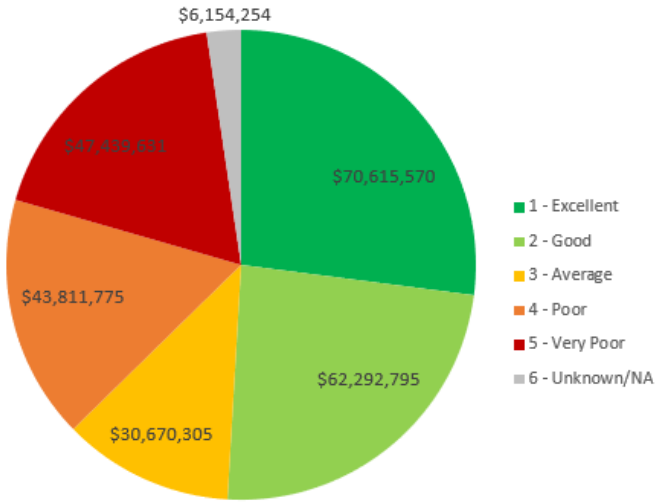


All figure values are shown in current day dollars. Graph current as of 18 January 2024

The unknown condition profile is mostly represented by “non-water mains” assets as most of these assets have no condition assessment and represent almost 85% of the GCRC of this Unknown Category. The P&E assets with a condition grade between 1 and 5 represent around 12% of the GCRC of this group.

The condition profile of the Water Supply activity’s pipe assets is shown in Figure 5.1.5.1.

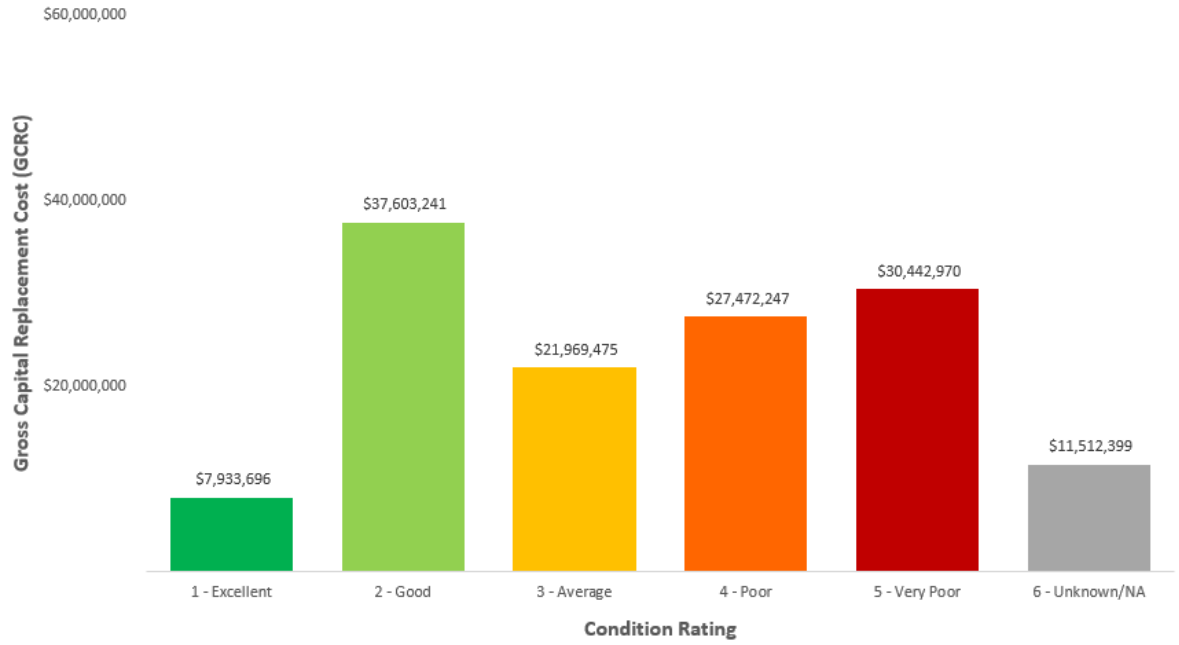
Figure 5.1.5.2: Pipes asset condition profile (% based on GCRC)



For the pipes (mains) assets, 250km of mains (30% of the total length) are in poor (or very poor) condition; this represents more than 35% of the GCRC for this group of assets. Typically, renewal dependent assets are renewed at the same time as base assets (i.e. trunk or distribution mains), not individually based on the asset’s age. Any resulting course of action can subsequently be applied for all the linked underground assets.

The criticality scores for water supply reticulation mains are assessed using the process and scoring system detailed in the Water, Wastewater and Stormwater Mains Criticality and Renewals Prioritisation Process (ECM# 988741). These scores are converted into criticality ratings that are not related to the critical assets identified in Section 6.1. The condition profile of water supply assets identified with a critical or important criticality ranking in the asset management systems is shown in Figure 5.1.5.3.

Figure 5.1.5.3: Condition profile of the assets assessed with critical or important criticality ranking



All figure values are shown in current day dollars. Graph current as of 18 January 2024

5.2 Operations and Maintenance Plan

Operations activities are the regular activities required to provide the service. Examples of typical operational activities include monitoring inputs and outputs, cleaning, security, insurance, inspection and utility costs.

Maintenance activities are the regular actions necessary to keep the asset as near as practicable to an appropriate service condition and to keep assets operating. These types of activities may be proactive/ scheduled, reactive/unscheduled, or even completed in emergency situations. Examples include the servicing of equipment, minor repairs, pot-hole patching, pipe leak repair, modelling updates, etc.

The maintenance budget is considered to be insufficient to meet planned service levels. This budget includes an allocation for both preventive and reactive maintenance. Assessment and prioritisation of reactive maintenance is undertaken by operations team members using experience and best judgement. For shared assets such as buildings, maintenance is undertaken according to the specifications in the relevant Service Level Agreements (SLA's).

There is currently no Maintenance Management Plan detailing how water supply assets are identified, recorded, measured, analysed, and optimised/improved in terms of maintenance activity and performance. Creating a plan will result in less reactive maintenance and will reduce the associated higher levels of risk and costs.

The management plan should also consider:

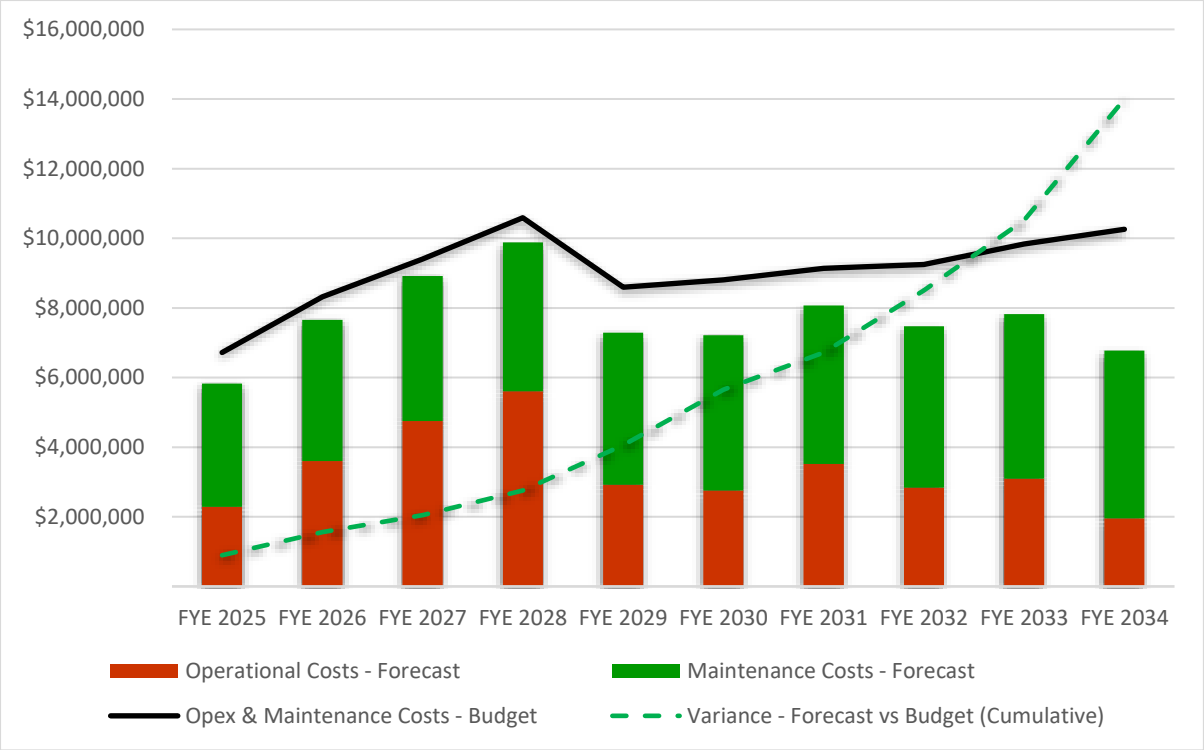
- Updating the asset inventory of P&E assets needs to reflect the physical assets,
- Assigning a maintenance schedule for mechanical assets,

- Identifying a common platform to record the maintenance tasks, and
- Identifying the P&E assets that are not tagged with a P&ID reference number.

5.2.1 Summary of forecast operations and maintenance costs

Forecast operations and maintenance costs are expected to vary in relation to the total value of the asset portfolio. As additional assets are acquired, the future operations and maintenance costs are forecast to increase. Where assets are disposed of, the forecast operations and maintenance costs are expected to decrease. Figure 5.2.1 shows the forecasted operations and maintenance costs relative to the proposed operations and maintenance budget.

Figure 5.2.1 Operations and maintenance summary



All values are inflation-adjusted. The forecast values only consider the projects included in the first budget submission of the LTP and exclude the projects that have been removed from the budget request before the submission. Section 6.4 makes reference to some of these projects and budgets.

The initial general operation and maintenance budget request was made under the direction of previous legislation that Three Waters could only be included for only the first 2 years of the LTP. As such, maintenance and general operation budgets were based on an extrapolation from historical spend amounts and were not subject to a full forecasting process.

On advice from AuditNZ that Council should include a full ten-year forecast for Three Waters, the general operation and maintenance budgets have been subject to a full forecast exercise. Most of the variance in the figure above is due to the increase between the initial forecast and the received budget. The maintenance budget matches this updated forecast for the ten year period, so there is no deferred maintenance for the next LTP.

Almost 60% of the operational costs budget is consequential or seed funding opex budget associated with capital projects (portion of the projects that cannot be capitalized, i.e. initial investigations or concept design), the Lake Mangamahoe Safety Upgrades Project (assets are owned by Manawa Energy - Refer to Section 5.1.3), or decommissioning projects as the Waitara Industrial Supply (asset disposal).

65% of the variance in the consequential or seed funding opex budget is related to the WCP. The remaining 35% of the variance is mainly related to the projects that have not been included as part of the ten-year LTP period (Refer to section 6.4 for details of the projects not included).

The increase in the trend of the consequential and seed funding opex budget until 2028 is related to the groundwater field investigations associated with the Supplementary Water Source project and the Lake Mangamahoe Safety Upgrades Project. The Waitara Industrial Supply Decommission Programme of works is scheduled to happen between 2028 and 2034.

5.3 Renewal Plan

Renewal works are those activities that restore, rehabilitate, replace or renew existing assets back to the original or 'as new' standard. This work does not significantly alter the original service provided; any work that goes over and above renewal work is considered to be an acquisition (see Section 5.4).

Assets that require renewal are determined through:

- Asset condition assessments that return assessments of 'poor' or 'very poor',
- RUL information and values captured in the asset register,
- Staff judgement on the remaining life of the asset based on asset condition, maintenance expense, or average renewal requirements for network assets (for example buried pipes or road renewals).

Renewals may be initiated for an asset prior to scheduled end-of-life dates if other works are planned to occur in the same area and efficiencies may be gained by undertaking scheduled renewal works at the same time. This approach may also be applied when Council assets are impacted by other organisations. For example, if a road is being trenched to work on power or phone lines, Council may decide to renew the nearby water, wastewater or stormwater pipes before the road surface is re-sealed. This approach will minimise overall disruption and rework and could ultimately provide financial cost efficiencies for Council and ratepayers.

5.3.1 Asset age and useful life

The total useful lives of the assets in this AMP are shown in table 5.3.1. Asset useful lives were last reviewed in June 2022 as part of Council's scheduled asset valuation process.

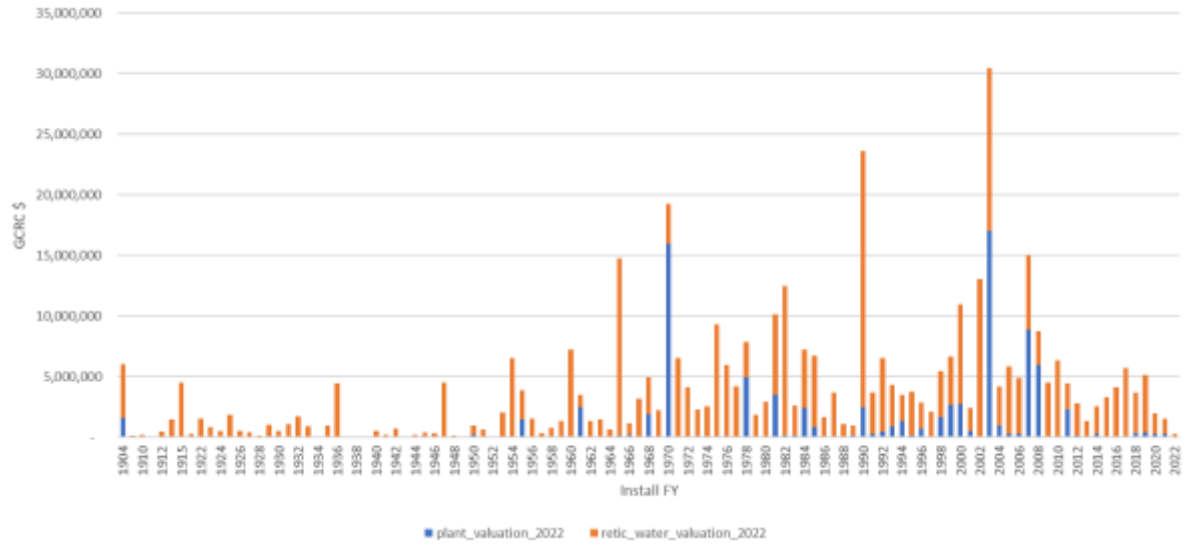
Table 5.3.1: Total useful lives of assets (years)

Asset category	Description	Asset Type	Total useful life
Plant and Equipment (P&E)	Headworks and intakes	Civil	30-100
		Mechanical, Electrical and instrumentation	15-60
	WTP	Civil	20-100
		Mechanical, Electrical and instrumentation	5-100
	Pump Station	Mechanical, Electrical and instrumentation	15-50
	Reservoir	Civil	20-100
		Mechanical, Electrical and instrumentation	10-100
Reticulation	Manholes		100
	Mains	Asbestos Cement	50
		Cast Iron	110
		Concrete	60
		Flexible	100
		Steel	50-100
		Others	90-120
	Pipe bridges		TBC
	Hydrants		90
	Backflows		20
	Meters		20
	Valves		40-80
	Services		(same as pipes)
	Tobies		75
Resource Consents			10-35
Hydraulic Models			10

Source: NPDC 2022 Valuation of 3 Waters Network Assets (2022, WSP).

The age profile of the assets included in this plan are shown in Figure 5.3.1.1.

Figure 5.3.1.1: Asset age profile (Financial Year installed)

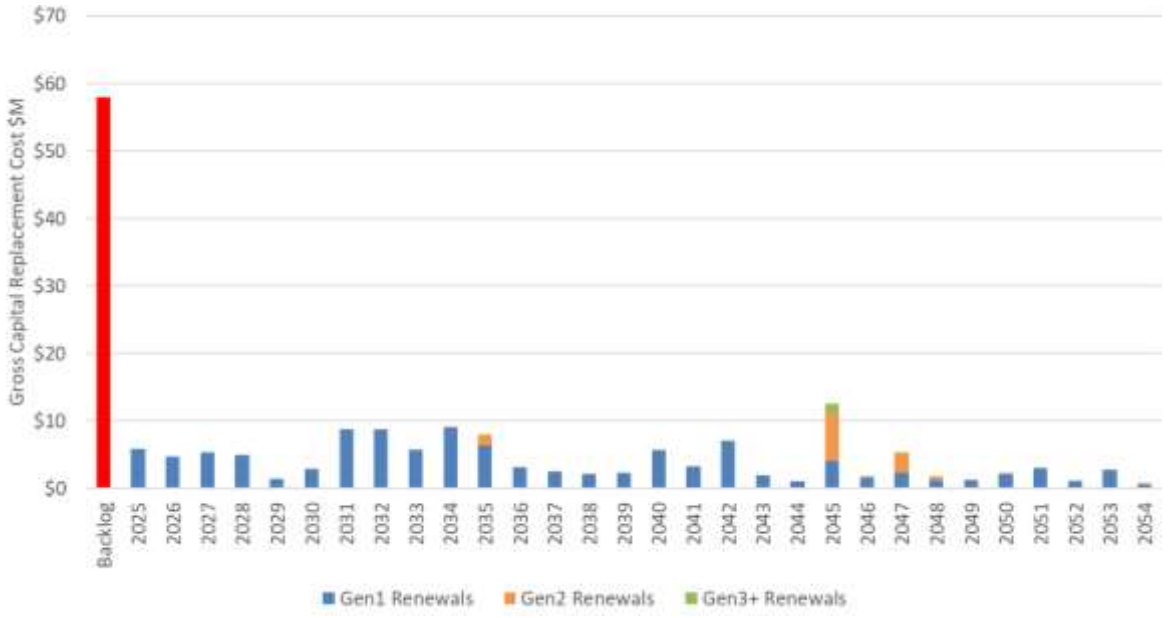


All figure values are shown in current day dollars.

Figure 5.3.1.2 provides a 30-year forecast of the future renewal requirements based on RUL. This information is often used to guide long-term planning (i.e. 10-30 years) but is less frequently used to guide short to medium-term planning (i.e. 1-10yrs), as Council's data does not consistently consider factors such as condition assessment within the recorded RUL figures.

Figure 5.3.1.2 shows in red the assets overdue for renewal (backlog), being $44M of reticulation assets and $9.6M P&E assets. The reticulation backlog is mainly represented by the Asbestos Cement pipes that are due for renewal ($33M). There are approximately $4.2M assets in the asset management system without an expected life, therefore a default date of 1904 was used, and these are included as backlog.

Figure 5.3.1.2: Asset renewal forecast by RUL



All figure values are shown in current day dollars.

The renewal backlog of $58M - in addition to the $57M that is needed during this ten year period - is $19M greater than the $96M of budget requested as part of the AMPs timeframe (refer to section 5.3.2). An amount of $92M has been initially approved for renewals within the current LTP. The backlog is expected to decrease after the ten year period, however this will be dependent on the improvements of the condition assessment programme. It also needs to be considered that the reticulation renewal programme includes the renewal of the associated assets when renewing a pipe (i.e. manholes, service connections, hydrants, and valves) that may not have reached their useful life but are either impossible or not cost effective to renew separately.

The renewal forecast in this AMP is primarily based on asset criticality, age, condition (where available) and staff judgement. Strengthening the overall quality of data within the asset management information systems is a planned future improvement.

5.3.2 Renewal ranking criteria

Asset renewal is typically undertaken to either:

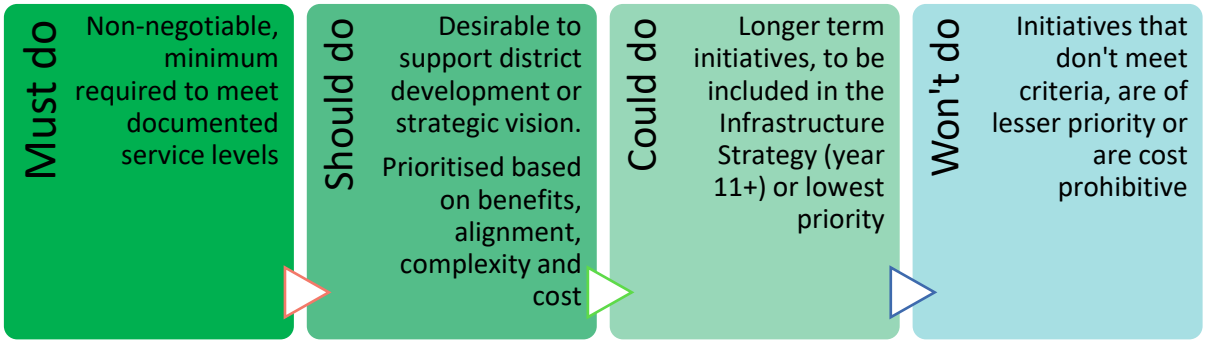
- ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate (e.g. replacing a bridge that has a 5 tonne load limit), or
- to ensure the infrastructure is of sufficient quality to meet the service requirements (e.g. condition of a playground)

It is possible to prioritise renewals by identifying assets or asset groups that:

- have a high consequence of failure
- have high use and subsequent impact on users would be significant
- have higher than expected operational or maintenance costs, or

- have potential to reduce lifecycle costs by replacement of a modern equivalent asset that can provide the equivalent service at a reduced cost

Council prioritises renewals as part of the project prioritisation process, occurring as part of Council's legislatively required LTP process. The initial assessment stage of the project prioritisation process is most crucial for renewals, and divides projects into four categories.



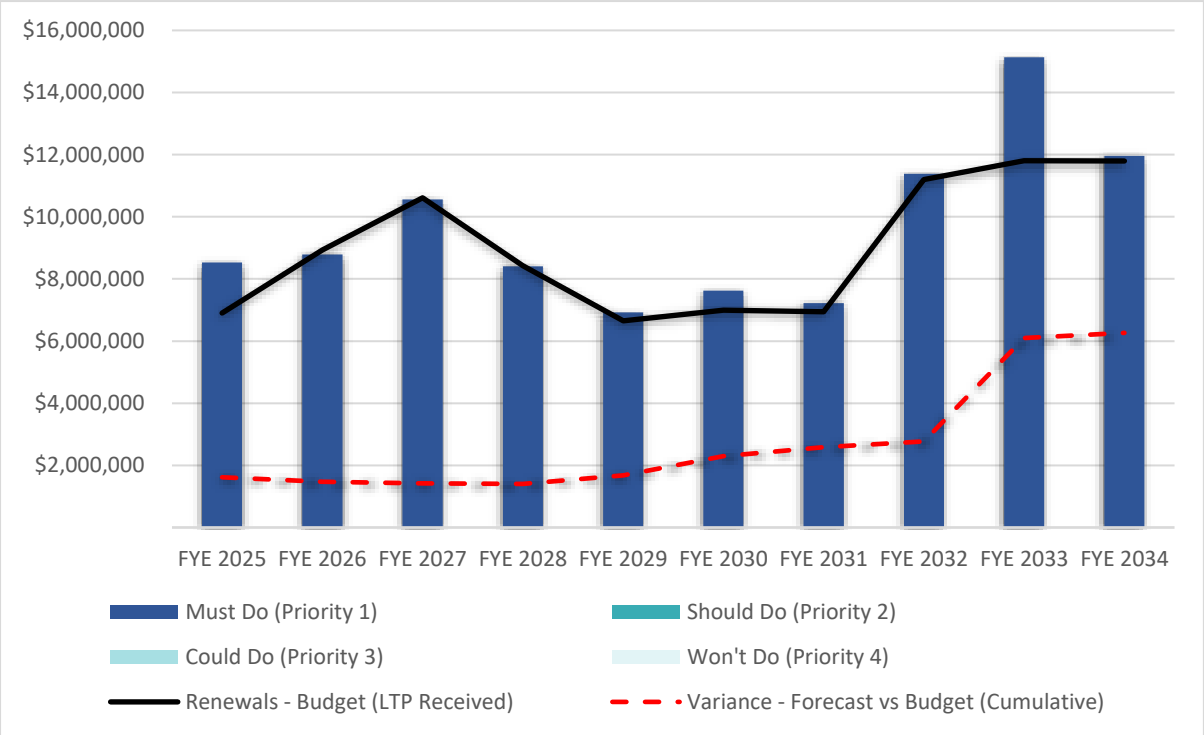
The 'Must do' category includes all critical renewals (including the mitigation of risks ranked medium and above, Appendix 3) and the standard renewal budgets for small recurring renewals (these are primarily miscellaneous budgets of <$100K/year).

Non-critical asset renewals are captured in the 'Should do' category and undergo prioritisation as described in section 5.4.1. (Note: Critical assets are detailed in Section 6.1).

5.3.3 Summary of future renewal costs

Forecast renewal costs are projected to increase over time if the asset stock increases. The forecast costs associated with renewals are shown relative to the proposed renewal budget in Figure 5.3.3.

Figure 5.3.3: Forecast renewal summary



All figure values are inflation-adjusted. The forecast values only consider the projects included in the first budget submission of the LTP and excludes the projects that have been removed from the budget request before the submission. Section 6.4 refers to some of these projects and budgets.

All the water supply renewals projects were categorised as 'Must Do' in the LTP process.

The bulk of the requested renewals funding has been provided, however will not be sufficient to fully cover the backlog (Refer to Section 5.3.1). The requested budget for the Water Reticulation Renewals Project (programme to deliver reticulation renewals) has been reduced to meet deliverability and resources constrains.

There are projects with a renewal component (i.e. Bell Block water supply network upgrades, Veale Rd PRV replacement, or the Veale Road pump station upgrade) that have not been included in the ten-year LTP period, and then are the main reason for the variance seen in Figure 5.3.3.

5.4 Acquisition Plan

Asset acquisitions include the following types of projects:

- projects that create assets that did not previously exist,
- works which will upgrade or improve an existing asset beyond its current capacity, and
- assets that have been donated to Council.

The drivers for undertaking acquisition projects or acquiring new assets can be due to level of service changes, growth, or a combination of each. Renewal works may also be combined with acquisition projects where there is a desire to change service levels or respond to growth.

5.4.1 Selection criteria

Proposed acquisitions of new assets, and upgrading of existing assets, are identified from various sources such as community requests, proposals identified by strategic plans or partnerships with others.

Council has a documented project prioritisation framework that provides a transparent and structured approach to reviewing and prioritising projects for inclusion in our LTP. The same process and prioritisation criteria are used for both acquisition and renewal projects.

Proposed upgrade and new work analysis also include the development of a lifecycle costs estimate to ensure that the services are sustainable over the longer term. This is captured within the Detailed Business Case which is prepared for all except the simplest projects.

The priority ranking criteria and weighting is detailed in Table 5.4.1.

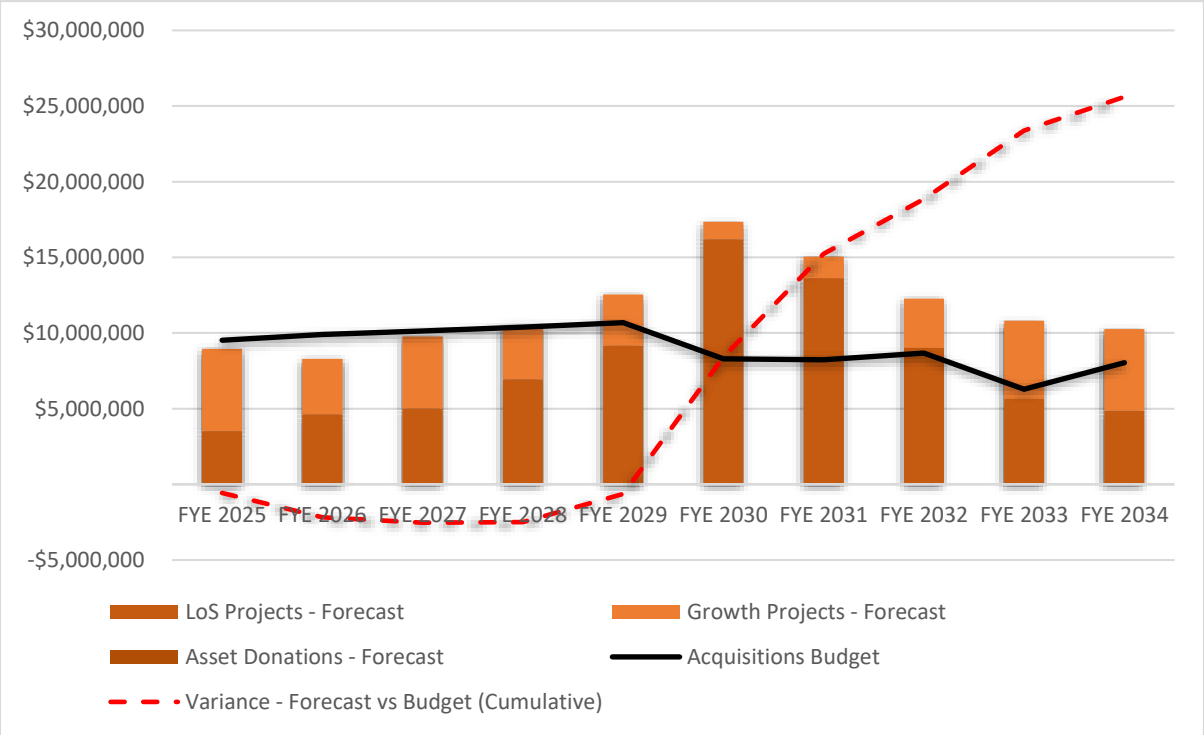
Table 5.4.1: Project prioritisation criteria & weighting

Criteria	Weighting
Strategic alignment	35%
Benefits	20%
Level of Service	15%
Risk Mitigation	15%
Ease of execution	15%
Total	**100%**

5.4.2 Summary of future acquisition costs

Forecast acquisition asset costs are summarised in Figure 5.4.2.1 and shown relative to the proposed acquisition budget.

Figure 5.4.2.1: Acquisition summary



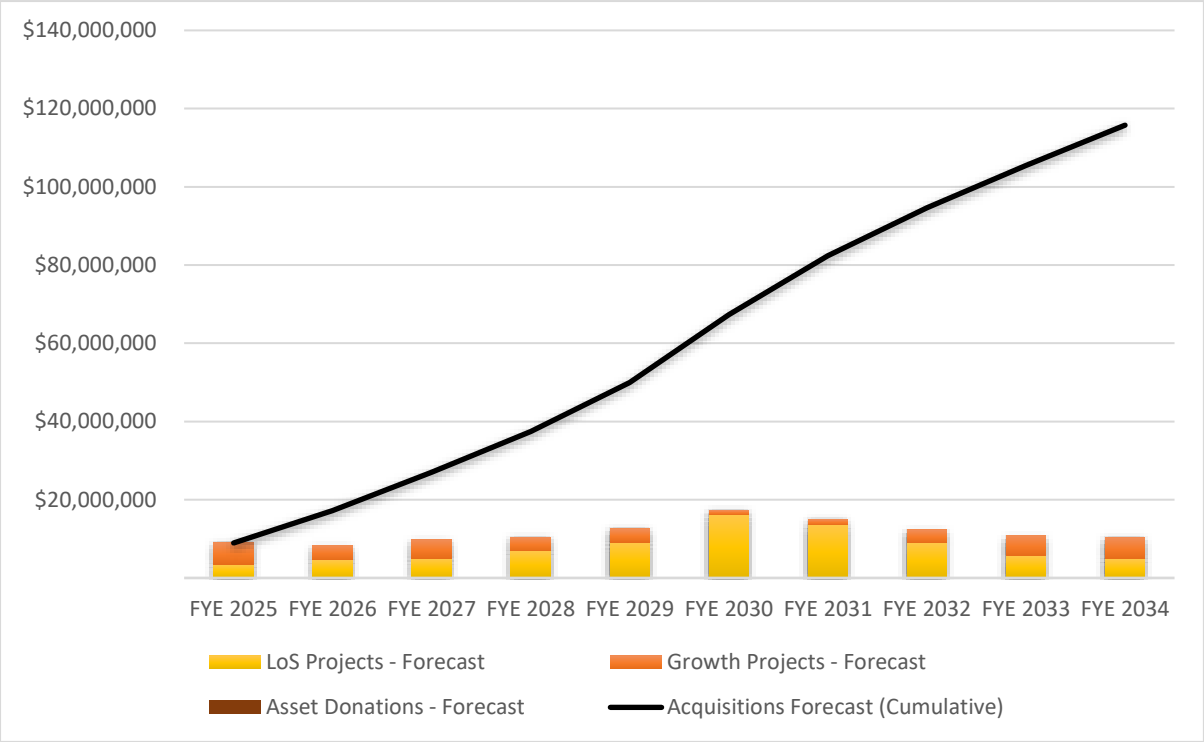
All figure values are inflation-adjusted. The forecast values only consider the projects included in the first budget submission of the LTP and excludes the projects that have been removed from the budget request before the submission. Section 6.4 refers to some of these projects and budgets.

During the first three years of the LTP the requested acquisition budget is meeting the received budget. The exclusion of the firefighting reticulation improvements programme (requested to start in FYE 2028) has a strong impact on the variance. The other projects with significant impact on the variance are Bell Block water supply network upgrades, Water Resilience - Reservoirs Inlets-Outlets, and NPWTP filter upgrade (seismic and media) among others (Refer to section 6.4.1 for the projects that have been requested and not considered for the ten-year AMP period).

For all new assets there are corresponding future operations, maintenance and renewal costs that must be accounted for within the LTP. Future depreciation must also be considered when reviewing long-term sustainability. This is one activity within the LTP process that Council needs to improve upon, as clarity on the lifecycle costs of future acquisitions will ensure that these costs are factored appropriately into Council's lifecycle budgeting.

The cumulative value of all acquisition work, including both constructed and contributed assets, is shown in Figure 5.4.2.2.

Figure 5.4.2.2: Cumulative asset acquisition



All figure values are inflation-adjusted. The forecast values only consider the projects included in the first budget submission of the LTP and excludes the projects that have been removed from the budget request before the submission. Section 6.4 refers to some of these projects and budgets.

Expenditure on new assets and services in the capital works programme will be accommodated in the LTP, but only to the extent that there is available funding.

Historically, water assets are vested to Council (donated) by developers at the completion of their subdivisions, at which time council takes over the operation and maintenance of these assets. We have used historical values of assets vested to estimate future values.

5.5 Disposal Plan

Disposals includes any activities associated with the disposal of a decommissioned asset. This includes the sale, demolition, or the relocation of the asset.

Assets identified for possible decommissioning and disposal are shown in Table 5.5. A summary of the disposal costs and estimated reductions in annual operations and maintenance of disposing of the assets are also outlined in Table 5.5. Any costs or revenue gained from asset disposals is included in the long-term financial plan.

Table 5.5: Assets identified for disposal

Asset or System	Reason for Disposal	Timing	Disposal Costs	Operations & Maintenance Annual Savings
Waitara Industrial Supply System	The system is mothballed and there are no active users of this system. Indications are that much of it is in poor condition and would require significant investment to recommission. There are health, safety and environmental risks associated with retaining the system.	2028-2034	$5.3M (inflated)	Actual values of $11k annually plus $100k to renew resource consents.

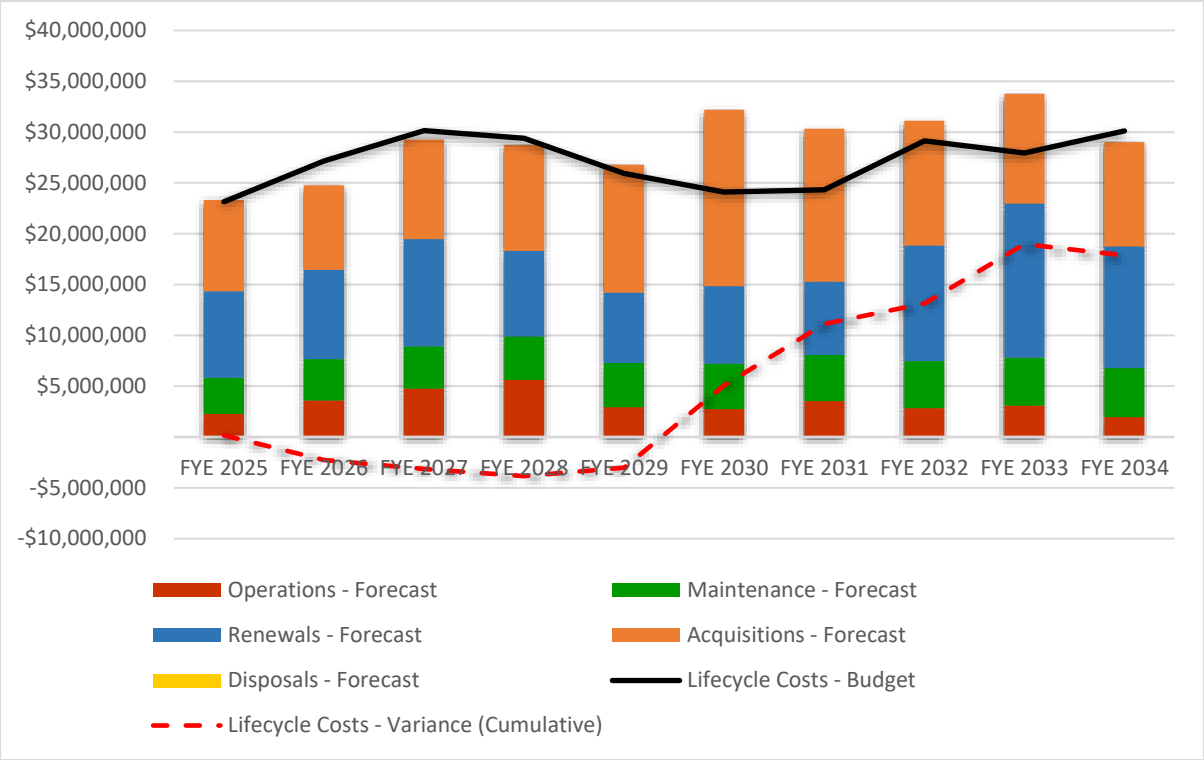
Note: The Waitara Industrial Supply Decommissioning Programme has been included as part of the consequential and seed funding opex (Section 5.2) as it can't be capitalized.

5.6 Summary of forecast costs

The financial projections from this AMP are shown in Figure 5.6.1. These projections include forecast costs for acquisition, operation, maintenance, renewal, and disposal. These forecast costs are shown relative to the proposed budget.

The bars in the graph represent the forecast costs needed to optimise the lifecycle management of these assets and ensure alignment with community needs/expectations. The proposed budget line indicates the estimate of available funding. The gap between the forecast work and the proposed budget is the basis of the discussion on achieving balance between costs, levels of service and risk to achieve the best value outcome.

Figure 5.6.1: Lifecycle Summary



All figure values are inflation-adjusted. The forecast values only consider the projects included in the first budget submission of the LTP and excludes the projects that have been removed from the budget request before the submission. Section 6.4 refers to some of these projects and budgets. The Waitara Industrial Supply Decommissioning Programme (disposal) has been included as part of the consequential and seed funding opex (Operations) as it can't be capitalized.

Reviewing the lifecycle summary costs for NPDC for the timeframe of this AMP, the organisation's budgets are in reasonable shape for the forecasted costs. However, there exist clear financial gaps between the funds Council has available versus what Council needs to spend to meet the future demands of district residents.

Almost 60% of the operational costs budget is consequential or seed funding opex budget associated with capital projects (the portion of the projects that cannot be capitalized, i.e. initial investigations or concept design), the Lake Mangamahoe Safety Upgrades Project (assets are owned by Manawa Energy - Refer to Section 5.1.3), or decommissioning projects as the Waitara Industrial Supply (asset disposal).

The high prevalence of renewal costs stems from a historical lack of renewals (backlog). The bulk of the requested renewals funding has been provided, however will not be sufficient to fully cover the backlog.

The main projects that will enable growth account for $37M in the ten year period and have been included as part of the acquisition budget (Smart Road development project and the Supplementary Source WTP and conveyance system were delayed before the first ELT/TRU budget submission, thus are not represented in the acquisition forecast). Increased acquisition costs indicate a growing

amount of work will be required to meet both the current and future growth demands of a district with a population that is only predicted to increase throughout the next decade.

The variance is due to the exclusion of projects in the ten year period of the LTP such as the firefighting reticulation improvements programme, the resilience improvements identified after ex-cyclone Gita, Bell Block water supply network upgrades, the water conservation programme, NPWTP filter upgrade (seismic and media) and Veale Road pump-station upgrade, apart from other smaller projects (refer to Section 6.4.1).

Risk Management Planning

The purpose of risk management planning is to identify and address potential risks and opportunities associated with Council's infrastructure assets. This section defines those assets which are critical to operations and the potential results of failure. The significant (High or Extreme) risks being managed include those risks outside of Council's risk appetite; and considers the resilience of these assets in the context of service delivery.

6.1 Critical Assets

Critical assets are defined as:

"Assets that are significant in providing essential services to our community, and which may also be important in emergency situations. These assets have high consequences of failure, and as such require a higher level of proactive maintenance and management."

Since 2021, we have been working on a resilience assessment of the potable water network. As part of this work we have performed a risk assessment of the water supply assets that included:

- understanding the nature, extent, affected assets and probability of different hazards or events the potable water network is exposed to,
- identifying customer needs and their current resilience to reduced levels of service of the water supply system (including focus on critical customers),
- undertaking a criticality assessment of the existing network components from source to end-user, to assist in identifying population-based asset consequence levels, and
- identifying the water supply assets with higher risk of loss of service.

The high-level risk of the individual assets was assessed throughout the district and based on what hazard level the asset is exposed to (i.e. probability), its vulnerability to failure and criticality (i.e. consequence). Assessments of this nature aren't able to predict damage, consequences or impacts with precision, but on the best available evidence, past experience and expert solicitation, are able to provide a strong basis for decision-making.

A specific risk assessment framework was customized to perform this work[7]. After implementing the customized framework, a risk score was assigned to each of the potable water and those assets classified as Extreme or High risk were identified as critical assets for the Water Supply activity. Nine assets were classified as an Extreme risk, all of them within the New Plymouth System. This includes the diversion structure, the two dams, the NPWTP, and five pipe bridges (three in the "Common Section" (i.e. Eastern and Central Feeder), one in the Eastern Feeder, and the Waitara Bridge).

[7] NPDC has a Corporate Risk Management Framework that focuses on the council's wide range of activities to deliver services and the many risks that are exposed on a daily and ongoing basis. The scale of the problem presented in NPDC's Risk Management Framework is different when compared to the resilience assessment, where most of the consequences will be assessed as catastrophic and all the hazards (related to natural events) will be assessed as unlikely. To allow for a different scale, a specific risk assessment framework was customized to perform the Resilience Assessment of the Potable Water Network works.

Twelve assets were also classified as at High risk, including Inglewood and Ōkato WTP's and their intakes. In the New Plymouth System, the water source and reservoirs at the WTP are included as well as the Eastern Feeder (including a pipe bridge), the Waitara trunk mains and the Onaero pipe bridge.

Table 6.1 describes those critical assets, as well as the mode by which the asset could fail, and the likely impact of that failure.

Table 6.1: Critical Assets

Critical Asset(s)	Key Failure Modes	Impact
Waiwhakaiho River Diversion Structure – Owned and operated by Manawa Energy	A preliminary assessment concluded the structure is at risk of extensive damage in seismic events. This structure is expected to be impacted by flowing lahars running through the Waiwhakaiho River. Lahars can cause the destruction of this asset (or bury it in place) due to the immense force and concentration of particles.	If we lose this asset, we lose the ability to convey water to Lake Mangamahoe, and then to the NPWTP. Potable water will not be able to be delivered to the New Plymouth system. Temporary arrangements to reinstate this asset after an event can take between 1 week and 1 month.
Lake Mangamahoe: Dams (Saddle Dam and Main Dam) – Owned and operated by Manawa Energy and source water	Issues around the seismic performance of both dams remain critical and both dams could fail during a large seismic event. Source water can be impacted by ashfall during a Volcanic Eruption (increased turbidity). There is a risk of algal bloom, with cyanobacteria bloom being of particular concern, during extensive low flow periods (drought) in Lake Mangamahoe.	We do not have the ability to bypass Lake Mangamahoe to convey water to the WTP as we are not able to use only the River Intake - this intake alone cannot deliver the minimum flow required to operate the WTP. If we lose Lake Mangamahoe due to an earthquake (dam failure), we lose the ability to store water in the lake and convey it to the NPWTP. Full reinstatement of the dam after a seismic event can take between 1 week and 1 month. Water quality issues in source water restrict our ability to treat water and to produce potable water. In this case, the duration of the impact will depend on the duration of the event.
New Plymouth Water Treatment Plant and Reservoirs	The administration building and chemical storage building are earthquake prone (NBS <33%). The clearwater tank (disinfection system) is in an earthquake risk building (45% NBS). The reservoirs have been strengthened (2002 standards); however, the service could be compromised during a large earthquake event due to the lack of isolation pipes and valves. This WTP has processes with open structures (Clarifiers and filters) that can be severely impacted due to ash fall deposition.	Potable water will not be able to be delivered or will be compromised to the New Plymouth system during a large earthquake. It will take between 1 month and 3 months to reinstate a temporary full production disinfection system, meanwhile "boil water" notice should be in place. If ashfall deposition exceeds the treatment capacity, it will compromise the ability to deliver potable water. Losing the reservoirs will impact our ability to provide firefighting pressures to certain areas.
Pipe bridges in the Central Feeder "Common Section" and in the Eastern Feeder (upstream Waiwhakaiho River)	These pipe bridges could be damaged by floods (not enough freeboard - scouring bridges which support attached pipes) or by exposure to severe storms (something falling directly on the pipe bridge).	The failure of these pipes will result in no supply the eastern areas (Bell Block, Waitara, Tikorangi, Urenui and Onaero) and will compromise the supply to some central areas (i.e. Highlands Park).

Critical Asset(s)	Key Failure Modes	Impact
	Up to Hydro Rd are AC pipes, which are more vulnerable to damage during a seismic event due to pipe breaks or differential settlement.	To reinstate each of the pipe bridges individually will take between 1 day and 3 days.
Waitara Pipe Bridge and Trunk mains	Waitara is expected to be impacted by lahars flowing through the Waitara River. The pipe bridge crossing the river would be impacted by erosion due to lahars and lahars may cause erosive damage to under-ground pipes (trunk mains). Erosion by lahars can undermine bridge supports and other structures that are situated close to the river edges, causing them to collapse. The pipe bridge (in poor condition and reaching the end of life) and water mains are in a High Liquefaction Susceptibility Class area (ground subsidence is expected after an earthquake), the pipe material is AC and is expected to be extensively damaged under a large earthquake event (pipe breaks). The pipe bridge is also expected to fail during a seismic event due to differential settlement. Floods and Tsunami may also impact the Waitara Pipe Bridge assets (scouring bridges which support attached pipes).	The failure of the Waitara Pipe bridge and Waitara trunk mains will result in no supply to the east of Waitara including Waitara East, Tikorangi, Urenui and Onaero. To rebuild the Waitara bridge it might take between 1 and 3 months.
Inglewood intakes and WTP	Inglewood WTPs and intakes are located in an extensive lahars flow area and are expected to be impacted. Lahars can cause the destruction of this asset (or bury it in place) due to the immense force and concentration of particles. The earthquake rating for the Inglewood WTP is unknown and thus the failure mode from an earthquake is also unknown.	Lahars will bury the intakes and will compromise the WTP if they reach the area. The failure of the WTP or intakes will result in no supply to Inglewood. To install a provisional - Package WTP to supply Inglewood it might take between 1 and 3 months.
Ōkato intake and WTP	Ōkato intake is located in an extensive lahar flow area and is expected to be impacted by lahars. Lahars can cause the destruction of this asset (or bury it in place) due to the immense force and concentration of particles. The earthquake ratings for the Ōkato intake and WTP are unknown, thus the failure mode from an earthquake in unknown. The Ōkato intake is expected to be impacted in a storm event, particularly the upstream end of the infiltration gallery.	The failure of the WTP or intake will result in no supply to Ōkato. It might take 1 week to commission emergency bores; however, water might not be fully potable. To install a Provisional - Package WTP to supply Ōkato might take between 1 and 3 months.
Eastern Feeder (crossing of the Waiwhakaiho River and downstream sections)	Lahars will likely impact bridges crossing the river where lahars flow. The crossings and pipe section parallel to the river are expected to be impacted by flowing lahars (erosion) flowing through the Waiwhakaiho River. Erosion by lahars can undermine bridge supports and other structures that are	The failure of this pipe section will result in no supply the eastern areas (Bell Block, Waitara, Tikorangi, Urenui and Onaero). The reinstatement of this sections might take up to a month.

Critical Asset(s)	Key Failure Modes	Impact
	situated close to the river edges, causing them to collapse.	
Onaero Pipe Bridge	This pipe bridge is in a High Liquefaction Susceptibility Class area (ground subsidence is expected after an earthquake) and is expected to experience damage from a large earthquake. Due to the location, it could also be damaged due to floods (scouring bridges which support attached pipes).	The failure of this pipe section will result in no supply to Urenui. To reinstate the pipe bridges will take between 1 day and 3 days.

Details related to the Individual Assets Risk Assessment Methodology and Results can be found in the Council document 'water supply resilience Assessment Phase 1 - Risk Assessment – Final' (ECM #8857344).

By determining critical assets, operations, maintenance and renewal strategies can be refined, inspections and investigations can be prioritised, high risk information gaps can be identified, and confidence in programming of works is increased.

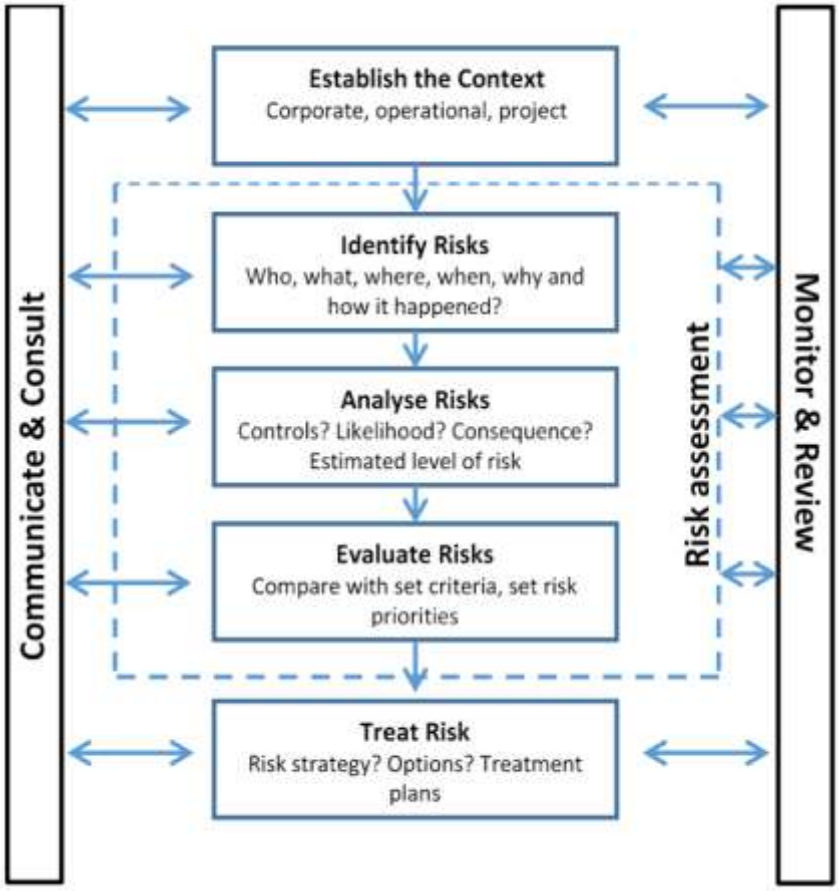
Critical assets will be prioritised when allocating maintenance and renewal funding, undertaking condition assessments and for improvement works.

6.2 Risk Assessment

Risk is an inherent element of all Council operations, and the management of these risks is a critical element of ensuring the organisation is able to deliver services and meet its obligations. For risk management to be effective, Council has developed and utilises its Corporate Risk Management Framework - Policy and Process (ECM# 1479536). This internal document is based on the fundamentals of ISO 31000:2009 (Risk Management) and provides key information and advice for how risk assessments are conducted, recorded, managed, escalated and monitored.

The five key steps to Council's risk management procedure are establishing the context, risk identification, analysing risk, risk evaluation and risk treatment – as illustrated in Figure 6.2.

Figure 6.2: Risk Management Framework



A summary of the current key risks relevant to the Council's assets is included in the Risks and Improvements Section of the Asset Management Strategy. The list includes risks to the specific assets, risk to service delivery, and risk relating to the overarching asset management system.

6.2.1 High level risks

Identification of High and Extreme risks ensures that Council can prepare for situations that may result in negative consequences, such as the loss or reduction of a service, injury, financial damage, loss of reputation, damage to the environment and more.

Table 6.2.1 lists all risks considered High or Extreme that are relevant to the management of water supply assets. This may overlap with the generic risks identified in the strategy but will focus on the actions to be taken to address those risks. Prioritisation of the projects relating to these risks occurs in P3M (Council's Projects, Portfolio and Programme management software).

Table 6.2.1: Planned treatments and costs for identified high risks

Risk type(s)	Risk Description	Current risk rating	Current Performance	Proposed Risk treatment actions and projects	Post treatment risk rating
Operations and service delivery Planning and Strategy	Infrastructure assets failure because of poor condition or life consumed. Resulting in increased reactive maintenance cost, inability to maintain the levels of service and subsequent community discontent.	High	Our infrastructure is aging. 250km of pipes in poor condition and 50% of pipeline assets network life is consumed. Renewals backlog and assets reaching end of life.	Asset renewals programme and renewals projects. Continued renewal programmes for reticulation, P&E to maintain current LoS.	Medium
Operations and service delivery Financial	Service delivery failure at the Water Treatment Plant, or in critical assets throughout the reticulation systems caused by: - severe weather; - a natural disaster; - a fire; - a chemical spill; or -accidental or malicious action. This will result in disruption service, reactive reinstatement of the system at high costs and impact in public confidence.	High	Limited resilience with just one source and WTP for the New Plymouth system being the eastern areas more vulnerable due to river crossing. The New Plymouth WTP admin building has poor seismic resilience (<33% NBS – earthquake prone), as does the clearwell (45% NBS – earthquake risk).	Improve the system resilience considering the following projects (for details refer to Section 6.2.4): Supplementary water source for the New Plymouth System (plus WTP and conveyance) Project Major upgrades to the NPWTP project Waiwhakaiho River Diversion Structure Improvements project River intake fish screen and falling main project Mangamahoe Dam Safety Upgrades Waitara Resilience Main Phase 3 Project	Medium/ High
Planning and Strategy Finance	The volume of drinking water available at a number of locations within the district during low flow periods may need to be reduced after the implementation of Te Mana o te Wai principles. Consequently, we will be unable to maintain the levels of service and	High	There are no limits in the allocation volume for the water supply systems. The New Plymouth system has indirect allocation restrictions due to the restrictions associated to Manawa Energy water take form the	Supplementary water source for the New Plymouth System (plus WTP and conveyance) Project – Having a supplementary source will help to cope with uncertainties related to the implementation of Te Mana o te Wai.	Medium

Risk type(s)	Risk Description	Current risk rating	Current Performance	Proposed Risk treatment actions and projects	Post treatment risk rating
	reactive investment will be required to look for an additional source of water.		Waiwhakaiho River, however, the limits could be potentially more restricted.		
Legislative compliance and control	Council could be prosecuted because the Water Supply activity does not comply with the Health and Safety at Work (Hazardous Substances) Regulations or other regulations or directions from Central Government.	High	The NPWTP currently has: • Staff welfare issues. • No compliance of some legislative requirements. • Temporary fluoridation arrangement in place (expected to last 5 years); however, the Ministry of Health has directed for a permanent arrangement.	Major structural replacements and upgrades proposed for the NPWTP Project - The WTP will be upgraded to comply with regulations.	Insignificant
Financial Operations and service delivery	NPDC cannot obtain a consent for an additional water source as we cannot demonstrate that we are using our water efficiently. Consequently, reactive capital investment will be required to cope with growth and we will be unable to maintain the levels of service.	High	We are not using water efficiently (high water consumption per person) and when lodging the water take consents we committed with TRC to implement a WCP to manage water demand. If water consumption per capita is not reduced, additional investment will be needed to enable growth (Over $120M capex needed to meet increased water demand due to growth over the next 30yrs).	UWM project underway. Project will be 80% complete at the end of FY24. A reduction of 25% is expected for the gross per capita consumption.	Insignificant
Planning and Strategy Governance	Insufficient planning and funding to enable growth in certain areas of the district or that development will occur without sufficient water supply provisions. This will lead to reputation damage and poor growth outcomes impacting on the levels of service (including firefighting).	High	Growth areas are unserved or need major upgrades to enable growth. Growth in the eastern areas of the Waiwhakaiho River is restricted due to constrains in the eastern feeder (currently there is marginal capacity) - Refer to section 5.1.4 for current performance issues related to the Mountain Road reservoir.	New or upgrade of network projects to enable growth areas. Supplementary water source for the New Plymouth System (plus WTP and conveyance) Project. The commissioning of new water sources to provide water directly to the Mountain Rd reservoir, will provide resilience to the system and will enable growth avoiding	Insignificant

Risk type(s)	Risk Description	Current risk rating	Current Performance	Proposed Risk treatment actions and projects	Post treatment risk rating
				the duplication of approx. 6.5km of the Eastern Feeder ($52M).	
Governance Health, safety and wellbeing	Inadequate provision of water for firefighting to the network (lack of water pressure) could result in a fatality and will lead to reputation damage.	High	Several areas of the district are not meeting the agreed firefighting levels of service (refer to Section 3.4.2).	Implement a Firefighting upgrades programme that will consider continued firefighting upgrades projects. Specific projects to improve the firefighting LoS: Bell Block water supply network upgrades and Barrett Road trunk main completion.	Medium
Legislative compliance and control	We breach consent terms because of our (and/or our contractor's) action or inaction, resulting in prosecution and/or fines and consequently reputation damage.	High	The fish screens in the NPWTP intake are non-compliant.	River intake fish screen and falling main project.	Insignificant
Heath, safety and wellbeing	There is a risk of contamination of the potable water through backflow can lead to rapid and major outbreaks of illness.	High	Many of extraordinary properties do not have backflow preventers and these devices now need to be installed. There are also a number of residential connections at higher risk due to their location in the network.	Backflow preventors programme - Increasing the number of backflow preventers on high-risk properties.	Medium

Note: Current risk is the risk at the point in time this AMP is published, it is not reflective of the full untreated (inherent) risk. The post-treatment risk associated to this projects or programmes of works once the proposed treatments have been implemented.

6.2.2 Risks outside of Council's appetite

It is not always possible to remove all risks. For a treatment to be considered effective the residual risk must be within NPDC's risk appetite. NPDC's risk appetite varies depending on the Risk Category:

- Averse means generally avoiding or eliminating a risk because of its potential impact on Council's service delivery (e.g. disruption to drinking water supply) and/or the health and safety of our staff or the public.
- Balanced means having a flexible approach depending on the nature of the risk, weighing the consequence of not achieving an objective if the risk is avoided or eliminated with the cost of implementing controls.

- Tolerant means being willing to take on significant risks to exploit opportunities associated with activities that support the achievement of Council's strategic goals, despite potentially major consequences if a risk is realised.

The following table defines those projects for which risk is not within Council's appetite, but a decision has been made to delay or not undertake remedial works.

Table 6.2.2: Justification and future treatment for risks outside of NPDC's appetite

Risk Type	Risk Appetite	Risk Description	Current risk rating	Risk treatment actions	Justification for delay to remedy
Operations and service delivery Planning and Strategy Financial	Averse (Medium)	Service delivery failure at the Water Treatment Plant, or in critical assets throughout the reticulation systems caused by: - severe weather; - a natural disaster; - a fire; - a chemical spill; or - accidental or malicious action. This will result in disruption service, reactive reinstatement of the system at high costs and impact in public confidence	High	Supplementary water source for the New Plymouth System (WTP and conveyance) Project. In the LTP there is budget allocated to look for groundwater investigations between years 1 and 5 of the LTP, however there is no budget allocated in the 2024-2034 LTP for the conveyance system and a supplementary WTP. NPWTP Filter upgrade (seismic and media) project has not been included in the 2024-2034 LTP. Major upgrades to the NPWTP project has been delayed two years in the 2024-2034 LTP, but it is still fully completed in the ten year period. The Waitara resilience water main (Phase 3) has been included in the 10-period, however budget has been reduced, and the project has been delayed.	Budget constraints/resources available.
Operations and service delivery Planning and Strategy	Averse (Medium)	Infrastructure assets failure because of poor condition or life consumed. Resulting in increased reactive maintenance costs, inability to maintain the levels of service and subsequent community discontent.	High	Asset renewals programme and renewals projects: Continued renewal programmes for reticulation, P&E to maintain current LoS. The budget has been renewed in the first two years of the LTP. Central and Eastern Feeder Renewal project has been delayed and budget has been reduced in the ten year period. Emergency renewals reticulation budget has been removed from the first two years of the LTP.	Budget Constraints (Refer to section 5.3.3).

Risk Type	Risk Appetite	Risk Description	Current risk rating	Risk treatment actions	Justification for delay to remedy
Governance Heath, safety and wellbeing	Averse (Medium)	Inadequate provision of water for firefighting to the network (lack of water pressure) could end up in a fatality and will lead to reputation damage.	High	Implement a Firefighting upgrades programme that will consider continued firefighting upgrades projects throughout the district to meet firefighting LoS. Implementation of the Bell Block water supply network upgrades project that will help to meet the firefighting LoS in the Bell Block industrial area.	Projects have not been included in the 2024-2034 LTP due to budget constraints.
Heath, safety and wellbeing	Averse (Medium)	Ōākura No.1 reservoir has never been assessed for seismic stability and has never been upgraded since it was built in 1980. In the event of a severe earthquake there is a real risk of structural damage leading to sudden major loss of containment. Both Ōākura No.1 (circular) and No.2 (rectangular) reservoir outlets are connected via a normally open valve to a common distribution main. Loss of containment could lead to the introduction of pathogens in the reticulation network, with consequential public health issues.	Medium	Ōākura Reservoir seismic strengthening project.	Project has not been included in the 2024-2034 LTP due to budget constraints.
Operations and service delivery Planning and Strategy Financial Heath, safety and wellbeing	Averse (Medium)	Service delivery failure at the WTP, or in critical assets throughout the reticulation systems caused by: - severe weather; - a natural disaster; - a fire; - a chemical spill; or -accidental or malicious action. this will result in disruption service, reactive reinstatement of the system, public health issues and impact in public confidence	Medium	After ex-Cyclone Gita different actions were identified. 1. Replacement flow meters to Water Reservoirs and Treatment plants. 2. Eliminating across boundary flow by installing double block and bleed valves at all normally closed zone isolation valves. 3. Addressing issues with the seismic stability of the reservoirs. In 2002 several reservoirs underwent seismic strengthening to standards current at the time, however they don't include seismic isolation pipework and seismic isolation valves on the outlet valve to trigger reservoir isolation based on a seismic trigger and measured outflow. 4. Currently there is no clear level of service when it comes to resilience and redundancy for our water pump stations. NPDC operates four gravity water supply	Projects have not been included in the 2024-2034 LTP due to budget constraints.

Risk Type	Risk Appetite	Risk Description	Current risk rating	Risk treatment actions	Justification for delay to remedy
				systems that serve the great majority of its urban customers. The supply system also includes six water pumping stations that boost water flow and pressure to meet required levels of service for customers. Veale Road pump station upgrade was a project considered to improve resilience and create redundancy.	
Governance	Averse (Medium)	NPDC not leading by example can lead to some impact on public confidence, reflected by local media and community interest in the Council's performance.	Medium	Implementation of the full WCP.	Project has not been included in the 2024-2034 LTP due to budget constraints.
Project/Quality Management	Balanced (High)	Delays in project delivery and/or inability to deliver on the AMP programme due to inadequate internal staffing.	High	Unclear at this time. Council is in the process of restructuring which is currently impacting capacity to deliver due to unfilled roles and may continue to impact resourcing depending upon its final outcome.	Public and Councillor perception around headcount and efficiency and effectiveness of Council internal resources.

6.3 Resilience

The New Zealand Infrastructure Strategy/Rautaki Hanganga o Aotearoa describes resilience as "*the ability to anticipate and resist the effects of a disruptive event, minimise adverse impacts, respond effectively post-event, maintain or recover functionality, and adapt in a way that allows for learning and thriving*."

Resilience differs from risk management as it is focused on management of events that are either unpredictable or have a very low likelihood of occurring, but which have high consequences. In addition, these events are typically complex with multiple interdependencies and therefore have added complexity. This includes events such as natural disasters, economic crises, significant infrastructure failure, cyber-attacks, global conflict, terrorism and climate change.

The resilience of the network is a function of both the resilience of the infrastructure and the organisational resilience. According to Resilient Organisations, organisational resilience is the ability to survive a crisis and thrive in a world of uncertainty. It is based on three main components: leadership & culture, networks & relationships and being change ready. Organisational resilience is not specifically addressed in this AMP as it is covered in the broader "Organisational Response" aspects of the Infrastructure Strategy.

Improving the resilience of our assets and adapting to climate change are key drivers for Infrastructure management at NPDC. Therefore, since 2021, we have been working on a Resilience assessment of the potable water network[8] that aims to:

- Improve NPDC's understanding of the hazards its potable water networks face and how the current networks and systems would respond if these hazards eventuated.
- Set resilience levels of services to provide the community a better understanding of how long they need to be self-reliant and how long it will take to restore certain levels of service.
- Create a prioritised improvement programme to allow for more targeted and integrated expenditure through integrating resilience improvement with other renewal, LoS and growth projects leading to reduced costs for an enhanced outcome.

6.3.1 Current Resilience Levels of Service

There are Levels of Service (LoS) established for normal operations but during and after an event these may be compromised for a short or extended period of time, possibly over weeks and months.

During an event, individuals and families need to have access to water that is safe to drink, firefighters need a large amount of non-potable water, and hospitals need a large amount of good quality water to provide for patients and staff.

The proposed current resilience levels of service shown in Figure 6.3.1 are based on the estimated time to reinstate the network following a major event. The analysis is based upon two credible large event scenarios that were chosen as representative in scale and diversity of impact to perform the assessment - a Volcanic Eruption Scenario and a Large Earthquake Scenario.

[8] Details related to the Resilience LoS Assessment Methodology can be found in ECM 8857344 and ECM 9040374.

Figure 6.3.1: Current Resilience Levels of Service

Days 1-14 Emergency Stage	Days 15-45 Survival Stage	From Day 46 Operational Stage
•People and businesses will be self-sufficient •It's likely that no water will be delivered via the network. •If delivered to some restricted locations, it's possibly not potable and "boil water" notice may be required.	•Customers start to receive water to their boundary ("boil water" notice to be expected) with increased access to water. •Distribution Points (500-1000m distance walk) will make 20 L/p/d available for residents without water supply •Vulnerable Customers will have dedicated water delivery to their boundaries. •Critical Customers will begin to receive some water to their boundary.	•The district moves towards restoration of normal service. •80% of customers, including critical customers, have water delivered to their property and 70 L/p/d should be provided for health and hygiene. •Some customers, especially directly impacted customers, could still be accessing water from distribution points.

Details related to the Resilience LoS Assessment Methodology can be found in NPDC's 'Potable Water Resilience Assessment - Phase 2 - Resilience Levels of Service (Current and Future)' (ECM #9040374).

6.3.2 Proposed Resilience Improvements

A proactive approach to improve the resilience of the network combines preparedness, emergency response, efficient operations, and long-term infrastructure capital investments. Often these improvements can be achieved at minimal cost if combined with wider operational, maintenance, renewal, level of service and growth projects and this is the approach being taken by NPDC. Table 6.3.2 identifies the initiatives that are specific to the potable water supply that will help improve the resilience of the network.

Table 6.3.2: Resilience improvement initiatives for the water supply systems

Key point of failure	Event and / or related impacts	Improvement Actions / Project
Waiwhakaiho River Diversion Structure failure	Critical asset, refer to Section 6.1. Extensive damage is expected in seismic events and expected to be extensively impacted (buried) by flowing lahars.	Waiwhakaiho River Diversion Structure Improvements project. (Upgrades to cope with large earthquake events and to increase the resilience of this structure under a volcanic eruption event).
River intake not delivering the minimum flow required to operate the WTP under an emergency.	The River intake is the only intake that could potentially be used in case the lake needs to be dewatered (i.e. due to a large seismic event) or there are water quality issues in the lake (extensive drought).	River intake fish screen and falling main project. (Look for a combined solution to address the hydraulic constraints of the falling main and the fish screens requirements – Refer to Section 6.2.1).

Key point of failure	Event and / or related impacts	Improvement Actions / Project
Mangamahoe Dams failure	Critical asset, refer to Section 6.1. Issues around the seismic performance of both dams remain critical and both dams could fail during a seismic event.	Mangamahoe Dam Safety Upgrades (strengthening) are being considered for the Saddle and Main Dams by Manawa Energy.*
NPWTP loss of function	Critical asset, refer to Section 6.1. The administration building and chemical storage building are earthquake prone (NBS <33%). The clearwater tank (disinfection system) is an earthquake risk asset (45% NBS). Both structures could fail during a seismic event.	Major upgrades to the NPWTP project (proposed as part of the NPWTP Improvements Plan).
Central and Eastern feeder failure	Three pipe bridges located along this feeder have been identified as critical assets (Refer to Section 6.1). The central and eastern feeder up to the Waiwhakaiho Bridge have issues related to the asset condition that are affecting performance (Refer to Section 5.1.4). Up to Hydro Rd, this is an AC pipe, therefore vulnerable (high damage) under a Large Earthquake Event. Also, the pipe bridges are vulnerable to large storm events.	This project considers the condition assessment of the Central and Eastern Feeder from the WTP Reservoir 1 up to the Waiwhakaiho River crossing.
New Plymouth System Source loss of service	The NPWTP and source have been identified as critical assets (Section 6.1). Having just one source and one treatment plant provides limited resilience to potential adverse events like natural events (Large Earthquake, Volcanic Eruption and drought). The eastern areas are more vulnerable and exposed to a potential loss of service due to hazards of a river crossing (impacted by flowing lahars in a Volcanic Eruption and pipe bridges vulnerable to seismic events).	Supplementary water source for the New Plymouth System (plus WTP and conveyance) Project. The commissioning of new water sources (including WTP) to provide water directly to the Mountain Rd reservoir, will provide resilience to the system and will enable growth – refer to Section 6.2.4 (A Supplementary Source will avoid the duplication of approx. 6.5 km of the Eastern Feeder - $52M).).

Key point of failure	Event and / or related impacts	Improvement Actions / Project
Waitara pipe bridge failure	The Waitara water pipe bridge has been identified as a critical asset (Section 6.1) and is also at the end of its useful life. This pipe bridge is vulnerable to seismic events, volcanic eruption, tsunami, coastal flood and flooding events.	Waitara Resilience Main Phase 3 Project. Phases 1 and 2 of this programme have already been completed, from Princess Street (North) to the east side of the Waitara Bridge on SH3. The third phase will include the construction of the water main from the bridge's east margin to the trunk main in Waitara (completing the loop). Once the loop is completed, works can be undertaken to renew the Waitara Bridge pipe (currently there is limited capacity to perform the renewal due to the lack of redundancy).
Loss of function of the network (including critical assets)	Loss of service due to poor/very poor condition of the network.	Asset renewals programme. Designing backup options for parts of the water supply network supplied by a single pipe. More inspections and preventative maintenance of critical assets. More backup spare parts for critical equipment such as spare pipes, valves and pumps Upgrading critical pipe bridges
Pump Stations loss of service due to power outage	Pump stations rely on third party power supply (electricity) to operate. Power outages typically occur as a result of destructive storm events.	Upgrading water pump stations to include backup power supplies and warning alarm systems. Negotiations are needed between Council and Fire & Emergency to agree on Level of Service in respect of flow for firefighting purposes.

* Assets owned, operated, and maintained by Manawa Energy. Financial responsibilities still need to be agreed.

These initiatives, once completed, are expected to improve the level of service to that shown in Figure 6.3.2.

Figure 6.3.2: Current vs Future Aspirational (Proposed) Resilience Levels of Service

Stage	Emergency Stage	Survival Stage.	Operational Stage
Current resilience LoS (Days)	1-14	15-45	From Day 46
Aspirational resilience LoS (Days)	1-7	8-30	From Day 31

6.4 Service and Risk Trade-offs

The decisions made during the preparation of the LTP are initially guided by the first draft of this AMP and are later reflected in the final iteration. The goal is to ensure that the optimum benefits are received from the available resources, then capture where Council will be unable to achieve all the intended outcomes.

6.4.1 What we cannot do

The following is a list of the operations and maintenance activities and capital projects that Council is unable to complete within the timeframe of this AMP. These include:

- Supplementary Source for the New Plymouth water supply system conveyance system and Water Treatment Plant (this component of the projects was excluded from the LTP budget request before the first ELT/TRU submission of the budget, which is why it has not been listed in section 5.4).
- Firefighting reticulation improvements programme to meet target firefighting LoS (district-wide programme of projects). Originally this project was requested to start on the FYE1, and was delayed to FYE4 for the first ELT/TRU budget submission.
- Bell Block water supply network upgrades (to improve the firefighting LoS in the industrial area and to upgrade the system to enable growth in the Bell Block pressure zone).
- Requested reticulation renewals budget for the next ten year period to maintain current LoS has been reduced, and some renewals will not be completed (renewals programme originally requested a higher budget, it was reduced before the first ELT/TRU submission).
- Smart Road Reservoir and water supply trunk main – this growth project has been delayed by four years before the initial LTP budget submission to NPDC ELT/TRU, thus was not included in the graphs of section 5.4.
- Ōākura Reservoir seismic strengthening project.
- After ex-Cyclone Gita, a number of resilience actions were identified. These are not scheduled to occur within this ten year period:
    - Water Resilience - Flow Metering: Replacement flow meters to water reservoirs and treatment plants.
    - Water Resilience - Reticulation Zones: Eliminating across boundary flow by installing double block and bleed valves at all normally closed zone isolation valves.
    - Water Resilience - Reservoirs Inlets-Outlets: Addressing issues with the seismic stability of the reservoirs.
    - Water Resilience - pump station upgrades: Upgrades to improve resilience and redundancy for our water pump stations.
- Veale Road pump station upgrade to improve resilience and create redundancy.
- Veale Road pressure reduction valve replacement.
- Implementation of the full WCP operational and capital budget.
- NPWTP filter upgrade (seismic and media) and NPWTP clarifiers improvements.
- Long-term solution for disposal of NPWTP solids residuals.
- Inglewood Reservoir 1 remediation.
- Capacity of pipework downstream of Tikorangi Reservoir.

6.4.2 Service Trade-offs

Work that cannot be completed will result in a service consequence to users. This trade-off is necessary to retain a reasonable balance between expenditure and service. The service consequences resulting from the work that cannot be completed include:

- After a large event that affects the operation of NPWTP, New Plymouth System customers will not be able to receive drinking water until emergency provisions are in place.
- Firefighting capabilities will be restricted in certain areas of the district.
- Pressure fluctuations in the Veale Pressure Zone.

6.4.3 Risk Trade-offs

Work that cannot be completed may also create risk consequences. These risk consequences include;

- growth in the Bell Block pressure zone may be restricted,
- disruption of service after a large event,
- reactive maintenance costs and inability to maintain the required LoS,
- fatalities due to inadequate provision of water for firefighting to the network, and
- public health issues due to loss of containment of the water reservoirs.

Financial Summary

This section seeks to describe the financial requirements resulting from the information presented in the previous sections of this AMP. Financial projections will be improved as the discussion on desired levels of service and asset performance matures.

7.1 Financial Strategy

Council's financial strategy and accounting policies are documented in the Financial Information section of the LTP. This financial strategy determines how funding will be provided, whereas the AMP communicates how and when this will be spent, along with the service and risk consequences of various service alternatives.

7.2 Financial Sustainability & Projections

7.2.1 Sustainability of service delivery

There are two key indicators of sustainable service delivery that are considered in this AMP; they include:

- The asset renewal funding ratio (ARFR), and
- The current asset funding indicator (CAFI)

Asset Renewal Funding Ratio

The Asset Renewal Funding Ratio (ARFR) is an important indicator that provides context for Council's planned renewals.

The calculation is shown in Table 7.2.1.1.

$$\text{ARFR (\%)} = \frac{\text{Proposed renewal budget for 10-year period}}{\text{Forecast renewal costs for 10-year period}} \times 100$$

Table 7.2.1.1: Renewal forecast

Indicator	Value
Ten-year renewal budget	$90,266,336
Ten-year renewal forecast	$96,530,431
Asset Renewal Funding Ratio	93.5 %

The forecast values only consider the projects included in the first budget submission of the LTP and excludes the projects that have been removed from the budget request before the submission. In current-day values, an additional $5M was requested for 100% renewals projects in the ten year period but were not included in the ELT/TRU submission.

The information presented in Table 7.2.1.1 illustrates that over the next 10 years, Council expects to have 93.5% of the funds required for the renewal of assets. However, as stated in section 5.3 this funding will not be sufficient to cover the backlog in the ten year period and is not fully representative of the requested budget (forecast).

Current Asset Funding Indicator

The Current Asset Funding Indicator (CAFI) identifies the capacity of the organisation to fund the ongoing operations, maintenance and renewal of the existing asset portfolio in a sustainable manner.

$$\text{CAFI (\%)} = \frac{\text{Proposed operation, maintenance \& renewal budget for 10-yr period}}{\text{Forecast operation, maintenance, and renewal costs for 10-yr period}} \times 100$$

This calculation is shown in Table 7.2.1.2 below.

Table 7.2.1.2: Existing asset funding sustainability

Indicator	Value
Ten-year proposed budget for existing assets	$181,182,043
Ten-year forecast costs for existing assets (operations, maintenance & renewals)	$173,449,096
Average annual funding gap	-$773,295
Current Asset Funding Indicator	104.5%

The forecast values only consider the projects included in the first budget submission of the LTP and exclude the projects that have been removed from the budget request before the submission.

The CAFI is masked however by the increased general operational and maintenance budget described in section 5.2.1. When this 'surplus' is excluded, there is an average annual funding gap of ~$773K per annum. 104.5% of the forecast costs needed to provide the services documented in this AMP are accommodated in the proposed budget.

7.2.2 Forecast costs for the Long-Term Plan

Table 7.2.2 shows the expenditure forecast summary (outlays) required for consideration in the LTP.

Providing services in a financially sustainable manner requires a balance between the forecast outlays required to deliver the agreed service levels and the planned budget allocations in the LTP.

A financial gap between the forecast outlays and the amounts allocated in the financial plan indicates further work is required on reviewing target service levels in the AMP.

Table 7.2.2: Expenditure forecast summary

Activity	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34	LTP Total
Operations	$ 2.29	$ 3.60	$ 4.76	$ 5.60	$ 2.92	$ 2.76	$ 3.52	$ 2.83	$ 3.10	$ 1.96	**$ 33.34**
Maintenance	$ 3.54	$ 4.06	$ 4.16	$ 4.28	$ 4.37	$ 4.46	$ 4.54	$ 4.63	$ 4.72	$ 4.82	**$ 43.58**
Total Opex	**$ 5.82**	**$ 7.66**	**$ 8.91**	**$ 9.88**	**$ 7.29**	**$ 7.22**	**$ 8.07**	**$ 7.47**	**$ 7.82**	**$ 6.77**	**$ 76.92**
Level of Service	$ 3.52	$ 4.64	$ 5.02	$ 6.94	$ 9.16	$ 16.19	$ 13.62	$ 9.01	$ 5.65	$ 4.86	**$ 78.61**
Growth	$ 5.42	$ 3.66	$ 4.76	$ 3.48	$ 3.40	$ 1.16	$ 1.43	$ 3.27	$ 5.17	$ 5.41	**$ 37.17**
Renewals	$ 8.53	$ 8.79	$ 10.56	$ 8.41	$ 6.93	$ 7.62	$ 7.22	$ 11.38	$ 15.14	$ 11.96	**$ 96.53**
Total Capex	**$ 17.47**	**$ 17.09**	**$ 20.34**	**$ 18.83**	**$ 19.48**	**$ 24.97**	**$ 22.27**	**$ 23.67**	**$ 25.95**	**$ 22.23**	**$ 212.31**

Values in $million. All figure values are inflated. The Waitara Industrial Supply Decommissioning Programme (disposal) has been included as part of the consequential and seed funding opex (Operations) as it can't be capitalized.

The forecast values only consider the projects included in the first budget submission of the LTP and exclude the projects that have been removed from the budget request before the submission. Some examples of the projects with a reduced budget, or a project delay from the ten year period in the ELT/TRU submission include:

- Supplementary Source for the NP water supply system conveyance system and NPWTP
- Renewals budget for the next ten year period to maintain current LoS has been reduced and some renewals will not be able to happen
- Reduction of budget of the Water Master Planning project (opex)

The methods currently used by NPDC to prepare financial forecasts do not provide a straight-forward breakdown into the Asset Management lifecycle stages of acquisition, operation, maintenance, renewal or disposal. Table 7.2.2 can be aligned with the lifecycle stages by reading as follows:

- asset acquisitions are indicated by the combined totals of Level of Service and Growth activities (above 'Total Capex')
- asset renewals are captured under the Renewals activity heading
- operations and maintenance costs are collectively provided as 'Total Opex' with no individual breakdown currently available

An improvement action has been identified to improve forecast definition in the AMP including providing separate operations, preventative and reactive maintenance forecasts.

7.3 Valuation Forecasts

7.3.1 Asset valuations

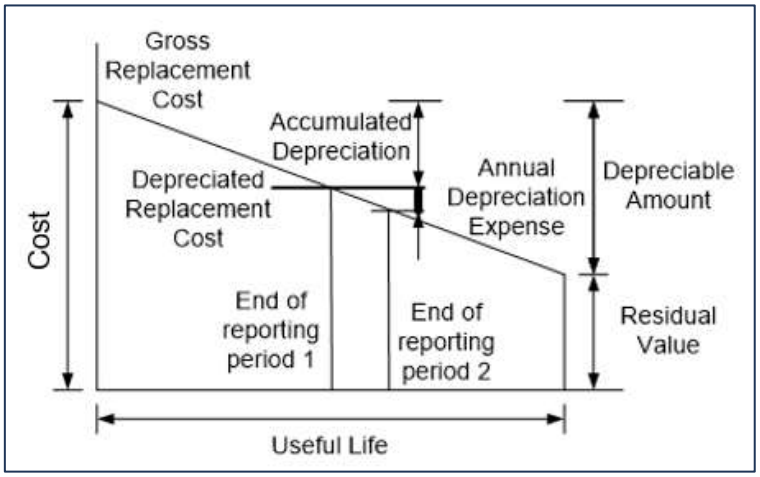
The best available estimate of the value of assets included in this AMP is shown below. Council's asset valuation methodology is described in the Statement of Accounting Policies included in the Financial Information section of the LTP.

Table 7.3.1 Asset valuations as of 30 June 2022

Measure	Value
GCRC (Current/Gross)	$ 418.8M
Depreciated Replacement Cost[9]	$ 204.7M
Annual Depreciation	$6.0M

Figure 7.3.1 provides a graphical comparison of the values given above.

Figure 7.3.1: Understanding valuation and depreciation values



7.3.2 Valuation forecast

Total asset portfolio value is forecast to increase over the ten-year term of this AMP as additional assets are added. Additional assets will generally result in increased costs due to:

- operations and maintenance needs
- future renewal costs
- future depreciation forecasts

7.4 Key Assumptions

In compiling this AMP it was necessary to make some assumptions. This section details the key assumptions made and should provide readers with an understanding of the level of confidence in the data behind the financial forecasts.

Key financial assumptions made in this AMP are:

- Asset valuations primarily based upon sale price of an asset do reflect an accurate assessment of the replacement cost.

[9] Also reported as Written Down Value, Carrying or Net Book Value.

- Costs relating to lifecycle forecasts are based on engineering judgement that is assumed to be correct/accurate.
- All costs for future work programmes, project works and future asset acquisitions are based on best judgement of Council staff, utilising available cost estimation tools.
- Budget and forecast have been inflated.
- The forecast values shown in the graph consider the projects included in the first ELT/TRU budget submission and exclude the projects that have been requested but were removed or delayed before the submission.
- The assets to be disposed have been considered as part of the operational budget as they cannot be capitalized.

7.5 Forecast Reliability & Confidence

The forecast costs, proposed budgets, and valuation projections in this AMP are based on the best available data. For effective asset and financial management it is critical that the information is current and accurate. Data confidence is classified on an A – E level scale in accordance with Table 7.5.1.

Table 7.5.1: Data Confidence Grading System

Confidence Grade	Description
A. Very High	Data is based on sound records, procedures, investigations, and analysis, documented properly and agreed as the best method of assessment. Dataset is complete and estimated to be accurate (i.e. accuracy level ±2%)
B. High	Data is based on sound records, procedures, investigations, and analysis, documented properly but has minor shortcomings, for example some of the data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or some extrapolation. Dataset is complete and estimated to be accurate (i.e. accuracy level ±10%)
C. Medium	Data is 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 data are available. Dataset is substantially complete but up to 50% is extrapolated data and accuracy estimated (i.e. accuracy level ±25%)
D. Low	Data is based on unconfirmed verbal reports and/or cursory inspections and analysis. Dataset may not be fully complete, and most data is estimated or extrapolated. (i.e. accuracy level ±40%)
E. Very Low	None or very little data held

The estimated confidence level for and reliability of data used in this AMP is shown in Table 7.5.2.

Table 7.5.2: Data Confidence Assessment for Data used in AMP

Data	Confidence Assessment	Comment
Demand drivers	C. Medium	Uncertainty in forecasts arises due to the potential for change within national and global economies and politics, and the occurrence of natural events and disasters which all impact long-term forecast reliability.
Growth projections	B. High	There is high confidence in expected population and demographic changes in the District, however lower confidence in expected immigration and tourism forecasts are noted due to international instability.
Acquisition forecast	E. Very Low	Most of the projects included as part of the ten-year term of LTP are in early stages (feasibility or concept design) and there are no detailed Business Cases to support the financial forecast. The values included in the cost estimates are mostly based on unclassified estimates with high levels of uncertainty.
Operation forecast	C. Medium	Consequential and seed funding opex budgets associated to capital projects have very low levels of confidence as per above comment. Other operational forecasts are based on data of previous years' actual expenditure, thus provide a high level of confidence.
Maintenance forecast	B. High	Data is based on previous years actual expenditure.
Renewal forecast - Asset values	C. Medium	Data is based on age-based renewal selection for reticulation. For water supply P&E assets there is no formalised condition assessment programme in place.
Asset useful lives	C. Medium	Asset useful lives were last reviewed in June 2022 as part of Council's scheduled asset valuation process and are based on standard theorical numbers and not historical incidence. Renewal requirements are based on RUL. There are approximately $4.2M assets in the asset management system without an expected life, therefore a default date of 1904 was used and included as backlog.
Condition modelling	C. Medium	For water mains assets, the condition grades are based on remaining useful life and as such are not considered to be an accurate representation of actual condition. However, they are the best available information to infer the potential condition of an asset when there is no inspection programme in place. For water supply P&E assets, there is no formalised condition assessment programme in place.
Disposal forecast	C. Medium	Projects in early stages without detailed business cases.

The overall estimated confidence level for reliability of data used in this AMP is C. Medium.

Improvement & Monitoring

This section provides information about improvement and monitoring of the asset management system and processes at Council.

8.1 Asset Management Maturity

NPDC undertook an asset management maturity assessment across the entire Council asset management system in March 2021. An overview of this review is provided in the 2022 Asset Management Strategy (ECM# 7819335). Council currently has an average rating of 2 (Developing) and is working toward a maturity rating of 3 (Competent). Current focus areas for increasing Council's asset management maturity include:

- Increasing process documentation: to provide consistency and minimise knowledge loss during change
- Implementing management reviews: to enhance overall visibility of activities and more closely track performance
- Introducing spot checks: to ensure documented processes are aligned to reality

8.2 Improvement Plan

The following table lists the areas of this AMP that can be improved upon through the development and implementation of improved processes or methodologies, behaviours and tools. Implementation of these actions will enhance operational efficiency and effectiveness and improve overall asset management maturity.

Table 8.2.1: Improvement Plan

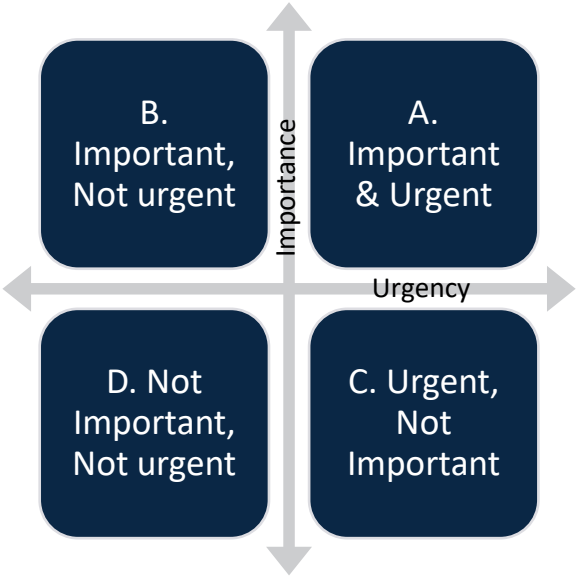
Activity	Task	Priority	Accountable	Responsible	Resources Required	Due date
Data collection	Set firm timeframes for the handover of new asset data and embed in process. (Ref: Section 5.1.1)	B	Manager PMO (capital works) 3W Networks Mgr. (renewals)	Project Delivery Manager Works Delivery Manager	BAU collaboration between Asset Data, Projects and Operations teams	Mar 2025
Critical assets	Adopt an asset criticality framework for 3W that supports the systematic identification of all critical assets and it is consistent throughout Council. (Ref: Section 6.1).	B	Manager Strategic Planning	Asset & Data Lead	BAU collaboration across asset owners, no additional funds necessary	Jun 2025
Critical Assets	Create a programme to prioritise critical assets for maintenance and renewal funding, undertaking condition assessments and for improvement works	B	Three Waters Manager	3W Planning Lead	BAU collaboration across asset owners, no additional	Jun 2025

Activity	Task	Priority	Accountable	Responsible	Resources Required	Due date
					funds necessary	
Agree LoS	Agree and implement Resilience and Firefighting LoS	A	Manager Three Waters	Three Waters Planning Lead	TBC	TBC
Engagement	Continue our journey towards partnership with iwi and hapū	A	Chief executive	Iwi Liaison Engagement Lead	BAU	Ongoing
Condition rating data and programme (pipe bridges)	Develop and implement a condition inspection programme for reticulation assets (pipe bridges and river crossings and pipes) to understand the actual condition and deterioration rate of assets	B	Manager Three Waters Networks	Stormwater, Dam and Renewals Engineer	BAU activity	Ongoing
Condition rating data and programme (reticulation)	Develop and implement a condition inspection programme for reticulation assets (refer to section 5.1.5 and 5.3.1)	A	Manager Three Waters Networks	Stormwater, Dam and Renewals Engineer	BAU activity	Ongoing
Condition rating data and programme (P&E)	Develop and implement a formal condition inspection programme for P&E assets (WTP buildings, pump stations and reservoirs) to understand the actual condition and deterioration rate of assets (refer to section 5.3.1)	A	Three Waters Manager	Water Treatment Plant Lead	BAU activity	Ongoing
Telemetry and communications technology	Implement a robust renewal programme for telemetry and communications technology	B	Engineering & Technical Support Manager	Control Systems Lead	BAU activity	Ongoing
Maintenance schedule	Implement a maintenance schedule for P&E	A	Three Waters Production Manager	Water Treatment Lead	BAU activity	June 2025
Operational procedures	Create and update operating manuals (refer to section 5.2)	A	Three Waters Production Manager	Engineering & Technical Support Manager	BAU activity	Ongoing
Growth models	Update the growth models based on the Operative District Plan assumptions	B	Manager Strategic Planning	District Planning and Growth Lead	BAU activity	June 2025
Hazards assessment	Update the hazards impacts considering a range of return periods	D	Three Waters Planning Lead	TBC	BAU activity	June 2025
Decarbonisation Programme	Create standards to design, build and manage future NPDC assets according to low carbon principles Update with carbon baseline information and process for developing carbon reduction road map	A	Sustainability Manager	Climate Change Response Lead	BAU activity	TBC
Lifecycle costing	Development and implementation of a process for lifecycle costing (Refer to Section 5.4.2)	A	Manager Project Management Office	Project Delivery Managers	TBC	TBC
Model maintenance guidelines	Creation of a hydraulic model update and maintenance guideline	C	Three Waters Planning Lead	Planning Engineer-	BAU activity	June 2025

Activity	Task	Priority	Accountable	Responsible	Resources Required	Due date
				Network Modelling		
Forecast definition	Create a programme of works to provide separate operations, preventative and reactive maintenance forecasts (refer to section 7.2.2).	C	Engineering & Technical Support Manager, Manager Three Waters Networks	Mechanical Maintenance Supervisor, Drainage Network Supervisor	BAU Activity	Ongoing
Data and information (Benchmarking)	Implement a benchmark programme of water demand to understand baseline water consumption, identify measurements to focus on and track over time, and decide how the data will be analysed.	A	Manager Three Waters Networks	Principal Operations Engineer	BAU activity	June 2025
Valuation	Add resource consents and hydraulic models to the asset register and assign a $-value.	B	Manager Strategic Planning	Asset Data Lead	BAU collaboration between Asset Data, Three Waters Planning and Operations	Ongoing
Environmental Sustainability engagement and inclusion	Ensure that Environmental Sustainability Policy settings are incorporated into all actions and commitments indicated within LTP and AMP.	C	Three Waters Planning Lead	Project Delivery Managers	BAU activity	Ongoing

Note: Action priority is set using the Eisenhower Matrix as a model, with the highest priority works graded as A and lowest priority works graded as D.

Image 8.2.1: Eisenhower Matrix



8.3 Monitoring & Review Procedures

This AMP will be reviewed and updated annually as part of the wider Council annual planning process. These annual reviews will ensure the AMP continues to accurately communicate the current service levels, asset values, forecast costs and planned budgets.

Every three years the AMP will be completely revised to reflect the adjustments to the organisational strategic direction that result from the triennial election of Council's elected members. The AMP review is also aligned to the LTP process for which the AMP is essential supporting information and as such these AMPs will be made available for the LTP audit in their draft form. The draft AMP will capture the best-case scenario for management of the assets aligned to anticipated budgets. The final version will reflect the decisions made by Council's elected members, including where service levels are expected to be impacted by the availability of funds.

8.4 Performance Measures

The effectiveness of the AMPs is monitored through regular internal assessments conducted multiple times throughout the year by the asset group's senior management team. The internal assessments will identify the extent to which the actions defined within the plan have been implemented, act as a feedback mechanism for senior management, and consider the following:

- accuracy of forecast costs and alignment to the LTP;
- alignment to the Asset Management Strategy and other key strategic documents;
- completion rate of forecast works including renewals, acquisitions, essential maintenance, condition assessments and improvement or risk management activities;
- inclusion of key risk and improvement actions within the relevant organisational systems and the completion of corrective actions in a timely manner;
- completeness of information; and,
- other relevant topics identified at the time of the assessment.

References

- IPWEA, 2006, 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, International Infrastructure Management Manual (IIMM) - Aotearoa
- IPWEA, 2015, 3rd edn., 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, International Infrastructure Management Manual (IIMM) - Aotearoa
- Department of Internal Affairs, (n.d). *Local Government Act 2002,* Local Government Act 2002 No 84 (as at 01 October 2023), Public Act Contents – New Zealand Legislation
- International Organisation for Standardisation – ISO (2009) *ISO 31000:2009 Risk management – guidelines* ISO 31000:2009 - Risk management — Principles and guidelines
- New Zealand Infrastructure Commission, Te Waihanga, (2022*). Rautaki Hanganga o Aotearoa – New Zealand Infrastructure Strategy 2022-2052*, rautaki-hanganga-o-aotearoa-new-zealand-infrastructure-strategy.pdf
- New Zealand Lifelines Council, (2023). Aotearoa-New Zealand Critical Infrastructure: A National Vulnerability Assessment. Download Part B: Main Report
- NPDC, (2021). Long Term Plan 2021-2031 https://www.npdc.govt.nz/council/strategies-plans-and-policies/plans/long-term-plans/
- NPDC, (2023). *Significant non-financial forecasting assumptions*, supporting-information.pdf
- NPDC, (2023). *Asset Management Strategy for infrastructure and property assets 2023-2025*, (ECM# 8927919)
- NPDC, (2023). *Our Vision*, https://www.npdc.govt.nz/planning-our-future/our-vision/
- NPDC, (2023). *Infrastructure Strategy (pg 39 onwards),* Long-Term Plan 2024-2034, https://www.npdc.govt.nz/media/1r4hjp0n/informing-our-planning.pdf
- NPDC, (2023). *District-wide Emissions Reduction Plan,* district-wide-emissions-reduction-plan-2023-adopted-12-september-2023.pdf (npdc.govt.nz)
- NPDC, (2023). *Corporate risk management framework – policy and process*, (ECM# 1479536)
- NPDC (2010*). Water, Wastewater and Stormwater Mains Criticality and Renewals Prioritisation Process* (ECM# 988741)
- NPDC (2021) *Asset management plans (Parks, Property, Stormwater & Flood protection, Transportation, Waste management and minimisation, Wastewater and Water Supply*), NPDC Asset Management Plans
- NPDC (2022). *Potable Water Resilience Assessment – Phase 1: High Level Risk Assessment* (ECM #8857344)
- NPDC (2023). *Annual Plan documents*. Annual Plans
- NPDC (2023). *NPDC Community Survey.* NPDC Community Survey
- NPDC (2023) *Cost estimating and control framework* (ECM# 8923299)
- NPDC (2023). Asset value information, data export from TechOne EAM.

- NPDC (2023). *Potable Water Resilience Assessment – Phase 2: Future and Aspirational Resilience Levels of Service (*ECM #9040374)
- Ministry for the Environment, (2020). *National Policy Statement for Freshwater Management*. National Policy Statement for Freshwater Management 2020 (Amended January 2024)
- Ministry for the Environment, (2022, May). *Te hau mārohi ki anamata, Towards a productive, sustainable and inclusive economy, Aotearoa New Zealand's first emissions reduction plan*, Aotearoa New Zealand's first Emissions Reduction Plan
- Research First, (2023, June). *New Plymouth District Council Community Survey 2023*, NPDC Annual Customer Survey Report 2023
- WSP, (2022). NPDC 3 Waters Asset Valuation Report 2022 - FINAL. (ECM #9084112)

Glossary

Term/ Phrase/ Acronym	Definition
Acquisition	Those activities involved in the creation/ purchase/ donation or otherwise gain of new or upgraded assets.
ADAPT	Adapt Solutions (asset management software)
AIR	Asset Information Refresh project
AMIS	Asset Management Information System
AMP/AMPs	Asset Management Plan/Asset Management Plans
ARFR	Asset Renewal Funding Ratio
AS/NZS	Australian/ New Zealand Standards
Asset	An item, thing or entity that has potential or actual value to NPDC (such as plant, machinery, buildings, roads, etc).
Asset lifecycle	Describes the activities/ actions relating to an asset from initial planning and acquisition, through operation and maintenance of the asset, to disposal at 'end-of-life.' Many assets are not disposed of but are renewed and their condition and performance reset to 'as new.'
Asset Owner	The person at Council who is accountable for managing the specific asset group. This is generally the functional manager of the relevant area (e.g. Manager Infrastructure).
Asset Register	The record of asset information including asset attribute data (e.g. quantity, type, construction cost or value).
AMS/AM Strategy	Asset Management Strategy
CAFI	Current Asset Funding Indicator
CAPEX	Capital Expenditure
CBD	Central Business District
CCO	Council Controlled Organisation
CDEM	Civil Defence and Emergency Management
Council	Refers to New Plymouth District Council specifically
Customer	Customer in this document is used to describe anyone who uses the products or services provided by Council assets or who has a vested interest in those assets. This includes ratepayers, local community groups and businesses, local iwi and hapū, regulators or statutory bodies and visitors to the region.
Current day dollars	The dollar amount required to undertake a task/activity if it was to be completed today. Potential future inflation is not included in these figures.
Demand	A driver or pressure that has the potential to change the requirements/ expectations of Council's assets.
dia	Refers to the pipe diameter.
Disposal	Any activities associated with the disposal of a decommissioned asset. This includes the sale, demolition, or the relocation of the asset.
DWQAR	Drinking Water Quality Assurance Rules
EAM	TechOne Enterprise Asset Management – Council's asset register software. Manages financial information, customer information and requests, asset registers and history, work order management and maintenance scheduling.

Term/ Phrase/ Acronym	Definition
ECM	Enterprise Content Management
ELT	Executive Leadership Team
FENZ	Fire and Emergency New Zealand
FW	Fire Water classification number
FY or FYE	Financial Year or Financial Year End
GCRC	Gross Capital Replacement Cost
GDP	Gross Domestic Product
GIS	Geographic Information System.
HSNO	Hazardous Substances and New Organisms
HSREQ	Health, Safety, Risk, Environment and Quality
IIMM	International Infrastructure Management Manual
Infrastructure Strategy	A document that must be prepared as part of the LTP (required by the Local Government Act). This document identifies significant infrastructure issues and potential options for their management for a 30-year period.
IPWEA	Institute of Public Works Engineering Australasia
ISO 55001	International Standard for Asset Management – Management System requirements
LGA	Local Government Act 2002 (and subsequent amendments)
LoS	Level of Service (a statement by Council that clearly identifies what it intends to deliver in terms of providing local infrastructure, public services and regulatory functions).
LTP	Long-Term Plan
Maintenance	Those actions necessary to keep the asset as near as practicable to an appropriate service condition including regular, ongoing day-to-day work necessary to keep assets operating.
MCC room	Motor Control Centre room
MfE	Ministry for the Environment
NBS	New Building Standard - Earthquake-prone buildings are given an earthquake rating, commonly referred to as a percentage of the new building standard.
NES-FM	National Environmental Standards for Freshwater Management
NPDC	New Plymouth District Council
NZD	New Zealand Dollar
NZS	New Zealand Standard
NPWTP	New Plymouth Water Treatment Plant
Operations	Those regular activities required to provide a service. Examples of typical operational activities/costs that would be charged here include monitoring inputs and outputs, cleaning, security, insurance, inspection and utility costs.
OPEX	Operational Expenditure
Performance measure	The means by which Council measures achievement of its level of service statements.
Pinnacle	NPDC's health, safety, risk, environment and quality (HSREQ) management software.
P&E	Plant & Equipment assets
P&ID	Piping and Instrumentation Diagram; a diagram which shows the interconnection of process equipment, and the instrumentation used to control the process.
P3M	Council's Portfolio, Programme and Project Management framework.
PVC	Polyvinyl Chloride
Ratepayer	Residents, property owners and businesses who pay rates to NPDC.

Term/ Phrase/ Acronym	Definition
RCP	Representative Concentration Pathway, a greenhouse gas concentration (not emissions) trajectory adopted by the IPCC.
Rd	Road
Renewals	Those activities that restore, rehabilitate, replace or renew existing assets back to an original or 'as new' standard.
Replacement	The complete replacement of an asset that has reached the end of its life, so as to provide a similar, or agreed alternative level of service.
Research First	The organisation responsible for undertaking the independent community survey.
Risk appetite	The amount and type of risk that the Council is prepared to accept in the pursuit of its objectives.
Risk management	The coordinated activities to direct and control an organisation with regard to risk.
Risk treatment	Proposed or agreed method for fixing or reducing a risk that Council is currently exposed to.
RUL	Remaining Useful Life – the amount of time remaining before the asset condition or performance will no longer be capable of meeting required levels of service and must be renewed or disposed of.
SCADA	Supervisory Control and Data Acquisition (SCADA) systems are used for controlling, monitoring, and analysing water supply devices and processes.
SDC	Stratford District Council
SLA	Service Level Agreements
SNZ PAS	Firefighting Water Supplies Code of Practice
STDC	South Taranaki District Council
TechOne / Tech1 / T1	Council's EAM and ECM system provider
TRC	Taranaki Regional Council
TRM	Te Rōpū Manawataki (NPDC Tier 3 Management Team)
TRU	Te Ranga Urungi (NPDC Tier 1 & 2 Management Team)
UMW	Universal Water Metering
WCP	Water Conservation Programme
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

Appendices

Appendix 1 – Legislation & Regulations

The following is a list of all relevant legislation and regulations relating to the delivery of water supply.

Legislation/Regulation	Relevance to service/assets
LGA 2002 and Amendments	This Act sets the statutory requirements for local governments and includes the mandatory preparation and adoption of a 30 year Infrastructure Strategy that underpins each LTP.
Building Act 2004 and Amendments	In New Zealand, the building of houses and other buildings is controlled by this Act. It applies to the construction of new buildings as well as the alteration and demolition of existing buildings.
Fire and Emergency New Zealand Act 2017 and Amendments	This Act provides the framework under which Fire and Emergency New Zealand operate.
Resource Management (National Environmental Standards for Freshwater) Regulations 2020 (Freshwater NES)	The Freshwater NES regulates activities that pose risks to the health of freshwater and freshwater ecosystems.
Operative New Plymouth District Plan (2005) and Proposed District Plan (2023)	The District Plan includes objectives, policies and rules that manage the adverse effects of activities on the environment with a focus on land use and subdivision activities.
Regional Fresh Water Plan (2001)	The Regional Fresh Water Plan promotes sustainable management of the region's freshwater resources by applying rules and conditions to various activities. The Plan is currently under review.
Civil Defence Emergency Management Act 2002 and Amendments	The Act requires that an emergency management plan is maintained and reviewed annually and that it is accepted as suitable by independent review.
HSNO Act 1996 and Amendments	The use of hazardous substances at any water supply sites needs to comply with the HSNO Act.
Health and Safety at Work (Hazardous Substances) Regulations 2017	The regulation of hazardous substances that affect human health and safety in the workplace. Of relevance is the handling of hazardous substances to treat drinking water.
Climate Change Response Act 2002 and Amendments	This Act created a legal framework for New Zealand to ratify the Kyoto Protocol and to meet obligations under the United Nations Framework Convention on Climate Change.

Legislation/Regulation	Relevance to service/assets
Public Works Act 1981 and Amendments	This Act acknowledges that works often cannot be carried out without affecting private landowners. It provides the Crown with legislative powers to compulsorily acquire land for public works so that public works proposals are not unreasonably delayed.
Water Supply Services Management System and Contracts	The service levels, strategies, and information requirements described in the AMP are incorporated within contract specifications, Key Performance Indicator and reporting documentation.
New Zealand Standard (NZS) 4404:2010 – Land development and subdivision infrastructure	This Standard provides criteria for design and construction of land development and subdivision infrastructure.
Land development and subdivision infrastructure standard (local amendment Version 3)	This Standard was jointly prepared by NPDC, South Taranaki District Council (STDC) and Stratford District Council (SDC) and is based on NZS 4404:2010.
Water and Sanitary Assessment (2009)	This document provides an assessment of water services as required by the LGA.
Infrastructure Asset Grading Guidelines 1999	This is a guide used when carrying out condition assessments to determining the grading of assets life and condition.
Water, Wastewater and Stormwater Services Bylaw (2008, amended and readopted in 2014)	Part 9 of this Bylaw covers specific requirements for water supply additional to the general requirements in the Bylaw.
Guidelines for Earthworks (2006)	The aim of these guidelines is to provide guidance to consulting engineers and contractors working within the Taranaki region, on practical measures to help them meet the conditions of the earthwork activities rules contained in the Regional Fresh Water Plan.

Appendix 2 – Operations, Capital and Maintenance Expenditure Forecast

The following is a complete list of the forecast costs associated with operations and maintenance for the ten-year term of this plan. Future iterations of this plan will improve the breakdown classification.

Table A3.1: Operations and Capital Expenditure forecast

Activity	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34	Total
General Operating Costs	$2.27M	$3.22M	$3.60M	$4.47M	$2.33M	$2.38M	$2.54M	$2.46M	$2.83M	$3.00M	$29.09M
Direct Costs	$4.45M	$5.10M	$5.81M	$6.12M	$6.27M	$6.43M	$6.60M	$6.79M	$7.00M	$7.26M	$61.82M
Internal Charges	$4.96M	$5.43M	$5.33M	$5.51M	$5.62M	$5.71M	$5.70M	$5.75M	$5.79M	$5.89M	$55.68M
Total Operating Expenditure	**$11.68M**	**$13.74M**	**$14.73M**	**$16.10M**	**$14.22M**	**$14.52M**	**$14.83M**	**$15.00M**	**$15.63M**	**$16.15M**	**$146.59M**
Level of Service	$3.76M	$5.46M	$4.92M	$5.12M	$7.44M	$7.83M	$7.59M	$6.16M	$1.96M	$2.82M	$53.07M
Growth	$5.76M	$4.45M	$5.20M	$5.27M	$3.24M	$0.46M	$0.64M	$2.51M	$4.33M	$5.23M	$37.10M
Renewals	$6.91M	$8.93M	$10.61M	$8.43M	$6.65M	$7.00M	$6.94M	$11.20M	$11.81M	$11.80M	$90.27M
Total Capital Expenditure	**$16.42M**	**$18.85M**	**$20.74M**	**$18.81M**	**$17.34M**	**$15.29M**	**$15.17M**	**$19.87M**	**$18.09M**	**$19.85M**	**$180.43M**

Table A3.2: Maintenance expenditure forecast

Activity	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34	Total
Planned Maintenance	$1.57M	$1.89M	$2.24M	$2.40M	$2.46M	$2.54M	$2.62M	$2.71M	$2.81M	$2.93M	$24.15M
Reactive Maintenance	$1.52M	$1.83M	$2.17M	$2.32M	$2.38M	$2.45M	$2.53M	$2.62M	$2.72M	$2.84M	$23.38M
Emergency Maintenance											
Total Maintenance Expenditure	**$3.09M**	**$3.72M**	**$4.41M**	**$4.71M**	**$4.85M**	**$4.99M**	**$5.15M**	**$5.32M**	**$5.53M**	**$5.77M**	**$47.53M**

Appendix 3 – Project Prioritisation Matrix

SCORE	**Criteria 1 – Strategic Alignment** *How well does this opportunity contribute to the delivery of our goals, vision & strategies?*	**Criteria 2 –Benefits** *What benefits (efficiency, innovation, social or economic) will the community gain from this opportunity?*	**Criteria 3 – Level of Services** *How does this project Impact our level of service?*	**Criteria 4 – Risk Mitigation** *How does this project mitigate overall risk profile?*	**Criteria 5 – Ease of Execution** *How easy is this project to execute? Any quick wins?*
Weight	***35%***	***20%***	***15%***	***15%***	***15%***
5	• Contributes to all community outcomes or corporate goals OR is required to achieve one outcome / goal • Critical community demand (>80%) via pre-consultation	• Significantly improve delivery efficiency, digital interaction, or innovation (impact more than 75% ratepayers or employees) • Significant measurable benefits to local economy • Significant measurable social benefits • Cost Benefit Ratio (CBR) > 3 • 100% externally funded (including most internal costs), with a CBR>1	Addresses failure to meet existing stated levels of service	NPDC or the community is exposed to very high risks (*) (*) as per NPDC risk framework	Business As Usual activity, already scoped and well defined, easy to implement (Tier 5)
4	• Contributes to three community outcomes or corporate goals OR very strong contribution to one outcome / goal • Enabler to an approved Council strategy, policy or framework • Key community Demand (>60%) • Support delivery of cultural narrative and partnership with Tangata Whenua • Included in community board plan	• Significantly improve delivery efficiency, digital interaction or innovation (impact more than 50% ratepayers or employees) • Some benefits to local economy • Some social benefits • Cost Benefit Ratio (CBR) > 2 • Attract external funding contributing to more than 80% of project costs	Maintains existing levels of service	NPDC or the community is exposed to high risks (*)	Very low complexity project - typically Tier 4, Roadmap 0

3	• Contributes to two community outcomes or corporate goals OR strong contribution to one outcome / goal • Contribution to an approved Council strategy, policy or framework • Important community Demand (>40%)	• Improve delivery efficiency, digital interaction or innovation (impact more than 35% ratepayers or employees) • Cost Benefit Ratio (CBR) > 1 • Attract external funding contributing to more than 60% of project costs	• Increases level of service: - across the District - to support bringing community together - to support vulnerable part of the community	NPDC or the community is exposed to medium risks (*)	Low complexity project - typically Tier 3, Roadmap 1
2	Contributes to one community outcome or one corporate goal	• Some improvement to delivery efficiency, digital interaction or innovation • Attract external funding contributing to less than 60 % of project costs	Increases level of service for part of the community	NPDC or the community is exposed to low risks (*)	Medium complexity project – typically Tier 2, Roadmap 2
1	No contribution to community outcomes or corporate goals	• Do not attract external funding • No social or economic benefits	No impact on level of services	NPDC or the community is exposed to very low risks (*)	High complexity project - typically Tier 1, Roadmap 3

Appendix 4 – Alignment between AMP templates

There were quite significant modifications made between the 2021 Asset Management Plans and these 2024 Asset Management Plans. The below colour coded list shows where the information can be found in the old template. Bold colours represent major sections, lighter tints represent subsections. Section headers 3 tiers and below have been removed.

A large amount of the more detailed content has been moved into the Appendices where it is visible but does not disrupt the flow of the overall plan for the reader. Sections without a colour tag are new or sufficiently different that there is no equivalent in the old template.

2021 AMP Contents		2024 AMP Contents	
1	Executive Summary	1	Executive Summary
2	Introduction	2	Introduction
2.1	Asset Descriptions	2.1	Background
2.2	Asset Information and Data	2.2	Asset management planning
3	Strategic Framework	3	Levels of Service
3.1	Strategic Alignment	3.1	Customer research
3.2	Key Issues	3.2	Strategic and corporate goals
3.3	Statutory and Regulatory requirements	3.3	Legislative requirements
4	Levels of Service	3.4	Customer values
4.1	Customer Levels of Service	3.5	Levels of Service
4.2	Technical Levels of Service	4	Future demand
4.3	Level of Service Projects	4.1	Demand drivers
5	Future Demand	4.2	Demand forecasts
5.1	Growth Projects	4.3	Demand impact and management plan
6	Lifecycle	4.4	Asset programmes to meet demand
6.1	Identify need and plan	4.5	Climate change adaptation
6.2	Design and Build	5	Lifecycle management plan
6.3	Operations and Maintenance	5.1	Background data
6.4	Renewals	5.2	Operations and maintenance plan
6.5	Disposals	5.3	Renewal plan
7	Risk management	5.4	Acquisition plan
7.1	Risk assessment	5.5	Disposal plan
7.2	Infrastructure resilience approach	5.6	Summary of forecast costs
8	Financial summary	6	Risk management planning
8.1	Funding strategy	6.1	Critical assets
8.2	Valuation forecasts	6.2	Risk assessment
8.3	Expenditure forecast summary for opex and capex	6.3	Resilience
8.4	Level of service project capex expenditure forecast summary	6.4	Service and risk trade-offs
8.5	Growth project capex expenditure forecast summary	7	Financial summary
8.6	Opex projects related to capex projects expenditure forecast summary	7.1	Financial sustainability and projections

Te Kaunihera-ā-Rohe o Ngāmotu
New Plymouth District Council

Plan owner:	Manager Three Waters	**Content owner:**	L. Rock
Approved by:	General Manager Operational Excellence	**Date approved:**	30 April 2025
Review period:	3 years	**Next review:**	30 June 2026
Document No:	ECM: 9496411	**Version:**	Final
Type:	Asset Management Plan		

REVISIONS

Version	Description	Written by	Revision date	Peer Reviewer(s)	Final Approver	Approval Date	Issue date
Final	New document	L. Rock	Feb 2023 – Apr 2025	A. Humphrey, M. Coronno	S. Downs	30 April 2025	30 April 2025